

# MIND – MILANO INNOVATION DISTRICT

ECONOMIC, ENVIRONMENTAL,  
SOCIAL AND INNOVATION DIMENSIONS  
OF MILAN INNOVATION DISTRICT  
AND CONTRIBUTION TO ITALIAN  
RECOVERY AND RESILIENCE



**MIND – MILANO  
INNOVATION DISTRICT**  
**ECONOMIC, ENVIRONMENTAL,  
SOCIAL AND INNOVATION DIMENSIONS  
OF MILAN INNOVATION DISTRICT  
AND CONTRIBUTION TO ITALIAN  
RECOVERY AND RESILIENCE**

## ACKNOWLEDGEMENTS

PlusValue and Politecnico di Milano would like to express their gratitude to the organizations, experts and practitioners who have contributed and shared valuable information on their organizations’ operations and vision on MIND for the preparation of this report.

In particular, we would like to thank the authors of this report: Fiorenza Lipparini, Filippo Addarii, Amerigo Lombardi, Elena Bologna, Francesco La Loggia, Marco Sebastianelli, Prof. Mario Motta, Ing. Jacopo Famiglietti, Hashem Amini Toosi, Prof. Marika Arena, Laura Dell’Agostino, Andrea Flori, Francesco Scotti, Prof. Mario Calderini, Irene Bengo, Danny Crispini, Giulia Rossi. We also thank: Lendlease, Arexpo, Galeazzi-Sant’Ambrogio Hospital, Human Technopole, Università Statale di Milano, Fondazione Triulza, Fondazione Cariplo, Cariplo Factory, Federated Innovation® @MIND members, AstraZeneca, Rold, Illumina, Bio4Dreams, Milano&Partners, and LAND.

## PREMISE

The following text is an extract from the first impact report of MIND – Milano Innovation District: “MIND Impact Assessment Report 2022”. For further information and methodology, the complete text can be consulted at this link: [https://www.hbritalia.it/userUpload/MIND\\_Impact\\_assessment\\_report\\_final\\_v7.pdf](https://www.hbritalia.it/userUpload/MIND_Impact_assessment_report_final_v7.pdf)

## SUMMARY

Page	
<b>4</b>	<b>INTRODUCING MIND</b>
4	MIND’s philosophy: innovation as cooperation
4	The strategy of MIND
5	MIND’s unique value proposition
5	Key investments in R&D infrastructure
6	Federated Innovation and key network actors
6	Economic, Environmental and Social Impact Measurement
7	Wider Economic Effects
8	MIND as a new model of urban sustainability
9	Social Impact for MIND’s Stakeholders
<b>12</b>	<b>1. MIND: MAIN PLAYERS AND KEY INVESTMENTS IN R&amp;D</b>
12	1.1 The anchors of MIND
13	1.2 The New Science Campus of the University of Milan at MIND
15	1.3 The Human Technopole
17	1.4 The Galeazzi Sant’Ambrogio Hospital
18	1.5 Berkeley SkyDeck Europe, Milano
18	1.6 MIND as a regional innovation hub
19	1.7 Private Investment in MIND
21	1.8 Federated Innovation @MIND
26	1.9 Support to Technology Transfer (TT)
27	1.10 Incubation and acceleration
28	1.11 Innovation Circle™ from B4D
29	1.12 From academia to industry: a selection of ongoing projects
30	1.13 MIND compared to other innovation
32	1.14 The Key Performance Indicators of MIND districts

Page	
<b>34</b>	<b>2. THE SOCIAL IMPACT OF MIND</b>
34	2.1 Introduction
34	2.2 Stakeholder analysis
38	2.3 Overview of the evaluation framework
39	2.4 The social value chain: AS IS State vs impact maximization
39	2.5 Defining the Key Performance Indicators
43	2.6 Fair and inclusive economic growth
44	2.7 Promoting social value through procurement
44	2.8 Suppliers' selection criteria
44	2.9 Creating impact-oriented innovation
46	2.10 Community Cohesion, Social Inclusion and Wellbeing
46	2.11 Building community in MIND
48	2.12 Survey results – tenants and employees' expectations
50	2.13 Urban planning and accessibility
52	2.14 Areas of Leisure
52	2.15 Green Areas
53	2.16 Sports facilities
53	2.17 Community facilities
53	2.18 Programma 2121
54	2.19 Accessible education and research
55	2.20 Vision
55	2.21 Governance
58	2.22 Social Policy
59	2.23 Defining MIND impact strategy at ecosystem level
59	2.24 Conclusions

Page	
<b>60</b>	<b>3. SUSTAINABILITY AND CARBON FOOTPRINT IN MIND</b>
60	3.1 Introduction
61	3.2 Alignment with the EU Green Deal
61	3.3 Assessment tools and methods
63	3.4 Goal and scope
63	3.5 Results and discussion
64	3.6 The carbon footprint of the reference building
66	3.7 The carbon footprint of Renaissance I
66	3.8 Conclusions
<b>68</b>	<b>4. ECONOMIC IMPACT ASSESSMENT</b>
68	4.1 Financial appraisal
71	4.2 Economic appraisal
72	4.3 Economic Appraisal: Sensitivity Analysis
75	4.4 Wider Economic Effects
76	4.5 Wider economic effects during the construction phase
80	4.6 Conclusions
<b>82</b>	<b>FINAL CONCLUSIONS AND AN INVITATION</b>

# INTRODUCING MIND

**MIND – Milano Innovation District** is the global biotech hub at the gates of Italy’s second largest city, built on the vast area of EXPO 2015, the World Fair dedicated to food, nutrition and well-being hosted by the City of Milan which attracted 21 million visitors. MIND combines an orientation towards the Life Sciences with a strong vocation as an international platform for territorial excellence in biological, pharmacological, and medical research and development. The district also pioneers concepts of sustainability in urban living and green mobility. MIND aspires to become a city district that fosters collaborative innovation and experimentation of sustainable lifestyles in order to create social, cultural and economic growth, with benefits for the new city district and the Milano metro area as a whole.

When EXPO 2015 ended, the Italian government established a new research center, the Human Technopole, dedicated to genomics, structural biology, computational biology, neuroscience and health data science. EXPO 2015 put Milan on the map as one of the world’s leading innovation hubs and created a gateway for regional and national excellence in R&D and industrial manufacturing in the biotech and agrifood sector.

It was **Lendlease** and **Arexpo** that built the foundations for Italy’s largest innovation district. The ecosystem that enabled the realization of MIND was based on **five public-interest anchors**, the **University of Milan (UniMi)**, the **Galeazzi Sant’Ambrogio Hospital**, the **Human Technopole**, the **Politecnico di Milano (PoliMi)** and **Fondazione Triulza** which have attracted public and private stakeholders interested in inhabiting the innovation district and aiming to collaborate to compete, to promote new projects that operate under the paradigm of multi-disciplinary and cross-sectoral innovation.

The creation of a major research infrastructure, both in terms of laboratories and the interweaving of relations, is a unique asset in the Italian tech landscape. The following figures give an idea of the sheer size of MIND:

- 1 million sqm surface area, with 40 hectares of public open space;
- 10-year construction phase, 99-year concession for the PPP underlying the development;
- 60,000 people living and working when MIND fully operational in 2031;
- €4.5 billion in public and private investment;
- 1,000+ researchers (2022).

## MIND’s philosophy: innovation as cooptation

The analysis of MIND is based on the postulate that innovation districts are defined as “geographic areas where anchor institutions and companies *cluster* and *connect* with small firms, start-ups, and business incubators”<sup>1</sup>, which need more than the co-location of companies and organizations to succeed. Innovation districts succeed if they foster cooptation in research and product development activities, by facilitating interchange between key actors and leveraging local strengths to address global challenges. All innovation districts possess a combination of economic assets, physical assets, and social networking assets, and MIND particularly so.

## The strategy of MIND

MIND – Milano Innovation District aims to become a dominant hub in biotechnological and biomedical research in Europe by leveraging its distinctive scientific and locational assets:

- One of the largest private-public partnerships

<sup>1</sup> The Brookings Institution

(Lendlease-Arexpo) in Italy to build research infrastructures;

- Major presence of research universities (UniMi, PoliMi), research hospitals (Galeazzi), research institutions (Human Technopole);
- Involvement of national, regional, and municipal levels government;
- A federated model of open, cooperative and competitive innovation;
- Attraction of international investment and human capital in R&D;
- A 60,000-strong model neighborhood for intellectual exchange, industrial collaboration, sustainable-living;
- Specialization of the Lombardy Region in biological research, medical innovation, private health care, and STEM education;
- Proximity to Milan, Italy's finance and knowledge capital, its 280,000 students and 5 international universities (Statale, Politecnico, Bocconi, Bicocca, Cattolica), and the vibrant economy of its metro area (3 million people; €215 million in GDP, the EU's third largest metropolitan economy);
- Excellent transport connections (subway, train, airports, highways).

Lendlease, MIND's private developer, supports this strategy by creating a city of innovation based on social inclusion and 100% green energy and mobility, and contributing to an ecosystem of innovation where private corporations, research centers academic institutions, and non-profit organizations can co-produce innovation and promote civic engagement.

### MIND's unique value proposition

The unique value proposition of the MIND innovation district leverages the unique competitive assets of Milano and Lombardy:

- Cross-disciplinary innovation and research specialization (City of the Future and Future of Health), which leverages Milan's human capital of students and researchers and Lombardy's specialization in biological and medical industries.
- Public and private investments and therefore public-private partnerships (PPPs) capable of attracting further investment and talent.
- A unique legal framework, Federated Innovation® @MIND, smoothing collaboration between anchors, local companies and integrated network of intermediaries to facilitate collaboration, streamline cumbersome bureaucratic procedures,

and accelerate commercialization - has conceived 100+ Research and Development (R&D) investment projects in less than 2 years, including 15 projects bringing MIND anchors and companies together.

- 6 Contracts and 30 MoUs signed with key intermediaries (including incubators, accelerators, IP experts, TTOs, VCs, labs).
- Institutional relations with key policy makers to secure agenda alignment on R&D priorities at local, regional, national and EU levels.
- Institutional relations established with relevant industry associations and stakeholder organizations to advance the priorities of MIND.
- Platform technologies to facilitate specialization and convergence across disparate sectors and disciplines (e.g. UniMi's Digital Twin kickstart project to facilitate mining of health data through 5G technologies).

### Key investments in R&D infrastructure

The group of anchors which gathers public-interest investors made a strong initial commitment to the project: the University of Milan contributed **€340 million** to build its new science campus, Human Technopole **totalled an investment of €1.4 billion**, while Galeazzi Sant'Ambrogio Hospital made **€500m investment** in construction and medical equipment for its new hospital. These initial investments were central to support the influx of tech companies and innovation projects, attracting forward-thinking, research-intensive organizations, be they academic, corporate or institutional. Likewise, the size of the private investment made by Lendlease is a key indicator of innovation attractiveness. Lendlease was granted the concession agreement for the development and management of MIND for the next 99 years. Lendlease's private development rights cover around half the MIND's area, for an estimated development end value of **about €2.5 billion**, bringing the **total amount of capital invested to €4.7 billion including public investment**.

In July 2021, Lendlease established a joint venture with Canada Pension Plan Investment Board (CPP Investments) to invest in a dedicated Italian real estate alternative investment fund. CPP Investments and Lendlease have agreed to a 50:50 joint investment equalling about **€400 million** of equity in the Fund to develop and maintain ownership of

150,000 sqm of Lendlease's 480,000 sqm of private development, the West Gate. The total value of the investment for the construction of new innovative spaces like laboratories, incubators and coworking spaces in this first phase of the development amounts to more than **€85 million**. The size of the investment earmarked by MIND's major tenants, **AstraZeneca, Bio4Dreams, Rold, Illumina**, demonstrates the attractiveness of the district's vision as a cutting-edge innovation hub in Europe.

### Federated Innovation and key network actors

These major investment efforts are put to service of a new logic of innovation which links the district's firms, pushing them to collaborate externally to compete internally. To date, Federated Innovation® @MIND comprises 38 companies that are working together in a collaborative environment to accelerate innovation capacity. Total **yearly contribution of Federated Innovation member is €1,900,000** (cash plus in-kind contributions). In addition, the University of Milan has involved Federated Innovation @MIND companies in all applications in the life sciences presented under the framework of the National Recovery and Resilience Plan (PNRR, the Italian acronym), for a total value of around **€600 million** in April 2022.

Despite not being fully operational, MIND has already managed to establish new partnerships, secure competitive funding, channel knowledge and investments to incubate and accelerate new business, particularly in the life science domain. A selection of the most significant initiatives:

- An innovation team that designs ecosystem support activities together with MIND companies and anchor institutions.
- Partnership between Lendlease and Politecnico di Milano (PoliMi) to enlarge the innovation ecosystem (with Lendlease contributing €1 million).
- Berkeley SkyDeck Europe, the international program resulting from the collaboration between LendLease and Berkeley Skydeck, the accelerator of the University of California at Berkeley, has set up shop in MIND. The Lombardy Region and the Fondazione Cariplo back the initiative with €2.75 million.
- Lendlease invests in MIND ecosystem, through a direct investment in Berkeley SkyDeck startups of €1.3 million.

- Over €20 million raised through competitive grants for R&D projects to be developed at MIND, in addition to PNRR funding.
  - Partnership with Milano&Partners to attract investments, talents and support start-ups.
  - Partnership with E.ON to manage the provision of energy so as to meet MIND's zero-carbon target.
- MIND is not only a place for the incubation and acceleration of innovative companies, it is also a place for experiencing new forms of urban life. The birth of an international district specialized in health, genomics and information technology will lead to the creation of a new neighborhood and a new community that will include medical professionals, university students, researchers, students, administrative staff, users and residents; it is a unique ecosystem for activating synergies between education, research and innovation.

### Economic, Environmental and Social Impact Measurement

PlusValue and Politecnico di Milano were asked by Lendlease to draft the first impact assessment of the Milano Innovation District (MIND) development, aiming to identify the actual and expected economic, social, environmental and innovative benefits generated by the project for the various stakeholders of the project and the spaces where they interact. The impact analysis is conducted on a subset of MIND: Renaissance I (2024), a portion of West Gate, and the Village (2023), since these represent the first areas directly developed and managed by Lendlease.

#### Economic Assessment

This section presents the results of the analysis aimed at evaluating the financial and economic impacts of the investment project Renaissance I, implemented by Lendlease Italy SGR S.p.A. More specifically, the analysis encompasses a financial and economic appraisal of the cash-flows generated by the SGR over the 2020-2031 time frame and the assessment of the wider economic effects generated by the project during the construction and management phases.

#### Financial appraisal

The financial appraisal estimates a Financial Rate of Return (FRR) equal to **9.93%** in the standard scenario and **10.06%** when maintenance costs of





the counterfactual scenario are taken into account. A sensitivity analysis, assuming that all provisions and contingencies are real cash-outflows leads to an FRR equal to 8.77% and 8.90%, respectively.

### Economic appraisal

The economic appraisal demonstrates the positive impact of the project. The **Expected Rate of Return (ERR) is equal to 10.50% in the standard scenario** (10.63% considering the counterfactual scenario and 10.53% when a conversion factor equal to 0.99 for the manpower component of direct costs is applied). Finally, the sensitivity analysis leads to an ERR equal to 9.30% in the standard scenario (or 9.44% considering the counterfactual scenario).

### Wider economic effects

At the **national level**, the main results show a **total impact on production of €877 million** (€219 million on a yearly average) and **on total**

**value-added of €347 million** (a 39.6% percentage with respect to production). The employment impact is estimated to be **between 3,564 and 6,090 Full-Time Equivalent Jobs (FTE)**, considering only employees or also self-employed persons, respectively (between 891 and 1,523 FTE a year on average).

At the **regional level**, the main results show a **total impact on production of €414 million** (€138 million per year) and a **value-added impact of €238 million**. Estimates of total employment impact are **between 1,903 and 3,274 FTE** (between 476 and 819 FTs on a yearly average).

During the **management phase**, externalities are assessed with respect to the economic activities performed by tenants in the Renaissance I area. To quantify them, we have focused on **Retail, Hotel, Head Offices, R&D Laboratories**. Due to the sectoral heterogeneity, industry-specific measures are used. The estimates show value

added generated on a yearly basis by each sector of tenants and, where possible, other aggregate economic figures (e.g. revenues, employees, costs for goods and services, wages etc.).

Overall, the following wider economic effects generated during the management phase are expected to be:

- For the Retail sector, the value added generated by tenants' activities is estimated at around €13.5 million, with the involvement of 354 employees per year. Revenues and costs for goods and services account for €68.5 million and €56.1 million, respectively;
- For the Hotel industry, the value added is estimated at around €4.6 million, with the involvement of 88 employees per year. Revenues and costs for goods and services account for €10.5 million and 5.7 million, respectively;
- For the Head offices, the value added related to the compensation of employees is about €250.3 million, with a total number of employees around 8,100 per year.
- For the R&D Labs, the value added is estimated at around €73.1 million, with the involvement of 571 employees per year.
- Overall, it is estimated that all sectors combined will involve 9115.5 employees per year.

### **MIND as a new model of urban sustainability**

One aspect that differentiates MIND from most innovation districts around the world is that it is committed to being a carbon neutral neighborhood powered by 100% renewable energy. Unlike other districts, MIND bases its development on minimizing the ecological impact and on the sustainability of the buildings. The ambition for MIND is to become fully decarbonized by 2040. Only electric and sustainable mobility is allowed in the innovation district, as MIND is conceived as a test bed for creating an urban environment with transport infrastructure and built spaces that respond to the imperatives of the ecological transition. MIND has already made progress in developing a smart grid for highly efficient district heating and cooling. MIND is therefore in line with the environmental policy objectives of the European Green New Deal, which aims to make the entire European Union carbon neutral by 2050. In other words, MIND will be a zero-emission zone.

### **Carbon Footprint**

A life cycle approach aims to evaluate the environmental profile of a product (good or service) during its entire life cycle, including the production, construction, use and end-of-life phases. The time criterion for evaluating the carbon footprint of the Renaissance I buildings in terms of overall CO<sub>2</sub> equivalent emissions is Design Service Life (DSL), which considers the project throughout its entire life span. DSL has been considered 50 years as the minimum useful life for non-temporary buildings, in accordance with the framework of the Joint Research Center of the European Commission.

### **Energy demand**

The energy demand of the buildings within the Renaissance I will be supplied by a 5<sup>th</sup> generation district heating network, designed by E.ON to provide space heating, space cooling, and the domestic hot water service. The appliances that supply thermal energy to the network are powered entirely by renewable energy, using low global warming potential refrigerant gases. Additionally, the proposed building construction systems maximize construction prefabrication and modularity, reducing inefficiencies in manufacture and assembly. Furthermore, with design for disassembly, construction materials' reusability for other applications is maximized.

Estimated energy consumption of buildings in Renaissance I show that renewable primary energy reaches around 89% on average of total primary energy (renewable and non-renewable) consumption during the buildings' service life.<sup>2</sup>

### **Case study: the carbon footprint of Renaissance I<sup>3</sup>**

The carbon footprint assessment was implemented to evaluate the climate profile – CO<sub>2</sub>eq

<sup>2</sup> The value was assessed considering:

- the amount of renewable energy used by the heat pumps installed in the ectogrid (5GDH network – E.ON); renewable energy to the evaporator from the external environment: 66% is space cooling and domestic hot water mode; the amount of electricity from photovoltaic panels that supply the ectogrid (approx. 10%), based on the energy strategy report (version May 2022);
- the amount of renewable energy from Renewable Energy Certificates (RECs) declared by Lendlease: 100% renewable electricity by 2030 (as declared in MIND-Renaissance I, Business plan, page 12);
- the amount of renewable energy in the national electricity grid, approx. equal to 19%.

<sup>3</sup> In order to use the results of the study for business to business or business to consumer communication, the results should undergo a critical review based on the requirements of ISO 14044 and the consequent environmental communication must follow the indications of the ISO 14020 standard.

emissions generated during the life cycle of the buildings within Renaissance I. The result obtained was equal to 600 kgCO<sub>2</sub>eq per m<sup>2</sup> of gross external surface area, selected as a functional unit, considering 50 years as a time horizon. The outcomes were compared with a specific benchmark to evaluate the sustainability performance of buildings. The benchmark was defined as equal to 1,319 kgCO<sub>2</sub>eq per functional unit. **The CO<sub>2</sub> equivalent emissions are 26% and 83% lower than the benchmark for construction materials and operational energy consumption, respectively.**

The analysis shows that the buildings in Renaissance I have a high level of environmental performance compared to the benchmark due to the high operational energy efficiency of the designed buildings. **All buildings in Renaissance I had an overall CO<sub>2</sub> eq emission lower than the benchmark defined.** The environmental performance of the buildings of Renaissance I were approx. **55% lower than the benchmark selected: the best-performing buildings in Lombardy Region, corresponding to**

**the median of buildings with best performances considering the operational energy consumptions (class A) and construction technology.**

The estimated benefit in terms of CO<sub>2</sub>eq emissions avoided can be determined by calculating the difference between the benchmark (1,319 kgCO<sub>2</sub>eq per FU) and the average value of buildings (600 kgCO<sub>2</sub>eq per FU), **equalling 719 kgCO<sub>2</sub>eq per FU. The benefit equates to 149,677 tCO<sub>2</sub>eq over 50 years when extrapolated to the gross external surface area of Renaissance I (equal to 208,174 m<sup>2</sup>).**

### Social Impact for MIND's Stakeholders

The main social impacts produced by the project are clustered by the relative Sustainable Development Goals (SDGs) set by the UN at the start of the millennium:

- Fair and inclusive economic growth;
- Community cohesion, social inclusion and wellbeing;
- Accessible education and research.

Figure 1 - MIND Impact Areas



### Fair and inclusive economic growth

MIND generates fair and inclusive growth in three ways: through its **procurement strategy**, by promoting **impact-oriented innovation**, and through the **MIND Skills Academy program**. The procurement policy embraced by Lendlease for the development of MIND requires open tenders in order to promote fair competition and the efficient allocation of resources. Beside typical legal requirements, Lendlease's procurement policy requires contractors to provide **additional assurances and certifications**, including the commitment to actively contribute to **Programma 2121**, MIND's work inclusion program for prison inmates. Moreover, by dividing the Procurement Contracts into autonomous lots in line with the size of potential suppliers, **Lendlease also favors micro, small and medium enterprises (SMEs) as suppliers**, and with a target of 80% participation of local companies in the construction of MIND.

The project's focus on impact-oriented innovation is firstly advanced through **collaboration and co-creation processes** between public and private entities, but also through individual initiatives and organizations. These include the **Federated Innovation**, a growing network of 36 leading innovative companies contributing to the advancement of joint R&D, and the **Social Innovation Academy**, which is the physical place within MIND where enterprises, non-profit organizations, academia, and institutions can meet, network and promote socially sustainable innovation. The linkages between Federated Innovation and the Social Innovation Academy resulted in a collaboration between life-science organizations and Fondazione Triulza leading to two projects: one related to territorial health care planning, and the other aiming to promote executive education on sustainability and impact for health care professionals.

**MIND Skills Academy** was launched by Lendlease in partnership with **ELIS** and the general contractors in the Village and West Gate to **support skills development for construction and other technical workers**. It provides professional training and employment opportunities in construction sites and related industries to enable the unemployed, the disadvantaged (including migrants, NEETs, former addicts, etc.) and low-skilled workers to improve their job skills.

The program has so far attracted 7 industry partners and the first batch of trainees were selected in the spring-summer 2022.

### Community cohesion, social inclusion and wellbeing

Several community engagement activities have been carried out so far within MIND, including: a) the **Triulza Foundation's "10 tables for 100 years of sustainable development"**, an event aimed at collecting the ideas of local communities about MIND and its integration with the surrounding areas; b) two **surveys submitted to employees** of companies that are moving to MIND and to Federated Innovation members, in order to understand their needs and expectations; and c) 60 **semi-structured interviews with the broader regional R&D ecosystem** carried out in 2018-2019 to design the district's R&D strategy. In terms of urban planning and accessibility, MIND has been planned according to the **15-minute city principle**, which allows maximum accessibility to people with disabilities or with reduced mobility. To further overcome architectural barriers, Lendlease has planned a **smart wayfinding design** that includes solutions such as signposts with smart colour use and real-time data, **multi-sensorial boards and soundscapes** to intuitively direct people – and particularly people with disabilities – along the district's routes. MIND also includes greater portions of **publicly accessible areas** (47 to 72%), leisure areas (13 to 15.5%), **sport facilities** areas (0.9 to 3%), **green areas** (6 to 18%) and **community facilities** areas (3 to 13%) with respect to any other urban regeneration projects in the city of Milan.

In terms of workforce's health & well-being, Global Minimum Requirements (GMRs) are applied in all worksites, and some GMRs are stricter than Italian safety regulations. This has led to the **absence of any work-related injury** during the Village construction.

### Accessible education and research

MIND's third impact focus for the creation of social value – education – was addressed primarily through **MIND Education**. The latter is an initiative launched in 2018 by Arexpo and LendLease in partnership with Fondazione Triulza, the EU Commission Joint Research Center (JRC) and several schools and universities in Lombardy. The

project, which all the MIND anchors are involved in, recognises the need to **involve younger generations, seen as citizens of tomorrow, in the development of the area**. Over **4,600 students** in primary and secondary education have been involved in the program, leading to the development of over 90 story-telling projects in the last 3 editions, and over **980 high school students** have participated so far in the program.

