INTEGRATED REPORT 2022

HUMAN
TECHNOPOLE

INTEGRATED REPORT 2022

TABLE OF CONTENTS

Letter to stakeholders

Dear Stakeholders,

2022 has been a year of intense work and transition for the Human Technopole Foundation that has witnessed the appointment of the governance bodies with the start of the new Consiglio di Sorveglianza's term of office on 7th July 2022 and reappointment of the Management Committee on 20th October 2022. In this regard, we must express our sincere thanks to those who established and ran the Foundation in its early years: Professor Marco Simoni and Professor Iain W. Mattaj who, in their respective roles of first Chairman and Director, have contributed to Human Technopole's development with commitment and dedication, also guiding us through the crucial period of the pandemic.

In summarising the main achievements of 2022, we are pleased to highlight the first tangible accolades for the scientific research conducted by our researchers. In addition to important publications in the most prestigious scientific magazines and journals and partnerships with Italian and foreign Research Institutes and Universities, we would also like to mention the awarding of several research grants by international institutions (including the European Research Council, HEU, EMBO, AIRC - Italian Cancer Research Foundation - and others).

2022 also witnessed completion of public consultation prior to the launch of the Foundation's research centre activities assigned by the Government in 2019 and identification of the first National Facilities that indicate Human Technopole as an entity capable of offering facilities with high technological impact for the entire national biomedical research community. Various training schemes have been implemented and developed, also covering matters of specific relevance to the Centre for Innovation and Technology Transfer (CITT) that our Foundation has set up as a complementary activity at Parliament's request.

But 2022 is also an important year for the document you are holding. This third issue of the Integrated Report continues with its aim of sharing the Human Technopole development path with all Stakeholders in a comprehensive, transparent manner, through an accountability model that can represent an exemplary benchmark for Italian and foreign research institutes. The 2022 integrated report has also made significant progress from a technical viewpoint. An example is provided by implementation of the requirements of the GRI 3 standard that integrates the materiality analysis focused on Foundation strategic objectives through representation of the Foundation's most significant impacts on matters of sustainability in its broadest sense encompassing the three areas typically found in literature, i.e. environmental sustainability, social accountability and governance.
All this confirms our commitment to follow as best we can the core values of innovation, sustainability, knowledge sharing, behavioural integrity and transparent relations in all our dealings with other parties that characterise the Human Technopole mission.

We wish you a pleasant read.

Gianmario Verona

Chairman of the Consiglio di Sorveglianza

Fabio Terragni

Chairman a.i. of the Management Committee

Methodology note

The Integrated Report is the tool used to describe how the Human Technopole Foundation (hereinafter "HT" or "Foundation") generates sustainable short-term and long-term value.

The purpose of this document is to illustrate, analyse and assess the resources utilised by the Foundation to achieve its specified strategic objectives. In addition to being the result of an organisational and cultural process designed to extend conventional financial reporting, the Integrated Report is also a means of facilitating the coordination of internal departments in collecting and organising the information needed for the decision-making process.

Furthermore, the document clearly explains the methods of integration of economic, social and environmental sustainability employed in decision-making processes, strategy and governance, as well as the methods of interaction and engagement with both direct and indirect stakeholders.
Finally, the Integrated Report addresses the need to bring transparency to the Foundation's path towards responsible and sustainable growth as far as organisational behaviour, operating procedures and activities are concerned.

The Foundation is publishing its third Integrated Report and in 2022, by implementing the provisions of the new GRI 3, it began to identify the material topics which, based on their potential impacts on the economy, environment and people, formed the core of its eight strategic objectives, details of which you can find under subchapter 2.3 "*Strategy*".

REPORTING GUIDELINES AND PROCESS

The Integrated Report has been developed in accordance with the provisions of the IIRC (International Integrated Reporting Council- Integrated Reporting) Framework and drafted in conformity with GRI Standards: "**in accordance**" option (**GRI - Home (globalreporting.org**).

As in previous years, several performance indicators not mentioned in GRI Standards have been utilised with the twin objectives of (i) effectively portraying their connection with the eight strategic objectives laid down by the Foundation and (ii) monitoring the extent to which they have been achieved.

Although not amongst the requirements specified by Legislative Decree No. 254/2016, the Human Technopole Integrated Report pays special attention to the issues and areas mentioned therein. These issues are given extensive coverage in the reporting of the current situation and in the numerous projects implemented through specific corporate policies and processes designed to monitor and improve both non-financial performance and the efficiency of operational processes.

During 2022, the Foundation paid special attention to "sustainability" issues. More specifically, an advisory committee to the *Consiglio di Sorveglianza* known as the "Sustainability Committee" was established; its functions are to advise on ESG issues.

As regards the strategic objective of Sustainability, early in 2022 the Foundation approved the Gender Equality Plan, a policy paper laying down a series of actions and measures that confirm HT's commitment to gender equality issues. The plan responds to the guidelines of the European Institute for Gender Equality (EIGE) as it aims to identify and implement innovative strategies to promote cultural change and equal opportunities in universities and research centres. The Plan is implemented by the Gender Equality Team (GET), i.e. a coordinating team that monitors and supports implementation of the measures specified in the plan.

For details of the activities performed by GET in 2022, please refer to subchapter 2.2 "*Value creation system*" under the "*Human Capital*" section.

Special attention has also been paid to environmental and social issues through the implementation of regulations aimed at environmental protection, compliance with the principles of legality and transparency, promotion of equality and inclusion and combating any form of discrimination.

In order to produce the Integrated Report, an engagement process involving the active participation of both the administrative and research support organisational areas, as well as the scientific groups has been implemented. More specifically, the reporting process is based on the integrated information systems established at the Foundation that use special data collection and analysis tools. The data is mainly processed by extraction from the enterprise resource planning software and careful calculation and estimates were utilised in the case of the specific reports received. Research Centre and Facility staff were directly involved in the case of some content of the Integrated Report, e.g. information about the areas of research or infrastructures.

As regards the construction process for the Integrated Report, the Foundation's ongoing aim is to further strengthen and organise the information system by integrating the ERP software currently used by the various scientific and administration departments with an integrated system containing business intelligence applications to ensure transparent, fully digital management of financial, documentary and operating records. Furthermore, bearing in mind the regulatory developments relating to the reporting of non-financial performance, we are considering the implementation of specific software for optimised management of the performance details and indicators underlying the Foundation's strategic objectives.

As mentioned earlier, following on from the document structure employed in previous years, the Integrated Report has been organised in accordance with the IIRC framework.

We have detailed and described the capitals (Financial, Infrastructural, Intellectual, Human and Relational) forming the resources available to HT and used to achieve strategic objectives. In addition, special attention has been paid to the Foundation's value creation system, by illustrating the main activities performed and their connection with the above-mentioned strategic objectives.

Adequate information has also been provided on the HT governance structure, strategy and key practices and policies in place along the entire value creation chain, as well as details of stakeholder engagement performed by the Foundation. In addition, extensive coverage is given to the links between Foundation strategic objectives and UN Agenda 2030 sustainable development goals. More specifically, as regards sustainable development goals, in accordance with the new **Standard GRI 3**: **Material Topics**, the Foundation has begun the process of determining the material topics representing its most significant impacts on the economy, environment and people. For details of this process, please see subchapter 2.1 "*Stakeholder engagement and materiality matrix*".

With an eye to the future, the risks and opportunities arising from both the internal and external context have been analysed and specific details can be found herein under subchapter 3.1 "*Risks and opportunities*".

Finally, there is a section covering HT financial performance as reported in the financial statements for the year ending 31st December 2022 and approved on 20th April 2023.

As regards the reporting principles utilised, in order to provide a complete picture, the following details are provided:

PRINCIPLES FOR DEFINING INTEGRATED REPORT CONTENT

REPORTING PRINCIPLES	APPLICATION METHODS
ACCURACY	HT reports qualitative information that is consistent with available evidence and other reported information, indicating and describing data measurements and bases for calculations. Furthermore, HT ensures that the margin of error for data measurements does not inappropriately influence the assessment of stakeholders and indicates which data has been estimated
BALANCE	HT reports information in an unbiased way and provides a fair representation of its negative and positive impacts, not omitting information concerning its negative impacts and not overemphasising positive news or impacts
CLARITY	HT reports information in a way that is understandable, using graphs and tables to make it accessible to everyone. HT presents information in a way that it can be understood by users who have reasonable knowledge of the Foundation and its activities
COMPARABILITY	HT reports information consistently to enable an analysis of changes in its impacts over time and an analysis of these impacts relative to those of other organisations. When available, HT also presents information from the previous period and maintains consistency in the methods used to measure and calculate and in explaining the methods and assumptions used
COMPLETENESS	HT reports all material matters that have emerged from the materiality analysis and assesses them on the basis of their impact boundaries. As regards the reporting of ESG impacts, this is performed on the basis of the levels of significance previously determined, details of which can be found under subchapter 2.1 herein
SUSTAINABILITY CONTEXT	HT reports corporate non-financial and sustainability performance by considering the context in which it operates and the numerous standards and normative references such as ESG, SDGs, GRI Standards: **in accordance** option. HT performs an annual materiality assessment designed to determine the maximum material impacts for both the Foundation and its stakeholders (through engagement activities). In accordance with the new GRI 3, impact assessment has been extended to ESG issues
TIMELINESS	HT indicates the time period covered by the reported information, ensuring consistency in the length of reporting periods. HT publishes information on a regular basis after the reporting period has ended
VERIFIABILITY	HT gathers, records, compiles, and analyses information in such a way that the information can be examined to establish its quality. The Integrated Report undergoes external assurance conducted by a firm of auditors

There have been no significant changes in the reporting scope compared to previous issues of the Integrated Report. Besides retaining the performance indicators from previous years, other KPIs representative of the activities carried out by the Foundation have been added.

The 2022 Integrated Report has been verified by a specially appointed firm of auditors. The reference standard used to certify the document is the international standard on auditing "International Standard on Assurance Engagements 3000 (Revised) - Assurance Engagements Other than Audits or Reviews of Historical Financial Information" (hereinafter also "ISAE 3000 Revised"), issued by the "International Auditing and Assurance Standards Board" (IAASB).

REPORTING PERIOD

The information contained herein refers to the period 01/01/2022-31/12/2022. Nevertheless, the document also mentions activities that began in early 2023. In addition, where possible, the reported data has been compared to the previous financial year.

GRI STANDARDS

Where possible, sustainability details are reported in accordance with the provisions of GRI Standards: **in accordance** option and suitably identified using the respective reference number. As regards *Foundations*, *General Disclosures* and *Material Topics*, we have considered the provisions of GRI 1, GRI 2 and GRI 3, effective for reports published on or after 1st January 2023.

CAPITALS

As previously mentioned, HT creates value over time using the resources represented by the following five "capitals":

Financial, i.e. the financial resources, allocated by public and private funds, made available to HT in order to carry out its activities;

Infrastructural, i.e. owned or leased real estate, facilities, structures, infrastructures, machinery and equipment;

Intellectual, i.e. scientific know-how, operational processes and procedures designed to guarantee the quality of activities;

Human, i.e. the intangible asset represented by the skills, abilities and experience of scientific and administrative staff;

Relational, i.e. the relationships with the main stakeholders and partnerships with other scientific institutes or universities.

STRATEGIC OBJECTIVES

The following table specifies the eight pillars of the HT strategy identified by a specific set of symbols:

Generate **innovation and quality of research**

Develop and provide **infrastructures and innovative research instruments**

Attract and train **research talents** and share **research outputs**

Obtain **scientific reputation** and promote **dissemination**

Promote **innovation through research**

Contribute to **sustainability (environmental, social and economic)**

Build **partnerships and networking** and promote **stakeholder engagement**

Achieve **effectiveness and efficiency of operational processes**

SUSTAINABLE DEVELOPMENT GOALS (SDGs)

HT strategy is also based on the sustainable development goals of UN Agenda 2030.

The UN goals considered most pertinent to HT activities are then linked to the strategic objectives in order to highlight their specific, interconnected relationships. Furthermore, we have determined and analysed the actual and potential impacts that the Foundation's strategic activities have on the economy, environment, and people. These impacts, summarised as six ESG material topics, have been assessed according to the level of significance, also determined through stakeholder engagement, and prioritised.

The following table specifies the ten SDGs to which HT can or does provide or the largest contribution:

The following scheme specifies the six ESG material topics summarising the actual and potential impacts on the economy, environment and people:

GOVERNANCE AND ETHICS

SOCIAL ISSUES AND PEOPLE

ENVIRONMENTAL PROTECTION

HEALTH AND SAFETY IN THE WORKPLACE

GENDER EQUALITY

RESEARCH AND INNOVATION

REFERENCES

For comments, requests, opinions and ideas for improvement regarding HT sustainability activities and the information contained herein, please contact the HT Finance team by sending an e-mail to the following address: **ht-dept-finance@fht.org**.

01 ABOUT US

Human Technopole is the institute for life science research located in the heart of MIND – Milan Innovation District.
Born upon impulse of the Italian Government, HT carries out basic research aimed at developing innovative approaches to personalised and preventive medicine

1.1 Mission, vision and values

Human Technopole Foundation is an Italian Life Science research institute whose interdisciplinary approach seeks to promote innovation in the health sector and improve health and wellbeing.
After having represented and extolled Italian excellence to millions of visitors during EXPO 2015, the Italian government decided to take up the legacy of the universal exhibition by establishing an open research centre to promote collaboration and bring added value to the Italian and international scientific research ecosystem. After complete conversion and renovation, "**Palazzo Italia**", the former Italian EXPO 2015 exhibition hall, now forms the HT corporate premises.

Using an interdisciplinary approach based on knowledge creation and sharing, HT promotes innovation in the health sector and seeks to improve health and well-being.

HT is a foundation, established by Law No. 232 dated 11th December 2016, with which the Government decided to implement a project based on the setting up of an integrated multidisciplinary scientific research complex of national importance in the fields of health, genomics and data and decision science. The HT Founder Members are **the Economy and Finance Ministry, the Health Ministry and the Ministry for University and Research (University and Research Ministry)** that also perform supervisory duties.

The Foundation mission has been extended under the terms of article 1, paragraph 275-277, of Law No. 160 dated 27th December 2019 that also assigns HT the specific function of science and technology park to support national scientific research, using an integrated multidisciplinary approach, in compliance with the principles of full access for the national scientific community, publication and transparency of activities and verifiability of scientific results achieved, in accordance with international best practices.

In order to implement this additional legislation, on 30th December 2020, HT signed an Agreement with the Founding Ministries to set up, manage and promote the so-called National Facilities. National Facilities are facilities which have a high technological impact on the national scientific community in order to conduct high-quality research.

Furthermore, pursuant to Law No. 77 dated 17th July 2020, the government has assigned HT a further mission, i.e. to establish a "Centre for Innovation and Technology Transfer in the field of life sciences", providing sufficient financial resources to support innovative processes proposed by public and private entities from the research and innovation system.

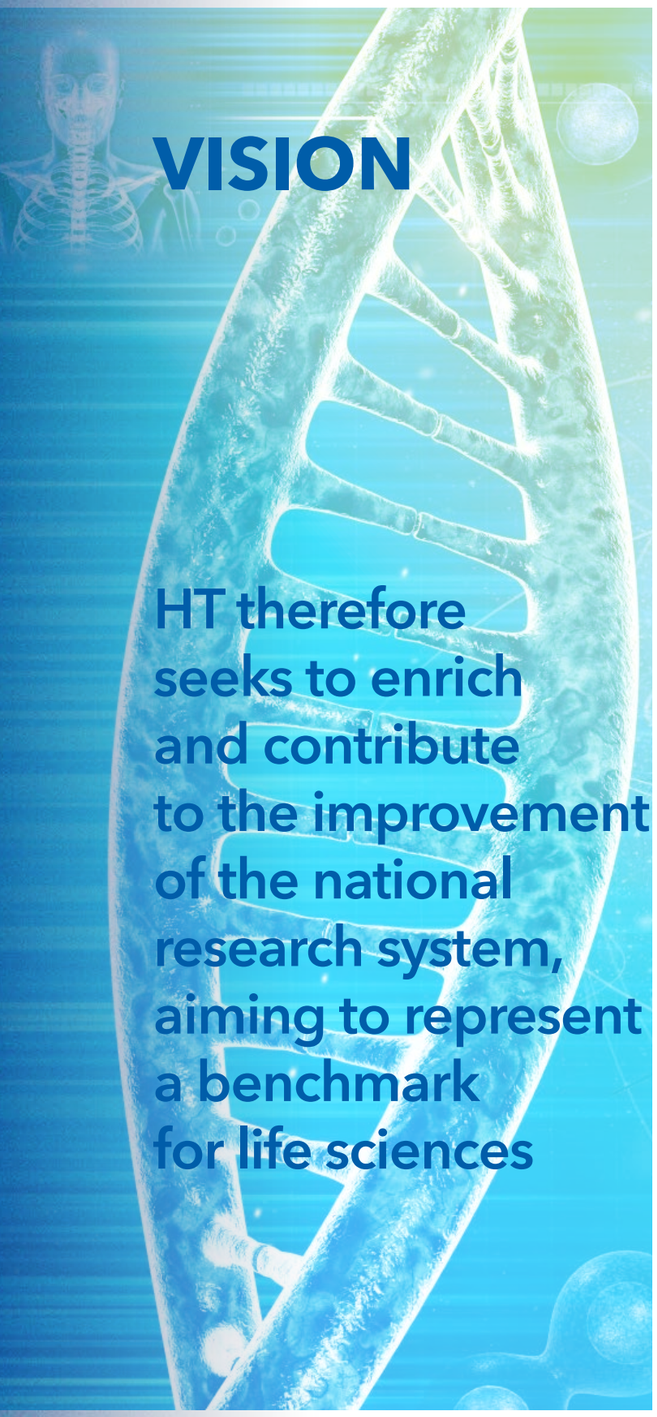
Finally, following publication in Official Journal No. 234 dated 30th September 2021, HT has been recognised as an institutional unit of the public bodies included in the consolidated profit and loss account (ISTAT list) selected pursuant to article 1, paragraph 3, of Law No. 196 dated 31st December 2009 as amended (Accounting and Government Finance Act).

MISSION

The HT mission is to improve human health and well-being

The mission will be achieved by:

- **establishing and running** scientific services and facilities that can be made available to external scientists, thus meeting the requirements of national and international life science research communities;
- **performing** frontier life science research aimed at developing innovative approaches to personalised and preventive medicine;
- **organising and offering** career development and opportunities for the next generation of scientists;
- **driving innovation and progress** by promoting technology transfer and engaging with industry in order to help turn scientific discoveries into tangible applications for the benefit of patients and society;
- **disseminating** scientific activities and achievements to strengthen the message that science is a public asset.



Scientific excellence is the guiding principle for all HT activities. HT's vision is that of an internationally competitive research institute, applying the highest standards in biomedical research. HT staff are recruited through international, open calls and strict meritocratic selection procedures carried out by internal and external experts in the various fields. The aim is to attract the most talented scientists and provide them with an optimal environment in which to pursue their research interests, as well as help to create a dynamic, constantly evolving scientific environment allowing continuous development of the institute's skills and scientific profile.

At the same time, HT wants to train highly-qualified researchers who, after leaving the institute, can enrich the national scientific community, having a beneficial long-term cascade effect on the country's research system.

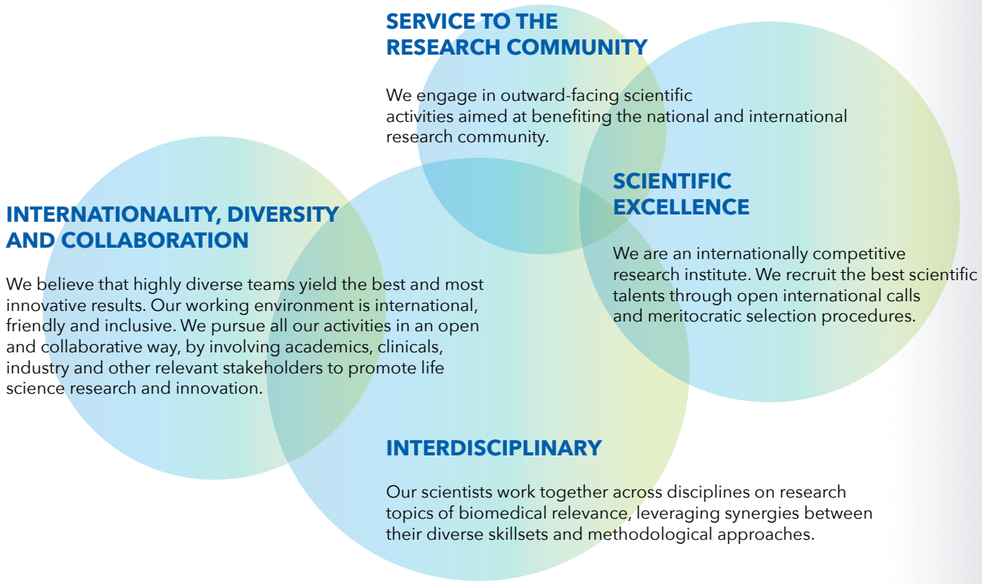
HT serves the national scientific community, also by granting access to hi-tech scientific facilities and offering high-level training opportunities through research and coordination partnerships in specific areas.

Furthermore, HT's research vision is based on a mix of fundamental and translational research. Indeed, HT boasts extensive fundamental research expertise in areas key to understanding human biology and physiology. On the other hand, it is expected that translational, more medically-oriented research will mostly be conducted in collaboration with external organisations and industrial, clinical and hospital partners.

HT therefore seeks to enrich and contribute to the improvement of the national research system, aiming to represent a benchmark for Italian life sciences.

VALUES

The values shown in the following figure are put into practice under the terms of the behavioural principles contained in the Foundation Code of Ethics:



The Foundation's general ethical principles represent the fundamental values of the operating procedures designed to achieve the institutional purpose. These are shown in the following figure:

- LEGALITY
- COMPLIANCE WITH ISTITUTIONAL PROCEDURES
- TRANSPARENCY
- FAIRNESS IN THE EVENT OF POTENTIAL CONFLICTS OF INTEREST
- COMPLIANCE WITH THE SYSTEM OF POWER OF ATTORNEY AND THE MANDATE
- PRIVACY
- DILIGENCE
- IMPARTIALITY AND NON-DISCRIMINATION
- PROTECTION OF THE INTEGRITY AND DEVELOPMENT OF HUMAN RESOURCES
- OPPOSITION TO RACISM AND XENOPHOBIA
- INTERNAL CONTROLS
- HEALTH, SAFETY AND ENVIRONMENTAL PROTECTION
- PROTECTION OF INSTITUTIONAL ASSETS
- PROPER USE OF THE INFORMATION SYSTEM AND COPYRIGHT PROTECTION
- FAIRNESS IN THE PERFORMANCE OF SCIENTIFIC ACTIVITIES
- REPUDIATION OF CRIMINAL ORGANISATIONS
- ANTI-CORRUPTION AND ANTI-MONEY LAUNDERING COMPLIANCE
- CAREFUL MANAGEMENT OF THE FINANCIAL RESOURCES, PREPARATION OF THE FINANCIAL STATEMENTS AND OTHER INSTITUTIONAL COMMUNICATIONS
- REPUDIATION OF TERRORISM AND SUBVERSION OF THE DEMOCRATIC SYSTEM
- RELATIONSHIPS WITH SUPERVISING MINISTRIES, PUBLIC SUPERVISORY AUTHORITIES, CONTROL BODIES AND PUBLIC INSTITUTIONS IN GENERAL
- TAX COMPLIANCE

1.2 Research Centres and scientific Facilities

THE SCIENTIFIC CONTEXT

In biomedical sciences, the ultimate aim of research is to improve personal health and wellbeing. Today, this is especially important since our society is ageing rapidly due to increased life expectancy, declining fertility rates and rapid social and economic development. Many people are living longer, but not necessarily living well or in good health, and strenuous efforts to prevent and manage disease are required in order for people of all ages to enjoy a better quality of life.

Health, ageing and quality of life are intricately affected by a combination of intrinsic factors, primarily related to the genetics of each one of us, and extrinsic factors, such as lifestyle and environment. Due to their complexity and effect on biological mechanisms, traditional approaches to disease are no longer considered sufficient.

Against this background, a new approach to human health research is under development. Based on causal pathways including genes, environment and lifestyle, this approach increasingly leads to an etiology-based treatment of illness.

Great technological advances over the last decade have paved the way for systematic interrogation of the entire human genome (the complete DNA sequence of an individual) and other aspects of human biology. These include the epigenome (modifications to the genome that often occur in response to the environment and alter gene expression and function), the transcriptome (all the RNAs transcribed from the genome), the proteome (all the proteins made from RNAs) and the metabolome (all metabolites found in a cell, organ, tissue or organism).

At the same time, digital technology and advanced computational analysis generate comprehensive datasets comprising a variety of information about many individuals and the methods required for its analysis. As a result, we are experiencing a new era in biomedical research in which important biological issues directly related to human health can be tackled, at least in part, by studying human subjects directly and, where necessary, still using model organisms and other simpler systems.

Integrating and leveraging the information from these massive amounts of data has boosted scientists' chances of developing stratified approaches and better strategies with more emphasis on fighting or preventing disease in a "personalised" or "stratified" approach to health whereby information about a person's genetic makeup or his diseased tissue is used to select the most appropriate course of action.

A certain number of these personalised treatments are already in use in diseases such as cancer, cystic fibrosis or hereditary forms of blindness. Development of these treatments depends on having both knowledge of the specific DNA or protein sequence of the "disease gene" in the patient and a deep understanding of how a genetic change in that gene or protein can give rise to a disease state. It is widely believed that stratified or personalised approaches will change the way many illnesses are treated, to the extent that many countries, including the United Kingdom, Finland, Iceland and the USA, are undertaking large-scale genomic sequencing studies as part of the cohort analysis of individuals whose health and wellbeing are monitored over many years.

At the same time, other types of large-scale data from a range of sources, for example clinical or socioeconomic data, can be leveraged in a similar way to develop new public health strategies or improve health system management, whilst also maximising personal health and wellbeing.

Clearly, in its current state as described, health research requires a holistic, multi-scale approach and further development of new disciplines.

In view of the current, unprecedented opportunities for health research, the idea of establishing an Italian life science centre the size of HT seemed extremely appropriate.

RESEARCH AT HT

Against this backdrop, HT has decided to establish broad-based research centres with disciplines or fields covering many different aspects of human health and disease.

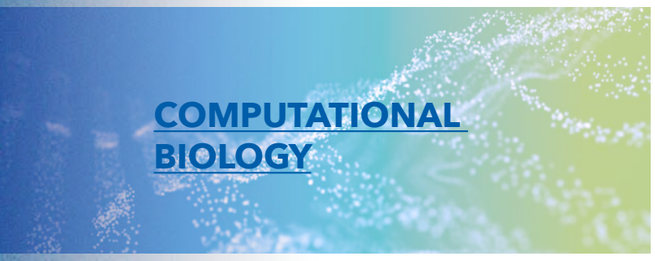
The reasoning behind this strategic decision is, on the one hand, to increase the possibility of recruiting outstanding research leaders, regardless of their specialist field and on the other hand, maximise opportunities for interdisciplinary collaboration, both inside and outside HT, that can be applied to a wide range of biological and health problems.

HT's contribution to human health is represented by a comprehensive, interdisciplinary approach to human biology study aimed at understanding basic physiological and disease mechanisms in order to help tackle some of the most important health challenges.

HT's research work helps to increase understanding of and develop new therapeutic strategies for various disease groups, including some chronic and degenerative diseases.

Five complementary areas of great importance to biomedical and health research have been selected to form the basis of HT's research strategy: Genomics, Neurogenomics, Structural Biology, Computational Biology and Health Data Science.

THE RESEARCH CENTRES



GENOMICS

The Genomic Research Centre aims to identify the complex mechanisms regulating gene expression and how heritable genetic information defines phenotypic traits. The Centre develops technology to study the essential mechanisms regulating genome activity in all cells of the human body, both healthy and diseased. Within the context of precision medicine, when applied to humans, this type of research can identify molecular targets and markers for disease prevention, early diagnosis and personalised treatment.

In addition to carrying out genetic and genomic studies with a focus on disease-associated mechanisms, the Centre aims to implement large-scale genomic screening projects for patient stratification.

The Genomic Research Centre currently features two complementary research programmes: Medical and Population Genomics (i.e. the use of genomic information to pinpoint the genetic causes of specific defects) and Functional Genomics (i.e. the development and use of new methods to study interactions between individual genomes and biological function).

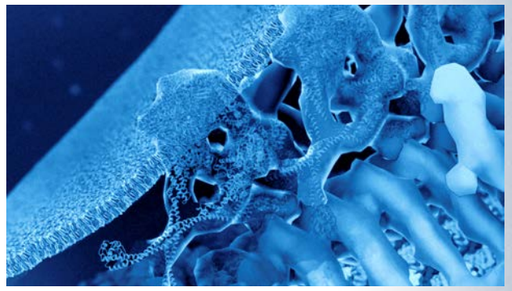
AS AT 31ST DECEMBER 2022, EIGHT RESEARCH GROUPS HAVE BEEN SET UP IN THE GENOMIC CENTRE, ONE OF WHICH IS SCHEDULED TO BEGIN ITS ACTIVITIES IN 2023.

NEUROGENOMICS

Neurogenomic research studies the mechanisms responsible for human neuropsychiatric and neurological disorders, ranging from neurodevelopmental to neurodegenerative disorders, combining basic and translational research through different experimental systems and computational approaches (from brain organoids to animal models and epidemiological cohorts) to probe nervous system structure, function and development at multiple scales of resolution.

AS AT 31ST DECEMBER 2022, THE NEUROGENOMIC CENTRE WAS RESPONSIBLE FOR FIVE RESEARCH GROUPS.

STRUCTURAL BIOLOGY



How do macromolecular machines work and harmonise their activities in order to form a fully functional cell? How are these processes regulated and what happens in human disease? The Structural Biology Research Centre seeks to answer these questions by gaining detailed knowledge of the structure of macromolecules and macromolecular complexes, thus enabling their function to be understood, also by leveraging synergies with the other HT research centres. The Structural Biology Research Centre employs a state-of-the-art Cryo-EM technology facility employing both single particle analysis (SPA) and Cryo-Electron Tomography (cryo-ET) to obtain high-resolution macromolecular structures both in isolation and in the cellular context. The Centre also employs complementary approaches, such as x-ray crystallography, single-molecule fluorescence microscopy, native and cross-linking mass spectrometry and a plethora of biophysical analyses to obtain details of macromolecular functional mechanisms.

AS AT 31ST DECEMBER 2022, THE STRUCTURAL BIOLOGY RESEARCH CENTRE WAS RESPONSIBLE FOR FIVE RESEARCH GROUPS.

COMPUTATIONAL BIOLOGY

The objective of the Computational Biology Centre is to develop new mathematical and computational approaches to analyse and interpret medical and biological data. At HT, computational biology is not just about developing new data analysis methods, but in addition focuses on the importance of posing essential questions about human biology and health that can only be addressed using computational approaches, from mathematical modelling of dynamical systems to machine learning and artificial intelligence. The Centre's ultimate goal is to make sense of the huge amount of data generated in biomedicine with a view to conceiving improved patient treatments. More specifically, one of the many research objectives is to identify cancer drug resistance mechanisms in order to predict tumour progression and thus take timely and effective action for every patient. The Computational Biology Centre is also expected to be involved in conceiving cancer drug discovery and repurposing methods, using functional genomics data from cancer vulnerability screening and in vitro models. In addition to analysing genetic data from model systems and patients, activities also focus on single-cell and multi-omic data analysis, as well as processing medical and microscopy images using artificial intelligence.

AS AT 31ST DECEMBER 2022, THE COMPUTATIONAL BIOLOGY CENTRE WAS RESPONSIBLE FOR FOUR RESEARCH GROUPS.

HEALTH DATA SCIENCE

Established in partnership with the Milan Institute of Technology, the Health Data Science Centre aims to assist in transforming scientific understanding and, as a result, disease prevention and treatment, through the use of large-scale data science in order to support tangible, innovative approaches that improve the health of the population.

The Centre aims to assist research with important new clinical knowledge through innovative integrative studies of genetic data, electronic medical records, imaging, wearable and biomolecular data. The ultimate goal is to create new IT infrastructures, analytical capabilities, data science methods and multidisciplinary research programmes that allow health research both in Italy and around the world to progress.

In order to achieve this objective, the Centre employs three complementary approaches:

- collection and integration of health data from various public sources, engaging with regional healthcare districts, hospitals and scientific societies;
- generation of new biomolecular data from population studies;
- improvement of data analysis and interpretation using new analytical methods integrated with clinical epidemiology and health research.

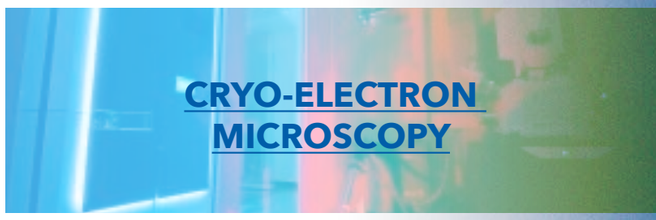
The Health Data Science Centre therefore aims to become a benchmark institute for large-scale health data analysis, working in close cooperation with national and international partners. The Centre's work reflects HT's global approach to life science that embraces basic research and the use of artificial intelligence and big data to improve health and wellbeing.

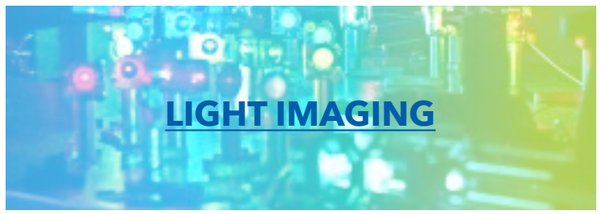
AS AT 31ST DECEMBER 2022, THE HEALTH DATA SCIENCE CENTRE WAS RESPONSIBLE FOR TWO RESEARCH GROUPS, ONE OF WHICH IS SCHEDULED TO BEGIN ITS ACTIVITIES IN 2023.

SCIENTIFIC FACILITIES

HT is developing state-of-the-art facilities on its Campus and will be home to the so-called "National Facilities" that can be used by Italian researchers through open, transparent calls for proposals and selection procedures.

The first technological facilities currently available to in-house research lines are:





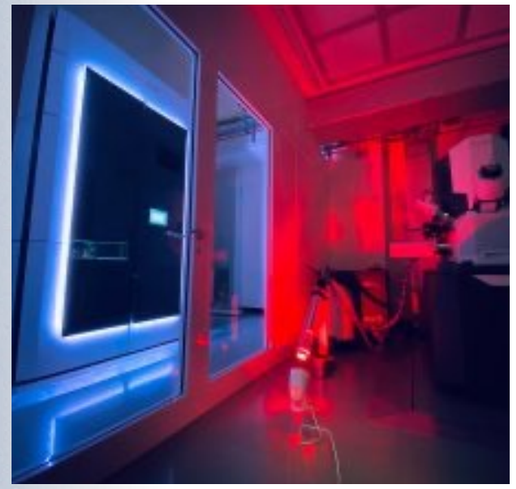
DATA CENTRE

Research activity requires considerable storage capacity to manage and analyse a huge amount of clinical information, biological data, images, etc. The Campus is therefore equipped with a data centre of high storage and computing capacity and an ultrafast broadband connection.

Completed last year, the Data Centre project witnessed the installation of new mechanical, electrical, special and fire-suppression systems for the DPC, Library and UPS rooms located in the Palazzo Italia basement. The design solution employed currently houses the new HPC systems composed of 60 compute nodes interconnected over an InfiniBand HDR100/25 Gb Ethernet network. The cluster is managed and made accessible to users by means of two redundant head nodes. All nodes access BeeGFS-based high-availability parallel storage of 2.1 PB capacity. The cluster also has a direct connection to central data storage installed inside the shelter, physically located in the equipment room outside Palazzo Italia. The DPC also houses the backup server, based on Bacula Enterprise with dedicated storage of 2.2 PB, and used to back up Virtual Machines, Office365 and the shares present in central data storage. Furthermore, the project also included the construction of a facility complete with cooling system and redundant power supply in a 2N configuration used for the IT load to ensure that the necessary temperature and humidity conditions are maintained.

For fire detection purposes, all rooms are equipped with smoke detector and air-sampling early fire detection system. In the event of fire, the NOVEC gaseous fire suppression system is triggered in order to extinguish it. Handling and monitoring of the systems' critical and sensitive alarms will be integrated with and managed by the Building Management System (BMS) currently installed in Palazzo Italia.

CRYO-ELECTRON MICROSCOPY



The HT Cryo-Electron Microscopy Facility's mission is to provide access to a world-leading, high-output scientific facility capable of solving in detail, from tissue to amino-acid side chains, the many issues that contemporary life sciences are called upon to tackle.

All biological processes, including physiological and pathological events, are precisely orchestrated by active and reactive biological macromolecules. The function, organisation and activity of these molecules closely depend on both their three-dimensional (3D) structure and the cellular environment in which they operate. The HT Cryo-Electron Microscopy Facility seeks to identify, visualise and characterise these biological players, both alone and in their cellular compartment.

The facility benefits from cutting-edge equipment such as:

- A Thermo Scientific Titan Krios G4i 300 kV transmission electron microscope (TEM) equipped with a Thermo Scientific Falcon 4 detector, Thermo Scientific Selectris X energy filter, Thermo Scientific CETA 16M camera and a Volta phase-plate
- A Thermo Scientific Spectra 300 kV scanning transmission electron microscope (STEM) equipped with a Thermo Scientific CETA 16M camera with speed enhancement solution for tomography scanning
- A Thermo Scientific Glacios 200 kV transmission electron microscope (TEM) equipped with a Thermo Scientific Falcon 4 detector, Thermo Scientific CETA 16M camera and a Volta phase-plate
- A Thermo Scientific Talos L120C 120kV transmission electron microscope (TEM) equipped with Thermo Scientific CETA 16M camera for both room temperature and cryogenic imaging (using Gatan Elsa cryo-transfer holder)
- A Thermo Scientific Aquilos 2 dual-beam electron microscope for cryo-lamella preparation

Ancillary equipment includes a fluorescence microscope with a cryo-stage for CLEM applications, plunge freezing devices, glow discharge units, plasma cleaners, carbon coating system and other sample preparation tools for high-pressure freezing, freeze substitution and ultramicrotomy of vitrified-resin-embedded samples.

HT's Cryo-Electron Microscopy Facility is designed to efficiently combine single-particle analysis (SPA), electron tomography (ET) and correlative light electron microscopy (CLEM) workflows to study in detail the structure of single macromolecules and entire cellular compartments.

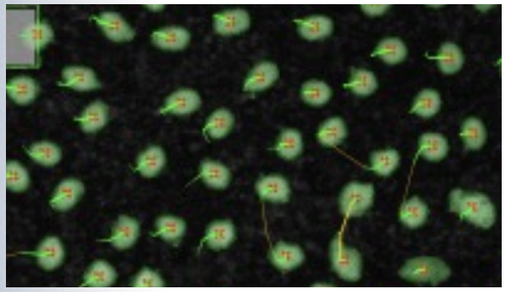
The Cryo-EM Facility supports the scientific requirements of HT's five interdisciplinary research centres. For example, by using SPA you can obtain a high-resolution 3D structure of proteins, enzymes and other macromolecules. ET is also employed at the Cryo-EM Facility to explore the internal architecture of cells, tissues and organoids. Focused ion beam-scanning electron microscopy (FIB-SEM) technology means that the Cryo-EM Facility can allow researchers to look inside vitrified samples.

In addition, the Facility can perform sample preparation (e.g. high-pressure freezing, freeze-substitution, heavy metal staining, plunge freezing, micro-patterning) and analysis (e.g. sample screening by negative staining and Cryo-EM, correlative microscopy).

LIGHT IMAGING

Optical microscopy is a more traditional technique which allows samples to be observed with lens magnification using visible light. The facility focuses on 3D imaging to meet the growing demand to photograph rare, dynamic and continually evolving processes.

IMAGE ANALYSIS



Modern imaging techniques in light and electron microscopy and computational approaches are changing the way biomedical research is conducted. Solutions for image restoration, (semi-) automated downstream processing, smart microscopy or real-time image analysis, big data management and big data visualisation are key to the success of image- and imaging-centric research. Many of these skills are provided by the HT Image Analysis Facility and users can therefore focus on their area of research and benefit from centrally provided, cutting-edge methods, tools, and services.

The Image Analysis Facility's central mission is to act as a knowledge incubator. Bearing in mind the frequent turnover of scientific staff, the Facility set-up answers the following question: *how can HT retain knowledge about complex bio-image analysis workflows for its scientific community*? The Facility's strategy is to keep workflows and tools active, even after their specific inventor, architect or developer has left the Foundation.

Besides this core technical support, the Image Analysis Facility also offers training opportunities for scientific staff across all backgrounds and career paths. This is an important activity for keeping the community educated and informed, using new knowledge-exchange models.

The key to the Facility mission is to build bridges between all HT Research Centres and research communities in Italy and abroad. Indeed, the Facility is intended to be a venue for scientists to meet and exchange ideas and experience and, of course, also a place in which to receive support from facility staff.

This "direct access" to the internal and external community and overview of frequently occurring analysis problems means that identification of the required solutions and, consequently, the act of making new technology available when needed are key contributions to the quality of scientific life of all users.

GENOMICS

The Genomics Facility is an infrastructure strategic to HT in implementing its mission and projects. The Genomics Facility is at the service of all HT Genomics Research Centres, enabling the development of projects on extensive patient cohorts and single-cell analysis. It is therefore possible to analyse various types of samples with an increasing level of sensitivity and specificity.

Thanks to a team of specialist, highly qualified professionals with proven technical and scientific experience in the application of sequencing technologies in different fields of investigation, the Facility can provide innovative, state-of-the-art services in various fields of genomic, transcriptomic, epigenomic and metagenomic research.

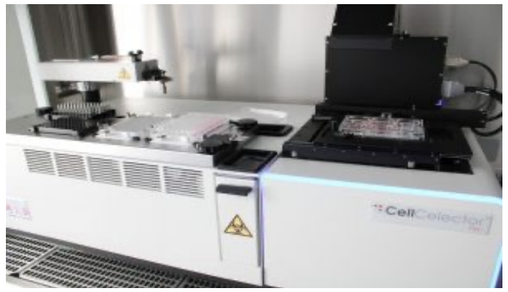
The Genomics Facility boasts state-of-the-art equipment such as:

- Illumina NovaSeq 600, Illumina's most powerful sequencing system
- PromethION 48 Oxford Nanopore
- Chronium Controller and Chronium X10x Genomics
- CellenONE f1.4 ScienION
- Chromium Connect 10x Genomics
- BD Rhapsody Single-Cell Analysis System BD Bioscience
- MiSeq Illumina
- TapeStation 4200 Agilent
- Fragment Analyzer Agilent
- FEMTO Pulse Agilent
- Bravo NGS Workstation Agilent
- Covaris E220 Focused ultrasonicator
- QIACube HT QIAGEN
- Glomax Discover Microplate Reader Promega

The Genomics Facility collaborates with HT Research Centres in carrying out research projects in the following areas:

- genomic studies of large patient cohorts aimed at identifying genetic markers associated with disease predisposition or onset;
- functional genomic studies aimed at understanding the molecular mechanisms underlying transcriptional and epigenetic regulation;
- neurogenomic studies aimed at analysing the differentiation of neuronal cells and tissues from pluripotent stem cells to brain organoids;
- single-cell sequencing studies to obtain immune profiles in COVID-19 patients, study the immune infiltrate in tumours or determine the immunological mechanisms underlying the onset of immune system disorders.

STEM CELL AND ORGANOID AUTOMATION



The Automated Stem Cell and Organoid Facility represents an especially innovative technological venture. Using automated pipelines, it is designed to streamline the processes needed to create biological models for disease study. These include somatic cell reprogramming, genome editing and long-term organoid culture.

1.3 Key details

The figure below illustrates some of the most important results achieved during 2022 for each strategic objective:

HIGHLIGHTS 2022

+8,000
sqm of laboratories already established

+15,000
sqm of laboratories to be set up in the near future

2 M
in annual contributions for the CITT

+60
stakeholders with whom Technology Transfer relationships have been established

4
HT scientists elected EMBO members

1
HT scientist received NIHR Senior Investigators award

13
new partnerships with Universities/IRCCS (Treatment and Research Hospitals)/ Research Institutes/Industry

+30
institutional projects and events, including with other players from the MIND district

55%
female employees at 31/12/2022

45%
male employees at 31/12/2022

5
Research Centres

24
Research Groups

+90
publications in international peer-reviewed journals

250
employees at 31/12/2022

110
people hired in 2022

Consolidation of Digital Transformation projects

93%
of incidents in the Campus area successfully resolved

ROADMAP 2022

Details follow of the salient events that have characterised HT's 2022:

- HT research laboratories inaugurated in the presence of former University and Research Minister Maria Cristina Messa
- Associate Head of the Health Data Science Centre appointed
- Selection of Scientific Committee members completed and Chairman Gualtiero Ricciardi appointed
- Work begins on the refurbishment of Palazzo Italia and the South Pavilion
- Appointment of the new Chairman of the *Consiglio di Sorveglianza* and four new members to replace the outgoing ones
- Three new advisory committees appointed: Control and Risk Committee, Appointments and Remuneration Committee, Sustainability Committee
- Completion of the second-stage public consultation to identify National Facilities and preparation of Technical Committee Final Report
- Final project design activities for the South Building and Tech Hub completed
- Selections for second Early Career Fellowship (ECF) Programme completed and two winners awarded five-year fellowships
- Reappointment of the Management Committee members whose term of office had expired, along with appointment of new Foundation Director

2022 ACTIVITIES

The following figure shows the main activities and projects carried out by Foundation departments during 2022:

Governance activities

- Conclusion of the procedure for selecting the Scientific Committee members and appointment of the Chairman
- Appointment of the new Chairman of the *Consiglio di Sorveglianza* and four new members to replace the outgoing ones
- Establishment of three new advisory committees: Control and Risk Committee, Appointments and Remuneration Committee, Sustainability Committee
- Completion of the second-stage public consultation to identify National Facilities and prepare Final Report
- Appointment of the new Board of Statutory Auditors
- Conclusion of the selection procedure for the new Foundation Director and reappointment o f the three members of the Management Committee whose term of office had expired
- Approval of various Policies, Internal Rules and Guidelines
- Approval of the Gender Equality Plan (GEP), appointment of the Gender Equality Team (GET) and implementation of the first schemes
- Approval of the 2023-2025 Budget

Scientific activities

- Assessment of applications for the second ECF Programme and awarding of the five-year fellowship to the two winners
- Continuation of scientific training activities (both internal and external) and participation in various international scientific events
- New formal partnerships and scientific collaboration agreements, both in Italy and abroad
- Many publications in prestigious international journals, participation in several cohort studies and development of new experimental methods and protocols
- Awarding of prestigious international awards and accolades to some researchers, as well as new grants from external research funds

Administrative and institutional activities

- Recruitment of additional staff, both scientific and administrative
- Preparation of 2022 Internal Audit Plan and auditing of several corporate departments
- HSE investments to increase staff safety
- Implementation of schemes to support employee wellbeing and promote work-life balance
- Delivering training in non-scientific fields
- Promotion of communication and institutional schemes involving national and local stakeholders
- Carrying on CITT's activities
- Continuation of Digital Transformation activities (ERP implementation, IT Governance, Cyber Security, Data Governance)
- Implementation of new Project Management activities
- Introduction of "Service Now" for improving the internal assistance service efficiency of some administrative and scientific areas
- Introduction of an electronic access control system
- Completion of the Initial Environmental Assessment conducted by the HSE division
- Mobility Manager appointment and drafting initial version of the Home Work Mobility Plan
- Establishment of the Energy Manager role
- Financial Risk Management project development and finalisation of the Integrated Report design stage
- Preparation and submission to the Supervising Ministries of the Biennial Report on completed and planned activities

Campus activities

- Starting of refurbishment works for the creation of new offices in Palazzo Italia and for the plant and civil engineering additions to the South Pavilion
- Finalisation of the activation of areas for scientific research in the Incubator Labs and the North Pavilion
- Realisation of the structure related to the Data Centre facility
- Finalisation of liquid nitrogen supply line design
- Conclusion of the final design of the new building complex consisting of South Building and Tech Hub (Final Project and financial coverage approved in February 2023)

1.4 Governance and organisation

The governance system laid down in HT's Statute and its Regulations is that of a dual model.

More specifically, the *Consiglio di Sorveglianza*, chaired by the President of the Foundation, is the body responsible for the general direction and control of the Foundation's activities, while the Management Committee, chaired by the Director of the Foundation, is responsible for carrying out activities for the Foundation's running operations and the achievement of its objectives.

THE PRESIDENT

The President is the legal representative of the Foundation. He acts as Chairman of the *Consiglio di Sorveglianza*, is responsible for strategic policy making, manages institutional and public relations and promotes training and communication activities relating to the social and economic impact of scientific research and the Foundation's public commitment. Prof. Marco Simoni was the first President of the Foundation, appointed on 16th May 2018 by a Decree of the President of the Council of Ministers of the Italian Government. His term of office expired in 2022.
The President of the Council of Ministers appointed a new Chairman of the *Consiglio di Sorveglianza* of the Foundation, Professor Gianmario Verona, with a decree dated 7th July 2022.

Prof. Verona was Rector of the Bocconi University of Milan (2016/2022). He is Professor of Management and his research, teaching and advisorship work focuses on the strategic and organisational management of technology and innovation.

CONSIGLIO DI SORVEGLIANZA

The *Consiglio di Sorveglianza* is responsible for the excellence of the Foundation and ensuring compliance with the rules governing the appointment of its bodies. It monitors the use of resources, supervises the general coordination of internal audit functions, manages the scientific assessment of the Foundation's activities and carries out general policy-making and supervisory activity.
In accordance with the By-laws, the *Consiglio di Sorveglianza* has thirteen members, including its Chairman, appointed as follows:

- seven by decree of the President of the Council of Ministers, of which two are designated by the Minister of Economy and Finance, one by the Minister of Health and one by the Minister of Universities and Research;
- the remainder are appointed as follows by decree of the President of the Council of Ministers, in consultation with the Ministers for the Economy and Finance, Health and Universities and Research, designated as follows:
  - one, in agreement between the Municipality of Milan and the Region of Lombardy;
  - one, in agreement between the members, on condition that they pay, even jointly, at least three percent of the annual contribution paid by the State;
  - one, from the Conference of Italian University Rectors (CRUI);
  - one, by the Council of the Presidents of public research institutions;
  - two, by the *Consiglio di Sorveglianza* from among scientists in disciplines related to the HT research projects and from among international public health experts, who mainly work abroad.

Each member of the *Consiglio di Sorveglianza* remains in office for four years and until new members are appointed. Each member can only be appointed for a second term once. The *Consiglio di Sorveglianza* meets approximately every 45 days and extraordinarily if necessary.
As at 31st December 2021, the *Consiglio di Sorveglianza* of the Human Technopole Foundation was composed of twelve members, including the Chairman, six of whom were appointed by a Decree of the President of the Council of Ministers (DPCM) on 16th May 2018, four of whom were appointed by a DPCM on 29th January 2020, one appointed by a DPCM on 30th September 2021 and one by a DPCM of 5th November 2021. The four-year term of office of the first members of the *Consiglio di Sorveglianza*, appointed pursuant to article 12, paragraph 2, letter a) of the By-laws, expired on 15th May 2022 and, by a DPCM of 7th July 2022, the President of the Council of Ministers appointed five new members, including the Chairman, to replace the previous members whose term of office had expired, and also confirmed the second term of office of one member for a further four years.

A thirteenth member may be appointed by the Participating Members, upon mutual agreement, on condition that they pay, even jointly, at least three percent of the annual contribution paid by the State. To date, the Foundation has no Participating Members.

The composition of the *Consiglio di Sorveglianza* as at 31st December 2022 was as follows:

GIANMARIO VERONA	President of the Foundation, former Rector of Bocconi University (2016/2022) and Professor of Management
MAURA FRANCESE	Executive in the Structural Economic Analysis Directorate, Directorate General for Economics, Statistics and Research, Bank of Italy
GIOVANNA IANNANTUONI	Rector of the University of Milan-Bicocca and Professor of Political Economy
MASSIMO INGUSCIO	Professor Emeritus of Physics of Matter at the Bio-Medico University Campus, Rome
GIUSEPPE IPPOLITO	Director General for Research and Innovation in Health of the Ministry of Health
BIAGIO MAZZOTTA	*Ragioniere Generale dello Stato*
MARCELLA PANUCCI	Head of Cabinet of the Minister of Universities and Research
FRANCESCA PASINELLI	Director General of the Telethon Foundation
MARIA GRAZIA RONCAROLO	Director of the "Centre for Definitive and Curative Medicine" and Professor of Paediatrics and Medicine at Stanford University
SERENA SILEONI	Professor of Constitutional Law at the Suor Orsola Benincasa University, former Advisor at the Presidency of the Council of Ministers
GIANLUCA VAGO	President of the CNAO Foundation, former Rector of the University of Milan
ALESSANDRO VESPIGNANI	Professor of Physics at Northeastern University and Founding Director of the Northeastern Network Science Institute in Boston

Article 12, paragraph 8 of the Human Technopole Foundation By-laws states that "*The Consiglio di Sorveglianza may form sub-committees*". On 1st August 2022, the *Consiglio di Sorveglianza* unanimously resolved to replace the existing board committees (Supervisory Committee, Appointments Committee, Remuneration Committee) with three new committees. The committees are each composed of three to five members of the *Consiglio di Sorveglianza*, one of which acts as the coordinator. The names and powers of each committee are reported below.

CONTROL AND RISK COMMITTEE	The committee has an advisory role. It carries out preliminary investigations and submits proposals to the *Consiglio di Sorveglianza* on risks and the internal control system including matters regarding the Organisation Model pursuant to Legislative Decree No. 231/2001 and the Personal Data Protection Organisational Model. It does this also in coordination with Internal Audit & Compliance.
APPOINTMENTS AND REMUNERATION COMMITTEE	The committee has an advisory role. It carries out preliminary investigations and submits proposals to the *Consiglio di Sorveglianza* on appointments for which the *Consiglio di Sorveglianza* itself is responsible. The Committee also makes proposals to the *Consiglio di Sorveglianza* concerning initiatives for the audit and supervision of appointments for which the Management Committee is responsible and also concerning personnel remuneration policies.
SUSTAINABILITY COMMITTEE	The committee has an advisory role. It carries out preliminary investigations and submits proposals to the *Consiglio di Sorveglianza* on inclusion policies, by seeking to remove all *de facto barriers* to equal opportunities within the Foundation with regard to both working conditions and remuneration policies. The Committee also deals with broader policies related to ESG (Environmental, Social and Governance) sustainability issues.

THE DIRECTOR

The Director of the Foundation is responsible for implementing the long-term strategic plan and chairs the Management Committee. Prof. Iain Mattaj was the first Director of the Foundation, appointed on 18th June 2018 by the *Consiglio di Sorveglianza* as a result of an international competition.

His term of office expired on 31st December 2022 and continued until the appointment of a new Director on 28th February 2023, when the *Consiglio di Sorveglianza* appointed Prof. Marino Zerial as the Foundation's new Director.

Prof. Zerial graduated in Biology from the University of Trieste in 1982 with a thesis on lysosomal storage diseases. He held postdoctoral positions at the Institut Jacques Monod (Paris, France) and at the European Molecular Biology Laboratory, EMBL (Heidelberg, Germany). He became research group leader at EMBL in 1989, Director and co-founder of the Max Planck Institute for Molecular Cell Biology and Genetics, MPI-CBG, (Dresden, Germany) in 1998. He is also an Honorary Professor at the Medical Faculty of the Technische Universität Dresden (Germany).

THE MANAGEMENT COMMITTEE

The Management Committee is responsible for the management of the Foundation's regular activities and operations. The Committee is composed of five members, including the Director, who chairs it. Each member of the Management Committee remains in office for four years and until new members are appointed. Each member can only be appointed for a second term once. The members of the Management Committee are appointed by the *Consiglio di Sorveglianza*. On 20th October 2022, the *Consiglio di Sorveglianza* reappointed the three members whose term of office expired in 2022, Prof. Irene Bozzoni, Dr. Nando Minnella, and Prof. Stefano Piccolo, for a new four-year term of office.

The composition of the Management Committee as at 31st December 2022 was as follows:

IAIN MATTAJ	Director of the Foundation, from 2005 to 2018 Director General of the European Molecular Biology Laboratory (EMBL, Heidelberg)
IRENE BOZZONI	Full Professor of Molecular Biology at the Sapienza University, Rome and Senior Researcher at Istituto Italiano di Tecnologia
NANDO MINNELLA	Director General at the National Institute of Nuclear Physics
STEFANO PICCOLO	Full Professor of Molecular Biology at the University of Padua
FABIO TERRAGNI	Partner and Director of Alchema

THE SCIENTIFIC COMMITTEE

In 2019, the Foundation was still at a stage that was preparatory to its actual scientific research operations. Therefore, in order to ensure the efficiency, efficacy and cost-effectiveness of the Foundation's work, the *Consiglio di Sorveglianza* decided not to immediately appoint a Scientific Committee in the manner and form laid down in the By-laws and Operating Regulations, because the high operating costs would have been inconsistent with the actual activities it was called upon to perform.

The *Consiglio di Sorveglianza* therefore decided to appoint a smaller Scientific Advisory Board, consisting of four members and a Coordinator.

This panel was appointed on 15th November 2019 and was called upon to perform the functions and powers laid down in the By-laws for the Scientific Committee, on a temporary basis and, in any case, until no later than 1st March 2022.

In the second half of 2021, the *Consiglio di Sorveglianza* started procedures to select the members of the Scientific Committee. On 28th January 2022 the selection work resulted in the appointment of fifteen members and six substitute members from leading Italian, European and US scientific institutions. They were selected from around 200 applicants who met the required criteria. The appointment was accepted by fourteen members who, together with five substitutes, formed the Scientific Committee as at 31st December 2022.
These experts, who include eminent scientists from outside the institute, are assigned an important advisory role by the Foundation's By-laws. The wide-ranging functions assigned to them

include the evaluation of scientific work, the respective organisation of the work in the medium term and the proper allocation of resources, both economic and human, to the various projects that are carried out. The Scientific Committee therefore replaced the provisional Scientific Advisory Board, which performed the same duties during HT's initial start-up stage.

The members hold office for four years and the first meeting of the Scientific Committee was held on 28th March 2022, which unanimously elected Prof. Gualtiero Ricciardi as its chairman.

The current members of the Scientific Committee are as follows:

GUALTIERO RICCIARDI	Professor of Hygiene and Public Health at the Università Cattolica del Sacro Cuore, Rome	*Chairman*
GENEVIÈVE ALMOUZNI	Director of research, Centre National de la Recherche Scientifique, Institut Curie, France	*SC member*
ANDREA BALLABIO	Director, Telethon Institute of Genetics and Medicine (TIGEM), Italy	*SC member*
PIETRO DE CAMILLI	Director, Programme in Cellular Neuroscience, Neurodegeneration and Repair (CNNR), Yale School of Medicine, USA	*SC member*
KRISTIAN HELIN	CEO and President, The Institute of Cancer Research, United Kingdom	*SC member*
ALBERTO MANTOVANI	Scientific Director, Humanitas Clinical Institute, Italy	*SC member*
MARGARET MCMAHON	Global Head Data Science, Roche Information Solutions Data & Analytics, Switzerland	*SC member*
GENNARO MELINO	Full Professor of Biochemistry, Director of Centre "Torvergata Oncoscience Research" (TOR), Tor Vergata University of Rome, Italy	*SC member*
LUCA PANI	Professor of Clinical Psychiatry, University of Miami and full professor of Pharmacology and Clinical Pharmacology, University of Modena and Reggio Emilia, Italy	*SC member*
ALFIO QUARTERONI	Professor and Director, MOX (Laboratory of Modelling and Scientific Computing), Milan-Polytechnic, Italy	*SC member*
NADIA ROSENTHAL	Scientific Director, The Jackson Laboratory, USA	*SC member*
MICHAEL SNYDER	Director, Centre for Genomics and Personalised Medicine, Stanford University School of Medicine, USA	*SC member*
GIULIO SUPERTI – FURGA	Scientific Director, CeMM Research Centre for Molecular Medicine, Austria	*SC member*
FIONA WATT	Director, European Molecular Biology Organisation, Germany	*SC member*

BOARD OF AUDITORS

The Board of Auditors is composed of three effective members and three alternate members. They are appointed from among persons enrolled in the register of statutory auditors by a Decree of the President of the Council, based on a proposal from the Ministry of Economy and Finance and after prior designation by the Founding Ministries. Each Founder chooses one effective member and one alternate member. The members of the Board of Auditors remain in office for three years and may be reappointed once. The Board of Auditors audits the management of the Foundation and its accounts, performs cash audits and prepares reports on the final accounts, which it submits to the *Consiglio di Sorveglianza*.

The term of office of the previous Board of Auditors expired in 2022 and it was therefore necessary to form a new board, appointed by a Decree of the President of the Council of Ministers dated 30th December 2022, registered by the Budget Office and verified for administrative-accounting regularity with stamp No. 88 dated 11th January 2023.

The composition of the Board of Auditors as at 31st December 2022 was as follows:

PIERA MARZO	Chairman
SARA ROSSI	Effective member
ANDREA VESTITA	Effective member

ORGANISMO DI VIGILANZA

The Human Technopole Foundation has adopted and effectively implements an organisation and management model designed to prevent offences pursuant to Legislative Decree No. 231/2001 (231 Model).

The task of supervising the functioning of and compliance with the 231 Model and ensuring that it is updated is entrusted to and carried out by a body with independent powers of initiative and supervision, the *Organismo di Vigilanza* (OdV).

The Foundation's OdV fulfils the following requirements for the effective performance of its tasks:

- **Autonomy and independence**: these requirements are essential to ensure that the OdV is not directly involved in the operational activities which it oversees. The hierarchical independence of the OdV must be guaranteed. The *Organismo di Vigilanza* is therefore positioned as a staff unit at the most senior level possible.
- **Professionalism**: the members of the OdV possess the technical and legal expertise needed to perform their duties. These characteristics, together with the independence of the members, guarantee their objectivity.
- **Continuity of action**: the OdV maintains a constant presence in order to ensure the effective and continuous application of the Organisation, Management and Control Model pursuant to Legislative Decree No. 231/2001 (231 Model).

More specifically, the OdV supervises with regard to the following:

- the effectiveness and adequacy of the 231 Model, i.e. its concrete ability to prevent predicate offences being committed, in consideration of the Foundation's organisation and operations;
- the efficacy of the 231 Model, i.e. the monitoring of compliance with it by the persons to whom it applies;
- maintaining the requirements of effectiveness and adequacy over time;
- ensuring that the 231 model is updated where necessary or appropriate, especially when changes occur in an entity's organisation, operations or in the regulations that apply to it.