Moreover, a total of **10 projects were launched** with Milanese universities, developing **58 project concepts over the last 4 years**. A total of €20,000 was made available to students to further develop their ideas. Student beneficiaries have also been involved in MIND through internships in Arexpo and Lendlease, and many STEM students get to pitch their project ideas directly to MIND stakeholders.

# 1. MIND: MAIN PLAYERS AND KEY INVESTMENTS IN R&D

## 1.1 The anchors of MIND

The anchors are the public-interest institutions that are driving the development of MIND by catalyzing an influx of innovative companies and projects. These institutions are the University of Milan, the Human Technopole, the Galeazzi Sant'Ambrogio Hospital, the Polytechnic of Milan and the Triulza Foundation. These are therefore two of the largest public universities in Italy, a new research body with public and private capital, a large private hospital and a non-profit foundation specializing in social innovation. These entities are supported by the private developer, Lendlease, and the public owner of the area, AREXPO, both from an infrastructural point of view and from the incubation and acceleration of new companies and research projects. The Anchors' investments further the innovation-driven mission of MIND, attracting research-intensive academic, institutional and industrial organizations.

### 1.1.1 Partnership between Lendlease and Politecnico di Milano

PoliMi has entered a 10-year partnership with MIND. The agreement was signed at the end of 2021, with a view to attract companies and startups to the local innovation ecosystem and to stimulate collaboration between the public and private sectors. PoliMI plays the role of incubator and LendLease the role of accelerator and scale-up enabler. In the framework of the partnership, PoliMI and Lendlease will:

- Encourage and promote research and innovation at regional, national and international level;
- Promote and support technology transfer and the related dissemination of knowledge within scientific institutions;
- Perform research projects, initially focusing on sustainable buildings with Lendlease contributing €1 million.

In this context, MIND is pivotal since the partnership envisages that the activities will be consistent with MIND's mission and PoliMI will be afforded spaces (2000 sqm) in the MIND area by Lendlease in order to carry out research and teaching activities.<sup>4</sup>

### 1.1.2 New Company with E.ON

Lendlease and E.ON created<sup>5</sup> a new company that will provide and manage the energy supply of MIND buildings. The new company will implement ectogrid™ technology, a fifth generation distributed heating and cooling network developed by E.ON Sweden, to connect buildings with different needs and create a cycle of thermal energy flows. The ectogrid™ will effectively use all available energy flows, working with the same ground temperature and facilitating the utilisation of renewable energy.

### 1.1.3 Partnership between Lendlease and Milano&Partners

Milano&Partners is the investment promotion agency of the City of Milan, founded by the Municipality of Milan and the Milan Chamber of Commerce. In collaboration with Promos Italia, it supports the soft landing of foreign direct investment in the metropolitan area and promotes Milan by attracting foreign talents and boosting its competitive environment. It promotes the brand *YesMilano* in the world to market Milan as tourist and business destination.

In 2020 Milano&Partners created a unit dedicated to attract foreign investments (FDIs), focusing on two key sectors: fintech and life sciences. The choice of the sectors is the result of in-depth anal-

<sup>4</sup> In exchange, Lendlease will be provided a space owned by PoliMI in the Innovation District located in *Campus Bovisa*.

<sup>5</sup> The partnership has been formalized in April 2022.

<p>The <b>University of Milan</b> aka La Statale is one of Europe's largest universities, with 60,000 students and 2,000 faculty members. Established in 1924, it has a strong specialization in medicine and the natural sciences, as well in philosophy, history and the humanities. UniMi plans to move all its science departments and students to MIND, in its brand-new campus at Rho Fiera which will set the standard for scientific higher learning in Italy.</p>	<p>The <b>Human Technopole</b> is headquartered in the former Italian pavilion of Expo 2015. It has been attracting more than hundreds of international researchers to MIND, so they can contribute to the development of biology, bioinformatics, genomics and computer science applied to medical research, working in over 35,000 square meters of laboratory space on research projects of national and transnational relevance.</p>
<p><b>Fondazione Triulza</b> is the non-profit soul of MIND. A foundation hosted by the same-name Cascina (Lombard farmhouse), Triulza has focused on UN Sustainable Development Goals, NGOs and social innovation since its inception in the 2010s. The Cascina is also a remnant of the agricultural landscape prior to the development of the area.</p>	<p>The Galeazzi Hospital, owned by Gruppo San Donato, a private health provider, has long been synonymous of world excellence in orthopedic treatment and research. It has now merged with the Sant'Ambrogio clinic and moved its hospital from Bruzzano to MIND, becoming the <b>Galeazzi Sant'Ambrogio Hospital</b>. Opened in the fall of 2022, the new medical establishment is also specialized in cardiology and neurosurgery.</p>
<p><b>Lendlease</b> is a transnational property developer legally headquartered in Australia. One of the biggest construction companies in the world (more than \$10 billion in revenues), in 2019 it signed a deal to develop all of Google's US properties. Lendlease specializes in large projects of urban regeneration, development and renewal (e.g. the 2012 London Olympics' Village). Its global cities of operation are currently London, Sydney, Melbourne, and Milan.</p>	<p><b>Arexpo</b> Arexpo is a state-owned private company established in 2011 to acquire the site of Expo Milano 2015, an area over one million square meters. After the world fair, Arexpo partnered with private developer Lendlease to build MIND, an innovation district and a new district of the city; a project with strong international ambitions, strategic for the entire Italian economy. Arexpo's shareholders are the Italy Ministry of Finance, the Lombardy Region, the City of Milan, and Fondazione Fiera Milano, as well as the Milano Metropolitan Area and Rho Municipality. Arexpo is the visible public hand in MIND. It also deals with international promotion by developing relationships with technology hubs and science parks around the world.</p>
<p><b>Federated Innovation @MIND</b> is an open model of competitive collaboration and development in applied research between anchors and firms. To date, 38 innovative companies have joined in Federated Innovation @MIND to accelerate research, development and innovation projects dedicated to the city of the future and the future of health.</p>	<p>Il <b>Politecnico di Milano</b> is Italy's largest and most prestigious technical university, with more than 45,000 students, mostly enrolled in engineering, architecture and design. Named best university in Italy by the latest QS Rankings, it leads European research in bioengineering, new materials, mechanical engineering and data science, and has a unit specializing in the design and optimization of health services.</p>

ysis and research into investment flows in Europe and Milan's competitive capacity compared to other benchmark cities: Barcelona, Berlin, Helsinki, Munich and Stockholm, to name a few. In this context, MIND represents a unique development opportunity for the city and an international reference in life sciences, capable of accelerating technology transfer and attracting new companies to the area.

MIND is currently being communicated in various ways: through articles, brochures, marketing campaigns, social media presence, and video messages from Ambassadors who have invested in MIND and at many international events. The response from the market has been positive, attracting the attention of several leading foreign life sciences companies.

The aim of the partnership with Lendlease, started in December 2021, is to increase the effectiveness

of the district's promotion and visibility, focusing on the following initiatives:

- National - MIND is used to promote the Milan brand around the world. MIND is an exceptional asset of the city and the entire surrounding area.
- Attraction of talents (and start-ups) by taking advantage of MIND's start-up and university campus programs.
- Regulatory experimentation using MIND as a testbed for rethinking existing regulations on innovation districts.

## 1.2 The New Science Campus of the University of Milan at MIND

UniMi has chosen MIND as the location to create an up-to-date scientific campus where all the science departments presently scattered across the city can be reunified in a single, highly integrated

structure with state-of-the-art lab facilities. The objective of Milan's largest university (established in 1924) is to pursue basic and applied research according to the highest international standards in an environment made fertile by the presence of other scientific research institutions, clinical research hospitals, and innovative industries.

The UniMi campus at MIND will be composed of 5 buildings and cover approximately 200,000 sqm of total built environments. The abundance of unbuilt space with a built/unbuilt ratio of less than 50% will enable future expansions. The design of the Campus includes an auditorium capable of hosting 14,000 students, and small classrooms to enable a more experimental type of teaching including open air rooms. Specific attention is given to the teaching laboratories, which will be fully digitized and equipped for the experimental teaching of physics, biology, basic chemistry and pharmaceutical chemistry, pharmacology, and agritech science. In addition to the new library, study rooms will be available for a total of 700 additional seats. The construction of the UniMI campus is scheduled to be completed for the 2025-2026 Academic Year, its forecasted cost is in excess of €339 million.

These are the schools and departments where the scientific strengths of Milan's public university will be played out in the new Science Campus:

- **Science and Technology**, coordinates the scientific degree programs involving seven departments: Biosciences, Chemistry, Physics, Computer Science, Mathematics, Earth Sciences and Environmental Sciences and Politics;
- **Agricultural and Food Sciences** is the largest school in Italy and the only one in Lombardy. It offers diversified education and important training opportunities thanks to the new up-to-date laboratories - including those for plant advanced computer systems, chemistry, microbiology, sensorial analysis, genetics and molecular biology, plus three experimental farms and a greenhouse complex;
- **Pharmacy**, the youngest UniMi school which has grown rapidly over its 50 years by attaining international excellence.
- **Medicine**, majorly present at MIND with its pre-clinical departments to do work in basic, translational, and clinical research across disciplines and specialties, and discover fundamental insights that will lead to new diagnostic tools and treatments in human health.

The creation of the new campus will significantly enrich UniMi educational offer by providing novel, digitally equipped, student-centered teaching rooms and facilities, together with student and research laboratories with state-of-the-art instrumentation; in addition the presence in the innovation district will facilitate the interactions with the Federated Companies present in MIND, including the organization of internships for UniMi students, seminars, post-graduate courses.

A large scientific library and a science museum with historical exhibits collected by the departments of Bioscience, Earth Science and Pharmacology will be integral parts of the UniMi Science Campus.

The added value provided by UniMi to MIND is illustrated as follow:

*Intersectorial research collaborations:* starting from Italian Resiliency and Recovery Plan, where UniMi has involved Federated Innovation @MIND companies in all applications brought forward in the life sciences domain, whose total value amounted to around €600 million in April 2022.

*New entrepreneurship:* UniMi has been active in the creation of spin-offs, such as Petroceramics SpA, Tethis SpA and Wise srl, and is part of the Seed4Innovation program with a view to increase synergies between MIND companies and academic research.

*Intellectual Property:* technology transfer is carried out through the development and utilisation of patents, an activity in which UniMi is already active.

*Accredited laboratories:* UniMi is home to specific accredited laboratories in MIND domains, especially in the biomedical and agri-food sectors.

*International cooperation projects:* the scientific research agenda developed on campus at MIND relates mostly to United Nations Sustainable Development Goals. The campus enables international scientific cooperation, starting with the agri-food sector, and extending to climate change resilience and human health.

*Scientific conferences:* the modern design of conference spaces on campus enhances quality and size of scientific congresses and symposia.

*Cultural events:* UniMi's Science Campus at MIND is designed to interact with the Milan Metro Area, thanks to the availability of space for public exhibits and workshops.



### 1.2.1 UniMi research at MIND

UniMi is a leading Italian university for investment in research. UniMi has ranked first in Italy for its **research quality** in the very recent VQR evaluation conducted by ANVUR, the Evaluation Organ of the Ministry of Education and Research (<https://www.anvur.it/attivita/vqr/vqr-2015-2019/>). With about 15,000 publications/year (32% of each in the top 10% international journals), and recipient of major research funds and grants (35 ERC awards, 8 Departments of Excellence, about 150 Horizon 2020 awarded projects) UniMi is a leader in scientific research in Italy, ranked #1 in Life Sciences and Medicine and in Pharmacy & Pharmacology, and in the 5 top positions four Chemistry, Agriculture & Forestry, Physics & Astronomy<sup>6</sup>.

To support university researchers UniMi created selected core facilities aimed at facilitating the use of sophisticated instrumentation, providing experienced personnel able to facilitate experimental data production and analysis and enhancing the efficiency and effectiveness of the University's research. The high-level multidisciplinary technical assistance and services provided by the core laboratories, both inside and outside the University, proved successful in stimulating development and innovation in a context that favors the encounter of diverse research fields. At present time, the core facilities available are:

- **Cospect:** dedicated to the structural and compositional characterization of natural and synthetic substances and materials by means of Nuclear Magnetic Resonance Spectroscopy (NMR), High-Resolution Mass Spectrometry (HR-MS) ESI-Q-ToF and MALDI-ToF, Liquid chromatography UPLC-UV/Vis, Microscopy with Electron Microprobe, Transmission Electron Microscopy (TEM), X-ray Diffractometry<sup>7</sup>.
- **NOLIMITS:** dedicated to in vitro and in vivo imaging with the use of Transmitted and Fluorescence Optical Microscopy; Multi- and single-photon confocal microscopy for in vivo analysis on microorganisms and on animal and vegetable organisms; Electron Microscopy; SEM-EDS and TEM-EELS on inorganic, polymeric and biological materials; MRI for magnetic resonance analysis of small animals.<sup>8</sup>

- **OMICs:** created to support proteomic, lipidomic and metabolomic studies based on mass spectrometry to identify and quantify molecules in different biological matrices and plant extracts.<sup>9</sup>
- **INDACO:** a computing infrastructure for the analysis of complex data that provides high-performance processors for 512 cores and 600 TB storage on a parallel file system, and an Infiniband communication network<sup>10</sup>.

These facilities will be significantly expanded at MIND with the creation of a so-called “macroplatform” designed to house core and departmental highly specialised functional units. The scientific macroplatform will be housed in several buildings covering an area of more than 15,000 sqm.

Current plans indicate that the macroplatform will host animal facilities with an area of 3,000 sqm for selected animal species (insects, amphibian, fish and rodents) equipped with modern imaging facilities (bioluminescence, PET and NMR), breeding rooms, surgery and facilities for behavioural studies and biocontainments labs (BSL 2-3). Among the structures present in the macroplatform are: a large data center, a cryopreservation center, GXP facilities, clean rooms, radiation rooms, high pressure dangerous preparation rooms, optical tables and advanced material, chemistry and agrarian pilot plants; a central workshop, labs for cytofluorimetry, a petrology unit, and seed storage unit.

### 1.3 The Human Technopole

In November 2015 an Italian government decree<sup>11</sup> mandated a scientific proposal and executive project for the Human Technopole in the area that hosted EXPO Milan 2015. Initially based on a plan developed by the Italian Institute of Technology (IIT) in collaboration with local institutions, research centers and hospitals, the research center relies on government funding of €140 million per year from 2023 onwards, with an investment of over 400 million already committed to date.

The campus will be made up of five main buildings, covering a surface of roughly 30,000 sqm:

- **Palazzo Italia:** the former Italian pavilion at EXPO Milan 2015, has been completely refurbished and is the institutional headquarters of Human Technopole.

<sup>6</sup> QS World University Rankings 2022.

<sup>7</sup> <https://www.unimi.it/en/research/places-organizations-and-infrastructures/unitech/cospect-unitech>

<sup>8</sup> <https://www.unimi.it/en/research/places-organizations-and-infrastructures/unitech/nolimits-unitech>

<sup>9</sup> <https://www.unimi.it/en/research/places-organizations-and-infrastructures/unitech/omics-unitech>

<sup>10</sup> <https://www.unimi.it/en/research/places-organizations-and-infrastructures/unitech/indaco-unitech>

<sup>11</sup> Article 5 of decree-law no. 185 of 25 November 2015, converted, with amendments, by law no. 9 of 22 January 2016

- Incubator labs: Human Technopole’s first experimental laboratories built in the area around the Tree of Life, next to Palazzo Italia.
- North Pavilion: the building has undergone an intense redevelopment to transform it into an adequate space for facilities (described below) to be hosted. It has support spaces for the preparation of samples and offices for the facilities managers.
- South Pavilion: currently under renovation, it will host experimental laboratories and further Human Technopole facilities.
- South Building: the main building of the Human Technopole Campus. Once completed it will host laboratory space for up to 800 scientists, alongside offices, spaces for events, workshops and training courses.

### 1.3.1 The strategy: scientific excellence, interdisciplinarity and openness

The Human Technopole’s Masterplan was coordinated by the Italian Institute of Technology (ITT) and developed together with Milanese research institutions. The Masterplan stemmed from the theme of Milan EXPO 2015 “Feeding the planet, energy for life”, encompassing various areas pertaining to human health. When Human Technopole kicked off in 2019, the research institute’s mission was unveiled. Human Technopole aims to improve human health and well-being through the development of personalized medicine approaches. This will be carried out by five interdisciplinary Research Centers: Genomics, Neurogenomics, Structural Biology, Computational Biology, and a focus on public health care with the Health Data Science Center, a collaboration with PoliMi. Human Technopole’s Research operates in a virtually barrier-free setting and is characterized by a collegial management style, fostering an inclusive and open culture, by sharing laboratories and facilities, and broad collaboration between different teams, including interdisciplinary collaboration across research centers.

### 1.3.2 A hub of scientific talent

The Human Technopole will employ roughly 1,000 scientists including biologists, bioinformaticians, chemists, engineers, mathematicians, and computer scientists. As of 1 December 2021, the Human Technopole has a scientific staff of over 150 people. Internationality is a strong focus of recruitment activity: over 60% of scientific staff

comes from outside Italy, including from prestigious international academic and research institutions (RIKEN, Sanger, Cambridge University, Institute Cancer Research, Max Planck institutes, etc.). Currently, it hosts scientists of 22 different nationalities. All candidates are evaluated and selected by panels of internal and external experts in the relevant field. This, in combination with a fixed-term contract policy, promotes the international circulation of talent and expertise.

Furthermore, scientific training at Human Technopole aims at enhancing the scientific capacity of in-house and external researchers through advanced training activities in the relevant focus areas in Human Technopole. Ultimately, Human Technopole aims to become a reference point for scientific training in the life sciences for the national and international scientific community.

Human Technopole’s strategy to support PhD students and Postdocs includes actions promoting scientific and career development as well as training in cutting-edge technologies and topics at the forefront of their respective research fields.

Gender diversity is another core value. As of 1 December 2021 the staff at Human Technopole is composed of 197 members: 104 women, 93 men.

At regime roughly 80% of the staff is expected to be scientific personnel, and roughly 20% in administrative/support roles. Of the 80% scientific personnel, it is currently envisaged that roughly 60% will be dedicated to research and roughly 40% to service and scientific/technical support activities. The vast majority of Group Leaders hired at Human Technopole consists of junior PIs (Principal Investigators) who, following successful postdoctoral research endeavors, lead an independent research group for the first time.

### 1.3.3 Research facilities at the Human Technopole

Six core facilities equipped with state-of-the-art scientific equipment are being set up: Data Center, Genomics Facility, Image Analysis Facility, Light Imaging Facility, CryoEM Facility and Automated Stem Cell and Organoid Facility.

Among Human Technopole’s Core Facilities, the Cryo-Electron Microscopy and the Automated Stem Cell and Organoid Facility constitute truly innovative endeavors, in terms of research infrastructures that Human Technopole is bringing to the national and international research landscape.

As a matter of fact, the Cryo-Electron Microscopy Facility represents one of the most comprehensive platforms globally for high-resolution molecular structure determination, including single particle analysis, cryo-focused ion-beam milling and cryo-electron tomography. On the other hand, the Automated Stem Cell and Organoid Facility is aimed at streamlining the key rate-limiting steps in disease modelling based on human cells and tissues, i.e. cell reprogramming, genome editing and longitudinal organoid culture and characterization. Core funding for the Human Technopole comes from the Italian government. Additional funding comes from international research agencies like the European Council, National Institute of Health, the Chan Zuckerberg Initiative, and others.

#### 1.4 The Galeazzi Sant’Ambrogio Hospital

The Galeazzi Sant’Ambrogio Hospital, owned by Gruppo San Donato, is the first hospital for orthopaedic hospitalizations in the Lombardy Region, the first in Italy for prosthetic surgery (knee, ankle and hip) and spinal arthrodesis interventions. It also ranks first in Italy for case-mix, an indicator reflecting the complexity of treated cases. The hospital works on advanced therapies, particularly on tissue engineering and fourth generation biomarkers. No less important is the fact that Galeazzi is at the forefront of health-services innovation, being one of the few hospitals in Italy to undertake civic audits and managing four regional prosthetic registers including information on surgical approaches and long-term impacts on patient quality of life.

The total value of the investment in construction and technological equipment for the new hospital in MIND is approximately €0.5 billion. The new and vast 16-floor hospital has recently been inaugurated: it will host up to 9,000 people per day, adding Cardiology to its specializations, thanks to the acquisition of the Sant’Ambrogio clinical hospital<sup>12</sup>. This treatment and research hospital facility offers health care of the future with a surface area of approximately 150,000 sqm, over 550 beds, 5000 users and outpatient services, approximately 700 doctors, 1,100 nurses and health care workers and 500 researchers, students and postgrads.

<sup>12</sup> MIND Milano Innovation Ecosystem Executive Update Q3 2021. - Galeazzi Group website.

In MIND, the Galeazzi Sant’Ambrogio Hospital will carry out clinical research activities aimed at innovation and the advancement of medicine. The research laboratories are going to occupy 2000 sqm while advanced magnetic resonances for research will occupy 1000 sqm. Furthermore, the operation of the hospital will be entirely based on digital systems through its clinical management systems (an electronic medical record), tracking of patient flows, scheduling and operational management of surgical activities, goods tracking and digital patient relationship systems, including relationships with patients’ family members<sup>13</sup>.

From the point of view of sustainability, the hospital follows “green building” conceptualization, supporting environmental and occupational wellbeing. Galeazzi aims to obtain the LEED GOLD (Leadership in Energy and Environmental Design) certification,<sup>14</sup> representing the international standard in sustainability and energy, ecological and design efficiency. This will result in a reduction of the carbon footprint of the hospital building by up to 30% of its total emissions output. In fact, the new hospital has been built using the most modern and efficient solutions in terms of energy saving and environmental sustainability, minimizing not only waste and consumption, but also noise and pollutant emissions<sup>15</sup>. To reduce the impact on the city’s electricity grid, photovoltaic and/or solar thermal systems will be used on the entire surface of the roof of the new Galeazzi, while the plants (water, electricity, air treatment, etc.) will be designed to optimize consumption through circular economy principles: avoiding waste and dispersion, using resource or energy recovery systems wherever possible and reducing embodied emissions. The achievement of a green building certification follows the EU Green Deal strategy, which entails the decarbonization of the Europe’s building stock by 2050. Great attention has also been paid to comfort, the design of interior spaces and natural lighting.

<sup>13</sup> Information collected through a written interview of managers of IRCCS Galeazzi.

<sup>14</sup> IRCCS Galeazzi is already registered for the assessment procedure and is a candidate for the LEED GOLD V4 Certification for environmental sustainability. The procedure can only be finalised upon completion of construction works.

<sup>15</sup> L’Ospedale per la sanità del XXI secolo: Il nuovo IRCCS Galeazzi - Gruppo San Donato. Information was collected during an interview with the referents of Galeazzi Hospital

#### 1.4.1 Generating impact through the MIND ecosystem

The Galeazzi Sant’Ambrogio Hospital will be critical for the enhancement of innovation in the life sciences ecosystem at MIND, facilitating the cross-contamination of ideas between people, projects, and other entities. The Galeazzi Sant’Ambrogio Hospital, together with Lend-Lease, Confindustria Dispositivi Medici and Bio4Dreams is leading the Primary Site project, aimed at supporting 10 innovative start-ups or SMEs operating in the medical device sector requiring support to acquire the CE mark.<sup>16</sup>

The hospital is a strategic health care partner of the Life Sciences & Health care section of Federated Innovation. The Galeazzi Orthopedic Hospital has already launched joint projects with Human Technopole and the UniMi<sup>17</sup>. The vision of the Galeazzi Sant’Ambrogio Hospital is to be an important element for the future of health where preventative treatment will supersede reactive, cure-based treatments. In fact, improved data collection will help citizens to be better informed about health and thus willing to take personal responsibility for their own wellbeing.

#### 1.5 Berkeley SkyDeck Europe, Milano

Spawned by UC Berkeley’s Haas School of Business and the College of Engineering, Berkeley SkyDeck offers a powerful environment for start-ups to grow and launch. SkyDeck’s accelerator program is a benchmark in Silicon Valley and each year attracts over 3,000 applications from around the world, with 40 accepted each term. To date, Skydeck has supported the development of over 1,000 start-ups. The top 80 startups have raised €1.47 billion after acceleration through the Berkeley SkyDeck Fund, whose underwriters include Sequoia Capital, Mayfield Fund, Canvas Ventures and Sierra Ventures.

In January 2022, Berkeley SkyDeck in MIND launched a new accelerator program designed for accelerating European-focused start-ups, that will be able to more easily access the vast network of advisors, mentors, VCs, and corpo-

rations: Berkeley SkyDeck Europe. The acceleration program was initiated by Lendlease and MIND Advisory Board’s Chair Professor Alberto Luigi Sangiovanni-Vincentelli<sup>18</sup> worked in collaboration with Skydeck Berkeley. By collaborating with LendLease, the Lombardy Region and the Fondazione Cariplo, Skydeck intends to:

- Support the growth and development, including international development, of local innovative enterprises (start-ups);
- Develop entrepreneurial strengthening programs for attracting talent, initiatives and investments, including from abroad;
- Strengthening the innovation support mile (so-called Death Valley) which competes for technological validation and scalability of solutions;
- Integrate the best international experiences to the benefit of the innovation value chain, also in support of the country system.