The composition of the OdV as at 31st December 2022 was as follows:

VITO BRANCA	Chairman
ANDREA CALLEA	Effective internal member
SALVATORE SCUTO	Effective member

In 2022, the OdV verified the functioning of the Foundation's 231 Model and compliance with it and periodically submitted reports on that work required by the 231 Model to the *Consiglio di Sorveglianza*.

More specifically, the OdV examined the information sent to it – in accordance with the provisions of the 231 Model – by the Foundation's bodies, departments and areas, also carrying out further investigations of specific processes and cases.

Furthermore, the OdV helped to update the 231 Model by sharing observations designed to further improve the 231 Model itself on the basis of practical experience acquired in previous years.

The final and updated version of the 231 Model, which included comments made by the OdV, was approved and adopted by a resolution of the *Consiglio di Sorveglianza* dated 29th June 2022.

INTERNAL AUDIT & COMPLIANCE

As an organisation that is mainly financed by public funds, the Foundation is fully aware of the importance of internal controls and as such it has voluntarily set up a Compliance & Internal Audit unit that reports functionally and administratively to the President regarding compliance activities and to the *Consiglio di Sorveglianza*, through the President, for Internal Audit activities.

The unit interfaces with the Departments and Areas of the Foundation that carry out operational activities, performing first-line controls. The function operates, both ex ante as Compliance (second level controls) to ensure the definition of an internal regulatory framework and ex post, as Internal Audit (third level controls) to carry out compliance audits.

This set of three levels forms the Foundation's "Control Structure", which is systematically presented and explained to each new recruit in onboarding sessions.

HUMAN TECHNOPOLE FOUNDATION - CONTROL STRUCTURE

1° LEVEL CHECK	2° LEVEL CHECK	3° LEVEL CHECK
RESEARCH/ ADMINISTRATION	COMPLIANCE	INTERNAL AUDIT
• Responsible: all managers and employees	• Responsible: Compliance Manager	• Responsible: Internal Audit Manager
• Objective/Task: ensuring that operations are carried out according to internal procedures; control activities may be incorporated in the procedures or performed spontaneously by employees	• Objective/Task: guaranteeing the correct application of and compliance with the relevant regulatory framework; identification, assessment, prevention and monitoring of the overall compliance risks (EX ANTE)	• Objective/Task: assessing and periodically checking the completeness, functionality and adequacy of the internal control system (EX POST)

The Internal Audit department has a charter and regulations approved by the *Consiglio di Sorveglianza*, in compliance with the International Professional Practices Framework (IPPF) drawn up by the Institute of Internal Auditors (Florida, USA), a professional association recognised as the sole international reference on the subject.

The charter lays down aims, powers and responsibilities and establishes the function's position within the organisation and its functional reporting lines. At the same time, it authorises access to data, personnel and the assets needed by the Foundation for its operation including their scope.

The regulations govern the activities, the respective methods employed and the results and reporting, including reporting to the *Consiglio di Sorveglianza*.

The main activities carried out by Internal Audit in 2022 are listed as follows:

- drawing up the 2022 Internal Audit Plan, by carrying out a risk assessment which analysed the Foundation's processes in order to identify the Areas and Departments with the greatest residual risks on which to focus assurance activities. This Audit Plan was approved by the *Consiglio di Sorveglianza*;
- Purchases audit (updated to 30th June 2022);
- ICT & Digitalisation audit;
- HSE and Campus Development & Facility Management audit;
- Missions and Transfers audit (follow-up);
- Human Resources audit.

As concerns the Compliance unit, the Foundation has drawn up a set of internal regulations designed to ensure that applicable legislation and regulations in force are incorporated in those internal regulations and that activities are standardised. These regulations are contained in documents of three types, as illustrated below.

TYPES OF INTERNAL REGULATIONS

A	**Policies** provide the general framework for each area of activity, by establishing general principles that govern the fundamental aspects of the functioning of the organisation. Policies are seldom subject to modifications – **APPROVED BY THE *CONSIGLIO DI SORVEGLIANZA***
B	**Internal Rules** define in detail the internal modus operandi for performing the different activities regulated therein (i.e. workflows), by establishing the expected behaviours of the recipients; Internal Rules are regularly revised to ensure that their provisions are up to date – **APPROVED BY THE MANAGEMENT COMMITTEE**
C	**Guidelines** provide broad explanations and indications on specific issues for which the Foundation wants to issue guidance in the form of operational instructions – **APPROVED BY THE DIRECTOR**

When a document is first drafted or later revised, the person responsible for the draft is required to submit it to Compliance for *ex ante* controls and audit.

In 2022 Compliance provided opinions on interpretation, especially with regard to the implementation of the internal regulatory system.

For part of 2022 Compliance also managed a Conflicts of Interest Register, which records the declarations of new recruits, and assessments regarding cases such as the Foundation's agreements and collaborations. From September 2022 onwards, monitoring of conflicts of interest was transferred to the Human Resources area.

ADMINISTRATION

The implementation of the Foundation's scientific activities goes hand-in-hand with the expansion and consolidation of a very rapid growth phase for the Foundation. This included the recruitment of international scientific personnel, the creation of laboratory space, the renovation of existing buildings, the design and construction of new buildings to complete the Campus, the acquisition of new equipment and the development of intangible infrastructure.

In 2021, the *Consiglio di Sorveglianza* approved HT's "Organisational Regulations", which lay down regulations for the organisation as a whole and allocate duties and responsibilities within the Foundation. The Organisational Regulations define HT's general overall organisational structure, describe the activities and responsibilities of the various organisational units and define the hierarchical and functional relations between them. The organisational structure is essential to the pursuit of HT's institutional and legal obligations and it satisfies the criteria of good management, transparency, efficacy and efficiency. An Administration department was therefore created as part of the Organisational Regulations reporting to the Administrative Director who coordinates and supervises all the areas and functions.

FINANCIAL REPORTING OFFICER

The position of a Financial Reporting Officer was created in 2021. The holder is responsible for accounting and corporate documents, in accordance with Ministry of Economy and Finance (MEF) circulars for the application of Art. 154-*bis* of the Consolidated Law on Finance to the companies in which it holds stakes.

The Financial Reporting Officer is also responsible for the Finance area and was appointed on 13th July 2021 after a resolution was approved by the *Consiglio di Sorveglianza* on 30th June 2021 with the approval of the Foundation's Organisational Regulations, in accordance with article 154-bis of Legislative Decree No. 58/1998. The officer is responsible for the following:

- establishing appropriate administrative and accounting procedures necessary for generating accounting and corporate documents and drafting all other communications of a financial nature, ensuring that they are adequate and are applied effectively;
- certifying, jointly with the Foundation's Administrative Body, in a special report attached to the Financial Statements:
  - the adequacy and effective application of these procedures during the period to which the documents relate;
  - that the documents are prepared in accordance with the national accounting standards issued by the OIC (Italian Accounting Board);
  - that the documents correspond to the records kept in the accounting books and ledgers;
  - that they are able to give a true and fair view of the Foundation's assets and liabilities, operating performance and financial position;
  - that for the Annual Report, the management report provides a reliable analysis of the performance, operating results and financial position of the Foundation, together with a description of the main risks and uncertainties to which it is exposed.

A project was therefore implemented in 2022 designed to analyse and map the existing situation compared to the target situation with regard to the SoD (Segregation of Duties) and the main manual and automatic controls in place in the Finance area to monitor and mitigate risks, also with a view to future developments.

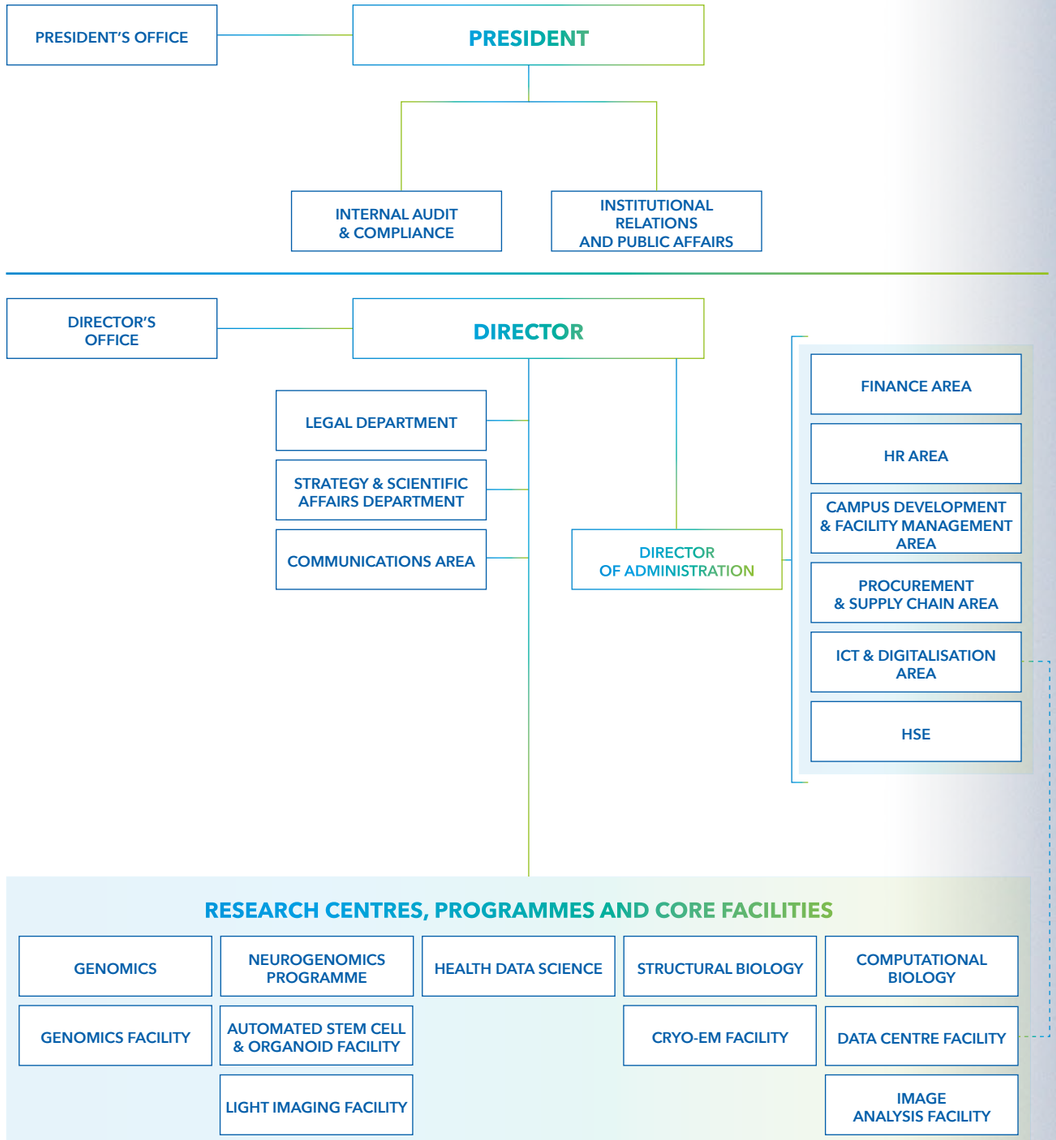
The project focused in particular on the following operational processes:

- Financial Reporting Closing Cycle;
- Income Reporting Cycle;
- Expenditure Reporting Cycle (partially completed);
- Purchasing Cycle;
- Tax Cycle;
- General Ledger Accounting Cycle;
- Treasury Cycle (partially completed);
- Payroll Cycle;
- Integrated Report Cycle.

In general terms, the findings led to the construction of specific risk and control matrices for the above operating processes and also the identification of further control points and policies and procedures to be implemented or updated in order to mitigate "balance sheet risk".

ORGANISATION CHART*

The organisational structure of the Foundation is officially stated in its organisation chart as follows:



** Organisation chart as at 31/12/2022.*

02 OUR APPROACH TO VALUE CREATION

Human Technopole has been created to bring added value to the scientific research ecosystem in Italy and Europe

2.1 Stakeholder engagement and materiality matrix

MATERIALITY ANALYSIS

The Foundation decided to adopt a dual operational approach for its materiality analysis for the year 2022. On the one hand, HT's strategic objectives, as set out in the materiality matrix for strategic objectives already reported in the 2021 edition of the Integrated Report, have been analysed and confirmed. On the other hand, a process has been launched to identify and measure material topics which reflect the actual and potential impacts (positive and negative) on the environment, on people and on the economy resulting from Human Technopole's activities and which may influence stakeholder decisions *(ESG materiality)*.

We show that the two approaches are closely interrelated and that each impact identified and measured in the ESG materiality matrix is connected to at least one strategic objective in the *"materiality matrix for strategic objectives"* as well as being connected to one of the UN 2030 Agenda sustainable development objectives.

The ESG materiality analysis therefore shows the most significant environmental, social and economic impacts of the operations underlying the eight strategic objectives reported both in the "materiality matrix for strategic objectives" and in the value creation model.

MATERIALITY MATRIX FOR STRATEGIC OBJECTIVES

The prioritisation of HT's strategic objectives was assigned with the involvement of corporate bodies, management and corporate functions and it follows the same guidelines as those defined in the 2020-2024 Strategic Plan. The new mission set for the Foundation by law, i.e. the creation, management and maintenance of "National Facilities" was taken into account. Moreover, this was already reflected in 2021 in the strategic objective entitled "Development and provision of infrastructures and innovative research instruments", when a "Convention" was signed at the end December 2020 between the Foundation and the three supervising Founding Ministries (article 1, paragraph 276, letter a, of Law No. 160 of 17th December 2019).

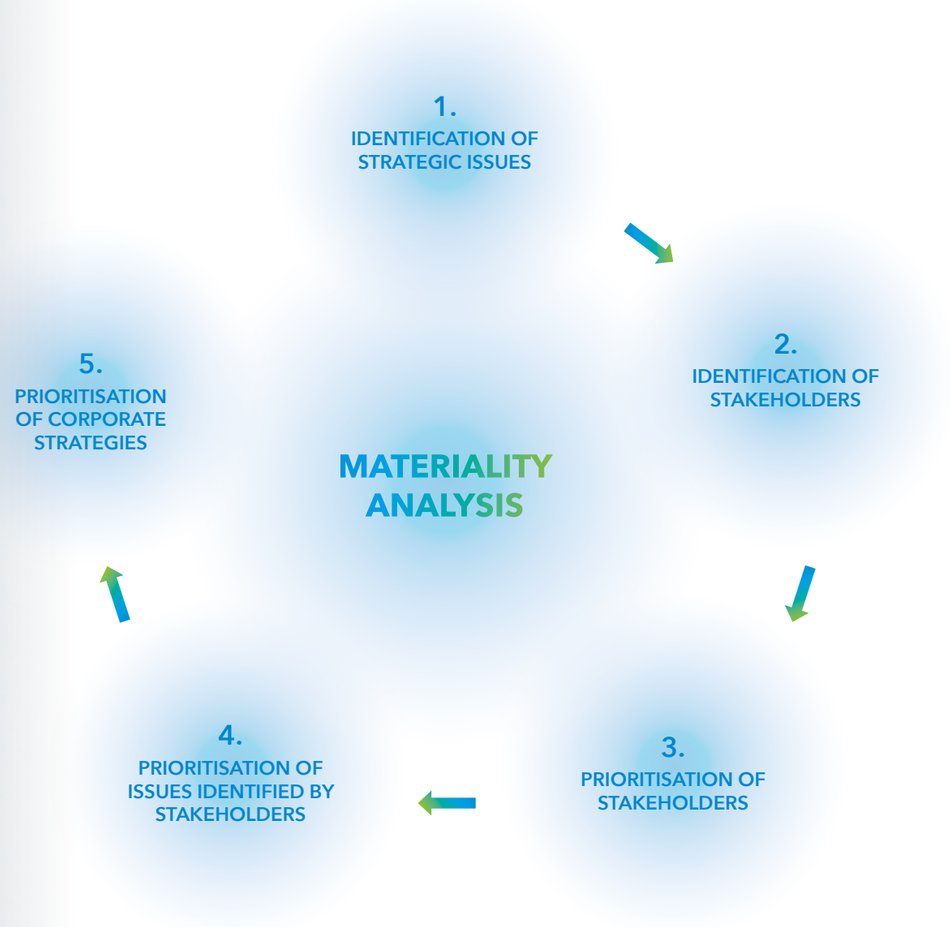
The following chart shows **the Foundation's eight strategic objectives**, as well as some of the corresponding results already achieved or the projected results for the coming years:

STRATEGIC OBJECTIVES	RESULTS
Generate innovation and quality of research	**5** Research Centres and **24** research groups. **95** publications in international peer-reviewed journals.
Develop and provide infrastructure and innovative research instruments	**6** Research Facilities, around **51,000** sqm of offices and laboratories in the near future, **410** "dry" workstations, **190** "wet" workstations already implemented.
Attract and train talents and share research outputs	Up to **500** people will be hired by 2024 and roughly 70% will be dedicated to scientific research, services and scientific support. **29%** of Italians hired in 2022 are from abroad. **44** scientific seminars held at HT.
Obtain scientific reputation and promote dissemination	In 2022 HT scientists were hosted at more than **160** conferences and **7** internationally prestigious awards were received by our scientists. More than **400** participants at scientific training events organised by HT.
Promote innovation through research	2022 contribution of **2M** for the management of CITT. More than **50** HT scientists trained in 2022 on Technology Transfer.
Contribute to sustainability (environmental, social and economic)	**93%** of energy from renewable sources and numerous initiatives related to gender equality and support for work-life balance.
Build partnership, networking and promote stakeholder engagement	**13** partnerships with universities/IRCCS/research institutes/industry, **25** collaborations with players in the MIND area.
Achieve efficiency and effectiveness of operational processes	ERP system development and start-up and consolidation of Digital Transformation projects.

Please refer to subchapter 2.3 *"Strategy"* for further details on the Foundation's strategic objectives.

The materiality analysis was conducted in accordance with IIRC (International Integrated Reporting Council) guidelines. However, reference has been made to accountability criteria and GRI (Global Reporting Initiative) Standards for a definition of key topics and the application of materiality principles.

The chart below shows the stages of the materiality analysis carried out by the Foundation, starting from the financial year 2020 and confirmed in subsequent years:



The materiality matrix summarises HT's various priorities and those of its stakeholders to give a summary of the strategic objectives which guide the Foundation's actions and performance and thus are able to influence decisions made by stakeholders. The materiality matrix also shows the degree of alignment or misalignment between the priorities assigned by the stakeholders to the different strategic objectives and the level of HT's commitment to them.

If we look in detail at the major HT stakeholders, the analysis identified the following seven categories: **HT internal structure, Founding Ministries, Industrial Associations, Local Institutions, Civil Society and Local Communities, Suppliers and Partners, Research Institutions and Communities**.

The importance of the various stakeholders was assessed and weighted on the basis of the following parameters: dependence (defined as the importance of the relationship for the stakeholder), influence (defined as the importance of the relationship to HT) and urgency (defined as importance of timing in the relationship).

The following aspects of HT's eight strategic objectives have been examined in detail:

- for stakeholders, the **importance of each strategic objective as perceived by the stakeholders and the "direction" of their expectations** (i.e. an expectation of commitment rather than disengagement on the part of HT);
- for HT, an **evaluation of the strategic objectives based on the current and future commitment to them** and their impact on the Foundation's activities.

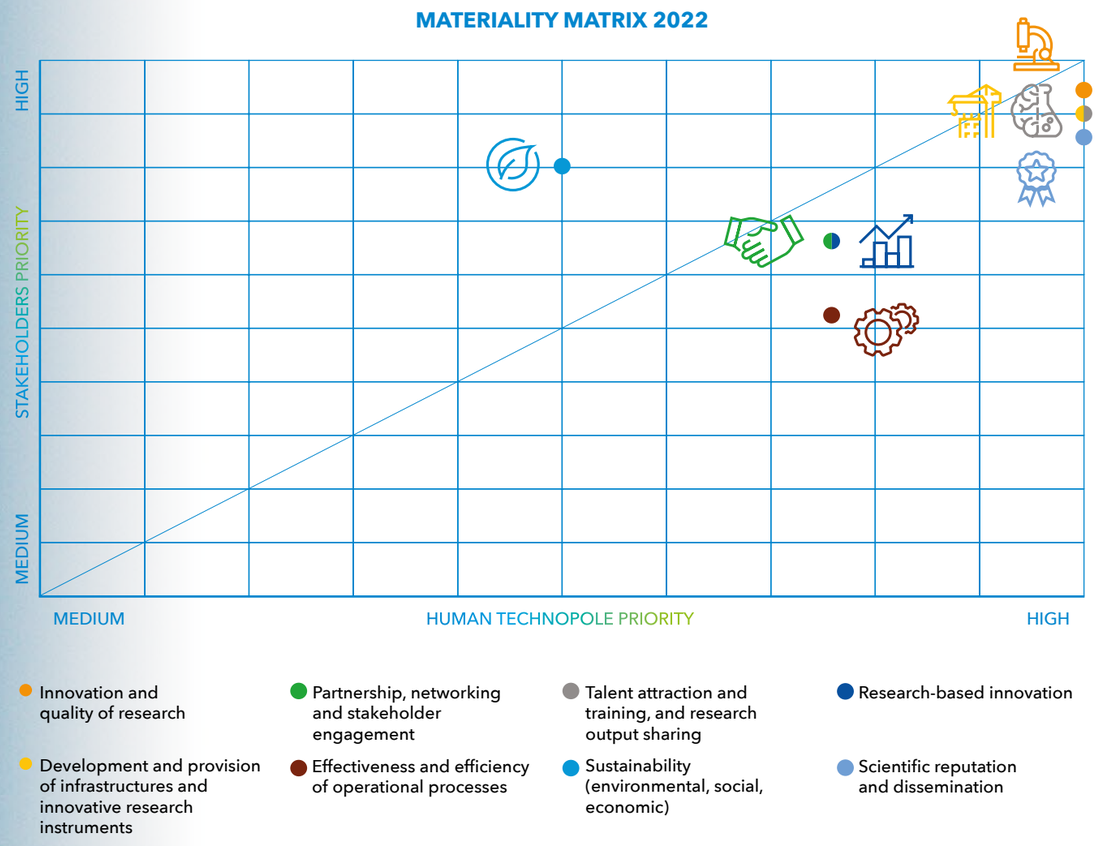
A snapshot was taken of the importance of the strategic objectives for stakeholders by analysing the results of interview, involvement and dialogue initiatives, which HT has undertaken in the past few years. Interviews, surveys, institutional relations at national and local level and media monitoring are just a few examples of the methods used by the Foundation to reach its stakeholders.

As in the previous year, it was considered best for the financial year 2022 to update the materiality matrix first generated in 2020 by conducting a further series of interviews and analyses designed to both refine the engagement process and to confirm the stakeholder priorities expressed in previous years.

Viewing the materiality matrix along each of its axes, helps to understand the following:

- on the **vertical axis, the priority**, appropriately calibrated on the basis of its importance to the Foundation, **that stakeholders** attach to the various strategic objectives. In the upper part of the matrix we therefore see the topics for which stakeholders demand most commitment from HT in terms of investments, best use of existing activities and management systems or the formal declaration of clear commitments and policies;
- on the **horizontal axis, the strategic objectives on which HT plans to focus its efforts**. On the right-hand side of the matrix we therefore see the topics on which a high level of current commitment is guaranteed now and planned in coming years within the framework of HT's strategic objectives.

The most important strategic objectives for both the Foundation and the stakeholders can be identified from the combination of these two different perspectives and consequently the degree of alignment (or misalignment) between external expectations and internal relevance can be ascertained.



COMMENTS ON THE MATERIALITY MATRIX FOR STRATEGIC OBJECTIVES

The materiality matrix for 2022 shows substantial general alignment between almost all the Foundation's strategic objectives and the priorities expressed by stakeholders. As for the previous year, the materiality matrix shows that the strategic goals considered most important by HT, which are "**Innovation and quality of research**" and "**Scientific reputation and dissemination**", are also priorities for stakeholders, as is the strategic objective "**Development and provision of infrastructures and innovative research instruments**". The latter, which confirms what had emerged in the 2021, was identified as a priority by both the HT bodies and the scientific stakeholders, i.e. research institutes and universities. These considerations are confirmed, amongst other things, by the considerable efforts made by the Foundation 2022 to implement the Convention signed with the Founding Ministries - the Ministry of University and Research, the Ministry of Economy and Finance and the Ministry of Health. In fact, this Convention assigns the task of supporting newly established scientific facilities (defined as "facilities, resources and related services, used by the scientific community to conduct high quality research in their respective fields, without any national or institutional membership requirement") to the HT Foundation, as part of its mission as a key scientific infrastructure designed to support national scientific research. We also report that internally the strategic objective to "**Talent attraction and training, and research output sharing**" is of even more importance to the Foundation. These four strategic objectives are those to which HT has now assigned the highest level of priority and on which the Foundation has focused most of its efforts, which have taken concrete form in various operational activities that are highlighted in the relative sections of this report.

We also report the assignment of a high priority compared with the previous year, both internally and externally, to the strategic objective of "**Efficiency and effectiveness of operational processes**". This is due to the intense stage of development and growth in size that HT is undergoing currently.

The objectives of "**Research-based innovation**" and "**Partnership, networking and stakeholder engagement**" are positioned, on both axes, with a high level of priority where there is clear alignment with the need and desire to invest in cooperation and partnership between Human Technopole and both scientific and institutional stakeholders. Similarly, the goal to invest in research results is also of high importance both within and outside the Foundation. More specifically, although the activities of the Centre for Innovation and Technology Transfer were limited in 2022 to business training and the study of international models potentially applicable to the Italian context, the Foundation's commitment remains high, demonstrated by its intention, in the near future, to develop strategies to foster technology transfer.

Lastly, with regard to the strategic objective of "**Sustainability**", which is given high external priority with a further increase compared with previous years, we also see a concrete commitment by the Foundation with the official appointment in 2022 of a Sustainability Committee and a series of concrete initiatives, some already implemented, details of which are provided in the section of this report on Human Technopole's responsible and sustainable approach (subchapter 2.4).

In addition to providing the elements needed to generate the materiality matrix, the stakeholder engagement activity allowed an in-depth analysis of the degree of alignment of each individual stakeholder with the Foundation's respective strategic objectives.

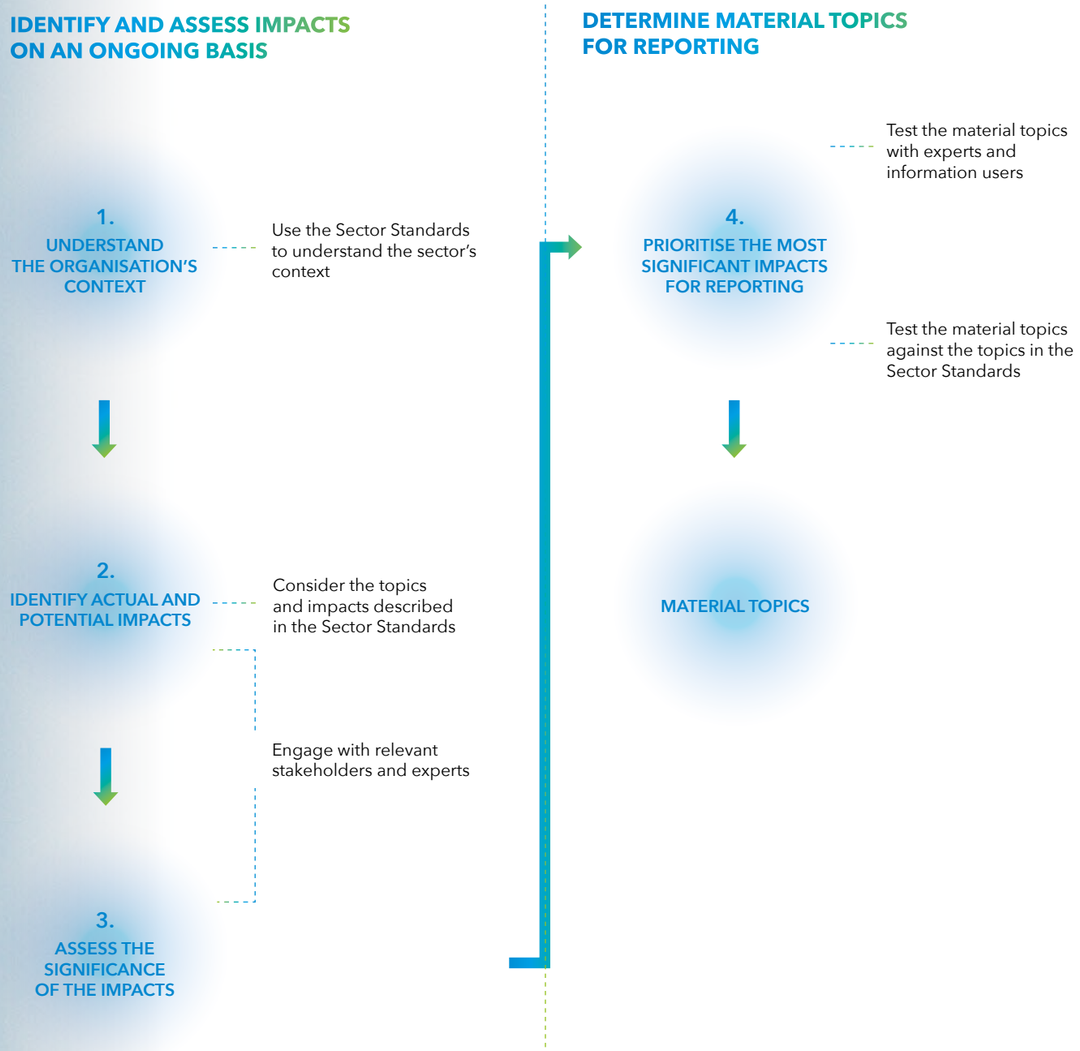
The table below shows the different categories of our key stakeholders and gives a description of their main characteristics:

Stakeholder	Expectations on HT	Stakeholder priorities	Link to capitals of output	HT commitment
FOUNDING MINISTRIES	As founding and funding members, the Ministries require HT to carry out its statutory activities according to criteria of economy, effectiveness and disclosure. They also require transparent reporting on how funds are used, on the activities carried out and on the Foundation's development perspectives		• Relational Capital • Intellectual Capital • Human Capital • Infrastructural Capital	• Development of programmes and activities in line with the missions assigned by Ministries • Accountability in the use of resources and transparency in financial reports and disclosures • Involvement in defining guidelines for the growth of the Foundation
INDUSTRIAL ASSOCIATIONS	The industrial associations require HT to market the results of research by creating partnerships and promoting technology transfer		• Relational Capital • Financial Capital	• Development of partnerships and collaborations with external players in the implementation of CITT activities (Centre for Innovation and Technology Transfer)
LOCAL INSTITUTIONS	Local institutions require HT to implement programmes of scientific excellence and efficiency in operational processes, thereby contributing to the development of the local communities in terms of global sustainability		• Relational Capital • Intellectual Capital • Infrastructural Capital	• Development of programmes of scientific excellence • Organisation of science dissemination events and initiatives and development of scientific partnerships and collaborations • Development of digitalisation programmes and internal procedures to streamline business processes
CIVIL SOCIETY AND LOCAL COMMUNITIES	Civil society and local communities require HT to contribute to the development of local communities in terms of global sustainability and through the creation of partnerships		• Relational Capital • Intellectual Capital	• Development of initiatives to raise awareness of scientific research • Development of initiatives focused on sustainable activities and ESG topics • Capitalise on scientific reputation and sharing research outputs
SUPPLIERS, PARTNERS	This category of stakeholders requires HT to engage in the development of valuable, fair and transparent collaborations, including, wherever possible, contributing added value to the MIND area		• Relational Capital • Intellectual Capital	• Organisation and management of fair and transparent purchase procedures, tender and "expression of interest" processes • Development of interactions aimed at creating partnerships in the MIND area
HT INTERNAL STRUCTURE	HT staff play a critical role in ensuring the achievement of HT strategic objectives. It's important to understand their needs and aspirations by creating an optimal working environment for the development of the best skills		• Relational Capital • Intellectual Capital • Human Capital • Infrastructural Capital	• Training programmes • Employee involvement through surveys and regular meetings • Conventions and welfare programmes • Work-life balance initiatives • Internal communication campaigns • Code of Ethics • Development of gender equality programmes
RESEARCH INSTITUTIONS/ COMMUNITIES	Research institutions/communities require HT to be available to create scientific partnerships, by establishing joint projects and making the developed scientific infrastructure available		• Intellectual Capital • Human Capital • Infrastructural Capital • Relational Capital	• Definition of scientific partnerships and scientific joint projects • Sharing of infrastructures and research instruments • Development and implementation of National Facilities

ESG MATERIALITY ANALYSIS

As previously reported, in addition to presenting a new materiality matrix which reports HT's strategic goals, the Foundation has also carefully studied the impacts that the underlying operational activities generate in environmental, social and economic terms.

The process of identifying impacts and material topics was divided into steps, with account taken of the new GRI 3. The process is illustrated in the chart below:



STEP 1: UNDERSTAND THE ORGANISATION'S CONTEXT

As the specific sector standards for the Foundation's activities were not yet available at the time of publication of the 2022 Integrated Report, the starting point for an analysis of actual and potential impacts, was as follows:

1. understanding Human Technopole's context from an understanding of the Foundation's mission and values and an analysis of its Strategic Plan as well as the effects of the new mission assigned to the Foundation by the legislator (i.e. the implementation and management of the "National Facilities");
2. analysis of the operational activities underlying Human Technopole's strategic objectives already included in the materiality matrix for the years 2020 and 2021;
3. analysis of the value creation model already implemented in previous years and confirmation of that model by key internal personnel;
4. confirmation of stakeholders already engaged and opening up engagement activities to new stakeholders. No change occurred in the categories identified previously. Constructive dialogue continued with stakeholders in an even more structured form in order to render Human Technopole's sustainable and responsible growth path explicit and transparent. More specifically, relations with national and international scientific research institutes were consolidated and expanded, institutional relations were intensified and it was also considered important to encourage relations with local institutions and parties that are connected in various capacities with MIND (the Milan Innovation District) and make these constant.

STEP 2: IDENTIFY ACTUAL AND POTENTIAL IMPACTS

In addition to the initial considerations made in the previous step, the following activities were carried out in order to identify actual and potential impacts:

1. identification and analysis of all new company policies in order to understand the direction and the initiatives taken by the governance bodies;
2. checking the main news items concerning Human Technopole, whether originating on the Foundation's website or already published in the press or available on the web. This news covers the main activities and events involving the Foundation during 2022;
3. analysis of the main scientific collaboration programmes developed by the Foundation in 2022;
4. internal discussions with executives in charge of the different areas and departments (both scientific and administrative) of the Foundation concerning the main activities carried out and the development of future programmes;
5. study of the content of the fortnightly plenary meetings chaired by the Director of the Foundation and addressed to the entire Human Technopole population ("HT All Staff Meeting").

In this first year of "ESG materiality" analysis, as per the new GRI 3, over 27 impacts (actual/potential) with both positive and negative aspects were identified.
These impacts are the consequence of the main operational activities comprised within the eight Human Technopole strategic objectives.

The operational activities identified are as follows:

- development of scientific excellence research programmes;
- development and sharing of sustainable and innovative buildings and infrastructures (National Facilities);
- activities and programmes for the development of the "Centre for Innovation and Technology Transfer";
- development of an approach to digital transformation;
- development of partnerships and collaborations with players in MIND;
- development of partnerships and collaborations with universities and research institutes on scientific research projects;
- adoption of a Code of Ethics and 231 Model;
- award and management of public contracts according to principles of cost savings, efficiency, timeliness and fairness;
- support for a work-life balance and parenthood;
- responsible supply chain management;
- development of job opportunities for researchers and administrative staff;
- education and training programmes for the next generation of scientists, which includes organising initiatives for the exchange of scientific knowledge, researcher mobility and the organisation of scientific initiatives and events;
- sustainable management of consumption and the development of energy efficiency programmes;
- effective waste management;
- greater attention to health and safety issues within the Foundation through preventive actions (HSE policies);
- greater awareness of gender issues at HT and in the world of scientific research in general;
- achievement of gender balance in senior, leadership and positions of responsibility;
- fight against discrimination and gender harassment.

These operational activities were then grouped together into six general categories:

GOVERNANCE AND ETHICS

SOCIAL ISSUES AND PEOPLE

ENVIRONMENTAL PROTECTION

HEALTH AND SAFETY IN THE WORKPLACE

GENDER EQUALITY

RESEARCH AND INNOVATION

The 27 impacts identified and then validated by the Sustainability Committee, an internal committee of the *Consiglio di Sorveglianza*, with fact-finding functions, were ordered on a priority basis by our stakeholders to determine their degree of materiality.

STEP 3: ASSESS THE SIGNIFICANCE OF THE IMPACTS

In its assessment of the impacts, the Foundation determined a level of significance by considering the following:

IMPORTANCE	i.e. how grave a negative impact is (or could be) and how beneficial a positive impact is (or could be);
SCALE	i.e. how widespread a negative or positive impact is (or could be);
IRREMEDIABLE CHARACTER	how hard it is to counteract or make good the harm resulting from a negative impact;
LIKELIHOOD	the chance of the potential impact happening.

The level of materiality was then weighted according to the influence that each individual stakeholder has on the Foundation, thereby maintaining consistency with the approach used to determine the priorities expressed by the stakeholders themselves with respect to the Foundation's strategic objectives (materiality matrix for strategic objectives).

The impacts were then assessed by stakeholders by means of engagement activities consisting of interviews and surveys.

STEP 4: PRIORITISE THE MOST SIGNIFICANT IMPACTS FOR REPORTING

Once the degree of materiality has been defined and account has been taken of the priorities assigned by internal and external stakeholders, the impacts are divided into those with a "*higher level of materiality*" and those with a "*lower level of materiality*".

In the 2022 Integrated Report, only impacts above the materiality threshold defined in the previous step (STEP 3) have been reported and described, together with the mitigation measures put in place by the Foundation to counteract the negative impacts.

The table that follows gives all 27 impacts identified, ordered on the basis of the priorities assigned, based in turn on the results of discussions with stakeholders.

As shown in the table, each impact is associated with the following:

- the relative activity that generated it;
- the general category into which it falls;
- the main related strategic objective as per the "materiality matrix for strategic objectives";
- the sustainable development goals (SDGs) according to the UN 2030 Agenda, which the Foundation either already meets or intends to meet;
- whether the impact is reported in the 2022 Integrated Report.

PRIORITISATION OF MATERIAL TOPICS

HT STRATEGIC OBJECTIVES	ACTIVITIES	IMPACTS	GENERAL CATEGORY	SDGs	INTEGRATED REPORT 2022
INNOVATION AND QUALITY OF RESEARCH	Development of scientific research programmes of excellence	Effects on people's well-being and health status through scientific research programmes of excellence	RESEARCH AND INNOVATION	3 and 9	YES
		Effects on the environment from the use of chemical preparations for experiments, production of potentially hazardous waste (crops and biological agents), etc.			
PARTNERSHIP, NETWORKING AND STAKEHOLDER ENGAGEMENT	Development of partnerships and collaborations with universities and research institutes on scientific research projects	Positive effects on the economy and people as a result of developing partnerships and collaborations with universities and research institutes on scientific research projects, including exploiting NRRP opportunities	RESEARCH AND INNOVATION	3 and 9	YES
		Potential negative economic effects due to a potential competitive risk arising in the event of ineffective management of collaborations/partnerships with other scientific institutions			
SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	Supporting work-life balance and parenthood	Positive effects on people's well-being due to the adoption of policies to support work-life balance and parenthood	SOCIAL ISSUES AND PEOPLE	8	YES
TALENT ATTRACTION AND TRAINING, AND RESEARCH OUTPUT SHARING SCIENTIFIC REPUTATION AND DISSEMINATION	Education and training programmes developed for scientists, including through promotion initiatives for the exchange of scientific knowledge, researcher mobility and the organisation of scientific events	Positive effects on people as a consequence of the training programmes developed for scientists, including through initiatives to promote the exchange of scientific knowledge, researcher mobility and the organisation of scientific events	SOCIAL ISSUES AND PEOPLE	4	YES
SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	Efficient waste management	Positive effects on the environment through effective management of hazardous and non-hazardous waste, water discharge monitoring, HSE policy for environmental impact analysis	ENVIRONMENTAL PROTECTION	6, 11, 12	YES
		Environmental impacts caused by the consumption of automotive resources, atmospheric CO_2 emissions and noise pollution from vehicle traffic resulting from waste management during disposal			
RESEARCH-BASED INNOVATION	Activities and programmes for the development of the "Centre for Innovation and Technology Transfer"	Potential positive effects on economic resources and people through development programmes aimed at promoting the economic exploitation of intellectual property (new scientific patents) and the related technology transfer to the market ("Centre for Innovation and Technology Transfer")	RESEARCH AND INNOVATION	8 and 9	YES
DEVELOPMENT AND PROVISION OF INFRASTRUCTURES AND INNOVATIVE RESEARCH INSTRUMENTS	Development and sharing of sustainable and innovative buildings and infrastructure (National Facilities)	Potential positive effects on the environment, economic resources and people's well-being through the development of a "user access" strategy that can ensure transparent and effective use of HT infrastructures (National Facilities) by making them available to the national scientific community	RESEARCH AND INNOVATION	9 and 11	YES

	HT STRATEGIC OBJECTIVES	ACTIVITIES	IMPACTS	GENERAL CATEGORY	SDGs	INTEGRATED REPORT 2022
	TALENT ATTRACTION AND TRAINING, AND RESEARCH OUTPUT SHARING	Development of job opportunities for researchers and administrative staff	Positive effects on the economy and people from the development of job opportunities for researchers and administrative staff Indirect negative effects on the environment, in particular in terms of atmospheric emissions, due to increased mobility and movement (as a result of an increase in the HT population)	SOCIAL ISSUES AND PEOPLE	8 and 9	YES
	SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	Achieving gender balance in leadership and decision-making positions	Potential positive effects on people achieving gender balance in leadership and decision-making positions	GENDER EQUALITY	5	YES
	SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	Responsible supply chain management	Potential positive effects on the environment, economic resources and people's well-being through responsible supply chain management (with a focus on environmental and social sustainability requirements) Potential negative economic effects resulting from excessive bureaucracy and long lead times for the acquisition of resources due to the para-public nature of HT	SOCIAL ISSUES AND PEOPLE	8 and 12	YES
	SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	Sustainable consumption management and development of energy efficiency programmes	Positive effects on the environment through sustainable consumption management and the development of energy efficiency programmes (e.g. appointment of an Energy Manager, installation of photovoltaic systems, energy consumption monitoring plans, HSE policy for environmental impact analysis, monitoring of atmospheric emissions) Potential short-term negative effects on people due to the use of more financial resources for energy efficiency investments, such as plant implementation/ maintenance, resulting in decreased resources for scientific research	ENVIRONMENTAL PROTECTION	7	YES
	THRESHOLD OF SIGNIFICANCE					
	SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	Fight against gender discrimination and harassment	Positive effects on people as a consequence of fighting gender discrimination and harassment	GENDER EQUALITY	5	NO
	SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	Award and management of public contracts in compliance with the principles of economy, efficiency, timeliness and fairness	Positive effects on the environment, economy and people of awarding and managing public contracts in compliance with the principles of economy, efficiency, timeliness and fairness, taking into account social and environmental sustainability criteria Potential negative economic effects caused by excessive bureaucracy and long lead times for the acquisition of resources mainly due to the para-public nature of HT. Consequent slowdown in infrastructure investments and in the implementation of the Foundation's strategy, as decided by the internal boards	GOVERNANCE AND ETHICS	8, 12, 16	NO

	HT STRATEGIC OBJECTIVES	ACTIVITIES	IMPACTS	GENERAL CATEGORY	SDGs	INTEGRATED REPORT 2022
	PARTNERSHIP, NETWORKING AND STAKEHOLDER ENGAGEMENT	Development of partnerships and collaborations with MIND area players	Potential effects on the environment, economy and people as a result of the development of partnerships and collaborations with MIND area players aimed at promoting sustainability, innovation and inclusiveness	RESEARCH AND INNOVATION	9	NO
	SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	Adoption of a Code of Ethics and a 231 Model	Positive effects on the environment, economy and people thanks to the adoption of a Code of Ethics and a 231 Model with the aim of providing an absolute guarantee of legality, transparency and fairness in the management of its activities (e.g. environmental compliance, accounting compliance and management of relations with Supervisory Authorities and Financial Backers, health and safety compliance, operational tools for whistleblowing and violence harassment reports) Potential negative effects on the environment, economic resources and people's well-being related to the lack of or slower socio-economic development of the community in the area in which the Foundation operates due to non-compliance with the 231 legislation on crimes	GOVERNANCE AND ETHICS	8, 12, 16	NO
	SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	Awareness-raising initiatives on gender issues in HT and in the world of scientific research in general	Positive effects on people from awareness-raising initiatives on gender issues in HT and in the world of scientific research in general	GENDER EQUALITY	5	NO
	EFFECTIVENESS AND EFFICIENCY OF OPERATIONAL PROCESSES	Development of a digital transformation approach	Effects on economic resources and people's well-being following the development of Digital Transformation programmes aimed at achieving greater operational efficiency Potential negative effects on economic resources and people's health and safety in the event of inadequate internal management and regulation of Digital Transformation (e.g. mental and physical well-being and cyber crime)	RESEARCH AND INNOVATION	9	NO
	SUSTAINABILITY (ENVIRONMENTAL, SOCIAL, ECONOMIC)	Carrying out preventive actions to protect health and safety within the Foundation	Positive effects on people for carrying out preventive actions to protect health and safety within the Foundation, implemented through mandatory training, health monitoring, H&S risk assessments, workplace incident/hazard reporting tools	HEALTH AND SAFETY IN THE WORKPLACE	8	NO

As shown in the table above, the impact prioritisation process shows 17 topics positioned above the materiality threshold.

These impacts are discussed in detail in subchapter 2.4 "*Responsible and sustainable approach*" of this report.

The research that HT conducts is high-level, with a high technological impact and lies in areas that are vital in biomedical and health terms. This aspect helps bring together researchers of excellent national and international standing who provide high-value research and results.

2.2 Value creation model

This section of the Integrated Report seeks via a chart to describe how the Foundation generates sustainable value for stakeholders. Human Technopole's value creation model focuses on strategic objectives which direct its activities towards the generation of different outputs by using the different types of capital available to it.

If we look at the details of the value creation model, we see that although the Foundation has not yet been fully implemented and structured, it can already make, through its activities, a significant, sustainable and socially responsible contribution to both the scientific community and the community at large.

The research that HT has started to conduct is high-level, with a high technological impact and lies in areas that are vital in biomedical and health terms. This aspect helps bring together researchers of excellent national and international standing who provide high-value research and results.

The infrastructure and technologies that HT possesses, which will be further implemented in the future, will be accessible to external scientists and will contribute significantly to the needs of the scientific community.

By establishing that a quota of the public funds guaranteed to finance HT feeds into what is known as the "National Facilities", the new Convention signed with the three Founding Ministries is compatible with the strategic objective of sharing HT's infrastructures and making them available to others.

Advanced scientific training programmes available both inside and outside HT are another of the Foundation's strategic pillars. The fundamental and founding principle of these training activities is to create a centre of excellence for the training of talented researchers in the biomedical sciences and to provide broad access to HT's expertise, its methods and its resources.

For Human Technopole human capital, i.e. its people, their skills and their diversity, is a fundamental asset. In addition to human capital, HT makes use of the important resources obtained from its financial capital, which, as established by article 1, paragraph 119 of Law No. 232 of 11th December 2016, consists of grants from the founding Italian ministries and is bolstered by further grants from different sources. Its infrastructural capital, consisting of tangible assets and facilities, as well as its intellectual capital, HT's know-how, helps it to achieve its objectives of scientific excellence and making its infrastructure available to external scientists and other research institutions. Relations with stakeholders, partnerships and collaborations with other research institutions, which constitute its relational capital, lie at the heart of its value creation model's activities.

All these different types of capital constitute the fundamental basis for creating value through strategic initiatives in the short, medium and long-term.

INPUT

Financial Capital
Financial resources available through public and private funding

Human Capital
Competence, experience, excellence and diversity of scientific and non-scientific staff

Infrastructural Capital
Assets owned by HT, facilities, infrastructures, equipment and services

Relational Capital
Relations with stakeholders group and collaboration with research centres and universities

Intellectual Capital
The Foundation's wealth of knowledge and organisation of scientific research

INNOVATION AND QUALITY OF RESEARCH

- Centre for Genomics
- Centre for Neurogenomics
- Centre for Computational Biology
- Centre for Structural Biology
- Centre for Health Data Science
- Publications / Grants

INFRASTRUCTURES AND INNOVATIVE RESEARCH INSTRUMENTS

- Data Centre
- Genomics Facility
- Cryo-EM Facility
- Light Imaging Facility
- Image Analysis Facility
- Automated Stem Cell and Organoid Facility
- National Facilities

NETWORKING AND PARTNERSHIP

RESEARCH-BASED INNOVATION

- Centre for Innovation and Technology Transfer
- Partnership with pharmaceutical industries and companies
- Collaborations of R&D

TALENT ATTRACTION AND TRAINING

- PhD Training
- Courses and conferences for external scientists
- Scientific Visitors Programmes
- Early Career Fellowship Programme

EFFICIENCY AND EFFECTIVENESS OF OPERATIONAL PROCESSES

SCIENTIFIC REPUTATION AND DISSEMINATION

- Awards
- Events
- Conferences
- Scientific initiatives
- Conventions

SUSTAINABILITY

OUTPUT

Transformation of scientific discoveries into tangible applications for the benefit of patients and society

Attraction of additional funding, including from private sources

Development and career opportunities to the next generation of scientists

Operating scientific services and facilities to be made available to external scientists

Scientific collaboration, institutional events and initiatives of great relevance

Innovative approaches for personalized and preventive medicine

Awareness importance of science and scientific literacy

FINANCIAL CAPITAL

The pool of funds that is:

- **Available to an organisation for use in the production of goods or the provision of services**
- **Obtained through financing, such as debt, equity or grants, or generated through operations or investment**

The core funding for infrastructure development and conducting HT's activities comes from public funds allocated by the Italian government. These funds are provided on the basis of article 1, paragraph 121 of Law No. 232 of 11th December 2016, which, as of the financial year 2021, will be used with account also taken of the provisions of the Convention signed by HT on 30th December 2020 with the Founding Ministries in accordance with Law No. 160/2019. This Convention requires that a quota of not less than 55% of funding provided by law is allocated to "National Facilities" (NF), i.e. to the construction, operation and maintenance of specific scientific infrastructures, identified through a multi-level consultation process, to be made available to external scientific projects.

HT's financial capital is also composed of government grants received pursuant to article 49-bis of Decree Law No. 34/2020, which provided for the creation of a facility entitled "Centre for Innovation and Technology Transfer in the Life Sciences" (CITT). This Decree Law, converted with amendments by Law No. 77 of 17th July 2020, requires the HT Foundation to adopt specific organisational measures for the use of the funds allocated for this purpose.

Finally, HT's financial capital also includes additional financing and grants, some of which were formalised in 2022 and 2021, from sources other than government grants. It is expected that, in view of the growth and development of the Foundation and the implementation of scientific research activities, HT will be able to attract a growing quantity of different forms of grants from different sources.

The Foundation's assets are composed of an endowment fund, which is unavailable and restricted to the pursuit of By-law related purposes, and an operating fund, which is used for HT's operating expenses.

The allocation of the HT endowment fund is restricted to the start-up of the scientific project. It was initially assigned to the *Istituto Italiano di Tecnologia* (IIT – Italian Technology Institute) for an original amount of €79,900,000 and was then transferred to the Foundation, both in the form of funding and assets in kind, with a remaining balance of €77,230,557. The difference between the original amount of the fund and the amount transferred to the Foundation corresponds to the costs incurred for the launch of the project by IIT.

As concerns the operating fund, paragraph 121 of the founding Law No. 232 of 11th December 2016 authorised spending on the HT project as follows: €10 million for 2017, €114.3 million for 2018, €136.5 million for 2019, €112.1 million for 2020, €122.1 million for 2021, €133.6 million for 2022 and €140.3 million starting from 2023. This grant is paid out according to the progress of the HT project. Finally, that same operating fund also includes the amounts authorised by article 49-bis of Decree Law No. 34/2020, according to which grants of €10 million for 2020 and €2 million per year as from 2021 are made to HT to promote and finance the "Centre for Innovation and Technology Transfer".

FINANCIAL CAPITAL – 2022 RESULTS

At year-end 2022 the operating fund was recognised within the Foundation's equity and totalled €393,155,844. It included the grants indicated in article 1, paragraph 121 of Law No. 232 of 11th December 2016, relating to the years 2019, 2020, 2021 and 2022, for the part not spent as at the reporting date and the contributions granted for the "Centre for Innovation and Technology Transfer in the Life Sciences".

This fund consists of three different items:

- the operating fund for internal research activities amounting to €236,760,236;
- the operating fund for infrastructure hub activities (i.e. National Facilities) amounting to €143,164,179;
- the operating fund for the Centre for Innovation and Technology Transfer amounting to €13,231,429.

The table below shows changes in the operating fund and its allocation between the Human Technopole quota and the National Facilities quota:

HT AND NF OPERATING FUND [€]

PERIOD	GRANTS UNDER L. 232/2016	GRANTS USED					GRANTS TO BE USED	OF WHICH	
		2018	2019	2020	2021	2022		HT	NF
2017	10,000,000	275,387	5,070,516	4,654,097	-	-	-	-	-
2018	114,300,000	-	-	68,154,251	46,145,749	-	-	-	-
2019	136,500,000	-	-	-	2,596,626	-	133,903,374	133,903,374	-
2020	112,100,000	-	-	-	-	-	112,100,000	112,100,000	-
2021	122,100,000	-	-	-	52,530,252	-	69,569,748	-	69,569,748
2022	133,600,000	-	-	-	-	69,248,708	64,351,292	(9,243,138)	73,594,431
TOTAL	**628,600,000**	**275,387**	**5,070,516**	**72,808,348**	**101,272,627**	**69,248,708**	**379,924,414**	**236,760,236**	**143,164,179**

The following table shows the changes in the CITT operating fund:

CITT OPERATING FUND [€]

PERIOD	GRANTS UNDER THE ART. 49-BIS OF LEGISLATIVE DECREE 34/2020 (CONV. INTO LAW 77/2020)	GRANTS USED					GRANTS TO BE USED
		2018	2019	2020	2021	2022	
2020	10,000,000	-	-	90,775	422,857	254,939	9,231,429
2021	2,000,000	-	-	-	-	-	2,000,000
2022	2,000,000	-	-	-	-	-	2,000,000
TOTAL	**14,000,000**	**-**	**-**	**90,775**	**422,857**	**254,939**	**13,231,429**

The grant for the Centre for Innovation and Technology Transfer for 2020 amounted to €10,000,000 and to €4,000,000 for 2021 and 2022. After costs incurred it amounted to €13,231,429 as at 31.12.2022.

The year 2022 ended with an operating surplus of €38,032 for the HT Foundation, after provisions for corporate income tax (IRES) and regional production tax (IRAP) of €617,441. Depreciation, amortisation and write-downs on tangible and intangible fixed assets amounting to €12,837,770 were recognised.

Activities carried out in 2022 resulted in total financial commitments of over €115 million. These commitments translated into the recognition in the balance sheet of operating grants and capital grants of over €65.8 million, relating to the quota for the financial year, and to approximately €134.2 million in deferred income, for the part of those commitments designated for future years.

In financial terms, revenues of approximately €128 million in grants were recognised in 2022, against cash outlays of approximately €75 million.

The table below gives details of the key amounts for the financial year 2022 compared with the previous year:

EURO	31/12/2022	31/12/2021
VALUE OF PRODUCTION	65,779,053	36,220,072
GROSS OPERATING MARGIN	13,521,012	6,556,405
OPERATING RESULT	666,249	559,501
OPERATING SURPLUS	38,032	17,747
FIXED ASSETS	125,810,834	115,623,825
TOTAL EQUITY	470,516,175	404,381,790
NET FINANCIAL POSITION	113,929,831	60,479,034

RECLASSIFIED INCOME STATEMENT

The value of production includes grants made by the Ministry of Economy and Finance (MEF) totalling €64,737,640, of which €51,925,398 consists of operating grants and €12,812,242 of capital grants attributable to HT's activities. Additionally operating grants of €254,939 relate to the activities of the new Centre for Innovation and Technology Transfer (CITT) and €46,625 to the National Facilities.

Grants amounting to €548,158 from other entities (non-MEF funds) and "other revenues" amounting to €191,691, of which 38,032 from commercial rentals of space in Palazzo Italia, were also recognised.

The reclassified income statement compared with that for the previous financial year is given below (in euro):

RECLASSIFIED INCOME STATEMENT [€]	31/12/2022	31/12/2021	VARIATIONS
VALUE OF PRODUCTION	65,779,053	36,220,072	29,558,981
EXTERNAL COSTS	34,605,713	19,083,397	15,522,317
ADDED VALUE	**31,173,340**	**17,136,675**	**14,036,665**
LABOUR COST	17,652,328	10,580,270	7,072,058
GROSS OPERATING MARGIN	**13,521,012**	**6,556,405**	**6,964,607**
AMORTISATION, DEPRECIATION AND OTHER ACCRUALS	12,854,763	5,996,905	6,857,858
OPERATING RESULT	**666,249**	**559,501**	**106,749**
NON-RECURRING INCOME	-	-	-
FINANCIAL INCOME AND CHARGES	(10,777)	785	(11,562)
ORDINARY RESULT	**655,472**	**560,286**	**95,187**
REVALUATIONS AND DEPRECIATIONS	-	-	-
PROFIT BEFORE TAXES	**655,472**	**560,286**	**95,187**
INCOME TAXES	617,441	542,538	74,902
NET PROFIT	**38,032**	**17,747**	**20,284**

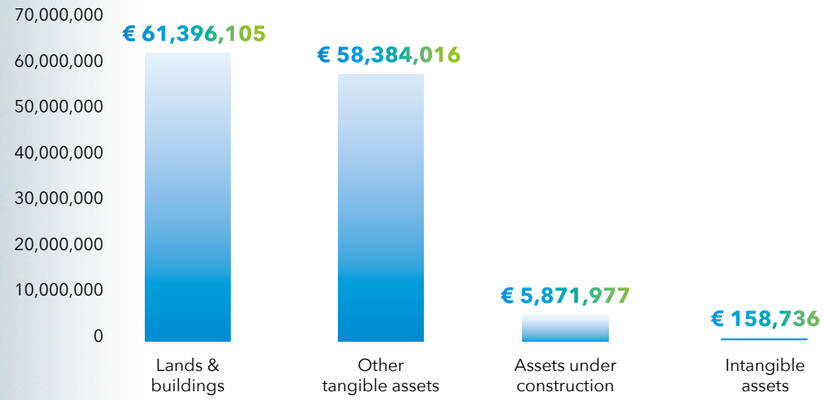
RECLASSIFIED BALANCE SHEET

The main changes in the balance sheet occurring in 2022 have been summarised in the table below. The asset and liability items have been appropriately reclassified to show invested capital, sources of funding and their determinants. The table shows figures for the financial year 2022 compared with the previous year:

RECLASSIFIED BALANCE SHEET [€]	31/12/2022	31/12/2021	VARIATIONS
NET INTANGIBLE ASSETS	158,736	38,564	120,172
NET TANGIBLE ASSETS	125,652,098	115,585,261	10,066,837
EQUITY INVESTMENTS AND OTHER FINANCIAL ASSETS	-	-	-
FIXED CAPITAL	**125,810,834**	**115,623,825**	**10,187,009**
STOCK INVENTORIES	58,004	73,696	(15,692)
TRADE RECEIVABLES	87,702	93,594	(5,892)
OTHER ACCOUNTS RECEIVABLE	390,172,018	375,352,395	14,819,623
ACCRUED INCOME AND PREPAYMENTS	1,452,443	562,319	890,124
SHORT-TERM ASSETS	**391,770,166**	**376,082,004**	**15,688,162**
PAYABLES TO SUPPLIERS	20,482,890	18,807,062	1,675,828
DOWN PAYMENTS	-	-	-
TAX AND SOCIAL SECURITY DEBTS	4,045,710	1,356,689	2,689,020
OTHER DEBTS	1,188,949	488,796	700,153
ACCRUED LIABILITIES AND DEFERRED INCOME	134,252,672	126,585,603	7,667,068
SHORT-TERM LIABILITIES	**159,970,220**	**147,238,150**	**12,732,070**
NET OPERATING CAPITAL	**231,799,946**	**228,843,854**	**2,956,092**
EMPLOYEES' LEAVING INDEMNITY	1,023,134	564,922	458,212
TAX AND SOCIAL SECURITY DEBTS (BEYOND THE FOLLOWING FINANCIAL YEAR)	-	-	-
OTHER MEDIUM & LONG-TERM LIABILITIES	1,301	-	1,301
MEDIUM & LONG-TERM LIABILITIES	**1,024,436**	**564,922**	**459,513**
INVESTED CAPITAL	**356,586,344**	**343,902,756**	**12,683,588**
EQUITY	470,516,175	404,381,790	66,134,385
MEDIUM & LONG-TERM NET FINANCIAL POSITION	-	-	-
SHORT-TERM NET FINANCIAL POSITION	113,929,831	60,479,034	53,450,797
EQUITY AND NET FINANCIAL DEBT	**356,586,344**	**343,902,756**	**12,683,588**

The table below shows the composition of fixed assets as at 31st December 2022 and also changes compared with the previous year:

ASSETS 2022



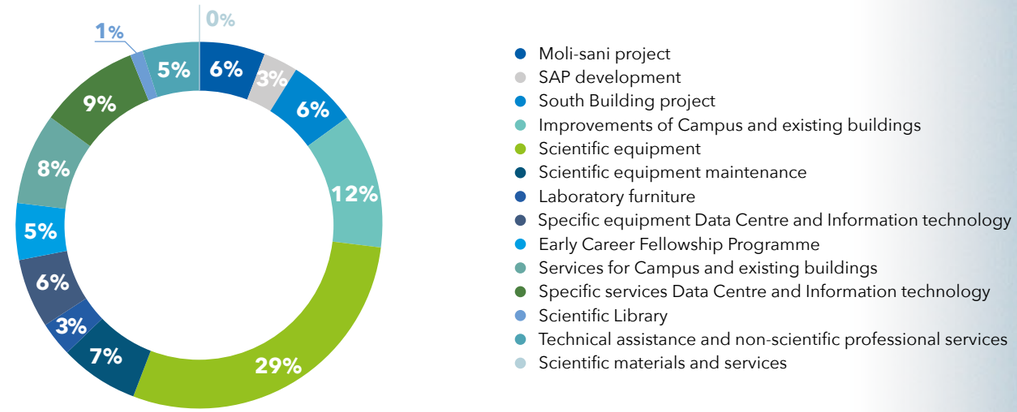
DETAIL OF CHANGES IN FIXED ASSETS [€]	31/12/2022	31/12/2021	NET INVESTMENTS
TANGIBLE ASSETS			
LAND AND BUILDINGS	61,396,105	58,077,835	3,318,270
PLANT AND MACHINERY	2,713,821	1,809,382	904,439
INDUSTRIAL AND COMMERCIAL EQUIPMENT	31,975,887	27,110,243	4,865,644
OTHER ASSETS	23,694,308	24,263,846	(569,538)
ASSETS UNDER CONSTRUCTION	5,871,977	4,323,955	1,548,023
INTANGIBLE ASSETS			
CONCESSIONS, LICENCES, TRADEMARKS AND SIMILAR RIGHTS	38,134	6,981	31,153
OTHERS	120,602	31,583	89,019

The item "Land and buildings" relates to the acquisition of buildings owned by the Foundation consisting of Palazzo Italia, the US6/North Pavilion and the Cardo/South Pavilion as well as the related costs incurred in 2022 for change in their use.

Further investments were also made in 2022 in laboratory equipment, machinery and furnishings. These items have been classified within "other tangible fixed assets".

The table below shows the composition of the commitments as at 31st December 2022, not stated in the Balance Sheet, which will be completed in coming years for a total of more than €50 million.

ONGOING COMMITMENTS 2022 FOR OVER €50 M



ECONOMIC VALUE GENERATED AND DISTRIBUTED

The table below shows details of how HT generates and distributes value:

DETERMINATION OF THE ECONOMIC VALUE DIRECTLY GENERATED AND DISTRIBUTED [€]	2022	2021
ECONOMIC VALUE GENERATED	**65,779,053**	**36,222,040**
REVENUES	-	-
OTHER INCOME	65,779,053	36,220,072
FINANCIAL INCOME	-	1,968
ECONOMIC VALUE DISTRIBUTED	**52,901,951**	**30,133,693**
OPERATING COSTS (PURCHASES, SERVICES, INVESTMENTS)	34,555,804	18,892,279
EMPLOYEE REMUNERATION	17,652,328	10,580,270
REMUNERATION OF THE PUBLIC ADMINISTRATION (TAXES)	690,506	661,032
SHAREHOLDER REMUNERATION	-	-
FINANCIAL BACKERS REMUNERATION	3,313	112
INVESTMENTS IN THE COMMUNITY	-	-
ECONOMIC VALUE RETAINED	**12,877,103**	**6,088,347**
DEPRECIATION, AMORTISATION AND WRITE-DOWNS	12,839,071	6,070,601
ANNUAL RESULT ALLOCATED TO RESERVES	38,032	17,746

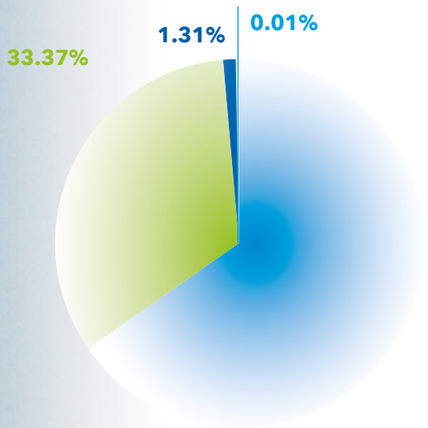
In the year ended 31.12.2022, the Foundation generated value of €65.8 million, up by approximately 182% compared with 2021, due to operating grants and capital grants paid by the MEF, in addition to operating grants related to CITT and National Facilities activities. The economic value generated is completed with other grants for scientific projects and, to a lesser extent, with other revenues generated by commercial activities.

The economic value distributed among stakeholders amounted to €52.9 million of which 65.32% is attributable to suppliers (costs for the purchase of materials, services, etc.) and 33.37% to employees (costs for wages and salaries). However, the remainder (1.31%) consists of public administration remuneration for taxes and duties.

On the other hand, the economic value retained consists almost entirely of depreciation, amortisation and write-downs, and only 0.07% is attributable to self-financing (operating surplus for the year) generated by commercial activities.

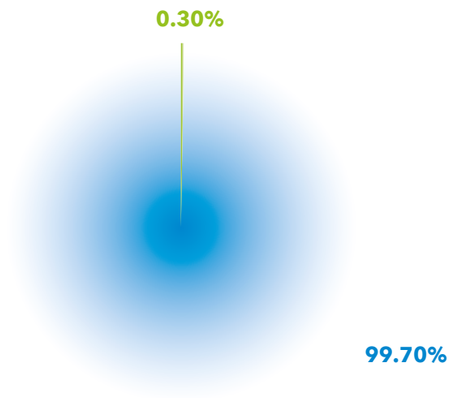
ECONOMIC VALUE GENERATED AND DISTRIBUTED IN 2022 AT A GLANCE

ECONOMIC VALUE DISTRIBUTED €52.90 M



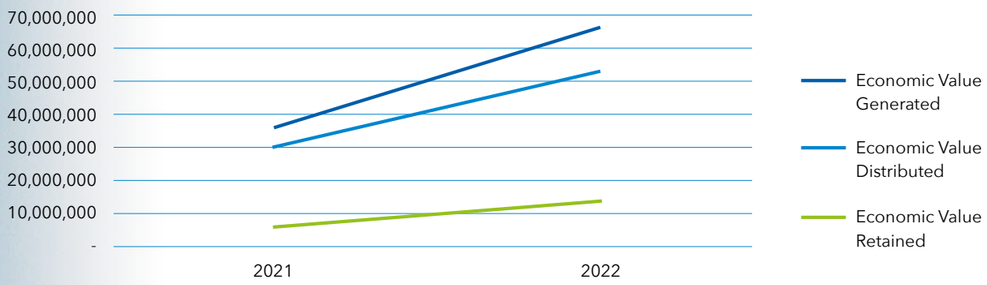
- Operating costs (purchases, services, investments)
- Employee remuneration
- Remuneration of the Public Administration (taxes)
- Financial backers remuneration

ECONOMIC VALUE RETAINED €12.88 M



- Depreciation, amortisation and write downs
- Self-financing

ECONOMIC VALUE GENERATED AND DISTRIBUTED [€]



ADDITIONAL FINANCING

In 2022 the Foundation succeeded in attracting additional funding other than that granted by the State. These are grants and financing awarded to HT within the framework of scientific projects and collaboration agreements. The tables below give a list of this funding showing the amount, the project or collaboration and the source of funding.

For full disclosure we are also reporting data on the first months of 2023:

RESEARCH CENTRE	INSTITUTE/ENTITY	PROJECT	EURO
COMPUTATIONAL BIOLOGY	SVCF	Dense Segmentations	17,643
COMPUTATIONAL BIOLOGY	AIRC	Non-genetic mechanisms of drug resistance in breast cancer: role of cancer associated fibroblasts	105,000
NEUROGENOMICS	HEU	NEUROCOVID	3,234,940
NEUROGENOMICS	HEU	R2D2-MH	500,000
NEUROGENOMICS	EMBO	EMBO postdoctoral fellowship	132,000
NEUROGENOMICS	AIRC	Role of the morphology of glioblastoma stem cells in proliferation and invasiveness	460,268
NEUROGENOMICS	Warren Alpert Foundation	Dissecting the long-term pathology of anti-NMDAR encephalitis using human stem cell models	339,423
COMPUTATIONAL BIOLOGY	HORIZON	AI4LIFE	767,000
STRUCTURAL BIOLOGY	HEU-ERC	THYROMOL	1,498,750
STRUCTURAL BIOLOGY	EMBO	EMBO fellowship	132,000
STRUCTURAL BIOLOGY	EMBO	Functional and structural study of the human NSUN2 protein writer of m5c RNA modifications	134,400
FUNCTIONAL GENOMICS	EUREKA	PhD SEMM 38th cycle	145,772
TOTAL GRANTS FORMALISED 2022			**7,467,196***

** Of which €3,239K collected as at 31.12.2022.*
In 2022 an additional €441K were collected relating to grants formalised in 2021.

RESEARCH CENTRE	INSTITUTE/ENTITY	PROJECT	EURO
STRUCTURAL BIOLOGY	EMBO	EMBO postdoctoral fellowship	134,400
TOTAL GRANTS FORMALISED 2023			**134,400***

** An additional €332K were collected in early 2023 relating to grants formalised in 2021, 2022 and 2023.*

RESEARCH CENTRE	INSTITUTE/ENTITY	PROJECT	EURO
COMPUTATIONAL BIOLOGY	HORIZON	IMAGINE	189,875
TOTAL GRANTS AWARDED BUT NOT YET FORMALISED			**189,875**

PROCUREMENT AND PURCHASES 2022

THE PRINCIPLES OF HT'S PROCUREMENT ACTIVITIES

When it awards public contracts for the acquisition of works, services and supplies, the Foundation acts in accordance with the principles of economy, effectiveness, timeliness and fairness. It also complies with the principles of free competition, non-discrimination, transparency, proportionality and disclosure, as well as the principle of rotating invitations and awards in those procedures that require it, taking into account the criteria of energy and environmental sustainability and avoiding situations of conflict of interest.

As an institutional unit that forms part of the Public Administration sector (Sector S.13), the Foundation complies with Legislative Decree No. 50/2016 and subsequent amendments additions for its procurement activities.

When it awards contracts for the acquisition of works, services and supplies, the Foundation acts in accordance with the principles of cost savings, effectiveness, timeliness and fairness. It also complies with the principles of free competition, non-discrimination, transparency, proportionality and disclosure, as well as the principle of rotating invitations and awards in those procedures that require it, taking into account the criteria of energy and environmental sustainability and avoiding conflicts of interest.

The Foundation also guarantees compliance with the principles of disclosure and transparency, pursuant to article 29 of Legislative Decree No. 50/2016, as amended, and it publishes information required by ANAC Resolution No. 1134/2017 – Attachment I, Section Invitations to Tender and Contracts, with reference to private sector entities pursuant to Art. 2-bis, paragraph 3, of Legislative Decree No. 33/2013.

HT has created a regulation that also governs conflicts of interest within the Foundation and provides for appropriate measures to combat fraud and corruption, as well as to identify, prevent and effectively resolve any possible conflicts of interest in its contract award procedures, in order to avoid any distortion of competition and ensure equal treatment for all business operators.

Finally, the Foundation carries out checks pursuant to article 80 on suppliers, which also include an assessment of corruption offences (Legislative Decree No. 50/2016, article 80 paragraph 1 letter a).

ACTIVITIES 2022

In 2022, the Foundation conducted the following activities for the procurement of goods and services in accordance with Legislative Decree No. 50/2016:

PURCHASE CATEGORY	PURCHASED VALUE IN EURO
PURCHASES OUTSIDE OF APPLICATION LEGISLATIVE DECREE 50/2016	2,003,365
ADHESION TO FRAMEWORK AGREEMENTS/CENTRAL PURCHASING AGREEMENTS	7,806,705
PURCHASES UNDER LEGISLATIVE DECREE 50/2016	43,244,088
CONTRACTS UNDER LEGISLATIVE DECREE 50/2016	564,000
TOTAL	**53,618,157**

Trade payables for the year ended 31st December 2022 were composed geographically as follows:

- 98.26% Italian suppliers;
- 0.18% EU suppliers;
- 1.56% non-EU suppliers.

As of June 2022, HT has also implemented a warehouse/supply chain structure with the following objectives:

- to manage the entire supply chain with a view to making savings on costs;
- to streamline the procurement flow of material for research activities (time/resources).

HUMAN CAPITAL

People's competencies, capabilities and experience, and their motivations to innovate, including their:

- **Alignment with and support for an organisation's governance framework, risk management approach, and ethical values**
- **Ability to understand, develop and implement an organisation's strategy**
- **Loyalties and motivations for improving processes, good and services, including their ability to lead, manage and collaborate**

Human Technopole's Human Resource area strategy is guided by the knowledge that employees' skills and involvement are crucial to the Foundation's success. Hard skills and professional competencies are of course fundamental requirements, but the Foundation also values the importance of soft skills in its role as an international and multicultural research Institute.

These factors are key to sharing a culture based on specific values which are reflected directly in styles of work and leadership, in people's behaviour and in the working environment. HT's ambition is therefore to set an example as an internationally recognised research institute able to attract the best scientists and the best talents.

The guiding pillars of HT's Human Resource area are as follows:

The Foundation follows the principles of disclosure, transparency, gender equality and non-discrimination when recruiting staff and strives constantly to create research groups that are as diverse as possible in order to foster the exchange of ideas and achieve the best results in each field.

It is for this reason that the Foundation selects and welcomes male and female researchers at all levels and with diverse experiences, ranging from young PhD students to expert scientists who lead highly competitive research centres.

The table below lists the heads of the Foundation's research areas:

PIERO CARNINCI	Geneticist, Head of the Genomic Research Centre, Functional Genomics Programme. Team Leader of the Laboratory for Transcriptome Technology, Director of the Division of Genomic Technologies and Deputy Director of the RIKEN Centre for Integrative Medical Sciences in Yokohama (Japan); he is also a member of the European Molecular Biology Organisation (EMBO)
NICOLE SORANZO	Geneticist, Head of the Genomic Research Centre, Medical and Population Genomics Programme. She is also Senior Group Leader at the Wellcome Sanger Institute at Hinxton (UK), Professor of Human Genetics at the University of Cambridge and a member of the European Molecular Biology Organisation (EMBO); in 2022 she was also elected as a member of the Executive Office of the International Common Disease Alliance (ICDA) and of the Academia Europea
ALESSANDRO VANNINI	Molecular biologist and biochemist, Head of the Structural Biology Research Centre, after almost eight years in the UK as Principal Investigator and Deputy Head of Division at the Institute of Cancer Research in London
GAIA PIGINO	Biologist, Associate Head of the Structural Biology Research Centre. She is also a research group leader and faculty member at the Max Planck Institute of Molecular Cell Biology and Genetics in Dresden (Germany) and since 2022 a member of the European Molecular Biology Organisation (EMBO)
ANDREA SOTTORIVA	Head of the Computational Biology Research Centre. He is Director of the Centre for Evolution and Cancer and Leader of the Evolutionary Genomics and Modelling Team at the Institute of Cancer Research in London
EMANUELE DI ANGELANTONIO	Head of the Health Data Science Research Centre, set up under an agreement with the Politecnico di Milano. Professor of Clinical Epidemiology in the Department of Public Health and Primary Care at the University of Cambridge and elected Senior Investigator of the National Institute for Health and Care Research (NIHR) in the UK in 2022
FRANCESCA IEVA	Associate Head of the Health Data Science Research Centre, with the Politecnico di Milano. She is Associate Professor of Statistics at MOX, the Modelling and Scientific Computing laboratory at the Department of Mathematics, Politecnico di Milano
GIUSEPPE TESTA	Molecular biologist, he is Head of the Neurogenomic Research Programme under an agreement with the University of Milan. He is Full Professor of Molecular Biology in the Department of Oncology and Haemato-Oncology at the University of Milan. He is also Director of Science in the Society Project at the European Institute of Oncology (IEO), a member of the Scientific Council and Group Leader of the "High Definition Disease Modelling Lab Stem Cell and Organoid Epigenetics". In 2022 he was elected member of the European Molecular Biology Organisation (EMBO)

TRAINING AT HT

The improvement of its staff's expertise through training programmes and initiatives is a very important aspect of life at HT. HT supports its research staff in their scientific career growth by providing training on cutting-edge subjects and technologies in biomedical and life sciences research and also by actively promoting the career development of its scientists at all stages of their professional life.

Training at HT targets not only internal scientists but also external research staff through the development and provision of advanced training opportunities. HT's dynamic and multidisciplinary approach provides an ideal environment to foster the growth of talented young scientists. Training activities at HT are inclusive and designed to promote a diverse environment.
Details of these activities are given below.

INTERNAL TRAINING

The objective of internal training at HT is to enable our staff to reach their full potential as independent researchers and future scientists of excellence.

INTERNAL TRAINING	
TRAINEES	university students are offered the opportunity to complete their thesis at HT, in a laboratory of their choice, subject to acceptance by the corresponding group leader. HT has established partnerships for joint internships with several universities
DOCTORATES	HT participates in doctoral programmes in cooperation with national and international academic institutions. For example, the Foundation is a host institution of the European School of Molecular Medicine (SEMM) PhD programme in Systems Medicine. HT is also part of the joint doctoral programme in Data Analytics and Decision Sciences (DADS) with the Politecnico di Milano
POST-DOCTORAL TRAINING	aimed at broadening and deepening the research and soft skills of post-doctoral researchers, including courses in specific research areas and technologies
GROUP LEADER TRAINING	i.e. a comprehensive training programme designed to increase the skills needed to effectively manage a laboratory or to establish oneself as a leader in a specific field of research. This programme includes mentoring and career development activities

EXTERNAL TRAINING

The driving force behind HT's external training programmes is the intention to create a centre of excellence to train promising researchers in the biomedical sciences through access to the Foundation's expertise, methods and resources. Training events for external scientists include conferences with cutting-edge themes, symposia, workshops and courses related to scientific and technological development in areas of great importance to modern biomedical research.

SCIENTIFIC VISITORS

HT offers research staff from the national and international scientific community the chance to spend a period of time in its laboratories to develop research collaborations, to learn and/or teach cutting-edge methods and technologies, or to use HT's infrastructure and facilities. More specifically, a scientific visitor is an external researcher who comes from anywhere in the world and is at any stage of their career, who is hosted for a variable period (from one week up to a maximum of one year). During this period, a Group Leader or HT Head of Facility (the "Scientific Host") takes the scientific visitor in their laboratory or facility as a guest to collaborate on a research project of mutual interest and/or to train or be trained on a specific topic or technology. Following the introduction of a specific programme, these initiatives were regulated in 2022 through the Management Committee's approval of an *"Internal Regulation on Scientific Visitors"*. Further details on these initiatives are given in subchapter 2.3 *"Strategy"* in the section *"Talent attraction and training, and research output sharing"*.

EARLY CAREER FELLOWSHIP (ECF) PROGRAMME

The ECF programme is designed to support career development by helping talented researchers to commence independent research.

The programme is open to researchers of all nationalities who have completed a PhD and whose projects focus on one of the Foundation's research areas: Genomics, Neurogenomics, Computational Biology, Structural Biology and Health Data Science. Thanks to the ECF programme, young researchers have the chance to win a scholarship worth €200,000 per year for five years to support their research.

Please refer to the specific page on the Foundation's website (4th November 2022) (Early Career Fellowship Programme - Human Technopole).

EMPLOYEE SAFETY AT HT

Human Technopole continues to increase its commitment to the implementation of its health and safety policy as an integral part of its Strategic Plan.

A central role in this respect is undoubtedly played by the HSE function of the Administrative Directorate. This function has in fact introduced several instruments designed to guarantee workers' health and safety.

More specifically, investments made in personnel safety are as follows:

- in 2022 the health and safety section of the "Risk Assessment Document" (RAD) was updated, consisting of a general part and specific assessments;
- in 2022, two workers' representatives for health, safety and the environment (WRHSE) were elected, a new Corporate Physician was appointed and two new Prevention and Protection Service Personnel (PPSP) were designated. In addition, external technicians were appointed, including a laser safety officer and a radiation protection expert in accordance with article 128, paragraph 2 of Legislative Decree No. 101/2020;
- with regard to health monitoring, in 2022 the Corporate Physician saw 187 patients and carried out 198 diagnostic imaging and similar examinations;
- with regard to firefighting and first aid management, six-monthly firefighting audits were conducted by the company AREXPO, which acted as an auxiliary contracting authority (agreement for the maintenance and management of infrastructure in the MIND area). The annual emergency and evacuation drill was conducted in December 2022. Monthly monitoring of firefighting equipment (as recommended by the UNI 9994-1 standard) and first-aid kits was ensured by the HSE team, following the procedures set out in the relevant internal regulation;
- with regard to information, education and training, HSE training and onboarding courses were provided during the financial year 2022 as per the relative schedule;
- the periodic meeting pursuant to article 35 of Legislative Decree No. 81/08 was held as required;
- as concerns personnel involvement and awareness of training activities, the Foundation's personnel received regular communications by email and through the publication of information on the Foundation's intranet. HT personnel have received a periodic "HSE Newsletter" since January 2022 and since April 2022 the HSE area has held regular operational meetings of laboratory managers to update them on HSE issues and to present regulations and guidelines.

HUMAN CAPITAL – 2022 RESULTS

Human Technopole's staff recruitment and selection activities continued throughout 2022. At the end of 2022 the workforce was composed of 250 people, 91 more than at the end of 2021.

In the research area in particular numerous senior positions had been filled and this included the selection of further group leaders in the areas of genomics, computational biology and health data science.

The Foundation's Group leaders recruited in 2022 are listed below:

CECILIA DOMÍNGUEZ CONDE	group leader in the genomics research centre, medical and population genomics programme. Her research group uses state-of-the-art genomic and computational methods to study human immunity in early childhood and immune-mediated diseases in children;
CRAIG GLASTONBURY	group leader in the genomics research centre, population and medical genomics programme. His laboratory develops and applies machine learning methods to understand the genetic basis of a broad spectrum of complex diseases through the collection of large-scale biomedical imaging datasets;
MAGDA BIENKO	group leader in the genomics research centre, functional genomics programme. The main goal of her research is to understand the principles and design mechanisms that model the spatial arrangement of DNA, RNA and proteins in the mammalian cell nucleus, thereby developing new sequencing and single cell microscopy methods, as well as new mathematical modelling approaches;
IVANO LEGNINI	a molecular and systems biologist who will launch his research group at HT in March 2023. Located in the genomics research centre, he will work in the field of gene regulation and RNA metabolism, as well as on the development of new genomic technologies to perturb and measure gene expression;
FERNANDA PINHEIRO	group leader in the computational biology research centre. Her group brings together experimental and theoretical research to develop a predictive framework for evolutionary processes under conditions of ecological complexity, based on models of cell metabolism;
LUISA ZUCCOLO	group leader in the health data science research centre. In her laboratory, epidemiologists, statisticians and data scientists analyse complex, highly dimensional data to improve understanding of maternal and child health, with a focus on intergenerational effects.

In addition to the group leaders listed above, those already selected in previous years are as follows:

LORENZO CALVIELLO	molecular and computational biologist. His laboratory uses omics technologies and computational approaches to highlight different aspects of translational control, examining both the coding and non-coding transcriptome;
BLAGOJE SOSKIC	immunologist and geneticist. His research group uses a broad range of genomic and immunological experiments to study variations in the immune system. The group is particularly interested in understanding the genetic control of T cell – B cell interaction and antibody production;
NEREO KALEBIC	group leader in the centre for neurogenomics. His research focuses on the molecular and cellular biological mechanisms underlying the development of the human neocortex and its implications for human evolution and neurodevelopmental disorders;
OLIVER HARSCHNITZ	stem cell biologist. His research focuses on the mechanisms that cause neuro-immunological diseases, in particular what leads to inflammation in the brain;
ELENA TAVERNA	neuroscientist. Her research seeks to understand how neuronal stem cells influence brain formation. Answering this question is of crucial importance to understanding mechanisms underlying how the brain develops and evolves and how these mechanisms are altered in neurodevelopmental disorders;
JOSÈ DAVILA-VELDERRAIN	computational systems biologist. He is interested in developing a deeper understanding of the diversity and dynamic behaviour of human brain cells;
FRANCESCA COSCIA	Italian biochemist, expert in electronic cryo-microscopy. Her research focuses on molecular mechanisms that underlie thyroid function and diseases;
PHILIPP ERDMANN	chemical biologist and microscopist. His laboratory focuses on the analysis of the effects of liquid-liquid phase separation (LLPS) using cryo-electron tomography;
ANA CASAÑAL	a biochemist, expert in integrated structural biology with a focus on cryo-electron microscopy. At HT her group combines state-of-the-art cryo-electron microscopy with biochemical and biophysical methods to decipher mRNA processing mechanisms and understand how their deregulation affects disease;
FRANCESCO IORIO	group leader in the Centre for Computational Biology where he is establishing a research programme in Computational Cancer Pharmacogenomics and Therapeutic Target Discovery;
FLORIAN JUG	group leader in the centre for computational biology. His research seeks to push the boundaries of what artificial intelligence and machine learning can do to improve how we analyse and quantify biological data.

An overview of HT's workforce as at 31st December 2022 compared with the previous year is given below:

159 EMPLOYEES (DECEMBER 2021)

75

84

250 EMPLOYEES (DECEMBER 2022)

113

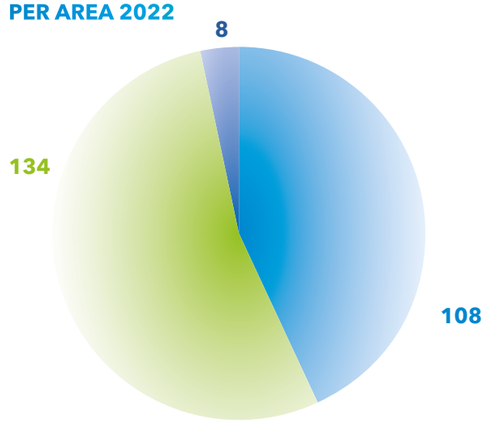
137

COMPOSITION OF EMPLOYEES AS AT 31ST DECEMBER 2022

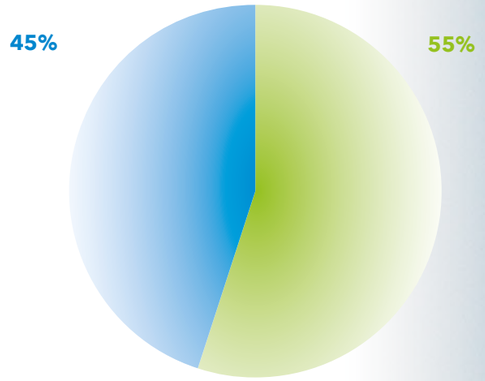
TOTAL EMPLOYEES	**250**
EMPLOYEES ON TEMPORARY CONTRACTS	**77**
OF WHICH WOMEN	49%
OF WHICH MEN	51%
OF WHICH ITALIAN	66%
OF WHICH NON-ITALIAN	34%
PERMANENT EMPLOYEES	**173**
OF WHICH WOMEN	57%
OF WHICH MEN	43%
OF WHICH ITALIAN	89%
OF WHICH NON-ITALIAN	11%
PART-TIME EMPLOYEES	**7**
OF WHICH WOMEN	57%
OF WHICH MEN	43%
OF WHICH ITALIAN	86%
OF WHICH NON-ITALIAN	14%
FULL-TIME EMPLOYEES	**243**
OF WHICH WOMEN	55%
OF WHICH MEN	45%
OF WHICH ITALIAN	82%
OF WHICH NON-ITALIAN	18%

The tables below show the HT population as at 31st December 2022, by area of work, gender, age and nationality:

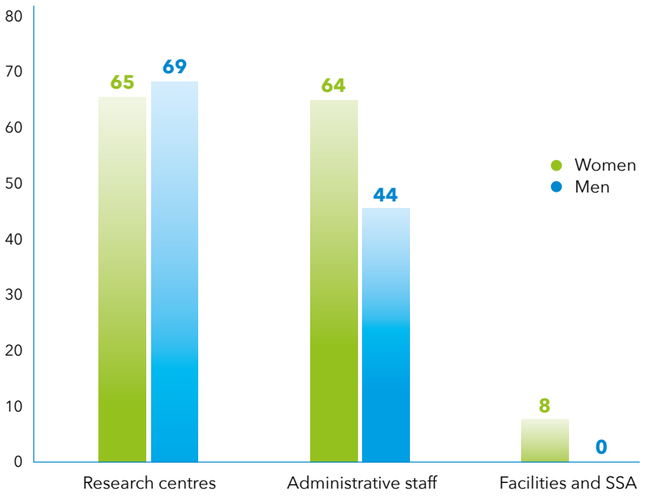
HT HUMAN RESOURCES PER AREA 2022



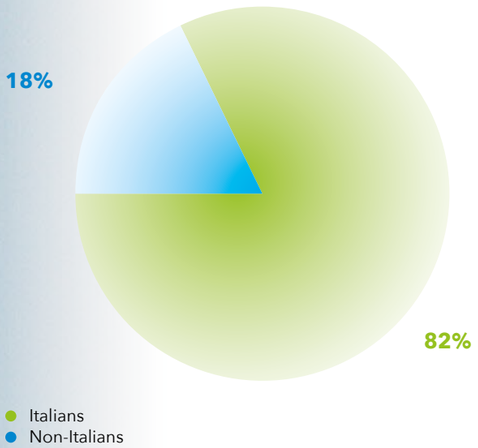
HT OVERALL GENDER DIVERSITY RATIO 2022



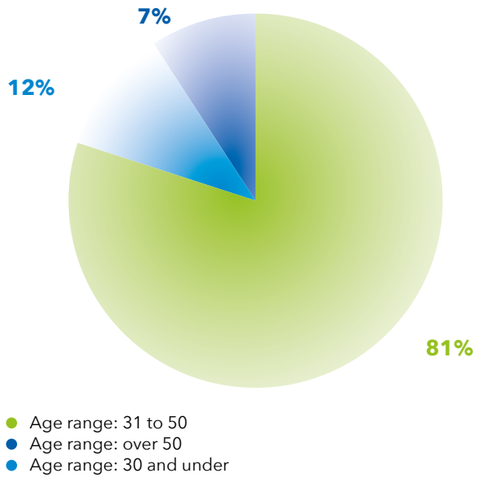
HT GENDER DISTRIBUTION BY AREA - 2022



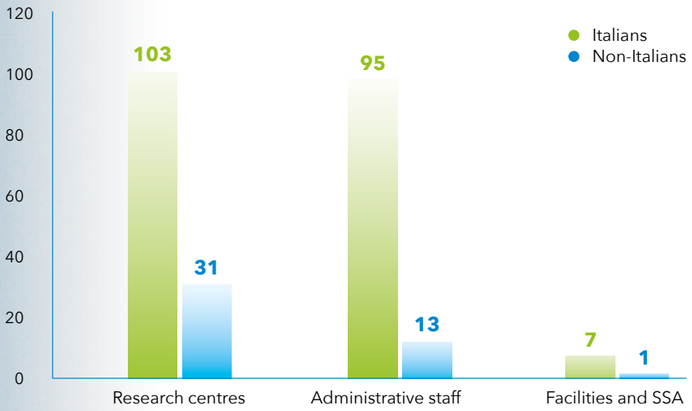
NON-ITALIANS / ITALIANS RATIO



HT AGE DISTRIBUTION

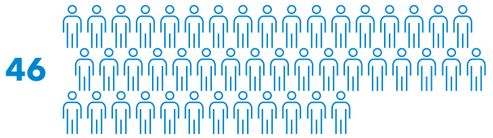


HT NON-ITALIANS / ITALIANS DISTRIBUTION BY AREA



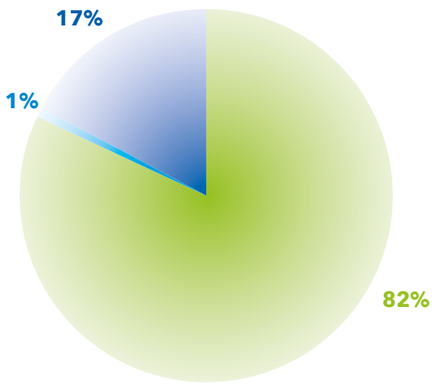
An overview is given below of employees recruited and departing in 2022, by gender and age:

110 EMPLOYEES RECRUITED 2022

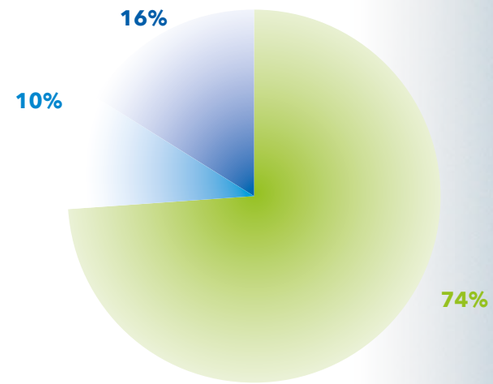


19 EMPLOYEES DEPARTED 2022

HT 2022 RECRUITED, DISTRIBUTION BY AGE GROUP



HT 2022 DEPARTED, DISTRIBUTION BY AGE GROUP



79% of new employees in 2022 were Italian and 21% non-Italian.
Of the employees departing in 2022, 63% were Italian and 37% non-Italian.

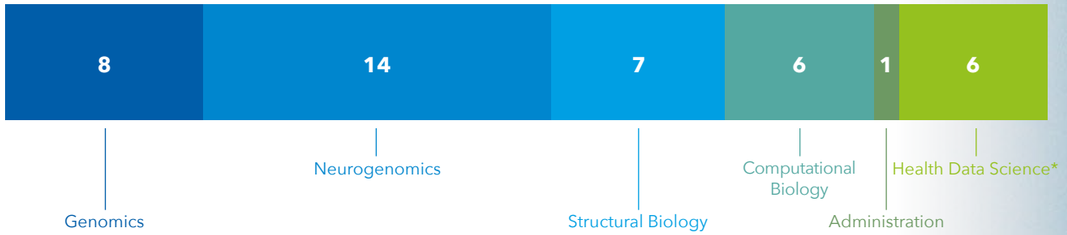
As at 31.12.2022, the Human Technopole Foundation also had 18 workers on "Co.Co.Co." (associate workers on a co-ordinated and continuous basis) contracts (+100% compared with 31.12.2021). Personnel also included 62 PhDs and trainees (72% as at 31.12.2021) who mainly carry out scientific work.

The tables below show the composition of postdocs by area as at 31st December 2022 and the number of PhD students as at the same date:

POSTDOCS AS AT 31ST DECEMBER 2022

FORMER INSTITUTE	COUNTRY OF FORMER INSTITUTE	DEPARTMENT
Genentecs	USA	Functional Genomics Centre
Grenoble Alpes University	France	Health Data Science Centre
Istituto Europeo di Oncologia	Italy	Medical & Population Genomics Centre
Institut für Molekulare Medizin	Germany	Neurogenomics Centre
Istituto Europeo di Chimica e Biologia (Bordeaux)	France	Structural Biology Centre
Leiden University	Netherlands	Structural Biology Centre
Otto Von Guericke University Magdeburg	Germany	Medical & Population Genomics Centre
Università di Milano Bicocca	Italy	Computational Biology Centre
Università San Raffaele	Italy	Functional Genomics Centre
Politecnico di Milano	Italy	Health Data Science Centre
European Bioinformatics Institute	UK	Computational Biology Centre
University of Bordeaux	France	Structural Biology Centre
Max Planck	Germany	Structural Biology Centre
Institute of Cancer Research (London)	UK	Computational Biology Centre
Dresden and the Gurdon Institute and Cambridge Advance Imaging Center and GSK	Germany	Neurogenomics Centre
Università di Torino	Italy	Computational Biology Centre
Technische Universitaeat Meunchen	Germany	Computational Biology Centre
University of Cambridge	UK	Structural Biology Centre
University of Geneva	Switzerland	Structural Biology Centre
University of Leicester	UK	Functional Genomics Centre
University of Natural Resources and Life Sciences	Austria	Structural Biology Centre
University of Oxford	UK	Neurogenomics Centre
University of Regensburg	Germany	Functional Genomics Centre

PHD STUDENTS AS AT 31ST DECEMBER 2022



** Four of whom working at the Politecnico di Milano.*

TRAINING INITIATIVES AND ACTIVITIES 2022

In 2022, HT revised its *"Regulation on the recruitment of Human Technopole Foundation administrative and scientific personnel"*. The revision covered the recruitment process, starting with the definition and approval of "Personnel Requirements" through to the formulation of offers to candidates and the subsequent contracts. The main underlying principles of the entire process as set out in the regulation are as follows:

- advertising of the post and selection procedures which ensure impartiality, cost-effectiveness and speed;
- impartiality, which involves the adoption of objective and transparent procedures, designed to ensure candidates possess the right aptitude and professional requirements for the position to be filled;
- transparency, which ensures that those intending to apply for a position to know how to apply, providing details of the recruitment and selection process, the documentation relating to their position and the final outcome;
- equal treatment, gender equality and non-discrimination.

In 2022, the Foundation's Human Resources area also introduced some important initiatives to support its employees:

- A feedback session was introduced. From March 2022 onwards, a "mediator" was introduced and interviews were held with newcomers in order to monitor their work experience at HT during their trial periods. These are individual, informal interviews lasting around half an hour, in which the mediator records their responses anonymously to be used for subsequent data analysis. The first interview is scheduled approximately six weeks after starting the position and the second approximately six weeks before the end of the trial period. At the request of the employee or their line manager, interim interviews may be held to realign expectations and goals, or to bring up problems encountered at work.

- The onboarding process has a structured framework through the provision of a series of activities and meetings for newcomers. This was designed to familiarise them with the Foundation and its organisational structure, working environment, colleagues and information essential for them to make the most of their initial, more sensitive period at Human Technopole. The onboarding process involves the participation of at least one representative from some of the functions and/or areas, such as the Communication area, the Internal Audit & Compliance area, the Human Resources area and the Finance area. Since 2023, participation in the onboarding process has been broadened to include the Purchasing and Supply Chain area, and further expansion to include other useful areas and functions of the Foundation is planned for the future.

- A counselling service was launched to enable all employees to benefit care and support in times of need.

- In February 2022, the Foundation approved and published a **Gender Equality Plan** (GEP), which meets the guidelines of the European Institute for Gender Equality (EIGE). In order to ensure proper implementation of the GEP, a special team (Gender Equality Team - GET) was appointed, consisting of five members and six personnel from different HT functions coordinated by the Administrative Director. GET's work started on 2nd May 2022 and a review of the GEP was carried out in October 2022 to identify critical issues and areas for improvement to be proposed to the Foundation's Sustainability Committee and governance bodies. This revision was prompted by changes in both the external and internal context. From an external point of view, the update of the Equal Opportunities Code entailed the following:
  - the obligation to prepare a "Personnel Situation Report" for 2020-2021;
  - establishment of a reward scheme for companies that obtain "Gender Equality Certification" (not mandatory);
  - gender balance as an opportunity for sustainability reporting.

  The initial findings following the review were as follows (note that the results were last updated to November 2022):
  - **goal 1:** the GET met five times since its formation (May 2022) and a new intranet page with a notice board was created to receive input from employees;
  - **goal 2:** eight meetings were held with schools to encourage STEM studies, and guidelines were drawn up and approved in early 2023 to support recruiters, hiring managers and to appoint members of recruitment committees to address gender bias in personnel recruitment processes;
  - **goal 3:** a number of dedicated spaces at the Foundation have been made available for expectant and new mothers to use when needed and five places have been reserved at local nurseries for 2022-2024;
  - **goal 4**: a training session was organised for line managers ("Double standard: gender inequalities in research and science") on gender inequalities in science and research;
  - **goal 5:** in March 2022, an *"Internal procedure for reporting harassment and/or violence at the workplace"* was drawn up together with the corresponding form to be used to report cases of violence and harassment (we emphasise that reports are assessed by an Internal Anti-Harassment and Violence Committee, which may subsequently take appropriate measures on these matters).

  Further details and information on the GEP are given in subchapter 2.4 *"Responsible and sustainable approach"* in the section *"Achieving gender balance in senior leadership and decision-making positions"*.
- The *"Internal procedure on remuneration and total rewards"* was revised. It presents an overview of all rewards offered to employees, not only in terms of fixed and variable pay, but also in terms of additional benefits, such as health and pension funds, welfare programmes and specific services. The procedure also introduces an employee performance appraisal system and defines the rules for awarding bonuses.

Finally, training activities are another key factor in Human Technopole's HR strategy. Details of internal scientific training are given in subchapter 2.3 *"Strategy"*, in the sections *"Talent attraction and training, and research output sharing"* and *"Scientific reputation and dissemination"*.

Details of training opportunities in the Administrative area are given in subchapter 2.3 *"Strategy"* in the section *"Efficiency and effectiveness of operational processes"*.

Average hours of training delivered (scientific and administrative) by category and gender are as follows:

11.47 average training **HOURS** per **EMPLOYEE**

17.73 average training hours for **SENIOR MANAGERS**

13.10 average training hours for **MIDDLE MANAGERS**

9.37 average training hours for **OFFICE WORKERS**

13.31 average training hours for **MEN**

9.96 average training hours for **WOMEN**

Average hours of training delivered for HSE activities by category and gender are as follows:

2.73 average training **HOURS** per **EMPLOYEE**

1.20 average training hours for **SENIOR MANAGERS**

1.17 average training hours for **MIDDLE MANAGERS**

3.68 average training hours for **OFFICE WORKERS**

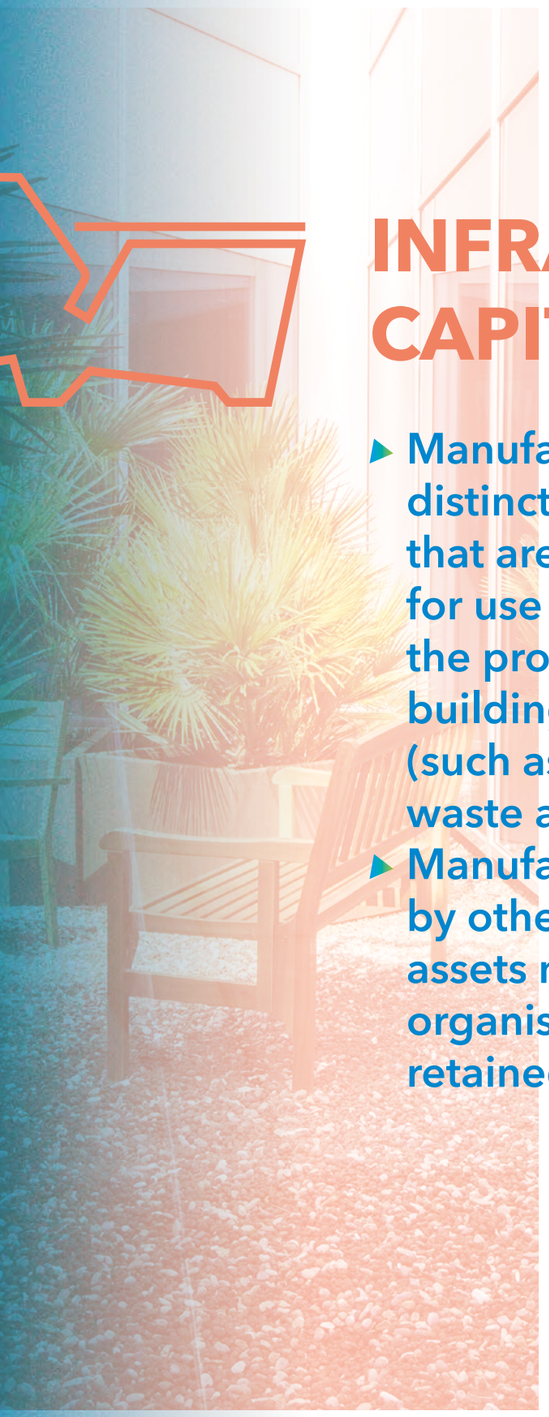
2.66 average training hours for **MEN**

2.79 average training hours for **WOMEN**

In 2022 the average hours of training per employee for Health & Safety declined compared with the previous year. In 2021, a large-scale training campaign was organised for new firefighting and first aid officers, as well as refresher training for previously appointed officers whose certificates had expired.

An e-learning platform with training on the following is planned for the future:

- general health and safety training;
- specific training for scientists;
- specific training for video terminal operators and technicians;
- 20 "special" courses for workers (valid as refresher courses in the following five-year period);
- 10 "special" courses for senior management and Foundation officers (valid as refresher courses in the following five-year period).



INFRASTRUCTURAL CAPITAL

- **Manufactured physical objects (as distinct from natural physical objects) that are available to an organisation for use in the production of goods or the provision of services, including: building, equipment and infrastructure (such as roads, ports, bridges, and waste and water treatment, plants)**
- **Manufactured capital is often created by other organisations, but includes assets manufactured by the reporting organisation for sale or when they are retained for its own use**

HT lies at the heart of MIND (Milan Innovation District), a new district of the city which covers over one million square metres on the former Expo 2015 site, located in the north-west of Milan.

MILANO INNOVATION DISTRICT

On its completion, MIND will constitute a mix of public and private sector functions, which form an integrated science and technology park dedicated to the Life Sciences, Healthcare, Biotech, Pharma, Agri-Food, Nutrition, Data Science and Smart Cities.

MIND is also a public-private partnership which brings together two main real estate organisations, with AREXPO (the owner of the site) representing the public sector and the Australian multinational Lendlease, specialised in urban regeneration and infrastructure projects, representing the private sector. The MIND district also hosts the new headquarters of the IRCCS Galeazzi - Sant'Ambrogio hospital (part of the San Donato private hospital group), the headquarters of the Triulza Foundation and, in the future, the campus of the science faculties of Milan University.

The "Decumanus", the central approximately 1,500 metre-long section of the site, will become a green area, to become one of the longest linear parks in Europe.

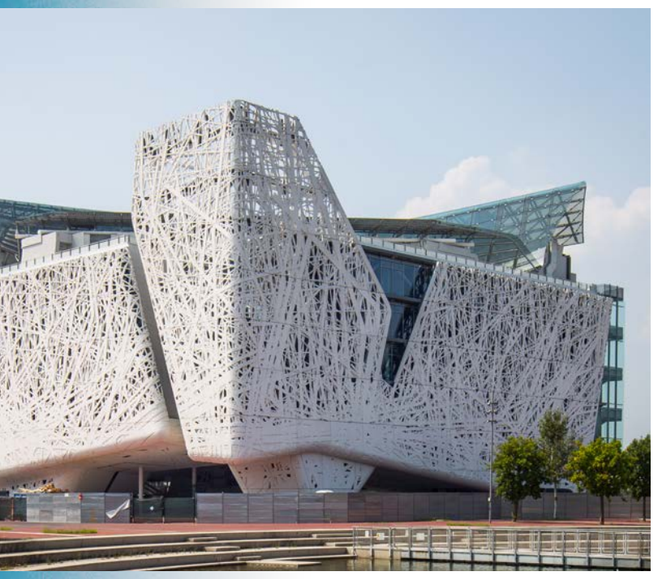
Plans for the complete urban redesign of the area are based on a masterplan proposed by the international design and innovation firm Carlo Ratti Associati, winner of the international competition for the redesign of the site.

The project, promoted by Lendlease, is based on a number of important principles, including urban innovation, environmental sustainability and smart mobility.

BUILDINGS AND LABORATORIES

In this context, the HT project is central to MIND's development plans and as such its buildings are of high iconic value.

PALAZZO ITALIA



After representing Italy during EXPO 2015, Palazzo Italia is now the HT's institutional headquarters. Designed by the firm Nemesi, the building sits in front of the Tree of Life and has five floors, with a total height of 35 metres covering an area of 18,000 square metres. The architecture is based on the idea of an urban forest with patterns of lines that generate light and shade. It was designed according to sustainability principles and conceived as a low-energy building. During EXPO Milan 2015, the exhibition spaces were dedicated to the power of beauty and the future to highlight Italy's creativity and potential. At the end of the World Expo, Palazzo Italia underwent intensive structural changes to transform the exhibition areas into spaces able to accommodate around 400 workstations. Several areas have been retained, including the restaurant area, the auditorium, the panoramic terrace and the inner square.

INCUBATOR LABS

HT's first scientific laboratories were built on an area adjacent to Palazzo Italia and the Tree of Life. They consist of three buildings, two of these occupy two floors and mainly house laboratories, and a third, on one floor, hosts support for the cryo-electron microscopy facility equipped with two microscopes, a sample preparation room and a microscope control room. These house around 130 "wet" stations, which are individual bench spaces for experimental researchers, with support desks, laboratories, instrument rooms, cell cultures, core services (glassware washing, kitchen, warehouse, etc.) and some offices. The laboratories have been operational since 2021.

NORTH PAVILION

The North Pavilion underwent substantial refurbishing to be able to host imaging facilities with cryo-electron microscopes (Cryo-EM) and optical microscopes (light microscopy imaging). It is equipped with support spaces for sample preparation and offices for the managers of the two facilities. The first floor is home to various open plan workstations for the image analysis facility personnel and support for users of the two facilities. The building underwent major restructuring work so that it could house microscopes, which need a stable floor that is not subject to tremors, vibrations or the slightest oscillations and able to support their weight. The building has been operational since 2021.

SOUTH PAVILION

The South Pavilion was completely renovated in 2021 and is currently undergoing system and structural improvements. Starting in 2023, it will house new experimental research laboratories for the various centres and additional facilities, as well as office space.

SOUTH BUILDING

The new building will be composed of two functional and flexible units that will be developed around the "Common Ground", the focal point from which the entire building is generated. This is a central area that will lie at the heart of the building both in terms of its position and its function. It will have a ground floor that is partly open and partly glazed. Communal space will wind through all the floors to create a single interconnected space that reaches up to the roof, thereby creating new spaces for gathering and relaxation. The first and ninth floors will be dedicated to laboratories and administrative offices, while the top floor will house catering areas, training rooms, meeting rooms for representatives, executive offices and terraces with direct access to the green roof. The green roof is an iconic feature of the building composed of asymmetrical slopes and a sequence of south-facing green terraces overlooking the city of Milan. The roofing system redirects rainwater and will contribute to the generation of renewable energy in line with the green design approach which uses a photovoltaic system and the green roof.

PROPERTY DEVELOPMENT ACTIVITIES, CRITERIA AND PLANS

Campus development plans are composed of three phases:

1ST PHASE

This phase started in the second half of 2018 and continued until the first half of 2021. Detailed planning of the incubator labs was mainly carried out in 2019-20, working closely with the first group of research centre managers and group leaders recruited at HT. On the other hand Palazzo Italia has hosted the core administrative activities and part of the Foundation's research activities since the beginning of 2018. A further round of renovation work on Palazzo Italia was completed in 2021, and further repurposing work began in 2022.

2ND PHASE

This phase will last until the end of construction work on the South Building, expected by early 2028, and is designed to consolidate the first core of HT's experimental research and service activities (i.e. the genomics, neurogenomics and structural biology research centres), located in the Incubator Labs and the North Pavilion and South Pavilion. From 2021 onwards these spaces will host primary research laboratories, the first of HT's core facilities, as well as other shared common services.

3RD PHASE

The experimental research and service activities started in the Incubator Labs and the North and South Pavilion will be gradually transferred, subject to completion of the South Building.

Building and infrastructure development work and programmes in the MIND area are based on the following criteria:

FLEXIBILITY	the ability to adapt, modify and reconfigure spaces over time to meet changing demands and accommodate new lines of research and technology. This aspect above all is fundamental to modern research in the life sciences and therefore also to HT
DURABILITY AND MAINTENANCE	design and technical solutions are employed to ensure maximum durability, limit the need for routine and extraordinary maintenance and optimise and reduce operating and maintenance costs
INNOVATIVE CONSTRUCTION TECHNOLOGIES	where possible, priorities are given to industrialised construction solutions and the use of advanced materials, in line with the principles of modularity and construction efficiency
ENVIRONMENTAL SUSTAINABILITY AND ENERGY EFFICIENCY	work and installations are designed according to energy-saving and environmental sustainability criteria, with the use of innovative and technologically advanced components, as well as adopting architectural solutions that reduce consumption and produce energy. These include systematic reference to their social and environmental impact, with specific rules, procedures and guidelines based on existing standards and regulations, such as "Minimum Environmental Criteria" (CAM) for awarding contracts and the LEED (Leadership in Energy and Environmental Design) green building rating system or life cycle assessment methods for assessing the environmental impact of laboratories and buildings
THE "COMMON SPACE" CONCEPT	MIND's overall development design includes buildings with a permeable ground floor ("common space") and the absence of individual, enclosed building lots. The degree to which the ground floors of HT's newly constructed buildings are "open" is defined by considering the demands of the new research centres with regard to internal logistics requirements for scientific activities, the logistical needs (pedestrian and vehicular traffic) of personnel, external suppliers and visitors and the safety and security issues of HT's research work

INFRASTRUCTURAL CAPITAL - 2022 ACTIVITIES AND RESULTS

With regard to the development of Campus building infrastructures, on the basis amongst other things, of the MIND (Milano Innovation District) Integrated Intervention Programme (in accordance with Milan City Council resolution No. 129 of 31/01/2020), in 2022 the Foundation completed work to progressively commence use of spaces intended for scientific research in the temporary structures, the Incubator Labs, and in the North Pavilion. The design of a liquid nitrogen supply line to serve the cryo-EM laboratories and a future storage area for biological samples (biobank) was also finalised. A tender, which included the works for the supply line, the set-up of the bio-bank and the supply of medical gases was, however, abandoned and will be tendered again at the beginning of 2023 following price updates due to special market conditions.

In 2022, all the remaining activities resulting from the sale and purchase agreements for Palazzo Italia (dated 30th July 2020) and for the North Pavilion/South Pavilion (dated 28th September 2021) were also completed. The photovoltaic systems for the three complexes, now complete, will therefore become operational in 2023 with energy savings for the Foundation.

From the viewpoint of continuous improvement to the interiors of buildings, in 2022 HT carried out the following:

- the award of an integrated contract for the design and execution of repurposing works for the creation of new offices in Palazzo Italia. Organised in four steps, the work involves all floors of the building, with work on acoustics for privacy, the functionality of the offices and the creation of new space in the basement to be used as a warehouse and biobank. The first two steps (around 50% of the works) were successfully completed in 2022;
- the executive design and tendering of works to provide system and structural additions to support new facilities in the South Pavilion. Work is currently underway and the first laboratory installations are scheduled to be delivered in early 2023;
- the landscaping and furnishings for the north and south terraces, the interior greenery and the central square of Palazzo Italia;
- furnishings and fittings for the canteen area on the fourth floor of Palazzo Italia;
- the construction of the Data Centre facility, a 10 Gb data connectivity and networking star centre, a tape library room in the basement of Palazzo Italia.

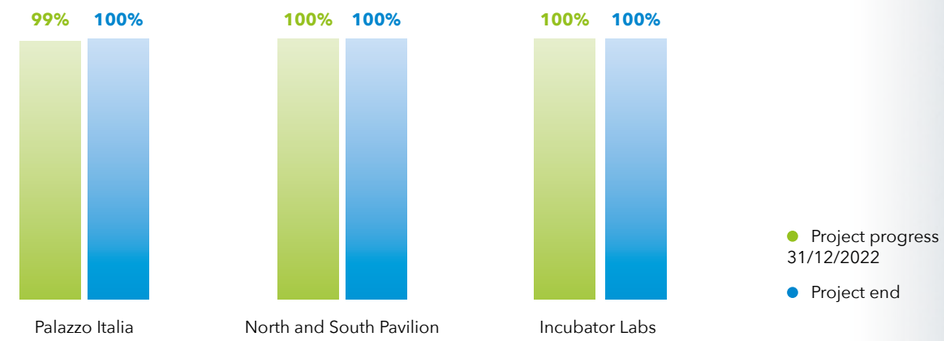
As regards completion of the Campus in the medium to long-term, HT finished the final design work for the new building complex consisting of two buildings, the South Building and the Technology Hub, as well as the complementary works for expected total works costing approximately €170 million, before VAT.

In February 2023, on the basis of a proposal from the Management Committee, the *Consiglio di Sorveglianza*, approved the final design and the financing to meet the final project costs for the South Building and Technology Hub. The project will be submitted to the "Services Conference" to obtain the building permit.

At the same time, in February 2023 HT finalised the purchase of the land needed to complete the Campus perimeter, as programmed in the MIND area Integrated Intervention Plan.

The following chart shows the state of progress in the construction and renovation of the buildings at the end of 2022:

% PROGRESS IN INFRASTRUCTURE DEVELOPMENT PROJECTS



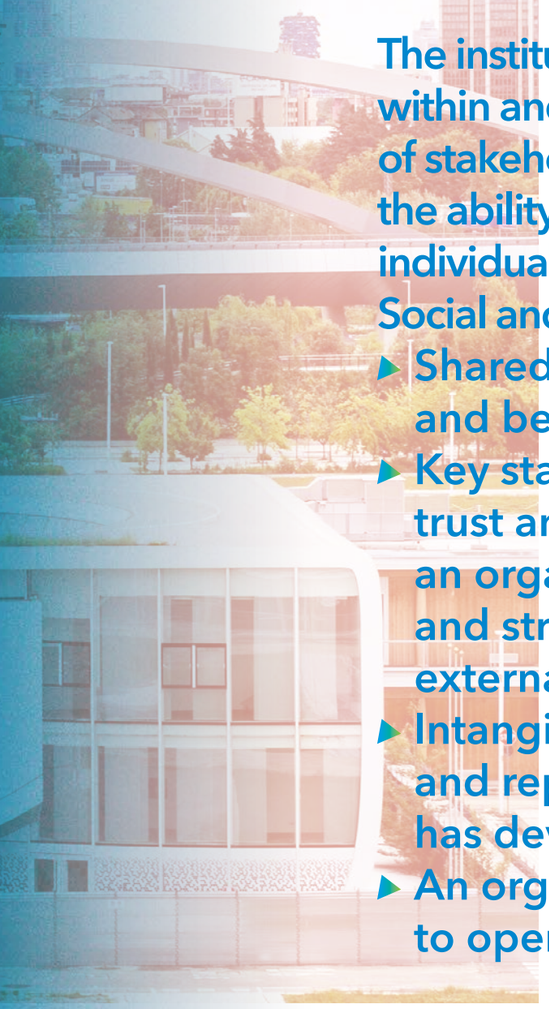
** The table does not include the new projects, launched in 2022, related to the repurposing of Palazzo Italia and the South Pavilion.*

The following tables show the percentage of square metres allocated to research for the HT Campus buildings, at the end of 2022:

DETAILS OF HT SQ M		PERCENTAGE OF LABORATORIES 2022
SOUTH PAVILION		
Laboratories	2,765	
NORTH PAVILION		
Laboratories	1,158	
INCUBATOR LABS		
Laboratories	3,298	41%
PALAZZO ITALIA		
Laboratories	1,067	
Offices and Services	11,916	

DETAILS OF FORECAST SQ M	
SOUTH BUILDING (FORECAST 2022-2028)	
Laboratories	15,460
Services	11,004
Offices	3,914

RELATIONAL CAPITAL



The institutions and the relationships within and between communities, groups of stakeholders and other networks, and the ability to share information to enhance individual and collective well-being.

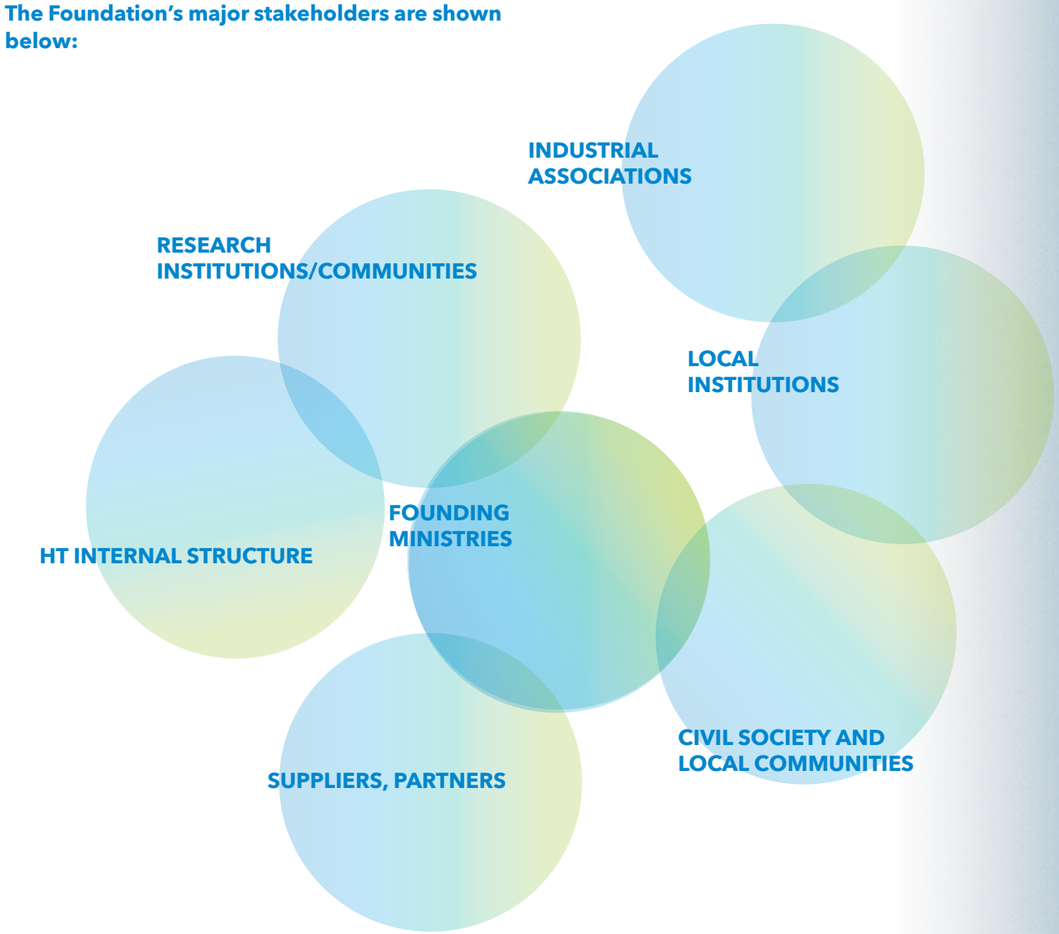
Social and relationship capital includes:

- **Shared norms, and commons values and behaviours**
- **Key stakeholder relationships, and the trust and willingness to engage that an organisation has developed and strives to build and protect with external stakeholders**
- **Intangibles associated with the brand and reputation that an organisation has developed**
- **An organisation's social licence to operate**

OUR STAKEHOLDERS

The Foundation intends to maintain an inclusive approach to stakeholders, by establishing strong relationships through transparent and effective communication. HT has implemented this approach through a series of structured engagements (interviews, institutional and scientific initiatives, surveys) with "stakeholders". A stakeholder mapping process forms the basis of our engagement activities, which involve all internal units. The approach to stakeholder engagement is dealt with in detail in subchapter 2.1 *"Stakeholder engagement and the materiality matrix"* of this document.

The Foundation's major stakeholders are shown below:



Human Technopole is aware of the importance of people and the local area in which it operates. It makes a constant commitment to implement specific scientific and institutional initiatives, which it makes also to the economic, social and cultural areas in which the Foundation is located.

Major stakeholder engagement initiatives include collaborations, partnerships and institutional initiatives.

SCIENTIFIC PARTNERSHIPS AND COLLABORATIONS

HT creates ties with and participates in consortia and collaborative research activities at European and international level. Some of these initiatives are:

- HT is an associate partner of **LifeTime**, a pan-European research initiative that aims to revolutionise healthcare by understanding and monitoring human disease at single cell resolution to transform patient care and the sustainability of healthcare systems. The LifeTime consortium brings together more than 120 leading scientists from over 90 European research institutes. The University of Milan is an official partner of the consortium, while other Italian associate partners include the European Institute of Oncology, the FIRC Foundation Institute of Molecular Oncology, the Institute of Biomedical Technologies and the Institute of Photonics and Nanotechnology of the National Research Council, as well as several leading Italian universities;
- **Human Cell Atlas** is a global effort which brings together expertise in biology, medicine, genomics, technology development and computation with the goal of building a complete collection of cell maps which characterise each of the thousands of cell types present in the human body. A systematic study of the molecular mechanisms that underlie the production, function and combined activity of different cell types would be an incredibly valuable resource for the global research community;
- **The Cancer Dependency Map** is a partnership created between the Broad Institute (USA) and the Wellcome Sanger Institute (UK) that brings together expertise, data and computational tools to systematically identify the genetic and pharmacological dependencies of cancer and the biomarkers that predict them.