#### 1.6 MIND as a regional innovation hub

The regional context plays a fundamental role in the development of tech districts. This is true for MIND, which can rely on a particularly strong specialization in medicine and biology in Milan and the surrounding Lombardy region. Beside the role of leading research anchors and a supportive local ecosystem, a key factor in the advancement of MIND is the support of local government institutions, the City of Milan and the Lombardy Region, particularly in supporting the district’s start-up phase and in facilitating the involvement of private actors.

The Lombardy Region supports the program with a total contribution of €1.5 million over the 2021-2023 period, allocated to the granting of non-repayable contributions in the co-financing of costs relating to acceleration services<sup>19</sup>. The SkyDeck project in MIND is now being implemented thanks to the Lombardy Region and Fondazione Cariplo which will together grant €2.75 million to the initiative (Fondazione Cariplo, 2021). To date, over 571 applications have been submitted and 9 startups selected by SkyDeck Europe in the first cohort of the program.

**Fondazione Cariplo**, the largest banking foundation funding social projects in region, sees the

<sup>16</sup> Primary Site is further described in the section “Much more than its parts”.

<sup>17</sup> Information was collected during an interview with the referents of Galeazzi Hospital.

MIND Milano Innovation Ecosystem Executive Update Q3 2021.

<sup>18</sup> Full professor at the University of California Berkeley, Department of Electrical Engineering and Computer Science.

<sup>19</sup> Deliberation N° XI/5479 08/11/2021 Lombardy Region.

following main benefits in terms of impact on the Lombardy innovation ecosystem<sup>20</sup>:

- Increase in the competitiveness of the R&D ecosystem;
- Improvements in technology transfer processes and the acceleration of spinoffs/start-ups
- Improvements in international positioning with reference to the main rankings;
- Improving attractiveness to talent, innovators, mentors and investors;
- The growth of community cohesion (economic and social);
- The creation of international value-added networks between the main R&I stakeholders;
- The creation of qualified and stable employment through support for innovative enterprises;
- Valorization of the competences and skills of young people in the area;
- Adaptability of local companies to changes (technological or market-driven) in competitive scenarios.

## 1.7 Private Investment in MIND

### 1.7.1 Lendlease

The company's vision is oriented to create places that inspire and enrich the lives of people around the world with a focus on safety, innovation and sustainability. In 2021, Lendlease reported a Statutory Profit after Tax of \$222 million and a core operating profit of \$377 million. In addition, the Group made significant progress on its strategic priorities. Investment partner initiatives worth \$5.1 billion that will drive future funds under management also progressed.

Lendlease has signed the concession agreement for the development and management of MIND for the next 99 years, envisaging a total investment of approximately €4.5 billion<sup>21</sup>. Lendlease's private development rights cover around half the district's area, which is 480,000 sqm, with an estimated development end value of about €2.5 billion (Lendlease, 2021).

The total area dedicated to laboratories occupies an area around 24,595.60 sqm which will be situated on the Village and West Gate areas. The first laboratories completed, Rold Labs and B4D Shared Labs, are going to be available respectively

in the second and third quarter of 2022 as shown in Figure 1.

MIND will offer spaces to bring together industry players, including start-ups and scale-ups, creating an important locus for smaller nodes within the district. These spaces will include highly competent accelerators for software or hardware where research institutions and start-ups can share space and collaborate for as long as they need, plus functional spaces designed to foster research and innovation including co-working spaces and conference rooms. Accelerators will have spaces dedicated to prototyping and production, with the addition of services provided to move proof-of-concept through prototyping stages, to its eventual commercialization. Figure 1 provides details regarding incubators and accelerators, coworking spaces and competence centers. The total value of the investment for the construction of these new innovative spaces (laboratories, incubators and accelerators, coworking and competence center spaces) amounts to €85.5 million.

In July 2021, Lendlease established a joint venture with Canada Pension Plan Investment Board (CPP Investments) in order to invest in a dedicated Italian real estate alternative investment fund (the Renaissance I Fund) following the development of Phase 1 of the West Gate area of MIND. The joint venture between Lendlease and CPP Investments builds upon a strong relationship already established across projects at both Barangaroo in Sydney, Australia, and Elephant Park in London, UK. It is the first time that CPP invests in Italy.

CPP Investments and Lendlease have agreed to a 50:50 joint investment equalling circa €400 million of equity in the Fund to develop and maintain ownership of 150,000 sqm of Lendlease's 480,000 sqm of private-development land. The Fund will develop part of the West Gate area of MIND; the mixed-use area will become a recognizable destination for researchers, workers, residents and other visitors to the district's west entrance. The Fund will be managed by Lendlease Italy SGR SpA, with Lendlease Services Srl undertaking the role of development and project management.

### 1.7.2 Key Tenants' investment outlays

MIND tenants will make an essential contribution to catalyzing innovation and developing new therapies. The first company to join MIND was pharma

<sup>20</sup> Information collected through the written interview with Carlo Factory.

<sup>21</sup> MIND Project Overview 2019.

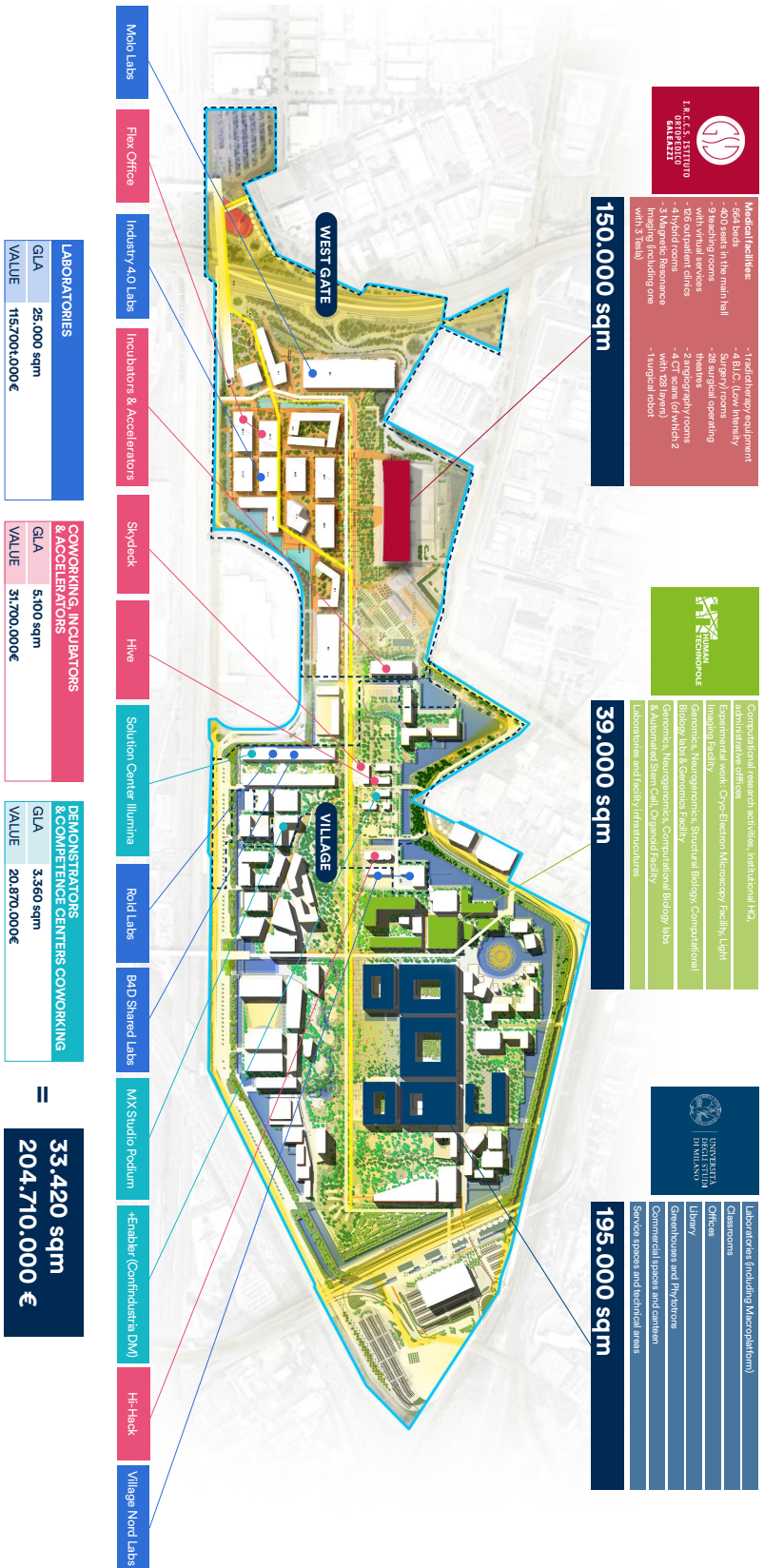


Figure 2  
Overview of MIND Project  
Size and Key Partners

giant AstraZeneca. By 2022, AstraZeneca will hire 200 employees, and by 2023 it will double its investment in clinical research, bringing it up to €48 million. This in turn will generate €2 billion of Italian GDP and the creation of 6,000 FTE.

Rold, a leading designer and manufacturer of innovative components, solutions and platforms for the domestic, professional and industrial sectors, also established its position in MIND early on.

Bio4Dreams, a certified incubator dedicated to early-stage innovative start-ups in the Life Sciences, support technology transfer for innovative research, is also a MIND tenant.

Illumina, global leader in genomic sequencing, will open its first and only Italian Solution Center at MIND. The company provides a line of products and services that serve the sequencing, genotyping and gene expression, and proteomics markets. Illumina has arrived the second half of 2022 with a solution center dedicated to genome research and sequencing, alongside researchers from Human Technopole.

MIND's key tenants (AstraZeneca, Illumina, Bio4Dreams and Rold) were consulted as part of the impact assessment exercise to understand their motivations to move to MIND and the potential benefits of this decision on their organization and on the ecosystem. All companies surveyed agreed that the key driver for the acquisition of spaces at MIND was the biotech and medical specialization of the district, the presence of public anchors, and logistical efficiency.

The ratio between R&D spending and revenue is 7.7% for Bio4Dreams, 20% for Illumina and 8% for Rold. The total investment in MIND of key tenants (€5 million for Illumina, €3.4 million for Bio4Dreams, and around €2 million for Rold) demonstrates how much these companies strongly believe in the site as a place to develop activities and collaborations.

Astrazeneca is a founder of Federated Innovation @MIND, sitting both in the company's board and co-leading R&D activities in the Health and Life Sciences thematic areas, with a particular focus on new digital health solutions.

Rold intends to carry out applied research and innovation and training activities in the district, which are focal points for its permanence in the district to increase the effectiveness and activities of their innovation and research center, R-Lab, and the Rold Academy. The former is an applied

research laboratory the the latter provides continuous training to students and professionals on evolving technological innovation. Specifically, in MIND, Rold developed a new collaboration with UniMi, thus expanding its research areas (mainly in the domain of physics).

Bio4Dreams will mainly focus on innovative start-ups incubation, R&D projects, and shared research laboratories. Moreover, innovation-driven projects specifically designed for MIND, such as Shared-Labs™, Innovation Circle™, and Health Care 4.0, will contribute to its successfully long-term presence in the district.

Illumina will have an office with a solution center in MIND, dedicated to genome research and sequencing applications, as well as back office operational activities for the Italian public market. The solution center will strengthen Illumina's network of solution centers in EMEA (UK, France, Germany, Netherlands and Russia). Paula Dowdy, Illumina's Senior Vice President and General Manager for EMEA stated: "The new Solution Center will strengthen our relationships with hospitals, clinics, universities and companies across Italy... positioning MIND as an innovative health care hub in Europe".

The link with the university and the academy is a key asset for tenants. Illumina has strong links with UniMi, whose success in technology transfer can provide scenarios for future applications and may become a partner for Illumina's technology. The possibility to stock products combined with the opportunity to be close to the clinical and pharmaceutical sectors are key elements for Illumina's strategy.

Bio4Dreams and Rold have already started to collaborate with each other, while Bio4Dreams is also looking forward to a collaboration with Illumina and is already collaborating with Galeazzi Sant'Ambrogio Hospital. Astrazeneca has been among the founding companies of Federated Innovation @MIND and is working proactively with companies in the Health and Life Science, as well as with the district's public anchors.

### 1.8 Federated Innovation @MIND

Federated Innovation @MIND was conceived by Lendlease as a way to bridge the gap between Anchor Institutions and the business environment, both in terms of advancing a shared innovation agenda, and in terms of ensuring that physical

infrastructure (built and public environment, as well as connections between spaces) and services provided to the district tenants converged in the pursuit of innovation and sustainability, maximising the positive socio-economic impacts of large urban regeneration projects<sup>22</sup>.

Federated Innovation is a unique model, designed to go beyond open innovation and proprietary innovation which makes independent research and innovation available to all partners. It leverages on a special IP agile framework and physical proximity simultaneously to drive the implementation of innovation in real estate and regeneration projects. To date, it features 36 companies that are working together in a virtuous and collaborative environment to accelerate their innovation capacity with Cariplo Factory acting as the Ecosystem Catalyst. Federated Innovation is built on five different layers: Layer 1: The Innovation Alliance; Layer 2: The 11 Thematic Areas (with Chapter Areas or Subthematic Areas enabling focused domains of interest in each); Layer 3: The Innovation Initiatives; Layer 4: The Business Community and Layer 5: The Talent Community.

- **Layer 1 – The Innovation Alliance** defines Federated Innovation’s vision, mission, innovation strategy and agenda, and the allocation of the Federated Innovation budget. The Innovation Alliance co-designs and sets up the policies and the rules of The Federated Innovation, proposes and discusses KPIs and monitors the overall ecosystem performance.
- **Layer 2 – The 11 Thematic Areas** defines the Innovation Agenda of each Thematic Area, allocates the Thematic Area Budget, offers the opportunity to host companies’ Innovation Ecosystems within the Federated Innovation, and identifies strategic ideas and initiatives.
- **Layer 3 – The Innovation Initiatives** offers services designed to facilitate: the opportunity to rapid prototype innovations in a controlled urban environment; the access to prestigious universities, MIND “public anchors” and the research community; the construction of the innovation initiative team; priority access to top-tier advisors and investors; and the access to high-value services, provided by Lendlease.
- **Layer 4 – The Business Community** and **Layer 5 – The Talent Community** provide

a basin of talent and know-how to Layer 1 and 2, fostering the implementation of innovation initiatives at Layer 3 level.

The annual contribution to join the Innovation Alliance is €50,000 and this layer does not grant the access to any thematic area. Therefore, companies willing to join a specific Layer 2 thematic area will pay a fee of €50,000. Any additional thematic area will have a €25,000 cost. The Layer 2 fee consists of €25,000 directly going to the innovation initiatives (in the form of in-kind contribution, eg. event organization and/or research activities), while the remaining €25,000 are used to cover running costs. The first layer is composed of 14 members, 45 companies compose Layer 2 and three of them (**Esselunga**, **ENI** and **Accenture**) participate to two thematic areas. The total contribution is €1,900,000.

The Figure 3 below is a snapshot of Federated Innovation, providing an overview of the different layers, research partners, institutional partners, sponsors & industrial partners, and innovation partners.

The core of the ecosystem is composed of the anchors, i.e. UniMi, PoliMi, the Galeazzi Sant’Ambrogio Hospital and Human Technopole, who came together with Fondazione Triulza, Lendlease and Arexpo. These key stakeholders are together in a Strategic Committee which provides guidance to the whole district and liaises with the Federated Innovation community, with two appointed representatives (L1 Ambassadors) for the private sector representing the two key innovation pillars of the district (i.e., Future of Health and City of the Future). Institutional players and R&D partners further support the ecosystem by providing strategic advice and guidance, participating in innovation initiatives, or joining events and initiatives organized by the district actors.

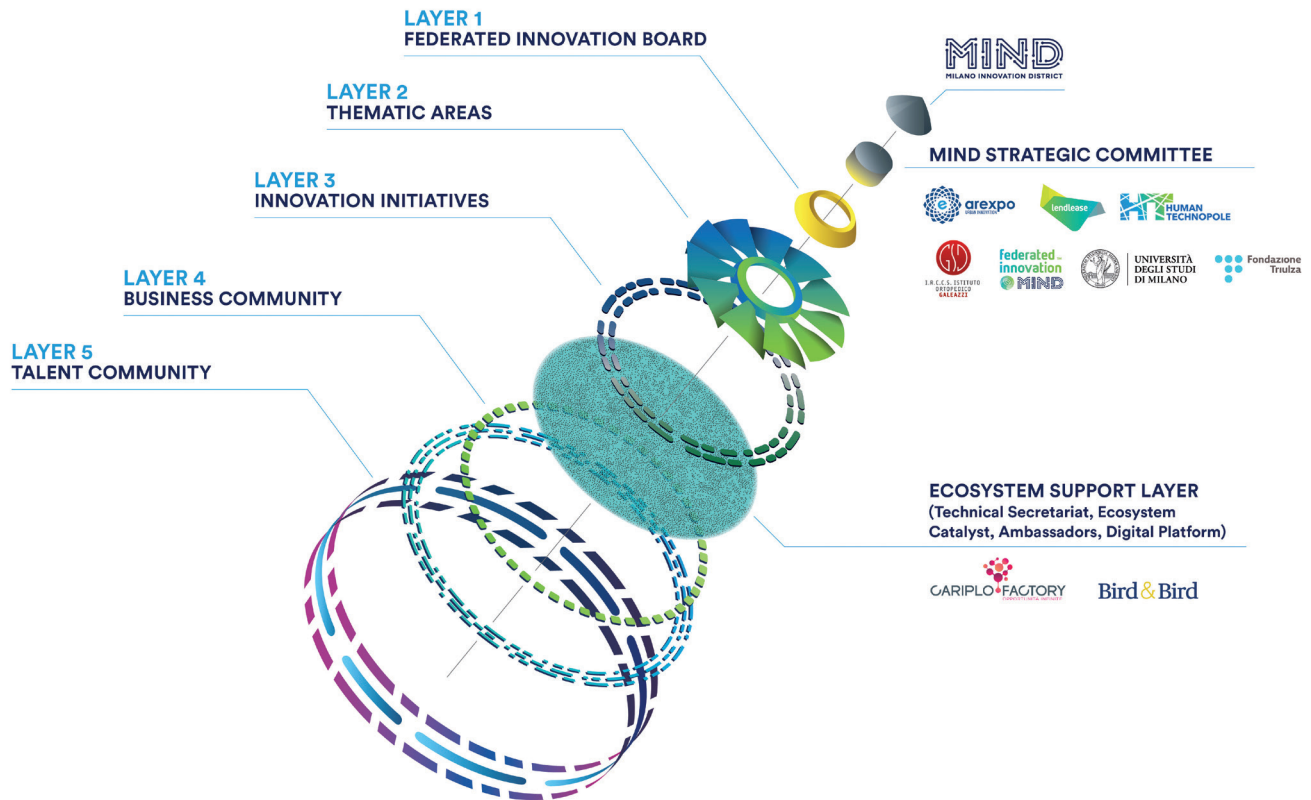
Launched in January 2021, the network’s operating model goes beyond open innovation thanks to the critical mass of early players and a specially-tailored legal framework, to embrace a nimble ‘collaborate to compete’ paradigm. Ambassadors have a primary role: they are experts in their defined fields and chosen by the companies, so their role is key not only in the content but in the grounding of the projects themselves. Moreover, they are key to ensure coordination between the different Thematic Areas.

The Catalyst is responsible for the development of

<sup>22</sup> Federated Innovation, MIND, Playbook, December 2020.



Figure 3 - Federated Innovation model



innovation in the operational context, supporting the Thematic Areas in the realization of an Innovation Agenda capable of generating innovation initiatives among the different area members. The Catalyst supports the companies, guiding them by proposing working tools and managing the Digital Platform, the Federated Innovation's online working tool. It fosters cross-contamination between areas, building bridges with the district's public anchors. Finally, it also works on aspects of communication and external relations, facilitating the landing of both new players and institutional players of potential interest to the ecosystem.

Each Thematic Area has a dedicated agenda. MIND's Thematic Areas are:

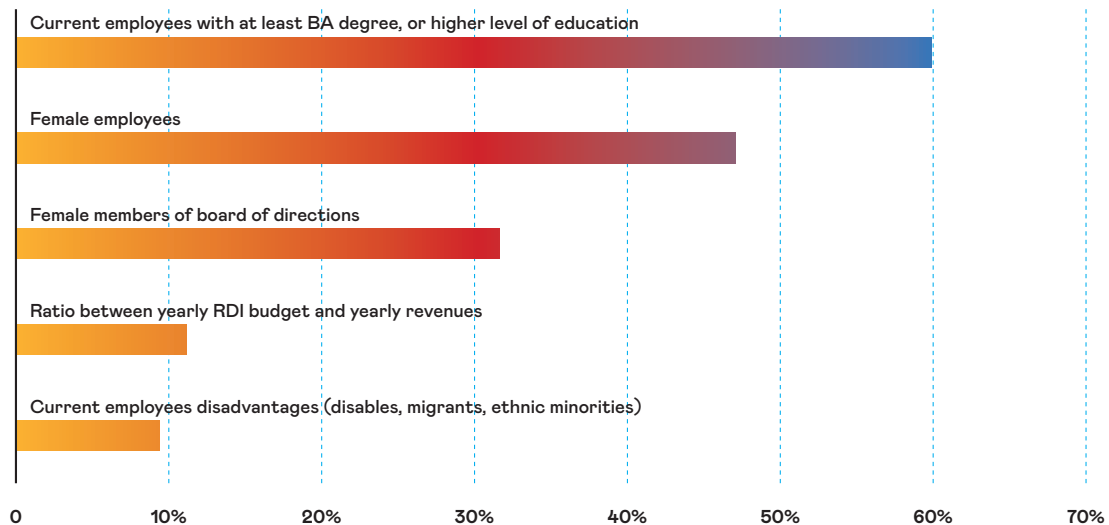
- **Life Sciences & Health Care;**
- **Agrifood Tech & Wellbeing;**
- **Construction Tech;**
- **Energy;**
- **Fintech;**
- **Greentech & Circular Economy;**

- **Mobility & Logistics;**
- **PropTech & Smart Spaces;**
- **Retail Tech;**
- **Security & Defence;**
- **Urban Digital Tech.**

During the first year of activity, the 11 innovation agendas were developed and were presented at a public event on September 22. The success of the initial agendas is embodied in the work prompted by AstraZeneca, part of Layer 1, who shared its first innovation initiative, Prometeo, with the ecosystem. Moreover, its networking activities led to signing 2 sponsorship agreements, and the onboarding of 6 new realities in Layer 2, the level of thematic areas.

In light of the experiences thus far, companies could benefit from greater support in grounding projects by reconciling and synthesizing all needs, interests and prospects with support from the ecosystem. In addition, further fundraising, possibly

Figure 4 - Social and Governance issues



in connection with the PNRR (National Recovery and Resilience Plan) would be valuable and useful. The primary goal for 2022 is to increase the internal efficiency of the network.<sup>23</sup> The lack of in-person networking events and meetings with the MIND ecosystem is now overcome with the lifting of pandemic restrictions in Milan and the rest of Italy. Public anchors and other members of the ecosystem, including Berkeley Skydeck and its induced activities, are certainly key elements for MIND’s network and its development.<sup>24</sup>

**1.8.1 The innovation potential of Federated Innovation companies: the results of the survey**

Federated Innovation companies were surveyed to collect information about the composition of their employee population, in addition to the strategies, investments, and types of R&D activities that they intend to develop in the framework of the Federated Innovation. The survey included 12 questions (a mix of open and multiple-choice questions) with 19 companies taking part, ranging from 2 to 45,000 employees. Some general features of the companies networked by Federated Innovation can be inferred. Companies with a higher percentage of female

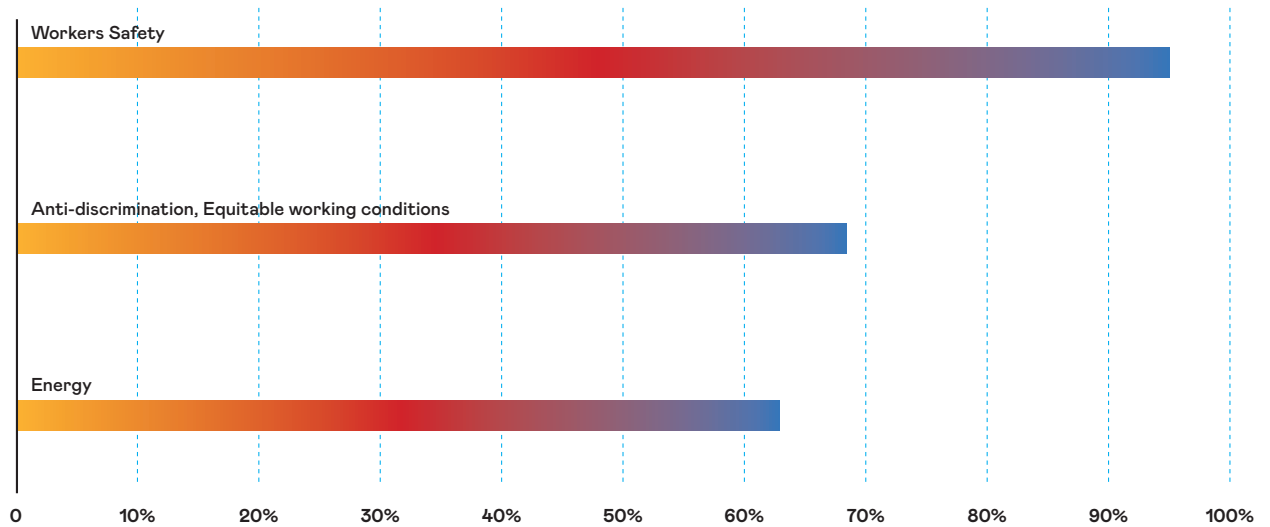
employees also have a more highly educated personnel (having at least an undergraduate degree) and are those that implement systematic policies on worker safety, anti-discrimination, and equitable working conditions.