The following subchapters give information on other scientific partnerships and collaborations: 2.3 *"Strategy"* in the section *"Partnership, networking and stakeholder engagement"*; 2.4 *"Responsible and sustainable approach"* in the section *"Developing partnerships and cooperation for scientific research projects with universities and research institutes"*.

INSTITUTIONAL INITIATIVES

HT's institutional activities help it to develop and monitor relations with national and local government entities, European and international institutions, companies and employer associations, its neighbours at MIND (Milano Innovation District) and stakeholders that are important to the Foundation, in order to promote, consolidate and defend its interests.

HT's Institutional Relations area works closely with the Communication area and the Strategy and Scientific Affairs department to assist with formulating activities to promote the Foundation's image and to publicise the economic and social impact of HT's scientific research.

RELATIONAL CAPITAL - 2022 INITIATIVES AND RESULTS

INSTITUTIONAL AND COMMUNICATION INITIATIVES IN 2022

Some of the institutional initiatives involving HT in 2022:

INAUGURATION OF HT LABORATORIES	The event took place in the presence of the former Minister of Universities and Research, Maria Cristina Messa, the former Health Undersecretary Pierpaolo Sileri, the Economics Undersecretary Federico Freni, the Lombardy Region Economic Development Councillor Guido Guidesi and the Milan Deputy Mayor Anna Scavuzzo
VERNISSAGE	Decorating the auditorium with scientific images produced by HT scientists
VISIT BY THE SENIOR MANAGEMENT OF THE INSTITUTE OF SCIENCE AND TECHNOLOGY AUSTRIA (ISTA)	Human Technopole welcomed a visit by the senior management of the Institute of Science and Technology Austria (ISTA), an Austrian research institute active in training and cutting-edge research in various fields, including the life sciences. During the day, ISTA and Human Technopole management and researchers discussed some of the most pressing scientific issues and exchanged information on current studies and activities with a view to developing future collaborations
KNOWLEDGE ECONOMY AND IMPACT ON SOCIETY	This event was designed to explore the role of science and technology as a driver for social and cultural development and innovation. It took place at the Chamber of Deputies in the presence of the former Minister of Economy Daniele Franco, Giovanna Melandri (MAXXI), Ferruccio Resta (CRUI), Francesca Pasinelli (Telethon), Maria Bianca Farina (Italian Post Office) and Vittorio Bo (Festival of Sciences)
INAUGURATION OF "URBAN CLIMATE OASIS MILAN"	A project organised by Markus Jeschaunig at the HT Centre for Structural Biology, selected by the MEET-Digital Culture Centre in Milan as part of S+T+ARTS, the call was promoted by the European Commission to draw the future in an increasingly sustainable perspective by promoting spaces for hybrid collaboration between science, technology and art
THE INTEGRATED REPORT AND SUSTAINABLE GROWTH	HT's Finance department organised an event to present the Foundation's Integrated Reporting project, explaining its importance, critical issues and achievements. During the event, the assumptions, methodologies and purposes of integrated reporting and regulatory developments were explored, but it was also an opportunity to discuss sustainability issues with experts from various fields
ITRE COMMITTEE VISIT TO MIND	The "anchors" of the district presented MIND to a delegation from the European Parliament's ITRE Commission
SPEAKING OF THE FUTURE	This initiative, organised together with Treccani Futura, provided an opportunity to debate the scenarios that are opening up before us, with an interdisciplinary approach that systematically brought together the voices of science and technology and those of the humanities, on issues that question the relationship between technology and different spheres (art and culture, medicine, education)
HUMAN TECHNOPOLE MEETS LOCAL COMMUNITIES	Visit by the mayors and councillors of Rho, Pero, Baranzate and Milan's "Municipality 8" district, organised in cooperation with the Environment and Territory Committees, to present development prospects and the impact of Human Technopole's activities on the local area
OPEN HT	Meeting and dialogue between the Institute for Life Sciences and the national scientific community. This initiative was an opportunity to share Human Technopole developments in 2020 and 2021 and to present future plans

In 2022, the President of HT (Prof. Marco Simoni until July 2022 and subsequently Prof. Gianmario Verona) took part as a speaker at numerous events on healthcare and research. Examples included the following: *"**NET-HEALTH, Sanità in rete 2030**"* at the Luiss Guido Carli Welfare Observatory; *"**BIOEQUITY EUROPE 2022**"*; *"**TECHNOLOGY FORUM LIFE SCIENCES 2022 – Le Scienze della Vita nell'era del PNRR**"* organised by European House Ambrosetti; *"**Milano Life Sciences Forum 2022 – Un settore strategico per il Paese: dalla crisi pandemica alle opportunità del Piano Nazionale di Ripresa e Resilienza**"* organised by Assolombarda.

The Foundation's senior management also met the heads of a number of national, local and international institutions, as well as scientific, industrial and civil society stakeholders, in order to raise outside awareness of HT's activities and their impact on the country's economy.

HT also supported the Festival of Sciences, of which it is a scientific partner, with two in-person events at the Parco della Musica Auditorium in Rome, and provided the Milan Triennale with two images produced by its researchers for the 23rd international exhibition "Unknown Unknowns", which opened on 15th July and was curated by Ersilia Vaudo, astrophysicist and ESA Chief Diversity Officer.

Human Technopole also took part in a series of events and initiatives organised by MIND partners (MIND Education, Social Innovation Academy, meetings with schools and international delegations), representing and narrating the Foundation's activities.

The Foundation's relationship activities also include building a network of agreements with important partners which include the National Agency for Regional Health Services (AGENAS) and the Italian Red Cross. HT also contributed to the work of the Master in Cultural Diplomacy at the Catholic University of Rome.

2022 MEDIA AND SOCIAL NETWORK PERFORMANCE

HT's communication activities are designed to increase the institute's visibility and bolster its reputation as an innovative research centre, attracting scientific talent from all over the world and performing high-quality science.

Furthermore, part of HT's mission is to inform public opinion of the importance of science and research and to promote science outreach to a wide variety of non-scientific stakeholders.

HT attained a constant presence during the course of the year in the main Italian media (press, TV and online).

2022 saw a significant increase in digital activity on all platforms, with several new communication initiatives designed to create dialogue and engagement with those who follow HT's social media accounts.

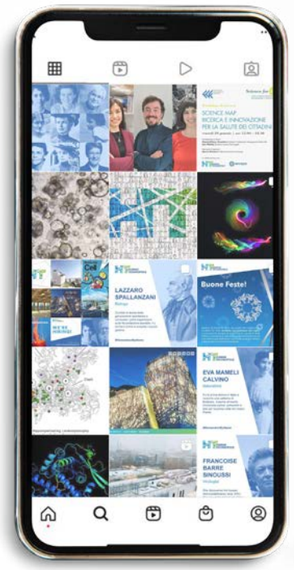
In 2022, the total number of mentions in newspapers and on the web, radio and TV was 1,695. Of these, 534 were the result of proactive media activity, distributed as follows:

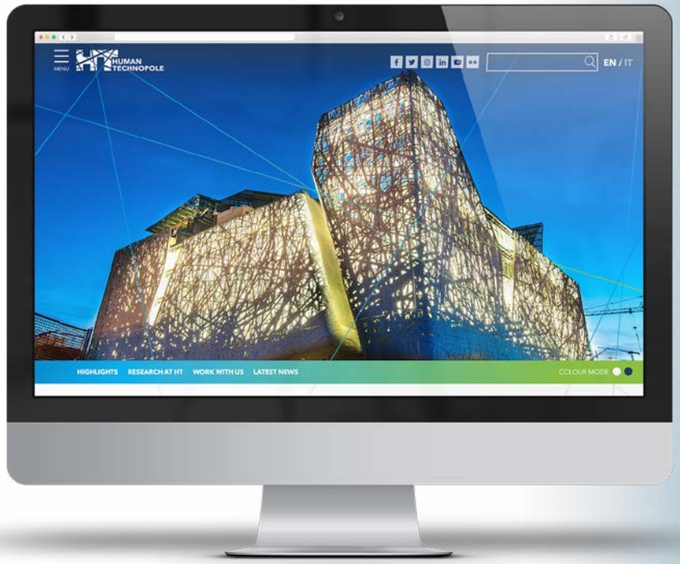
- 16 national newspapers;
- 8 national tv stations;
- 9 national radio stations;
- 2 local radio stations;
- 356 web news articles;
- 8 local editions of national newspapers;
- 33 local newspapers;
- 4 local tv stations;
- 98 news agencies.

Finally, a significant increase in digital activity on all platforms occurred in 2022, as detailed below:

PLATFORM	TOTAL FOLLOWERS AS AT 31.12.2022	GROWTH COMPARED WITH THE PREVIOUS YEAR
TWITTER	7,381	+31.45%
LINKEDIN	22,773	+53.24%
INSTAGRAM	2,328	+35.03%
FACEBOOK	2,431	+4.56%
YOUTUBE	189	+68.75%
NEWSLETTER	1,077	+7.49%

In 2022, HT's website (HOME-HT) received over 250,000 visits.



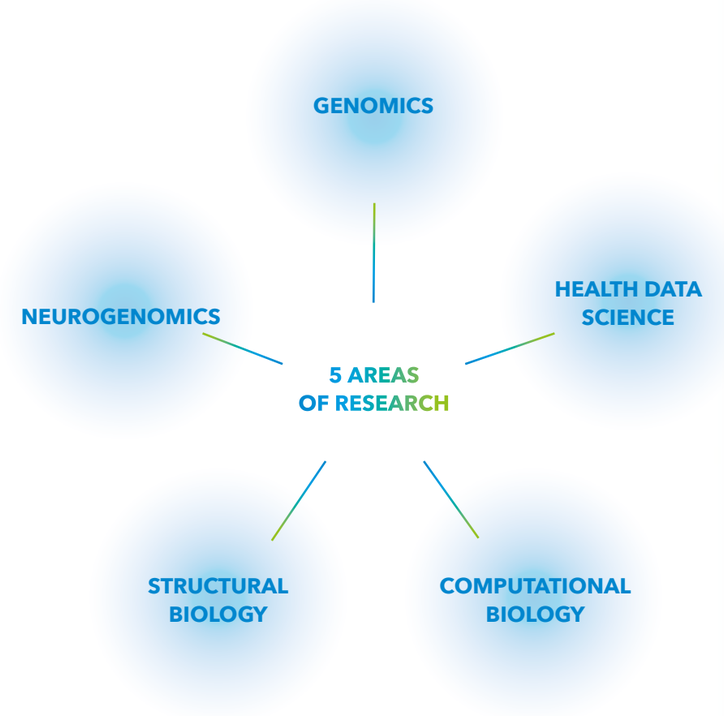


INTELLECTUAL CAPITAL

Organisational, knowledge-based intangibles, including:

- Copyrights, software, rights and licences
- "Organisational capital" such as tacit knowledge, systems, procedures and protocols

HT's research activities are organised in five different areas, each of which is supported by a research centre:



HT's science is interdisciplinary and is comprised of biologists, bioinformaticians, chemists, engineers, physicists, mathematicians and computer scientists with a medical background. The benefit of this broad range of available expertise, however, can only be reaped if scientists work together across different disciplines in order to exploit the synergies between their different fields of expertise.

HT promotes and rewards interdisciplinary collaboration, by for example the dual appointment of group leaders in more than one research centre, joint interdisciplinary doctoral and/or postdoctoral projects between centres and the funding of jointly supervised pre- or postdoctoral fellowships.

Additionally, Human Technopole carries out its research in a barrier-free environment and employs a collegial management approach, which fosters an inclusive and open culture, with extensive collaboration between different teams, the sharing of laboratories and facilities and collaboration between different centres.

INTELLECTUAL CAPITAL – 2022 RESULTS

In 2022, Human Technopole scientists (HT-affiliated researchers) achieved many scientific results in their respective fields of research, leading to **95 publications** in prestigious international journals.

Details of these publications by research centre are given below.

GENOMICS CENTRE

TITLE	AUTHORS	JOURNAL
An atlas of endogenous DNA double-strand breaks arising during human neural cell fate determination	R. Ballarino, B. A. M. Bouwman, F. Agostini, L. Harbers, C. Diekmann, E. Wernersson, **M. Bienko**, **N. Crosetto**	*Scientific Data*
The era of 3D and spatial genomics	B. A. M. Bouwman, **N. Crosetto**, **M. Bienko**	*Trends in Genetics*
FRET-FISH probes chromatin compaction at individual genomic loci in single cells	A. Mota, S. Berezicki, E. Wernersson, L. Harbers, X. Li-Wang, K. Gradin, C. Peuckert, **N. Crosetto**, **M. Bienko**	*Nature Communications*
Aberrant cortical development is driven by impaired cell cycle and translational control in a DDX3X syndrome model	M. L. Hoye, **L. Calviello**, A. J. Poff, N. Ejimogu, C. R. Newman, M. D. Montgomery, J. Ou, S. N. Floor, D. L. Silver	*eLife*
Standardized annotation of translated open reading frames	J. M. Mudge, J. Ruiz-Orera, J. R. Prensner, ..., **L. Calviello**, et al.	*Nature Biotechnology*
Inducing human retinal pigment epithelium-like cells from somatic tissue	I. N. Woogeng, B. Kaczkowski, I. Abugessaisa, ..., **P. Carninci**, et al.	*Stem Cell Reports*
Multiomic atlas with functional stratification and developmental dynamics of zebrafish cis-regulatory elements	D. Baranasic, M. Hörtenhuber, P. J. Balwierz, ..., **P. Carninci**, et al.	*Nature Genetics*
Recombination of repeat elements generates somatic complexity in human genomes	G. Pascarella, C. C. Hon, K. Hashimoto, A. Busch, J. Luginbühl, C. Parr, W. H. Yip, K. Abe, A. Kratz, A. Bonetti, F. Agostini, J. Severin, S. Murayama, Y. Suzuki, S. Gustincich, M. Frith, **P. Carninci**	*Cell*
Deep sequencing of short capped RNAs reveals novel families of noncoding RNAs	M. de Hoon, A. Bonetti, C. Plessy, Y. Ando, C. Hon, Y. Ishizu, M. Itoh, S. Kato, D. Lin, S. Maekawa, M. Murata, H. Nishiyori, ..., **P. Carninci**, et al.	*Genome Research*
Whole-genome sequencing of chronic lymphocytic leukemia identifies subgroups with distinct biological and clinical features	P. Robbe, K. E. Ridout, D. V. Vavoulis, H. Dréau, B. Kinnersley, N. Denny, D. Chubb, N. Appleby, A. Cutts, A. J. Cornish, ..., **P. Carninci**, et al.	*Nature Genetics*
SCAFE: a software suite for analysis of transcribed cis-regulatory elements in single cells	J. Moody, T. Kouno, J. Chang, Y. Ando, **P. Carninci**, J. W. Shin, C. Hon	*Bioinformatics*
Prediction of the cell-type-specific transcription of non-coding RNAs from genome sequences via machine learning	M. Koido, C. Hon, S. Koyama, H. Kawaji, Y. Murakawa, K. Ishigaki, K. Ito, J. Sese, N. F. Parrish, Y. Kamatani, **P. Carninci**, C. Terao	*Nature Biomedical Engineering*
Piwil2 (Mili) sustains neurogenesis and prevents cellular senescence in the postnatal hippocampus	C. Gasperini, K. Tuntevski, S. Beatini, R. Pelizzoli, A. Lo Van, D. Mangoni, R. M. Cossu, G. Pascarella, P. Bianchini, P. Bielefeld, M. Scarpato, M. Pons-Espinal, R. Sanges, A. Diaspro, C. P. Fitzsimons, **P. Carninci**, S. Gustincich, D. De Pietri Tonelli	*EMBO reports*
Antisense-oligonucleotide-mediated perturbation of long non-coding RNA reveals functional features in stem cells and across cell types	C. W. Yip, C. Hon, K. Yasuzawa, ..., **P. Carninci**, J. W. Shin	*Cell Reports*
Contrastive Mixture of Posteriors for Counterfactual Inference, Data Integration and Fairness	A. Foster, A. Vezer, **C. A. Glastonbury**, P. Creed, S. Abujudeh, A. Sim	*ICML / Proceedings of Machine Learning Research*
Genetic associations at regulatory phenotypes improve fine-mapping of causal variants for 12 immune-mediated diseases	K. Kundu, M. Tardaguila, A. L. Mann, S. Watt, H. Ponstingl, L. Vasquez, D. Von Schiller, N. W. Morrell, O. Stegle, T. Pastinen, S. J. Sawcer, C. A. Anderson, K. Walter, **N. Soranzo**	*Nature Genetics*
Whole-exome sequencing identifies rare genetic variants associated with human plasma metabolites	L. Bomba, K. Walter, Q. Guo, P. Surendran, K. Kundu, S. Nongmaithem, M. A. Karim, I. D. Stewart, C. Langenberg, J. Danesh, **E. Di Angelantonio**, D. J. Roberts, W. H. Ouwehand, INTERVAL study; I. Dunham, A. S. Butterworth, **N. Soranzo**	*The American Journal of Human Genetics*
GWAS of genetic factors affecting white blood cell morphological parameters in Sardinians uncovers influence of chromosome 11 innate immunity gene cluster on eosinophil morphology	M. Marongiu, G. Pérez-Mejías, V. Orrù, M. Steri, C. Sidore, A. Díaz-Quintana, A. Mulas, F. Busonero, A. Maschio, K. Walter, M. Tardaguila, P. Akbari, **N. Soranzo**, et al.	*Human Molecular Genetics*
GWAS and autoimmunity: What have we learned and what next	A. Gerussi, **B. Soskic**, R. Asselta, P. Invernizzi, M. E. Gershwin	*Journal of Autoimmunity*

TITLE	AUTHORS	JOURNAL
Genetic variants associated with psychiatric disorders are enriched at epigenetically active sites in lymphoid cells	M. Lynall, **B. Soskic**, J. Hayhurst, J. Schwartzentruber, D. F. Levey, G. A. Pathak, R. Polimanti, J. Gelernter, M. B. Stein, G. Trynka, M. R. Clatworthy, E. Bullmore	*Nature Communications Circulation*
Genetic Landscape of the ACE2 Coronavirus Receptor	Z. Yang, E. Macdonald-Dunlop, J. Chen, R. Zhai, T. Li, A. Richmond, L. Klarić, **N. Pirastu**, et al.	*Circulation*
Large-scale GWAS of food liking reveals genetic determinants and genetic correlations with distinct neurophysiological traits	S. May-Wilson, N. Matoba, K. H. Wade, J. Hottenga, M. P. Concas, ..., **N. Pirastu**	*Nature Communications*
Using genetic variation to disentangle the complex relationship between food intake and health outcomes	**N. Pirastu**, C. McDonnell, E. J. Grzeszkowiak, N. Mounier, F. Imamura, J. Merino, F. R. Day, J. Zheng, N. Taba, et al.	*PLoS Genetics*
Genome-wide Association Study of Liking for Several Types of Physical Activity in the UK Biobank and Two Replication Cohorts	Y. C. Klimentidis, M. Newell, M. D VAN DER Zee, V. L. Bland, S. May-Wilson, ..., **N. Pirastu**	*Medicine & Science in Sport & Exercise*
Impact of cultural and genetic structure on food choices along the Silk Road	S. Aneli, M. Mezzavilla, E Bortolini, **N. Pirastu**, G. Girotto, B. Spedicati, P. Berchialla, P. Gasparini, L. Pagani	*PNAS*
Lipid-loaded tumor-associated macrophages sustain tumor growth and invasiveness in prostate cancer	M. Masetti, R. Carriero, F. Portale, G. Marelli, ..., **C. Peano**, et al.	*Journal of Experimental Medicine*
Intrahepatic CD69+Vδ1 T cells re-circulate in the blood of patients with metastatic colorectal cancer and limit tumor progression	E. Bruni, M. M. Cimino, M. Donadon, R. Carriero, S. Terzoli, ..., **C. Peano**, et al.	*Journal for ImmunoTherapy of Cancer*
Multimodal single-cell profiling of intrahepatic cholangiocarcinoma defines hyperactivated Tregs as a potential therapeutic target	G. Alvisi, A. Termanini, C. Soldani, F. Portale, R. Carriero, K. Pilipow, G. Costa, M. Polidoro, ..., **C. Peano**, et al.	*Journal of Hepatology*
The mutational spectrum of SARS-CoV-2 genomic and antigenomic RNA	L. Zhao, M. Hall, **M. de Cesare**, G. MacIntyre-Cockett, K. Lythgoe, C. Fraser, D. Bonsall, T. Golubchik, COVID-19 Genomics UK (COG-UK) Consortium. and L. Ferretti	*Proceedings of the Royal Society - Biological Science*
Genomic Profiling Identifies Putative Pathogenic Alterations in NSCLC Brain Metastases	M. Nicoś, L. Harbers, E. Patrucco, ..., **M. Bienko**, P. Krawczyk, J. Jassem, C. Ambrogio, **N. Crosetto**	*JTO Clinical and Research Reports*

NEUROGENOMICS CENTRE

TITLE	AUTHORS	JOURNAL
BACE-1 inhibition facilitates the transition from homeostatic microglia to DAM-1	N. Singh, M. R. Benoit, J. Zhou, B. D., **J. Davila-Velderrain**, M. Kellis, L. Tsai, X. Hu, R. Yan	*Science Advances*
APOE4 impairs myelination via cholesterol dysregulation in oligodendrocytes	J.W. Blanchard, L. A. Akay, **J. Davila-Velderrain**, et al.	*Nature*
The neuroinvasiveness, neurotropism, and neurovirulence of SARS-CoV-2	L. Bauer, B. M. Laksono, F. M. S. de Vrij, S. A. Kushner, **O. Harschnitz**, D. van Riel	*Trends in Neuroscience*
Human stem cell models to study placode development, function and pathology	**E. Conti**, **O. Harschnitz**	*Development*
Roots of the Malformations of Cortical Development in the Cell Biology of Neural Progenitor Cells	**C. Ossola, N. Kalebic**	*Frontiers in Neuroscience*
Forebrain Organoids to Model the Cell Biology of Basal Radial Glia in Neurodevelopmental Disorders and Brain Evolution	**F. K. Don**, **N. Kalebic**	*Frontiers in Cell and Developmental Biology*
Thymic stroma and TFII-I: towards new targeted therapies	P. G. Manti, S. Trattaro, **D. Castaldi**, **M. Pezzali**, L. Spaggiari, G. Testa	*Trends in Molecular Medicine*
From cohorts to molecules: Adverse impacts of endocrine disrupting mixtures	**N. Caporale**, M. Leemans, L. Birgersson, P. Germain, **C. Cheroni**, ..., **G. Testa**	*Science*
CHD8 haploinsufficiency links autism to transient alterations in excitatory and inhibitory trajectories	**C. E. Villa**, **C. Cheroni**, C. P. Dotter, **A. López-Tóbon**, B. Oliveira, R. Sacco, A. Ç. Yahya, J. Morandell, M. Gabriele, M. R. Tavakoli, J. Lyudchik, C. Sommer, M. Gabitto, J. G Danzl, **G. Testa**, G. Novarino	*Cell Reports*
EZH2-Mediated H3K27me3 Targets Transcriptional Circuits of Neuronal Differentiation	S. Buontempo, P. Laise, J. M. Hughes, **S. Trattaro**, V. Das, C. Rencurel, **G. Testa**	*Frontiers in Neuroscience*
Temporal mapping of derived high-frequency gene variants supports the mosaic nature of the evolution of Homo sapiens	A. Andirkó, J. Moriano, **A. Vitriolo**, M. Kuhlwilm, **G. Testa**, C. Boeckx	*Scientific Reports*
A nomenclature consensus for nervous system organoids and assembloids	S. P. Paşca, P. Arlotta, H. S. Bateup, J. G. Camp, S. Cappello, F. H. Gage, J. A. Knoblich, A. R. Kriegstein, M. A. Lancaster, ..., **G. Testa**, B. Treutlein, F. M. Vaccarino	*Nature*

TITLE	AUTHORS	JOURNAL
Benchmarking brain organoid recapitulation of fetal corticogenesis	**C. Cheroni**, S. Trattaro, **N. Caporale**, **A. López-Tobón**, E. Tenderini, S. Sebastiani, **F. Troglio**, M. Gabriele, R. Bardini Bressan, S. M. Pollard, W. T. Gibson, **G. Testa**	*Translational Psychiatry*
Single cell-derived spheroids capture the self-renewing subpopulations of metastatic ovarian cancer	T. Velletri, **C. E. Villa**, D. Cilli, B. Barzaghi, P. Lo Riso, M. Lupia, ..., G. Testa	*Cell Death & Differentiation*
Automatized protocol and interface to simulate QM/MM time-resolved transient absorption at TD-DFT level with COBRAMM	D. Avagliano, **M. Bonfanti**, A. Nenov, M. Garavelli	*Journal of Computational Chemistry*

STRUCTURAL BIOLOGY CENTRE

TITLE	AUTHORS	JOURNAL
A glance at post-translational modifications of human thyroglobulin: potential impact on function and pathogenesis	**L. Tosatto**, **F. Coscia**	*European Thyroid Journal*
Molecular Genetics of GLUT1DS Italian Pediatric Cohort: 10 Novel Disease-Related Variants and Structural Analysis	A. Mauri, A. Duse, G. Palm, R. Previtali, S. M. Bova, S. Olivotto, S. Benedetti, **F. Coscia**, P. Veggiotti, C. Cereda	*International Journal of Molecular Sciences*
In situ structural analysis reveals membrane shape transitions during autophagosome formation	A. Bieber, C. Capitanio, **P. S. Erdmann**, F. Fiedler, F. Beck, C. Lee, D. Li, G. Hummer, B. A. Schulman, W. Baumeister, F. Wilfling	*PNAS*
Recent Advances in Gas Injection System-Free Cryo-FIB Lift-Out Transfer for Cryo-Electron Tomography of Multicellular Organisms and Tissues	S. Klumpe, J. Kuba, O. H. Schioetz, **P. S. Erdmann**, A. Rigort, J. M. Plitzko	*Microscopy today*
Correlative Cryo-FIB Milling using METEOR, an Integrated Fluorescent Light Microscope	M. Smeets, C. Capitanio, A. Bieber, O. Schioetz, **P. Erdmann**, J. Plitzko	*Microscopy Microanalysis*
Fabrication of High Aspect Ratio Gold Nanowires within the Microtubule Lumen	F. M. Joshi, G. Alvarez Viar, **G. Pigino**, H. Drechsler, S. Diez	*Nano Letters*
In situ architecture of the ciliary base reveals the stepwise assembly of intraflagellar transport trains	H. van den Hoek, **N. Klena**, M. A. Jordan, **G. Alvarez Viar**, R. D. Righetto, M. Schaffer, **P. S. Erdmann**, W. Wan, S. Geimer, J. M. Plitzko, W. Baumeister, **G. Pigino**, V. Hamel, P. Guichard, B. D. Engel	*Science*

TITLE	AUTHORS	JOURNAL
Conversion of anterograde into retrograde trains is an intrinsic property of intraflagellar transport	A. P. Nievergelt, I. Zykov, D. Diener, A. Chhatre, T. Buchholz, M. Delling, S. Diez, **F. Jug**, L. Štěpánek, **G. Pigino**	*Current Biology*
Structural Biology of Cilia and Intraflagellar Transport	**N. Klena**, **G. Pigino**	*Annual Review of Cell and Developmental Biology*
Integrative modeling reveals the molecular architecture of the intraflagellar transport A (IFT-A) complex	C. L McCafferty, O. Papoulas, M. A. Jordan, G. Hoogerbrugge, C. Nichols, **G. Pigino**, D. W. Taylor, J. B. Wallingford, E. M. Marcotte	*eLife*
The human RNA polymerase I structure reveals an HMG-like docking domain specific to metazoans	J. L. Daiß, M. Pilsl, K. Straub, A. Bleckmann, ..., **A. Vannini**, T. Moss, C. Engel	*Life Science Alliance*
Structural basis of SNAPc-dependent snRNA transcription initiation by RNA polymerase II	S. Rengachari, S. Schilbach, T. Kaliyappan, J. Gouge, K. Zumer, J. Schwarz, H. Urlaub, C. Dienemann, **A. Vannini**, P.Cramer	*Nature Structural & Molecular Biology*

COMPUTATIONAL BIOLOGY CENTRE

TITLE	AUTHORS	JOURNAL
Computational estimation of quality and clinical relevance of cancer cell lines	**L. Trastulla**, J. Noorbakhsh, F. Vazquez, J. McFarland, **F. Iorio**	*Molecular Systems Biology*
Reduced gene templates for supervised analysis of scale-limited CRISPR-Cas9 fitness screens	**A. Vinceti**, **U. Perron**, **L. Trastulla**, **F. Iorio**	*Cell Reports*
N2V2 - Fixing Noise2Void Checkerboard Artifacts with Modified Sampling Strategies and a Tweaked Network Architecture	E. Höck, T. O. Buchholz, A. Brachmann, **F. Jug**, A. Freytag	*Proceedings of the European Conference on Computer Vision (ECCV) Workshops*
EmbedSeg: Embedding-based Instance Segmentation for Biomedical Microscopy Data	M. Lalit, P. Tomancak, **F. Jug**	*Medical Image Analysis*
ScipionTomo: Towards cryo-electron tomography software integration, reproducibility, and validation	J. Jiménez de la Morena, P. Conesa, Y. C. Fonseca, ..., **F. Jug**, A. Martinez-Sanchez, M. Harastani, S. Jonic, J. J. Conesa, A. Cuervo, P. Losana, I. Sánchez, M. Iceta, L. Del Cano, M. Gragera, R. Melero, G. Sharov, D. Castaño-Díez, A. Koster, J. G. Piccirillo, J. L. Vilas, J. Otón, R. Marabini, C. O. S. Sorzano, J. M. Carazo	*Journal of Structural Biology*

TITLE	AUTHORS	JOURNAL
Extracellular mechanical forces drive endocardial cell volume decrease during zebrafish cardiac valve morphogenesis	H. Vignes, C. Vagena-Pantoula, M. Prakash, H. Fukui, C. Norden, N. Mochizuki, **F. Jug**, J. Vermot	*Developmental Cell*
Interpretable Unsupervised Diversity Denoising and Artefact Removal	M. Prakash, M. Delbracio, P. Milanfar, **F. Jug**	*International Conference on Learning Representations (ICLR)*
LABKIT: labeling and segmentation toolkit for big image data	M. Arzt, **J. Deschamps**, **C. Schmied**, T. Pietzsch, D. Schmidt, P. Tomancak, R. Haase, F. Jug	*Frontiers in Computer Science*
Fourier image transformer	T. O. Buchholz, **F. Jug**	*Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR Workshop)*
Quantification of spatial subclonal interactions enhancing the invasive phenotype of pediatric glioma	H. Tari, K. Kessler, N. Trahearn, B. Werner, M. Vinci, C. Jones, **A. Sottoriva**	*Cell Reports*
The co-evolution of the genome and epigenome in colorectal cancer	**T. Heide**, J. Househam, G. D. Cresswell, I. Spiteri, C. Lynn, M. Mossner, ..., T. A. Graham, **A. Sottoriva**	*Nature*
Phenotypic plasticity and genetic control in colorectal cancer evolution	J. Househam, **T. Heide**, G. D. Cresswell, I. Spiteri, C. Kimberley, L. Zapata, C. Lynn, C. James, M. Mossner, J. Fernandez-Mateos, **A. Vinceti**, A. Baker, ..., **F. Iorio**, M. Jansen, G. Caravagna, C. P. Barnes, D. Shibata, J. Bridgewater, M. Rodriguez-Justo, L. Magnani, **A. Sottoriva**, T. A. Graham	*Nature*
Characterization of SARS-CoV-2 Mutational Signatures from 1.5+ Million Raw Sequencing Samples	A. Aroldi, **F. Angaroni**, D. D'Aliberti, S. Spinelli, I. Crespiatico, V. Crippa, R. Piazza, A. Graudenzi, D. Ramazzotti	*Viruses*

HEALTH DATA SCIENCE

TITLE	AUTHORS	JOURNAL
Machine learning optimized polygenic scores for blood cell traits identify sex-specific trajectories and genetic correlations with disease	Y. Xu, D. Vuckovic, S. C. Ritchie, P. Akbari, T. Jiang, J. Grealey, A. S. Butterworth, W. H. Ouwehand, D. J. Roberts, **E. Di Angelantonio**, J. Danesh, N. Soranzo, M. Inouye	*Cell Genomics*
Modifiable traits, healthy behaviours, and leukocyte telomere length: a population-based study in UK Biobank	V. Bountziouka, C. Musicha, E. Allara, S. Kaptoge, Q. Wang, **E. Di Angelantonio**, A. S. Butterworth, J. R. Thompson, J. N. Danesh, A. M. Wood, C. P. Nelson, V. Codd, N. J Samani	*The Lancet Healthy Longevity*
Including Measures of Chronic Kidney Disease to Improve Cardiovascular Risk Prediction by SCORE2 and SCORE2-OP	K. Matsushita, S. Kaptoge, S. H. Hageman, Y. Sang, S. H. Ballew, M. E. Grams, A. Surapaneni, ..., **E. Di Angelantonio**, et al.	*European Journal of Preventive Cardiology*
Obesity and cardiovascular disease: mechanistic insights and management strategies. A joint position paper by the World Heart Federation and World Obesity Federation	F. Lopez-Jimenez, W. Almahmeed, H. Bays, A. Cuevas, **E. Di Angelantonio**, C. W. le Roux, N. Sattar, M. C. Sun, G. Wittert, F. J. Pinto, J. P. Wilding	*European Journal of Preventive Cardiology*
Estimating individual lifetime risk of incident cardiovascular events in adults with type 2 diabetes: an update and geographical calibration of the DIAbetes Lifetime perspective model (DIAL2)	H. B. Østergaard, S. H. J. Hageman, S. H. Read, O. Taylor, L. Pennells, ..., **E. Di Angelantonio**, J. A. N. Dorresteijn	*European Journal of Preventive Cardiology*
Gene Sequencing Identifies Perturbation in Nitric Oxide Signaling as a Nonlipid Molecular Subtype of Coronary Artery Disease	A. V. Khera, M. Wang, M. Chaffin, C. A. Emdin, N. J. Samani, H. Schunkert, ..., **E. Di Angelantonio**, et al.	*Circulation: Genomic and Precision Medicine*
Systematic Mendelian randomization using the human plasma proteome to discover potential therapeutic targets for stroke	L. Chen, J. E. Peters, B. Prins, E. Persyn, M. Traylor, P. Surendran, S. Karthikeyan, E. Yonova-Doing, **E. Di Angelantonio**, et al.	*Nature Communications*
CO-CONNECT: A hybrid architecture to facilitate rapid discovery and access to UK wide data in the response to the COVID-19 pandemic	E. Jefferson, C. Cole, S. Mumtaz, S. Cox, T. Giles, S. Adejumo, E. Urwin, ..., **E. Di Angelantonio**, et al.	*Journal of Medical Internet Research*
Rare and common genetic determinants of metabolic individuality and their effects on human health	P. Surendran, I.D. Stewart, V. P. W. Au Yeung, M. Pietzner, J. Raffler, M. A. Wörheide, C. Li, R. F. Smith, L. B. L. Wittemans, L. Bomba, C. Menni, J. Zierer, N. Rossi, P.A. Sheridan, N. A. Watkins, M. Mangino, P. G. Hysi, **E. Di Angelantonio**, M. Falchi, T. D. Spector, N. Soranzo, G. A. Michelotti, W. Arlt, L. A. Lotta, S. Denaxas, H. Hemingway, E. R. Gamazon, J. M. M. Howson, A. M. Wood, J. Danesh, N. J. Wareham, G. Kastenmüller, E. B. Fauman, K. Suhre, A. S. Butterworth, C. Langenberg	*Nature Medicine*

TITLE	AUTHORS	JOURNAL
Mild-to-Moderate Kidney Dysfunction and Cardiovascular Disease: Observational and Mendelian Randomization Analyses	L. Gaziano, L. Sun, M. Arnold, S. Bell, K. Cho, S. K. Kaptoge, ..., **E. Di Angelantonio**, et al.	*Circulation*
Genetically personalised organ-specific metabolic models in health and disease	C. Foguet, Yu Xu, S.C. Ritchie, S. A. Lambert, E. Persyn, A. P. Nath, E. E. Davenport, D. J. Roberts, D. S. Paul, **E. Di Angelantonio**, J. Danesh, A. S. Butterworth, C. Yau, M. Inouye	*Nature Communications*
New Way to "SCORE" Risk: Updates on the ESC Scoring System and Incorporation into ESC Cardiovascular Prevention Guidelines	I. M. Graham, **E. Di Angelantonio**, R. Huculeci, European Society of Cardiology's Cardiovascular Risk Collaboration (CRC)	*Current Cardiology Reports*
Oligoscore: a clinical score to predict overall survival in patients with oligometastatic disease treated with stereotactic body radiotherapy	D. Franceschini, V. Polenghi, C. Franzese, T. Comito, P. Navarria, G. R. D'Agostino, **F. Ieva**, M. Scorsetti	*Acta Oncologica*
PET/CT-based radiomics of mass-forming intrahepatic cholangiocarcinoma improves prediction of pathology data and survival	F. Fiz, C. Masci, G. Costa, M. Sollini, A. Chiti, **F. Ieva**, G. Torzilli, L. Viganò	*European Journal of Nuclear Medicine and Molecular Imaging volume*
A Deep Survival EWAS approach estimating risk profile based on pre-diagnostic DNA methylation: An application to breast cancer time to diagnosis	**M. C. Massi**, L. Dominoni, **F. Ieva**, G. Fiorito	*PLoS Computational Biology*
A blood DNA methylation biomarker for predicting short-term risk of cardiovascular events	A. Cappozzo, C. McCrory, O. Robinson, A. Freni Sterrantino, C. Sacerdote, ..., **F. Ieva**, G. Fiorito	*Clinical Epigenetics*
Imaging-based representation and stratification of intra-tumor heterogeneity via tree-edit distance	L. Cavinato, M. Pegoraro, A. Ragni, **F. Ieva**	*Scientific Reports*

TITLE	AUTHORS	JOURNAL
Modelling time-varying covariates effect on survival via functional data analysis: application to the MRC BO06 trial in osteosarcoma	M. Spreafico, **F. Ieva**, M. Fiocco	*Statistical Methods & Applications*
Distant supervision for imaging-based cancer sub-typing in Intrahepatic Cholangiocarcinoma	M. S. Savino, L. Cavinato, G. Costa, F. Fiz, G. Torzilli, L. Viganò, **F. Ieva**	*EMBC 2022*
Feature selection for imbalanced data with deep sparse autoencoders ensemble	**M. C. Massi**, F. Gasperoni, **F. Ieva**, **A. M. Paganoni**	*Statistical Journal and Data Mining*
Semiparametric multinomial mixed-effects models: A university students profiling tool	C. Masci, **F. Ieva**, A. M. Paganoni	*The Annals of Applied Statistics*
A deep variational approach to clustering survival data	L. Manduchi, R. Marcinkevics, **M. C. Massi**, T. Weikert, A. Sauter, V. Gotta, T. Muller, et al.	*ICLR 2022*
A Deep Survival EWAS approach estimating risk profile based on pre-diagnostic DNA methylation: An application to breast cancer time to diagnosis	**M. C. Massi**, L. Dominoni, **F. Ieva**, G. Fiorito	*PLoS Computational Biology*
Partial identification of the average causal effect in multiple study populations: the challenge of combining Mendelian randomization studies	E. W. Diemer, **L. Zuccolo**, S. A. Swanson	*Epidemiology*
Genetic diversity fuels gene discovery for tobacco and alcohol use	G. R. B. Saunders, X. Wang, F. Chen, S.-K. Jang, M. Liu, ..., **L. Zuccolo**, 23andMe Research Team, The Biobank Japan Project, C. Batini, A. W. Bergen, L. J. Bierut, S. P. David, S. A. Gagliano Taliun, D. B. Hancock, B. Jiang, M. R. Munafò, Th. E. Thorgeirsson, D. J. Liu & S. Vrieze	*Nature*

** The publications listed include reviews and peer-reviewed research articles.*

In 2022, we also report 36 cohort studies (research projects in which groups of people are studied over a determined period of time) and 26 new experimental methods and protocols developed with the participation of HT affiliated research workers.

COHORT STUDIES

TITLE	AUTHORS	JOURNAL
GWAS of genetic factors affecting white blood cell morphological parameters in Sardinians uncovers influence of chromosome 11 innate immunity gene cluster on eosinophil morphology	M. Marongiu, G. Pérez-Mejías, V. Orrù, M. Steri, C. Sidore, A. Díaz-Quintana, A. Mulas, F. Busonero, A. Maschio, K. Walter, M. Tardaguila, P. Akbari, **N. Soranzo**, et al.	*Human Molecular Genetics*
Whole-exome sequencing identifies rare genetic variants associated with human plasma metabolites	L. Bomba, K. Walter, Q. Guo, P. Surendran, K. Kundu, S. Nongmaithem, M. A. Karim, I. D. Stewart, C. Langenberg, J. Danesh, **E. Di Angelantonio**, D. J. Roberts, W. H. Ouwehand, INTERVAL study; I. Dunham, A. S. Butterworth, **N. Soranzo**	*The American Journal of Human Genetics*
Genetic Landscape of the ACE2 Coronavirus Receptor	Z. Yang, E. Macdonald-Dunlop, J. Chen, R. Zhai, T. Li, A. Richmond, L. Klarić, **N. Pirastu**, et al.	*Circulation*
Large-scale GWAS of food liking reveals genetic determinants and genetic correlations with distinct neurophysiological traits	S. May-Wilson, N. Matoba, K. H. Wade, J. Hottenga, M. P. Concas, ..., **N. Pirastu**	*Nature Communications*
Using genetic variation to disentangle the complex relationship between food intake and health outcomes	**N. Pirastu**, C. McDonnell, E. J. Grzeszkowiak, N. Mounier, F. Imamura, J. Merino, F. R. Day, J. Zheng, N. Taba, et al.	*PLoS Genetics*
Genome-wide Association Study of Liking for Several Types of Physical Activity in the UK Biobank and Two Replication Cohorts	Y. C. Klimentidis, M. Newell, M. D VAN DER Zee, V. L. Bland, S. May-Wilson, ..., **N. Pirastu**	*Medicine & Science in Sport & Exercise*
Impact of cultural and genetic structure on food choices along the Silk Road	S. Aneli, M. Mezzavilla, E. Bortolini, **N. Pirastu**, G. Girotto, B. Spedicati, P. Berchialla, P. Gasparini, L. Pagani	*PNAS*
Lipid-loaded tumor-associated macrophages sustain tumor growth and invasiveness in prostate cancer	M. Masetti, R. Carriero, F. Portale, G. Marelli, ..., **C. Peano**, et al.	*Journal of Experimental Medicine*
Intrahepatic CD69+Vδ1 T cells re-circulate in the blood of patients with metastatic colorectal cancer and limit tumor progression	E. Bruni, M. M. Cimino, M. Donadon, R. Carriero, S. Terzoli , ..., **C. Peano**, et al.	*Journal for ImmunoTherapy of Cancer*

TITLE	AUTHORS	JOURNAL
Multimodal single-cell profiling of intrahepatic cholangiocarcinoma defines hyperactivated Tregs as a potential therapeutic target	G. Alvisi, A. Termanini, C. Soldani, F. Portale, R. Carriero, K. Pilipow, G. Costa, M. Polidoro, ..., **C. Peano**, et al.	*Journal of Hepatology*
Genomic Profiling Identifies Putative Pathogenic Alterations in NSCLC Brain Metastases	M. Nicoś, L. Harbers, E. Patrucco, ..., **M. Bienko**, P. Krawczyk, J. Jassem, C. Ambrogio, **N. Crosetto**	*JTO Clinical and Research Reports*
APOE4 impairs myelination via cholesterol dysregulation in oligodendrocytes	J.W. Blanchard, L. A. Akay, **J. Davila-Velderrain**, et al.	*Nature*
From cohorts to molecules: Adverse impacts of endocrine disrupting mixtures	**N. Caporale**, M. Leemans, L. Birgersson, P. Germain, **C. Cheroni**, ..., **G. Testa**	*Science*
Molecular Genetics of GLUT1DS Italian Pediatric Cohort: 10 Novel Disease-Related Variants and Structural Analysis	A. Mauri, A. Duse, G. Palm, R. Previtali, S. M. Bova, S. Olivotto, S. Benedetti, **F. Coscia**, P. Veggiotti, C. Cereda	*International Journal of Molecular Sciences*
The co-evolution of the genome and epigenome in colorectal cancer	**T. Heide**, J. Househam, G. D. Cresswell, I. Spiteri, C. Lynn, M. Mossner, ..., T. A. Graham, **A. Sottoriva**	*Nature*
Phenotypic plasticity and genetic control in colorectal cancer evolution	J. Househam, **T. Heide**, G. D. Cresswell, I. Spiteri, C. Kimberley, L. Zapata, C. Lynn, C. James, M. Mossner, J. Fernandez-Mateos, **A. Vinceti**, A. Baker , ..., **F. Iorio**, M. Jansen, G. Caravagna, C. P. Barnes, D. Shibata, J. Bridgewater, M. Rodriguez-Justo, L. Magnani, **A. Sottoriva**, T. A. Graham	*Nature*
Machine learning optimized polygenic scores for blood cell traits identify sex-specific trajectories and genetic correlations with disease	Y. Xu, D. Vuckovic, S. C. Ritchie, P. Akbari, T. Jiang, J. Grealey, A. S. Butterworth, W. H. Ouwehand, D. J. Roberts, **E. Di Angelantonio**, J. Danesh, N. Soranzo, M. Inouye	*Cell Genomics*
Modifiable traits, healthy behaviours, and leukocyte telomere length: a population-based study in UK Biobank	V. Bountziouka, C. Musicha, E. Allara, S. Kaptoge, Q. Wang, **E. Di Angelantonio**, A. S. Butterworth, J. R. Thompson, J. N. Danesh, A. M. Wood, C. P. Nelson, V. Codd, N. J. Samani	*The Lancet Healthy Longevity*
Including Measures of Chronic Kidney Disease to Improve Cardiovascular Risk Prediction by SCORE2 and SCORE2-OP	K. Matsushita, S. Kaptoge, S. H. Hageman, Y. Sang, S. H. Ballew, M. E. Grams, A. Surapaneni, ..., **E. Di Angelantonio**, et al.	*European Journal of Preventive Cardiology*

TITLE	AUTHORS	JOURNAL
Obesity and cardiovascular disease: mechanistic insights and management strategies. A joint position paper by the World Heart Federation and World Obesity Federation	F. Lopez-Jimenez, W. Almahmeed, H. Bays, A. Cuevas, **E. Di Angelantonio**, C. W. le Roux, N. Sattar, M. C. Sun, G. Wittert, F. J. Pinto, J. P. Wilding	*European Journal of Preventive Cardiology*
Estimating individual lifetime risk of incident cardiovascular events in adults with type 2 diabetes: an update and geographical calibration of the DIAbetes Lifetime perspective model (DIAL2)	H. B. Østergaard, S. H. J. Hageman, S. H. Read, O. Taylor, L. Pennells, ..., **E. Di Angelantonio**, J. A. N. Dorresteijn	*European Journal of Preventive Cardiology*
Gene Sequencing Identifies Perturbation in Nitric Oxide Signaling as a Nonlipid Molecular Subtype of Coronary Artery Disease	A. V. Khera, M. Wang, M. Chaffin, C. A. Emdin, N. J. Samani, H. Schunkert, ..., **E. Di Angelantonio**, et al.	*Circulation: Genomic and Precision Medicine*
Systematic Mendelian randomization using the human plasma proteome to discover potential therapeutic targets for stroke	L. Chen, J. E. Peters, B. Prins, E. Persyn, M. Traylor., P. Surendran, S. Karthikeyan, E. Yonova-Doing, **E. Di Angelantonio**, et al.	*Nature Communications*
A Hybrid Architecture (CO-CONNECT) to Facilitate Rapid Discovery and Access to Data Across the United Kingdom in Response to the COVID-19 Pandemic: Development Study	E. Jefferson, C. Cole, S. Mumtaz, S. Cox, T. Giles, S. Adejumo, E. Urwin, ..., **E. Di Angelantonio**, et al.	*Journal of Medical Internet Research*
Rare and common genetic determinants of metabolic individuality and their effects on human health	P. Surendran, I. D. Stewart, V. P. W. Au Yeung, M. Pietzner, J. Raffler, M. A. Wörheide, C. Li, R. F. Smith, L. B. L. Wittemans, L. Bomba, C. Menni, J. Zierer, N. Rossi, P. A. Sheridan, N. A. Watkins, M. Mangino, P. G. Hysi, **E. Di Angelantonio**, et al.	*Nature Medicine*
Mild-to-Moderate Kidney Dysfunction and Cardiovascular Disease: Observational and Mendelian Randomization Analyses	L. Gaziano, L. Sun, M. Arnold, S. Bell, K. Cho, S. K. Kaptoge, ..., **E. Di Angelantonio**, et al.	*Circulation*
Oligoscore: a clinical score to predict overall survival in patients with oligometastatic disease treated with stereotactic body radiotherapy	D. Franceschini, V. Polenghi, C. Franzese, T. Comito, P. Navarria, G. R. D'Agostino, **F. Ieva**, M. Scorsetti	*Acta Oncologica*

TITLE	AUTHORS	JOURNAL
PET/CT-based radiomics of mass-forming intrahepatic cholangiocarcinoma improves prediction of pathology data and survival	F. Fiz, C. Masci, G. Costa, M. Sollini, A. Chiti, **F. Ieva**, G. Torzilli, L. Viganò	*European Journal of Nuclear Medicine and Molecular Imaging volume*
A Deep Survival EWAS approach estimating risk profile based on pre-diagnostic DNA methylation: An application to breast cancer time to diagnosis	**M. C. Massi**, L. Dominoni, **F. Ieva**, G. Fiorito	*PLoS Computational Biology*
A blood DNA methylation biomarker for predicting short-term risk of cardiovascular events	A. Cappozzo, C. McCrory, O Robinson, A. Freni Sterrantino, C. Sacerdote, ..., **F. Ieva**, G. Fiorito	*Clinical Epigenetics*
Imaging-based representation and stratification of intra-tumor heterogeneity via tree-edit distance	L. Cavinato, M. Pegoraro, A. Ragni, …, **F. Ieva**	*Scientific Reports*
Modelling time-varying covariates effect on survival via functional data analysis: application to the MRC BO06 trial in osteosarcoma	M. Spreafico, **F. Ieva**, M. Fiocco	*Statistical Methods & Applications*
A deep variational approach to clustering survival data	L. Manduchi, R. Marcinkevics, **M. C. Massi**, T. Weikert, A. Sauter, V. Gotta,T. Muller, et al.	*ICLR 2022*
Genetically personalised organ-specific metabolic models in health and disease	C. Foguet, Yu Xu, S.C. Ritchie, S. A. Lambert, E. Persyn, A. P. Nath, E. E. Davenport, D. J. Roberts, D. S. Paul, **E. Di Angelantonio**, J. Danesh, A. S. Butterworth, C. Yau, M. Inouye	*Nature Communications*
Genetic diversity fuels gene discovery for tobacco and alcohol use	G.R.B. Saunders, X. Wang, F. Chen, S.-K. Jang, M. Liu, ..., **L. Zuccolo**, 23andMe Research Team, The Biobank Japan Project, C. Batini, A. W. Bergen, L. J. Bierut, S. P. David, S. A. Gagliano Taliun, D. B. Hancock, B. Jiang, M. R. Munafò, Th. E. Thorgeirsson, D. J. Liu & S. Vrieze	*Nature*
Partial identification of the average causal effect in multiple study populations: the challenge of combining Mendelian randomization studies	E. W. Diemer, **L. Zuccolo**, S. A. Swanson	*Epidemiology*

NEW EXPERIMENTAL METHODS AND PROTOCOLS

TITLE	HT AUTHORS	DESCRIPTION
FRET-FISH probes chromatin compaction at individual genomic loci in single cells	M. Bienko, N. Crosetto	Description of FRET-FISH, a method combining fluorescence resonance energy transfer (FRET) with DNA fluorescence in situ hybridization (FISH) to probe chromatin compaction at select loci in single cells
Inducing human retinal pigment epithelium-like cells from somatic tissue	P. Carninci	Description of an induced retinal pigment epithelium (iRPE) system coupled to comprehensive single-cell RNA sequencing profiling. This system may enable robust retinal cell induction for basic research and affordable autologous human RPE tissue for regenerative cell theraphy
Recombination of repeat elements generates somatic complexity in human genomes	P. Carninci	Combine short- and long-DNA read sequencing of repeated elements with a new bioinformatics pipeline to show that somatic recombination of repeted elements is widespread in the human genome
Deep sequencing of short capped RNAs reveals novel families of noncoding RNAs	P. Carninci	Description of a sequencing library preparation protocol for short capped RNAs
SCAFE: a software suite for analysis of transcribed cis-regulatory elements in single cells	P. Carninci	Developmet of SCAFE – Single-Cell Analysis of Five-prime Ends – a software suite that processes Single-cell RNA 5'end sequencing data to de novo identify transcription start sites clusters based on multiple logistic regression
Discovery of widespread transcription initiation at microsatellites predictable by sequence-based deep neural network	P. Carninci	Development of Cap Trap RNA-seq, a technology which combines cap trapping and long read MinION sequencing
Prediction of the cell-type-specific transcription of non-coding RNAs from genome sequences via machine learning	P. Carninci	Development of a machine-learning model (MENTR) that reliably links genome sequence and ncRNA expression at the cell type level

TITLE	HT AUTHORS	DESCRIPTION
Contrastive Mixture of Posteriors for Counterfactual Inference, Data Integration and Fairness	C. A. Glastonbury	Description of Contrastive Mixture of Posteriors (CoMP), a new method for learning aligned representations in a CVAE framework
Whole-exome sequencing identifies rare genetic variants associated with human plasma metabolites	N. Soranzo	Developmet of algorithms to prioritise putative driver variants at each locus
Single cell-derived spheroids capture the self-renewing subpopulations of metastatic ovarian cancer	C. E. Villa	Establishment of a new method to isolate and grow single cells directly from patients' metastatic ascites, establishing the conditions for propagating them as 3D cultures
Automatized protocol and interface to simulate QM/MM time-resolved transient absorption at TD-DFT level with COBRAMM	M. Bonfanti	New implementations introduced in the open-source academic software COBRAMM
Fabrication of High Aspect Ratio Gold Nanowires within the Microtubule Lumen	G. Pigino	New strategy for the growth of gold nanowires from seed nanoparticles within the lumen of microtubules
Reduced gene templates for supervised analysis of scale-limited CRISPR-Cas9 fitness screens	A. Vinceti, U. Perron, L. Trastulla, F. Iorio	Development of a computational framework identifying optimal subsets of known essential and nonessential genes (at different subsampling percentages) that can be used as templates for supervised analyses of scale-limited CRISPR-Cas9 screens
EmbedSeg: Embedding-based Instance Segmentation for Biomedical Microscopy Data	F. Jug	Desciption of EmbedSeg, an embedding-based instance segmentation method designed to segment instances of desired objects visible in 2D or 3D biomedical image data

TITLE	HT AUTHORS	DESCRIPTION
N2V2 - Fixing Noise2Void Checkerboard Artifacts with Modified Sampling Strategies and a Tweaked Network Architecture	F. Jug	Modifications to the vanilla N2V setup for image denoising
EmbedSeg: Embedding-based Instance Segmentation for Biomedical Microscopy Data	F. Jug	Segmentation method for biomedical image data analysis
ScipionTomo: Towards cryo-electron tomography software integration, reproducibility, and validation	F. Jug	Extension of Scipion software based on a set of tomography plugins
Interpretable Unsupervised Diversity Denoising and Artefact Removal	F. Jug	Approach to remove imaging artefacts commonly occurring in microscopy data
LABKIT: labeling and segmentation toolkit for big image data	F. Jug	Fiji plugin for the segmentation of microscopy image data
Quantification of spatial subclonal interactions enhancing the invasive phenotype of pediatric glioma	A. Sottoriva	Development of a Bayesian inference framework to quantify spatial subclonal interactions between molecular and phenotypically distinct diffuse midline glioma lineages with different patterns of invasion

TITLE	HT AUTHORS	DESCRIPTION
Oligoscore: a clinical score to predict overall survival in patients with oligometastatic disease treated with stereotactic body radiotherapy	F. Ieva	Novel practical approach for radiation oncologists to classify patients with oligometastatic disease according to easily accessible clinical features
A Deep Survival EWAS approach estimating risk profile based on pre-diagnostic DNA methylation: An application to breast cancer time to diagnosis	M. C. Massi, F. Ieva	Development of a new Deep Learning-based approach assessing the relevance of individual CpG Islands in determining the Time To Diagnosis while modeling their combined effect in a survival analysis scenario
Modelling time-varying covariates effect on survival via functional data analysis: application to the MRC BO06 trial in osteosarcoma	F. Ieva	Description of Functional covariate Cox Model (FunCM) method, whcih allows to detect differences between patients with different biomarkers and treatment evolutions, and to include this information in the survival model
Distant supervision for imaging-based cancer sub-typing in Intrahepatic Cholangiocarcinoma	F. Ieva	Description of a distant supervision model for imaging-based cancer sub-typing in Intrahepatic Cholangiocar-cinoma patients
Feature selection for imbalanced data with deep sparse autoencoders ensemble	M. C. Massi, F. Ieva, M. Paganoni	Novel filtering Feature Selection (FS) algorithm
A deep variational approach to clustering survival data	M. C. Massi	A novel semi-supervised probabilistic approach to cluster survival data

2.3 Strategy

Details follow of Human Technopole's ***eight strategic objectives*** as shown in the materiality matrix and forming the basis of the value creation system mentioned earlier.

INNOVATION AND QUALITY OF RESEARCH IN THE AREAS OF GENOMICS, NEUROGENOMICS, COMPUTATIONAL BIOLOGY, STRUCTURAL BIOLOGY, HEALTH DATA SCIENCE

This strategic objective comprises the following steps:

- **Developing outstanding national and international scientific research programmes**
- **Developing new approaches to preventive and personalised medicine and new strategies to support public health**
- **Creating innovation through an interdisciplinary approach**
- **Helping to promote the Italian biomedical research system**
- **Producing high-quality scientific publications**

«Scientific research is an attempt to satisfy man's innate curiosity without any prior conditioning by certain vested interests. This is the true value of basic research.»
«In scientific research, added value is provided by innovation and a multidisciplinary approach obtained by pooling the knowhow of experts in various fields, at times having very different backgrounds to each other.»
«Principally, I see sustainability as an environmental and social issue. In other words, our daily routine should focus on reducing laboratory processing waste and looking after the individual. As regards the latter, in Italy as well, I have noted awareness of the value of policies embracing every form of diversity.»

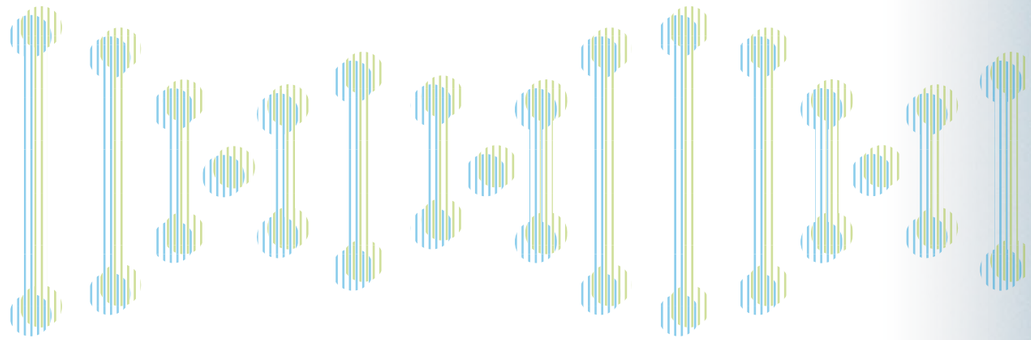
Aurora Savino
Postdoc at the Computational Biology Research Centre.

There are five large complementary areas used for biomedical and health research which form the basis of the HT research strategy for the period 2020-2024.

These areas are represented by the five Research Centres that HT has set up in the fields described hereafter.

GENOMICS

Genomics is an essential component of modern biomedicine. In general, research in this area aims to identify the mechanisms regulating gene expression and the way in which hereditary genetic material gives rise to important differences between individuals that affect health and wellbeing. Genome research in HT is extensive and formed by two complementary research programmes: one covering functional genomics and the other medical and population genomics. One of the main objectives of this type of research is to help characterise Italy's genetic variability and unique environment so as to improve our understanding of the genetic causes of various diseases, unleashing additional potential for both research and clinical purposes.



NEUROGENOMICS

Neurogenomics is another very important area of research for HT, bearing in mind that neurological disorders are a considerable burden on the health service. At the same time, neurogenomics is an area of research in which significant benefits resulting from the integration of genomics, disease modelling and other cutting-edge methods are waiting to be generaed. In particular, the application of new technology to the study of neurogenomics is intended to complement and create synergies with high-profile national and European research programmes and activities. HT's neurogenomic research combines computational and experimental approaches using different systems to investigate the nervous system's structure/function and development with a special focus on the mechanisms underlying neuropsychiatric and neurodegenerative disorders. Research in this area provides detailed insight into molecular function, as well as representing a crucial first step in new drug design.

STRUCTURAL BIOLOGY

HT's scientific strategy leans strongly towards structural biology that focuses on studying the three-dimensional structure of macromolecules. In addition to the importance of these studies, oriented towards the discovery of disease-regulating mechanisms, the strategic focus on structural biology is also motivated by the possibility for HT to grant access, through its Cryo-electron Microscopy Facility, to a recent revolutionary technology in the field of structural biology research that is not yet widely available to Italian scientists due to its high cost and technical complexity.

COMPUTATIONAL BIOLOGY

Research in the areas described above generates huge amounts of data. It therefore becomes necessary to have close integration with computational biology research that is absolutely essential to every aspect of modern life science research. HT computational biologists use statistical, computational and bioinformatic approaches to develop solutions for large-scale data analysis, management and integration to support all research areas. In the area of computational biology, HT also plans to develop, host and manage software tools and data resources make them available to the wider biomedical community. The aim is to both provide a service to the outside community and link publicly accessible international biomolecular data to more limited national medical informatic data.