With regard to policies adopted, worker safety policies and guidelines are adopted by almost all (95%) companies in the sample, followed by anti-discrimination employment practices and policies on inclusive and equitable working conditions. While most of the companies agree on the benefits of MIND and Federated Innovation in improving networking capacity and in particular in creating new business relations, a less positive perspective is perceived on the impact of MIND and Federated Innovation as a driver of public-private partnerships: 53% of companies classified its magnitude as “some impact”.

The average budget allocated to R&D projects by the 9 respondents is €2.15 million while average R&D intensity is 11.2%. According to respondents, the number of projects and the networking generated (number of partnerships, % increase in networking) are the two most common indicators to monitor MIND’s impact on R&D capacity. This question provides a broad range of interesting answers, though, including: ROI and Order Acquisition, the Percentage of New Revenues Stream on Total Revenues, the total economic value of those projects (e.g. grants, sum

<sup>23</sup> Written interview with Cariplo Factory (Catalyst).  
<sup>24</sup> Ibid.

Figure 5 - Policies' adoption



of allocated resources from MIND members and external partners), and the number of scientific publications and patents.

1.8.2 UniMi digital twin project<sup>25</sup>

Given its high level of expertise in the biomedical sector, UniMi intends to create digital twins of living matter by creating a specifically designed hub in Città Studi (UniMI-Scienza @Città Studi), which will be closely interconnected with

the research to be carried out at MIND and in the Lombardy region health centers and teaching hospitals. The idea is to equip the MIND campus with multidimensional services dedicated to the safe and harmonized collection of big data as complement to their computational analysis. This will meet the need to improve independent research by creating a frontier tool entirely dedicated to the maintenance, harmonisation and inference of the metadata produced by the research.

UniMi is already working in partnership with universities and hospitals in the area and with MIND

<sup>25</sup> Information drawn from the confidential document "Lombardia Capitale Europea della Salute", June 2021.

Figure 6 - Impact on networking capacity

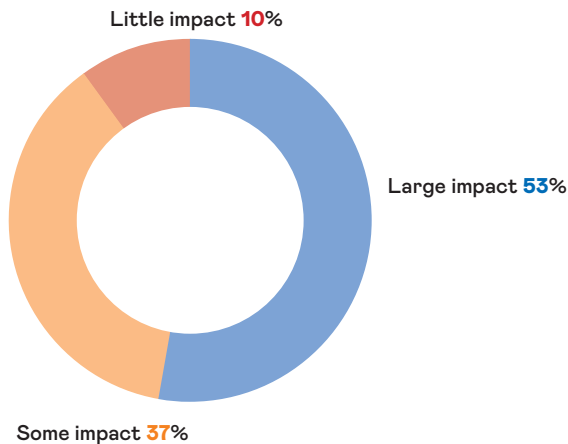
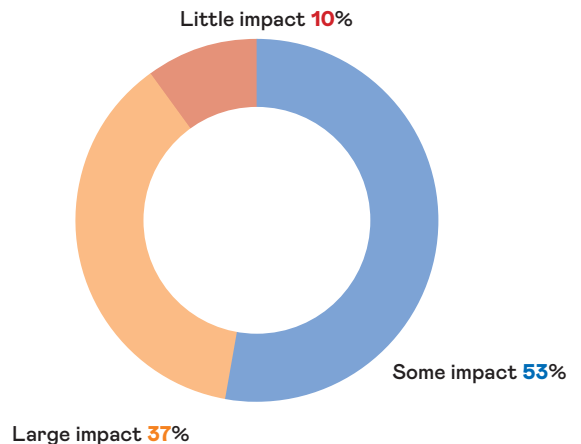


Figure 7 - Impact on the capacity to develop PPPs



companies to implement the project in its research, innovation, training and infrastructural dimensions. The project aims to create a digital hub for biomedicine in Milan to boost the application of AI in the life sciences and medical sector and to encourage translational research. By bringing together basic and clinical research, the center is expected to have a major impact on public health and the local economy. Thanks to UniMi's valorization activities, there will be consistent value creation in terms of intellectual property and innovation, business initiatives, patents and know-how.

This project will be partly supported by PNRR funding under the rubric of "Innovation Ecosystems", where UniMi will work in close collaboration with PoliMi, Bicocca University of Milan, Bocconi University and five companies of Federated Innovation, i.e. Astrazeneca, Bracco, Novartis, Bio4Dreams and TIM.

## 1.9 Support to Technology Transfer (TT)

While Lombardy is home to some of the most innovative start-ups and SMEs in the Life Sciences, entry barriers in the pharma, biotech and medical devices industries are still significant. This is due to the high costs of technologies, laboratories and equipment, strong regulatory obligations, and the difficulty for smaller organizations to interact with both universities and larger companies. Similarly, while the Lombardy region – and Italy in general – are renowned for the quality of their scientific output, Technology Transfer (TT) processes in the life sciences sector are underperforming compared to other regions. MIND partners are addressing such weakness by creating a uniquely supporting environment following an open innovation model. Both UniMi and Human Technopole are working to turn MIND into a reference site for TT activities in the life sciences domain at the national and EU level. Furthermore, Bird&Bird created a cutting-edge IP strategy to support joint research among MIND Federated Innovation Partners, including a toolkit of pre-defined contracts and the set-up of a virtual Technology Transfer Office (TTO) aiming to:

- 1) Identify the best IP protection option (patents, copyright, trade secrets, models, sui generis works, etc.),
- 2) Perform early-stage technology landscaping and ownership due diligence;
- 3) Utilize IP "orphan" rights.

### 1.9.1 Seed4Innovation

UniMi is supporting the start-up ecosystem with the **Seed4Innovation** program, aiming to identify innovation projects within the academic community which are willing to adopt open innovation. The program is open to UniMI professors, researchers, students and alumni and research partners, whose projects bring innovative technologies, products and services that represent new value solutions and can generate innovation for industrial or commercial application. Additionally, the mentor network facilitates the exchange and acquisition of expertise in order to accompany the projects through to maturity and market.

Seed4innovation has 3 characteristics that distinguish it from other solutions:

- It encourages technology transfer and enhances the know-how present in universities in search of innovative solutions, technologies, products and ideas;
- It offers access to a customised development program for projects that access the acceleration phase, increasing their growth opportunities;
- It promotes a context of open innovation with the aim of creating value through the contamination of skills between academy and business.

For the 2021/2022 edition, corporate partners include: Medtronic, Chiesi, Vertex, Sintetica, Boehringer Ingelheim and STMicroelectronics. In addition to the corporate partners, discussions have started with a wide range of companies, for example: Novartis, Enel, Biofarma Group, Amadori, Cameo, RIINA, Electrolux, Dompè, Menarini Group, Poste Italiane and Bio4Dreams. For this edition, projects must relate to one of the following thematic areas: Life Sciences and Health Care, Agrifood, Sustainability, or Digital and Manufacturing. The 10 innovative projects, products and services that pass the final selection will access the following prizes:

- Academic grants for the first 8 winning solutions equivalent to a total of €400,000;
- Media Coverage: visibility in the UniMi network, Deloitte, Bugnion, CA Group, plus other Research and Corporate Partners;
- Corporate Grant for the winning solutions selected by Corporate;
- Access to the Acceleration Program: Business Advisory and Industrial Co-development Project followed by the network of Mentors of UniMi Foundation and Corporate Partners.

In terms of track-record, some successful examples from UniMi include:

- **WISE (Wiringless Implantable Stretchable Electronics)**, a biomedical scaleup developing a new generation of implantable wires for Neuro-modulation and Neuromonitoring. It enables the production of electrodes firmly attached to polymers, which are flexible, stretchable, biocompatible and allow highly effective stimulation with a wide range of applications. It has raised €10.6 million and was recognised at European level as one of the 10 best European start-ups at the European Venture Contest in 2012.
- **Newronika**, a spin-off of Fondazione Policlinico and UniMi, develops innovative and adaptable deep brain stimulation (DBS) systems for the treatment of movement disorders and for the application of constant transcranial currents (tDCS), applicable to basic neurophysiological research, therapy and research for Alzheimer's, migraines, strokes, aphasia and multiple sclerosis. It has raised €10.1 million and currently collaborates with Fondazione Ca' Granda Ospedale Maggiore Policlinico.

### 1.9.2 Human Technopole's Center for Innovation and Technology Transfer (CITT)

Human Technopole's overall mission is to improve human health and well-being by contributing to the development of personalised medicine approaches. This mission is pursued through numerous public and private partnerships and collaborative initiatives throughout Italy, including with universities, hospitals, health organizations and biomedical research institutes.

Human Technopole conducted over 70 interviews with relevant stakeholders in the innovation sector, on the topic of technology transfer in order to understand cutting-edge innovations in order to create a shared platform and set up a special department to launch the first activities: the **CITT – Center for Innovation and Technology Transfer**. These first activities include a number of training initiatives on Technology Transfer, in partnership with leading partners in the field, which launched in early 2022.

The CITT aims to reinforce weak Italian technology transfer capabilities in the Italian market for the Life Sciences by:

- Offering services complementary to those already offered by local TTOs;

- Promoting a network to create synergies between institutional players (Universities and research centers), researchers, investors and industry, making available an open and participative portfolio of services;
- Supporting business creation and acceleration to foster innovation processes;
- Supporting the skills development of life sciences researchers and practitioners in the area of business creation and the economic management of scientific research initiatives.

### 1.10 Incubation and acceleration

MIND, thanks to the agglomeration of connected assets, will form a living lab where start-ups can be incubated and accelerated. Although MIND is still at its development stage, it is already providing start-ups with assistance, support and value growth. The following case histories are some of the business ventures that are finding the initial spurt at MIND:

- **Sofia Locks**: scale-up Proptech that provides digital and cloud-native solutions for the access control of smart buildings. By pooling their skills in the cloud, the 6 founders started an acceleration path first in TIM WCAP, then in Polihub, eventually receiving funding grants from Cisco and Microsoft. Sofia Locks eventually became the access control provider for Leandlease's MIND Village. They have recently been acquired by ISEO Ultimate Access Technology.
- **Phononic Vibes**: is an innovative start-up born within Polihub and supported by the MIT that deals with the study, construction and application of geometries and materials for the reduction of sound vibrations. They came into contact with MIND through Polihub and were assisted by the Berkeley Skydeck international accelerator program. Phononic Vibes now follows the acceleration path at Berkeley which involves a consolidation of the product, including patenting and corporate maturation. In Italy, Leandlease immediately proposed itself as a customer for Phononic Vibes soundproofing worksite hoardings in the construction of MIND. The next step might be the hotel industry.
- **E4Shield** is new revolutionary technology to fight pandemic viruses, developed with the Sacco Hospital and the Celio Military Hospital, and promoted by Leandlease and Elettronica, a company at the forefront of the Electronic Defence and Elec-

tromagnetic Spectrum industry, this patented and scientifically tested technology can destroy viral loads in aerosols in real time. It has significant areas of application (e.g. schools, public transport, elevators) and has positive feedback in over 90% of cases. Lendlease is studying, in collaboration with PoliMi, an environmental safety protocol that employs technologies like these to monitor the health safety of indoor environments.

#### 1.10.1 Primary Site

*Primary Site* is the pilot project aimed at testing a broad set of services to accelerate innovation and the impact capabilities of start-ups and SMEs in the field of medical devices. As one of the key target areas for MIND, this may lead to Primary Site becoming a permanent activity within the MIND ecosystem. The acceleration activities targeted a selection of 10 innovative start-ups and SMEs operating in the medical device sector which needed support to acquire the CE mark, which represents a manufacturer's declaration that products comply with the EU's New Approach Directives. Project partners and their role are briefly presented below.

- *Confindustria Dispositivi Medici (CDM)* represents and promotes companies operating in the medical device sector in Italy, which counts around 400 companies among its members, including large enterprises, SMEs and start-ups. Within the project it provided support to start-ups and SMEs from the product development phase to marketing, providing consultancy services in the regulatory field tailored to the companies.
- *The Galeazzi Sant'Ambrogio Hospital* set the necessary parameters to carry out the clinical trials (including the definition of cohort and clinical trial budget) needed to acquire the CE mark. In addition, it carried out an evaluation of the impact of the new service on both the competitiveness of the start-up/SME, the prospective savings afforded to public health providers and the benefits for patients, with a view to scaling-up the service at MIND.
- *PlusValue* analyzed the companies, evaluating possible financing procedures. The work carried out highlighted the specific characteristics of the companies and their strengths, evaluating company data in light of the public funds available at national, regional and local level.

- *Bio4Dreams* is a certified business incubator and an international aggregator specific to Life Science. It provided support in the final stages of the project: it undertook and developed investment strategies tailored to the needs of each individual company involved in the project.
- *LendLease* participated as institutional partner.

#### 1.11 Innovation Circle™ from B4D

Innovation Circle™, a project that started in July 2020, represents an approach, under the Bio4Dreams brand, capable of overcoming the limits of traditional technology transfer in the Life Sciences. It is a physical and virtual space directly involving players in the innovation chain, and is an opportunity to define the most effective, rapid development paths for start-ups and entrepreneurial projects. Bio4Dreams has 12 locations in Italy and 6 locations abroad, including MIND.

The *project platform* collects and evaluates the projects that the partners decide to present. The thematic areas are therapeutics, diagnostics, medical devices, regenerative medicine, digital health and AI for health. Bio4Dreams, after planning Innovation Circle™, now manages SharedLabs™ at MIND, which are laboratories designed to promote innovative approaches through access to research laboratories, which would previously be well outside of start-up budgets. As a result, these promote sustainable economic conditions, leading to for example, the obtainment of Proof of Concept or experimental results.

For the first time in Italy, shared research laboratory spaces were made available on demand, with no cost incurred on start-ups for the equipment and management of the laboratories themselves. A key feature of this approach is modularity: lab spaces are organized and equipped in modules for specific research areas and functions. Currently, SharedLabs™ offer modules dedicated to sensor and biomaterial studies, and to molecular, cellular, chemical and biochemical biology analyses. The laboratory modules currently envisaged are:

- **Sensors** – For the study and development of prototypes linked to sensors, biomedical equipment, rehabilitation technologies;
- **Biomaterials** – For the study and development of prototypes linked to biocompatible scaffolds, bioreactors, or products linked to regenerative medicine;

- Molecular biology – For Research and Development (R&D) focused on molecular and genomic analysis (RNA, DNA, transcriptomics);
- Cell biology – For the development of products and services related to the management of in vitro or ex vivo cell cultures;
- Chemistry and biochemistry – For the development of products and services requiring analysis of biochemical processes or chemical processing.

## 1.12 From academia to industry: a selection of ongoing projects

### 1.12.1 Competitive funding

MIND is home to a variety of projects and programs that will boost its capacity to generate innovation and impact on the domains in which MIND actors operate while testing new approaches to urban regeneration. All these projects and programs establish synergies between people, academia and businesses that accelerate idea generation, thus improving the competitiveness of the whole community. Despite not being fully operational, MIND has already managed to establish new partnerships, secure competitive funding and channel knowledge and investments. Furthermore, MIND is succeeding in developing programs to incubate and accelerate new business, particularly in the Life Science domain. These programs, promoted by MIND actors with the involvement of a multitude of external stakeholders, are testing and developing the ecosystem's competitiveness.

### **T-FACTOR**

T-Factor is an €8 million Horizon 2020 funded project<sup>26</sup> utilising 'meanwhile use' as a strategic period of time to boost radical new approaches to urban regeneration, focusing on the key role that meanwhile spaces can play in unleashing inclusive, sustainable and thriving urban areas. Launched in June 2020, the 4-year project gathers a diverse world-class consortium led by ANCI Toscana, which includes 24 organizations from 11 European countries, aiming to study some of the most advanced cases of 'meanwhile' innovations. These include cases from New York (US), Barcelona (Spain), Marseille (France), Dortmund (Germany), Florence (Italy), Lodz (Poland), Lon-

don (UK) and Shanghai (China), while targeting six major European early-stage projects (Science Park Amsterdam; Zorrotzaure Bilbao; Aleksotas, Kaunas; Trafaria, Lisbon; Euston, London; MIND, Milan) to become the testbed for designing and developing new approaches and tools for place activation and strategic policy-making. PlusValue together with Lendlease, PoliMi, UniMI and LAND is leading the research and implementation of the T-Factor project in MIND with support from many other MIND partners, including Fondazione Triulza as main community partner and Arexpo, Galeazzi Sant'Ambrogio and Human Technopole as local pilot anchors.

A "meanwhile use" describes a situation where a site is used for a duration of time before it is turned into a more permanent end state, taking advantage of a short window of opportunity. The target groups of the MIND meanwhile strategy are mainly local actors (residents, policymakers, local organizations) and actors from the life sciences R&D field at the local, national and international levels. The strategy wants to achieve positive outcomes such as quality public spaces, enhanced knowledge and awareness on innovation and sustainability, new skills and capacities, increased motivation and desire to participate in the place-making of the area and improved collaboration, among others.

### **PRINTMED-3D**

PRINTMED-3D is the winner of the Lombardy Region's call for a "Research and Innovation Hub", and is supported by the European Regional Development Fund with a contribution of over €3.1 million, highlighting its strategic importance. It is a multidisciplinary platform for three-dimensional systems that integrates **Virtual Reality (VR) environments and 3D additive printing** from radiological/diagnostic images available on data management and exchange infrastructures, for clinical, diagnostic and pre-clinical applications. UniMi is the lead partner and coordinating body of PRINTMED-3D.

PRINTMED-3D aims to create an infrastructure to develop enabling solutions for personalised medicine and specialised training through the combined use of virtual reality and functional additive printing (3D printing) technologies. Thanks to the PrintMed 3D tools and project, it is possible to disseminate science and research outputs to the gen-

<sup>26</sup> Horizon 2020 research & innovation program with grant agreement n° 868887.

eral public and vulnerable groups in the vicinity of MIND. For example, a living donor liver transplant took place at Niguarda in Milan in June 2021, involving a son as donor and a father as recipient. The 3D model of the donor liver was printed with a biosimilar gel that mimics the consistency of biological tissues, with a 1:1 scale reconstruction with identical organ weight and 100% accurate anatomy of vessels and structures. The ‘3D clone’ was created by cross-referencing MRI and CT data from the donor liver.

### 1.12.2 MIND FoodS Hub

In recent years, Milan has been at the forefront of innovation in food and agritech. Expo 2015, dedicated to “Feeding the Planet, Energy for Life”, prompted innovations in urban food systems in Lombardy. Since then, Milan has been one of the first global cities to adopt a City Food Policy (MUFFP), which was awarded Prince William’s Earthshot Prize 2021 in the Build a Waste-Free World category, thanks to its food waste hubs that reallocate nutrition to the needy.

MIND FoodS Hub is funded by the Lombardy Region through the call “Research & Innovation Hub”<sup>27</sup>, led by Arexpo and developed by the Department of Food, Environmental and Nutritional Sciences of UniMi.

The project is based on an innovative concept aimed at the identification, production and sustainable transformation of plant products and derivatives which feature excellent nutritional profiles and low carbon footprints, achieved, for example, through the optimization of agri-tech innovation and vertical farming. MIND FoodS Hub is engaged in the following key activities: advanced agronomic on field practises and vertical farming; a pilot infrastructure including intelligent devices/sensors, edge processors, 5G communication network and cloud computing architectures; an interconnected platform for advanced products’ multi-omics characterization; business cases for the validation of the food system; the nutritional and health impact of enhanced foods, nutraceuticals and dietary patterns; and dissemination at a scientific and industry level, raising awareness and empowering of citizens.

<sup>27</sup> The call promotes R&D projects in the agri-food industry as an engine for innovation, development, and social responsibility at the international level.

### 1.12.3 Next Generation Healthcare Center (NGHC)

The Next Generation Healthcare Center (NGHC) is the project led by PoliMi and UniMi to establish an innovation hub in MIND, connecting research institutes, clinical centers, companies, financial, advocacy and public institutions. It will harness the potential of the digital revolution in the settings of care by accelerating the transition to more effective, efficient, safe, and sustainable **technological, architectural and organizational solutions** throughout the entire health care chain, from acute care hospital to the patient’s home and territorial health care system.

NGHC’s ambition is to be a groundbreaking infrastructure pursuing 5 key missions:

- Improve the state of health and care and the quality of life of citizens thanks to a unique national infrastructure;
- Foster the competitiveness of the Italian Health industry by becoming a global reference center;
- Accelerate digital transformation through a trans-disciplinary training playground;
- Enhance health-outcomes and cost-effectiveness leveraging an extraordinary innovation ecosystem;
- Develop new organizational, technological, spatial and structural models for the smart hospital and the territorial and home care systems;
- The project is one of the 25 awarded projects funded through the PNRR by the European Union – Next Generation EU for the realisation of an integrated system of research and innovation infrastructure’.

### 1.13 MIND compared to other innovation districts

The governance of innovation districts has evolved from simple alignment of strategies to more sophisticated interventions on creation of places, entrepreneurial support, and data collaboration. The imperative of significant social inclusion – an innovation district that works for everyone – must lead to a substantial reformulation of strategies for the future ecosystem of research, invention, spillover. The main enabling factors for the success of an innovation district are the existence of a strong university/research anchor, a supportive local ecosystem supported by local public institutions and, of course, the growth trajectory of the district itself.

Similarly to other successful technology hubs, MIND



is designed as a city within a city and integrates its global research activities with the local economy.

The governance, strategies and activities of other leading global innovation districts were analyzed in comparison with MIND<sup>28</sup>, in order to highlight the competitive assets, funding structures, research outputs, and therefore opportunities for incubation, acceleration and growth of companies operating in the technological district. The districts taken into consideration for comparative analysis and benchmarking were:

- **Skolkovo**<sup>29</sup> (Moscow, Russia - Energy, IT, Bio-medical, Space, Nuclear)
- **22@Barcelona**<sup>30</sup> (Barcelona, Spain - ICT, Media, Bio-Medical, Energy, and Design)
- **MaRS Discovery District**<sup>31</sup> (Toronto, Canada - Health, Fintech, Cleantech, Enterprise)
- **Melborne Innovation District**<sup>32</sup> (Melborne, Australia - Life Science, STEM)
- **Paris Saclay**<sup>33</sup> (Paris, France (ICT, Health, Energy, Aerospace, Mobility)
- **Kendall Square**<sup>34</sup> (Boston, US - Life Science, ICT, Real Estate, Education)
- **Babraham Institute**<sup>35</sup> (Cambridge, UK - Life Science)
- **Leuven Innovation Region**<sup>36</sup> (Leuven, Belgium - Life Science, Nanotechnology, Mechatronics & Smart Systems and Cleantech)
- **Stanford Research Park**<sup>37</sup> (Palo Alto, US - Life Science)
- **Zhangjiang Science City**<sup>38</sup> (Shanghai, China - Integrated Circuits, Life Science and AI)
- **Tsinghua University Science Park - TUS-Park**<sup>39</sup> (Beijing, China - Biotechnology; Energy; Environment; ICT & Communications).

<sup>28</sup> The review was based on the information publicly available.

<sup>29</sup> Skolkovo website.

<sup>30</sup> 22@Barcelona Brookings Education report.

<sup>31</sup> MaRS Discovery District website.

<sup>32</sup> Melbourne Innovation District website.

<sup>33</sup> Paris Saclay Innovation Cluster.

<sup>34</sup> Kendall Square website.

<sup>35</sup> Babraham Institute website.

<sup>36</sup> Leuven High Tech Region.

<sup>37</sup> Stanford Research Park website.

<sup>38</sup> Zhangjiang Science City website.

<sup>39</sup> TusPark China website – IASP Tsinghua University Science Park.

### 1.13.1 University and research institutions

All the districts reviewed have a university in the area that was key for the success of the innovation district, as it is particularly evident in the case of TUSPark, Skolkovo, Babraham, Leuven and Stanford – all of which originated around top tier university and research institutions. The nature and quality of the universities, and in particular the university departments involved in innovation districts, appear to be key in determining the specialization of districts, and a good predictor of their performance.

The new UniMi Science Campus at MIND supports a wide range of research topics (health & medicine, biology, chemistry and pharmaceuticals, environmental science, etc.) fostering applied research and innovation outcomes at the site. Building upon UniMi's strong specialization in the Life Sciences, MIND has been clustering around biotech and the medical sciences, with an additional specialization in green tech.

### 1.13.2 Innovation ecosystems and public support

The following is a review of how public actors were pivotal in leading innovation districts worldwide:

- The location of **Melbourne Innovation District (MID)** combines a unique cluster of institutions and activities with connections to a much wider network of locations, transport and institutional connections. MID is home to 21% (60,260) of all knowledge sector jobs in Melbourne.
- **MaRS** receives restricted grants from the Province of Ontario and the Government of Canada, and restricted donations and other grants from philanthropic donors and other funders. It is home to a curated mix of start-ups, global corporates and leading research labs. To meet demand from Toronto's burgeoning tech ecosystem, MaRS opened its West Tower expansion in 2016, doubling the building's size.
- The French state is boosting the development of **Paris Saclay** with an unprecedented financial effort comprising EUR 1.5 billion into university building projects and €1 billion into research laboratories and facilities, plus the new line 18 of the Grand Paris Express Metro. With its exceptional concentration of higher education institutions, research laboratories, high tech industries, engineering companies and some 105,800 executives and engineers working in the private

sector, Paris-Saclay is a major employment hub with a highly competitive workforce. It stands as France's third largest qualified employment zone after the Paris Center/La Défense business district and Lyons. It benefits from the cluster's positive economic trend and positioning in R&D and high added value sectors.

- President Kennedy intended to build NASA's headquarters in **Kendall Square**, formerly an undeveloped industrial neighborhood. Concerted investments since that time have turned Kendall Square into an innovation hub of global importance, with a remarkably high concentration of start-ups and quality of innovation across a wide range of industries. The Massachusetts Institute of Technology (MIT) is an institutional member.
- At **Babraham**, the co-location of a vibrant community of start-up and scale-up companies able to access world-leading academic research and state-of-the-art scientific facilities from the Babraham Institute, are unique features of the Campus that differentiate it from other life sciences campuses in the UK.
- In **Leuven**, a strong and dynamic triple helix cooperation between industry, knowledge institutes and government has led to a very favorable entrepreneurial climate. The city of Leuven, the province of Vlaams-Brabant and the Flemish government collaborate closely on regional development. Together with the knowledge regions Eindhoven (The Netherlands) and Aachen (Germany), Leuven forms a strong cross-border network: ELAt (Eindhoven-Leuven-Aachen triangle). ELAt is one of the top European technological regions, promoting a knowledge economy via cross-border and interregional cooperation.
- **Zhangjiang Science City** serves as a major base for implementing the national strategy to build Shanghai as a comprehensive national science powerhouse and a globally influential sci-tech innovation center. Shanghai is home to dozens of new R&D institutes specialising in researching cutting-edge science and technologies, with 44 national-level key laboratories, 21 national-level engineering technology research centers, and 14 national-level major sci-tech facilities built or under construction.

### 1.13.3 Maturity level of the district

The following table lists MIND as an emerging global innovation district next to the major research hubs of the world, starting with the two largest ones Stanford Research Park in the US, and Zhangjiang Science City in China. We can see that MIND is comparable to existing European innovation districts (Leuven Innovation Region, Cambridge University's Kendall Square, 22 Barcelona) in terms of surface developed and investment outlays.

### 1.14 The Key Performance Indicators of MIND

MIND, although not fully operational yet, is already channelling significant investments for innovation and providing concrete support to start-up, thus showing it has what it takes to deliver long term, sustained success, relying on its capacity to continue cultivating innovation in life sciences. But how it can improve itself depends on its success in leveraging its innovation potential generated within its ecosystem. Thus, how will MIND leverage its distinctive advantages to grow and strengthen the innovation capacity of its tenants and anchors?

MIND's success be measured along **three Key Performance Indicators (KPIs)**:

- **Critical mass**, interpreted as raw indicators of the size and economic output of a district (e.g. total number of residents, total number of jobs, percentage of workers with a BA degree or higher, etc.)
- **Innovation capacity**, that is a range of indicators on the quality of the district's output, including the level of disruptiveness and the impact of the results achieved. This is by far the most relevant indicator of the innovation districts' performance (e.g. number of publications, number of patents, number of startups, R&D budget, etc.)
- **Diversity and inclusion**, a dimension that is monitored to make sure that MIND has an equalizing effect on the community (e.g. workers by race/ethnicity and gender, percentage of jobs with minimal experience required for entry, number of training hours provided to employees and researchers, etc.)

Table 1 - MIND and other districts (overview)

Innovation District	Year of foundation	Size (sqm)	Economic indicators	Number of start-ups	Research output (publications & patents)
Stanford Research Park	1951	2.8m sqm	\$27.3 billion deals annually from proximate VC firms (2015)	+250 start-ups	1,000+ (publications per year)
Zhangjiang Science City	1992	95m sqm	€2,61 billion investment in infrastructures	+2,600 companies under incubation	577 (total patents 1992-2018)
Babraham Research Campus	1998	18,500 sqm	€4.07 billion (total companies' market value)	15 (start-ups incubated since 2018)	126 (publications in 2020)
22@Barcelona	2000	2m sqm	€310 million Investment in infrastructures	Home to 8000+ companies employing 93,000 workers	
MaRS Discovery District	2000	140,000 sqm	MaRS Investment Accelerator Fund (MaRS IAF) from 2010-2021 invested in 167 projects for total follow-on funding of C\$1.59 billion	1,400 in the ecosystem	
Leuven Innovation Region	2004	130,000 sqm	€800 million (K.U. Leuven and Imec combined R&D budget 2016)	142	7000 (publications per year by KU Leuven and Imec) 180 (patents filed per year by KU Leuven and Imec)
Skolkovo	2010	4.6m sqm	€5 billion (private + public investments 2010-2020) €13 million (grants and R&D contracts)	49 founded 3000+ in the ecosystem	2,273 (publications 2013-2019) +1500 (patents 2013-2019)
Stanford Research Park	1951	2.8m sqm	\$27.3 billion deals annually from proximate VC firms (2015)	+250 start-ups	1,000+ (publications per year) 250 (patents filed per year)
Zhangjiang Science City	1992	95m sqm	€2,61 billion investment in infrastructures	+2,600 companies under incubation	577 (total patents 1992-2018)

## 2. THE SOCIAL IMPACT OF MIND

### 2.1 Introduction

This chapter presents a preliminary assessment of the social impact that Milano Innovation District (MIND) can generate for its different stakeholders. Among these, we highlight programs such as “Programma 2121”, which provides traineeship opportunities for inmates, and MIND Education, which involves university and school students in the MIND masterplan.

Socioeconomic targets are pursued in the context of MIND thanks to the assistance of Fondazione Triulza, with path-breaking initiatives such as the Social Innovation Academy, in conjunction with the companies present in the Federated Innovation network, and the MIND Skills Academy, for employment training that promotes objectives of social inclusion.

Another sphere of the project that generates positive social impacts is undoubtedly the physical planning of the district, according to urban design, architectural and infrastructural criteria that favor the goal of creating a fully accessible and inclusive neighborhood, in which public common spaces promote stakeholder interactions, community building and widespread sociability and sustainability.

### 2.2 Stakeholder analysis

Stakeholders are all the social actors that are varying affected by an economic initiative. As social inclusion is a major objective for MIND, a detailed mapping of the various categories of stakeholders was undertaken, summarized by the following table.

#### 2.2.1 Definition of MIND impact areas and linkages with SDGs

Based on a preliminary study, we selected 10

goals that inspire the development of MIND and are conducive to social value generation in the area. Based on the expectations of different stakeholders and the inputs provided by Lendlease, we clustered the SDGs into three categories: socio-economic improvement, community engagement and quality of life, and education. Based on each of the three categories of SDGs, we defined an impact area, i.e. a final macro-goal that MIND is aiming at, and that contributes to the creation of an impact sentiment in the area. The defined impact areas according to which MIND’s social externalities are assessed are the following:

- Fair and inclusive economic growth
- Community cohesion, social inclusion and wellbeing
- Accessible education and research.

Table 2 - Stakeholder analysis matrix

Stakeholder	Interest, needs and expectations	Capacity and motivation	Possible actions to satisfy stakeholder's interests and needs	Risks
<b>Area developer</b>	<ul style="list-style-type: none"> <li>• Attract investment in the area</li> <li>• Networking, partnerships, collaboration</li> <li>• Return on initial investment</li> <li>• Replicability of intervention</li> <li>• Establish and maintain partnership with public administrations</li> </ul>	<ul style="list-style-type: none"> <li>• Experience in development projects</li> <li>• Overview of implementation and management</li> </ul>	<ul style="list-style-type: none"> <li>• Roundtable/discussion with stakeholders and community</li> </ul>	<ul style="list-style-type: none"> <li>• Trade-off between impact and financial return</li> </ul>
<b>Corporate companies and private investors</b>	<ul style="list-style-type: none"> <li>• Networking, partnership, collaboration, innovation</li> <li>• Return on investment</li> <li>• Develop a set of guidelines on circular economy for suppliers and providers of services operating in MIND.</li> <li>• Establish and maintain partnership with public administrations.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide resources, participate in MIND initiatives and projects, provide funding</li> </ul>	<ul style="list-style-type: none"> <li>• Engage them in projects that bring value to the company but also to the MIND community – co-creation projects, open innovation calls, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Trade-off between impact and financial return</li> <li>• Lack of cooperation in R&amp;D due to IP issues.</li> </ul>
<b>Public bodies and investors</b>	<ul style="list-style-type: none"> <li>• Networking, partnership, experiment new ways of collaboration, promote policy transformation</li> <li>• Develop a set of guidelines on circular economy for suppliers and providers of services operating in MIND.</li> <li>• Develop an integrated sanitary system connecting new services to the already existing ones active in the area.</li> <li>• Create a shared housing model adaptable to different stakeholders' needs.</li> </ul>	<ul style="list-style-type: none"> <li>• Planning, policy implementation, funding</li> </ul>	<ul style="list-style-type: none"> <li>• Engage with private entities (co-creation process), engage MIND community</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of human resources to actively participate in co-creation process.</li> <li>• Conflict between policy interests</li> </ul>
<b>Retailers</b>	<ul style="list-style-type: none"> <li>• A competitive marketplace</li> </ul>	<ul style="list-style-type: none"> <li>• Provide good product/services to MIND Community</li> </ul>	<ul style="list-style-type: none"> <li>• Generate a strong affluence of people in MIND. Guarantee a strong customer base (people settled in MIND)</li> </ul>	<ul style="list-style-type: none"> <li>• Low returns in first years of operations</li> </ul>
<b>Start-ups</b>	<ul style="list-style-type: none"> <li>• Networking, spaces and services, capacity building, a place to experiment</li> </ul>	<ul style="list-style-type: none"> <li>• Bring innovation to the ecosystem, provide products/services to the community</li> </ul>	<ul style="list-style-type: none"> <li>• Provide them the necessary resources and services, offer them networking opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of interest in new ideas from ecosystem actors</li> </ul>
<b>Support service providers (accelerators, incubators, etc.)</b>	<ul style="list-style-type: none"> <li>• Promote the growth of start-ups</li> <li>• Offer competitive services</li> <li>• Reach out for the best talents</li> <li>• Connections with other ecosystem actors</li> </ul>	<ul style="list-style-type: none"> <li>• Know-how about market trends</li> <li>• Specific mentorship and support for start-ups</li> </ul>	<ul style="list-style-type: none"> <li>• Offer offices and spaces in MIND</li> <li>• Favorite partnerships with other actors</li> </ul>	<ul style="list-style-type: none"> <li>• High competition between actors</li> </ul>

Stakeholder	Interest, needs and expectations	Capacity and motivation	Possible actions to satisfy stakeholder's interests and needs	Risks
<b>Hybrid Organization/ Non-Profit</b>	<ul style="list-style-type: none"> <li>Affordable spaces, networking, capacity building, a place to experiment.</li> <li>Develop an integrated sanitary system connecting new services to the already existing ones active in the area.</li> <li>Create a shared housing model adaptable to different stakeholders' needs.</li> <li>Develop connections and collaborations with the surrounding territory and its inhabitants.</li> <li>Guarantee the presence of a wide variety of stakeholders and target groups in the area to avoid the creation of an exclusive and discriminatory city.</li> </ul>	<ul style="list-style-type: none"> <li>Include people from disadvantage categories, provide products/services to the community</li> </ul>	<ul style="list-style-type: none"> <li>Provide affordable spaces, support them in increasing their impact through networking, collaborations, initiatives and capacity building</li> </ul>	<ul style="list-style-type: none"> <li>Trade-off between social value and economic return.</li> <li>Becoming outsiders in the ecosystem</li> </ul>
<b>Universities and research centers</b>	<ul style="list-style-type: none"> <li>Get involved in R&amp;D projects</li> <li>Collaborate with ecosystem actors (e.g. Human Technopole, Arexpo, Federated Innovation)</li> <li>Establish partnerships to provide opportunities for students (internships, etc.)</li> <li>Collaborate with startups and support service providers (scientific advice)</li> </ul>	<ul style="list-style-type: none"> <li>Provide education and research expertise</li> </ul>	<ul style="list-style-type: none"> <li>Involvement in MIND education project and create joint research projects.</li> <li>Create partnerships with ecosystem actors</li> </ul>	<ul style="list-style-type: none"> <li>Possible trade-off between scientific activity and commercial logics</li> </ul>
<b>MIND Population - inhabitants</b>	<ul style="list-style-type: none"> <li>Find all the primary services and a good connection with nerve center (es. city center). Green spaces</li> <li>Develop a set of guidelines on circular economy for suppliers and providers of services operating in MIND.</li> <li>Develop an integrated sanitary system connecting new services to the already existing ones active in the area.</li> <li>Create a shared housing model adaptable to different stakeholders' needs.</li> <li>Guarantee the presence of a wide variety of stakeholders and target groups in the area to avoid the creation of an exclusive and discriminatory city</li> </ul>	<ul style="list-style-type: none"> <li>Participate to community initiatives.</li> <li>Buy "local"</li> </ul>	<ul style="list-style-type: none"> <li>Provide all the primary products and services (market, pharma, etc), included an efficient mobility.</li> <li>Build a community.</li> <li>Provide aggregating spaces and facilities (sport &amp; leisure, entertainment, etc)</li> </ul>	<ul style="list-style-type: none"> <li>Lack of diversity in population: only employees in residential building.</li> <li>Unaffordability of housing unit.</li> </ul>

Stakeholder	Interest, needs and expectations	Capacity and motivation	Possible actions to satisfy stakeholder's interests and needs	Risks
<b>MIND Population – Professionals/ Employees</b>	<ul style="list-style-type: none"> <li>• Work-life balance, stimulating environment, networking</li> </ul>	<ul style="list-style-type: none"> <li>• Participate to community initiatives.</li> <li>• Buy “local”</li> </ul>	<ul style="list-style-type: none"> <li>• Offer places to rest &amp; reset during breaks or after work (common space, green areas, sport facilities).</li> <li>• Provide primary services. Efficient mobility connection</li> </ul>	<ul style="list-style-type: none"> <li>• Being disconnected from the neighborhood: seeing the district only as workplace and not contributing to community life.</li> <li>• Longer commuting time (non-resident)</li> </ul>
<b>MIND Population - Students</b>	<ul style="list-style-type: none"> <li>• Good mobility connection.</li> <li>• Common areas and facilities, in particular some study places</li> <li>• Participate in the cultural life of the area</li> </ul>	<ul style="list-style-type: none"> <li>• Use common areas and spaces.</li> <li>• Buy “local”</li> </ul>	<ul style="list-style-type: none"> <li>• Offer places to study and socialize during breaks or after lessons (study space, green areas, sport facilities, bar, library).</li> <li>• Efficient mobility connection</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in time of commuting to work (non-resident)</li> </ul>
<b>MIND Population - visitors</b>	<ul style="list-style-type: none"> <li>• Easy-to-access, ease of movement and orientation in MIND, efficient services</li> </ul>	<ul style="list-style-type: none"> <li>• Use of common areas, services and spaces</li> </ul>	<ul style="list-style-type: none"> <li>• Facilitate the experience of new visitors to made them return to MIND</li> </ul>	
<b>Surrounding communities</b>	<ul style="list-style-type: none"> <li>• Connections between MIND and the surroundings. Involvement of youth</li> <li>• Develop an integrated sanitary system connecting new services to the already existing ones active in the area.</li> <li>• Logistic integration between MIND and surrounding areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Populate MIND Area, creation of connections and synergies</li> </ul>	<ul style="list-style-type: none"> <li>• Involved the surrounding communities in MIND activities. Foster integration, enhancement of common places</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of discontent and inequalities exacerbation if MIND become an exclusive area, not well integrated with the surroundings</li> </ul>
<b>Area developer</b>	<ul style="list-style-type: none"> <li>• Attract investment in the area</li> <li>• Networking, partnerships, collaboration</li> <li>• Return on initial investment</li> <li>• Replicability of intervention</li> <li>• Establish and maintain partnership with public administrations</li> </ul>	<ul style="list-style-type: none"> <li>• Experience in development projects</li> <li>• Overview of implementation and management</li> </ul>	<ul style="list-style-type: none"> <li>• Roundtable/discussion with stakeholders and community</li> </ul>	<ul style="list-style-type: none"> <li>• Trade-off between impact and financial return</li> </ul>

Figure 8 - MIND Impact Areas



For convenience, in Figure 8 we reproduce in an enlarged form the visual representation that enucleates the UN Sustainable Development Goals (SDGs) that define the three macro-areas of social impact of the technology district. MIND generates inclusive growth because it undoubtedly pursues objectives 9 (infrastructure and industrial innovation) and 8 (decent work and economic growth), is a results-oriented partnership (goal 17) and promotes responsible consumption and production according to the philosophy of the circular economy (goal 12). The second area of social impact, community cohesion and social inclusion proper is at the heart of social innovation as conceived and practiced at MIND: building a sustainable neighborhood and community (goal 11), promoting health and well-being, both in research and in the community areas (objective 3), promote gender equality in research and administrative personnel (objective 5), and operate interventions that reduce socio-economic inequalities and combat forms of discrimination (objective 10). The third area of impact is that of research and education being made accessible to the entire population of MIND and above all to the surrounding territorial communities, through quality education (objective 4) and innovative research (part of

objective 9) . The construction of a new campus, a new hospital and a new research institute are the most evident contributions of MIND in this domain, not to mention the numerous public and private laboratories and research teams operating within the new district and which respond to the dual mission of economic and social innovation. We have linked the three impact areas to specific actions that determine social outcomes and outputs, which further facilitates the process of selecting standardized indicators to measure the impact generated by MIND.

### 2.3 Overview of the evaluation framework

The evaluation framework considers the impact generated by demolition, renovation and construction work necessary for building the Village and West Gate, and by the daily operations and interactions of MIND's various actors. As shown in the figure below, the project objectives and targets were defined in accordance with the main non-financial reporting tools - such as the EU directive on non-financial disclosure and the GRI - and the sustainable finance framework, including the EU Social Taxonomy and the principle of ESG investment (especially the social and



governance dimensions). Based on the project objectives, we defined a social value chain highlighting the resources needed to carry out the activities and the social outputs and outcomes these activities can generate, in order to contribute to each MIND impact area. In this way, it is possible to assess both the changes within the MIND ecosystem – experienced by the organizations and the individuals residing in MIND, including the employees of stakeholders – and the effects for the local community and the Italian social and entrepreneurial system.

As shown in Figure 10, the framework captures a preliminary impact assessment related to concluded and ongoing activities and allows us to foresee the potential future outcomes and impacts of MIND. A strategy for impact integration supported by data collection and analysis activities, according to the framework, is used in cases where an *ex-ante* evaluation is not feasible. This adopted framework will therefore guarantee the flexibility needed to adapt to the changes that might occur in the ecosystem and that will lead to the foresight of social outcomes and impacts.

Furthermore, the framework allows us to consider the effects for the local community thus highlighting the ties and connections that MIND will be able to generate with for-profit and non-profit organizations, as well as residents in neighboring cities. In addition, the framework serves as a tool to evaluate and mainstream organizational models that were studied in MIND (i.e. public-private partnerships, open innovation models, cooperation schemes) and how they can be replicated in different contexts and the wider Italian economy.

## 2.4 The social value chain: AS IS State vs impact maximization

In order to address the impact management and measurement of the project, we adopted a Theory of Change approach accounting for the identified social outcomes descending from the creation of MIND and the activities that are carried out in the district daily. The social value chain was developed based on the stakeholder analysis presented above and validated through different interviews with representatives of Lendlease and other MIND actors. The social value chain adopted represents the outputs and outcomes that can be generated by both the construction activities and the interactions between stakeholders in MIND.

The social value chain is the main tool used to explore the potential of MIND to generate social outcomes and impacts in the short, medium and long term. For each phase we identified the necessary resources – with particular reference to the policies adopted – for planned or implemented activities, the results in terms of activity output, outcomes for MIND actors and their beneficiaries, and the impact on the MIND ecosystem and the local community. Once dimensions have been identified they are connected with the overall impact areas.

At Figure 10 below, there is a graphic representing the social value chain developed for this study, containing the outputs that are already measurable and the outcomes and impacts that are capable of being generated in the first 10 years of development of the project. In the social value chain, the dimensions in dark green are the ones that were measured and included in this report, while the ones in gray refer to dimensions for which data are not yet available or refer to outcomes and impacts that have not yet been tracked and that are expected in future.

## 2.5 Defining the Key Performance Indicators

Based on the social value chain and in order to properly measure the capacity of MIND to generate social value, we adopted a set of KPIs that capture the effects of the actions taken and the changes tested by stakeholders. For each output, outcome and impact dimension we developed one or more KPI(s), provided a description of the metrics used, an indication about the nature of the KPI (qualitative, quantitative or mixed) and a protocol for measuring it. The defined KPIs are clustered by three different categories – vision, governance and social – that will be explained below.

### Vision

All indicators referring to the creation of a community of social economy actors and an inclusive innovation culture were grouped under the vision category. This category is highly interrelated with the policies adopted and its general management structure as many of the foreseen social outcomes and impacts can be related to governance decisions by Lendlease and partners. Under this category we will evaluate the effects in terms of the network generated between organizations and

Figure 9 - MIND evaluation framework

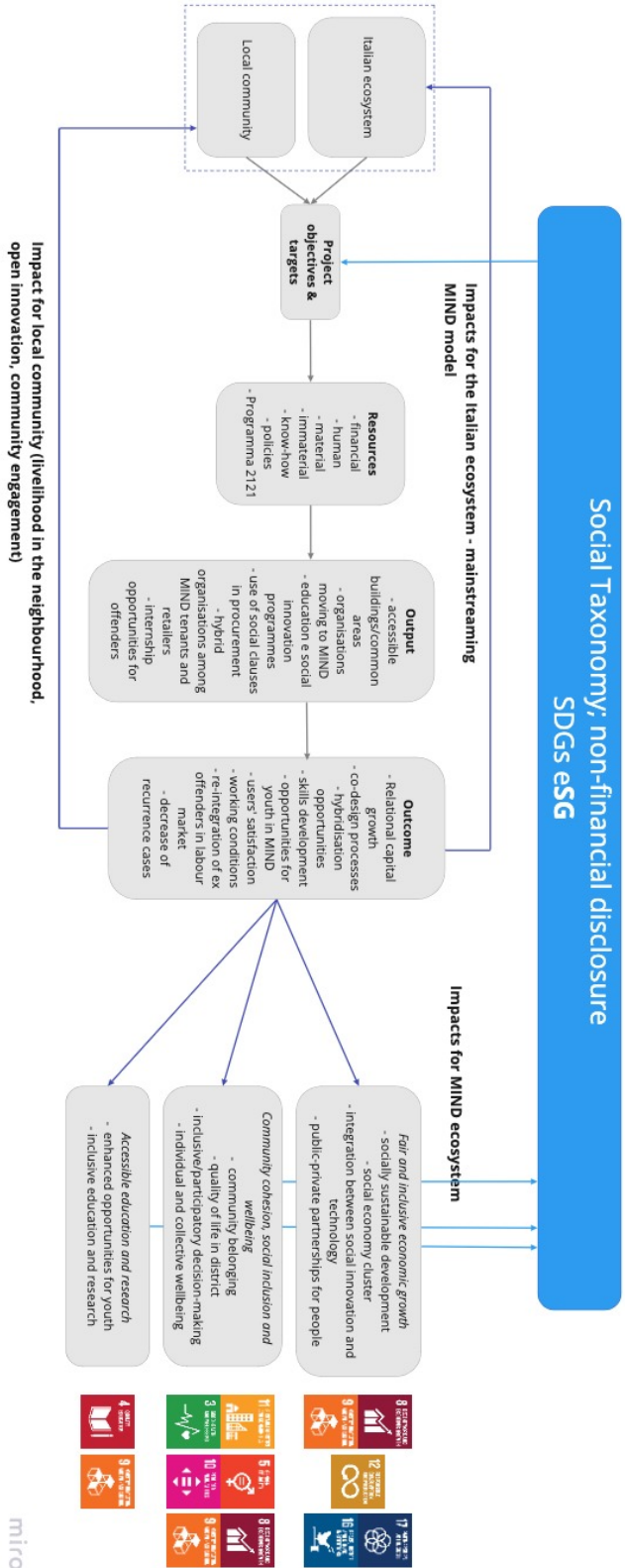
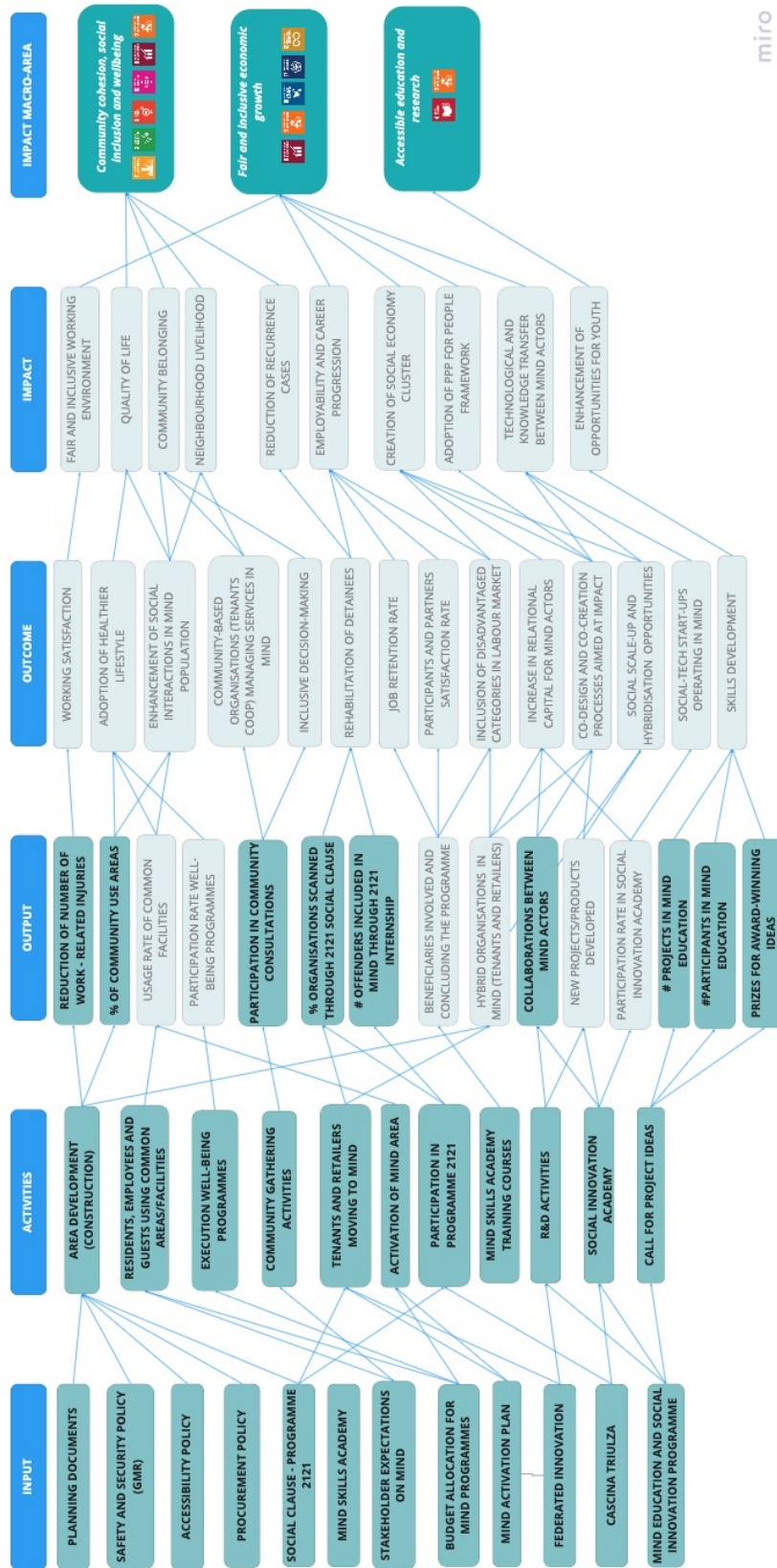


Figure 10 - The Mind Value Chain



miro

the outcomes of those interactions. In particular, this focuses on the transformation in terms of relations between actors, the creation of collaborations, social innovation and social technology development, and learning opportunities for MIND actors. Here the main reference point is the evaluation of complex systems to create an evaluation framework capable of gauging the different aspects of the developing innovation ecosystem and social economy cluster.