HEALTH DATA SCIENCE

Statistical and big data methods can be used to analyse different types of large-scale data or analyse and solve public health problems. HT's primary research objective in this field is to integrate big data from various sources to develop tools in support of the medical system, in particular, the areas of precision medicine and health and health economics management. Another HT objective for this type of research is to transfer this knowledge by providing analysis and advice to different stakeholders, but especially to the legislator. Indeed, the design and implementation of model systems to assess the socioeconomic impact on the national health system of various aspects of precision medicine can be important tools in helping to design policies that optimise efforts in the above-mentioned areas.

POTENTIAL FUTURE DEVELOPMENTS

In addition to the fields of research mentioned above, it is already possible to identify potential areas for HT's future development that are of great importance and represent an ideal addition for further strengthening of the Foundation's scientific activity, maximising the potential impact on human health. Such research areas are, for example, cell biology and metabolism. Cell biology, represents the natural missing link between understanding molecular structures and mechanisms (provided, for example, by structural biology) and the information obtained from large-scale (gen)omic studies of structures and mechanisms that operate at the organism level. Integration of these different disciplines will enable HT scientists to gain an in-depth, holistic understanding of the mechanisms regulating human health and their deregulation in disease. With a view to maximising synergies with the rest of HT's planned activities, the Centre for Metabolism will focus on areas related to the human metabolism and microbiome and the resultant individual response to the intake of food, medicines and microbes. This is an emerging and extremely promising aspect of human biomedicine that fits in well with other research, making optimal use of both genomics and other high-throughput technology, as well as computational biology infrastructures and expertise. HT's research work will advance our understanding of diseases and help to develop new therapeutic strategies for chronic and degenerative ones such as: cancer, cardiovascular disease and their intermediate phenotypes, neurodegenerative and neurodevelopmental disorders such as autism and intellectual disabilities, rare diseases such as primary ciliary dyskinesia or respiratory diseases such as cystic fibrosis.

2022 ACTIVITIES

As far as scientific research is concerned, 2022 was the first full year of activity after completing the initial appointment of the HT scientific leadership (i.e. recruitment of the Heads of Research Centre) and opening of the first test laboratories in 2021. Following the transfer to HT of a greater number of Group Leader activities and the engagement of additional scientific and technical assistants, the Foundation has continued to assemble a large body of staff, at year end comprising 24 research groups and more than 200 assistants in Research Centres, Facilities and Scientific Services.

During the course of the year, Foundation scientists recorded important scientific achievements in their respective fields, resulting in several peer-reviewed publications in prestigious international magazines, details of which can be found herein in the section "*Intellectual Capital*".

Here are some examples of projects launched by HT scientists during the course of the year:

- A thyroid function study known as the Thyromol project, awarded an ERC Starting Grant, that aims to investigate how the molecular mechanisms of production, release and storage of thyroid hormones are cross-regulated so that the body receives the right levels, laying a solid foundation for alternative and more targeted strategies for controlling thyroid hormone synthesis (Europe Awards Human Technopole's Research on Thyroid - Human Technopole).
- Development of a project with Eurac Research designed to enrich the content of the CHRIS population study biobank. The study continuously monitors a person's health, "from molecule to disease"; population studies that follow this approach are the cornerstone for the medicine of the future: predictive and precision medicine based on human biology (Shifting focus from disease to human health - Human Technopole).
- "NEUROCOV" international research project focusing on the long-term neurological and psychiatric effects of COVID-19. Funded by the European Commission, this five-year project was developed by HT and the German Center for Neurodegenerative Diseases (DZNE) and involves ten institutes from seven countries. Human Technopole will be studying the underlying mechanisms of the disease with a view to developing new treatments. The study will concentrate on the molecular mechanisms that are activated within the cells in the so-called "NeuroCOVID", the set of neurological and neuropsychological disorders related to COVID-19 infection. This new knowledge will help to develop new treatments and approaches that can predict the risk of neurological symptoms. Data will be collected through studies of patients of all ages in several European countries that will also involve "Long COVID" patient communities (Human Technopole Studies Neurological and Psychiatric Effects of Covid-19 - Human Technopole).
- An international study coordinated by HT along with researchers from the Institute for Cancer Research (ICR) in London has revealed that key answers to explain the onset and growth mechanisms of bowel cancer come not only from genetic mutations, but also so-called "epigenetics" and, in particular, chromatin alterations. Chromatin determines how the code of life is packaged and therefore utilised by cells. The evidence submitted could lay the foundations for the development of new treatments for colorectal cancer that is now the third most common cancer worldwide and the second most common cause of cancer death in Europe (Exploring The "Dark Matter" Of Colorectal Cancer - Human Technopole).
- A study conducted along with the Usher Institute at the University of Edinburgh representing the most comprehensive genetic analysis ever conducted to understand the drivers of food choices and identify new genetic loci associated with individual food preferences. This study can help to understand the molecular and neuronal mechanisms dictating individual food tastes. Given the importance of a balanced diet for human health, this knowledge could help in designing personalised diets to improve an individual's wellbeing (Why do we have preferences towards certain foods? - Human Technopole).
- Agreement between the Lombardy Regional Authority and Human Technopole Foundation to carry out a project called CoV-CVD. The agreement grants HT access to health records in order to investigate the effect of SARS-CoV-2 infections on the short-, medium- and long-term risk of heart attack, stroke and other cardiovascular events in order to estimate the size and impact of these adverse events on the population and identify those at greatest risk.

In addition, work has continued on certain important strategic projects started in previous years, i.e.:

- genomic projects to improve understanding of genetic diversity and disease predisposition in Italy - Complete genomic characterisation of the participants in the "Moli-Sani" study conducted by the Neuromed IRCCS (Treatment and Research Hospital) Mediterranean Neurological Institute;
- high-throughput brain organoid longitudinal profiling for neurodevelopmental disease deconvolution of cohorts from the Associazione Oasi Maria Santissima IRCCS (Treatment and Research Hospital) in Troina, Sicily.

In accordance with international research best practices and standards, the scientific activities that HT performs are monitored and assessed on a regular basis. As regards assessing the scientific activities of Research Centres and Facilities, in July 2022, the Foundation approved the *"In-house procedure covering the assessment of Human Technopole Research Centres and Core Facilities"*. The document specifies the methods to be followed (frequency, panel involved, documentation requested, process, purpose) when assessing the scientific activities of Research Centres and Core Facilities. The procedure aims to provide the HT Director, Management Committee and *Consiglio di Sorveglianza* with details and information regarding the performance of individual Group Leaders, Heads of Research Centres and Heads of Core Facilities.

DEVELOPMENT AND PROVISION OF INFRASTRUCTURES AND INNOVATIVE RESEARCH INSTRUMENTS

The main aims of this strategic objective are as follows:

- **To provide high quality infrastructures, instruments and services**
- **To guarantee high quality in research buildings and areas**
- **To offer external and internal researchers access to infrastructures, instruments and services**

«My concept of scientific research is akin to a "journey", I mean an idea exploration and development process with an objective in mind.»
«Research is based on "collaboration" between scientists, both by working on joint projects and sharing study findings. To this end, we also need to ensure that all researchers have access to funding and technology so they really can conduct better research by leveraging their individual talent and sharing ideas.»
«Sustainability in scientific research is paramount. From a "social" standpoint, I believe in scientific ethics capable of making results and knowhow available to society as a whole rather than just benefiting the privileged few.»

Aslihan Karabacak Calviello
Postdoc at the Genomic Research Centre, Functional Genomics Programme.

Research at HT is supported by state-of-the-art scientific infrastructures and facilities that are essential to remaining competitive in the current international research scene and will be accessible to internal and external users. Besides meeting the requirements of HT scientists, these facilities and services will be widely available to the external scientific community. HT's plans in the area of user-accessible scientific services are aimed as much as possible at addressing the needs of the research community, by providing access to equipment and technology that are not readily available and to which scientists working in Italy in particular have limited access. Development and use of and access to infrastructures and instruments therefore form an essential part of HT's strategic vision.

In developing a user access strategy, HT's priority will be to ensure transparent, time-effective use of infrastructures by both internal and external researchers.

Wherever possible, to extend and further facilitate researcher access and position HT's facilities internationally the facilities will join European schemes and other special programmes. In setting up its facilities, HT continually invests in innovative technology with a view to offering state-of-the-art equipment and expertise. An important aspect is the need to recruit highly-qualified professionals (e.g. senior technical staff) who understand the available technology and can support researchers in their experiments, as well as promote the dissemination of crucial resources, methods and expertise in specific areas of technology relevant to HT's research. HT facilities also play an active role in training aimed at both "biological users" and more specialised technical staff from other national and international institutes.
HT's prime facilities, already operative or nearing completion, are the Data Centre, Genomics Facility, Cryo-Electron Microscopy Facility, Light Imaging Facility, Image Analysis Facility and Automated Stem Cell Facility *(for full details of these facilities please see subchapter 1.2 herein "Research Centres and Facilities")*.

Furthermore, additional technological facilities are planned, including: Fluorescence Activated Cell Sorting (FACS) service, Protein Expression and Purification, Crystallisation and Biophysics, Proteomics, Metabolomics, Animal Research Facility and a Transgenic Facility.

A further step forward, completed in conformity with this strategic objective, is marked by the signing of the Agreement, introduced by article 1, paragraph 275, of Law No. 160 dated 27th December 2019, between HT and the Founding Italian Ministries. The Agreement is designed to promote HT's specific role of science and technology park to support national scientific research. The Agreement's field of application is to identify, construct and run new infrastructure facilities known as National Facilities, i.e. facilities, resources and services that can be used by the scientific community to conduct top-level research in their respective fields.

For more details about National Facilities, please refer to subchapter 2.4 *"Responsible and sustainable approach"* under the section *"Development and sharing of sustainable and innovative buildings and infrastructures (National Facilities)"*.

TALENT ATTRACTION AND TRAINING, AND RESEARCH OUTPUT SHARING

This strategic objective comprises the following steps:

- **Attract internationally renowned researchers**
- **Encourage the exchange of knowledge and experience**
- **Train the next generation of researchers**
- **Promote mobility and the exchange of outstanding researchers between research institutes and organisations**

«When I think of science, I envisage the future of humanity, materialising in knowledge development and transfer to benefit society as a whole.»
«In scientific research, the calibre and motivation of project members are important and research quality is better when researchers work as a team. This means sharing their specific technical expertise (such as in Biology and Data Science) and fostering cooperation between different workgroups and scientific institutions.»
«For me personally, sustainability means respecting the environment, for example by using reusable food containers. At a corporate level, I advocate "social" policies that address the needs of individuals, such as childcare support schemes for working women (flexitime, homeworking, crèche).»

Michela Carlotta Massi
Postdoc at the Health Data Science Centre.

Through its synergetic missions, HT helps to improve the national research system in the life science sector. At the same time, the Foundation seeks to establish itself as a key partner for other leading international institutes from the sector.

By joining and promoting scientific networks with prestigious (international) partners, HT aims to give greater visibility to Italian biomedical research, thus helping to raise its profile.

Since 2018, the Foundation has been part of the joint PhD programme in Data Analytics and Decision Sciences (DADS) with the Politecnico di Milano (Milan Institute of Technology), a partnership that involves three departments: Electronics, Computer Science and Bioengineering (DEIB), Management, Economics and Industrial Engineering (DIG) and Mathematics (DMAT)–and the Analysis, Decisions and Society Centre (now Health Data Science).

The part of this three-year programme that involves Health Data Science is designed to train highly-qualified data analysts and data managers who will be able to conduct important research for healthcare and the healthcare system at universities, clinical research centres, hospitals, health authorities, international institutes, financial institutions, technology companies, regulatory authorities and other public bodies.

In 2019, HT joined the European School of Molecular Medicine (SEMM) four-year PhD Programme in Systems Medicine as a host institute. Set up as a partnership between various Italian life science research institutes, Milan University and the University of Naples Federico II, SEMM is a private training foundation that combines basic, translational and clinical research in biomedicine's emerging sectors. In this context, the SEMM PhD in Systems Medicine offers courses in Molecular Oncology, Human Genetics, Computational Biology and Medical Humanities, as well as complete training courses, mainly held by the faculty of SEMM host institutes, in areas of particular relevance to these sectors of biomedicine.

In 2021, HT was admitted as a host institute to the national PhD programme in artificial intelligence (AI), coordinated by the National Research Council (CNR) and comprising five PhD courses involving 61 universities and research institutes. HT has also joined as a host institute the AI & Health and Life Sciences PhD Course that is led by the Campus Bio-Medico University of Rome. HT's participation is considered of great strategic value as regards both attracting outstanding young computational scientists and offering expertise that can help to shape activities in the AI field at national level.

In 2021, HT signed a Memorandum of Understanding with the International School for Advanced Studies (SISSA), University of Naples Federico II and Turin University. Besides laying the foundations for scientific partnerships, the agreement with these academic institutes offers the possibility of organising joint training schemes.

In 2022, an additional agreement was signed under whose terms HT will become a host institute of the PhD course in "Theoretical and Scientific Data Science" run by the International School for Advanced Studies (SISSA).

Another important project for Human Technopole, linked to the goal of attracting and training new talent, regards the organisation of mentoring programmes. More specifically, in March 2022, the Foundation approved *"Supervision and mentorship guidelines"*. The document is designed to provide a general framework regarding the principles and best practices to be applied by Group Leaders and the respective researchers undergoing supervision, as well as the mentors (i.e. the people chosen by the individual researcher who can offer career advice and chances to reflect and be challenged, especially as regards soft skills) and their mentees.

In accordance with this strategic objective, the Foundation is also continuing with its Scientific Visitor Programme. This is designed to promote the mobility and dissemination of skills and methods developed in-house, enabling external scientists to spend time at HT for research collaboration, learn methods in use at HT and to use the existing facilities.

In 2022, HT once again played host to more than twenty scientific visitors from eighteen different research institutes in Italy and abroad. They spent time at the Foundation in order to work with the scientists on specific projects in various areas of research or apply specific technology, available at Human Technopole, to its projects and/or acquire skills in the respective methods.

First launched in 2020, the Early Career Fellowship (ECF) Programme is a further project closely linked to this strategic objective. It is designed to support the professional development of talented researchers, helping them to set up their own independent research activity in Italy.

Thanks to the ECF programme, during 2021, five young researchers returned from abroad with a grant worth 200,000 euro per annum for 5 years, enabling them to set up their own research laboratory in institutes all over the country. In October 2021, selection began for the 2021 ECF and in 2022 assessment was completed of the applications received in response to this second call for proposals. As a result, two brilliant scientists were awarded a fellowship worth one million euro over five years to develop their innovative research projects in the life science field. These other two fellowships are in addition to the original five awarded in 2021, bringing the number of ECF grant holders funded by HT to a total of seven.

In addition to interaction with the world outside, interaction within the Foundation itself is of great importance, especially inside the research groups. Indeed, HT believes that scientific and social interaction are essential to building a collaborative environment and promoting discussion within a research group and/or members of different teams. To this end, the Foundation has approved an in-house procedure designed to organise and manage "scientific retreats", i.e. meetings held outside Foundation premises involving one or more research groups, facility members, support units or an external consultant specialising in one of the subjects being discussed.

HT sees retreats as a chance to break the daily scientific routine and provide the opportunity to discuss science and science-related issues without distractions and time constraints in a more informal environment.

To support the objective of "Talent attraction and training, and research output sharing" both effectively and operationally, significant support from the HT administration department is also required. In this regard, the Human Resources department International Desk Service plays an important role. Indeed, the International Desk assists Italian and foreign staff coming from abroad or transferring from one Italian location to another by starting and managing the immigration and relocation processes, providing colleagues from abroad with support in obtaining the documentation needed for permission to stay in Italy. The International Desk works in close cooperation with colleagues from the entire Human Resources department, becoming involved right from the time that the job offer is made to the applicant, helping with all matters concerning immigration, relocation, tax benefits and application of institutional policies.

Matters handled cover a wide range of processes and documents, including application for an entry permit, help with obtaining a visa and residence permit and issue of the papers allowing colleagues and their family members to stay in Italy.

As regards the extremely delicate relocation stage, affecting not only the work situation, but also the private life of colleagues from abroad, the International Desk offers support with the integration process, enabling employees to deal with the move from their home country to Italy with maximum peace of mind.

Support schemes include the recent launch of an experimental project designed to put the family members of colleagues arriving from abroad in contact with each other by creating a network (HT Club House) that can expand and remain active over time, offering prime assistance and guidance to those who have chosen to come to Italy with a family member and feel the need for support from those who have already had the same experience.
Furthermore, January 2023 saw the presentation of the International Desk Page, an intranet page for all colleagues needing a guide capable of illustrating, as clearly as possible, not only the immigration procedures for entering Italy, but also all aspects connected with the application and receipt of the Italian documents needed to obtain permission to live in the country. In order to strengthen the welcome and convey a sense of hospitality towards new colleagues, the page now includes a section containing a short introduction to the Italian regions and the unique things that Italy has to offer.

SCIENTIFIC REPUTATION AND DISSEMINATION

This strategic objective comprises the following steps:

- **Be a part of the most important international dissemination networks (conferences, associations, etc.) and scientific organisations**
- **Obtain research grants and awards**
- **Organise/host scientific events for an audience of experts and lay people**
- **Promote scientific literacy and its dissemination to a wider public**

«Scientific research embodies progress. Our projects aim to improve understanding of the human body's intricate workings, enabling us to identify quality-of-life-enhancing prevention and care strategies.»
«The beauty of scientific research lies in the pursuit of solutions to particularly complex problems by harnessing expertise and technology from diverse, yet complementary, fields. Ensuring ongoing research continuity is another important aspect and a prerequisite for scientific project development. This means providing the necessary funding, facilities and professional expertise, also by setting up a prominent centre of excellence.»
«Good research should aim for minimal impact on the environment in which it is conducted, through careful laboratory waste management and, where possible, the use of alternatives exerting a lesser effect. Additionally, optimising available resources is crucial, deciding which strategy is the most sustainable in achieving a specific outcome.»

Michela Colombo
Senior Technician at the Genomic Research Centre, Medical and Population Genomics Programme.

It is essential for HT to belong to major international networks and to play an active role in scientific collaboration projects. Various framework partnership agreements have already been signed, both to set up joint research projects or training programmes and promote interaction between industry and academia.

The aim of these projects is to boost national research and innovation skills in life science sectors, as well as to improve the reputation and promote scientific dissemination.

It is therefore important for HT to establish ties with European and international institutes, participating in large-scale research projects, international collaborative consortia, conferences and scientific associations. Taking part in all these projects is strategic for HT and cross-cutting, involving scientists from various Centres and Facilities who collaborate across various disciplines and areas of research.

During 2022, HT scientists were involved in many projects of international scientific importance. In particular, around 40 Foundation scientists attended more than 160 meetings and workshops all over the world.

The entire international scientific community has access to workshops held by HT Group Leaders, as well as to workshops, courses and conferences with top level international speakers held on the premises or in other research institutes.

HT scientific staff are also actively involved in external training so as to increase their experience of scientific dissemination.

Another very important goal for HT is to offer young scientists advanced scientific training programmes. HT provides specific training schemes with a dual purpose: to enhance knowledge and skills in certain areas of research and assist career growth and development in various life science sectors of interest to the scientist. Training activities are aimed at all categories of scientist: interns, PhD students, postdoctoral researchers, young group leaders and core-facility experts/managers.

For example, training programmes for young group leaders include laboratory leadership courses, mentoring schemes and professional development activities enabling them to acquire the skills needed to manage a laboratory and establish themselves as leaders in their field.

In 2022, HT PhD and postdoctoral communities were an important target for numerous in-house training and career-development events. These included three technical skills courses (light imaging, high performance computing and scientific image analysis), seven soft skills courses (e.g. scientific writing, research project management, presentation skills) and two career workshops. These in-house training activities and events have been supplemented by the launch of a series of internal workshops held by HT scientists and the organisation of a series of workshops at Foundation premises held by high-profile external scientists.

Following the end of the COVID-19 health emergency, during 2022, HT hosted four important in-person training events for the external life science research community. Week-long courses and workshops were organised covering single-cell technology, omics and image data analysis, as well as a scientific symposium on the theme of cryo-electron microscopy to celebrate the opening of the HT Cryo-EM Facility. Overall, these events were attended by more than 300 external scientists from national and international institutes.

A few Human Technopole researchers received prestigious international awards and accolades, including:

- Two HT scientists were elected new members of EMBO, an international organisation for researchers from the life science sector. Election as an EMBO member recognises the great worth of researchers who have made an important contribution to life science during the course of their career;
- An HT scientist won the NIHR Senior Investigator award, a personal award in recognition of outstanding contribution to applied health, public health or social care research and support for NIHR. NIHR Senior Investigators are among the most prominent and prestigious researchers funded by the NIHR and the most outstanding leaders of applied health and social care research within the NIHR community.

HT's commitment to scientific dissemination is confirmed by its willingness to engage with the external community that is also expressed by activities involving non-scientific stakeholders and the general public. HT has an ongoing commitment, in a range of awareness-raising, training and dissemination activities and an active role in popularising science effectively, promoting a public understanding of the importance of scientific research and knowledge-based innovation, as well as encouraging continuous, fruitful dialogue between representatives of science and society.

This dialogue is not restricted to academia, but also encompasses events with a more popularising purpose.

For example, in 2022, we held the "A proposito di Futuro" (About the Future) festival, organised jointly with Treccani Futura, offering a chance to discuss, by adopting an interdisciplinary approach that systematically unites the voices of science, technology and humanities, the emerging scenarios facing the community and issues that will question the relationship between technology and various fields (art and culture, medicine, education).

The event hosted several speakers from the world of culture and science and technology, sparking debate about key contemporary issues.

In conclusion, HT's aim is to play an active role in communicating about science effectively and ensuring that its work, just like that of more general science, is heard about and understood by not just scientists, but also the general public.

RESEARCH-BASED INNOVATION

This strategic objective comprises the following steps:

- **Sign agreements with external organisations and industry to generate economic and social value from our research findings**
- **Develop, file, register and protect patents**
- **Establish start-ups and promote technology transfer**
- **Provide innovative training and mentoring services for Italian (and international) academia**

«Researchers' work is driven by dedication and sacrifice in the belief that their daily laboratory routine can help to treat disease.»
«Achieving scientific results requires a multidisciplinary approach, that is, the ability to integrate Biology's various disciplines so as to benefit from different perspectives on the subject matter of the research. From an organisational viewpoint, this also means interconnecting different workgroups that can swap experiences and acquired know-how. Furthermore, we do not ignore the importance of applied research. This means having the opportunity to leverage the results achieved and transfer them to Society.»
«A feature of the world of research is the use of technology that whilst very cutting edge, "consumes" environmental resources; just think, for example, of the high levels of laboratory energy consumption. This awareness means changing our daily habits to reduce waste, including in our use of consumables.»

Martina Polenghi
PhD Student at the Neurogenomic Research Centre.

The life science sector, including medical technology, biotechnology and pharmaceuticals, is highly productive and represents an area of great interest for innovation.

Contributing to economic and social progress by transferring research findings to applications, treatments and products is one of HT's main objectives and an additional way for the Foundation to fulfil its mission.

As HT research activities grow, technology transfer activities will be arranged in a structured manner so as to help transform discoveries and inventions into tangible applications and marketable products.

New scientific technology and methods resulting from HT's work cover the entire range of life sciences in the broadest sense, including therapeutic and diagnostic strategies, enabling technology, molecular tools and assays, instruments and devices, as well as software applications and databases, to be developed in close cooperation with industrial partners from the pharmaceutical, biotech, engineering and IT sectors.

In addition to launching technology transfer activities and in line with the Foundation's commitment to the wider academic community, HT is investigating how it can help to improve transfer technology opportunities for Italian researchers.

Besides research experience, successful technology transfer requires a wide range of business skills and expertise in intellectual property, as well as the ability to identify and attract the interest of business partners with whom to negotiate in order to develop optimised strategies for bringing individual products and technology to the market.

With this in mind and further to the provisions of article 49-bis of Decree Law No. 34 dated 19th May 2020, enacted with amendments as Law No. 77 dated 17th July 2020, in July 2021, HT opened a new facility known as the "Centre for Innovation and Technology Transfer in the life science field". The Centre receives adequate funding and its function is to promote innovative processes submitted by public or private entities within the research and innovation system with particular focus on:

- Supporting patenting and maximising the value of intellectual property;
- Promoting collaboration between private entities from the innovation system and national and European research institutes;
- Assisting the dissemination of research findings and knowledge transfer;
- Encouraging research-based collaboration between businesses and start-ups to develop biotechnology, artificial intelligence technology for genetic, proteomic and metabolic analysis, as well as technology relating to diagnostics, active surveillance, protecting vulnerable people and improving the quality of life.

In 2022, activities at the Centre for Innovation and Technology Transfer (CITT) had three main aims:

- **Entrepreneurial training for researchers working in Italy**. CITT training activity aims to provide Italian life science researchers with the basic tools and contacts needed to leverage the intellectual property that their research has produced. For example, in 2022, CITT organised two training events ("Technology Transfer in Life Sciences - Training Workshop" on 23rd-24th February and "4-days full immersion training on Technology Transfer in Life Sciences" on 10th-13th October), for young life science researchers designed to provide attendees with the basic tools for understanding the technology transfer process. It also held a training session for HT in-house researchers about the Milanese Life Sciences value chain ("HT meets the Life Science and Tech Transfer Ecosystem in Milan" on 16th November), as well as several in-depth meetings between in-house scientists and venture capitalists.

- **Support for the establishment and continuous implementation of a network of players from the Technology Transfer sector**. CITT networking activity offers the various parties operating along the entire life science value chain opportunities to meet and exchange ideas. These partners, from research to business by way of finance, benefit from the promotion of mutual awareness and open innovation processes. In 2022, CITT signed partnership agreements with CDP Venture Capital and Cariplo Factory (as part of the Berkley Skydeck Europe Milano accelerator programme), to name two examples, to promote joint schemes in the sector.

- **International promotion**. Bearing in mind Human Technopole's strong international profile and the contribution that the Foundation is making to the country in assisting brain circulation, not only bringing Italian excellence back to the country, but also attracting talent from abroad, CITT intends to promote this process still further by extending it to technology transfer-related activities. The aim is to encourage interaction between the Italian Technology Transfer system and that of other countries, so as to study models potentially applicable to the Italian system, promote exchanges between researchers and attract talent and funding towards innovation produced in Italy. In 2022, CITT pursued these objectives by studying the Swiss Technology Transfer, taking part in the "Switzerland, Cradle of Innovation: Lausanne, Basel, Zurich, Bellinzona" Study Tour (14th-16th June). This led to an event organised jointly with the Swiss diplomatic delegation and Milan & Partners, "Life Sciences Ecosystem in Milan: meeting the Swiss Delegation" (24th November). Furthermore, CITT attended the event "Tyrol 2030: New prospects for Life Sciences" (25th October) and has begun talks to explore possible cooperation with Austria, Belgium, Brazil and Qatar.

In addition, the careful discussion process with value chain stakeholders has led to the establishment of the Centre and subsequent scouting of organisational and business models for the implementation of successful projects and the most beneficial policies in the sector. CITT maintains constant dialogue with national and local institutions in order to help identify suitable system policies that can support technology transfer processes.

SUSTAINABILITY (ENVIRONMENTAL, SOCIAL AND ECONOMIC)

The aims of this strategic objective are as follows:

- **ENVIRONMENTAL SUSTAINABILITY**
  Helping to minimise the MIND site's environmental impact and optimising the environmental efficiency of buildings and laboratories, at the same time keeping animal experiments to a minimum

- **SOCIAL SUSTAINABILITY**
  Promoting gender equality, improving people's quality of life (health, age, wellbeing), having a positive impact on the area (employment, ancillary economy, etc.), promoting awareness within society of the importance of science and research and becoming a benchmark for a new generation of students

- **ECONOMIC SUSTAINABILITY**
  Attracting investors (including private ones), being resource efficient and guaranteeing long-term profitability and liquidity by recording an operating profit

On the subject of economic sustainability, HT practises an optimum use of resources, guaranteeing profitability and liquidity, with a view to the long-term.

The Foundation is also hoping to attract additional investments, for example grants and funding of international scientific importance. In coming years, we also expect an increase in resources through new sources of external research funding from the European Commission, National Institutes of Health (NIH) - a US Federal funding mechanism that funds some activities outside the United States - or private foundations and non-profit organisations.

In addition, by consolidating activities to maximise the value of research findings, it is expected that additional contributions to HT's overall budget will come from patent licensing and revenues generated by intellectual property (e.g. royalties), as well as joint programmes with industry.

Generally speaking, sustainability is an integral and essential part of HT activities and reaching this objective corresponds with the simultaneous achievement of the 17 UN 2030 Agenda Sustainable Development Goals (SDGs).

HT has specified a set of goals supplementing the results of the activities performed with awareness of the social, environmental and economic effects associated with them. With the introduction of Integrated Reporting, HT implemented a process aimed at assessing and investigating the contribution that the Foundation can make towards achieving the sustainable development goals specified by government leaders of the UN's 193 Member States. For more details of sustainability goals following identification of the impacts arising from the Foundation's activities, especially those regarding environmental, social and economic aspects, please see subchapter 2.4 *"Responsible and sustainable approach"*.

PARTNERSHIP, NETWORKING AND STAKEHOLDER ENGAGEMENT

The main aims of this strategic objective are:

- **Establish long-term partnerships with the main stakeholders**
- **Contribute to the development and effectual use of the MIND site, promoting joint projects and synergies with its partners**
- **Promote stakeholder engagement**

«My idea of science is tied to the notion of developing human knowledge, keeping in mind the potential practical applications, but also allowing ourselves to be driven by pure scientific interest rather than the quest for tangible benefits alone. Indeed, many interesting discoveries are the result of "basic" research and the long-term implications of these studies are often unpredictable.»
«Key words in science are "multidisciplinary approach" and "cooperation" between researchers themselves and with the wider community as well. To use a pictorial analogy, research can be likened to a mosaic where each tile, or in this case each project, is interesting in its own right, but it is the overall effect that really makes the difference.»
«Research laboratory activities have a substantial environmental impact due, for example, to the use of potentially polluting reagents and sterile plastics for biological material. I believe we must seek innovative methods that can minimise the negative environmental impact without compromising the quality and efficiency of research activities.»

Mariavittoria Pizzinga
Postdoc at the Structural Biology Research Centre.

As previously stated, an important goal for HT is to consolidate the relationship with its stakeholders, by means of scientific collaboration, facility sharing and agreeing to organise and host scientific training activities and events aimed at in-house scientists and external scientists from universities and other research institutes.

As regards the latter, HT is continuing its discussions with various Italian stakeholders, including universities, scientific institutes and individual hospitals and research institutes, in order to identify areas of particular need.

Turning to interaction with the world of industry, HT believes that public/private partnerships may represent one of the best ways of leveraging the Foundation's skills and expertise with a view to stimulating industrial and technological development.

HT's location within the MIND district should help to promote such interaction as many highly-innovative businesses will move into the area of the HT Campus. As the MIND Campus develops, it will also become easier to set up an area in which research findings can take the first steps towards commercialisation, both by creating start-ups and through joint development with industrial partners.

In order to achieve these objectives, the HT communication strategy is aimed at building, consolidating and maintaining the Foundation's prime visibility and reputation, promoting events and projects that establish a positive relationship between the institute and its main stakeholders.

To this end, during 2022, Foundation executives met with various national and international institutional representatives, as well as scientific, industrial and civil society stakeholders, in order to raise their awareness of HT's activities and its effects on the domestic economy.

The Foundation's relationship-building activities also include establishing a network of agreements with prominent institutional partners such as the National Agency for Regional Health Services (AGENAS) and the Italian Red Cross. HT also supported the Master in Cultural Diplomacy at the Catholic University of Rome. Overall, communication activities assist HT's strategic development by increasing its visibility and creating reasonable expectations for stakeholders. The activities that HT conducts in this field have a number of different tools available that are used selectively according to the specific target audience from amongst the various stakeholder groups. These tools include the national press, radio, television and digital media, including some scientific media, social media or the organisation of and attendance at workshops, conferences or events, along with other methods of raising awareness of HT's mission and work, including amongst the general public.

HT's engagement with the younger generations through schools and scientific education programmes is particularly important in order to raise awareness of the importance of science and promote careers in life science or biomedical research. This year, Human Technopole was once again involved in the MIND Education programme, now in its fourth year and organised alongside partners from Milan's new innovation district. Activities for junior and senior pupils have been developed, as well as a Call4Ideas for universities designed to introduce young people to the world of science, research and innovation. In addition to this project, to mark Brain Awareness Week, science education activities were carried out with young pupils from Lainate Primary School.

In all areas described above, from scientific to clinical and industrial relations, right up to interaction with the general public, HT will continue to work with other national and international organisations. For further details concerning partnership activities, please refer to the section *"Developing partnerships and cooperation for scientific research projects with universities and research institutes"* under subchapter 2.4 *"Responsible and sustainable approach"* and the section *"Relational Capital"* that also describes the main events attended by the Foundation during 2022.

EFFECTIVENESS AND EFFICIENCY OF OPERATIONAL PROCESSES

The Foundation pursues maximum effectiveness and efficiency in its operations, with specific actions within the Administration. In particular, the aims of this strategic objective are as follows:

- **Develop technological and digital processes (e.g. Digital Transformation)**
- **Create an attractive environment for non-scientific talents/professionals**

«For me, science means starting from basic, simple concepts and universal knowledge to discover something new. Modern science can progress much faster than in the past, not only driven by a sudden brainwave, but also facilitated by a more structured process that can rely on cutting-edge technology and plentiful resources.»

«To ensure excellent scientific research and reputation, it is also essential to guarantee efficient and transparent use of available resources. Not only must we disclose quite openly "what we do", but also show that we do it well. If we are to use resources responsibly, steps must be taken to streamline operational processes, ensuring orderly activity management and careful allocation of financial resources, whilst avoiding waste.»

«Science provides an extremely useful contribution to achieving sustainability goals, but is equally capable of causing harm. Therefore, cooperation between administration and scientific departments plays a vital role in implementing solutions that reduce scientific activities' potentially detrimental effect on the world around us.»

Roberta Calabrese
Financial Reporting and Risk Management Analyst.

DIGITAL TRANSFORMATION

As regards digital transformation, HT is implementing a complex process aimed at acquiring new digital tools and skills in a public sector digitalisation framework designed to ensure the efficiency of operational processes and transparency and integrity of the Foundation's operating and financial data.

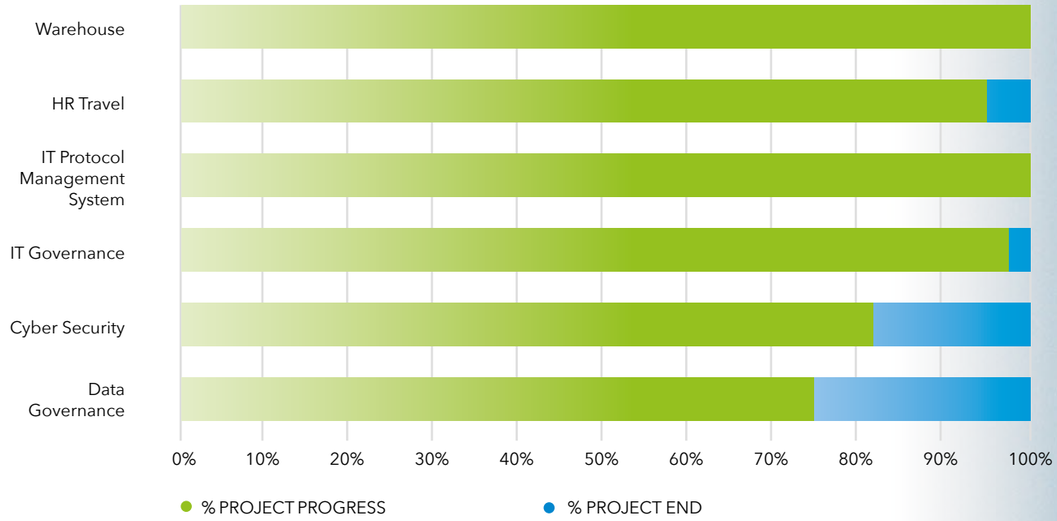
During 2021 and throughout 2022, steps were taken to implement the ERP system provided in order to handle the operational processes of the procurement and administration cycle.

The project has also been extended to other areas such as human resources, project management and warehouse management.

There will also be particular focus on developing a business intelligence platform that can interface with the ERP used by the Foundation in order to provide additional added value to administration processes.

The following table shows the status as at 31/12/2022 of the main digitalisation projects mentioned above:

% DIGITAL TRANSFORMATION PROJECT STATUS



PROJECT MANAGEMENT

Whilst developing the Digital Transformation projects, in 2021 the Foundation introduced a Project Management scheme to enable effective planning, organisation, monitoring and control of the administrative aspect of all projects. The aim of this scheme is to ensure that the various projects are completed by deadline and within budget.

Project Management also provides an overall picture of all Foundation projects, leveraging synergies and ensuring compliance with corporate strategy.

Using a continuous resource planning and control process, the PMO (Project Management Office) aims to increase overall project efficacy and obtain greater efficiency as regards:

- Resource optimisation;
- Risk containment;
- Cost containment.

The Project Management scheme was supported by a specific project, completed during 2022, with the aim of creating a project management culture and implementing a set of tools to monitor and coordinate all HT activities in a uniform manner.

To achieve this objective, part of the project was to analyse HT's current activities and abilities in order to identify and apply a Project Programme Portfolio Management approach/method.

Assisted by outside consultants, in 2022 the PMO implemented the Status Reporting management process whose objective is to perform regular project progress monitoring. Therefore, (by interviewing Foundation project managers/departmental heads) projects in progress or getting underway were mapped and some were chosen (based on their importance and critical nature) that the PMO began monitoring by holding regular meetings with managers.

This continuous monitoring system also provides assistance when individual projects are audited by the Audit & Compliance department.

In addition, a handbook has been created, available from the Foundation intranet page and accessible to all HT staff, offering a practical guide on how to manage a project from start to finish.

HELP DESK AND TICKETING SYSTEM

With a view to ensuring a high level of internal assistance in resolving "incidents" and improving cooperation between Foundation departments, in 2022, an in-house service called "Service Now" was introduced. It is a ticketing and booking system used by all Foundation divisions and departments to request assistance regarding ICT & Digitalisation, Campus Development & Facility Management and Human Resources issues or book services at the Genomics Facility. As the service develops, Service Now is expected to extend its current boundaries, a sort of "one-stop shop" for centralised handling of all in-house business needs.

More specifically, support requests from the Campus Development & Facility Management division may concern problems regarding buildings, furniture, equipment failure or freezers and machines installed in laboratories.

In addition, during 2022, the Campus Development & Facility Management division implemented and now manages a monitoring system called "Mean Operating Time". This system is used to analyse and monitor the activities performed in resolving the "incidents" handled throughout the year. This monitoring indicates that 430 incidents were reported during the course of the year with 93.02% bought to a successful conclusion in 2022 and early 2023. Service Now also offers the possibility of requesting a range of services from the Genomics Facility (e.g. DNA/RNA extraction, sequencing, etc.).

Service Now can also be used by Human Resources with requests for employment contracts, guest house services, employee childcare services, wage slip queries, relocation services, help and assistance with social security, taxation and welfare, etc. or to solve problems in the ICT & Digitalisation department (hardware, software, cyber security, database, data management, etc.).

PERIMETER SECURITY

Due to an increase in the number of people working at HT, night-time opening of laboratories and workspace extensions in various Campus buildings, the implementation of an electronic access control system has become necessary to guarantee personal safety.

As of June 2022, everyone entering HT premises has to use a badge that provides automatic opening of doors in all buildings. The automatic system records entry so that security staff know how many people are in the buildings at any given time and can thus handle emergencies effectively.

MANAGEMENT CONTROL SYSTEM

The aim for operational process efficiency and efficacy also requires efficient project and activity cost monitoring so as to enable precise and comprehensive reporting of the resources utilised. To this end, in 2021, the Foundation began a management-control-system implementation and review process.

The new HT control system is still under development and considers cost reporting requirements for the activities performed that must comply with the disclosure obligations towards the Foundation's financial backers or sponsors.

As stated in the *"Financial Capital"* section, a distinction should be made between:

- **Founding Ministries (Economy and Finance, University and Research and Health)** that provide annual funding in accordance with Law No. 232/2016 designed to support the creation of a scientific and research infrastructure **(Agreement)**;
- **Economy and Finance Ministry (MEF)** that provides annual funding pursuant to article 49-bis of Decree Law No. 34 dated 19th May 2020 (Recovery Decree), enacted as article 1, paragraph 1, of Law No. 77 dated 17th July 2020 (**CITT** – Centre for Innovation and Technology Transfer in the field of life sciences);
- **Other parties** that fund individual scientific research projects after taking part in specific calls for proposals (e.g. **EU grants, other contributions**).

Technically speaking, the management control system refers to a set of activities and tools used to verify whether corporate performance is in line with the objectives set by the Strategic Plan and Annual Budget and complies with cost effectiveness principles.

This system forms a part of the "Foundation system", regulating operating processes and tools used to achieve corporate targets in accordance with the organisational structure.

The HT control system is part of a general framework that provides for:

- **Value Creation System**, the set of strategic choices aimed at assisting sustainable long-term growth in order to create value across the board for all Foundation stakeholders;
- **Organisation and Processes**, the set of interrelations created between production cycle processes (e.g. supply planning, sourcing & procurement, logistics) and economic-financial processes (e.g. Finance) responsible for the efficiency of operational processes;
- **IT System**, the set of people, equipment, applications and procedures that allow an organisation to obtain the information needed to make suitable decisions.

The following diagram shows how the HT management control system integrates with the value creation system:

INPUT

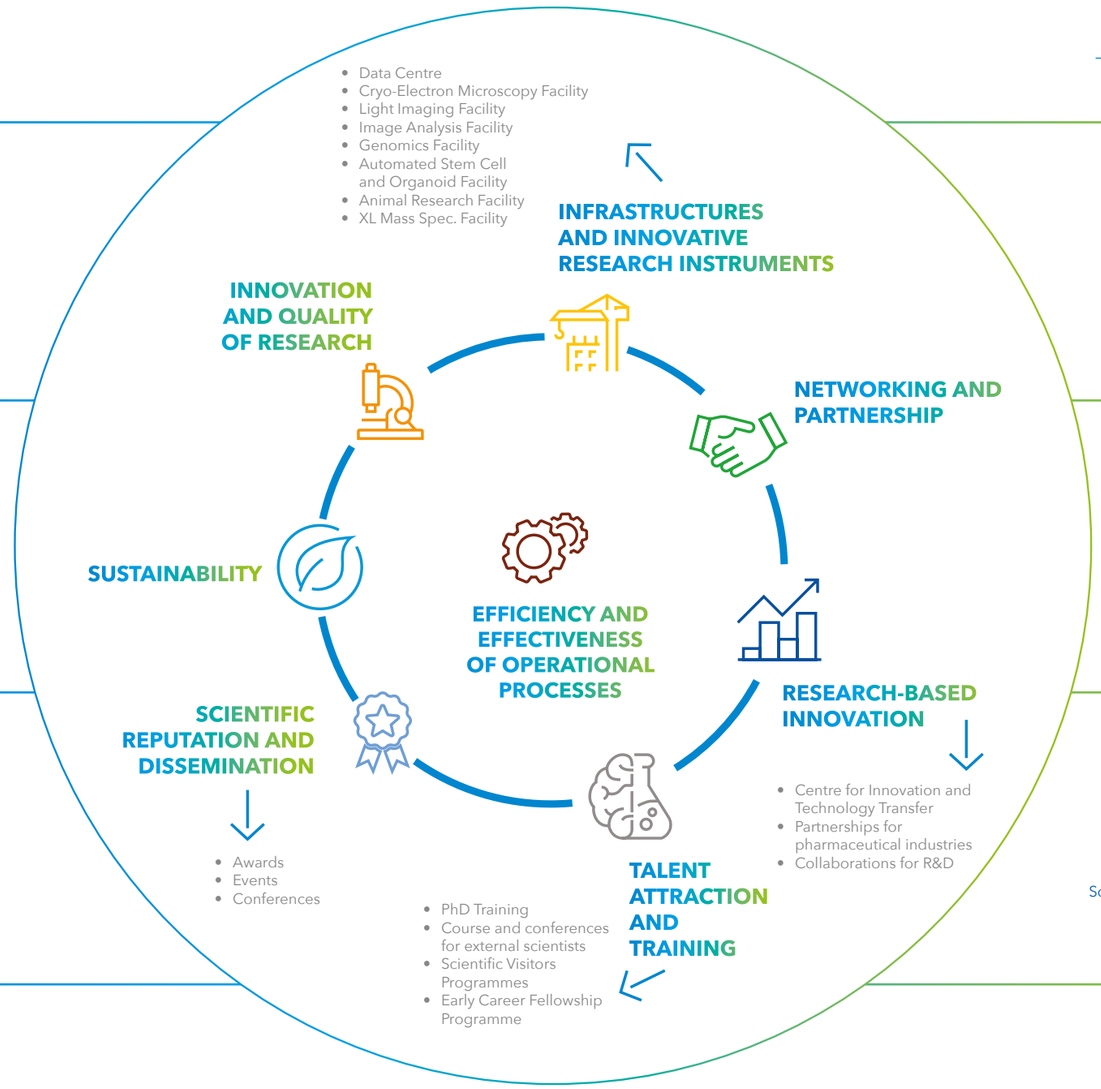
Financial Capital
«MEF» grants (Agreement, CITT)
External grants (e.g. EU)

Human Capital

Infrastructural Capital

Relational Capital

Intellectual Capital



OUTPUT

Transformation of scientific discoveries into tangible applications for the benefit of patiens

Attraction of additional funding, including from private sources

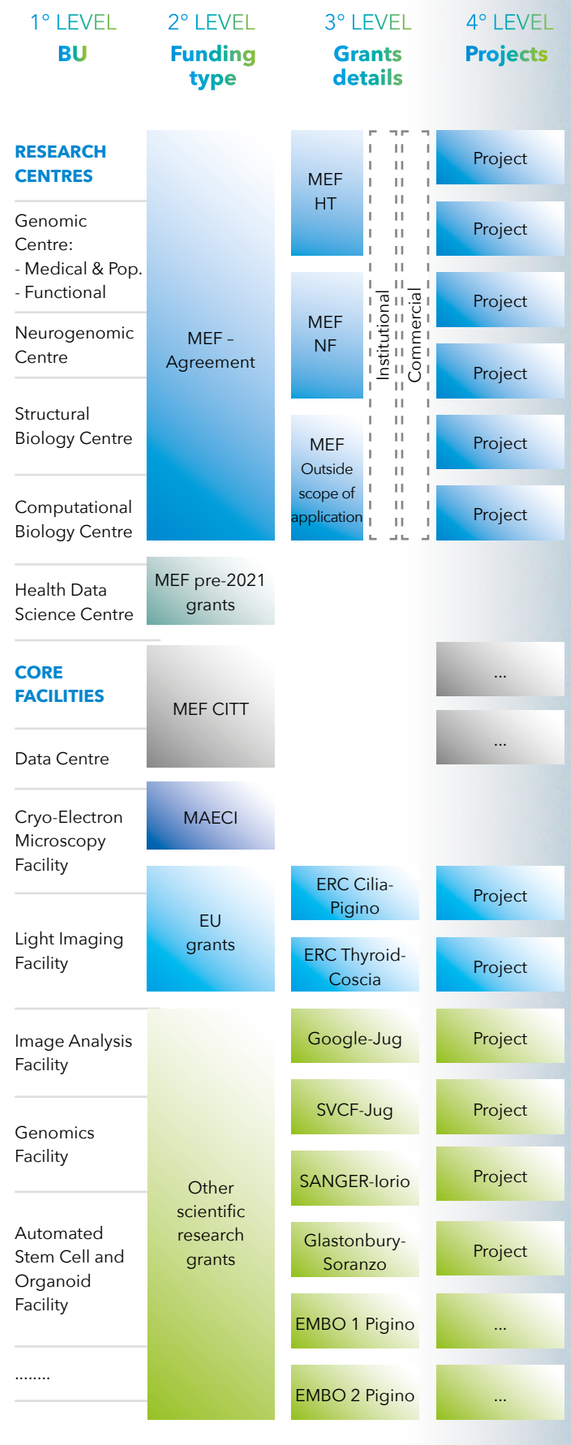
Career development and opportunities for the next generation of scientists

Operating scientific services and facilities to be made available to external scientists

Scientific collaboration, institutional events and initiatives of great relevance

Innovative approaches for personalized and preventive medicine

Awareness importance of science and scientific literacy



The control system therefore supports value creation in the field of the scientific research activities in which the Foundation operates, whilst pursuing the strategic objectives.

As previously described in the section concerning the value creation system, **INPUTS** differ according to the type of capital, which can be:

- **Financial**, i.e. financial resources obtained from MEF Grants (Agreement, pre-2021 and CITT Grants) and external grants, both institutional (MAECI (Foreign Ministry)) and scientific (e.g. EU);
- **Human**, i.e. skills, experience and excellence of both scientific and non-scientific staff;
- **Infrastructural**, i.e. assets belonging to HT, facilities, infrastructures and services;
- **Relational,** i.e. relations with the group of stakeholders and joint ventures with research centres and universities;
- **Intellectual**, i.e. the wealth of knowledge and organisation of the Foundation's scientific research.

OUTPUTS are designed to achieve strategic objectives and can be split into several types:

- Novel approaches for personalised and preventive medicine;
- Operational scientific services and facilities to be placed at the disposal of external scientists;
- Conversion of scientific discoveries to tangible applications for the benefit of patients and society;
- Career development and opportunities for the next generation of scientists;
- Awareness of the importance of science and scientific literacy;
- Attracting additional funding, including from private sources;
- Important scientific collaboration, institutional events and projects.

As part of the control system, these outputs are therefore split into **four** distinct **levels**:

- **Business Unit – "BU" (level 1)**, i.e. Research Centres and associated Facilities;
- **Funding Type (level 2)** including: MEF Grants (Agreement and remainder of pre-2021 grants), CITT Grants, MAECI, EU Grants and other grants;
- **Details of MEF Agreement Grant (level 3)** including: HT share (in turn split into institutional and commercial activity), NF share, outside scope of application;
- **Research projects (level 4)** with details of individual scientific research and institutional projects.

TRAINING OPPORTUNITIES

Turning to the additional aim of creating an attractive work environment for skilled non-scientific staff and professionals, as well as training and improving specific skills, HT offers its staff a series of training opportunities by organising courses covering soft skills and technical subjects of more general interest. The aim is to improve the professional profiles and promote the continuous personal and professional development of its employees.

In previous years, since the various divisions and departments were yet to be established, training activities were mainly provided to address emerging needs.

Since 2022, the Foundation has worked on organising a general training delivery process whose technical and professional part is intended for the Foundation's administration staff, whilst the more cross-cutting part is for all HT staff.

The courses held in 2022 were mainly focused on administration, management, regulations and contracts, cyber security, sustainability, leadership development and gender equality issues.

Italian courses for beginners were organised to aid the integration of international employees into the Italian environment, as well as advanced English courses for specific work purposes, to accommodate the multinational nature of our organisation.

For 2023, the choice of training will be widened, with plans, for courses covering project management, institutional and internal communication, regulatory updates and the use of information systems to name a few examples. Furthermore, training in relation to public procurement procedures is scheduled for employees holding the position of Senior Project Manager (SPM) and Project Manager (PM).

2.4 Responsible and sustainable approach

In 2015, United Nations Member States adopted the 2030 Agenda for sustainable development that provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), "which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth - all whilst tackling climate change and working to preserve our oceans and forests" (*United Nations website* - United Nations Sustainable Development Goals (unric.org)).

The 17 Sustainable Development Goals are pictured here below:

As regards 2022, the Foundation identified 27 (actual and potential) impacts on the economy, environment and people caused by the activities performed. Of the 27 impacts identified, as illustrated herein under subchapter 2.1 *"Stakeholder engagement and materiality matrix"*, 17 are positioned above the threshold previously set. Each impact is linked to an operating activity underlying one or more of HT's strategic objectives and, likewise, linked to one or more UN Agenda 2030 sustainable development goals.

This section of the report provides details of the 11 operating activities that cause (or may cause) the 17 impacts positioned above the significance threshold.

1. DEVELOPING OUTSTANDING SCIENTIFIC RESEARCH PROGRAMMES

This activity is linked to the "Innovation and quality of research" strategic objective and classified under the "Research and innovation" general category.

By developing outstanding scientific research programmes, the Foundation exerts positive effects on personal health and wellbeing, thus contributing to the progress of Sustainable Development Goal 3 "Good health and wellbeing". HT also contributes to the progress of Goal 9 "Industry, innovation and infrastructure" that, amongst other things, seeks to increase research and development (including scientific research), both in terms of staffing levels and public and private expenditure.

HT's primary mission is to assist the promotion of health and wellbeing. Therefore, the one of the main stakeholders is the general public who can obtain long-term benefits from the Foundation's activities.

More specifically, HT carries out numerous scientific research studies and projects in the various areas represented by the research centres and groups.

At the same time, partnerships are established with the Italian and international biomedical research community to work on joint projects.

In some cases, research activities may require the use of preparations and reagents or produce potentially environmentally-hazardous waste. Through a careful HSE policy, the Foundation endeavours to mitigate the risk of this negative impact caused by its activities, seeking to prevent environmental pollution and remove health hazards and risks. To this end, a special procedure has been implemented specifying precise operational management rules for potentially hazardous waste produced by research activities. These rules cover all stages of waste management: generation, disposal, handling, transport and storage.

Furthermore, the HSE department had previously launched an Initial Environmental Assessment (IEA) and as far as the issue of waste management is concerned, in 2021, it arranged to:

- identify areas of the Campus to be used for temporary waste storage;
- introduce ERP software to manage hazardous and non-hazardous waste generated by activities at the Research Centres.

The Initial Environmental Assessment was completed in 2022 with an assessment of the significant environmental impacts associated with the Foundation's processes and activities.

The Initial Environmental Assessment (IEA) was conducted by the HSE team for the purposes of:

- identifying internal and external factors and requirements and expectations of important stakeholders that could affect the expected outcomes (Context Analysis);
- on the basis of a "Life Cycle Perspective" (LCP) approach, identifying and keeping updated all environmental aspects linked to the activity performed and the products supplied by the Foundation and determining their significance in order to establish priority actions;
- identifying and updating the environmental legislation used to verify the regulatory compliance of such activities;
- assessing the current methods of handling the environmental aspects connected with the activities performed and identifying possible areas for improvement;
- obtaining a global evaluation of the environmental issues linked to its activities for use as a benchmark in making subsequent improvements.

The findings of the environmental risk assessment have shown that, under normal operating conditions, the risk levels for every HT process/activity considered, fall within the range 4 to 8 (medium risk level) or even 1 to 3 (low risk), as specified for every environmental aspect affected by the Foundation's activities in the Initial Environmental Assessment (IEA) report. Medium risk levels are also recorded for emergency situations and just a single case of high risk level regarding an emergency scenario.

For every environmental risk rated medium and/or high, appropriate mitigation actions, procedures and operating instructions have been specified (e.g. *"Waste management in-house procedure"*, visual management in laboratories, etc.).

Turning to environmental impacts that HT does not manage directly, but over which it can exert control (inbound and outbound logistics, maintenance firms, external suppliers in general), appropriate plans are specified when negotiating the contract, along with operating checks and supervisory activities, for the purposes of improving and monitoring the environmental performance of external suppliers.

On the basis of the behavioural principles and rules specified by the HT organisational, management and control model, in handling the environmental requirements of specific sensitive activities, the Foundation also continues with its strong commitment to specify and implement an Environmental Policy and an Environmental Management System (EMS) to standard UNI EN ISO 14001:2015 as an integral part of its Strategic Plan.

Therefore, following forthcoming implementation of the Environmental Management System, the Foundation will specify ways to:

- improve its environmental and energy performance;
- prevent environmental pollution;
- take tangible steps to implement its organisational, management and control model and prevent environmental offences, thus protecting the Foundation;
- ensure that operations and activities linked to significant environmental impacts, as identified by the Initial Environmental Assessment, are conducted in a planned and controlled manner.

2. DEVELOPING PARTNERSHIPS AND COOPERATION FOR SCIENTIFIC RESEARCH PROJECTS WITH UNIVERSITIES AND RESEARCH INSTITUTES

This activity is linked to the "Partnership, networking and stakeholder engagement" strategic objective and classified under the "Research and innovation" general category.

By developing partnerships and cooperation, the Foundation generates positive effects on personal health and wellbeing, thus contributing to the progress of Sustainable Development Goal 3 "Good health and wellbeing". Furthermore, this activity will have an economic impact, also contributing to UN Goal 9 "Industry, innovation and infrastructure": creating or belonging to a network centred on scientific research projects with other entities, such as universities and research institutes, contributes to an increase in public and private research and development spending (that, as previously stated, is one of the targets of Goal 9).

In particular, one of Human Technopole's main objectives is to establish and develop partnerships with the Italian and international biomedical research community.

Indeed, during 2022, numerous discussions were held on the subject of potential partnerships with universities, research centres, clinical research institutes, scientific societies and research networks both in Italy and abroad. These discussions have led to the establishment and/or renewal of formal partnerships (e.g. with Milan University and the Milan Institute of Technology) and the signing of various research collaboration agreements to set up joint projects with scientists from different universities, hospitals and research centres. Amongst others, the national universities and research hospitals involved in the above-mentioned collaborative projects include Trieste University, Oasi Maria Santissima IRCCS (Treatment and Research Hospital), National Cancer Institute IRCCS (Treatment and Research Hospital), Ca' Granda Ospedale Maggiore Policlinico IRCCS (Treatment and Research Hospital) and EURAC Research.

Human Technopole's availability for collaborative projects and partnerships with the biomedical community is vital, as is their management. Ineffective management of such relationships could lead to the creation of a competitive and reputational risk with potential repercussions on both available resources and Human Technopole's attractiveness. The Foundation's commitment to the development and consolidation of external relations is continually ongoing.

HT Organisational Regulations require that the Strategy and Scientific Affairs department, through the Scientific Relations, Partnerships and Collaborations Service, maintain relations with prominent scientific institutes and organisations, offer HT Scientific Leadership new opportunities for strategic scientific partnerships and, in coordination with the Legal department, identify the most appropriate form of legal agreement to support joint scientific projects between HT and external partners.

3. SUPPORTING WORK-LIFE BALANCE AND PARENTHOOD

This activity is linked to the "Sustainability (environmental, social and economic)" strategic objective and classified under the "Social issues and people" general category.

The policies implemented by the Foundation to support work-life balance produce positive effects on personal wellbeing, thus contributing to the progress of Sustainable Development Goal 8 "Decent work and economic growth".

Since its inception, the Foundation has been greatly committed to creating and promoting a work environment that takes the wellbeing and work-life balance of its employees very seriously, enabling them to better reconcile work and personal commitments.

Here are some of the schemes promoted for this purpose:

- remote working (up to 2 days per week) for employees with suitable positions/duties, regulated by specific in-house procedure;
- flexible working hours;
- training programmes;
- additional pension schemes;
- additional private health insurance for executives;
- corporate welfare programmes;
- in addition to statutory parental leave stipulated by Italian law, the Foundation offers one of the parents the possibility of additional leave with a 30% increase on the basic monthly salary for a maximum of one year from the child's birth date;
- education allowances for inpatriates whose children attend international schools;
- transparent remuneration policy, fully committed to ensuring equal pay for the same position;
- support with the organisation of the "HT Clubs", i.e. groups of employees that meet to socialise and pursue common interests (spontaneous events, for example, sport, culture and music, which have no connection with the HT employment contract);
- help for employees with the flu vaccination campaign;
- support for non-work events held in the MIND district.

In order to continue along this path, in 2022, the Foundation identified other forms of action that can be taken to further reconcile work and family life. These include developing agreements with nursery schools close to the workplace, starting in-house and external psychological wellbeing therapy, creating lactation rooms and the introduction of a specific *"In-house part-time employment procedure"* as a means of flexible working and achieving work-life balance.

4. TRAINING PROGRAMMES DEVELOPED FOR SCIENTISTS, INCLUDING SCHEMES TO PROMOTE THE EXCHANGE OF SCIENTIFIC KNOWLEDGE, RESEARCHER MOBILITY AND ORGANISATION OF SCIENTIFIC EVENTS

These activities are linked to the "Talent attraction and training, and research output sharing" and "Scientific reputation and dissemination" strategic objectives and classified under the "Social issues and people" general category.

The Foundation's activities have positive effects on people, thus contributing to the progress of Sustainable Development Goal 4 "Quality education".

During 2022, the Foundation ran various advanced scientific training schemes for both in-house scientists and the external life science community. In this respect, it is worth noting that in 2022 there was an increase of around 26 per cent in the number of PhD students and postdoctoral fellows at HT.

Furthermore, as regards PhD training, an additional agreement has been signed under whose terms HT will become a host institute of the PhD course in Theoretical and Scientific Data Science run by the International School for Advanced Studies (SISSA).

HT also hosted important training events covering single-cell technology, omics and image data analysis, as well as a scientific symposium on the theme of cryo-electron microscopy.

In order to encourage mobility and the exchange of skills, facilities and methods with the external research community, in 2022 HT also played host to more than twenty scientific visitors from eighteen different research institutes in Italy and abroad.

For further details regarding training activities and schemes to disseminate scientific knowledge, please refer to the various sections under subchapter 2.3 *"Strategy"*.

5. EFFECTIVE WASTE MANAGEMENT

This activity is linked to the "Sustainability (environmental, social and economic)" strategic objective and classified under the "Environmental protection" general category.

Through effective waste management, the Foundation has a positive effect on the environment, contributing to the progress of the following sustainable development goals:

- 6 "Clean water and sanitation" that also has the aim of reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safer reuse globally;
- 11 "Sustainable cities and communities" that prioritises, amongst other things, a reduction in the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management;
- 12 "Responsible consumption and production" that includes the aim to substantially reduce waste generation through prevention, reduction, recycling and reuse.

In January 2023, the Foundation introduced a new in-house procedure laying down the management process for hazardous and non-hazardous waste produced by scientific research activities and separate collection of recyclable waste produced by the Human Technopole administration department.
The in-house procedure is based on the behavioural principles and rules specified by the Foundation organisational, management and control model (Legislative Decree No. 231/01) that all corporate managers, each one for the aspects falling within their remit, must follow as regards the specific sensitive activities performed by the Foundation for the purposes of:

- preventing the commission of environmental offences as specified by Legislative Decree No. 231/01 (article 25-undecies "Environmental offences");
- ensuring fairness and transparency in conducting company business.

Therefore, the approach employed by the Foundation is designed to ensure that the operations and activities linked to the significant environmental impact of the waste management process, assessed by means of the Initial Environmental Assessment (including the impacts that could be produced by contractors, external maintenance engineers or visitors), are conducted in a planned and controlled manner. These activities are designed to prevent nonconformity with the Foundation's procedures, objectives and environmental compliance obligations.

The HSE division has specified classification, collection and disposal, transport and registration procedures for the waste that the Foundation generates, guaranteeing:

- improved environmental performance;
- fulfilment of environmental compliance obligations;
- achievement of environmental objectives;
- prevention of incidents that could lead to spillages of waste and/or other substances and preparations from storage areas when handling internally prior to sending for disposal.