### **Governance**

The governance category refers to the policy decisions adopted to manage the different phases of MIND development. This allows us to estimate the effects from an input perspective and forms the basis for identifying many of the social outcomes and impacts within the next section. Under this category, the policies that Lendlease adopted for selecting the general contractor and the suppliers during the construction phase, as well as the organizations and individuals that will populate MIND during the management phase, were evaluated. Particular attention in the evaluation is given to policy objectives related to health and safety, urban planning, as well as accessibility, as well as the social clause under “Programma 2121” inserted by Lendlease in all contracts pertaining to the acquisition of goods, employment and services at MIND.

### **Social**

The social impact category descends directly from the governance and the vision dimensions, as it represents the social value created in the MIND area through the policies and the interactions between different actors. The indicators in this category will reflect the tangible and non-tangible effects on MIND actors. Under this category, sub-dimensions have been highlighted such as the capability of MIND tenants to generate job opportunities for all, including people belonging to disadvantaged categories, the outcome of organizations’ participation in “Programma 2121”, and community engagement and participation in decision-making and health & wellbeing outcomes.

## 2.6 Fair and inclusive economic growth

Table 3 - Results presentation - Fair and Inclusive Economic Growth

Topics	Dimension	Level of Impact	Results
Promoting social value through procurement	<ul style="list-style-type: none"> <li>General procurement policy - Criteria to select the economic actors</li> </ul>	Governance	<ul style="list-style-type: none"> <li>Suppliers' selection criteria to encourage involvement of local SMEs as suppliers</li> </ul>
	<ul style="list-style-type: none"> <li>Social objectives in tender and procurement processes</li> </ul>	Governance	<ul style="list-style-type: none"> <li>Promotion of youth entrepreneurship and participation in the labor force through specific requirements in open tenders</li> </ul>
Creating impact oriented innovation	<ul style="list-style-type: none"> <li>Envisioned collaborations between MIND actors</li> </ul>	Vision	<ul style="list-style-type: none"> <li>MIND will become a reference point in terms of applied research, where technology and social objectives are strongly interrelated and achieved through co-development processes between private corporations, social enterprises, universities and public bodies. Collaboration between the Social Innovation Academy and Federated Innovation.</li> </ul>
	<ul style="list-style-type: none"> <li>Involvement of current and future tenants in FI activities</li> </ul>	Vision	<ul style="list-style-type: none"> <li>Number of organizations participating in federated innovation programs = 10</li> </ul>
	<ul style="list-style-type: none"> <li>Role of Berkeley Skydeck</li> </ul>	Vision	<ul style="list-style-type: none"> <li>Description of Berkeley Skydeck and its role as incubator and accelerator to foster entrepreneurship and innovation within the ecosystem</li> </ul>
	<ul style="list-style-type: none"> <li>Role of Social innovation academy</li> </ul>	Vision	<ul style="list-style-type: none"> <li>The Social Innovation Academy promoted by Fondazione Triulza and its partners it's already one of the most remarkable products of the MIND ecosystem. The Academy is active in promoting social tech processes, by scouting for innovative and tech-based social enterprises to attract towards the MIND ecosystem.</li> </ul>
	<ul style="list-style-type: none"> <li>Relevance of social-tech initiatives in the area</li> </ul>	Vision	<ul style="list-style-type: none"> <li>MIND can be a lab for impact economy and wellbeing economy facilitating social innovation while promoting technological transfer to the non-profit sector: interaction between Federated Innovation and Fondazione Triulza</li> </ul>
	<ul style="list-style-type: none"> <li>Hybrid organizations (benefit corporations, social startups...) as tenants in MIND</li> </ul>	Social	<ul style="list-style-type: none"> <li>Valore Italia – Impresa sociale</li> <li>Bio4Dreams (Sustainable start-up incubator in life science)</li> <li>PlusValue Italy Società Benefit</li> </ul>
MIND Skills Academy	<ul style="list-style-type: none"> <li>Organization involved in the program</li> </ul>	Vision	<ul style="list-style-type: none"> <li>A skill development center to train and provide employment opportunities to in constructions sites such as MIND.</li> </ul>

## 2.7 Promoting social value through procurement

### 2.7.1 Procurement policy

The procurement policy adopted by Lendlease for the development of the MIND area reflects the public-private partnership scheme at the basis of its development. The policy generally requires open tenders based on the planning developed by Lendlease and Arexpo, promoting competition and simultaneously allocating resources to fulfil the different needs, in terms of labor, services and goods, related to construction activities.

To speed up the selection process, Lendlease requires all suppliers to register through the Global Supplier Portal. Here, prospective suppliers can request an accreditation with Lendlease, diminishing the number of documents required for each tender.

### 2.8 Suppliers' selection criteria

When applying for a Lendlease tender, potential suppliers must be compliant with a long list of prerequisites and documentation, among which the following are most relevant:

- GMR acceptance, whose safety and security standards are more stringent than Italian workplace health and safety law
- Supplier code of conduct acceptance
- MOG 231 (risk management)
- Sustainability plan + Sustainability certifications + Sustainability projects
- Other certifications: 14001 environmental management, 45001 workers health & safety, 9001 quality management
- privacy policy and GDPR
- Supplier ethic code (to be attached)
- Work and materials source (to avoid modern slavery)
- Commitment to adhere to the social clause that sees its implementation in the Programma 2121 (for more details see the next indicator)

#### 2.8.1 Local procurement strategy

Lendlease has a target of 80% for the construction phase in MIND. Additionally, the territory where MIND is located is one of the most business-intensive in Italy, with thousands of firms which could benefit from the development of a project like MIND. In particular, in the union of 16 municipal-

ities that compose the Milan Metro Area where MIND is located, there are over 25,000 SMEs that might become future suppliers or service providers for Lendlease or the tenants in MIND, according to research conducted by Distretto 33 in 2020. Distretto 33 is a consortium created in 2009 which consists of 61 SMEs active in the north-west area of the Metropolitan city of Milan. The entities in the consortium are mainly working in the service sector, professional advice and construction. Distretto 33 works as a connector between the demand for services and work coming from Lendlease and the other tenants in MIND and maximize economic opportunities for local SMEs. At present interactions between Lendlease and Distretto 33 are underway, in order to map the needs of the public anchors in MIND and the tenants that will move to MIND in the near future.

## 2.9 Creating impact-oriented innovation

### 2.9.1 Envisioned collaborations between MIND actors

The MIND development project emerged from a public-private partnership between Lendlease and Arexpo, joined by the public anchors (Fondazione Triulza, Federated Innovation, UniMi, Human Technopole and Galeazzi Sant'Ambrogio Hospital). In line with the unit of analysis adopted for this report, we will only consider Fondazione Triulza and Federated Innovation in this section. However, some general comments related to the entire ecosystem are needed to analyze the context as a facilitator of interactions between firms, hybrid organizations, non-profit organizations (NPOs) and public bodies.

**Creating partnerships and promoting collaboration and co-creation processes** between public and private entities is crucial for the establishment and the development of an ecosystem within MIND (Torres-Prunonosa et al., 2020; Fulgencio, 2017). Collaborative mechanisms are the essence of innovation ecosystems, and extending those partnerships to NPOs reinforces policy implementation and promotes equitable growth (balancing economic growth with social and environmental sustainability). MIND can learn from previous use-cases such as Sofia Antipolis, 22@ Barcelona, Technopolis and Bioscience Park, and become an open lab to test public and

private policies enabling technological and social innovation. This can be utilized to support the development of MIND as a social economy cluster, where innovation and social impact are linked to one another and where all ecosystem actors build social value for communities within and external to MIND.

An ecosystem characterized by public-private schemes is not only capable of attracting more funds from both the financial market and public bodies, but it is also more capable of conjugating different policy goals (Fulgencio 2017), supporting resilient within MIND. The collaboration between government, academia and the private sector can set a high R&D bar for creating start-ups and spin-offs (Torres-Prunonosa et al. 2020), but adding NPOs to the framework will facilitate social spin-offs and social scale-up opportunities guaranteeing, in addition, technology transfer towards local non-profits.

### 2.9.2 Involvement of current and future tenants in Federated Innovation activities

The alliance is composed of 36 members (private firms), in addition to institutional, research and innovation partners. In a survey submitted to Federated Innovation members, from 19 responses received, 10 have explicitly declared their intention to participate in programs developed with other FI and MIND Actors and the relative budget allocated, averaging €41,667 per program. This budget will be dedicated to developing initiatives between Federated Innovation Members and the overall MIND community.

### 2.9.3 Social Innovation Academy

The Social Innovation Academy promoted by Fondazione Triulza and its partners is already one of the most remarkable products of the MIND ecosystem, contributing to the site's impact and innovation commons. The Academy is a place where enterprises, non-profit organizations, academia, and the institutions can meet, develop collaborative networks and promote socially sustainable innovation. The Social Innovation Academy has been particularly active in promoting social tech processes by scouting for innovative and tech-based social enterprises, acting as an incubator for social enterprises and creating a community of social entrepreneurs and NPOs by connecting

them with MIND's technological, financial and partnership opportunities for ideation alongside MIND actors.

The experience of the Academy is unique in the Italian landscape, and this is the added value of Fondazione Triulza at MIND. The work of the Academy will be fundamental in promoting innovation in the way services are offered inside MIND. The Social Innovation Academy has been partially responsible for testing and researching many of the forthcoming services, such as the kindergarten, education services for gifted children, the transportation system, services for elderly people and others. By bringing a variety of subjects to MIND, the Social Innovation Academy is contributing to workforce and social diversity exceeding typical innovation districts. Furthermore, the Social Innovation Academy will utilize NPOs and hybrid enterprises as innovators and not as mere executors of pre-defined services.

The Social Innovation Academy is an avenue to attract talented social entrepreneurs and innovators, but it's also a way to promote MIND innovation and impact commons beyond the MIND ecosystem. Start-ups, non-profits and entrepreneurs that are trained through the Academy programs might be established in MIND or even beyond its boundaries.

The involvement of the members of Federated Innovation in the Academy led to an integration of social innovation and technological development. One field in which this trend can already be seen is health care, where technology plays a role in facilitating interactions between different actors in the value chain (hospitals, day-care centers, practitioners, elderly care, etc.). To quote Chiara Penasi, Director of Fondazione Triulza, "this is the essence of social tech, integrating life-science and technological development together with social impact, while aligning with regional and national policy goals, in this case the revision of the Lombard health care management system".

The linkages created between Federated Innovation and the Social Innovation Academy resulted in a collaboration between life-science organizations and founding members of Fondazione Triulza in two projects, one related to territorial health care planning, the other focusing on education on sustainability and impact for health care executives.

#### 2.9.4 MIND Skills Academy

To support skills development for construction and other technical workers, Lendlease, in partnership with ELIS and the general contractors in the Village and West Gate, created the MIND Skills Academy. The Skills Academy will provide professional training and employment opportunities in construction sites and related industries, forming professional figures such as site managers, specialized construction workers, electric installers, mechanic installers, and carpenters, among others. This will enable workers to consolidate their competencies while providing unemployed people, low qualified workers, youth and other disadvantaged categories (including migrants, veterans, NEETs, former addicts, and former convicts) to acquire new professionalized skills to revitalize their careers.

The Skills Academy was developed in partnership with general contractors and suppliers active in the MIND working site, but it will be open for participation for other entities who are not MIND business partners. During the pilot phase, the Academy attracted 7 industry partners, or sponsors, of which 5 are general contractors and 2 are organizations highly interested in contributing to the creation of the Skills Academy. The sponsors, so far, are Costim, Colombo Costruzioni, Gianni Benvenuto, Meregalli, CBM, Carron and Zaffaroni. These are all located in the metropolitan city of Milan or in neighboring provinces in north of Italy (Lombardy and Emilia Romagna).

Through this pilot, Lendlease aims to train and provide job opportunities for 50 young people who are currently outside education and have not entered the labor market. This is expected to provide them with the necessary skills to start a career in the construction sector as well as life skills and competencies to enhance their employability. If the pilot proves successful, Lendlease aims to have 6 courses/year involving up to 300 beneficiaries on a yearly basis.

### 2.10 Community Cohesion, Social Inclusion and Wellbeing

#### 2.10.1 Community engagement and expectations

To be able to assess MIND's social impact, it is relevant to understand the area's specificities – most notably the type of tenants that will populate the district, the community that will be created and the initiatives put in place to activate the area.

### 2.11 Building community in MIND

MIND will be a living neighborhood of 60-70,000 people on a daily basis, a mix composed by residents and employees, students and researchers, in addition to visitors and partners (LendLease 2021). The diversity and richness of the expected tenants will bring complexity, supporting community creation and management as different actors carry out diverse needs, interests and expectations.

According to the planning documents, the housing units will be rather small, targeting mainly singles and couples. Most of the inhabitants will be young adults (18-35) and adults (35-55). The two should represent about 72% of the general population in MIND, out of which about 1/3 will be under 30. The rest is apportioned between an 8% over the age of 55, and adolescents and children, who will make up 20% of MIND's population. This population mix will make MIND one of the youngest neighborhoods in Milan.

To enhance community development, Fondazione Triulza is extremely active in promoting engagement events and in bringing different stakeholders to discuss the development of the area. As reported by Cascina Triulza Director, Chiara Penasi, their work is focused on community creation and involving local communities to bridge the gap between pre-existing neighborhoods and MIND. Without including this, MIND risks creating a segregated or uncohesive neighborhood lacking effective community ties.

Since 2018, Cascina Triulza has been organizing social innovation events and promoting dialogue between different stakeholders to create a shared decision-making system, where the community discusses challenges and proposes solutions to Lendlease and Arexpo. For example, during the event “10 tables for 100 years of sustainable development” **242 participants divided into 10 thematic groups proposed 20 different projects for fair, equitable and sustainable development** in MIND and in the neighboring areas. The thematic areas discussed were: fighting food waste and poverty; health and wellbeing; environmental sustainability; mobility and accessibility; agro-ecology and nutrition; social inclusion; youth; impact investing; urbanization; partnership and global networks.

Out of the 16 recommendations, over 70 projects were developed by the stakeholders engaged. Sev-



Table 4: Results presentation - Community Cohesion, Social Inclusion &amp; Wellbeing

Topics	Dimension	Level of Impact	Results
Community engagement and expectations	• Building a community in MIND	Vision	• Around 1800 residing in the area out of over 14.000 expected visitors (employees, service users etc). The objective is to build community ties, create a sense of belonging and promoting inclusive decision-making as the district grown
	• Stakeholders' needs and expectations	Vision	• "The 10 tables of 100 years of sustainable development" of Fondazione Triulza to collect the ideas of local communities • Two surveys submitted to Federated Innovation members (19 respondents) and companies' employees (49 respondents) placed in MIND as a way to understand needs and expectations • 60+ Interviews carried out with Milan innovation ecosystem stakeholders
	• Willingness to move to MIND	Vision	• Tenants: 8 agreements signed, 4 in progress, 4 non-binding terms signed • Co-working location: 13 agreements signed + 30 under discussion
	• Stakeholder engagement Policy: Activation strategy - Village	Governance	• Stakeholder engagement activities to promote sustainable lifestyles at MIND. Based on 5 pillars: Community; Sport & Wellness; Art & Culture; Business & Tech; Food.
Urban planning and accessibility	• Connection with surrounding areas	Vision	• System of hard mobility that connects the MIND district with the highways in the area. • Connection with the public mobility system and improvement to of the public transportation system with Milano and other the municipalities.
	• Urban planning and accessibility policy	Vision	• Planned according to the 15-minute city principle: where all services are reachable in 15-minutes by walking, with a wide variety of services available within 4-minutes' walk. • Accessibility: step-free access to common grounds, step-free paths, artificial tactile signs for blind people, dedicated parking facilities close to all buildings. • Wayfinding: signposts with smart use of colours to enhance contrast and legibility; multiple communication codes embedded
	• Publicly accessible areas (MIND common grounds)	Social	• West Gate: 47% of overall surface • Village: 72% of overall surface
	• Areas of leisure	Social	• West Gate: Gateway Square, Central plaza and Water Square - 13% of the total surface • Village: Piazza Podium, Piazza Darsena, Temporary Installation space - 15.5% of the total surface
	• Green areas	Social	• West Gate: The Decumano - 6% of the total surface • Village: Hortus - 18% of total surface
	• Sport facilities	Social	• West Gate: Open air Gym - 0.9% of the total surface • Village: Sport facilities - 3% total surface
	• Community facilities	Social	• West Gate Open-air working spaces, auditorium, educational services, medical practices and laboratories - 3% of total surface • Village: Podium studio, auditorium, outdoor working spaces - 13% of total surface

Topics	Dimension	Level of Impact	Results
<b>Health and Safety</b>	• Health and Safety policy	Governance	• The GMRs – Global Minimum Requirements – document provide guidelines to all Lendlease operations in terms of Governance, Investment, Design & Procurement, Establishment and Delivery. • Requirements above law.
	• Number of work-related injuries	Social	0
<b>Programma 2121</b>	• Social Clause – Programma 2121	Governance	• In collaboration with the Italian Ministry of Justice, Lendlease is the promoter of “ <i>Programma 2121</i> ”, a Program aimed at enhancing social inclusion through work placements of people who find themselves in a condition of personal freedom restriction in the Lombard penitentiary system.
	• Enterprises scanned through social clause	Social	• 100% as the social clause is mandatory in all contracts
	• Inclusion of detainees in the work-force	Social	• 33 detainees involved since the beginning of the program.

eral projects were immediately adopted by Arexpo and Lendlease for the development of the West Gate area, such as the development of the residential and work premises together with the park and public areas for each functional sector which represents an absolute novelty in the work of the area developers. Furthermore, Arexpo and Lendlease gave due consideration to requests to use a design for all tool when planning the common areas and mobility in the MIND area. Arexpo is currently working on a plan to bridge the gap between the future MIND community and the communities in the neighboring cities, based on recommendations from the tables.

In October 2021, Cascina Triulza launched the Community Park project, promoting the shared management of MIND’s green areas through a community cooperative to encourage an innovative, more inclusive governance and community funding system. At present Cascina Triulza is conducting several social labs to gather different opinions on the project and to test its viability. Using participatory planning tools will **enhance community ties, create a sense of belonging to the community and promote inclusive decision-making** within MIND and its surrounding community. This will be adopted at all levels of planning for services and projects in MIND to align stakeholder needs and the management decisions.

In a similar manner, Lendlease is now looking into the organization of community services in MIND and is adopting a system based on inhabitants’ cooperatives that are widely used in northern Italy. Building on the experience of Legacoop in the housing services sector, Lendlease opened a call for an organization to manage the services and community engagement mechanisms, as well as to develop a participatory mechanism for the management of the residential area and its related services. Doing so will be a first step towards the creation of an open community, where the interest of all parties will be accounted for as they will simultaneously be managers and beneficiaries of services provided to the residents of MIND.

### 2.12 Survey results – tenants and employees’ expectations

In order to investigate tenants’ expectations towards MIND, a survey of 37 questions has been submitted to 49 employees of 5 companies that have already moved or are moving their offices to MIND. Moreover, another survey has been submitted to Federated Innovation members with 19 out of 38 members responding.

It clearly emerged from the survey that respondents’ expectations on MIND go in two directions:

- from a professional point of view, MIND is seen as a place where workers can find a stimulating

and flexible environment and an opportunity to share knowledge and do networking;

- on the other hand, it is seen as a place where a better work-life balance is guaranteed through the development of green, open and leisure places and all the necessary primary services (grocery stores, health, transportation, etc).

The aspects related to networking, knowledge sharing and partnering particularly emerged in the survey submitted to the Federated Innovation members. Here more than half declared that MIND and Federated Innovation are expected to have a large impact on networking capacity and almost 90% of respondents think there will be some or large impact on their ability to develop public-private partnerships. Finally, around 30% show their willingness to allocate some financial resources in order to support scholarships for students/researchers within MIND Academic and Research Institutions.

#### 2.12.1 Stakeholder engagement policy: activation strategy - Village

One of the biggest challenges in MIND is community creation. A fundamental element for guaranteeing a cohesive, functional community is the adoption of a strong stakeholder engagement and management policy to bring residents, employees and visitors together. Considering time constraints, only the Activation policy for the Village area is examined in this report. Launched by Lendlease during 2121, the Activation policy is based on 5 pillars: Community; Sport & Wellness; Art & Culture; Business & Tech; Food.

The focus of the activation policy is to promote a MIND lifestyle where particular attention is given to wellbeing, work-life balance and quality interactions between tenants, residents and employees. The activation policy will then form the basis for a broader stakeholder policy for the West Gate area. Focusing on the Village activation strategy, Lendlease is gradually implementing the five pillars and aiming to run them in parallel with site development and the area's progressive increase in population. At the MIND Village's opening event, held in the beginning of May for over 10,000 attendees, with activities for public engagement, such as sport activities and challenges, food tracks and temporary landscape interventions. Moreover, local actors were involved in these initiatives, including some theater representations. The event

targeted both actual and prospective tenants as well as the communities of Bollate, Rho, and the whole Municipality of Milan.

In order to prepare the ground for the official opening, some temporary spatial interventions, with an expected life of 2 to 3 years, have been designed and implemented. A local artist was engaged to paint the streets in the Village, Decumano and Tree of Live areas. In addition, some sports and play areas, free and open to the public, were implemented, such as a basketball court, a volley and beach volley camp, an open-air workout area, chessboards, a bocce court and painted kids' games. In addition to the opening days, the site was opened for the Open Days of FAI, the Italian Environmental Fund, which organized guided tours in March.

#### 2.12.2 Willingness to move to MIND

Corporate tenants have every reason to move their R&D centers and general offices to MIND. As Diego Valazza, Business Development Director of Lendlease highlights in a recent interview, the primary pull-factor for MIND is Federated Innovation, whose added value and services are already being recognized; secondly, the presence of the anchors (Galeazzi Sant'Ambrogio, Fondazione Triulza, Human Technopole, UniMi and PoliMi), presents a unique opportunity for private-public, profit and non-profit collaborations; thirdly, the district is characterized by human-centered urbanism, where open and closed spaces are designed to foster "collisions" between tenants which produce innovation.

Moreover, a portfolio of continuously evolving services is taking shape, in order to detect inputs from current and future tenants.