As regards the activities performed by the Foundation, as at 31st December 2022, the following types of waste were registered:

CER CODE	HAZARDOUS WASTE (H) / NON-HAZARDOUS WASTE (NH)	DESCRIPTION OF WASTE	WASTE DIRECTED TO RECOVERY (R) / DISPOSAL (D)	ANECO DISPOSAL DATA
18.01.03	H	Research activities in the biological laboratory	R	Incineration with E recovery
			D	Incineration without recovery
18.01.06	H	Research activities in the biological laboratory	D	Incineration without recovery
15.01.10	H	Goods packaging	R13*	Incineration with E recovery
15.01.06 20.03.07	NH	Goods packaging Furniture maintenance and renovation	R13*	60% materials recovery 40% incineration with recovery
16.02.14	NH	Maintenance and renovation	R13*	80% materials recovery 20% incineration with recovery
16.03.04 16.03.06	NH	Transport of goods	D15*	Incineration without recovery

** R13: storage pending treatment.*

** D15: preliminary storage pending collection.*

In compliance with GRI 306-2020, details are provided of the waste handled during 2022. It should be noted that the data entered in the following table has been extrapolated from the SOGER waste management system according to the amount of each individual type of waste and how it is handled (recovery or disposal).

HT waste is sent to what is classed as a temporary storage facility that performs only type R 13 (storage pending treatment) and D 15 (preliminary storage pending collection) operations, i.e. sorting and separating the quantities that can actually be recycled from those to be sent for disposal (incineration with energy recovery, incineration without energy recovery, landfill, etc.).

TABLE 1. WASTE BY COMPOSITION, IN METRIC TONS (T), FOR THE YEAR 2022 (REF. GRI 306)

WASTE COMPOSITION				WASTE GENERATED (GRI 306-3-a)	WASTE DIVERTED FROM DISPOSAL (GRI 306-4-a)	WASTE DIRECTED TO DISPOSAL (GRI 306-5-a)
EER code and description	**Kind of waste**	**Waste source**	**Constituent materials**	**Metric tonnes**	**Metric tonnes**	**Metric tonnes**
Mixed packaging (EER 15.01.06)	Non- hazardous	Product packaging	Glass, iron, steel, items made entirely from, plastic, polyurethane foam, wood	2.132	1.2792	0.8528

TABLE 1. WASTE BY COMPOSITION, IN METRIC TONS (T), FOR THE YEAR 2022 (REF. GRI 306)

WASTE COMPOSITION				WASTE GENERATED (GRI 306-3-a)	WASTE DIVERTED FROM DISPOSAL (GRI 306-4-a)	WASTE DIRECTED TO DISPOSAL (GRI 306-5-a)
Discarded electrical and electronic equipment (DEEE) (EER 16.02.14)	Non- hazardous	Maintenance and renovation	Copper, iron, steel, plastic	0.274	0.2192	0.0548
Materials shipped whilst frozen (EER 16.03.04)	Non- hazardous	Freight forwarding	Water, plastic	0.739	-	0.739
Materials shipped whilst frozen (EER 16.03.06)	Non- hazardous	Freight forwarding	Water, plastic	0.089	-	0.089
Miscellaneous furniture such as cupboards, desks, and similar items (EER 20.03.07)	Non- hazardous	Furniture maintenance and renovation	Glass, iron, steel, items made entirely from, plastic, polyurethane foam, wood	21.475	12.885	8.59
Contaminated packaging (EER 15.01.10)	Hazardous	Product packaging	Glass, iron, steel, items made entirely from, plastic, polyurethane foam, wood, chemicals	0.113	-	0.113
Potentially-infectious mixed waste from microbiological research laboratory (EER 180103)	Hazardous	Research activity in the biological laboratory	Paper, glass, plastic packaging, plastic parts, organic substances, solvents, potentially-infectious biological liquids and solids	5.062	-	5.062
Aqueous solution produced by fermentation (EER 18.01.06)	Hazardous	Research activity in the biological laboratory	Water, plastic, chemicals	1.397	-	1.397
Aqueous solution produced by fermentation (EER 18.01.06)	Hazardous	Research activity in the biological laboratory	Water, plastic, chemicals	2.267	-	2.267
TOTAL WASTE				**33.548**	**14.3834**	**19.1646**

TABLE 2. WASTE DIVERTED FROM DISPOSAL BY RECOVERY OPERATION, IN METRIC TONNES (T) (RIF. GRI 306)

	ONSITE (GRI 306-4-d-i)	OFFSITE (GRI 306-4-d-ii)	TOTAL (GRI 306-4-b e c)
Hazardous waste			
Preparation for reuse	-	-	-
Recycling	-	-	-
Other recovery operations	-	-	-
TOTAL	**-**	**-**	**-**
Non-hazardous waste			
Preparation for reuse	-	-	-
Recycling	-	14.3834	14.3834
Other recovery operations	-	-	-
TOTAL	**-**	**14.3834**	**14.3834**
Waste prevented	-	-	-
Waste prevented	**-**	**-**	**-**

TABLE 3. WASTE DIRECTED TO DISPOSAL BY DISPOSAL OPERATION, IN METRIC TONNES

	ONSITE (GRI 306-5-d-i)	OFFSITE (GRI 306-5-d-ii)	TOTAL (GRI 306-5-b e c)
Hazardous waste			
Incineration (with energy recovery)	-	5.175	5.175
Incineration (without energy recovery)	-	3.664	3.664
Landfilling	-	-	-
Other disposal operations	-	-	-
TOTAL	**-**	**8.839**	**8.839**
Non-hazardous waste			
Incineration (with energy recovery)	-	9.4976	9.4976
Incineration (without energy recovery)	-	0.828	0.828
Landfilling	-	-	-
Other disposal operations	-	-	-
TOTAL	**-**	**10.3256**	**10.3256**

As regards waste transport management, following an assessment of the carriage of dangerous goods by road and the type of waste produced, the Foundation appointed a qualified expert to advise on transport safety. The aim is to help to ensure safety during carriage by road in accordance with the requirements of the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR).

As regards the atmospheric emission impacts arising from the transport of waste, the following details are provided:

- KPI = tonnes CO_2 / tonnes transported waste;
- CO_2 consumed = litres consumed * emission factor;
- Emission factors kg CO_2 / litres Diesel.

In 2022, the KPI of tonnes CO_2/tons transported waste amounted to 0.03, whilst total tonnes of CO_2 emitted due to the transport of waste is 1.174.

6. ACTIVITIES AND PROGRAMMES FOR THE DEVELOPMENT OF THE "CENTRE FOR INNOVATION AND TECHNOLOGY TRANSFER"

This activity is linked to the "Research-based innovation" strategic objective and classified under the "Research and innovation" general category.

By developing programmes designed to promote the commercialisation of intellectual property and technology transfer of research findings to the market, the Foundation can have positive effects on financial resources, contributing to the progress of Sustainable Development Goal 9 "Industry, innovation and infrastructure". Indeed, with this activity, HT supports the UN's aim to encourage innovation, technology development and research with consequential side effects, including of a financial nature. There are also potential positive effects on people, thus contributing to the progress of Goal 8 "Decent work and economic growth" whose aim is also to promote decent job creation and entrepreneurship.

With reference to such activity, it should be remembered that pursuant to article 49-bis of Decree Law No. 34 dated 19th May 2020, (enacted as Law No. 77 dated 17th July 2020), the Human Technopole Foundation has been assigned the task of establishing a "Centre for Innovation and Technology Transfer in the field of life sciences", providing sufficient financial resources to support innovative processes proposed by public and private entities from the research and innovation system.

Following a complex consultation process with sector stakeholders, designed to identify the requirements of the various parties involved in the technology transfer process, in July 2021, HT set up an internal department whose task is to support the growth of Tech Transfer (TT) culture in the Italian life science ecosystem.

For more details of the activities performed by the Centre for Innovation and Technology Transfer, please see the section *"Research-based innovation (Technology Transfer)"* under subchapter 2.3 "*Strategy*".

7. DEVELOPMENT AND SHARING OF SUSTAINABLE AND INNOVATIVE BUILDINGS AND INFRASTRUCTURES (NATIONAL FACILITIES)

This activity is linked to the "Development and provision of infrastructures and innovative research instruments" strategic objective and classified under the "Research and innovation" general category.

The Foundation can generate positive impacts on the environment, economic resources and personal wellbeing by developing a user access strategy that can ensure transparent and effective use of HT infrastructures (National Facilities) by making them available to the national scientific community. Thus, the Foundation can contribute to the progress of Sustainable Development Goals 9 "Industry, innovation and infrastructure" (focused on the construction of quality, sustainable and inclusive infrastructure to support economic development and human wellbeing, whilst considering environmental protection) and 11 "Sustainable cities and communities" (also supporting the concept of access to public spaces and participatory, integrated human settlement).

As regards this material topic, it is worth remembering that the Agreement signed on 30th December 2020 between the Economy and Finance Ministry, Health Ministry, Education, University and Research Ministry and Human Technopole Foundation regulates the selection of National Facilities (NFs) exerting a high technological impact to be constructed on the HT Campus. These facilities will be accessible to the national and international scientific community allowing them to conduct high-quality research in their respective fields regardless of their institutional or national background.

For the purposes of defining National Facilities under the terms of the Agreement, it was decided to apply the definition of "research infrastructure" introduced by the European Strategy Forum for Research Infrastructures (ESFRI), i.e. facilities, expertise, resources and related services that are used by the scientific community to conduct top-level research in their respective fields regardless of which institution or state they belong to.

Each National Facility will be formed by special operating units called Infrastructure Units (IUs) and defined as the combination of people, tools, resources, technological procedures and cutting-edge test protocols necessary for a particular line of research.

The Agreement states that the selection of National Facilities shall take place following public consultation open to the national scientific community and carried out in two stages: the first for selected stakeholders representing the research system in the life science sector, the second for the scientific community as a whole.

Responsibility for handling the consultation is assigned to the Technical Committee (TC) specified in the agreement. The TC is appointed by the Directorates General for Research of the University and Research and Health Ministries and comprises:

- the HT Foundation Director acting as Chairman;
- the Directorates General for Research of the University and Research and Health Ministries or their deputies acting as Deputy Chairmen;
- an Italian representative of the European Strategy Forum for Research Infrastructures (ESFRI);
- The Chairman of the Human Technopole Scientific Committee.

The TC's duties include:

- selecting existing Italian and European research infrastructures open to the national community;
- preparing the form to receive suggestions regarding NFs and respective IUs to be built in the Country;
- carrying out first- and second-stage consultations;
- drafting a final report summarising the results of the consultations and advising which NFs are most requested by the national scientific community.

The first-stage consultation, held from 23rd July to 30th September 2021, involved representatives from universities, treatment and research hospitals, public research bodies, industrial research, regional authorities, social partners (employer organisations and trade unions) and the most important Third Sector Organisations (TSOs) that conduct or fund research in the life science sector.

The CT identified a total of 167 entities and executives from these organisations were invited to submit their opinions and proposals regarding the potential NFs to be built at HT. Proposals were submitted through an online questionnaire along the lines of the one that ESFRI (European Strategy Forum on Research Infrastructures) uses to collect proposals to build research infrastructures for inclusion in the European roadmap.

The aim of this first-stage consultation is to obtain an aggregate view of the needs expressed by the majority of the communities that the entities involved represent.
Overall, this first-stage consultation has enabled us to identify core areas with high demand for NFs amongst Italian researchers in the respective fields of interest:

- the OMICS domain that encompasses genomics, single-cell sequencing technology, proteomics and metabolomics and genome editing;
- the IMAGING domain encompassing molecular, cellular and tissue imaging, structural biology and cryo-electron microscopy;
- the DATA HANDLING AND ANALYSIS core that will provide support for the two above-mentioned domains through data pipeline design, first-line analysis, data storage and sharing with NF users and, based on demand, community database creation.

The results of the first-stage consultation were then submitted to the Italian national scientific community that was invited to express its opinion on the identified core areas and propose any justified additions and/or deletions. The second-stage consultation, open from 19th April to 31st May 2022, confirmed that access to the identified technologies/services was considered paramount by a high proportion of the participating researchers. Indeed, of the 1,624 participants, 91%, 87% and 88%, respectively, advised that implementation of these three areas is a very high or high priority, confirming the strong demand for these services. In particular, 65% of participants consider the availability of OMICS services to be a very high priority, followed by DATA HANDLING AND ANALYSIS and IMAGING with 56% and 53% of contributors assigning them very high priority.

Details and necessary documentation are available from the Foundation website using the following link: Convenzione - Human Technopole.

8. JOB OPPORTUNITY DEVELOPMENT FOR RESEARCHERS AND ADMINISTRATION STAFF

This activity is linked to the "Talent attraction and training, and research output sharing" strategic objective and classified under the "Social issues and people" general category.

This activity is linked to the "Talent attraction and training, and research output sharing" strategic objective and classified under the "Social issues and people" general category.

The Foundation produces positive impacts on people and the economy arising from job opportunity development for researchers and administration staff, thus contributing to the progress of the Sustainable Development Goals 9 "Industry, innovation and infrastructure" and 8 "Decent work and economic growth".

One of the Foundation's primary objectives is to attract talent by offering an international, highly-cooperative work environment ensuring high-level interdisciplinary research in a dynamic setting with independent research groups capable of attracting graduates and postdoctoral fellows and access to cutting-edge facilities.

Human Technopole aims to attract the most talented scientists and administration staff, focusing on their expertise and professionalism through selection processes complying with international standards and managed through open vacancy notices.

In seeking to develop and expand job opportunities, Human Technopole offers similar terms of employment to major international research centres enhanced by a series of high-quality financial, welfare and insurance benefits.

In addition, the Foundation is committed to providing its employees with a flexible working environment to ensure a good work-life balance.

The current and expected increase over the coming years in Human Technopole staff levels has also led the Foundation to reflect on the possible negative environmental impacts from rises in CO_2 due to increased people flow and traffic.

Therefore in 2022, HT arranged to appoint a Mobility Manager, whose purpose is to handle the demand for transport, with particular reference to daily commuting behaviour, so as to promote (through both incentive and restriction schemes) sustainable mobility and encourage the use of local public transport as an alternative to the private car. The Mobility Manager's main task is to draw up a Commuting Plan whose initial version has been approved by HT and will be reviewed annually (by 31st December of each year). In drafting the plan, consideration was first given to the geographical context of the Foundation's premises and a questionnaire was issued to employees designed to assess their views on mobility and transport options. Having established the internal and external context, the areas requiring action and a respective roadmap were specified based on severity and urgency, also taking into account relationships with other local entities/companies. The approved plan includes the proposed measures for each area, complete with technical specifications, objectives, implementation methods and monitoring activities.

9. ACHIEVING GENDER BALANCE IN LEADERSHIP AND DECISION-MAKING IN SENIOR POSITIONS

This activity is linked to the "Sustainability (environmental, social and economic)" strategic objective and classified under the "Gender equality" general category.

The Foundation can impact positively on people through activities designed to achieve gender equality in senior job positions, thus contributing to the progress of Sustainable Development Goal 5 "Gender equality".

In February 2022, Human Technopole approved and published a Gender Equality Plan (GEP) (Our Gender Equality Plan - Human Technopole) that responds to the guidelines of the European Institute for Gender Equality (EIGE) and aims to "identify and implement innovative strategies to promote cultural change and equal opportunities" in universities and research centres.

The GEP targets are "to support the achievement of gender equality as a key component of sustainable human development". On the basis of the analysis conducted during a Gender Audit and with the help of HT researchers and administration staff, the GEP outlines a series of specific objectives, as well as the measures and actions needed to achieve them (the Plan is valid for the years 2022-2024). To monitor GEP implementation and progress, funding has been granted and a dedicated Gender Equality Team (GET) appointed, this comprising five members and six assistants from various HT departments coordinated by the Administration Manager. The GET started work on 2nd May 2022.

The GEP aims to achieve the following five main objectives:

- improve decision-making processes by addressing gender (and other types of) bias in order to seize new opportunities for excellence;
- promote the career development of both male and female employees and, in particular, encourage women to pursue a scientific career;
- support reconciliation of career and family life and promote a healthy work-life balance;
- incorporate the gender dimension variable into research as part of a broader commitment to diversity;
- implement measures against gender-based discrimination, including sexual harassment.

To achieve these objectives, the Foundation's GEP provides for a series of practical measures, whose implementation is monitored and assessed by the dedicated team using suitable indicators, that will be introduced on a priority basis (depending on urgency and availability of funding). In the autumn of 2022, an internal review of the document was performed in order to identify the most critical issues and areas for improvement to be proposed to the Foundation's Sustainability Committee and Governance Body.

The measures assigned the highest priority include those regarding "gender balance in leadership and the decision-making process" to be achieved through dissemination of a culture of gender equality within the Foundation. Some concrete schemes in this regard are, for example, the increase in the number of female speakers representing the HT Foundation at events and conferences to which it has been invited or, with effect from 2023, the review of all communication/image policies so that

they take gender equality and diversity into account or specification of guidelines that help to address gender bias in staff selection and recruitment processes.

Other measures identified and allocated high priority include promoting gender equality in the workplace, supporting the engagement of female staff in senior positions and ongoing support for women pursuing a scientific career. During 2022, the Foundation demonstrated its genuine commitment to diversity enhancement and support for workplace equality of all genders, ethnic groups and social classes by implementing *"Workplace equality, diversity and inclusion regulations"* with the aim of actually integrating these issues into organisational practices.

Amongst other things, the document also handles issues regarding:

- the Diversity and Inclusion (D&I) Committee and the Gender Equality Team (GET) whose purpose is to establish, monitor and implement best diversity, equality and inclusion practices in the workplace;
- the ways in which to ensure the creation of a leadership oriented towards workplace equality;
- schemes designed to promote inclusion within the Foundation, including training courses on diversity and inclusion and how to recognise, monitor and handle unconscious biases.

10. RESPONSIBLE SOURCING

This activity is linked to the "Sustainability (environmental, social and economic)" strategic objective and classified under the "Social issues and people" general category.

The Foundation can generate positive impacts on the environment, economic resources and personal wellbeing by responsible sourcing with particular attention to environmental and social sustainability requirements. This activity can contribute to the progress of the Sustainable Development Goals 8 "Decent work and economic growth" (focused on the promotion of decent work for all) and 12 "Responsible consumption and production" (that also refers to promotion of sustainable public procurement practices in accordance with national policies and priorities).

In order to operate and perform its institutional duties, the Foundation procures works, services and supplies in compliance with the requirements of Legislative Decree No. 50 dated 18th April 2016 as amended and current regulations governing public tenders and contracts.

When awarding public procurement contracts, Human Technopole follows the principles of cost effectiveness, efficacy, timeliness and fairness, also respecting those of open competition, non-discrimination, transparency, proportionality and disclosure, as well as the principle of rotation of the parties invited to or awarded the tender where procedure so requires.

The Foundation also plays careful attention to energy and environmental sustainability criteria, as well as situations that could lead to a conflict of interest. Economic operators wishing to bid for tenders are required to comply with the Foundation's Code of Ethics specifying the systems of behavioural values and rules to which constant reference should be made when conducting its business and to which all those acting on behalf of the Foundation should adhere, regardless of the, even temporary, relationship between them.

Back in 2021, the Foundation first implemented specific *"Purchasing Regulations"*, reviewed in September 2022, covering award, signing and performance of HT public procurement contracts.

For every tender, HT guarantees:

A	optimum use of resources needed for the selection process or contract performance in application of the principles of efficiency and cost-effectiveness;
B	appropriateness of its actions in achieving the intended purpose and protecting the public interest in application of the principle of efficacy;
C	no groundless protraction of the contractor selection process in application of the principle of timeliness;
D	honesty and integrity at both the tendering and performance stages in application of the principle of fairness;
E	access to the tendering process of all potentially affected stakeholders in application of the principle of open competition;
F	an equitable assessment of bidders and the removal of obstacles or restrictions in preparing and assessing bids in application of the principle of non-discrimination and equal treatment;
G	publication of tender notice, as well as the use of tools that allow fast and convenient access to information about the tender in application of the principles of transparency and disclosure;
H	the measure's appropriateness and fitness for purpose and amount of the tender in application of the principle of proportionality;
I	no closed circle of just a few economic operators, ensuring an equal opportunity for everyone of being awarded a procurement contract in application of the principle of rotation of the parties invited to or awarded the tender;
J	specification of statutory minimum environmental criteria in tender documents in application of energy and environmental sustainability criteria;
K	implementation of suitable measures to prevent and resolve conflicts of interest, both during tendering and contract performance in application of the principle of preventing and managing conflicts of interest.

Human Technopole, by developing digitalisation projects and effectively organising procurement activities, seeks to match the timelines dictated by in-house requirements, relating to the purchase of the goods and services needed to perform its institutional activities, to those necessary for fulfilment of the obligations specified by regulations governing public tenders and contracts.

11. SUSTAINABLE CONSUMPTION MANAGEMENT AND DEVELOPMENT OF ENERGY EFFICIENCY SCHEMES

These activities are linked to the "Sustainability (environmental, social and economic)" strategic objective and classified under the "Environmental protection" general category.

The Foundation's activities have positive effects on the environment as a result of sustainable consumption management and development of energy efficiency schemes, thus contributing to the progress of Sustainable Development Goal 7 "Affordable and clean energy".

HT's contribution to the progress of this SDG is heavily reliant on creating the position of Energy Manager.

The Energy Manager, a position formally introduced to Italy by article 19 of Law No. 10 dated 9th January 1991, is responsible for energy conservation and rational use by heavy consumers with a statutory duty to appoint one annually. An Energy Manager's duties include:

- energy consumption data collection;
- energy consumption data analysis;
- energy balance preparation;
- promotion of efficient energy within the organisation.

The Energy Manager assists management bodies in improving energy use within the organisation, performing facility management, end-user awareness raising and energy efficiency improvements.

The compulsory nature of the Energy Manager's appointment depends on the volume of Tonnes of Oil Equivalent (TOE), i.e. the unit of measurement used for energy balances (regional or corporate) that expresses primary and final energy consumption with a single unit covering every energy carrier (electricity, gas, gas oil, etc.). In the industrial sector, the appointment is compulsory when consumption exceeds 10,000 TEP/year, whilst in other sectors this figure is 1,000 TEP/year. Generally speaking, when assessing whether the mandatory threshold has been reached, all energy handled by a business entity needs to be considered whether it is paid for or free (e.g. renewables used to generate electricity), regards owned or leased property and is purchased directly or through energy service contracts. When the threshold has not been reached, the decision to appoint an Energy Manager can still be taken, especially to demonstrate sensitivity to the issues of rational energy use and sustainability.

During 2021, HT exceeded this threshold by a small amount, confirming a growing trend in electricity consumption. Clearly, contributing factors to the breaching of this threshold are the gradual occupancy of Palazzo Italia and the opening of new buildings used as research laboratories. It was therefore necessary to initiate an Energy Manager appointment process that can be summarised as follows:

THE APPOINTMENT PROCESS IN THE HT FOUNDATION:

01.02.2022
NEW JOB TITLE: MAINTENANCE ENGINEERING & ENERGY MANAGER

21.04.2022
COMMUNICATION TO FIRE FOR ENERGY MANAGER APPOINTMENT

27.04.2022
APPROVAL OF ENERGY MANAGER APPOINTMENT BY FIRE

** Founded in 1987, FIRE (Italian Federation for Rational Energy Use) is an independent, non-profit technical-scientific association whose aim is to promote efficient energy use, supporting sector operators through institutional activities and provision of services and promoting positive development of the legislative and regulatory framework. FIRE has been promoting the role of Energy Manager since 1992 and manages the appointments; currently, it has an unpaid mandate from the Green Transition Ministry.*

Human Technopole's scheduled path specifies a number of activities, also continuing during 2023 and 2024, that may be extended until achieving the objectives resulting from the first energy audit and then change on the basis of energy-efficiency and conversion work carried out on Campus buildings.

This path envisages a number of different stages:
- documentary review of existing buildings;
- survey of electrical systems;
- setting up energy consumption data collection;
- building the monitoring system;
- creating energy consumption records;
- comparison of core-business equipment and auxiliary systems and preparation of energy balance;
- defining the terms of the energy audit;
- implementation of savings measures;
- efficiency improvement work;
- roadmap verification and renewal.

It should be noted that savings measures relating to changes in operating procedures and staff behaviour are not necessarily required to await the energy audit, but can follow initial internal assessments such as checking the current state of electrical and HVAC systems.

The assessments carried out this year mean that the roadmap will already be improved during 2023, as occurred following the energy-saving schemes implemented by the Foundation in autumn 2022, thus updating targets on the basis of Campus development and the current energy landscape.

Operationally speaking, as regards energy consumption data collection, the power and energy loggers currently installed at the Foundation Campus allow viewing directly from the screen of the panel-mounted device; currently, 20 power and energy loggers have been catalogued by the Campus Development & Facility Management division.

The loggers measure both instant and total energy consumption for each Foundation building. Current systems have no remote connection, except for the North Pavilion where one is already configured in the Building Management System (BMS). Currently, monitoring includes daily reading of display data that the Campus Development & Facility Management division sends to the corporate SharePoint for subsequent analysis and modelling. Whilst this deputises temporarily for an effective energy monitoring system, it is essential to collect a significant amount of energy data to include seasonal changes, completion of scientific installations and actual use of all utilities.

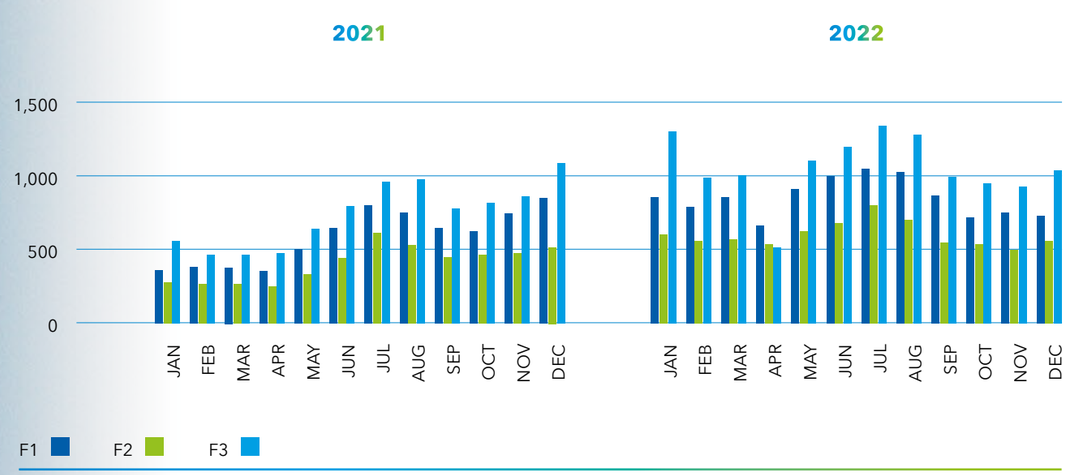
This table shows a list of measurement devices grouped according to Campus building:

ITEM	#	PANEL	ACRONYM	LOCATION	BRAND	MODEL
PITA	1	General device arrival	H01	basement PITA cabin MV/lv	ABB	REF542plus
	2	Bar (normal and UPS)	AS06015Y20141205	back-bar	Gewiss	GW96899
	3	Auditorium (normal and UPS)	AS06036Y20150129	back-stage	Gewiss	GW96899
ICT	4	CED-1 branch A	QE-P-A	basement PITA room 26	BTICINO	F4N200
	5	CED-1 branch B	QE-P-B	basement PITA room 26	BTICINO	F4N200
	6	Shelter n. 1 line pref. UPS A	QF7	node cabin	Schneider	FDM121
	7	Shelter n. 1 line spare UPS B	QF3	node cabin	Schneider	FDM122
INC	8	Section trafo 1: semi-bar 1 electrical and special systems	QGBT POWER CENTRE	cabin MV/lv INC	ABB	M4M20
	9	Section trafo 2: semi-bar 2 thermo-mechanical systems	QGBT POWER CENTRE	cabin MV/lv INC	ABB	M4M20
	10	electrical systems INC1	POWER SUPPLY QE.1.1.30	cabin MV/lv INC	ABB	SACE Tmax
	11	mechanical systems INC1	QMEC.B1	first floor INC1 room 30	ABB	DMTME-I-485
	12	electrical systems INC2	QEG.2.0.03	ground floor INC2 room 3	ABB	DMTME-I-485
	13	mechanical systems INC2	QMEC.B2	ground floor INC2 room 3	ABB	DMTME-I-485
	14	electrical systems INC3	POWER SUPPLY QE.3.0.01	cabin MV/lv INC	ABB	SACE Tmax
	15	mechanical systems INC3	QMEC.B3	ground floor INC3 room 1	ABB	DMTME-I-485
NPA	16	trafo 1: active	20006001	cabin lv NPA	ABB	M4M20
	17	trafo 2: not active	20006002	cabin lv NPA	ABB	M4M20
	18	polyvalent unit	GP01	cabin lv NPA	ABB	M20
	19	heat pump	PDC-02	cabin lv NPA	ABB	M20
SPA	20	medium voltage panel SM6	NM2020W1710006	cabin MV/lv SPA	Schneider	PM5100

The following tables show electricity consumption for the years 2021 and 2022, as well as estimates for the energy likely to be produced by the solar power plants installed on HT Campus buildings that will come into service shortly. Following implementation of the "green option" (an agreement signed with Consip in 2021), in 2022, 93% of electricity consumption was produced by renewable sources. It should be noted that whilst such agreement guarantees 100% renewable energy, due to an administrative oversight, the option's full benefit was not obtained in 2022, meaning that a lower percentage of green energy was recorded. In this respect, the following graph illustrates yearly emission savings arising from the use of renewable electricity.

Electricity consumption for the years 2021 and 2022:

ELECTRICITY CONSUMPTION (GJ)



** The table employs the following conversion factor: kWh to GJ.*

Energy intensity calculated for 2022 as the ratio of energy consumed within HT to the net area in m² amounts to: 0.04204 (ratio MWh/m²).

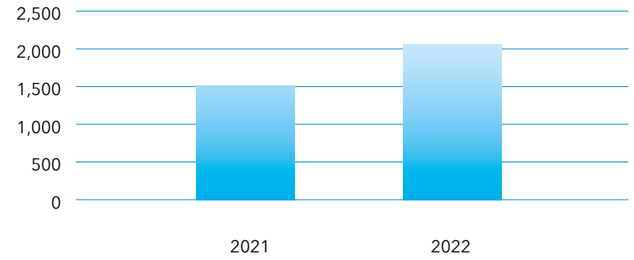
Estimates for the energy likely to be produced by solar power plants due to come into service shortly:

ENERGY FROM SOLAR POWER PLANTS

BUILDING	GJ PER YEAR ESTIMATED FOR 2023
Palazzo Italia	268
North Pavilion	47
South Pavilion	123
Incubator Labs	144
TOTAL	**582**

Emission savings arising from the use of renewable electricity:

TONNES OF CO_2EQ SAVED BY RENEWABLE ELECTRICITY CONSUMPTION



Details are also provided of the gigajoule (GJ) equivalent of the energy produced by the consumption of gas oil needed to ensure that facilities can continue operation in the event of energy failure. Consumption is mainly due to routine checks (twice weekly) and checks every two months whilst loaded:

ENERGY GENERATED BY E.G. IN 2022

GJ	**18.76**

** Conversion factor: litres to GJ.*

In 2022, direct GHG emissions arising from the consumption of gas oil amounted to 6,425 metric tons of CO_2eq.

Remaining with energy savings, HT helps to spread proper awareness of sustainable development by taking part in several specific schemes. For example, in March 2022, to mark the national "**M'illumino di meno 2022**" campaign promoted by the Italian radio show Caterpillar (broadcast on Radio 2), HT took part by symbolically turning off the lights in Palazzo Italia.

Turning to the question of water consumption, see below the results of the calculations based on the consumption per head of staff working on the Foundation Campus. It should be noted that water discharge figures entered in the table are taken as being total consumption less the amount sent for disposal as waste.

WATER WITHDRAWAL (303-3)

			2020		2021		2022	
			ALL AREAS	WATER-STRESSED AREAS	ALL AREAS	WATER-STRESSED AREAS	ALL AREAS	WATER-STRESSED AREAS
WATER WITHDRAWAL BY SOURCE	**Surface water (total)**							
	Freshwater (≤1,000 mg/l total dissolved solids)		-	-	-	-	-	-
	Other water (>1,000 mg/l total dissolved solids)		-	-	-	-	-	-
	Groundwater (total)							
	Freshwater (≤1,000 mg/l total dissolved solids)		-	-	-	-	-	-
	Other water (>1,000 mg/l total dissolved solids)		-	-	-	-	-	-
	Seawater							
	Freshwater (≤1,000 mg/l total dissolved solids)		-	-	-	-	-	-
	Other water (>1,000 mg/l total dissolved solids)		-	-	-	-	-	-
	Water produced (total)							
	Freshwater (≤1,000 mg/l total dissolved solids)		-	-	-	-	-	-
	Other water (>1,000 mg/l total dissolved solids)		-	-	-	-	-	-
	Third-party water resources (total)							
	Fresh water (≤1,000 mg/l total dissolved solids)		0.544	0.544	1.315	1.315	3.005	3.005
	Other water (>1,000 mg/l total dissolved solids)		-	-	-	-	-	-
	Total third-party water withdrawal by withdrawal source	Surface water	-	-	-	-	-	-
		Groundwater	0.544	0.544	1.315	1.315	3.005	3.005
		Seawater	-	-	-	-	-	-
		Water produced	-	-	-	-	-	-
TOTAL WATER WITHDRAWAL	**Surface water (total) + groundwater (total) + seawater (total) + produced water (total) + third-party water (total)**		**0.544**	**0.544**	**1.315**	**1.315**	**3.005**	**3.005**

WATER DISCHARGE (303-4)

			2020		2021		2022	
			ALL AREAS	WATER-STRESSED AREAS	ALL AREAS	WATER-STRESSED AREAS	ALL AREAS	WATER-STRESSED AREAS
WATER DISCHARGE BY DESTINATION	Surface water		-	-	-	-	-	-
	Groundwater		-	-	-	-	-	-
	Seawater		-	-	-	-	-	-
	Third-party water (total)		-	-	-	-	-	-
	Third-party water sent for use to other organisations (tot)		0.544	0.544	1.315	1.315	3.001	3.001
TOTAL WATER DISCHARGE	Surface water (total) + groundwater (total) + seawater (total) + produced water (total) + third-party water (total)		0.544	0.544	1.315	1.315	3.001	3.001
WATER DISCHARGE BY FRESHWATER AND OTHER WATER	Freshwater (≤1,000 mg/l total dissolved solids)		-	-	-	-	-	-
	Other water (>1,000 mg/l total dissolved solids)		-	-	-	-	-	-
WATER DISCHARGE BY LEVEL OF TREATMENT *Note: this is recommended, but not required*	No treatment		-	-	-	-	-	-
	Treatment level	[provide the title for treatment level]	-	-	-	-	-	-
		[provide the title for treatment level]	-	-	-	-	-	-
		[provide the title for treatment level]	-	-	-	-	-	-

WATER CONSUMPTION (303-5)

		2020		2021		2022	
		ALL AREAS	WATER-STRESSED AREAS	ALL AREAS	WATER-STRESSED AREAS	ALL AREAS	WATER-STRESSED AREAS
WATER CONSUMPTION	Water consumption	0.000	0.000	0.000	0.000	0.004	0.004
	Change in water storage, if water storage has been identified as having a significant water-related impact	-		-		-	

03

OUR EXPECTATIONS FOR THE FUTURE

The HT project represents an important opportunity to strengthen the life science scientific community in Italy.
It is essential, in order to reach the success of the institute, managing possible risks that may undermine its proper development and take full advantage of opportunities in the shortand medium term

3.1 Risks and opportunities

We can identify a series of risks, originating from both the external and internal context, that could have negative effects on both the short-term and medium-term development of HT.

The main risks originating from the **external context** are as follows:

a) The effect of HT's status as a government-backed entity on the implementation of its determined strategies.

At any time, the complexity and timeframes typical of public organisations, that allow due consideration to be given to the guidelines issued by public-spending watchdogs, could affect HT's ability to allocate available resources and implement its strategy in the form and manner decided by in-house bodies.

b) Political risk.

Changes to the Italian and international political scene could affect HT's medium-term mission and strategic objectives, causing potential uncertainty along the pathway to completion of the original project.

c) The risk of an insufficient level of interaction and collaboration with Italian research institutes operating in the same scientific sectors as HT.

The likelihood of such risk depends on the type of relationship that HT manages to establish with the other Italian research institutes once the project is fully underway. Indeed, we might witness competition rather than cooperation with a consequent effect on available resources and HT's national and international attractiveness.

d) The risk arising from the delay in the development of the MIND area.

As an urban district devoted to innovation, MIND was created to generate progress through a collective dimension. A delay in the development of site infrastructure and/or development plans for one of the public or private core areas could also have negative effects for HT. First of all, slowdowns or variants to the area's development plans could lead to extra costs or fewer services for the Campus, and, furthermore, if some actors, primarily the academic ones, procrastinate their settlement plans, this would slow down the establishment of scientific collaborative relationships in the district, aimed at fostering the ecosystem that is also, by definition, a space for exchange between disciplines and a space for technology and scientific transfer.

As regards the **internal context**, the main risks are as follows:

a) Possibility that HT becomes less attractive to outstanding national and international researchers after shifting the strategic focal point.

Partially shifting the focal point of HT activities to the development of National Facilities could be seen by potential talented researchers as liable to produce cuts in resources allocated to basic research and therefore in the resultant opportunities, thus making HT less attractive as a place for work and research.

RISK	RISK MANAGEMENT
Potential lower attractiveness to outstanding national and international researchers after shifting the strategic focal point	HT has developed human resources management practices and employment programmes comparable to those offered by international institutions. In addition, HT will continue to develop excellent scientific research and increase its scientific reputation. As long as the Foundation continues to receive steady support from its stakeholders, the risk can be considered low

b) Possibility that HT become less attractive to industrial partners after shifting the strategic focal point.

Partially shifting the focal point of HT activities to the development of National Facilities could be seen by private institutes, potential technology transfer partners, as a drop in HT's interest for such area of activity, thus weakening its relationship with industrial partners.

RISK	RISK MANAGEMENT
Potential lower attractiveness to industrial partners after shifting the strategic focal point	HT has launched activities concerning the implementation of a "Centre for Innovation and Technology Transfer". This risk can remain low thanks to an efficient activity carried out by CITT in attracting stakeholders and industrial partners to share new projects and collaborations

c) Potentially reduced standing of HT project and loss of reputation with stakeholders.

The slowdown in making infrastructural investments, also for external reasons, could lower the standing of the entire project and thus harm HT's reputation as an outstanding national project.

RISK	RISK MANAGEMENT
Potential lower standing of the HT project and loss of reputation with stakeholders due to delays in infrastructural investments	Such events, that have already delayed the development of HT in the past, may reoccur in the future. The Foundation will work with partners and stakeholders to try and ensure that the length of any delay is not such as to affect project completion. This risk is therefore considered manageable

On the other hand, as regards the main risks affecting ESG topics (e.g. environmental), please refer to subchapter 2.4 *"Responsible and sustainable approach"*.

The **opportunities** that could help HT's short- and medium-term development and success are as follows:

a) Availability of cutting-edge research infrastructures having a positive effect on the Foundation's image and its attractiveness to the world of science and industry.

The state-of-the-art research laboratories and equipment make HT of interest to numerous stakeholders: top researchers, research bodies and universities and industrial partners.

CUTTING-EDGE RESEARCH FACILITIES

OPPORTUNITY → **BENEFIT MAXIMISATION**

The availability of cutting-edge research facilities has a positive effect on HT's image making it attractive to the world of science and industry

HT can maximise the benefit of this opportunity by developing a "user access" strategy, ensuring transparent and effective use of its facilities that are made available to the scientific community

b) Availability of substantial financial, technological and human resources to be allocated to scientific research.

The availability of substantial, high-quality resources allows the development of important projects and is also a driving force in obtaining additional, especially financial, resources offered by national and international entities (e.g. participation in competitive calls, grants, etc.).

SIGNIFICANT FINANCIAL, TECHNOLOGICAL AND HUMAN RESOURCES

OPPORTUNITY → **BENEFIT MAXIMISATION**

The provision of substantial and high-quality resources allows the development of important projects and is also a driving force in obtaining additional, especially financial resources, made available by national and international institutions

HT can maximise the benefit of this opportunity by developing outstanding projects and excellent collaborations that can attract additional resources from national and international institutions (e.g. tenders, grants)

c) HT's location within the MIND area.

MIND is currently one of the most important national urban renewal projects of ever-increasing interest to international investors. HT's location within the MIND district provides an opportunity to develop relationships, collaborative projects and partnerships with the very best organisations and institutes in the field of scientific research and technology transfer, as well as an important public presence for the enhancement of this new area of Milan.

HT'S LOCATION WITHIN THE MIND AREA

OPPORTUNITY → **BENEFIT MAXIMISATION**

HT's location within the MIND area, currently a flagship national project of ever-increasing interest to international investors, provides an opportunity to develop relationships, collaborations and partnerships with top organisations and institutions in the field of scientific research and technology transfer

HT can maximise the benefit of this opportunity by developing and maintaining relationships with MIND area partners, scientific stakeholders and technology transfer partners. Further opportunities will occur by establishing relationships to achieve sustainable development goals (ESG)

04

PERFORMANCE ANALYSIS

Transparency, completeness, relevance and comprehensibility guide the evaluation of our performance

4.1 Key performance indicators

The table below gives the key performance indicators (KPI) as they relate to the Foundation's eight strategic objectives.

KEY PERFORMANCE INDICATORS/STRATEGIC OBJECTIVES

INNOVATION AND QUALITY OF RESEARCH

KPIS	2022 DATA/ REFERENCES	2021 DATA/ REFERENCES	NOTES
Number of research groups	24	20	Of which 2, related to 2022, not yet started
Number of cohort studies involved	36	8	
Amount of external grant funding (individual fellowships/grants and other research funding) formalised in 2022	€7,467,196 of which €3,239k claimed as at 31.12.2022	€1,934,611 of which €201k claimed as at 31.12.2021	In addition, in 2022 €441k were claimed relating to grants formalised in 2021
Amount of external grant funding (individual fellowships/grants and other research funding) formalised in 2023	€134,400	€1,964,204	In early 2023, an additional €332k were claimed (relating to grants formalised in 2021, 2022 and 2023)
Number of joint publications with external institutions	90	53	
Number of publications in international peer-reviewed journals	95	54	
Number of new experimental methods/tools/protocols	26	18	

DEVELOPMENT AND PROVISION OF INFRASTRUCTURES AND INNOVATIVE RESEARCH INSTRUMENTS

KPIS	2022 DATA/ REFERENCES	2021 DATA/ REFERENCES	NOTES
Investments (amount) in buildings/laboratories/ technologies	€10,066,838	€54,857,914	
Investments (amount) in intangible assets	€120,172	€4,564	
% progress of infrastructure development projects (projects on schedule)	% progress of existing buildings: 100% % progress of buildings under design: 2% The last phase of the project, the final acceptance, is scheduled for August 2028, postponed from the previous deadline of April 2027	% progress of existing buildings: 96% % progress of buildings under design: 1% The last phase of the project, the final acceptance, is scheduled for April 2027	
% of square metres dedicated to research laboratories	41%	41%	
National Facilities	See subchapter 2.3 sec. *"Development and provision of infrastructures and innovative research instruments"* and subchapter 2.4 sec. *"Development and sharing of sustainable and innovative buildings and infrastructures (National Facilities)"*	N/A	

TALENT ATTRACTION AND TRAINING, AND RESEARCH OUTPUT SHARING

KPIS	2022 DATA/ REFERENCES	2021 DATA/ REFERENCES	NOTES
Number of PhD students	42	30	
Number of postdocs	25	23	
Number of researchers from foreign institutions	90	50	
% Italians returning from abroad	29%	N/A	Italian employees and PhDs hired during 2022 from foreign institutions/total Italian employees and PhDs hired during the same period
Scientific visitors hosted	21	10	
Early career fellows funded	2	5	Allocations in the year
Number of scientific seminars held at HT	44	1	The 2021 figure refers only to internal seminars for PhD students and internal postdocs

SCIENTIFIC REPUTATION AND DISSEMINATION

KPIS	2022 DATA/ REFERENCES	2021 DATA/ REFERENCES	NOTES
Number of participations in conferences with presentation of validated talks/posters	162	95	
Number of researchers present in governance roles/bodies/review boards of international institutions/research organisations of excellence	14	7	
Scientific conferences/courses/training events organised (internal)	12	3	The 2021 figure includes both internal and external conferences/events/ courses
Scientific conferences/courses/ training events organised (external)	4		
Number of attendees of events/conferences/ scientific training courses organised (internal)	124	71	The 2021 figure includes both internal and external conferences/events/ courses
Number of attendees of events/conferences/ scientific training courses organised (external)	304		
Number of dissemination/educational initiatives organised for non-specialist stakeholders	7	21	The 2021 figure includes institutional events which in 2022 are instead reported in a separate KPI within the strategic objective of "Partnership, networking and stakeholder engagement"
Number of research awards/honours/prizes (per institution/field)	7	3	

RESEARCH-BASED INNOVATION

KPIS	2022 DATA/ REFERENCES	2021 DATA/ REFERENCES	NOTES
Number of training events on Technology Transfer	5	N/A	
Number of attendees in Technology Transfer training events	420	N/A	
Number of HT scientists/ professionals trained on Technology Transfer	52	N/A	HT scientists trained on Technology Transfer are among the attendees in Technology Transfer training events (mentioned in the previous KPI)
Number of stakeholders involved in Technology Transfer activities	65	N/A	
Number of international events HT participated in or organised	3	N/A	
Number of countries with which Technology Transfer relations have been established	5	N/A	
Number of agreements/ collaborations with companies/hospitals/ research institutes for Technology Transfer	3	N/A	
CITT (Centre for Innovation and Technology Transfer)	See subchapter 2.2 sec. *"Financial Capital"*, subchapter 2.3 sec. *"Research-based innovation"* and subchapter 2.4 sec. *"Activities and programmes for the development of the Centre for Innovation and Technology Transfer"*	See subchapter 2.2 sec. *"Financial Capital"*, subchapter 2.3 sec. *"Research-based innovation"* and subchapter 2.4 sec. *"Industry, innovation and infrastructure (ESG)"*	

SUSTAINABILITY (ENVIRONMENTAL, SOCIAL AND ECONOMIC)

KPIS	2022 DATA/ REFERENCES	2021 DATA/ REFERENCES	NOTES
ENVIRONMENTAL			
Energy from renewable sources	Available 2023 estimate. See subchapter 2.4 sec. *"Sustainable consumption management and development of energy efficiency programmes"*	Available 2022 estimate. See subchapter 2.4 sec. *"Clean and affordable energy"*	
Energy indirect (Scope 2) GHG emissions	Mb = 163 tons CO_2eq	N/A	GRI 305-2
CO_2 emissions avoided through the use of electricity from renewable sources	Lb = 2,093.41 tons CO_2eq (+36% compared to 2021)	N/A	
Direct (Scope 1) GHG emissions - Diesel fuel	6.425 tons CO_2eq	N/A	GRI 305-1
Other indirect (Scope 3) GHG emissions - Waste transport	0,03 tons CO_2/ton waste transported 1,174 tons CO_2 emitted for waste transport	0,02 tons CO_2eq	GRI 305-3. A value of 0.04 tons CO_2eq was reported in the Integrated Report 2021 due to an incorrect factor in the calculation of the figure
Number of environmental NC/number of audits	Total environmental audits: 2 Total environmental non-conformities found: 0	N/A	
SOCIAL			
Diversity and equal opportunity (employees gender)	Men: 45% Women: 55%	Men: 47% Women: 53%	GRI 405-1
Diversity and equal opportunity (employees age)	< 30: 12% 31-50: 81% > 50: 7%	< 30: 9% 31-50: 80% > 50: 11%	GRI 405-1
% of researchers in relation to total employees	54%	41%	
% of female staff representing HT in events	Women: 45% Men: 55% Percentage increase between 2022 and 2021 of female participation: 7%	N/A	
Annual % increase of female staff in higher grades (0-1-2-3 Executives)	Women: 45% Men: 55% Percentage increase between 2022 and 2021 of female staff: 3%	N/A	
% of improvement in gender balance in recruitment for grade 0-5 positions	47%	N/A	Year-on-year increase
Number of anonymous complaints of sexual harassment or gender offences handled per year	-	N/A	
Number of training courses on prejudice and unconscious bias issues per year	1	N/A	Training "Double standard: gender inequalities in research and science"; for more information, see subchapter 2.2 sec. *"Human Capital"*
Number of new services for child and/or family care provided to staff	1	N/A	This is an agreement between HT and a kindergarten located in the neighbouring Municipality of Arese
Parental leave - total number of eligible employees	113 men 137 women	N/A	During 2022, 5 female and 1 male employee(s) took parental leave
Number of children for whom childcare is supported per year	5	N/A	
Transparency in supplier selection	See subchapter 2.2 sec. *"Financial Capital - Procurement and purchases 2022"* and subchapter 2.4 sec. *"Responsible supply chain management"*	See subchapter 2.2 sec. *"Financial Capital - Procurement and purchases 2021"*	
ECONOMIC			
Funding received from parties other than MEF as a percentage of total funding 2022	2.85%	0.38%	
Commitments formalised in 2022 not stated in the Balance Sheet	See subchapter 2.2 sec. *"Financial Capital"*	See subchapter 2.2 sec. *"Financial Capital"*	
Other economic and financial data	See subchapter 2.2 sec. *"Financial Capital"*	See subchapter 2.2 sec. *"Financial Capital"*	
Revenues from commercial events	€38,032	N/A	

PARTNERSHIP, NETWORKING AND STAKEHOLDER ENGAGEMENT

KPIS	2022 DATA/ REFERENCES	2021 DATA/ REFERENCES	NOTES
Number of partnerships and collaborations with universities/ IRCCS/research centres/industry	13 partnerships and collaborations 3 Consortium Agreements. For further information, please refer to subchapter 2.2 sec. *"Relational Capital"* and subchapter 2.3 sec. *"Development of partnerships and collaborations with universities and research institutes on scientific research projects"*	7	New agreements concluded during the year. The 3 Consortium Agreements in which HT took part relate to the following projects: - NEUROCOV - AI4LIFE - R2D2-MH
Number of research infrastructure development projects co-managed with suppliers	1	1	
Number of institutional initiatives	7	-	The 2021 figure is included in the KPI "Number of dissemination/ educational initiatives organised for non-specialist stakeholders"
Number of initiatives developed in partnership with other MIND area parties	25	4	
Number of partnerships with other relevant stakeholders	3	1	
Indicators for press office activities	Press mentions: 1,695	Press mentions: 1,766	
Social media indicators	Social media followers: 35,102	Social media followers: 24,636	
Number of subscribers to newsletter	Newsletter subscribers: 1,077	Newsletter subscribers: 1,002	
Number of website single users	69,825	52,780	Data refer to the period August-December 2022 as the new tracking system was implemented in August
Number of website visits	268,913	100,878	Data refer to the period August-December 2022 as the new tracking system was implemented in August
News on website	52	N/A	Data refer to the period August-December 2022 as the new tracking system was implemented in August
Internal communication campaigns	57	N/A	
Number of external commercial events	10	N/A	

EFFECTIVENESS AND EFFICIENCY OF OPERATIONAL PROCESSES

KPIS	2022 DATA/ REFERENCES	2021 DATA/ REFERENCES	NOTES
% of development of Digital Transformation and PMO projects	Data Governance: 75% Cyber Security: 81% IT Governance: 98% PMO: 100% IT Protocol Management System: 100% HR Travel: 95% Warehouse: 100%	Data Governance: 18% Cyber Security: 24% IT Governance: 32% PMO: 42% IT Protocol Management System: 95% HR Travel: 40% E-catalogues: 20% Warehouse: 5%	
Number of HT projects monitored through the "Status Reporting" system	24	N/A	
% of incident resolution in Campus area (buildings, furniture, laboratory equipment)	Incidents opened during the year: 430 Successfully resolved: 93.02%	N/A	

The table below gives the key performance indicators contained in the GRI.

Statement of use	Human Technopole has reported in accordance with the GRI Standards for the period 01.01.22 - 31.12.22
GRI 1 used	GRI 1: Foundation 2021
Applicable GRI Sector Standard(s)	To date, there are no GRI Sector Standards relevant to Human Technopole's activity

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION	OMISSION			GRI SECTOR STANDARD REF. NO.	NOTES
			REQUIREMENT(S) OMITTED	REASON	EXPLANATION		
General disclosures							
GRI 2: General disclosures 2021	2-1 Organisational details	- Cover - Subchapter 1.1 *"Mission, vision and values"* - Subchapter 1.2 *"Research Centres and Facilities"* - Subchapter 2.2, sec. *"Infrastructural Capital"*					
	2-2 Entities included in the organisation's sustainability reporting	Subchapter 1.1 *"Mission, vision and values"*					
	2-3 Reporting period, frequency and contact point	Methodology note					
	2-4 Restatements of information	- Subchapter 4.1 *"Key performance indicators"* (performance indicators/strategic objectives): 305-3 Other indirect (Scope 3) GHG emissions - Waste transport (environmental, social and economic sustainability)					
	2-5 External assurance	- Methodology note - Subchapter 4.3 *"Auditors' Report on the Integrated Report"*					
	2-6 Activities, value chain and other business relationships	- Subchapter 1.2 *"Research Centres and Facilities"* - Subchapter 2.2, sec. *"Financial Capital"* - Subchapter 2.2, sec. *"Relational Capital"* - Subchapter 2.4, sec. 2 *"Development of partnerships and collaborations with universities and research institutes on scientific research projects"* and sec. 5 *"Responsible supply chain management"*					
	2-7 Employees	- Subchapter 2.2, sec. *"Human Capital"* Please note that the calculation methodology used is the number of people					
	2-8 Workers who are not employees	Subchapter 2.2, sec. *"Human Capital"*					

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION	OMISSION			GRI SECTOR STANDARD REF. NO.	NOTES
			REQUIREMENT(S) OMITTED	REASON	EXPLANATION		
GRI 2: General disclosures 2021	2-9 Governance structure and composition	- Subchapter 1.4 *"Governance and organisation"* - Table GRI 405-1 -Diversity and equal opportunity (member's Governance gender) – notes column					
	2-10 Nomination and selection of the highest governance body	Subchapter 1.4 *"Governance and organisation"*					
	2-11 Chair of the highest governance body	Subchapter 1.4 *"Governance and organisation"*					
	2-12 Role of the highest governance body in overseeing the management of impacts	Subchapter 1.4 *"Governance and organisation"*					
	2-13 Delegation of responsibility for managing impacts	Subchapter 1.4 *"Governance and organisation"*					
	2-14 Role of the highest governance body in sustainability reporting	Subchapter 1.4 *"Governance and organisation"*					
	2-15 Conflicts of interest	Subchapter 1.4 *"Governance and organisation"*, sec. *"Internal Audit & Compliance"*					
	2-16 Communication of critical concerns	Subchapter 1.4 *"Governance and organisation"*, sec. *"Organismo di Vigilanza"* and sec. *"Internal Audit & Compliance"*					For comments, requests, opinions and suggestions for improvement on HT's sustainability activities and the information contained within this Integrated Report, a dedicated email address is available: ht-dept-finance@fht.org. For evidence on the mechanism for tracking violations of the Code of Ethics and protection against whistleblowers, please refer to the Code of Ethics published on the Foundation's website:https://humantechnopole.it/en/
	2-17 Collective knowledge of the highest governance body	- Subchapter 2.2, sec. *"Human Capital"* and 2.4, sec. 9 (Gender Equality Plan) - Subchapter 2.2, sec. *"Relational Capital"* (Event "The Integrated Report and sustainable growth") - Subchapter 2.4, sec. 8 *"Development of job opportunities for researchers and administrative staff"* (Mobility Manager) - Subchapter 2.4, sec. 11 *"Sustainable consumption management and development of energy efficiency programmes"* (Energy Manager)					
	2-18 Evaluation of the performance of the highest governance body	Subchapter 1.4, sec. *"Sustainability Committee"*					It should be noted that the Sustainability Committee began its work in 2022
	2-19 Remuneration policies	The fees are determined in accordance with article 6 of decree of the President of the Council of Ministers No. 28 dated 27th February 2018, implementing article 1, paragraph 123, of Law No. 232 dated 2016					

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION	OMISSION			GRI SECTOR STANDARD REF. NO.	NOTES
			REQUIREMENT(S) OMITTED	REASON	EXPLANATION		
GRI 2: General disclosures 2021	2-20 Process to determine remuneration	The fees are determined in accordance with article 6 of decree of the President of the Council of Ministers No. 28 dated 27th February 2018, implementing article 1, paragraph 123, of Law No. 232 dated 2016					
	2-21 Annual total compensation ratio	See side note					The ratio of the annual total remuneration of the highest-paid employee to the median annual total remuneration of all employees is 5. Furthermore, compared to the previous year, the salary of the highest-paid employee did not change, nor did the median annual total remuneration of all employees (excluding the highest-paid)
	2-22 Statement on sustainable development strategy	Letter to stakeholders					
	2-23 Policy commitments	- Subchapter 1.1 *"Mission, vision and values"* - Subchapter 1.4 *"Governance and organisation"* - Subchapter 2.4 *"Responsible and sustainable approach"*	Information unavailable / incomplete		The Foundation does not have specific formalised policies on the three topics mentioned by the Standard and plans to formalise them in the short term		The Foundation has adopted a process for identifying, preventing and mitigating actual and potential impacts by prioritising them as described in subchapter 2.1 *"Stakeholder engagement and materiality matrix"* in the section *"ESG materiality analysis"*. Mitigation measures for potential negative impacts are also determined when conclusive scientific evidence is lacking but there is sufficient reason to expect serious or irreversible damage. The issue of human rights is addressed in several internal policies and regulations as well as in the Code of Ethics and the Model pursuant to Legislative Decree no. 231 available in the "Transparency" section of the HT website https://humantechnopole.it/en/transparent-administration/
	2-24 Embedding policy commitments	Subchapter 2.4 *"Responsible and sustainable approach"*					
	2-25 Processes to remediate negative impacts	Subchapter 2.4 *"Responsible and sustainable approach"*					
	2-26 Mechanisms for seeking advice and raising concerns	Methodology note					For comments, requests, opinions and suggestions for improvement on HT's sustainability activities and the information contained within this Integrated Report, a dedicated email address is available: ht-dept-finance@fht.org. For evidence on the mechanism for tracking violations of the Code of Ethics and protection of whistleblowers, please refer to the Code of Ethics published on the Foundation's website: https://humantechnopole.it/en/

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION	OMISSION			GRI SECTOR STANDARD REF. NO.	NOTES
			REQUIREMENT(S) OMITTED	REASON	EXPLANATION		
GRI 2: General disclosures 2021	2-27 Compliance with laws and regulations	N/A					With reference to the financial year 2022, there were no non-compliances with laws and/or regulations in social and economic matters that resulted in significant fines or non-monetary penalties
	2-28 Membership associations	Subchapter 2.2, sec. *"Relational Capital"*					
	2-29 Approach to stakeholder engagement	- Methodology note - Subchapter 2.1 *"Stakeholder engagement and materiality matrix"*					
	2-30 Collective bargaining agreements	N/A					The provisions dictated by the national contracts and regulations in force in the Country in which the Foundation operates are applied to 100% of employees. In particular, the National Collective Labour Agreement for the Chemical Industry applies to white collars and middle managers, while the National Collective Labour Agreement for Industry Managers applies to executives, also taking into account the provisions of the regulations applicable to Public Administrations (law 196/09, art. 1, par. 3)
GRI 3: Material topics 2021	3-1 Process to determine material topics	Subchapter 2.1, sec. *"ESG materiality analysis"*					
	3-2 List of material topics	Subchapter 2.1, sec. *"ESG materiality analysis"*					
GRI 201: Economic performance 2016	201-1 Direct economic value generated and distributed	Subchapter 2.2, sec. *"Financial Capital"*					
GRI 204: Procurement practices 2016	204-1 Proportion of spending on local suppliers	Subchapter 2.2, sec. *"Financial Capital - The principles of HT's procurement activities - Activities 2022"*					"Local" suppliers are those present in Italy
GRI 205: Anti-corruption 2016	205-1 Operations assessed for risks related to corruption	- Subchapter 1.4 *"Governance and organisation"*, sec. *"Organismo di Vigilanza"* - Subchapter 2.4, sec. 10 *"Responsible supply chain management"*					
	205-3 Confirmed incidents of corruption and actions taken	N/A					No incidents of corruption were established during 2022
GRI 302: Energy 2016 Topic-specific disclosures	302-1 Energy consumption within the organisation	Subchapter 2.4, sec. 11 *"Sustainable consumption management and development of energy efficiency programmes"*					
	302-1 g. Source of the conversion factors used	Subchapter 2.4, sec. 11 *"Sustainable consumption management and development of energy efficiency programmes"*					
	302-3 Energy intensity	Subchapter 2.4, sec. 11 *"Sustainable consumption management and development of energy efficiency programmes"*					

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION	OMISSION			GRI SECTOR STANDARD REF. NO.	NOTES
			REQUIREMENT(S) OMITTED	REASON	EXPLANATION		
GRI 303: Water and effluents 2018 Topic-specific disclosures	303-3 Water withdrawal	Subchapter 2.4, sec. 11 *"Sustainable consumption management and development of energy efficiency programmes"*					
	303-4 Water discharge	Subchapter 2.4, sec. 11 *"Sustainable consumption management and development of energy efficiency programmes"*					
	303-5 Water consumption	Subchapter 2.4, sec. 11 *"Sustainable consumption management and development of energy efficiency programmes"*					
GRI 305: Emissions 2016 Topic-specific disclosures	305-1 Direct (Scope 1) GHG emissions - Diesel fuel	- Subchapter 2.4, sec. 11 *"Sustainable consumption management and development of energy efficiency programmes"* - Subchapter 2.4 *"Key performance indicators"* (Environmental, social and economic sustainability)					
	305-2 Energy indirect (Scope 2) GHG emissions	- Subchapter 2.4, sec. 11 *"Sustainable consumption management and development of energy efficiency programmes"* - Subchapter 2.4 "*Key performance indicators*" (Environmental, social and economic sustainability)					
	305-3 Other indirect (Scope 3) GHG emissions - Waste transport	Subchapter 2.4, sec. 5 *"Effective waste management"*					Please note that the 2021 value is 0.02 tonnes CO_2eq. In the Integrated Report 2021 a value of 0.04 tonnes CO_2eq was reported due to an incorrect factor in the calculation of the figure
GRI 306: Waste 2020 Topic-specific disclosures	306-3 Waste generated	Subchapter 2.4, sec. 5 *"Effective waste management"*					
	306-4 Waste diverted from disposal	Subchapter 2.4, sec. 5 *"Effective waste management"*					
	306-5 Waste directed to disposal	Subchapter 2.4, sec. 5 *"Effective waste management"*					
GRI 401: Employment 2016 Topic-specific disclosures	401-1 a. New employee hires and employee turnover (hired)	Subchapter 2.2, sec. *"Human Capital"*					
	401-1 b. New employee hires and employee turnover (resigned)	Subchapter 2.2, sec. *"Human Capital"*					
	401-3 Parental leave	Subchapter 2.4, sec. 3 *"Supporting work-life balance and parenthood"*	401-3 c/d	Unavailable or incomplete information			For quantitative data, please refer to subchapter 4.1, sec. *"Performance Indicators/strategic objectives - Sustainability (environmental, social and economic)"*

GRI STANDARD/ OTHER SOURCE	DISCLOSURE	LOCATION	OMISSION			GRI SECTOR STANDARD REF. NO.	NOTES
			REQUIREMENT(S) OMITTED	REASON	EXPLANATION		
GRI 403: Occupational health and safety 2018 Topic-specific disclosures	403-8 Workers covered by an occupational health and safety management system	Subchapter 2.2, sec. *"Human Capital"*					
	403-9 a. Work-related injuries	N/A					During 2022 there were 4 accidents at work reported to INAIL
	403-9 b. Work-related injuries	N/A					No accidents occurred during 2022
	403-9 d. Work-related injuries	Subchapter 2.2, sec. *"Human Capital"*					
GRI 404: Training and education 2016 Topic-specific disclosures	404-1 Average hours of training per year per employee	Subchapter 2.2, sec. *"Human Capital"*					The 2021 figure referred exclusively to HSE training. In 2022, the figure was expanded to include other training courses, provided mainly from April 2022 onwards, as these activities intensified during the reporting year
	404-2 Programmes for upgrading employee skills and transition assistance programmes	- Subchapter 2.2, sec. *"Human Capital"* - Subchapter 2.3, sec. *"Talent attraction and training, and research output sharing"* - Subchapter 2.3, sec. *"Scientific reputation and dissemination"* - Subchapter 2.3, sec. *"Effectiveness and efficiency of operational processes"*					
	404-3 Percentage of employees receiving regular performance and career development reviews	Subchapter 2.2, sec. *"Human Capital"*					
GRI 405: Diversity and equal opportunity 2016	405-1 Diversity of governance bodies and employees (gender of Governance members)	N/A					Men: 65% - Women: 35% Please note that the data refer to the following governance bodies: ▸ *Consiglio di Sorveglianza* ▸ Management Committee ▸ Scientific Committee ▸ Board of Auditors ▸ *Organismo di Vigilanza*
	405-1 Diversity of governance bodies and employees (employees gender)	Subchapter 2.2, sec. *"Human Capital"*					
	405-1 Diversity of governance bodies and employees (employees age)	Subchapter 2.2, sec. *"Human Capital"*					
	405-1 Diversity of governance bodies and employees (employees origin)	Subchapter 2.2, sec. *"Human Capital"*					
	405-2 Ratio of basic salary and remuneration of women to men	N/A					Research and Facility area: women executives and managers earn 0.4% more than men. SSA area: women make up 100% of SSA staff. Administration and Governance: women executives and managers earn 0.3% more than men

4.2 Financial statements

FINANCIAL REPORT AND STATEMENTS FOR THE YEAR ENDED 31ST DECEMBER 2022

HUMAN TECHNOPOLE FOUNDATION

Head Offices: Viale Rita Levi Montalcini, 20157 MILAN (MI)

Endowment Fund: Euro 77.261.869

Tax Identification Number 97821360159 – VAT No. 11307810967

CONSIGLIO DI SORVEGLIANZA

CHAIRMAN	VERONA GIANMARIO
MEMBERS	FRANCESE MAURA
	IANNANTUONI GIOVANNA
	INGUSCIO MASSIMO
	IPPOLITO GIUSEPPE
	MAZZOTTA BIAGIO
	PANUCCI MARCELLA
	PASINELLI FRANCESCA
	RONCAROLO MARIA GRAZIA
	SILEONI SERENA
	VAGO GIANLUCA
	VESPIGNANI ALESSANDRO

MANAGEMENT COMMITTEE

CHAIRMAN	TERRAGNI FABIO
MEMBERS	BOZZONI IRENE
	MINNELLA NANDO
	PICCOLO STEFANO

SCIENTIFIC COMMITTEE

COORDINATOR	RICCIARDI GUALTIERO
MEMBERS	ALMOUZNI GENEVIÈVE
	BALLABIO ANDREA
	DE CAMILLI PIETRO
	HELIN KRISTIAN
	MANTOVANI ALBERTO
	MC MAHON MARGARET
	MELINO GENNARO
	PANI LUCA
	QUARTERONI ALFIO
	ROSENTHAL NADIA
	SNYDER MICHAEL
	SUPERTI-FUGA GIULIO
	WATT FIONA

BOARD OF AUDITORS

CHAIRWOMAN	MARZO PIERA
MEMBERS	ROSSI SARA
	VESTITA ANDREA

DIRECTOR OF ADMINISTRATION	POGGIANI ALESSANDRA
FINANCIAL REPORTING OFFICER	SELMI GIOVANNI

CONTENTS

The year 2022 was one of huge growth and important achievements for the Human Technopole Foundation. Internal research activities increased substantially and personnel and collaborator numbers rose significantly, comprised as they were of many PhD students and trainees. Approximately 21,000 sq m of existing infrastructure was completed, which included 8,000 sq m of laboratories, scientific facilities and data centre and networking areas, and the final design for the completion of the Campus was concluded.

Evidence of this vigorous growth is seen in both the value of production, which rose by almost 80%, and in the number of scientific personnel on the permanent workforce, which increased by over 70%.

It was also a year when numerous specialist scientific papers were published, when talented young scientists progressed on a number of distinctive training programmes and when the new "Early Career Fellowship" scholarships were awarded and many doctoral programmes were introduced.

Also in 2022 the public consultation carried out in preparation for the operational launch of a research infrastructure hub was finally brought to completion. Responsibility for this hub had been assigned to the Foundation by Law No. 190/2019 and by the related convention signed in December 2020 with the Supervisory Administrations. Following that consultation, carried out in two stages, the first "National Facilities" were identified which will see the Human Technopole Foundation as an institution able to design, create and manage cutting-edge scientific infrastructures with a high technological impact to the benefit of the entire national public life sciences research sector.

It is underlined that the results achieved in 2022 included the first tangible recognition of research excellence conducted by Human Technopole's scientists, which amongst other things led to the acquisition of outside funding and grants from international institutions which supplemented funding from the Italian government's budget, granted each year to the Foundation on the basis of its founding law.

Work then continued on the construction of the Centre for Innovation and Technology Transfer (CITT) in the life sciences, as an internal department of the Foundation. The department, set up in July 2021 in accordance with Law No. 77 of 17th July 2020, commenced business training for scientists and researchers in order to create a greater understanding of technology transfer mechanisms and the ability to build profitable relationships between basic research and the private sector.

The year 2022 was also one in which new appointments were made to the Foundation's governing bodies and in which the term of office of the Foundation's first director, Prof. Iain Mattaj came to an end. His legacy certainly constitutes an extraordinary stimulus for the future and also a challenge for the imminent further development of the Foundation and its important mission on the Italian and international science scene.

MANAGEMENT REPORT

The 2022 financial year of the Human Technopole Foundation (hereinafter also "HT Foundation", "Human Technopole" or "HT") ended with a positive result net of taxes of €38,032, after provisions for IRES (corporate income tax) and IRAP (regional production tax) taxes of €612,057. Depreciation and amortisation of tangible and intangible assets were recognised amounting to €12,837,770.

Furthermore, activities carried out in 2022 resulted in total financial commitments of over €115 million. These commitments translated into the recognition in the balance sheet of operating grants and capital grants of over €65.8 million, relating to the quota for the financial year, and to approximately €134.2 million in deferred income, for that part of those commitments designated for future years.

In financial terms, revenues of approximately €128 million in grants were recognised in 2022, against cash outlays of approximately €75 million.

The Financial Statements for the year ended 31st December 2022 have been prepared in accordance with articles 2423 et seq. of the Italian Civil Code, adopting the extended form, although the prerequisites set out in article 2435-bis for preparation in an abbreviated form apply.

The criteria used in the preparation of the accounts and measurement take account of the rules contained in national legislation pursuant to Legislative Decree No. 139/2015, which implemented Directive 2013/34/EU.
The financial statements are subject to certification by the Board of Auditors, as the statutory auditor.

ACTIVITIES CARRIED OUT IN 2022

The year 2022 was one of growth and consolidation for the Foundation.

As part of its specific mission, all the research centres became fully operational and this also involved the recruitment of additional group leaders in the genomics, computational biology and health data science areas for a total of 24 research groups by the end of 2022, as well as numerous Scientific Service Units to support both research centres and existing scientific facilities.

Also the process of setting up the administrative machine that commenced in 2021 was consolidated and the Foundation's compliance and operations were better defined. This occurred after the Foundation was included in the list of institutional units that form part of the public administrations sector (Sector S.13) drawn up by ISTAT (Italian office for statistics) in application of the European system of accounts (EU Regulation of the European Parliament and of the Council, No. 549/2013, SEC 2010) and after the related requirements were satisfied.

During the year, the Human Technopole Foundation also continued its construction, re-purposing and infrastructure creation activities on its site in the MIND ex-EXPO 2015 area. This involved completion of the first stage of the works, with all the available buildings operational and it completed the final design for the construction of buildings to complete the campus.

A. RESEARCH ACTIVITIES AND THE DEVELOPMENT OF FACILITIES

With regard to HT's scientific activities, 2022 was the first fully operational year, following the initial completion of its scientific leadership structure and the opening of the first experimental laboratories in 2021. With the recruitment of additional group leaders together with researchers and numerous technicians, the institute reached a critical mass with 24 research groups and a workforce of 220 employees and collaborators in its Research Centres, Facilities and scientific services by the end of the year.

Over the course of the year, HT's scientists achieved many significant results in their respective fields of research, which led to 95 peer-reviewed publications in prestigious international journals, as well as several international grants (including ERC, EC/Horizon, AIRC, EMBO) and brought the total for external competitive research funds received to over €9 million.

In line with HT's objective to establish and develop working relationships with the Italian and international biomedical research community, collaborations were carried forward during the year with numerous universities, research centres, clinical research institutes, scientific societies and research networks both in Italy and abroad. These interactions led to the conclusion and/or renewal of partnerships and collaboration agreements to carry out joint projects with various universities, hospitals and research centres. National universities and research hospitals involved in these joint projects include the University of Milan, Politecnico di Milano, the University of Turin, University of Trieste, European Institute of Oncology (IEO), the IRCCS Oasi Maria Santissima, IRCCS Ca' Granda Ospedale Maggiore Policlinico and EURAC Research.

Joint projects with international institutions included those with the Institute of Cancer Research and the Wellcome Sanger Institute (UK), the University of Edinburgh (UK), the Riken Institute in Japan, the DSMZ - Leibniz Institute and the Technische Universität Dresden in Germany.

Numerous activities were also carried out in the field of advanced scientific training for both internal and external scientists in the life sciences sector. The number of PhD students and postdoctoral fellows at HT continued to increase in 2022, reaching 42 and 25 respectively. As concerns doctoral training, in addition to joining the SEMM programme and the agreement with the Politecnico di Milano, a further doctoral agreement was signed for HT to become a host institution for the PhD in Theoretical and Scientific Data Science of the SISSA-Trieste School of Advanced Studies.

The scientific training programmes organised by the Foundation during the year included three courses on specialised technical skills (light imaging, high performance computing and light imaging), seven courses for PhD students on general skills (e.g. scientific writing, research project management, presentation skills) and two workshops on scientific careers. These training activities were supplemented by the launch of a series of in-house seminars given by HT scientists, and the organisation, again in-house, of a series of seminars by high-profile external scientists.

Courses and workshops were also held at HT in the areas of single cell technologies, omics and image data analysis, together with a scientific symposium on cryoelectron microscopy, when the Cryo-EM Facility was inaugurated. A total of over 300 external scientists from national and international institutions participated in these events.

In order to promote mobility and the sharing of skills, infrastructures and methods with the external research community, in 2022 the Foundation hosted over twenty visiting scientists from eighteen different research institutes in Italy and abroad. They spent time at the Foundation to work together with HT scientists on specific projects, in different research areas or to apply the specific technologies available at the Campus laboratories to their own projects and/or to acquire expertise in the relative methodologies.

Finally, the Early Career Fellowship (ECF) programme, designed to support talented scientists to establish their own independent research programmes at research institutes in Italy, continued with the evaluation of applications received in response to the second call published in 2021. Two brilliant scientists, one from Johannes Gutenberg University (Germany) and the other from the Wolfson Institute for Biomedical Research at University College London (UK) have each been awarded a €1 million grant to develop their innovative life sciences research projects over five years at the University of Parma and the Centre for Neuroscience and Cognitive Systems at the Rovereto branch of the Italian Institute of Technology, respectively. The award of these two scholarships brought the total number of ECF fellows supported by HT at Italian universities and institutes to seven.

B. BUILDING, PLANT AND TECHNOLOGY DEVELOPMENT OF THE FOUNDATION CAMPUS

In accordance with the MIND-Milano Innovation District Integrated Intervention Programme (pursuant to Milan City Council resolution No. 129 of 31/01/2020), in 2022 the Foundation completed work to commence use of spaces intended for scientific research in the temporary structures, the "Incubator Labs", in the North and South Pavilions and Palazzo Italia.

The design of a liquid nitrogen supply line to serve the Cryo-EM laboratories and a future storage area for biological samples (biobank) was finalised. The first tender, which included the works for the supply line, the set-up of the bio-bank and the supply of medical gases was unfortunately abandoned, due amongst other things, to the economic situation that arose in the civil engineering sector during the year. It will be retendered before the end of the first half of 2023.

During the course of the year, all the remaining work was completed resulting from the sale and purchase agreements for Palazzo Italia (dated 30th July 2020) and for the North Pavilion and South Pavilion (dated 28th September 2021), for which the photovoltaic systems will be installed in 2023, leading to energy savings for the Foundation.

From the viewpoint of the continuous improvement of the facilities, the other most significant activities carried out in 2022 were as follows:

- the award of an integrated contract for the design and execution of repurposing works for the creation of new offices in Palazzo Italia. Organised in four consecutive steps, the work involved all floors of the building, improvements to the acoustics and functionality of the offices and the creation of new space in the basement to be used for laboratory storage and a biobank. The first two steps (around 50% of the works) were successfully completed in 2022 and the works are scheduled for completion in June 2023;
- executive design and tender for systems and civil engineering additions to support new facilities in the South Pavilion. The works are currently underway and the first laboratory set-ups are scheduled for delivery in Q1-2023;
- landscaping and furnishings for the north and south terraces, the interior greenery, the central square and the canteen area on the fourth floor of Palazzo Italia;
- the construction of an on-premise data centre facility, in the basement rooms of Palazzo Italia, with a 10 Gb data connectivity and networking star centre and a Tape Library room.

As regards completion of the Campus in the medium-term, the final design has been completed on the new building complex consisting of two buildings, the South Building and the Technology Hub, as well as the complementary works for expected total works costing approximately €249.8 million. The project was approved by the *Consiglio di Sorveglianza* on 2nd February 2023 and preparatory activities for submission to the Services Conference to obtain the building permit are now underway.

At the same time, HT finalised the purchase by Arexpo of the land needed to complete the "HT sector" of the perimeter, as programmed in the MIND area Integrated Intervention Plan.

C. PROCUREMENT, TENDERING AND PURCHASING PROCESSES

The substantial increase in the value of production in 2022 went hand-in-hand with significant increases in procurement activities as summarised here:

TYPE OF PURCHASE	AMOUNT (IN EURO)	%
PURCHASES "OUT OF PROCEDURE" LEGISLATIVE DECREE NO. 50/2016	2,003,365	3.74%
PARTICIPATION IN FRAMEWORK AGREEMENTS/ CENTRAL PURCHASING AGREEMENTS	7,806,705	14.56%
PURCHASES UNDER LEGISLATIVE DECREE NO. 50/2016	43,244,088	80.65%
CONTRACTS UNDER LEGISLATIVE DECREE NO. 50/2016	564,000	1.05%
TOTAL	**53,618,157**	**100.00%**

It must be considered that notwithstanding the increase in volume in terms of purchases and tenders, the Foundation had only one case of litigation in 2022, which was resolved favourably and without conditions.

Additionally, following a significant revision of internal processes, in 2022 the Procurement and Supply Chain area was expanded by the creation of a "Warehouse" service to manage laboratory consumable materials and make research activities more efficient.

Finally, a project continued in 2022 to develop the internal management IT system "SAP Business ByDesign" which, given the complexity and highly specific nature of the institution, will have to aim over the next two years at the broader goal of overall administrative digitalisation of the institution, designed to ensure that operational processes are efficient and effective and also provide the Foundation's operational and financial data with greater transparency and integrity.

SUMMARY OF 2022 RESULTS

Paragraph 3, letter b) of article 2428 of the Italian Civil Code, as amended by Legislative Decree No. 32 of 2nd February 2007, states that the report on operations shall include, "to the extent necessary for an understanding of the company's position and performance, financial and, where appropriate, non-financial performance indicators relevant to the specific activities". Given the non-profit nature of Human Technopole, it was decided, without prejudice to what is set out in the financial statements and in the explanatory notes, to illustrate the salient data of the balance sheet, income statement and operating ratios that highlight the results achieved.

The financial statements for the year 2022, accompanied by this report and the notes to the financial statements, have been subjected to a mandatory audit by the Board of Auditors.

EURO	2022	2021
VALUE OF PRODUCTION	65,779,053	36,220,072
GROSS OPERATING MARGIN	13,521,012	6,556,405
OPERATING RESULT	666,249	559,501
OPERATING SURPLUS	38,032	17,747
FIXED ASSETS	125,810,834	115,623,825
TOTAL EQUITY	470,516,175	404,381,790
NET FINANCIAL POSITION	113,929,831	60,479,034

The value of production amounted to €65,779,053. The value of production includes grants from the MEF for a total of €64,737,640, of which €51,925,398 relate to operating grants and €12,812,242 to capital grants attributable to HT's activities. Additionally operating grants of €254,939 relate to the activities of the new Centre for Innovation and Technology Transfer (CITT) and €46,625 to the National Facilities.

Finally, grants amounting to €548,158 from other entities (non-MEF funds) and "other revenues" amounting to €191,691, of which €38,032 from commercial rentals of space in Palazzo Italia, were also recognised.

With regard to the balance sheet items, equity as at 31st December 2022 amounted to €470,516,175. In particular, it includes the Foundation's Endowment Fund of €77,261,869 and the HT Operating Fund, which amounted to €393,155,844 and consists of the overall annual grants, not yet used, that article 1 paragraph 121 of Law No. 232/2016 assigned to Human Technopole in the period 2017-2022. In addition, equity also includes the residual balance of the CITT Management Fund amounting to €13,231,429 and that attributable to the new National Facilities amounting to €143,164,179. Overall, €69 million of the Operating Fund was used, following the economic commitments undertaken by the Foundation.

Finally, equity also includes the 2021 operating surplus of €17,747 and the current year's operating surplus of €38,032.

The net financial position amounted to €113,929,929, consisting of the sum of cash and cash equivalents amounting to €10,204,900, and financial assets other than fixed assets amounting to €103,725,028, consisting of the centralised treasury account opened with the Bank of Italy during the year.

THE INCOME STATEMENT

The following table shows the results achieved during the year in euro, in terms of revenue, gross operating margin and operating surplus before tax.

EURO	2022	2021
VALUE OF PRODUCTION	65,779,053	36,220,072
GROSS OPERATING MARGIN	13,521,012	6,556,405
OPERATING SURPLUS BEFORE TAX	655,472	560,286

KEY OPERATING FIGURES

The reclassified income statement, compared with that of the previous year, is as follows (in euro).

EURO	31/12/2022	31/12/2021	CHANGE
VALUE OF PRODUCTION	65,779,053	36,220,072	29,558,981
EXTERNAL COSTS	34,605,713	19,083,397	15,522,317
VALUE ADDED	**31,173,340**	**17,136,675**	**14,036,665**
LABOUR COSTS	17,652,328	10,580,270	7,072,058
GROSS OPERATING MARGIN	**13,521,012**	**6,556,405**	**6,964,607**
DEPRECIATION, AMORTISATION AND WRITE-DOWNS AND OTHER PROVISIONS	12,854,763	5,996,905	6,857,858
OPERATING RESULT	**666,249**	**559,501**	**106,749**
NON-RECURRING INCOME	-	-	-
FINANCIAL INCOME AND CHARGES	(10,777)	785	(11,562)
RESULT ON ORDINARY OPERATIONS	**655,472**	**560,286**	**95,187**
REVALUATIONS AND WRITE-DOWNS	-	-	-
OPERATING SURPLUS BEFORE TAX	**655,472**	**560,286**	**95,187**
INCOME TAXES	617,441	542,538	74,902
NET OPERATING SURPLUS	**38,032**	**17,747**	**20,284**

THE BALANCE SHEET

The main movements in the balance sheet occurring in 2022 have been summarised in the table below, in which asset and liability items have been appropriately reclassified to show invested capital, sources of funding and their determinants.

EURO	31/12/2022	31/12/2021	CHANGE
NET INTANGIBLE ASSETS	158,736	38,564	120,172
NET TANGIBLE ASSETS	125,652,098	115,585,261	10,066,837
EQUITY INVESTMENTS AND OTHER FIXED FINANCIAL ASSETS	-	-	-
FIXED ASSETS	**125,810,834**	**115,623,825**	**10,187,009**
STOCK INVENTORIES	58,004	73,696	(15,692)
TRADE RECEIVABLES	87,702	93,594	(5,892)
OTHER RECEIVABLES	390,172,018	375,352,395	14,819,623
ACCRUED INCOME AND PREPAID EXPENSES	1,452,443	562,319	890,124
SHORT-TERM ASSETS	**391,770,166**	**376,082,004**	**15,688,162**
TRADE PAYABLES	20,482,890	18,807,062	1,675,828
DOWN PAYMENTS	-	-	-
TAX AND SOCIAL SECURITY DEBTS	4,045,710	1,356,689	2,689,020
OTHER DEBTS	1,188,949	488,796	700,153
ACCRUED LIABILITIES AND DEFERRED INCOME	134,252,672	126,585,603	7,667,068
SHORT-TERM LIABILITIES	**159,970,220**	**147,238,150**	**12,732,070**
NET WORKING CAPITAL	**231,799,946**	**228,843,854**	**2,956,092**
EMPLOYEE POST-EMPLOYMENT BENEFITS	1,023,134	564,922	458,212
TAX AND SOCIAL SECURITY DEBTS (BEYOND THE NEXT FINANCIAL YEAR)	-	-	-
OTHER MEDIUM AND LONG-TERM LIABILITIES	1,301	-	1,301
MEDIUM AND LONG-TERM LIABILITIES	**1,024,436**	**564,922**	**459,513**
INVESTED CAPITAL	**356,586,344**	**343,902,756**	**12,683,588**
EQUITY	470,516,175	404,381,790	66,134,385
MEDIUM TO LONG-TERM NET FINANCIAL POSITION	-	-	-
SHORT-TERM NET FINANCIAL POSITION	113,929,831	60,479,034	53,450,797
EQUITY AND NET FINANCIAL DEBT	**(356,586,344)**	**(343,902,756)**	**(12,683,588)**

In particular, after deducting the annual use of the overall operating fund, equity incorporates the increases recorded during the year. The latter relate to the 2022 operating fund, amounting to €2 million, attributed to the CITT (Centre for Innovation and Technology Transfer) by Law No. 77 of 17th July 2020, which converted Legislative Decree No. 34 of 19th May 2020, and to the Human Technopole operating fund, which was set at €133.6 million for the year 2022.

KEY FINANCIAL DATA

The net financial position as at 31/12/2022 was as follows:

EURO	31/12/2022	31/12/2021	CHANGE
BANK DEPOSITS	113,928,791	60,478,315	53,450,476
CASH AND OTHER VALUABLES ON HAND	1,137	719	418
CASH AND CASH EQUIVALENTS	**113,929,929**	**60,479,034**	**53,450,895**
FINANCIAL ASSETS OTHER THAN FIXED ASSETS	**-**	**-**	**-**
LOANS FROM BANKS (WITHIN TWELVE MONTHS)	98	-	98
SHORT-TERM FINANCIAL DEBTS	**98**	**-**	**98**
SHORT-TERM NET FINANCIAL POSITION	**113,929,831**	**60,479,034**	**53,450,797**
MEDIUM AND LONG-TERM NET FINANCIAL POSITION	**-**	**-**	**-**
NET FINANCIAL POSITION	**113,929,831**	**60,479,034**	**53,450,797**

It is underlined that the net financial position also comprises the balance on the centralised treasury account with the Bank of Italy, amounting to €103,725,028, which in the statutory financial statements is classified under the item "Financial assets other than fixed assets". More specifically, this account was opened in October 2020 in compliance with Article 49-bis, paragraph 4 of Law Decree No. 34/2020 (the "Relaunch Decree"), converted with amendments into Law No. 77/2020, which provided for the opening of a non interest-bearing account in the name of the HT Foundation at the State Treasury.
We report with regard to ordinary business with banks, a current account is also held in the name of HT with Banca Intesa, which carried a balance of €5,952,186, as well as a current account held with Banca Intesa in the name of CITT, whose a balance was €339,359 as at 31st December 2022 and a current account held with Banca Intesa relating to non-MEF funds, which carried a balance as at 31st December 2022 of €3,912,218.

The table below reports some balance sheet ratios to give a clearer understanding of the financial position.

EURO	31/12/2022	31/12/2021
FIXED ASSETS (FA) / INVESTED CAPITAL (IC)	35.3%	33.6%
READY LIQUIDITY (RL) / INVESTED CAPITAL (IC)	32.0%	17.6%
EQUITY LESS FIXED ASSETS	344,705,341	288,757,965

INVESTMENTS

During the year, investments were made in the following areas:

EURO - FIXED ASSETS	31/12/2022	31/12/2021	NET INVESTMENTS
TANGIBLE ASSETS			
LAND AND BUILDINGS	61,396,105	58,077,835	3,318,270
PLANT AND MACHINERY	2,713,821	1,809,382	904,439
INDUSTRIAL AND COMMERCIAL EQUIPMENT	31,975,887	27,110,243	4,865,644
OTHER ASSETS	23,694,308	24,263,846	(569,538)
ASSETS UNDER CONSTRUCTION	5,871,977	4,323,955	1,548,023
INTANGIBLE ASSETS			
CONCESSIONS, LICENCES, TRADEMARKS AND SIMILAR RIGHTS	38,134	6,981	31,153
OTHER	120,602	31,583	89,019

The item land and buildings relates mainly to costs for the repurposing of the South Pavilion and Palazzo Italia amounting to approximately €3 million.
In addition, further investments were made in laboratory equipment, machinery and furnishings. It is underlined that the balance at the end of 2022 of the item "other assets" was mainly determined by the reclassification of part of the 2021 balance from the item "assets under construction".

OTHER INFORMATION

The HT Foundation constantly monitors its internal operational processes, which are still in the process of growth and stabilisation, in order to progressively refine the way it governs its operations and functioning (regulations and procedures).

ORGANISATION, MANAGEMENT AND CONTROL MODEL

On 29th June 2022, the HT Foundation approved an update of its "Organisation, Management and Control Model" pursuant to Legislative Decree No. 231/2001, which regulates the corporate liability of entities regarding offences caused by crime. As an integral part of the aforementioned model, the Foundation has adopted a Code of Ethics, through which it has identified a system of values and rules of conduct to which constant reference should be made in the exercise of its activities.

ENTRY IN THE ISTAT LIST OF PUBLIC ADMINISTRATIONS

With a provision made in accordance with article 1, paragraph 2 of Legislative Decree No. 196/2009, the National Institute of Statistics *(Istituto Nazionale di Statistica – ISTAT)* included the HT Foundation in the ISTAT List of Public Administrations.

Following its registration, the HT Foundation is subject to provisions on public finance, including the rules on the containment of public expenditure, in force at the time, which are periodically communicated by the State General Accounting Office (most recently with Circular No. 23 of 19th May 2022) by means of a specific official document to which an overview of the applicable provisions is attached.

In this regard, in the uncertainty over the applicability of the public expenditure containment rules and in particular those rules which for the purposes of their application refer to financial statements relating to periods prior to the financial year 2018, i.e. before HT was operational, a question was submitted to the State General Accounting Office regarding the possibility of obtaining exemption from these expenditure containment rules, at least until the completion of the works designed to enable the Foundation's scientific activities to become operational (building and renovation of the structures and infrastructures) as per article 1, paragraph 275, of Law No. 160/2019.

On 11th January 2023 the HT Foundation received a reply from the State General Accounting Office in which it stated *that the request "would necessarily need to be submitted to the assessment of the supervisory administrations" which, however, have not yet been formalised*.

MULTI-ANNUAL PLANNING DOCUMENT 2023 - 2025

On 2nd February 2023, the *Consiglio di Sorveglianza* approved an update of the Foundation's Multi-Annual Planning Document for the period 2023 - 2025, on the basis of article 13 of the Statutes.

THE CENTRE FOR INNOVATION AND TECHNOLOGY TRANSFER

The Centre for Innovation and Technology Transfer was established pursuant to article 49-bis of Decree Law No. 34 of 19th May 2020 (converted into Law No. 77 on 17th July 2020) as an internal Department of the Foundation. In 2022 its activities focused on three lines of action:

1. Business training for Italian scientists and researchers working in the life sciences sector by providing specialist courses for young researchers with the aim of offering a basic understanding of the technology transfer process.

2. Support for the creation and implementation of a network of technology transfer partners. To achieve this, in 2022 CITT signed collaboration agreements with CDP Venture Capital and Cariplo Factory - Berkley Skydeck Europe to promote joint technology transfer initiatives.

3. International promotion, by fostering (i) interaction between the Italian technology transfer system and that of other countries, in order to study models potentially applicable to the Italian economy, (ii) exchanges between researchers and (iii) attracting talent and funds to invest in innovation produced in Italy. To achieve this, in 2022 CITT pursued these objectives by means of study tours and networking initiatives designed to explore possible collaborations with Switzerland, Austria, Belgium, Brazil and Qatar.

CONSIGLIO DI SORVEGLIANZA

As at 31st December 2022, the *Consiglio di Sorveglianza* of the Foundation was composed of twelve members, including the Chairman. We report that the four-year term of office of the first members of the *Consiglio di Sorveglianza*, appointed pursuant to article 12, paragraph 2, letter a) of the Statutes, expired on 15th May 2022 and, by a Decree of the President of the Council of Ministers (DPCM) of 7th July 2022, the President of the Council of Ministers appointed five new members, including the Chairman, to replace the previous members whose term of office had expired, and it also confirmed the second term of office of one member for a further four years.

Furthermore as already reported, an additional member of the *Consiglio di Sorveglianza* may be appointed by the Participating Members, by common agreement, on condition that they pay, jointly, at least 3% of the annual contribution paid by the State.

To date, the HT Foundation has no Participating Members.

MANAGEMENT COMMITTEE

As at 31st December 2022, the Management Committee of the Foundation was composed of five members, including the Chairman. On 20th October 2022, the *Consiglio di Sorveglianza* reappointed the three members whose term of office had expired during the year, Prof. Irene Bozzoni, Dr. Nando Minnella and Prof. Stefano Piccolo, for a new four-year term of office.

SCIENTIFIC COMMITTEE

The Scientific Committee of the Foundation is an advisory body to which the statute assigns a wide range of functions, which include assessing the Foundation's scientific activity, its organisation in the medium-term and the proper allocation of resources (both economic and human) to the various projects in operation.

The committee is composed of fifteen members appointed by the *Consiglio di Sorveglianza*. They hold office for four years.

In the second half of 2021, the search for and selection of the members of the Scientific Committee by the *Consiglio di Sorveglianza* began. To date this has resulted in the selection of fourteen members with five substitutes appointed on 28th January 2022. The first meeting of the Scientific Committee was held on 28th March 2022, when Prof. Gualtiero Ricciardi was elected as chairman.

INTERNAL AUDIT & COMPLIANCE AREA

In September 2020 the HT Foundation set up an Internal Audit and Compliance area.
With regard to its compliance activities, this function drew up and then implemented internal regulations as follows: regulations, approved by the Management Committee and the *Consiglio di Sorveglianza*; procedures, approved by the Management Committee; and guidelines, approved by the Director of the Foundation.

The function also manages the Register of Conflicts of Interest.
With regard to Internal Audit activities, the annual Internal Audit Plan was formulated, based on a risk analysis.
The following audits had been carried out as at 31st December 2022: Purchasing follow-up, ICT, HSE and Campus development, Missions and Transfers follow-up, Human Resources.

STAKEHOLDER RELATIONS

Meetings and institutional visits were organised in 2022 with national and local stakeholders of the Foundation. These included the then Ministers of Regional Affairs and of Technological Innovation and Digital Transition, the heads of the EneaTech and the Biomedical Foundation, the *Accademia dei Lincei*, members of the European Parliament's Committee on Industry, Research and Energy (ITRE) and numerous diplomats and representatives of local institutions who visited the Foundation's headquarters and laboratories.
Furthermore, acting on the basis of article 1, paragraph 275, letter a) of Law No. 160 of 27th December 2019, the Foundation produced a Biennial Report on activities carried out and planned. It was sent to the Supervising Ministries and Chambers of Parliament and presented to the national scientific community at an open day for discussions organised on 19th December 2022.

In 2022, the second edition of the Integrated Report was published to provide the Foundation's stakeholders with a unified view of HT's many aspects and also to progressively improve the transparency of the Institute. As part of activities related to the drafting of the document, an event entitled "The Integrated Report and Sustainable Growth" was held for the Foundation's stakeholders.

HUMAN RESOURCES AND ORGANISATION

The number of HT Foundation employees at the end of 2022 was 250, a substantial increase compared with 159 at the end of 2021. The employee count was composed of 37 senior managers (National Collective Bargaining Agreement - NCBA - Industry Executives), 58 middle managers and 155 administrative workers (NCBA - Chemicals). In 2022 110 personal were recruited compared with 19 departures.

Furthermore, numbers of PhD students and post-doctoral fellows continued to increase, having reached 42 and 25 respectively by the end of 2022.

The Foundation continued to work to refine its organisational structure in the reporting period, in order to improve rationalisation and efficiency in management of processes, by drawing up and updating regulations and internal procedures. The organisational regulations approved in 2021 now need to be updated, to accommodate the organisational growth that has taken place.

The non-scientific training courses provided in 2022 represented mainly compulsory training and, more specifically, safety at work, regulatory and contractual matters, IT security, English and Italian languages for personnel from abroad, leadership development and issues related to the gender equality plan approved in 2022 by the Foundation's governance bodies. The training was delivered using different methods of teaching in both e-learning and classroom modes.

EVENTS OCCURRING AFTER THE END OF THE FINANCIAL YEAR

In a meeting held on 2nd February 2023 the *Consiglio di Sorveglianza* approved an Implementation Plan for the National Facilities and also the final design for the South Building and the Technological Hub and the related "Technical and Economic Framework" showing the total costs to complete the work. In that same meeting, the purchase of the land owned by Arexpo on which the new buildings will be constructed was approved.

On 21st February 2023, the *Consiglio di Sorveglianza* completed the process of selecting a new Director and appointed Prof. Marino Zerial, who will take up the appointment in 2023 to replace Prof. Iain Mattaj, whose term of office ended on 31st December 2022. At the request of the governing bodies, Prof. Mattaj agreed to continue in his position until 28th February, pending the selection of a new director by those governing bodies.

OUTLOOK FOR FUTURE OPERATIONS

With regard to the development of internal research activities, it is planned to consolidate the lines of work of existing Research Groups and to continue the various medical genomics studies and large-scale collaborations between HT and other scientific institutions.

With regard to personnel, the selection and appointment of new personnel will continue, above all in the Research Centres and the scientific facilities, consistent with the growth plan contained in the "Programme Forecast Document" for 2023, which sets a goal of a 300-strong workforce by the end of the year.

As concerns infrastructure, the process of obtaining a building permit for the new buildings that will complete the Campus will continue, with the aim of putting the works for the construction of the buildings out to tender by the first quarter of 2024.

It is also planned to make significant investments in design and construction work to create spaces to house the first National Facilities, particularly in the South Pavilion, as well as to increase the necessary computing, storage and network infrastructure.

With regard to the "National Facilities Implementation Plan", the formulation and opening of the first calls for tenders for access to the facilities of the first external research projects is planned, in accordance with the Convention signed with the Supervising Administrations pursuant to Law No. 160/2019.

PROPOSAL FOR THE ALLOCATION OF THE OPERATING SURPLUS

Ladies, Gentlemen,

We would like to thank you for the trust you have placed in us and invite you to approve the Financial Statements, the Notes to the Financial Statements and this Report as presented. We also propose that the economic surplus for the financial year 2022, amounting to €38,032, be allocated to the Operating Fund.

Milan, 20th April 2023

THE *CONSIGLIO DI SORVEGLIANZA*
The Chairman
(Prof. Gianmario Verona)

FINANCIAL STATEMENTS - BALANCE SHEET AND INCOME STATEMENT

HT FOUNDATION BALANCE SHEET - ASSETS

BALANCE SHEET - ASSETS (AMOUNTS IN EURO)	31/12/2022	31/12/2021
A) RECEIVABLES FROM SHAREHOLDERS FOR PAYMENTS STILL DUE	**-**	**-**
Receivables from shareholders already called up	-	-
Receivables from shareholders not yet called up	-	-
B) FIXED ASSETS, WITH LEASED ASSETS SHOWN SEPARATELY	**125,810,834**	**115,623,825**
I. Intangible assets	**158,736**	**38,564**
1) Start-up and expansion costs	-	-
2) Research, development and advertising costs	-	-
3) Industrial patent and intellectual property rights	-	-
4) Concessions, licences, trademarks and similar rights	38,134	6,981
5) Goodwill	-	-
6) Intangible assets under construction and advances	-	-
7) Other	120,602	31,583
II. Tangible assets	**125,652,098**	**115,585,261**
1) Land and buildings	61,396,105	58,077,835
2) Plant and machinery	2,713,821	1,809,382
3) Industrial and office equipment	31,975,887	27,110,243
4) Other assets	23,694,308	24,263,846
5) Assets under construction and down payments	5,871,977	4,323,955
6) Leased	-	-
III. Financial assets	**-**	**-**
C) CURRENT ASSETS	**504,247,652**	**435,998,719**
I. Inventories	**58,004**	**73,696**
1) Raw materials, ancillaries and consumables	58,004	73,696

BALANCE SHEET - ASSETS (AMOUNTS IN EURO)	31/12/2022	31/12/2021
II. Loans and receivables	**390,259,720**	**375,445,989**
1) From customers	87,702	93,594
- within 12 months	87,702	93,594
- over 12 months	-	-
5-bis) Tax receivables	80,632	33,140
- within 12 months	80,632	33,140
- over 12 months	-	-
5- quater) From others	389,775,433	375,319,254
- within 12 months	389,775,433	375,319,254
- over 12 months	-	-
6) Other receivables for amounts charged back internally	315,953	-
- within 12 months	315,953	-
- over 12 months	-	-
III. Financial assets other than fixed assets	**103,725,028**	**40,013,999**
7) Non-interest-bearing accounts with the General State Treasury	103,725,028	40,013,999
IV. Cash and cash equivalents	**10,204,900**	**20,465,035**
1) Bank and postal accounts	10,203,763	20,464,315
2) Cheques	-	-
3) Cash and other valuables on hand	1,137	719
D) ACCRUED INCOME AND PREPAID EXPENSES	**1,452,443**	**562,319**
Discount on loans	-	-
Others	1,452,443	562,319
TOTAL ASSETS	**631,510,929**	**552,184,863**

HT FOUNDATION BALANCE SHEET - LIABILITIES

BALANCE SHEET - EQUITY AND LIABILITIES (IN EURO)	31/12/2022	31/12/2021
A) EQUITY	**470,516,175**	**404,381,790**
I. Endowment fund and reserves	**77,261,869**	**77,261,869**
- HT Endowment Fund	77,261,869	77,261,869
- CITT Endowment Fund	-	-
II. Equity restricted by third parties	**-**	**-**
III. Equity restricted by board decision	**-**	**-**
IV. Operating fund	**393,155,844**	**327,059,490**
- HT operating fund	236,760,236	246,003,374
- NF operating fund	143,164,179	69,569,748
- CITT operating fund	13,231,429	11,486,368
V. By-law related reserves	**-**	**-**
VI. Treasury share reserve	**-**	**-**
VII. Other reserves: stated separately	**-**	**-**
VIII. Retained operating surplus from previous year	**60,431**	**42,684**
IX. Operating surplus for the year	**38,032**	**17,747**
B) PROVISIONS FOR LIABILITIES AND CHARGES	**1,301**	**-**
1) Provision for pension and similar obligations	**-**	**-**
2) Provision for current and deferred taxes	**-**	**-**
3) Other provisions	**1,301**	**-**
C) POST-EMPLOYMENT BENEFIT PROVISION	**1,023,134**	**564,922**
D) LOANS AND PAYABLES	**25,717,646**	**20,652,547**

BALANCE SHEET - EQUITY AND LIABILITIES (IN EURO)	31/12/2022	31/12/2021
4) Loans from banks	**98**	**-**
- within 12 months	98	-
- over 12 months	-	-
7) Trade payables	**20,482,890**	**18,807,062**
- within 12 months	20,482,890	18,807,062
- over 12 months	-	-
12) Tax payables	**2,956,573**	**724,397**
- within 12 months	2,956,573	724,397
- over 12 months	-	-
13) Payables to pension and social security institutions	**1,089,137**	**632,292**
- within 12 months	1,089,137	632,292
- over 12 months	-	-
14) Other payables	**915,248**	**488,796**
- within 12 months	915,248	488,796
- over 12 months	-	-
15) Other payables for amounts charged back internally	**273,701**	**-**
- within 12 months	273,701	-
- over 12 months	-	-
E) ACCRUED EXPENSES AND DEFERRED INCOME	**134,252,672**	**126,585,603**
- premium on loans	-	-
- other	134,252,672	126,585,603
TOTAL EQUITY AND LIABILITIES	**631,510,929**	**552,184,863**

HT FOUNDATION INCOME STATEMENT

INCOME STATEMENT (IN EURO)	31/12/2022	31/12/2021
A) VALUE OF PRODUCTION	**65,779,053**	**36,220,072**
1) Revenues from sales and services	**-**	**-**
2) Change in inventories of work in progress, semi-finished and finished products	**-**	**-**
3) Change in work in progress on orders	**-**	**-**
4) Increase in internally constructed assets	**-**	**-**
5) Other revenues and income:	**65,779,053**	**36,220,072**
a) Other	191,691	49,363
b) Grants to HT:	64,737,640	35,566,404
- of which operating grants to HT*	51,925,398	29,495,803
- of which capital grants to HT	12,812,242	6,070,601
c) Grants to CITT	254,939	422,857
- of which capital grants to CITT	-	-
- of which operating grants to CITT	254,939	422,857
d) Grants to "National Facilities"*	46,625	119,979
e) Grants from other institutions	548,158	61,469
- of which capital grants from other institution	-	-
- of which operating grants from other institution	548,158	61,469
B) COSTS OF PRODUCTION	**65,112,804**	**35,660,571**
6) Cost of raw materials, ancillary materials, consumables and goods for resale	**8,923,279**	**2,596,936**
7) Cost of services	**23,453,360**	**14,719,853**
8) Cost of rents and leases	**1,140,275**	**1,640,201**
9) Personnel costs	**17,652,328**	**10,580,270**
a) Wages and salaries	12,807,916	7,808,324
b) Social security contributions	3,563,014	2,029,381
c) Post-employment benefits	862,395	496,983
d) Pensions and similar	107,485	63,499
e) Other costs	311,518	182,084
10) Amortisation, depreciation and write-downs	**12,837,770**	**6,070,601**
a) Amortisation of intangible assets	44,394	11,906

** 2021 item reclassified.*

INCOME STATEMENT (IN EURO)	31/12/2022	31/12/2021
b) Depreciation of tangible assets	12,793,376	6,058,695
c) Other fixed asset write-downs	-	-
d) Write downs of current receivables and cash and cash equivalents	-	-
11) Changes in raw materials, ancillary materials, consumables and goods for resale	**15,692**	**(73,696)**
12) Provision for liabilities and charges	**-**	**-**
13) Other provisions	**1,301**	**-**
14) Other operating costs	**1,088,799**	**126,407**
Difference between Value and Cost of Production	**666,249**	**559,501**
C) FINANCIAL INCOME AND COSTS	**(10,777)**	**785**
16) Other financial income	**-**	**1,968**
a) From loans and receivables (fixed assets)	-	-
b) From securities (fixed assets)	-	-
c) From securities (current assets)	-	-
d) From financial income other than the above:	-	1,968
- other financial income	-	1,968
17) Interest and other financial charges:	**(3,313)**	**(112)**
- to subsidiaries	-	-
- to associates	-	-
- to parent companies	-	-
- to others	(3.313)	(112)
17-bis) Exchange-rate gains and losses	**(7,464)**	**(1,072)**
D) VALUE ADJUSTMENTS TO FINANCIAL ASSETS	**-**	**-**
Operating surplus before tax	**655,472**	**560,285**
20) Income taxes	**617,441**	**542,538**
a) Current taxes	617,441	542,538
b) Deferred taxes	-	-
c) Prepaid taxes	-	-
d) Income (expense) from the participation in tax consolidation/fiscal transparency regime	-	-
21) Operating surplus for the year	**38,032**	**17,747**

CASH FLOW STATEMENT

HT FOUNDATION CASH FLOW STATEMENT

INDIRECT METHOD - DESCRIPTION [€]	31/12/2022	31/12/2021
A. CASH FLOWS FROM OPERATING ACTIVITIES		
Operating surplus for the year	38,032	17,747
Income taxes	617,441	542,538
Interest expense (interest income)	3,313	(1,856)
(Dividends)	-	-
(Gains)	-	-
Total capital (gains) / losses from the disposal of assets	-	-
of which tangible assets	-	-
of which intangible assets	-	-
of which fixed financial assets	-	-
1. Operating surplus for the year before income taxes, interest, dividends and capital gains/losses from sale	**658,785**	**558,429**
Adjustments for non-cash items with no offsetting items in net working capital	-	-
Provisions for the year	1,301	-
Amortisation / Depreciation of fixed assets	12,837,770	6,070,601
Write-downs of assets due to impairment	-	-
Adjustments to derivative financial assets and liabilities which do not result in changes in cash flows	-	-
Other adjustments to non-cash items	-	-
Total adjustments for non-cash items with no offsetting items in net working capital	12,839,071	6,070,601

INDIRECT METHOD - DESCRIPTION [€]	31/12/2022	31/12/2021
2. Cash flow before changes in net working capital	**13,497,856**	**6,629,029**
Changes in net working capital	-	-
Decrease/(increase) in inventories	15,692	(73,696)
Decrease/(increase) in trade receivables	5,892	(79,391)
Increase/(decrease) in trade payables	1,675,828	9,742,183
Decrease/(increase) in accrued income and prepaid expenses	(890,124)	(143,602)
Increase /(decrease) in accrued expenses and deferred income	7,667,068	65,824,257
Other decreases/(increases) in net working capital	(11,163,115)	(66,448,617)
Total changes in net working capital	(2,688,758)	8,821,134
3. Cash flow after changes in net working capital	**10,809,098**	**15,450,164**
Other adjustments	-	-
Interest collected/(paid)	(3,313)	1,856
(Income taxes paid)	(884,775)	(341,023)
Dividends collected	-	-
(Use of provisions)	458,212	343,984
Other collections/(payments)	-	-
Total other adjustments	(429,876)	4,817
CASH FLOW FROM OPERATING ACTIVITIES (A)	**10,379,222**	**15,454,981**

INDIRECT METHOD - DESCRIPTION [€]	31/12/2022	31/12/2021
B. CASH FLOW FROM INVESTING ACTIVITIES		
Tangible assets	**(22,860,213)**	**(60,916,609)**
(Investments)	(22,860,213)	(60,916,609)
Disinvestments	-	-
Intangible assets	**(164,566)**	**(16,470)**
(Investments)	(164,566)	(16,470)
Disinvestments	-	-
Financial assets	**-**	**-**
(Investments)	-	-
Disinvestments	-	-
Financial assets not included among fixed assets	**(63,711,029)**	**(6,008,047)**
(Investments)	(63,711,029)	(6,008,047)
Disinvestments	-	-
(Acquisition of business units net of cash and cash equivalents)	**-**	**-**
Disposal of business units net of cash and cash equivalents	**-**	**-**
CASH FLOW FROM INVESTING ACTIVITIES (B)	**(86,735,808)**	**(66,941,126)**
C. CASH FLOWS FROM FINANCING ACTIVITIES		
Debt	-	-
Increase/(decrease) in bank loans	98	(60)
New loans	-	-

INDIRECT METHOD - DESCRIPTION [€]	31/12/2022	31/12/2021
(Loans repaid)	-	-
Equity	-	-
Increase in Endowment Fund	-	-
Increase in Operating Fund	66,096,353	22,404,516
(Dividends and interim dividends paid)	-	-
CASH FLOW FROM FINANCING ACTIVITIES (C)	**66,096,451**	**22,404,456**
INCREASE/(DECREASE) IN CASH AND CASH EQUIVALENTS (A ± B ± C)	**(10,260,134)**	**(29,081,689)**
Exchange rate effect on cash and cash equivalents	-	-
Cash and cash equivalents at the beginning of the year	**-**	**-**
Bank and postal deposits	20,464,315	49,546,685
Cheques	-	-
Cash and valuables in hand	719	39
Total cash and cash equivalents at beginning of year	**20,465,035**	**49,546,724**
Of which restricted	-	-
Cash and cash equivalents at end of year	**-**	**-**
Bank and postal deposits	10,203,763	20,464,315
Cheques	-	-
Cash and valuables in hand	1,137	719
Total cash and cash equivalents at end of year	**10,204,900**	**20,465,035**
Of which restricted	-	-

INCOME STATEMENT – CITT DETAIL

INCOME STATEMENT (IN EURO)	31/12/2022	31/12/2021
A) VALUE OF PRODUCTION	**254,939**	**422,857**
1) Revenues from sales and services	**-**	**-**
2) Change in inventories of work in progress, semi-finished and finished products	**-**	**-**
3) Change in work in progress on orders	**-**	**-**
4) Increase in internally constructed assets	**-**	**-**
5) Other revenues and income:	**254,939**	**422,857**
a) Other	-	-
b) Grants to HT:	-	-
- of which operating grants to HT*	-	-
- of which capital grants to HT	-	-
c) Grants to CITT	254,939	422,857
- of which capital grants to CITT	-	-
- of which operating grants to CITT	254,939	422,857
d) Grants to "National Facilities"*	-	-
e) Grants from other institutions	-	-
- of which capital grants from other institution	-	-
- of which operating grants from other institution	-	-
B) COSTS OF PRODUCTION	**254,939**	**422,857**
6) Cost of raw materials, subsidiary materials, consumables and goods for resale	**-**	**-**
7) Cost of services	**130,867**	**386,115**
8) Cost of rents and leases	**-**	**-**
9) Personnel costs	**123,947**	**36,742**
a) Salaries and wages	114,143	36,742
b) Social security contributions	6,774	-
c) Post-employment benefits	1,568	-
d) Pensions and similar	534	-
e) Other costs	928	-
10) Amortisation, depreciation and write-downs	**-**	**-**
a) Amortisation of intangible assets	-	-

** 2021 item reclassified.*

INCOME STATEMENT (IN EURO)	31/12/2022	31/12/2021
b) Depreciation of tangible assets	-	-
c) Other assets write-downs	-	-
d) Write downs of current receivables and cash and cash equivalents	-	-
11) Changes in raw materials, subsidiary materials, consumables and goods for resale	**-**	**-**
12) Provision for liabilities and charges	**-**	**-**
13) Other provisions	**-**	**-**
14) Other operating costs	**125**	**-**
Difference between Value and Cost of Production	**-**	**-**
C) FINANCIAL INCOME AND COSTS	**-**	**-**
16) Other financial income	**-**	**-**
a) From loans and receivables (fixed assets)	-	-
b) From securities (fixed assets)	-	-
c) From securities (current assets)	-	-
d) From financial income other than the above:	-	-
- other financial income	-	-
17) Interest and other financial charges:	**-**	**-**
- to subsidiaries	-	-
- to associates	-	-
- to parent companies	-	-
- to others	-	-
17-bis) Exchange-rate gains and losses	**-**	**-**
D) VALUE ADJUSTMENTS TO FINANCIAL ASSETS	**-**	**-**
Pre-tax results	**-**	**-**
20) Income taxes	**-**	**-**
a) Current taxes	-	-
b) Deferred taxes	-	-
c) Prepaid taxes	-	-
d) Income (expense) from the participation in tax consolidation/fiscal transparency regime	-	-
21) Operating surplus for the year	**-**	**-**

INCOME STATEMENT – DETAIL OF BUSINESS ACTIVITY

INCOME STATEMENT (IN EURO)	31/12/2022	31/12/2021
A) VALUE OF PRODUCTION	**98,864**	**37,077**
1) Revenues from sales and services	**-**	**-**
2) Change in inventories of work in progress, semi-finished and finished products	**-**	**-**
3) Change in work in progress on orders	**-**	**-**
4) Increase in internally constructed assets	**-**	**-**
5) Other revenues and income:	**98,864**	**37,077**
a) Other	98,864	37,077
b) Grants to HT:	-	-
- of which operating grants to HT*	-	-
- of which capital grants to HT	-	-
c) Grants to CITT	-	-
- of which capital grants to CITT	-	-
- of which operating grants to CITT	-	-
d) Grants to "National Facilities"*	-	-
e) Grants from other institutions	-	-
- of which capital grants from other institution	-	-
- of which operating grants from other institution	-	-
B) COSTS OF PRODUCTION	**583,531**	**995,684**
6) Cost of raw materials, subsidiary materials, consumables and goods for resale	**(5,551)**	**136,697**
7) Cost of services	**207,479**	**459,105**
8) Cost of rents and leases	**-**	**-**
9) Personnel costs	**68,808**	**52,230**
a) Salaries and wages	51,744	47,422
b) Social security contributions	13,176	4,150
c) Post-employment benefits	2,876	659
d) Pensions and similar	12	-
e) Other costs	1,000	-
10) Amortisation, depreciation and write-downs	**256,480**	**239,016**
a) Amortisation of intangible assets	-	-

** 2021 item reclassified.*

INCOME STATEMENT (IN EURO)	31/12/2022	31/12/2021
b) Depreciation of tangible assets	256,480	239,016
c) Other assets write-downs	-	-
d) Write downs of current receivables and cash and cash equivalents	-	-
11) Changes in raw materials, subsidiary materials, consumables and goods for resale	**-**	**-**
12) Provision for liabilities and charges	**-**	**-**
13) Other provisions	**-**	**-**
14) Other operating costs	**56,314**	**108,637**
Difference between Value and Cost of Production	**(484,667)**	**(958,608)**
C) FINANCIAL INCOME AND COSTS	**(953)**	**-**
16) Other financial income	**-**	**-**
a) From loans and receivables (fixed assets)	-	-
b) From securities (fixed assets)	-	-
c) From securities (current assets)	-	-
d) From financial income other than the above:	-	-
- other financial income	-	-
17) Interest and other financial charges:	**-**	**-**
- to subsidiaries	-	-
- to associates	-	-
- to parent companies	-	-
- to others	-	-
17-bis) Exchange-rate gains and losses	**(953)**	**-**
D) VALUE ADJUSTMENTS TO FINANCIAL ASSETS	**-**	**-**
Pre-tax results	**(485,620)**	**(958,608)**
20) Income taxes	**186,270**	**258,126**
a) Current taxes	186,270	258,126
b) Deferred taxes	-	-
c) Prepaid taxes	-	-
d) Income (expense) from the participation in tax consolidation/fiscal transparency regime	-	-
21) Operating surplus for the year	**(671,890)**	**(1,216,734)**

Notes to the financial statements

PART A - INTRODUCTION

The Human Technopole Foundation - hereinafter: "HT Foundation", "Foundation", or "HT" - was founded by article 1, paragraph 116 of Law No. 232 of 11th December 2016.
The financial year ended 31st December 2022 was the Foundation's fifth year of operation and it saw the growth of its scientific operations through the launch of research activities and the infrastructure development of the HT Campus, which led to the re-purposing of the South Pavilion and Palazzo Italia.

The amounts shown in these financial statements take into account the forecasts contained in the Convention, already provided for by the Budget Law No. 160 of 27th December 2019, article 1 - paragraphs 275 to 277, which the Foundation signed on 30th December 2020 with the Founding Ministries - Ministry of Universities and Research, Ministry of the Economy and Finance and the Ministry of Health.

More specifically, the Convention assigns to the Human Technopole Foundation, as part of its mission as a scientific infrastructure hub supporting national scientific research, the task of supporting newly identified "scientific infrastructure facilities", defined as "structures, resources and related services used by the scientific community to conduct high-quality research in their respective fields, regardless of which organisation or country they come from".

Within the scope of this mandate, the Foundation is required to allocate a share of no less than 55% (fifty-five per cent) per annum of the public funding granted to the Foundation pursuant to article 1, paragraph 121, of Law No. 232 of 11th December 2016, but excluding from its "scope of application" "the facilities under construction in accordance with the provisions of the multi-year Strategic Plan for scientific activities referred to in articles 13.3(b) and 18.2(a) of the HT Foundation's Statutes, and the resources necessary for their construction, management and maintenance".

These financial statements, submitted for your examination and approval, show an operating surplus for the year of €38,032.

The following is a summary of the public grants received and the related use of financial resources during the year.

YEAR	ACTIVITY	AMOUNT (IN EURO)
2018 2019	Amount of grant received on 22.10.2018	6,531,520
	Amount of Endowment Fund received on 27.12.2019	77,140,000
	Outlays from 01.11.2018 to 31.12.2018	137,790
	Outlays from 01.01.2019 to 31.12.2019	4,372,803
	Remaining funds as at 31.12.2019	**79,160,927**
2020	Amount of grant received on 11.08.2020	35,812,898
	Amount of grant received on 17.12.2020	24,005,952
	Amount of grant received on 17.12.2020 CITT	10,000,000
2020	Receipt of residual endowment fund on 26.05.2020	31,312
	Reimbursement for cost recovery/amounts charged back from 01.01.2020 to 31.12.2020	90,063
	Outlays from 01.01.2020 to 31.12.2020 (Banca Intesa) and cash	65,520,110
	Outlays from 01.01.2020 to 31.12.2020 CITT	28,426
	Remaining funds as at 31.12.2020	**83,552,616**
2021	Amount of grant received on 09.10.2021 BDI	7,818,663
	Amount of grant received on 21.09.2021 BDI	30,763,999
	Amount of grant received on 16.12.2021 BDI	17,978,376
	Other amounts received from 01.01.2021 to 31.12.2021 (Banca Intesa) CITT	807
	Amount of grant received on 27.09.2021 (EMBO)	16,250
	Amount of grant received on 02.12.2021 (GOOGLE IRELAND LIMITED)	8,747
	Amount of grant received on 13.12.2021 (LONGEVITY IMPETUS)	176,062
	Amount of grant received on 24.12.2021 (MAECI)	12,810
	Net outlays from 01.01.2021 to 31.12.2021 (Banca Intesa) and cash	79,849,295
	Remaining funds as at 31.12.2021	**60,479,034**
2022	Amount of grant received on 15.11.2022	22,760,586
	Amount of grant received on 03.10.2022 BDI	41,165,459
	Amount of grant received on 22.12.2022 BDI	9,948,204
	Amount of grant received on 04.07.2022 BDI	30,000,000
	Amount of grant received on 27.12.2022 BDI	20,600,779
	Amount of grant received on 24.02.2022 (WAF - Harschnitz)	143,090
	Amount of grant received on 25.01.2022 (EI08A - SVCF-Deschamps)	17,643
	Amount of grant received on 27.01.2022 (EI07A - SVCF-Jug)	17,792
	Amount of grant received on 26.01.2022 (EI02A - EMBO-Pigino)	48,750
	Amount of grant received on 06.05.2022 (EI09A - ERC-Coscia)	524,563
	Amount of grant received on 27.06.2022 (Grant Helen Foster)	33,000
	Amount of grant received on 28.06.2022 (EI09A - ERC-Coscia)	374,688
	Amount of grant received on 22.11.2022 (EI12A - NEUROCOV)	1,132,229
	Amount of grant received on 17.11.2022 (EI16A - EUREKA)	36,443
	Amount of grant received on 11.11.2022 (BBRF HARSCHNITZ NARSAD)	16,778
	Amount of grant received on 19.10.2022 (EI03A - ERC PIGINO CILIATUBULIN)	325,056
	Amount of grant received on 17.10.2022 (AI4LIFE)	575,250
	Amount of grant received on 27.09.2022 (EI02A - EMBO-Pigino)	16,250
	Amount of grant received on 09.09.2022 (R2D2)	175,000
	Amount of grant received on 26.08.2022 (EI15A - EMBO HARSCHNITZ COLOMBO)	22,000
	Amount of grant received on 08.07.2022 (EI10A - WAF HARSCHNITZ)	196,333
	Outlays from 01.01.2022 to 31.12.2022 (Banca Intesa) and cash	74,678,998
	Remaining funds as at 31.12.2022	**113,929,929**

SIGNIFICANT EVENTS DURING THE YEAR

Reference is made in full to the Management Report.

ACCOUNTING POLICIES

The Financial Statements for the year ended 31st December 2022 have been prepared in accordance with articles 2423 et seq. of the Italian Civil Code, adopting the extended form, although the prerequisites set out in article 2435-bis for preparation in an abbreviated form apply. The criteria used in the preparation of the accounts and measurement take account of the rules contained in national legislation pursuant to Legislative Decree No. 139/2015, which implemented Directive 2013/34/EU.

Amounts in the balance sheet are shown in whole euros by rounding off the relative amounts. Rounding differences, if any, have been reported within the item "Euro rounding reserve" in equity. The notes to the financial statements have been prepared in whole euros in accordance with article 2423, paragraph 6 of the Italian Civil Code. The notes to the financial statements present information on items in the balance sheet and income statements in the order in which the relative items are shown in the respective financial statements.

BASIS OF PREPARATION

The measurement of items in the Financial Statements was based on criteria of prudence, accrual accounting principles and a "going concern" assumption.

In compliance with accrual accounting principles, the results of transactions and other events were recognised in the accounts and were attributed to the financial period to which those transactions and events relate and not to that in which the actual cash flows occurred (receipts and payments).

In application of the materiality principle, obligations concerning recognition, measurement, presentation and disclosure are not complied with when that compliance was immaterial for the purpose of giving a true and fair view.

Continuity over time in the application of measurement criteria constitutes a necessary criterion for the purposes of the comparability of the financial statements of the company over different financial years.