Based on information in March 2022, we registered the following in the Village area:

- Tenants: 8 agreements signed, 3 in progress, 4 non-binding terms signed;
- Co-working locations: 13 agreements signed + 30 under discussion.

This is an indicator for MIND's attractiveness to enterprises, as once the Village is open to the public, over 90% of the offices and working spaces will be either fully functional or soon to be rented.

## 2.13 Urban planning and accessibility

### 2.13.1 Connection with the surrounding areas

MIND has been designed to be highly connected with the surrounding neighborhood in order to guarantee the accessibility of the area and foster interactions. MIND is connected with the outside through gates (fixed entry and exit point), where multi-functional parking is available as switching points from hard mobility to the soft mobility used within the area.

In addition, the West gate is the main entry point for public transportation, with the Rho Fiera Milano subway and train station and MIND Merlata train stop, part of the expansion project of the Milan's public transit authority.

From the point of view of external mobility, some reduced speed zones are foreseen, for example near the Galeazzi Sant'Ambrogio Hospital, where access will be given to health care transportation and few other specific categories of visitors.

To be more connected with the public mobility system of the Milan Metro Area, improvements to public transportation have been planned with the municipalities. The area where MIND is located is quite underserved in terms of public services and the presence of MIND therefore requires new tram and bus lines to connect it with the neighboring districts of Milan.

### 2.13.2 Urban planning and Accessibility policy

The MIND district has been planned around the **15-Minute City principle**, where all services for residents and visitors can be reached under fifteen minutes from their homes or offices, with a wide variety of services available within 4-minutes' walk. This allows for both the creation of a people-friendly neighborhood and accommodates different needs from different types of residents and visitors. Using the 15-minute city principle in the planning of MIND will further develop car-free mobility and reduce the environmental and mental stress caused by traditional urban mobility. Using this criterion to plan the space will have a sensible impact on people's lives especially in terms of health and wellbeing, access and availability of services and in building a sense of cohe-

sion in the community. Planning according to the 15-minute city can also be a key to further develop smart and inclusive cities while building resilience in the pandemic recovery.

On the other hand, when planning a new district as it is the case in MIND, careful consideration is given to accessibility, allowing people with mobility-related disabilities to move in the space. Several reserved parking lots have been inserted close to each building entrance for people with disabilities and routes will always be available for them to use cars inside the MIND area. Furthermore, internal pedestrian routes are planned for people with disabilities according to existing Italian regulations to provide step-free access to common grounds, step-free paths between the buildings and the main landmarks as well as podotactile signage for blind people.

To further overcome architectural barriers, Lendlease has planned a wayfinding policy that accounts for the needs of several types of users that might have a different familiarity with the space surrounding them. Due consideration in the process of defining the wayfinding strategy has been given to disabilities and other factors hindering the ability to freely navigate the space.

The wayfinding strategy adopted in MIND is an absolute novelty in city planning and will provide greater accessibility. The system planned will make it possible to overcome many of the barriers that traditional wayfinding systems based only on one interaction code (generally visual) which prevents people with disabilities from enjoying a fully independent experience.

### 2.13.3 Public areas

The West Gate provides a total land surface of 112,752 sqm, representing about 11% of the overall MIND surface of 1 million sqm. Out of this area, 52,667 sqm is represented by the so-called public realm, public-access areas for leisure, social interaction, community living as well as sports and recreation. According to municipal urban regulations, publicly accessible areas should amount to at least 25% of total surface, but in this case they amount to 47% of West Gate's total surface area. In addition, the functional tranche A04, where most of the residential and private use buildings will be built, has an even high percentage of 61%, with 41,327 sqm of public space out of a total surface area of 67,413 sqm.



The Village is composed of two areas: the North Village located north of the Decumano, including elements of EXPO 2015 as well as the Intesa pavilion, and the South Village, south of the Decumano, which includes two longitudinal buildings which are retained service buildings from the EXPO. Overall, the Village comprises a walkable surface of 31,196 sqm, being smaller than West Gate, and accounts for about 3% of the entire MIND surface area. The criteria of having a balanced mix of private use and publicly accessible areas is reflected in the Village, too, where the public realm extends to 15,500 sqm, or 72% of the overall area. In this case the publicly accessible areas are about three times above the minimum requirements provided in municipal urban regulation. This highlights the centrality of publicly accessible areas as connectors between the buildings and the outside (e.g. roads, pedestrian pathways, etc.) as well as aggregation spaces for the future MIND population and visitors, defining a different way to live in and use city spaces. As described below, the public areas will connect people to MIND's services and lead to unique opportunities for interaction.

The public realm is organized into four main areas: areas of leisure, sport, community facilities and green areas. They are described below to show their composition and functions. We decided to focus on these areas as they are generally more related with the promotion of individual and collective wellbeing as well as with the enhancement of quality of life. The indicators are calculated based on the ratio between the area of interest and the public realm in the West Gate and the ratio between the same area of interest and the total terrestrial surface of the West Gate.

#### 2.14 Areas of Leisure

The areas of leisure are planned as aggregation points for the community in MIND, as places where people will gather to contribute to the areas' social and cultural life – where the community is built. Inside the West Gate, this function will be represented by the Gateway Square – representing the entry/exit point from the railway and metro station Rho Fiera – the Central Plaza – an open-air cultural center for events, art exhibitions and digital culture projects – and the Water Square – a semi-natural area where the water will act as the contact point between anthropic activities and nature. In the Village, this function will be repre-

sented by the Piazza Podium – the front section of the Podium Studio – the Darsena Square – which connects the main buildings in Village North – and the Temporary Installations square – an open-air space for artistic installations.

The squares are central to community cohesion at MIND: the total surface of the three squares in the West Gate is 14,500 sqm, representing 27% of the total area dedicated to public real estate and 13% of the total surface of the West Gate area. The total surface of the three squares in the Village is 4,900 sqm, representing 21% of the public realm in the Village and 15.5% of its overall surface. In addition, there will be a mix of offices and commercial services (shops, retails, supermarket, bar, restaurants), around the squares, and some parts of the West Gate residential buildings are directly connected. This will guarantee daily interactions between different stakeholders (residents, employees, service providers, retailers) and will form the basis for creating community level ties.

#### 2.15 Green Areas

The green areas in the West Gate are represented by the Decumano, a longitudinal park connecting the Central Plaza with all the facilities inside the area and with the other areas of MIND, in particular the Village and Galeazzi Sant'Ambrogio Hospital. The Decumano, recalling the Latin word to indicate the central alley in an encampment, is the central and vital core of the West Gate. This is formed of a 6,600 sqm walkable surface totally accessible and fully immersed in nature, covered with trees and close to the waterbed. The Decumano represents about 13% of the public realm, or 6% of the total West Gate surface. Despite not looking too wide against the total surface, the centrality of the Decumano in the West Gate is represented by its role in the car-free mobility policy adopted in MIND, with this being the central axis that integrates all mobility services onsite.

In the Village the green realm is represented by the Hortus, the tree-lined boulevard between the two longitudinal buildings. The Hortus consists of a 5,500 sqm walkable surface that will host different areas for people to gather, also representing an extension for the services and retailers in the area. Hortus represents 24% of the public realm in the Village or about 18% of the overall surface of the area.

## 2.16 Sports facilities

As health and wellbeing represent two central pillars in the development of MIND, dedicated areas have been reserved in both the West Gate and Village. Along the Decumano, in the West Gate, there will be a 1000 sqm surface acting as an open-air gym. In total the outdoor gym represents about 2% of the public real estate and slightly less than 1% of the total West Gate area. An additional 340 sqm indoor gym has been built in the Village to allow the population to exercise, while the Village North will feature 660 sqm of space for different sport fields, representing about 4% of the public real estate and 3% of the total surface.

The presence of an outdoor sports space will support the organization of several activities related to MIND's wellbeing strategy, promoting healthy lifestyles alongside points of aggregation between residents, employees and visitors.

## 2.17 Community facilities

Lastly, while planning a new neighborhood it is crucial to include areas that can host community facilities. These areas are vital for the development of a solid and healthy community as they contribute to both the social and cultural life of residents, employees and visitors. In particular, the community facility areas will complement the leisure areas and provide further space for interaction and aggregation.

Within the West Gate area, the community facilities are represented by open-air working spaces – technological oases along the Decumano that can be used by employees, students, residents and visitors; an auditorium – an open-air space for small events, conferences, debates, etc.; educational services – such as a new kindergarten and medical practices and laboratories. In total the community facilities will cover an area of 3,600 sqm, representing 7% of the public realm and 3% of the overall West Gate area.

Overall, the community facilities in the Village amount to 4,100 sqm, representing 18% of the public realm or 13% of the total surface.

The focus on creating open-air spaces for social life comes as a result of the recent Covid-19 pandemic and is supported by statistics that show how working *en plein air* for a few minutes per day can reduce stress and can facilitate social interaction.

### 2.17.1 Health and Safety

The GMRs – Global Minimum Requirements – document provide guidelines to all Lendlease operations in terms of Governance, Investment, Design & Procurement, Establishment and Delivery. Where there is a gap between Lendlease standards and those required by legislation, codes, standards and other external requirements, the higher standard applies.

Concerning the Security of Lendlease sites, as per GMRs guidelines, the recording of all incidents – featuring a clearly defined implementation process and set of guidelines – is required in order to assess performance and collect data, like working hours and the number of workers and sub-contractors on site.

As stated by Giorgio Fainello (Lendlease health and security), GMRs are applied in all worksites: some GMRs are even stricter than Italian Safety Law (81/2008), for example in the provision of personal protective equipment for every worker. Considering the high complexity and risks characterizing some worksites, additional security requirements may be applied in order to guarantee workers' safety.

Lendlease is committed to providing training to all workers on site, which goes beyond the mandatory training foreseen by law. The security coordinators meet each worker personally, and each worker undergoes a short *Safety induction* before entering the worksite.

In addition to all the security measures and efforts put in place throughout the operations on the worksite, there is a significant deal of design work upstream. Because, as Giorgio Fainello stated, security is a primary design, each supplier involved in the construction process is required to provide method statements which describe the technical aspects the interventions provided.

### 2.17.2 No work-related injuries

In line with the high standards of health and safety policies and procedures, we found no evidence that any work-related injury occurred during the construction of the Village.

## 2.18 Programma 2121

In 2018, Lendlease partnered with the Italian Ministry of Justice to launch “Programma 2121”, which provides for employment inclusion for people jailed by the Lombard penitentiary system. Aim-

ing to enhance social inclusion, Programma 2121 proactively addresses significant issues among former prison inmates, such as unemployment, which increases the likelihood of recidivism.

The agreement's goal with Lendlease is to create synergic interventions that will help promote social security inclusion for those who have been subjected to criminal procedures. Therefore, Lendlease is committed to inserting a social clause in all its procurement tenders, which states that every supplier will intend to involve itself with, and allocate resources to, the program. As Giorgio Fainello, Lendlease Health and Security Manager stated, the social clause's inclusion in the construction phase of the West Gate features a target of 1:40: one detainee for every forty employees. Each detainee will start with an internship and will receive training, with the final aim of offering them long-term employment where possible.

*The pilot edition* of Programma 2121 had a duration of 3 years, from 1 July 2018 until 30 June 2021. In this period, 33 detainees were placed on internships. The project was then renewed for another 5 years with the aim of increasing the number of detainees integrated through job opportunities on-site.

In line with these objectives, Fondazione Triulza and the Penitentiary provided training and the necessary tools to the detainees to manage the overall experience: how to write a CV, how to manage an interview, soft skills and relationships management with colleagues and supervisors. For companies, training and mentorship was provided in order to effectively manage detainee integration into the working environment.

In addition to Programma 2121, and contributing to providing the detainees with instruments for societal integration, two additional initiatives have been created:

- Educational paths for detainees to support them in managing their relationships with their children at home
- Financial education for managing savings properly, addressed to both the detainee and his/her family

These programs are supporting the fight against recidivism: It has been demonstrated that serving prison sentences with alternative measures – i.e. outside of prison – leads to a lower level of recidivism, around 20%, in comparison to the country average of 68%. The reduction of one single per-

centage of recidivism at a national level could lead to €51 million of savings (Stasio, 2012). In countries like France and the United Kingdom, the application of alternative measures is three times more frequent than in Italy, where the sentence is executed in prison in 82.6% of cases. These numbers show that in Italy there is still ample room to develop projects like Programma 2121, which contribute to both social impact generation and public savings.

## 2.19 Accessible education and research

### 2.19.1 MIND Education

MIND Education was launched in 2018 by Arexpo and LendLease in partnership with Fondazione Triulza, the EU Commission Joint Research Center (JRC) and several schools and universities in the Lombardy region.

In the first edition (2018) students from the Politecnico di Milano (PoliMi) developed a plan to individuate strategic elements for communication, while IULM's students created 21 communication plans for the short, medium and long term. Additionally, Brera Academy students presented a set of innovative techniques for the communication and diffusion of MIND's identity to complement its plans.

The second edition (2019) saw the birth of "A City in MIND" – a contest now in its 4<sup>th</sup> edition – directed to primary and secondary school children and featuring a specific program on career development and orientation for high school students, now in its 3<sup>rd</sup> edition (2022). As of the last edition, over 4600 primary and secondary school students have been involved in the program, developing over 90 story-telling projects. Additionally, Human Technopole established "Remember My Name", a special prize going to the 3 classes who prepared the best materials illustrating the lives of lesser known scientists. As a result, the first three laboratories in the Human Technopole have been named after the three scientists featured in the storytelling of high school students.

Additionally, a total of 10 project works was launched with several universities in Milan, leading to 58 project ideas being developed over the last 4 years. Each year the priorities set by MIND for the call for proposals were different, ranging from communication to water management, to life sciences, to art and entertainment, to data



management. What unites the call for ideas is the fact that each year they aim to fill gaps identified by the partners in MIND Education and to bring academia closer to the private sector.

The 2022 program launched two proposals in two different fields. The first one, related to Health Data Science, was launched by Human Technopole, the Galeazzi Sant’Ambrogio Hospital and several biotech corporations operating within Federated Innovation. Another call, Meanwhile Solutions @MIND, sought collaboration with the Horizon 2020 T-Factor project towards the development of meanwhile activities and programs to create shared value during the period of transformation.

Due to the continuous call for inputs, the enterprises in MIND are able to connect with new talents and fresh ideas, which can then be explored from a commercial perspective. Over the last 4 years, 3 award-winning students have been involved directly in MIND through internships in Arexpo and Lendlease. All students, following the internship, have been offered full-time jobs in Arexpo and Lendlease, showing the importance of programs such as MIND Education to scout and nurture talent.

Additionally, the involvement of the “Alta Scuola Politecnica” in the first Social Innovation Campus promoted by Fondazione Triulza enabled students to pitch their projects directly to MIND stakeholders. In one case, Galeazzi Sant’Ambrogio Hospital decided to fund further research, which provided innovation on the treatment of micro-fractures.

The developed with SDA Bocconi School of Management about the skills needed in future jobs has been utilized in the MIND Education program in high schools. Similarly, the board game “MIND the game” developed by NABA students has been produced by Arexpo and used as a marketing tool. The attention that Lendlease and Arexpo give to the outcomes of the MIND Education program is exemplified by the “no-wifi park” ideated by a group of secondary school students.

## 2.20 Vision

### 2.20.1 Promoting co-creation and co-production opportunities

MIND acts as a space of interactive innovation that promotes collaboration between public and private actors, and facilitates co-creation and co-pro-

duction processes for research advancement, social inclusion, and environmental sustainability. This represents an unicum for innovation districts and science parks, particularly the Federated Innovation model that fosters collaborative innovation between key firms.

A place like MIND facilitates interactions between for-profit and non-profit organizations spurring research for social innovation. Cascina Triulza’s Social Innovation Academy works Federated Innovation to integrate scientific and technological development with social innovation. Moreover, Distretto 33 can become a strategic stakeholder connecting municipalities to the local entrepreneurship and industrial ecosystem.

If co-production and co-creation processes become a main feature of the MIND district, knowledge and know-how transfer will be bolstered. In particular, the interactions between different stakeholders will promote a general knowledge transfer in the territory, supporting the scientific and technological advancement of several social economy actors and SMEs as well as social innovation processes at all levels.

An area where co-creation and co-production processes can prove successful is social innovation. The idea is to involve MIND tenants in shared social innovation processes where they work with third-sector professionals and university students to arrive at common solutions to welfare challenges.

### 2.20.2 Mainstreaming interaction models (MIND as a role model)

If proven successful, the MIND model could be an absolute novelty in terms of human development, reconciling economic, social and environmental goals and ensuring fruitful partnerships between private and public actors. This will not only create a more inclusive economy but could reduce the trade-off between technological development and social sustainability and reduce the gap between technology-based organizations and social economy actors.

## 2.21 Governance

These recommendations address the topic of collective governance in public-private partnerships and the creation of shared policies for social impact maximisation.

Table 5 - Result presentation - Accessible Education and Research

Topics	Dimension	Level of Impact	Results
MIND Education	• MIND EDUCATION # projects/call for ideas	Social	In the first 4 editions: • 58 projects developed based on 10 project work launched with several universities in Milan • 90 storytelling ideas through "A city in MIND"
	• MIND EDUCATION # participants in call for idea/year	Social	In the first 4 editions: • 4600 participants from primary and middle school • 980 participants from high schools
	• Prizes paid to award winning ideas	Social	• €9,000 in technological tools and devices for educational activities for the award-winning class in "A city in MIND" (2021 edition) • "Remember My Name" to the 3 classes who prepared storytelling materials about less known scientists. Prize provided by Human Technopole (2021 edition – A city in MIND) • €20,000.00 in funds for the award-winning ideas in the 2022 call for proposals
	• Projects selected for implementation	Social	Based on call for ideas: • New MIND logo • Branding tools and communication plan by Accademia Brera • MIND the game developed by NABA • Professional orientation toolkit by SDA Bocconi • From "A city in MIND": • No WIFI zone – included in the project for the park
	• Internship offered to MIND EDUCATION Participants	Social	• 3 internships offered to university students in AREXPO and Lendlease
	• Employability of MIND EDUCATION participants (Interns fully included in the staff)	Social	• 2 in Lendlease and 1 in AREXPO

2.21.1 **Transparency and monitoring system (data collection)**

When developing a project or implementing an intervention such as MIND, it is essential to develop a sound monitoring system to track any changes that occur, and clear metrics for each of the indicators adopted are vital to social outcomes and impacts. We suggest adopting an integrated dashboard that will describe the KPIs adopted, their metrics and the calculation protocol. The basis for metrics and calculation will be developed for all outcomes and impact dimensions highlighted in the social value chain so that it will be possible to measure them dynamically. Based on this it will be possible to develop a data collection protocol and define the period of collection and analysis. The monitoring system would be fully integrated into Lendlease’s activities, and each relevant department would cooperate in the process. To facilitate operations, the data collection process can be digitalized

and integrated in the tools that are already used by Lendlease. Once MIND is fully operational, the data collection activities shall be extended to tenants, retailers and all other actors in the MIND ecosystem; Lendlease will be the subject best placed to promote the adoption of the general infrastructure to all other actors in the district. This will enhance the quality of data collection ensuring that all relevant results are communicated through a one-stop-shop. With this in mind, we recommend establishing a subject in charge of data ownership. This can form a driver for corporate companies and NPOs to adopt a measurement structure to track their outcomes and impacts. Furthermore, having a proper mechanism for monitoring and constant evaluation will make it possible to evaluate the success of policies in supporting MIND to reach its vision and create social value. Additionally, in a context like MIND where many of the activities generating social

impact are related to multi-stakeholder partnerships, measuring the results achieved and the changes generated is fundamental for reinforcing the partnership itself and ensuring that all actors are aligned towards common goals. In this light, the monitoring and measuring mechanism will be a way to manage the partnerships at stage and to gain mutual recognition between the parties while ensuring measurability to the changes and effects generated by MIND.

Lastly, a monitoring mechanism will afford Lendlease enhanced transparency about MIND operations and reinforce communications on social outcomes and impacts at MIND. This will increase trust and strengthen the capacity to attract funds for the future development of the district.

#### 2.21.2 Defining targets and setting goals

Together with the definition of KPIs, it is crucial to set targets and goals for each of the social impacts generated by MIND, as internal targets exploit the possibility of generating intentional and additional impact, reinforcing the will to create social value. Targets can be defined in different domains: inclusion targets, referring to the involvement of specific categories of organizations or people, or overall outreach targets, defining the total amount of people involved in a specific program or projects during a certain period of time.

#### 2.21.3 Targets to involve people from disadvantaged categories in MIND Skills Academy

Another crucial area is defining targets for involving disadvantaged and underprivileged people in the MIND Skills Academy. As mentioned above, the overall target set for the Skills Academy by Lendlease is to organize 6 different training courses each year. Assuming that each course will target up to 50 people like the pilot, it will be possible for Lendlease to reach up to 300 people each year. This would prove very promising, ensuring that a steady intake of workers is taken by construction and facilities companies, although what needs to be addressed here are certain involvement targets related to specific categories of people.

From discussions with Lendlease, the main targets would include youth, migrants, army veterans and former convicts, especially those who participated in Programma 2121. In order to define the different

motivations for involvement in the skills academy, Lendlease should conduct stakeholder engagement activities with the selected categories of beneficiaries and define targets for their inclusion in the training program. This will reinforce the intentionality and additionality of the project, thus creating shared value.

#### 2.21.4 Collective governance – the 4P approach

Given the initial agreement between Arexpo and Lendlease and the centrality of the district's anchors (Fondazione Triulza, Federated Innovation, Human Technopole, Galeazzi Sant'Ambrogio Hospital and UniMi) for the development of the area, a collective governance approach that includes the fundamental stakeholders in the decision-making process needs to be adopted. The aim is to attain a more inclusive decision-making process that balances the interests and needs of private and public organizations, social actors as well as local residents and employees, to attain a Private-Public-People Partnership (4P), (Ng et al. 2013).

Private-Public-People Partnerships are defined as end-user approaches where all stakeholders including government, donor agencies, private sector firms and civil society organizations work together. This allows them to overcome the market-oriented logic of Public-Private-Partnerships (3P) structures, shifting from value for money to value for people and enabling the creation of a wellbeing economy ecosystem. Adopting a 4P approach for the development and management of MIND will improve access and equity to infrastructure and public services; enhance the efficient allocation of public and private resources; increase investments in resilience and climate change; ensure stakeholder engagement.

Reconsidering the existing Public-Private Partnership between Arexpo and Lendlease under the 4P approach could maximize MIND impact and enable citizen-level decision-making. Furthermore, a 4P approach can be coupled with an adaptive governance scheme to ensure that community planning and development is responsive with respect to the institutional, social and environmental changes occurring.

#### 2.21.5 Policy Priorities of MIND

As part of the 4P approach, Lendlease and its partners should promote the adoption of inclu-

sive policies that allow for the active engagement of communities. In order for MIND to reach the three impact areas presented above – community cohesion, social inclusion and wellbeing; fair and inclusive economic growth; and accessible education and research – Lendlease pays careful attention to other areas: health and safety of workers; fair working conditions; workers’ satisfaction; workers’ and residents’ wellbeing; involvement of social enterprises and social ventures in the MIND ecosystem; co-planning and co-creation tools to develop best practices such as the case with the program 2121; integration of disadvantaged people in workforce; diversity and inclusion policy targets.

## 2.22 Social Policy

### 2.22.1 Support of education and research activities

One of the main features of MIND is R&D in the Life Sciences. In this light, MIND shall promote interactions between tenants and the anchors towards cooperation in the development of knowledge and know-how in the medical, biomedical and biotechnological fields. The cooperative approach will enhance the capabilities of different actors and enable a mixed financing scheme where private funds can be added to public ones. To start this process of integration between public and private funds, Lendlease and the other members of Federated Innovation @MIND are developing an open platform for research and development that can guarantee higher access to research activities, through knowledge sharing and the leveraging of economies of scale.

Furthermore, MIND can promote life-long learning and skills development for all individuals in the district by extending the perimeter of MIND Education to tenant’s employees and people using the co-working spaces in the Village and West Gate through the development of skills development programs.

The MIND Education program can be reinforced by introducing a program of scholarships to be developed according to a 4P framework that includes the anchors and tenants towards the co-creation of a model that promotes opportunities for unprivileged youth. A preferential system of internships is being developed for university and high-school students that are already involved in the MIND Education activities.

### 2.22.2 Social standards in the selection of tenants, retailers and suppliers

Lendlease shall adopt targets related to the involvement of Social Economy Actors (SEAs) and hybrid organizations as tenants, retailers and suppliers. SEAs and hybrid organizations generally provide more inclusive management structures, presenting systems to measure and report on social outcomes and tend to offer employment for people belonging to disadvantaged categories or underprivileged groups. This therefore has the opportunity to enhance workforce diversity and reduce social exclusion for different societal groups.

### 2.22.3 Housing scheme

One essential aspect to promote social wellbeing is the development of housing schemes for residents of the district (e.g. researchers, employees, students, start-uppers etc.). Housing schemes which consider the heterogeneous needs of varied stakeholders in an array of solutions, based on typology of rent (entire house vs single rooms), length of contract (long-term vs short-terms) and price (market-price vs discounted price) can be highly effective. Having a competitive and socially inclusive housing scheme will also contribute to the creation of a diverse community in MIND and solve many of the inequalities observable in geographically close suburban areas like Rho, Arese, Bollate and Quarto Oggiaro. Furthermore, a well-planned housing scheme will allow MIND to attract highly qualified individuals from a diverse range of backgrounds and their families, as required by MIND’s institutions and organizations. This will contribute to the creation of an intersectional community, mitigating the social exclusion typical of suburban areas, while enhancing the variety of social interactions.