It is underlined that some of the balance sheet and income statement balances for the previous year have been reclassified to give a better presentation. The recognition and presentation of items in the financial statements take account of the substance of the transaction or contract.

The financial statements consist of the "Balance Sheet", the "Income Statement", the "Cash Flow Statement", the "Notes to the Financial Statements" and the "Management Report".

The "Balance Sheet" is divided into general classes in order of decreasing liquidity, while items and groups of items are divided according to their nature.

The various items in the balance sheet are stated net of the relative adjustments to them.
Memorandum accounts are no longer presented in the financial statements and are described in these notes.

The "Income Statement" has been prepared in accordance with the presentation contained in article 2425 of the Italian Civil Code and reports the Foundation's operations.
The presentation of the statement is based on production costs and revenues, presented in a single column, in which costs are ordered by nature.

The income statement is divided into areas as follows:

- **Ordinary operations**, (items A and B), consisting of both the Foundation's core activities and its non-recurring activities and the operating result is defined as the "Difference between the value and the cost of production";

- **Financial operations**, (items C and D), consist of expenses and income resulting from the acquisition of funding and the temporary investment of those funds until they are used in ordinary operations;

- **Income taxes**, (item 20), consist of direct taxes (IRAP – regional production tax, and IRES – corporate income tax) levied on taxable income for the year. They have been stated with account taken of the taxable income for the year and on the basis of the applicable tax regulations in force. At the end of the year, no deferred tax liabilities or deferred tax assets existed.

The comparison with the previous accounting period is given by means of two separate columns, one with the balance for the current year and the other with that for the previous year.

The Statement of Cash Flows forms part of the financial statements. We report that in compliance with the Italian National Accounting Standard, OIC 10, the Foundation has used the indirect method for this statement.

The Notes to the Financial Statements have been prepared for the purpose of explaining, completing and analysing the information contained in the Balance Sheet, Income Statement and Cash Flow Statement. It also provides information on the measurement criteria used and the changes that occurred in the various asset and liability, and expense and income items.

They form an integral part of these financial statements and provide information in the text and tables, with specific reference to balance sheet, income statement and financing aspects.

CASES OF EXCEPTIONS PURSUANT TO ARTICLE 2423, PARAGRAPH 5 OF THE ITALIAN CIVIL CODE

No cases of exceptions occurred to make recourse necessary to the exceptions provided for under article 2423, paragraph 5 of the Italian Civil Code.

MEASUREMENT CRITERIA APPLIED

FIXED ASSETS

Intangible

These are recognised at historical cost of purchase inclusive of ancillary costs and VAT (where this is considered non-deductible because of an item's use in institutional activities) and they are stated net of amortisation recognised over the years and charged directly to the individual items.

Licences, concessions and trademarks are amortised at an annual rate of 20%.

If the value of an asset is impaired, it is written down by the amount of the impairment, regardless of the accumulated depreciation already recognised. If in subsequent years the underlying reasons for the write-down are no longer valid, then the original value, adjusted for amortisation only, is written back.

Tangible

Tangible assets are recognised at the historical cost of purchase, inclusive of ancillary costs and non-deductible VAT, net of the corresponding accumulated depreciation.
The depreciation rates, recognised through profit and loss, have been calculated considering the expected use, destination and the technical and operating life of the assets and on the basis of the remaining possible useful life, a criterion which we consider is well represented by the following depreciation rates, reduced by half in the year in which the asset is brought into operation:

TYPE OF ASSET	% DEPRECIATION
Industrial buildings	3%
Plant and machinery	15%
Furniture	12%
Fittings	15%
Electronic office machines	20%
Mobile phones	20%
Servers	20%

If the value of an asset is impaired, it is written down by the amount of the impairment, regardless of the accumulated depreciation already recognised. If in subsequent years the underlying reasons for the write-down are no longer valid, then the original value, adjusted for amortisation only, is written back.

INVENTORIES

The method used to measure inventories changed in 2022. Inventories previously measured and recognised in the balance sheet at cost of purchase were recognised at the average weighted cost.

LOANS AND RECEIVABLES

These are stated at their expected realisable value with no use of the amortised cost method, because all loans and receivables are due in the short-term and therefore the result of the application of the amortised cost method would be immaterial.

FINANCIAL ASSETS OTHER THAN FIXED ASSETS

As of the financial year 2016, the issue of the Italian National Accounting Standard OIC 14 changed the classification and measurement of cash and cash equivalents, limiting these to current bank and post office accounts which meet the conditions that cash can be drawn on demand and that it may be used for any business purpose. Given these limitations, we report two important aspects regarding deposits in treasury accounts held with the Bank of Italy in the Foundation's name:

- they do not meet the on-demand requirement (given the procedure and the drawings limit set by the law and by guidelines agreed with the State General Accounting Department (Ragioneria Generale dello Stato – RGS);
- the way they operate is very similar to that of a centralised treasury because it is impossible for the Foundation to gain direct access to funds without first submitting an authorisation and transfer request to the RGS.

In compliance with the new OIC 14 standard, these assets of the HT Foundation, which are held in treasury accounts with the Bank of Italy, have therefore been recognised at face value within "Financial assets other than fixed assets".

EQUITY

The equity of non-profit entities is intended to support the acquisition in the long-term of the necessary factors of production of both a current and an investment nature. By its nature it is therefore defined as a "designated fund", used to achieve the purposes set out in the Foundation's statutes.

LOANS AND PAYABLES

Loans and payables are recognised at their face value, which is considered representative of their cost of settlement and is substantially in line with the amortised cost method.

Loans and payables in foreign currency are recognised on the basis of the exchange rates ruling on the date on which the relative transactions were carried out. Positive and negative differences arising from measurements of the items in foreign currency at the end- of-year exchange rate are credited or debited on an accruals basis.

In addition to liabilities for invoices received, "Trade payables" include the amount of invoices to be received for services provided and orders delivered, but not yet invoiced by the balance sheet date.

"Tax payables" include liabilities for withholding taxes levied as a withholding agent, direct taxes for the year consisting of IRAP (regional production tax) and IRES (corporate income tax) and also indirect taxes. The latter are calculated on the basis of a realistic forecast of the tax liability to be paid, with account taken of the applicable tax regulations and they are stated net of payments on account.

"Payables to pension and social security institutions" include pension and social security costs relating to employees and collaborators that have accrued, but not yet been paid as at the balance sheet date, including amounts owed to supplementary pension funds for those who have opted for the right provided for by Law No. 296 of 27.12.2006 concerning the allocation of post employment benefits as from 01.01.2007.

"Other payables" are composed of remaining payables which by their nature do not fall within the preceding items. They include payables to employees for all amounts accrued due to them, in accordance with the applicable legislation, inclusive of amounts for holidays and other benefits accruing, but not yet received as at the balance sheet date.

The item "Other payables for amounts charged back internally" includes costs charged back from one fund to another (projects).

ACCRUALS, DEFERRALS AND PREPAYMENTS

These were calculated on an accruals basis for the year.
The item "prepaid expenses" includes costs incurred before the end of the year for the part relating to the following year.

The item "deferred income" relates to income received before the end of the year, relating to the following year.

POST-EMPLOYMENT BENEFIT PROVISION

This consists of the actual liability accruing due to employees in accordance with the law and current employment contracts, with account taken of all forms of remuneration of a continuous nature.
The provision corresponds to the total of the individual benefit amounts accruing due to employees as at the balance sheet date and consists of the amount which would be due to employees if their employment relationship were to terminate on that date. The amount shown in this item relates to the quotas of the post-employment provision that most employees decided to keep within the company because they did not opt for the right provided for by Law No. 296 of 27.12.2006 to pay the quotas of the post-employment benefits provision accruing from 01.01.2007 into supplementary pension funds.

INCOME TAXES

Taxes are set aside on an accrual basis and in accordance with current tax regulations.

At the end of the year, no deferred tax liabilities or deferred tax assets existed.

INCOME AND EXPENSES

Income and expenses are recognised on an accrual basis, regardless of the date of receipt and payment, and in accordance with the principle of prudence and that of preserving Human Technopole's equity as well as on a "going concern" assumption basis.

OPERATING GRANTS

In application of accounting standard No. 1 for non-profit entities, both on the basis of the Law and contract clauses, operating grants received for specific activities of the Foundation are recognised on an accrual basis, in accordance with the costs incurred to which they relate, regardless of when they are received.

In this regard the standard states that, "where there is a clear relationship between the income, which is nevertheless not that of consideration (donations and grants), and the specific activities of an entity, it can be matched to the expenses incurred during the year. This relationship constitutes a key corollary of the accrual and matching principles for operating events typical of institutional activities and it meets the requirement to set costs for the year, whether they are certain or assumed, against related income". As these grants are specifically designated for the Foundation's ordinary operations, they are recognised in the income statement within item A5) "Other revenues and income" or they are stated separately in the sub-items "Operating grants to…".

Costs relating to the year are partly covered by the use of grants that have been deferred during the previous year by recognition of the part relating to future years within the item deferred income and partly through the use of the "Operating fund".

CAPITAL GRANTS

Grants received in full are recognised in the financial statements within deferred income and are reduced at the end of each tax period, with the annual quota charged to the income statement calculated on the basis of the useful life of the fixed assets acquired.

In application of the Italian National Accounting Standard OIC No. 16, letter F.II.a), the portion of capital grants received from the state designated for the acquisition of tangible assets (included in the mixed grant awarded annually in relation to investment plans destined both to expenses for the acquisition of depreciable capital assets and to expenses of a different nature specifically to meet orders formalised before the end of the financial year) are also recognised according to this criterion, commensurate with the cost of investments and with the requirement that they are necessary in relation to the Foundation's statutory and Statutes-related mission.

The accounting treatment used for capital grants is that of the "income method" according to which the amount of the grant, charged to the income statement within "other revenues and income", is deferred to future years by recognition of deferred income, with depreciation calculated on the gross cost of the assets equal to the grant relating to the year charged to the income statement.

GRANTS FROM OTHER INSTITUTIONS

These grants relate to European research projects and other similar funding from other institutions (from banking foundations or other public or private institutions). With the adoption of accounting standard No. 1 for non-profit entities they are recognised, at the time of disbursement, as deferred income and, at the end of the financial year, are charged to "income" on the basis of the costs incurred (if the grant was disbursed during the year).

OTHER REVENUES AND INCOME

This item includes all items of non-financial income that pertain to ancillary activities, which in the case of the Foundation mainly relate to the rental of premises for commercial activities.

This item also includes consideration received from other institutions as part of scientific projects of a profit-making nature.

MEMORANDUM ACCOUNTS

The commitments undertaken by the Foundation are set out in the relative section of the notes to the financial statements. In particular, the amount for contracts is reported for which a future, not yet firm, commitment exists.

PART B - INFORMATION ON THE BALANCE SHEET ASSETS

FIXED ASSETS

INTANGIBLE ASSETS

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
158,736	38,564	120,172

Intangible assets are the result of increases during the year ended 31.12.2022 and consisted mainly of "Other intangible assets".

CHANGES IN INTANGIBLE ASSETS

	START-UP AND EXPANSION COSTS	RESEARCH, DEVELOPMENT AND ADVERTISING COSTS	INDUSTRIAL PATENT AND INTELLECTUAL PROPERTY RIGHTS	CONCESSIONS, LICENCES, TRADEMARKS AND SIMILAR RIGHTS	GOODWILL	INTANGIBLE ASSETS UNDER CONSTRUCTION AND ADVANCES	OTHER	TOTAL INTANGIBLE ASSETS
BALANCE AT BEGINNING OF YEAR								
Historical cost	-	-	-	20,951	-	-	39,366	**60,317**
Write-ups	-	-	-	-	-	-	-	-
Accumulated amortisation	-	-	-	(13,970)	-	-	(7,783)	**(21,753)**
Write-downs	-	-	-	-	-	-	-	-
Book value	-	-	-	6,981	-	-	31,583	**38,564**
CHANGES DURING THE YEAR								
Increases for investments	-	-	-	57,206	-	-	107,360	**164,566**
Reclassifications of book value	-	-	-	-	-	-	-	**-**
Decreases (disposals and retirements)	-	-	-	-	-	-	-	-
Write-ups during the year	-	-	-	-	-	-	-	-
Amortisation for the year	-	-	-	(26,053)	-	-	(18,341)	**(44,394)**
Write-downs during the year	-	-	-	-	-	-	-	-
Other changes	-	-	-	-	-	-	-	-
Total changes	-	-	-	31,153	-	-	89,019	**120,172**
BALANCE AT YEAR-END								
Historical cost	-	-	-	78,157	-	-	146,726	**224,883**
Write-ups	-	-	-	-	-	-	-	-
Accumulated amortisation	-	-	-	(40,023)	-	-	(26,124)	**(66,147)**
Write-downs during the year	-	-	-	-	-	-	-	-
Book value	-	-	-	38,134	-	-	120,602	**158,736**

TANGIBLE ASSETS

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
125,652,098	115,585,261	10,066,837

CHANGES IN TANGIBLE ASSETS

	LAND AND BUILDINGS	PLANT AND MACHINERY	INDUSTRIAL AND OFFICE EQUIPMENT	OTHER ASSETS	ASSETS UNDER CONSTRUCTION AND DOWN PAYMENTS	TOTAL TANGIBLE ASSETS
BALANCE AT BEGINNING OF YEAR						
Historical cost	60,239,403	1,907,619	30,022,959	25,905,266	4,323,955	**122,399,202**
Write-ups	-	-	-	-	-	**-**
Accumulated depreciation	(2,161,568)	(98,237)	(2,912,716)	(1,629,334)	-	**(6,801,855)**
Write-downs	-	-	-	(12,086)	-	**(12,086)**
Book value	58,077,835	1,809,382	27,110,243	24,263,846	4,323,955	**115,585,261**
CHANGES DURING THE YEAR						
Increases for acquisitions	3,241,284	1,168,661	10,558,398	2,521,382	5,370,487	**22,860,213**
Reclassifications of book value	1,992,056	-	1,658,330	172,079	(3,822,465)	**-**
Decreases in book value (sales and retirements)	-	-	-	-	-	**-**
Write-ups during the year	-	-	-	-	-	**-**
Depreciation for the year	(1,915,070)	(264,222)	(7,351,084)	(3,263,000)	-	**(12,793,376)**
Write-downs during the year	-	-	-	-	-	**-**
Other changes	-	-	-	-	-	**-**
Total changes	3,318,270	904,439	4,865,644	(569,538)	1,548,023	**10,066,837**
BALANCE AT YEAR-END						
Historical cost	65,472,743	3,076,280	42,239,687	28,598,728	5,871,977	**145,259,415**
Write-ups	-	-	-	-	-	**-**
Accumulated depreciation	(4,076,638)	(362,459)	(10,263,800)	(4,892,334)	-	**(19,595,231)**
Write-downs during the year	-	-	-	(12,086)	-	**(12,086)**
Book value	61,396,105	2,713,821	31,975,887	23,694,308	5,871,977	**125,652,098**

Tangible assets recorded an increase in historical cost of €22,860,213 compared with the previous year.

The difference in the item "Land and buildings" is mainly due to the repurposing of the South Pavilion and Palazzo Italia which totalled approximately €2.8 million.

The increase in the item "industrial and office equipment" of approximately €11 million is mainly due to purchase of a Cryo-EM microscopy system facility for €2 million, a spectrometry system for €1.1 million, a flow cytometry system for €1.2 million, a cell transfection system for €350 thousand, a microscopy system for €360 thousand, a CellCelector system for €380 thousand and a macromolecular sample characterisation system for €743 thousand.

The change in the item "Other Assets" was composed as follows:

OTHER TANGIBLE ASSETS	FURNISHINGS AND FITTINGS	LIGHTWEIGHT CONSTRUCTIONS	LABORATORY FURNISHINGS AND FITTINGS	ELECTROMECHANICAL AND ELECTRONIC OFFICE EQUIPMENT
Historical cost	87,368	16,267,209	5,113,213	4,437,476
Accumulated depreciation	(11,118)	(813,360)	(178,520)	(638,422)
BALANCE AS AT 31/12/2021	**76,250**	**15,453,849**	**4,934,693**	**3,799,054**
Acquisitions during the year	590,413	672,424	290,154	1,140,471
Depreciation for the year	(91,710)	(1,693,622)	(461,059)	(1,016,609)
BALANCE AS AT 31/12/2022	**574,953**	**14,432,651**	**4,763,788**	**3,922,916**

- The increase in the item “Lightweight constructions” is due to the purchase of buildings for the "Incubator Labs";
- the increase in the item "Furnishings and fittings " is due to the purchase of new furniture for Palazzo Italia.

The item “Assets under construction and down payments” increased by €5,871,977, of which approximately €1.9 million related to design activities for the South Building and approximately €2 million to the repurposing of Palazzo Italia.

In 2022 reclassifications out of the item "assets under construction and down payments” were carried out amounting to approximately €3.8 million.

CURRENT ASSETS

INVENTORIES

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
58,004	73,696	(15,692)

INVENTORIES	BALANCE AT BEGINNING OF YEAR	CHANGE DURING THE YEAR	BALANCE AT YEAR-END
Raw materials, ancillaries and consumables	73,696	(15,692)	58,004
TOTAL INVENTORIES	**73,696**	**(15,692)**	**58,004**

LOANS AND RECEIVABLES (CURRENT ASSETS)

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
390,259,720	375,445,989	14,813,731

Changes and maturities of loans and receivables included in current assets:

	BALANCE AT BEGINNING OF YEAR	CHANGE DURING THE YEAR	BALANCE AT YEAR-END	PART DUE WITHIN TWELVE MONTHS	PART DUE AFTER TWELVE MONTHS	OF WHICH DUE AFTER FIVE YEARS
Trade receivables (current)	93,594	(5,892)	87,702	87,702	-	-
Tax receivables (current)	33,140	47,491	80,632	80,632	-	-
Other receivables (current)	375,319,254	14,772,132	390,091,386	390,091,386	-	-
TOTAL CURRENT RECEIVABLES	**375,445,989**	**14,813,731**	**390,259,720**	**390,259,720**	**-**	**-**

The item “Trade receivables” as at 31/12/2022 was composed as follows:

DESCRIPTION	AMOUNT
Trade receivables - Italy	15,340
Trade receivables - Abroad	64,130
Trade receivables for invoices yet to be issued - Italy	8,232
Trade receivables for invoices yet to be issued - Abroad	-
TOTAL	**87,702**

The item "Tax receivables" as at 31/12/2022 was composed of €25,797, consisting of a VAT credit due to the HT Foundation from the Revenue Agency following a transaction carried out by the Commercial Area, and also of €54,835 consisting of an IRES (corporate income tax) advance payment.

The item “Receivables from others" amounted to €390,091,386 as at 31/12/2022 and was composed as follows:

DESCRIPTION	AMOUNT
Receivables from the State for grants yet to be disbursed	385,213,563
Credit notes to be received	2,608,886
Other	2,268,938
TOTAL	**390,091,386**

The item Receivables from the State amounted to €385,213,563 and consisted of the grants indicated in article 1, paragraph 121 of Law No. 232 of 11th December 2016, relating to the years 2018, 2019, 2020, 2021 and 2022 amounting to €381,213,563 and the grants pursuant to Decree Law No. 34/2020 (CITT) relating to 2021 and 2022 amounting to €4,000,000, for the part not yet received at year-end, as summarised in the following tables:

PERIOD	GRANTS PURSUANT TO L. 232/2016	GRANTS DISBURSED AS AT 31.12.2019	REMAINING GRANTS AS AT 31.12.2019	GRANTS DISBURSED AS AT 31.12.2020	REMAINING GRANTS AS AT 31.12.2020	GRANTS DISBURSED AS AT 31.12.2021	REMAINING GRANTS AS AT 31.12.2021	GRANTS DISBURSED AS AT 31.12.2022	REMAINING GRANTS AS AT 31.12.2022
2017	10,000,000	6,531,520	3,468,480	3,468,480	-	-	-	-	-
2018	114,300,000	-	114,300,000	56,350,370	57,949,630	56,561,038	1,388,591	-	1,388,591
2019	136,500,000	-	136,500,000	-	136,500,000	-	136,500,000	-	136,500,000
2020	112,100,000	-	-	-	112,100,000	-	112,100,000	22,760,586	89,339,414
2021	122,100,000	-	-	-	-	-	122,100,000	51,113,663	70,986,337
2022	133,600,000	-	-	-	-	-	-	50,600,779	82,999,221
TOTAL	**628,600,000**	**6,531,520**	**254,268,480**	**59,818,850**	**306,549,630**	**56,561,038**	**372,088,591**	**124,475,028**	**381,213,563**

PERIOD	GRANTS PURSUANT TO D.L. 34/2020 (CITT)	GRANTS DISBURSED AS AT 31.12.2019	REMAINING GRANTS AS AT 31.12.2019	GRANTS DISBURSED AS AT 31.12.2020	REMAINING GRANTS AS AT 31.12.2020	GRANTS DISBURSED AS AT 31.12.2021	REMAINING GRANTS AS AT 31.12.2021	GRANTS DISBURSED AS AT 31.12.2022	REMAINING GRANTS AS AT 31.12.2022
2020	10,000,000	-	-	10,000,000	-	-	-	-	-
2021	2,000,000	-	-	-	-	-	2,000,000	-	2,000,000
2022	2,000,000	-	-	-	-	-	-	-	2,000,000
TOTAL	**14,000,000**	**-**	**-**	**10,000,000**	**-**	**-**	**2,000,000**	**-**	**4,000,000**

With regard to the item "Credit notes to be received", we report that the balance consists of invoices received with incorrect application of VAT (Split payment). Changes have been made on the account in order to ensure attention is paid to invoices with errors pending receipt of a credit note.

COMPOSITION OF CURRENT LOANS AND RECEIVABLES BY GEOGRAPHICAL AREA

The composition of non-current loans and receivables as at 31/12/2022 is immaterial.

FINANCIAL ASSETS OTHER THAN FIXED ASSETS

Changes in financial assets other than fixed assets are as follows:

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
103,725,028	40,013,999	63,711,029

DESCRIPTION	BALANCE AT BEGINNING OF YEAR	CHANGES DURING THE YEAR	BALANCE AT YEAR-END
Non-interest-bearing accounts held with the Central State Treasury	40,013,999	63,711,029	103,725,028
TOTAL FINANCIAL ASSETS OTHER THAN FIXED ASSETS	**40,013,999**	**63,711,029**	**103,725,028**

Paragraph 4 pursuant to Article 49-bis of Decree-Law No. 34 of 19th May 2020, converted with amendments by Law No. 77 of 17th July 2020, added the following sentence to the Law establishing the HT Foundation and more specifically to article 1, paragraph 121 of Law No. 232/2016: "The grants to the Foundation's endowment fund and operating fund paid from the State Budget shall be credited to a non-interest-bearing account opened with the State Treasury, in the name of the Foundation". Therefore, in compliance with the law, a non-interest-bearing account with number 25084 was opened with the Central State Treasury. This account is credited with the quota of the annual grant and the sum necessary for operations is transferred to a "cashier account" opened with Banca Intesa following the procedures laid down by Ministerial Decree MEF 49506 of 16th June 2010 and subsequent guidelines.

The balance as at 31/12/2022 was composed of the following amounts:

- €9,250,000 in accordance with article 49-bis of Decree-Law No. 34 of 19th May 2020, converted with amendments by Law No. 77 of 17th July 2020 for the establishment of the CITT;
- €94,475,028 from the portion of the grant for the years 2020, 2021 and 2022 received during the current financial year.

CASH AND CASH EQUIVALENTS

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
10,204,900	20,465,035	(10,260,134)

DESCRIPTION	BALANCE AT BEGINNING OF YEAR	CHANGES DURING THE YEAR	BALANCE AT YEAR-END
Bank and postal deposits	20,464,315	(10,260,553)	10,203,763
Cheques	-	-	-
Cash and other valuables on hand	719	418	1,137
TOTAL CASH AND CASH EQUIVALENTS	**20,465,035**	**(10,260,134)**	**10,204,900**

The balance represents cash and cash equivalents and the existence of current accounts and valuables at the end of the financial year.

The item "Bank and postal accounts" amounted to €10,203,763 as at 31/12/2022 and was composed as follows:

DESCRIPTION	AMOUNT
Banca Intesa account No. 162106	5,952,186
Banca Intesa account No. 176258	339,359
Banca Intesa account No. 17247 non- MEF funds	3,912,218
TOTAL	**10,203,763**

The Banca Intesa account No. 162106 is the Foundation's treasury account, the Banca Intesa account No. 176258 is the CITT account and the account No. 17247 is the account for non-MEF funds.

ACCRUED INCOME AND PREPAID EXPENSES

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
1,452,443	562,319	890,124

These measure income and expenses earned or incurred before or after the cash and/or documented event. They occur regardless of the date of payment or collection of the relative income and expenses. They are common to two or more financial years and can be allocated on a time basis. No prepayments and accrued income existed as at 31/12/2022 with a duration longer than five years.

	ACCRUED INCOME	PREPAID EXPENSES	TOTAL ACCRUED INCOME AND PREPAID EXPENSES
Balance at beginning of year	-	562,319	562,319
Change during the year	-	890,124	890,124
BALANCE AT YEAR-END	**-**	**1,452,443**	**1,452,443**

The item is composed as follows:

DESCRIPTION	AMOUNT
IT support and maintenance services	531,841
Costs PhD students	747,517
Rental of various equipment	3,648
Subscriptions to publications, newspapers and magazines	31,979
Other research support services	10,024
Administrative support services	4,003
Maintenance and repair services	101,636
Other insurance policies	897
Publication of advertisements and personnel recruitment	17,684
Other expenses for services	3,212
TOTAL PREPAID EXPENSES	**1,452,442**

PART B - INFORMATION ON THE BALANCE SHEET LIABILITIES AND EQUITY

EQUITY

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
470,516,175	404,381,790	66,134,385

Changes in equity items:

	BALANCE AT BEGINNING OF YEAR	USE OF PREVIOUS YEAR'S OPERATING SURPLUS		OTHER CHANGES			OPERATING SURPLUS FOR THE YEAR	BALANCE AT YEAR-END
		ALLOCATION OF DIVIDENDS	OTHER USES	INCREASES	DECREASES	RECLASSIFICATIONS		
Endowment Funds and Reserves	77,261,869	-	-	-	-	-	-	77,261,869
HT Operating Fund	246,003,374	-	(9,243,138)	-	-	-	-	236,760,236
NF Operating Fund	69,569,748	-	73,594,430	-	-	-	-	143,164,179
CITT Operating Fund	11,486,368	-	1,745,061	-	-	-	-	13,231,429
Operating surplus (deficit) for the previous year	42,684	-	17,747	-	-	-	-	60,431
Operating surplus (deficit) for the year	17,747	-	(17,747)	-	-	-	38,032	38,032
TOTAL EQUITY	**404,381,790**	**-**	**66,096,353**	**-**	**-**	**-**	**38,032**	**470,516,175**

As established by article 1, paragraph 119 of Law No. 232 of 11th December 2016, the Foundation's capital consists of grants received from the Founding Ministries and it is increased by further grants from the State, as well as funding from public and private entities.

The Endowment Fund consists of a restricted fund for the start up of Human Technopole's scientific project activities as provided for by article 5 of Decree Law No. 185 of 25th November 2015, converted, with amendments, into Law No. 9 of 22nd January 2016 and initially allocated to the Fondazione Istituto Italiano di Tecnologia (IIT) for an original amount of €79,900,000 and transferred, in the form of both funding and assets in kind, to the Human Technopole Foundation, for the remaining amount of €77,230,557, corresponding to the initial amount, net of the costs incurred for the project by IIT.

In accordance with article 6, paragraph 4 of Human Technopole Foundation's Statutes and article 3 of the regulation that governs the Foundation, contained in Decree of the President of the Council of Ministers dated 27th February 2018, the aforementioned endowment fund is unavailable and restricted to the pursuit of purposes as defined by its Statutes.

At year-end 2022 the operating fund was recognised within the Foundation's equity and totalled €393,155,844. It included the grants indicated in article 1, paragraph 121 of Law No. 232 of 11th December 2016, relating to the years 2019, 2020, 2021 and 2022, for the part not drawn as at the reporting date and the contributions granted for the "Centre for Innovation and Technology Transfer in the Life Sciences".

This fund consists of three different items:

- the HT Operating Fund amounting to €236,760,236;
- the NF Operating Fund amounting to €143,164,179;
- the CITT Operating Fund amounting to €13,231,429.

The following table shows the changes in the Operating Fund showing the part relating to HT and that to the National Facilities for a total of €379,924,414:

PERIOD	GRANTS PURSUANT TO L. 232/2016	GRANTS USED					GRANTS STILL TO BE USED	OF WHICH	
		2018	2019	2020	2021	2022		HT	NF
2017	10,000,000	275,387	5,070,516	4,654,097	-	-	-	-	-
2018	114,300,000	-	-	68,154,251	46,145,749	-	-	-	-
2019	136,500,000	-	-	-	2,596,626	-	133,903,374	133,903,374	-
2020	112,100,000	-	-	-	-	-	112,100,000	112,100,000	-
2021	122,100,000	-	-	-	52,530,252	-	69,569,748	-	69,569,748
2022	133,600,000	-	-	-	-	69,248,708	64,351,292	(9.243.138)	73,594,431
TOTAL	**628,600,000**	**275,387**	**5,070,516**	**72,808,348**	**101,272,627**	**69,248,708**	**379,924,414**	**236,760,236**	**143,164,179**

The following table shows the changes in the CITT operating fund:

PERIOD	GRANTS PURS. TO ART. 49-BIS OF DL 34/2020 (CONVERTED INTO L 77/2020)	GRANTS USED					GRANTS STILL TO BE USED
		2018	2019	2020	2021	2022	
2020	10,000,000	-	-	90,775	422,857	254,939	9,231,429
2021	2,000,000	-	-	-	-	-	2,000,000
2022	2,000,000	-	-	-	-	-	2,000,000
TOTAL	**14,000,000**	**-**	**-**	**90,775**	**422,857**	**254,939**	**13,231,429**

As reported in the introduction to these Notes to the Financial Statements, the "CITT Operating Fund" consists of a grant paid in accordance with article 49-bis of Decree Law No. 34 of 19th May 2020, converted with amendments by Law No. 77 of 17th July 2020, which provided for the establishment of the "Centre for innovation and technology transfer in the field of life sciences", and it specified that the HT Foundation must adopt specific organisational measures and operational methods for it, with the adoption of separate accounting for the use of the funds allocated for this purpose.

The grant to the Centre for Innovation and Technology Transfer for 2020 was €10,000,000 and €4,000,000 for the years 2021 and 2022. After costs incurred it amounted to €13,231,429 as at 31/12/2022.

PROVISIONS FOR LIABILITIES AND CHARGES

The item "Other provisions" within provisions for liabilities and charges shows a balance of €1,301 relating to provisions for 2022 training incentives.

POST-EMPLOYMENT BENEFIT PROVISION

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
1,023,134	564,922	458,212

	POST-EMPLOYMENT BENEFIT PROVISION
Balance at beginning of year	564,922
Changes during the year	885
Addition for the year	595,468
Use during the year	(129,896)
Other changes	(8,245)
Total changes	458,212
Balance at year-end	1,023,134

The provision represents the actual amount owed by the Foundation as at 31.12.2022 to employees in service at that date.

LOANS AND PAYABLES

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
25,717,646	20,652,547	5,065,100

CHANGES IN AND MATURITIES OF LOANS AND PAYABLES

Maturities of loans and payables were composed as follows:

	BALANCE AT BEGINNING OF YEAR	CHANGE DURING THE YEAR	BALANCE AT YEAR-END	AMOUNT DUE WITHIN TWELVE MONTHS	AMOUNT DUE AFTER TWELVE MONTHS	OF WHICH DUE AFTER FIVE YEARS
Loans from banks	-	98	98	98	-	-
Trade payables	18,807,062	1,675,828	20,482,890	20,482,890	-	-
Tax payables	724,397	2,232,176	2,956,573	2,956,573	-	-
Payables to pension and social security institutions	632,292	456,844	1,089,137	1,089,137	-	-
Other payables	488,796	700,153	1,188,949	1,188,949	-	-
TOTAL BORROWINGS AND PAYABLES	**20,652,547**	**5,065,100**	**25,717,646**	**25,717,646**	**-**	**-**

"Trade payables" are recognised at face value and the item also includes payables for invoices booked and amounts for invoices yet to be received for services relating to the year.

The total for the item "Trade payables" as at 31.12.2022 is composed as follows:

DESCRIPTION	AMOUNT
Suppliers of goods and services	6,648,421
Invoices to be received	13,834,468
TOTAL	**20,482,890**

The increase in the item "trade payables" compared with the previous year is mainly due to the increase in obligations to counterparties.

The item "tax payables" contains only liabilities for taxes of a known amount that are certain to be paid.

Tax payables include IRAP (regional production tax) amounting to €118,971, net of advance payments of €256,758 made during the year. Furthermore, no IRES (corporate income tax) payables existed net of advance payments made of €291,163.

The item "Taxes payable" as at 31/12/2022 was composed as follows:

DESCRIPTION	AMOUNT
IRAP (regional production tax) payable	118,971
IRES (corporate income tax) payable	-
Payables to tax authorities for withholding tax on employee income	319,474
Payables to tax authorities for withholding tax on self-employed income	23,983
Other tax payables	2,494,146
TOTAL	**2,956,573**

"Payables to pension and social security institutions" include amounts for social security and pension expenses relating to employees and collaborators, accruing but not yet paid as at 31st December 2022.

These payables are composed as follows:

DESCRIPTION	AMOUNT
Payables to INPS (national insurance)	939,979
Payables to INAIL (compulsory accident insurance)	22,168
Payables to PREVINDAI for employees	68,033
Payables to FONCHIM for employees	58,115
Payables to FASI for employees	91
Payables to FASCHIM for employees	-
Payables to other pension institutions	751
PAYABLES TO PENSION AND SOCIAL SECURITY INSTITUTIONS	**1,089,137**

"Other payables" and "Other payables for amounts charged back internally" totalled €1,188,949. They include remaining payables, which by nature are not included in the preceding items, and payables to the Foundation's collaborators. More specifically, they include payables for vacations accruing but not taken, amounting to €710,791. The increase in the balance for 2022 is due to an increase in personnel recruitment during the year.

LOANS AND PAYABLES BY GEOGRAPHICAL AREA

Loans and payables by geographical area as at 31/12/2022 are given in the following table:

GEOGRAPHICAL AREA	BONDS	CONVERTIBLE BONDS	PAYABLES DUE TO OWNERS FOR LOANS	BANK LOANS	LOANS FROM OTHER LENDERS	DOWN PAYMENTS	TRADE PAYABLES	DEBT SECURITIES ISSUED
Italy	-	-	-	-	-	-	20,126,349	-
EU	-	-	-	-	-	-	36,788	-
Non-EU	-	-	-	-	-	-	319,752	-
TOTAL	**-**	**-**	**-**	**-**	**-**	**-**	**20,482,890**	**-**

GEOGRAPHICAL AREA	PAYABLES DUE TO SUBSIDIARIES	PAYABLES DUE TO ASSOCIATES	PAYABLES DUE TO PARENT COMPANIES	PAYABLES DUE TO COMPANIES CONTROLLED BY PARENT COMPANIES	TAX PAYABLES	PAYABLES TO PENSION AND SOCIAL SECURITY INSTITUTES	OTHER LOANS AND PAYABLES	LOANS AND PAYABLES
Italy	-	-	-	-	2,289,681	1,089,137	1,188,949	4,567,767
TOTAL	**-**	**-**	**-**	**-**	**2,289,681**	**1,089,137**	**1,188,949**	**4,567,767**

ACCRUED EXPENSES AND DEFERRED INCOME

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
134,252,672	126,585,603	7,667,068

	ACCRUED EXPENSES	DEFERRED INCOME	TOTAL ACCRUED EXPENSES AND DEFERRED INCOME
Balance at beginning of year	-	126,585,603	126,585,603
Change during the year	-	7,667,068	7,667,068
BALANCE AT YEAR-END	**-**	**134,252,672**	**134,252,672**

The item is composed as follows:

DESCRIPTION	AMOUNT
Deferred income	8,193,021
Deferred grant income for plant	125,995,418
Other deferred income	64,233
TOTAL	**134,252,672**

The criteria adopted for the measurement and conversion of amounts denominated in foreign currency for these items are given in the first part of these notes to the financial statements.

The part of the capital grant (treated as advance income to be deferred) relating primarily to depreciable tangible assets acquired during the year and amounting to €125,995,418 has been recognised within deferred income in accordance with the indirect method pursuant to Italian National Accounting Standard OIC 16.

PART C - INFORMATION ON THE INCOME STATEMENT

VALUE OF PRODUCTION

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
65,779,053	36,220,072	29,558,981

DESCRIPTION	2022	2021	CHANGES
Revenues from sales and services	-	-	-
Other revenues and income	65,779,053	36,220,072	29,558,981
TOTAL	**65,779,053**	**36,220,072**	**29,558,981**

The item "Other revenues and income" is composed as follows:

- The HT Operating grant pursuant to article 1, paragraph 121 of Law No. 232/2016: this amounted to €51,925,398 and related to the part of the operating grant, which on an accruals basis was for specific activities of the Foundation on the basis of the costs incurred (in accordance with accounting standard No. 1 for non-profit entities).

- The CITT operating grant pursuant to article 49-bis of Decree Law No. 34/2020, converted with amendments by Law No. 77/2020: this amounted to €254,939 and related to the part of the operating grant designated to finance the "Centre for Innovation and Technology Transfer in the field of the life sciences". The total amount of the legally required 2022 grant was €2,000,000. Included in the item "Other revenues and income", it constitutes the part relating to the year ended 31.12.2022.

- HT capital grant: this amounted to €12,812,242 and consists of the capital grant for the year, calculated on the basis of the depreciation charged to the income statement according to the useful life of the assets acquired during the year and in previous years. The accounting treatment of capital grants is the "income method", whereby the amount of the grant, recognised in the income statement under "other revenues and income", is deferred to subsequent years through the recognition of deferred income, with depreciation charged to the income statement on the gross cost of assets equal to the portion of the grant attributable to the year.

- The operating grant – National Facilities: amounting to €21,097 (for operations) and €25,528 (for capital). It consists, on an accruals basis, of the part intended for specific activities for National Facilities based on the costs incurred (in accordance with accounting standard No. 1 for non-profit entities).

- Operating grant - Other Entities: amounting to €548,158, relating to the part of operating grant paid by entities other than the MEF for specific scientific research projects.

- Other revenues and income: this amounted to €191,691 and related to commercial activities of Foundation, consisting of the rental of floor space in Palazzo Italia and its share of revenues from a scientific project financed by the Sanger Institute.

COSTS OF PRODUCTION

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
65,112,804	35,660,571	29,452,233

DESCRIPTION	31/12/2022	31/12/2021	CHANGES
Raw, ancillary materials and goods for resale	8,923,279	2,596,936	6,326,343
Services	23,453,360	14,719,853	8,733,507
Rents and leases	1,140,275	1,640,201	(499,926)
Wages and salaries	12,807,916	7,808,324	4,999,592
Social security contributions	3,563,014	2,029,381	1,533,633
Post-employment benefits	862,395	496,983	365,412
Pensions and similar	107,485	63,499	43,986
Other costs	311,518	182,084	129,434
Amortisation of intangible assets	44,394	11,906	32,488
Depreciation of tangible assets	12,793,376	6,058,695	6,734,681
Other fixed asset write-downs	-	-	-
Changes in inventories of raw, ancillary and consumable materials and goods for resale	15,692	(73,696)	89,388
Other provisions	1,301	-	1,301
Other operating costs	1,088,799	126,407	962,392
TOTAL	**65,112,804**	**35,660,571**	**29,452,233**

COST OF RAW MATERIALS, ANCILLARY MATERIALS, CONSUMABLES AND GOODS FOR RESALE

These are costs incurred for supplies of consumable materials and they relate mainly to research centre activities for which the most significant projects are the Moli-sani - Troina cohort studies. They also include power supply costs (approx. €4 million).

COSTS OF SERVICES

Service costs amounted to €23,453,360 and were composed as follows:

COSTS OF SERVICES	2022
EURO	AMOUNT
Technical, administrative and legal advisory	1,642,263
Software support and maintenance services	4,002,162
Insurance	315,673
Collaborator remuneration	767,901
Fees for Boards and Committees	1,016,342
Maintenance and repairs	1,908,515
Other research support services	8,921,902
Training	224,894
Communication and publications	1,178,988
PhD student costs	850,981
Other service costs	2,419,718
Selection and publication services	204,020
TOTAL	**23,453,360**

The most significant "Costs of services" items are reported below.

- The item technical, administrative and legal advisory services includes engineering and design expenses of approximately €187 thousand, administrative and personnel support services of approximately €926 thousand, safety at the workplace related activities of approximately €259 thousand and legal advisory services of approximately €212 thousand.
- Software support and maintenance services relate mainly to costs incurred to develop the SAP system and the purchase of licences of approximately €1.1 million and for the implementation of the Data Centre of €1.6 million.
- Board and committee fees are comprised of fees for the *Consiglio di Sorveglianza*, the Management Committee, Scientific Committee, *Organismo di Vigilanza* and Board of Auditors amounting to approximately €881 thousand in addition to social security costs.
- The item maintenance and repairs mainly includes costs for the maintenance of buildings of €712 thousand and the maintenance of scientific instruments of approximately €777 thousand.
- The item other research support services consists mainly of costs incurred for outsourced laboratory services for genomic sequencing of approximately €8.1 million.
- Training costs relate to both compulsory and optional courses.
- Communications and publication expenses include costs incurred for the electronic scientific library of approximately €1 million.

- PhD costs relate to the costs of scholarships granted by the Foundation.
- The item other expenses includes costs incurred for Campus building security and monitoring services of approximately €685 thousand, cleaning costs of approximately €142 thousand, catering services of approximately €352 thousand, mission costs of approximately €363 thousand, conference and seminar costs of approximately €215 thousand, and customs duties of approximately €159 thousand.
- Employee selection costs have been reclassified into the item selection and publication services.

PERSONNEL COSTS

This item includes all expenses for employees inclusive of merit salary increases, promotions, inflation linked increases, cost of untaken annual leave and legal and industrial agreement related provisions.

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
17,652,328	10,580,270	7,072,058

The change reflects the increase in the number of employees recruited during the year.

DEPRECIATION AND AMORTISATION OF TANGIBLE AND INTANGIBLE ASSETS

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
12,837,770	6,070,601	6,767,169

Amortisation and depreciation have been calculated on the basis of the useful life of the asset and its use in production.

The balance as at 31/12/2022 is composed mainly of the following items:

- depreciation of buildings amounting to €3,608,691;
- depreciation of laboratory equipment amounting to €7,615,306;
- depreciation of office machinery amounting to €1,016,609;
- depreciation of furnishings amounting to €552,770.

OTHER OPERATING COSTS

The increase in the item "Other operating costs" is due to ECF costs paid directly by the HT Foundation, as well as to the payment of IMU (single municipal tax) and TARI (municipal waste tax).
With regard to the Early Career Fellowship programme (ECF), the Foundation funded five young researchers by awarding a fellowship worth €200,000 per year for five years to support their research projects in the fields of genomics, biology and health data science.

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
1,088,799	126,407	962,392

FINANCIAL INCOME AND COSTS

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
(10,777)	785	(11,562)

DESCRIPTION	31/12/2022	31/12/2021	CHANGES
Income other than above	-	1,968	(1,968)
(Interest and other financial expenses)	(3,313)	(112)	(3,201)
Gains (losses) on foreign exchange rates	(7,464)	(1,072)	(6,392)
TOTAL	**(10,777)**	**785**	**(11,562)**

CURRENT, DEFERRED AND PREPAID INCOME TAXES FOR THE YEAR

BALANCE AS AT 31/12/2022	BALANCE AS AT 31/12/2021	CHANGES
617,441	542,538	74,902

DESCRIPTION	31/12/2022	31/12/2021	CHANGES
Current taxes	**612,057**	**542,539**	**69,518**
IRES (corporate income tax)	236,328	285,780	(49,452)
IRAP (regional tax on production)	375,729	256,759	118,970
Deferred (prepaid) taxes	**-**	**-**	**-**
IRES	-	-	-
IRAP	-	-	-
TOTAL	**612,057**	**542,539**	**69,518**

The difference between the balance as at 31.12.2022 and the table giving details of current taxes is due to an IRES adjustment for the year 2021.

Taxes relating to the financial year have been taken into account.

Pursuant to article 2427, paragraph 1, No. 14 of the Italian Civil Code, we report that no temporary differences exist for the recognition of deferred taxation.

CALCULATION OF IRES

INSTITUTIONAL ACTIVITIES	31/12/2022
Income from buildings	317,657
IRES tax rate	24%
IRES INSTITUTIONAL ACTIVITIES	**76,238**

COMMERCIAL ACTIVITIES	31/12/2022
A) Value of production	682,395
5) Other revenues and income	682,395
B) Costs of production	(15,350)
Mixed costs	(12,023)
Land registry quota	(3,327)
Increase	-
Business income	667,045
IRES tax rate	24%
IRES COMMERCIAL ACTIVITIES	**160,091**

IRES TOTAL	31/12/2022
IRES institutional activities	76,238
IRES commercial activities	160,091
IRES FOR THE YEAR	**236,329**

CALCULATION OF IRAP

INSTITUTIONAL ACTIVITIES	31/12/2022
Personnel and collaborator costs	
Gross taxable income	13,352,264
Deductions	(4,389,468)
Net taxable income	8,962,796
IRAP tax rate	3.9%
IRAP INSTITUTIONAL ACTIVITIES	**349,549**

COMMERCIAL ACTIVITIES	31/12/2022
A) Value of production	682,394
B) Costs of production	(11,121)
IRAP recoveries	-
IRAP taxable income	671,273
IRAP tax rate	3.9%
IRAP COMMERCIAL ACTIVITIES	**26,180**

IRAP TOTAL	31/12/2022
IRAP institutional activities	349,549
IRAP commercial activities	26,180
IRAP FOR THE YEAR	**375,729**

IRAP has been calculated on the basis of regulations regarding non-profit entities, whereas IRES has been calculated considering that the properties owned by the HT Foundation contribute to income on the basis of the land registry results with no deduction of expenses or other specific negative components.

PART D – OTHER INFORMATION

Introduction, notes to the financial statements other information

EMPLOYMENT DATA

Reference is made in full to the Management Report. The composition of the workforce as at 31/12/2022 is shown below. Personnel were recruited to the Foundation's workforce through advertisements published on the Foundation's website and on major international recruitment sites (LinkedIn, Springer Nature, EuroJobsites).

The average personnel numbers by category, increased as follows compared with the previous year:

WORKFORCE	31/12/2022	31/12/2021	CHANGES
Executives	37	31	6
Middle managers	58	40	18
Office workers	155	88	67
Manual workers	-	-	-
Other	-	-	-
TOTAL	**250**	**159**	**91**

Reference is made in the management of employment contracts with regard to the remuneration and regulatory aspects to two National Collective Labour Agreements (hereinafter CCNL): (i) for employees with the rank of executives to the CCNL DIRIGENTI INDUSTRIA agreement; (ii) for other ranks, to the CCNL CHIMICA-AZIENDE INDUSTRIALI agreement.

	EXECUTIVES	MIDDLE MANAGERS	OFFICE WORKERS	OTHER EMPLOYEES	TOTAL EMPLOYEES
Average number 2022	35.1	49	131.7	-	**215.9**

REMUNERATION, ADVANCES AND LOANS GRANTED TO DIRECTORS AND AUDITORS AND COMMITMENTS UNDERTAKEN ON THEIR BEHALF

	CONSIGLIO DI SORVEGLIANZA	MANAGEMENT COMMITTEE	BOARD OF AUDITORS
Fees	435,916	115,000	29,712
Advances	-	-	-
Loans	-	-	-
Commitments entered into on their behalf into as a result of guarantees issued	-	-	-

COMMITMENTS, GUARANTEES AND CONTINGENT LIABILITIES NOT RECOGNISED IN THE BALANCE SHEET

Commitments as at 31.12.2022 that will be completed over the next few years amount to a total of €50,240,687, including:

- €3,034,239 for the Moli-sani project;
- €1,502,082 for SAP development activities;
- €3,092,055 for activities related to the South Building project;
- €6,055,324 for improvements to the Campus and to existing buildings;
- €14,714,712 for scientific equipment;
- €3,458,934 for the maintenance of scientific equipment;
- €1,669,657 for laboratory furnishings;
- €2,775,666 for specific data centre and IT equipment;
- €2,400,000 for the Early Career Fellowship programme;
- €4,022,325 for services to the Campus and existing buildings;
- €4,306,827 for specific data centre and IT services;
- €582,643 for the "Scientific Bookshop";
- €2,503,515 for non-scientific technical support and professional services;
- €122,703 for scientific materials and services.

We also report that bank guarantees were provided for a total of €540,000, composed as follows:

AMOUNT [€]	BENEFICIARY	DUE DATE
540,000	Enel	01.02.2024

INFORMATION ON RELATED-PARTY TRANSACTIONS

The entity has not entered into any related-party transactions.

DISCLOSURE OF AGREEMENTS FOR WHICH NO AMOUNTS ARE RECOGNISED IN THE BALANCE SHEET

Reference is made to information already given in the Management Report and to the information on "Commitments, guarantees and contingent liabilities not recognised in the balance sheet" in the preceding section.

DISCLOSURE OF IMPORTANT EVENTS AFTER THE END OF THE FINANCIAL YEAR

In a meeting held on 2nd February 2023 the *Consiglio di Sorveglianza* approved an Implementation Plan for the National Facilities and also the final design for the South Building and the Technological Hub and the related "Technical and Economic Framework", which contained the total costs to complete the work. In that same meeting, the purchase of the land owned by Arexpo on which the new buildings will be constructed was approved.

On 21st February 2023, the *Consiglio di Sorveglianza* completed the process of selecting a new Director and appointed Prof. Marino Zerial, who will take up the appointment in 2023 to replace Prof. Iain Mattaj, whose term of office ended on 31st December 2022. At the request of the Governing Bodies, Prof. Mattaj agreed to continue in his position until 28th February, pending the selection of a new director by those Governing Bodies.

DISCLOSURES OF DERIVATIVE FINANCIAL INSTRUMENTS PURSUANT TO ARTICLE 2427-BIS OF THE ITALIAN CIVIL CODE

The Foundation holds no derivative instruments.

DISCLOSURES PURSUANT TO ARTICLE 1, PARAGRAPH 125-BIS OF LAW NO. 124 OF 4TH AUGUST 2017

Pursuant to article 1, paragraph 125 of Law No. 124 of 4th August 2017, in compliance with the transparency obligation, we report that grant funding for the following amounts were received during the year:

- €22,760,586 of the remaining grants for 2020;
- €41,165,459 of the remaining grants for 2021;
- €9,948,204 as a quota of grants for 2021;
- €30,000,000 as a quota of grants for 2022;
- €20,600,779 as a quota of grants for 2022.

Lastly, we report that the Foundation has accrued operating grants, not yet received, amounting to €385,213,563, relating to the years 2019, 2020, 2021 and 2022.

OTHER INFORMATION

The table below summarises the income statement for the HT Foundation's commercial activities:

INCOME STATEMENT (IN EURO)	31/12/2022	31/12/2021
A) VALUE OF PRODUCTION	**98,864**	**37,077**
1) Revenues from sales and services	**-**	**-**
2) Change in inventories of work in progress, semi-finished and finished products	**-**	**-**
3) Change in work in progress on orders	**-**	**-**
4) Increase in internally constructed assets	**-**	**-**
5) Other revenues and income:	**98,864**	**37,077**
a) Other	98,864	37,077
b) Grants to HT:	-	-
- of which operating grants to HT*	-	-
- of which capital grants to HT	-	-
c) Grants to CITT	-	-
- of which capital grants to CITT	-	-
- of which operating grants to CITT	-	-
d) Grants to "National Facilities"*	-	-
e) Grants from other institutions	-	-
- of which capital grants from other institution	-	-
- of which operating grants from other institution	-	-
B) COSTS OF PRODUCTION	**583,531**	**995,684**
6) Cost of raw materials, subsidiary materials, consumables and goods for resale	**(5,551)**	**136,697**
7) Cost of services	**207,479**	**459,105**
8) Cost of rents and leases	**-**	**-**
9) Personnel costs	**68,808**	**52,230**
a) Salaries and wages	51,744	47,422
b) Social security contributions	13,176	4,150
c) Post-employment benefits	2,876	659
d) Pensions and similar	12	-
e) Other costs	1,000	-
10) Amortisation, depreciation and write-downs	**256,480**	**239,016**
a) Amortisation of intangible assets	-	-
b) Depreciation of tangible assets	256,480	239,016

** 2021 item reclassified.*

INCOME STATEMENT (IN EURO)	31/12/2022	31/12/2021
c) Other assets write-downs	-	-
d) Write downs of current receivables and cash and cash equivalents	-	-
11) Changes in raw materials, subsidiary materials, consumables and goods for resale	**-**	**-**
12) Provision for liabilities and charges	**-**	**-**
13) Other provisions	**-**	**-**
14) Other operating costs	**56,314**	**108,637**
Difference between Value and Cost of Production	**(484,667)**	**(958,608)**
C) FINANCIAL INCOME AND COSTS	**(953)**	**-**
16) Other financial income	**-**	**-**
a) From loans and receivables (fixed assets)	-	-
b) From securities (fixed assets)	-	-
c) From securities (current assets)	-	-
d) From financial income other than the above:	-	-
- other financial income	-	-
17) Interest and other financial charges:	**-**	**-**
- to subsidiaries	-	-
- to associates	-	-
- to parent companies	-	-
- to others	-	-
17-bis) Exchange-rate gains and losses	**(953)**	**-**
D) VALUE ADJUSTMENTS TO FINANCIAL ASSETS	**-**	**-**
Pre-tax results	**(485,620)**	**(958,608)**
20) Income taxes	**186,270**	**258,126**
a) Current taxes	186,270	258,126
b) Deferred taxes	-	-
c) Prepaid taxes	-	-
d) Income (expense) from the participation in tax consolidation/fiscal transparency regime	-	-
21) Operating surplus for the year	**(671,890)**	**(1,216,734)**

Paragraph 3 of article 49-bis of Decree Law No. 34 of 19th May 2020, converted with amendments by Law No. 77 of 17th July 2020 specifies, with regard to the development of the "Centre for Innovation and Technology Transfer in the field of Life Sciences", that: "the HT Foundation shall adopt specific organisational measures and operational methods for it, with the adoption of separate accounting for the use of the funds allocated for this purpose".

The table below summarises the income statement for the start-up of CITT:

INCOME STATEMENT (IN EURO)	31/12/2022	31/12/2021
A) VALUE OF PRODUCTION	**254,939**	**422,857**
1) Revenues from sales and services	**-**	**-**
2) Change in inventories of work in progress, semi-finished and finished products	**-**	**-**
3) Change in work in progress on orders	**-**	**-**
4) Increase in internally constructed assets	**-**	**-**
5) Other revenues and income:	**254,939**	**422,857**
a) Other	-	-
b) Grants to HT:	-	-
- of which operating grants to HT*	-	-
- of which capital grants to HT	-	-
c) Grants to CITT	254,939	422,857
- of which capital grants to CITT	-	-
- of which operating grants to CITT	254,939	422,857
d) Grants to "National Facilities"*	-	-
e) Grants from other institutions	-	-
- of which capital grants from other institution	-	-
- of which operating grants from other institution	-	-
B) COSTS OF PRODUCTION	**254,939**	**422,857**
6) Cost of raw materials, subsidiary materials, consumables and goods for resale	**-**	**-**
7) Cost of services	**130,867**	**386,115**
8) Cost of rents and leases	**-**	**-**
9) Personnel costs	**123,947**	**36,742**
a) Salaries and wages	114,143	36,742
b) Social security contributions	6,774	-
c) Post-employment benefits	1,568	-
d) Pensions and similar	534	-
e) Other costs	928	-
10) Amortisation, depreciation and write-downs	**-**	**-**

** 2021 item reclassified.*

INCOME STATEMENT (IN EURO)	31/12/2022	31/12/2021
a) Amortisation of intangible assets	-	-
b) Depreciation of tangible assets	-	-
c) Other assets write-downs	-	-
d) Write downs of current receivables and cash and cash equivalents	-	-
11) Changes in raw materials, subsidiary materials, consumables and goods for resale	**-**	**-**
12) Provision for liabilities and charges	**-**	**-**
13) Other provisions	**-**	**-**
14) Other operating costs	**125**	**-**
Difference between Value and Cost of Production	**-**	**-**
C) FINANCIAL INCOME AND COSTS	**-**	**-**
16) Other financial income	**-**	**-**
a) From loans and receivables (fixed assets)	-	-
b) From securities (fixed assets)	-	-
c) From securities (current assets)	-	-
d) From financial income other than the above:	-	-
- other financial income	-	-
17) Interest and other financial charges:	**-**	**-**
- to subsidiaries	-	-
- to associates	-	-
- to parent companies	-	-
- to others	-	-
17-bis) Exchange-rate gains and losses	**-**	**-**
D) VALUE ADJUSTMENTS TO FINANCIAL ASSETS	**-**	**-**
Pre-tax results	**-**	**-**
20) Income taxes	**-**	**-**
a) Current taxes	-	-
b) Deferred taxes	-	-
c) Prepaid taxes	-	-
d) Income (expense) from the participation in tax consolidation/fiscal transparency regime	-	-
21) Operating surplus for the year	**-**	**-**

These financial statements, consisting of the balance sheet, the income statement, the notes to the financial statements and the cash flow statement, give a true and fair view of the capital and financial position and its operating performance for the year and they are based on the relative accounting records.

4.3 Independent auditors' report on the Integrated Report

Fondazione Human Technopole

Independent auditors' report on the
"Integrated Report 2022"

This report has been translated into English from the original, which was prepared in Italian and represents the only authentic copy, solely for the convenience of international readers.

AMN/FMG/git - RC118222022BD3462

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Independent Auditors' Report on the Integrated Report 2022

To the Management Committee of Human Technopole Foundation

We have been engaged to perform a limited assurance engagement on the Integrated Report of Human Technopole Foundation for the year ended on December 31st, 2022.

Directors' responsibility for the Integrated Report

The Directors of Human Technopole Foundation are responsible for the preparation of the Integrated Report in accordance with the "GRI Sustainability Reporting Standards (GRI Standards)" issued by the GRI – Global Reporting Initiative, as described in the paragraph "Methodology" of the Integrated Report.

The Directors are responsible for that part of the internal control that they consider necessary in order to enable the preparation of a Integrated Report that is free from material misstatements, whether due to frauds or unintentional behaviors or events.

The Directors are also responsible for the definition of the objectives regarding the sustainability performance and the reporting of the achieved results, as well as for the identification of the stakeholders and the significant matters to report.

Auditors' independence and quality control

We are independent in accordance with the ethics and independence principles of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, based on fundamental principles of integrity, objectivity, professional competence and diligence, confidentiality and professional behaviour.

Our audit firm applies the International Standards on Quality Control 1 (ISQC Italia 1) and, consequently, maintains a quality control system that includes documented policies and procedures, regarding compliance with ethical requirements, professional standards and applicable laws and regulations.

Auditors' responsibility

It is our responsibility to express, on the basis of the procedures performed, a conclusion about the compliance of the Integrated Report with the requirements of the GRI Standards. We conducted our work in accordance with the principles included in the "International Standard on Assurance Engagements 3000 (Revised) – Assurance Engagements other than Audits or Reviews of Historical Financial Information" ("ISAE 3000 Revised"), issued by the International Auditing and Assurance Standards Board (IAASB) for limited assurance engagements. This standard requires the planning and execution of procedures in order to obtain limited assurance that the Integrated Report is free from material misstatement.

Therefore, the extent of work performed in our examination was lower than that required for a full examination in accordance with ISAE 3000 Revised ("reasonable assurance engagement") and, hence, it does not provide assurance that we have become aware of all significant matters and events that would have been identified during a reasonable assurance engagement.

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Iscritta al Registro dei Revisori Legali al n. 167911 con D.M. del 15/03/2013 G.U. n. 26 del 02/04/2013
BDO Italia S.p.A., società per azioni italiana, è membro di BDO International Limited, società di diritto inglese (company limited by guarantee), e fa parte della rete internazionale BDO, network di società indipendenti.

The procedures performed on the Integrated Report were based on our professional judgement and included inquiries, primarily with company's personnel responsible for the preparation of the information included in the Integrated Report, document analysis, recalculations and other procedures in order to obtain evidences considered appropriate.

In particular, we have performed the following procedures:

1. analysis of the process relating to the definition of material aspects included in the Integrated Report, with reference to the criteria applied to identify priorities for the different stakeholder categories and to the internal validation of the process results;
2. comparison of economic and financial data included in the specific paragraph of the Integrated Report with those included in the Financial Statements of the Human Technopole Foundation;
3. analysis of processes that support the generation, collection and management of data and information to the department responsible for the preparation of the Integrated Report. In particular, we have performed interviews and discussions with the management of Human Technopole Foundation to gather information about the accounting and reporting systems used in preparing the Integrated Report, as well as on the internal control procedures supporting the gathering, aggregation, processing and transmission of data and information to the department responsible for the preparation of the Integrated Report.

Furthermore, for the most important information, taken into consideration the activities and the characteristics of the Company:

a) with reference to the qualitative information contained in the Integrated Report, we carried out interviews and we have acquired supporting documentation to verify their consistency with the available evidence;
b) with reference to quantitative information, we carried out both analytical procedures and limited checks to ascertain the correct aggregation of data on a sample basis.

Conclusion

Based on the work performed, nothing has come to our attention that causes us to believe that the Integrated Report of Human Technopole Foundation for the period ended on December 31st, 2022 is not prepared, in all material respects, in accordance with the "GRI Sustainability Reporting Standards (GRI Standards)" issued by the GRI – Global Reporting Initiative, as stated in the paragraph "Methodology" of the Integrated Report.

Milan, June 28th, 2023

BDO Italia S.p.A.

Signed in the original by
Andrea Meneghel
Partner

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RISK MANAGEMENT & INTEGRATED REPORT TEAM
FINANCE AREA

GRAPHIC PROJECT
VISUALMADE, MILAN

IMAGES
HUMAN TECHNOPOLE ARCHIVE

COVER: IMAGE ACQUIRED BY OUR AUTOMATED STEM CELLS AND ORGANOID FACILITY, SHOWCASING NEURONS DERIVED FROM HUMAN PLURIPOTENT STEM CELLS MARKED BY A MAGENTA HUE (β3-TUBULIN) WHILE THEIR NUCLEI SHIMMER IN BLUE.

FOR COMMENTS, REQUESTS, OPINIONS AND IDEAS FOR IMPROVEMENT REGARDING HT SUSTAINABILITY ACTIVITIES AND THE INFORMATION CONTAINED HEREIN, PLEASE CONTACT THE HT FINANCE TEAM BY SENDING AN E-MAIL TO THE FOLLOWING ADDRESS: **HT-DEPT-FINANCE@FHT.ORG**

www.humantechnopole.it