The need for a properly planned housing policy emerged from the Fondazione Triulza event “10 tables for 100 years of sustainable development”, where participants encouraged Arexpo to adopt a competitive housing strategy capable of overcoming barriers to entry in Milan’s housing market, where high rents are creating social exclusion and individual anxiety.

To develop MIND as a laboratory for the wellbeing economy, it is essential to make housing services more affordable for families, workers, university students and young professionals. Developed alongside with local government bodies and

MIND's anchor institutions (particularly Fondazione Triulza), an inclusive housing scheme will enhance the quality of life in the neighborhood and have an impact on people's health and wellbeing, enabling enhanced access to services.

### 2.23 Defining MIND impact strategy at ecosystem level

Lendlease and the public anchors involved in MIND should define an impact statement outlining specific objectives for social value creation. Defining an impact statement and setting clear priorities will transform the way in which services are planned in MIND, pushing the entire ecosystem towards the achievement of shared impact dimensions. While developing the ecosystem impact statement, the three concepts of intentionality, measurability and additionality should be taken in due consideration to assure that social outcomes and impacts generated: i) will be genuinely owned by all actors in the ecosystem, so that each and every organization will contribute to strategic implementation; ii) will bring results that can be measured through quantitative and qualitative data; and iii) will create added value for all stakeholders in cases where the market has failed to provide a solution.

The definition of an impact strategy is the fundamental step towards assessing and managing the changes and transformations resulting from the activities of MIND's actors and stakeholders.

### 2.24 Conclusions

MIND - Milano Innovation District can create social value for the ecosystem actors, for the local community, and for the whole entire Italian R&D environment. Conducting an assessment through a methodological framework based on the Theory of Change has resulted in the delineation of three main areas of impact - social inclusion, community cohesion and wellbeing; fair and inclusive economic growth; and accessible education and research - and the output, outcome and impact dimensions linked to a set of indicators and metrics. The analysis mainly relates to how the present input can support the generation of social value in already measurable outputs. In particular, we see how the urban planning and development has been conducted according the 15-Minute City principle, providing a wide array of services

located in proximity to the two areas of analysis. Furthermore, the attention provided to the planning of publicly accessible areas offers information on how common ground can serve as a catalyst for interactions between stakeholders and generate social value. Although this value cannot be quantified today, Lendlease has opted for a distribution of common areas with aggregation spots in all portions of the wider MIND district. These aggregation spots will enable interactions between the community and nurture placemaking.

We can also see some of the preliminary results of the social impact projects that have been, and still are, implemented in the area. Projects like Programma 2121, MIND Education and the Social Innovation Academy have all proven successful in engaging and providing opportunities for different categories of stakeholders. MIND is not just a new neighborhood - it is a model city *and* an ecosystem characterized by the presence of multiple stakeholders such as public entities, enterprises, non-profit organizations, hybrid organizations, investors, residents, employees, researchers and students, and more. All these actors will interact and influence each other, both inside MIND and within its surrounding areas. While doing so, Lendlease has a crucial role to play in bringing the ecosystem together and in defining the impact statement and impact missions that will form the basis for future measurement and assessment, and support the further planning, measurement and benchmarking of the MIND ecosystem.

## 3. SUSTAINABILITY AND CARBON FOOTPRINT IN MIND

### 3.1 Introduction

In 2020 the Lendlease Group announced its decarbonization plan to align itself with Paris climate target of a maximum of +1.5°C in global temperatures. Lendlease is committed to achieve **Net Zero Carbon Emissions by 2025**, with respect to fuel and energy consumption; and **Absolute Zero Carbon by 2040**, by eliminating all emissions generated indirectly from in-house activities without the use of carbon offsets.

Lendlease's sustainability and decarbonization strategy in MIND encompasses a broad spectrum of testing and implementing innovative solutions for the green transition. Thus, MIND aims to set the standard in the climate challenge by bringing together the public and private sectors working on:

- 1) **SUSTAINABLE BUILDINGS:** All buildings within this new precinct will be designed and built to achieve the internationally recognized green building certification striving for LEED Platinum / WELL Gold. Likewise, the district is targeting LEED Cities and Communities GOLD certification, aiming for the entire project to be built sustainably with the community in mind.
- 2) **EMBODIED CARBON OF CONSTRUCTION MATERIALS:** A carbon budget is set per building use, technologies, and construction materials. A target was assumed of a 50% reduction against RICs carbon footprint benchmarks. The target will also be reached by Design for Manufacturing, Assembly, and Disassembly (DFMAD), using timber frames instead of concrete frames. The 100% wooden materials used for the MIND site (structural and not) are either reused or come from sustainably managed forests (FSC or PEFC certified products).

- 3) **WASTE MANAGEMENT STRATEGY:** the no-waste approach is applied to divert 98% of construction waste from landfills; meet the 15% reduction target in the production of urban waste, the 95% on-site recycling objective and send only up to 5% of waste to a waste facility by 2040, to reduce CO<sub>2</sub>eq emissions by 40% compared to baseline.
- 4) **MOBILITY STRATEGY:** To include fully electric vehicles on-site, walkable and cyclable routes, a broad range of green areas and a set of design strategies to eliminate car trips by 50% and encourage walking/cycling as low-carbon modes.
- 5) **WATER MANAGEMENT STRATEGY:** to set performances and an integrated approach to reduce sitewide potable water demand by specifying metering, low floor fittings and non-potable networks.
- 6) **RESILIENCE TO EXTREME WEATHER EVENTS:** the management plan was implemented considering the effect of heat islands and urban flooding, using site-specific projections to increase climate resilience. The masterplan was developed considering a Representative Concentration Pathways (RCP) equal to 8.5 W/m<sup>2</sup> in the 2090 scenario.

The sustainability strategy deployed in MIND covers not only all phases and elements of the construction life cycle, it also includes a plan designed with the district's public anchors, private companies and suppliers, aimed at informing, educating and engaging different target audiences in relevant activities and projects.

### 3.2 Alignment with the EU Green Deal

MIND contributes to the European Green Deal presented by the Commission on 11 December 2019, which aims to make Europe the first climate-neutral continent by 2050. In order to achieve this target, the Regulation of European Climate has set the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. The new European climate strategy not only aims to reduce emissions, but also to create new jobs and boost innovation and protect the natural environment<sup>40</sup>.

The Commission identifies buildings as one of the largest sources of energy consumption in Europe: the construction sector is responsible for over 35% of the EU's total waste generation; greenhouse gas emissions (GHG) from material extraction, manufacturing of construction products, and the construction and renovation of buildings are estimated to be 5-12% of total national GHG emissions. However, greater material efficiency could save 80% of those emissions<sup>41</sup>.

MIND aims to be an urban pilot where green transition ideas proposed by the European Commission can be tested and implemented. It meets the standards of the Energy Performance of Buildings Directive (EPBD), which requires all new buildings to be Nearly Zero Energy Buildings (nZEBs), through two main vectors. Firstly, 100% of temperature dynamics will be produced by heat pumps and energy supplied by a decarbonized electricity grid. Secondly, the whole district's electricity consumption will be satisfied by 100% renewable sources through photovoltaic plants on buildings' roofs and the purchase of certified renewable energy on the market. In addition, MIND has integrated circular economy principles in the construction phase, which follows the EU-Taxonomy mitigation criteria for new construction buildings, with 98% of construction site waste being reused or recycled<sup>42</sup>.

<sup>40</sup> See: EU. (2022). REGULATION (EU) 2021/1119 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 June 2021 establishing the framework for achieving climate neutrality. *EUR-LEX*, 243/1. [Online]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32021R1119>.

<sup>41</sup> See: European Commission (2020). *Circular Economy - Principles for Building Design*. [Online]. Available at: <https://ec.europa.eu/docsroom/documents/39984> [Accessed 4 April 2022].

<sup>42</sup> See: (2020). EU taxonomy for sustainable activities. [Online]. Available at: [https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities\\_en](https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en) [Accessed 4 April 2022].

MIND's carbon footprint was measured by a cradle-to-grave Life Cycle Assessment (LCA). In general, an LCA intends to assess the environmental impact of a product or service over its entire life cycle, including the production, construction, use, and end of life phases. The analysis in this document includes the carbon footprint of buildings in Renaissance I in terms of overall CO<sub>2</sub> equivalent emissions over its Design Service Life (DSL). Furthermore, it provides quantitative results informing the designers about the project's environmental performance concerning the existing baseline, which helps understand the extent to which the project achieves high environmental sustainability in the most critical life cycle phases in terms of the potential CO<sub>2</sub> emissions avoided by this project.

Generally, a Life Cycle Assessment (LCA) process starts with defining the goal and scope. It is followed by collecting the life cycle inventory, choosing, and implementing the Life Cycle Impact Assessment (LCIA) methods and ends with an optional step for interpreting results (Figure 13). This report extends the analysis by comparing the outcomes with baselines to provide a more detailed interpretation of results.

This chapter will follow the standard structure of implementing LCA studies (concerning process-based modeling and an attributional approach), with Figure 14 illustrating the steps followed.

### 3.3 Assessment tools and methods

This analysis utilized a new Python-based model developed by the Department of Energy of PoliMi<sup>43</sup>, which runs on the Ecoinvent database<sup>44</sup> and can assess several environmental impacts according to different Life Cycle Assessment (LCA) methods. The selected LCA method and tools are then applied to evaluate the potential environmental impacts of materials and operational energy consumption against appropriately defined baselines.

<sup>43</sup> Famiglietti J, Toosi HA, Dénarié A, Motta M, Developing a new data-driven LCA tool at the urban scale: The case of the energy performance of the building sector. *Energy Conversion and Management* 2022; 256:115389. <https://doi.org/10.1016/j.enconman.2022.115389>.

<sup>44</sup> Wernet G, Bauer C, Steubing B, Reinhard J, Moreno-Ruiz E, Weidema B. The Ecoinvent database version 3 (part I): overview and methodology. *International Journal of Life Cycle Assessment*, 2016; 21:1218–1230.

Figure 11 - **Steps of LCA (ISO 14040, 2006)**

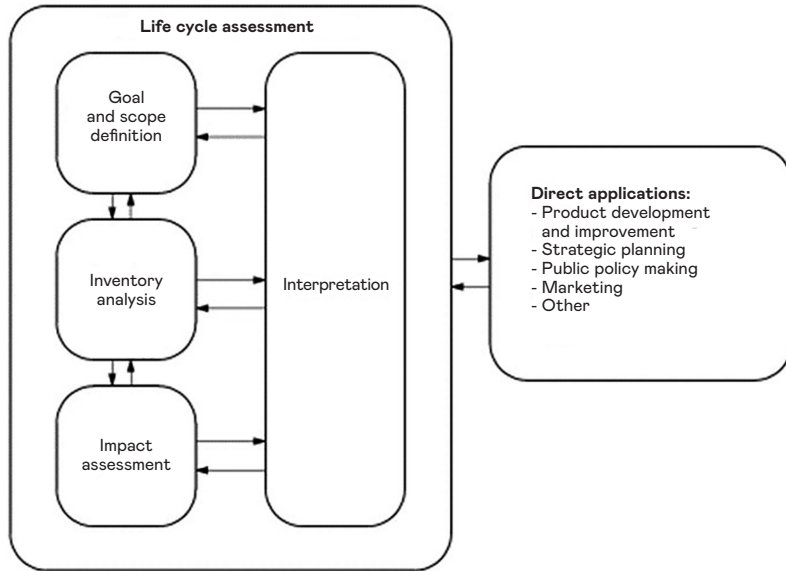


Figure 12 - **Detailed scope of the assessment**

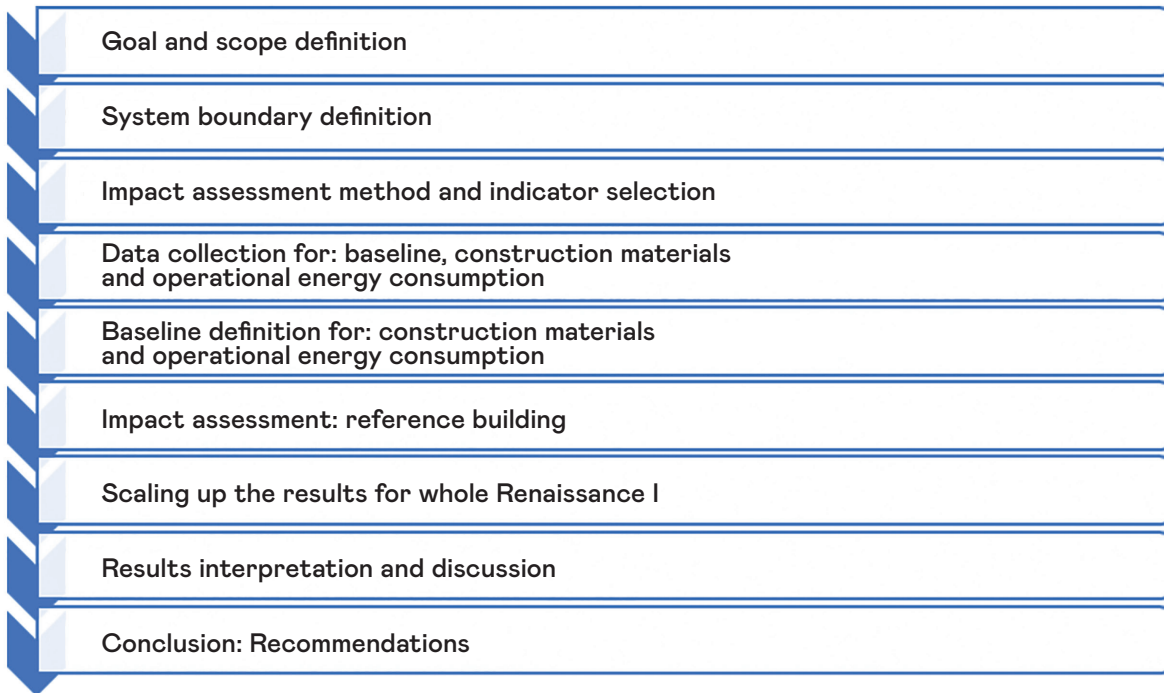




Figura 13 - Schema del sistema del motore computazionale

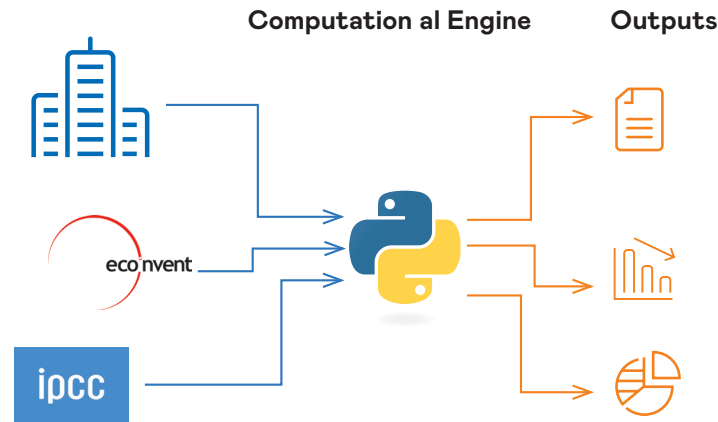


Figure 13 illustrates the scheme of the tool, which in this study integrates buildings' design data, the Ecoinvent 3.8 database to retrieve the life cycle inventory, and IPCC 2013 (presented in the EF 3.0 method EN 15804 version)<sup>45</sup> as the impact assessment method.

### 3.4 Goal and scope

The study conducted by the Department of Energy of the Politecnico aims to assess the carbon footprint of buildings located in Renaissance I in terms of overall CO<sub>2</sub> equivalent emissions over their whole life cycle. This includes, firstly, construction materials and activities and secondly, operational energy consumption for supplying heating, cooling, and hot water. The analysis proceeds by firstly evaluating the embodied impacts of construction materials in Building 1.1 (the only building for which the design team reported the design and materials used). The analysis will continue by scaling up the embodied impacts of the reference building to the whole of Renaissance I. It includes the operations impacts of all buildings in the project by performing a carbon footprint of provided data based on the estimated operational energy consumption of each building.

Figure 14 represents the scope of the assessment, i.e., the whole Renaissance I and the reference building (1.1). In the system boundaries were excluded the building ID 1.3 (not supplied by the 5<sup>th</sup> Generation District Heating network) and multi-story car parks.

### 3.5 Results and discussion

The benchmark value of CO<sub>2</sub> equivalent emissions related to the construction materials was estimated as **650kg CO<sub>2</sub>eq/m<sup>2</sup>**. The operational energy benchmark (module B6) was estimated as **669 kg CO<sub>2</sub>eq/m<sup>2</sup>** according to the results of data-driven analysis in the CENED database, which includes the operational energy consumption for heating, cooling, and domestic hot water of buildings. These two values can be summed up to realize the benchmark values of total CO<sub>2</sub> equivalent emissions, equal to **1,319 kg CO<sub>2</sub>eq/m<sup>2</sup>**.

The following sections represent the results of the carbon footprint assessment on the reference case and the whole of Renaissance I separately. The results were compared with benchmarks to measure how much CO<sub>2</sub> equivalent emissions can be saved by Renaissance I.

<sup>45</sup> CEN. EN 15804:2012, A2:2019 - Standards Publication Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products. European Standards 2019:70. <https://doi.org/10.1167/iov.11-8415>.

Figure 14 - Scope: Renaissance I and the reference building 1.1

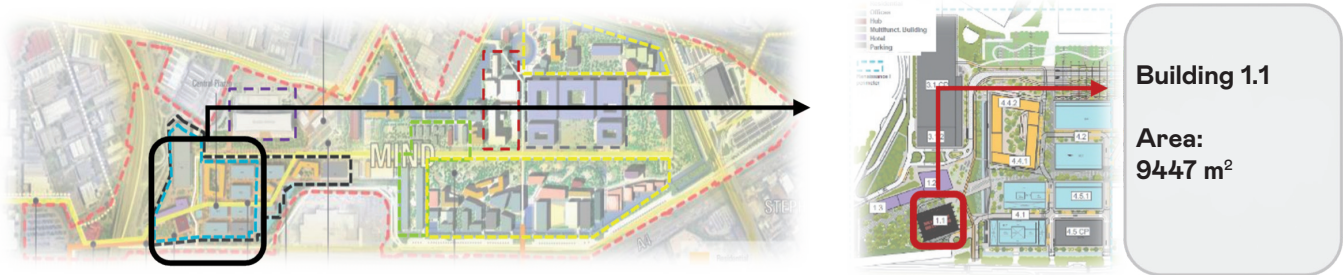
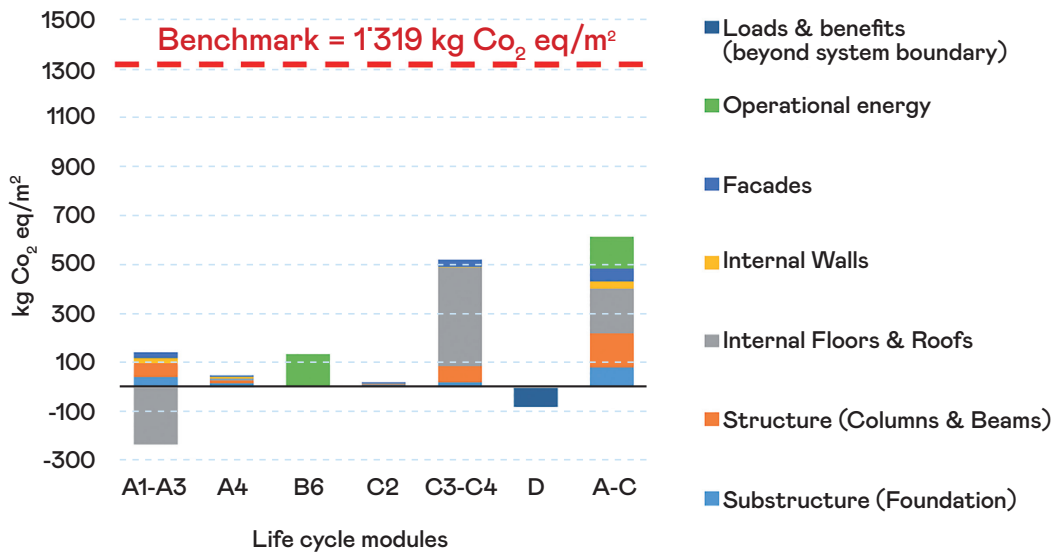


Figure 15 - Climate change impact of each building component and each life cycle module



### 3.6 The carbon footprint of the reference building

In this section, the outcomes obtained for Building 1.1 are shown. Table 14 and Figure 24 present the assessment results for the various modules (from A to D). Table 14 details the CO<sub>2</sub> equivalent emissions produced from the construction materials, operational energy consumption, and biogenic carbon uptake and release. The fossil, biogenic, and land-use change contributions are reported separately in the table and assigned to the related life cycle modules. Figure 25 shows the outcomes graphically.

As displayed, the result was lower than the benchmark defined. The potential impact on climate change of the construction materials used (embodied carbon) and the energy consumption during the operational phase were evaluated as:

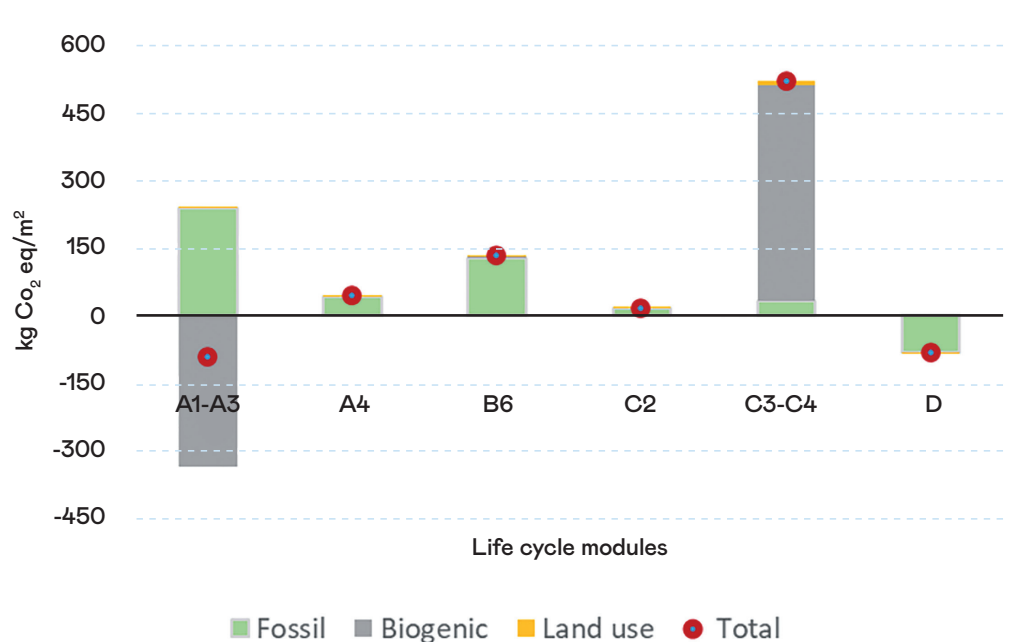
- embodied carbon (A1-3 and C2-4): 484 kg CO<sub>2</sub> eq/FU vs. 650 kg CO<sub>2</sub> eq/FU (benchmark);
- operational energy use (B6): 131 kg CO<sub>2</sub> eq/FU vs. 669 kg CO<sub>2</sub> eq/FU (benchmark).

The CO<sub>2</sub> equivalent emissions in the reference building are 26% and 80% lower than the benchmark for construction materials and operational energy consumption, respectively. Com-

Table 6 - Results for Building 1.1 [kgCO<sub>2</sub>eq/m<sup>2</sup>]

Builldin ID	A1-A3	A4	B6	C2	C3-C4	D
<b>Total</b>	-93.22	42.50	131.41	15.43	519.68	-82.58
<b>Fossil</b>	239.01	42.39	126.30	15.38	33.69	-81.88
<b>Biogenic</b>	-332.97	0.10	4.91	0.04	476.45	-0.66
<b>Land use</b>	0.74	0.02	0.20	0.01	9.54	-0.05

Figure 16 - Share of each life cycle module in per type of CO<sub>2</sub> eq emission



pared to the benchmark, the CO<sub>2</sub> equivalent emissions saved in the reference building is 704 kg CO<sub>2</sub> eq/m<sup>2</sup>.

### 3.7 The carbon footprint of Renaissance I

As previously stated, the climate profile of the other buildings of Renaissance I was assessed, scaling up the outcomes obtained for Building 1.1 concerning embodied carbon. The result, 484 kg CO<sub>2</sub> eq/FU, was multiplied for the whole surface of Renaissance I (208,174 m<sup>2</sup>), providing the result of 100,756.2 tons CO<sub>2</sub> eq/year as the total estimated embodied carbon.

All buildings in Renaissance I had overall CO<sub>2</sub> equivalent emissions lower than the benchmark. The average CO<sub>2</sub> equivalent emissions (including A1-A4, B6, and C1-C4) equals **600 kg CO<sub>2</sub> eq/m<sup>2</sup>**. **In addition, the estimated results of the energy consumption of buildings in Renaissance I show** that the average share of renewable primary energy reaches around 89% of the total primary energy (renewable and non-renewable) consumption during the buildings' service life.

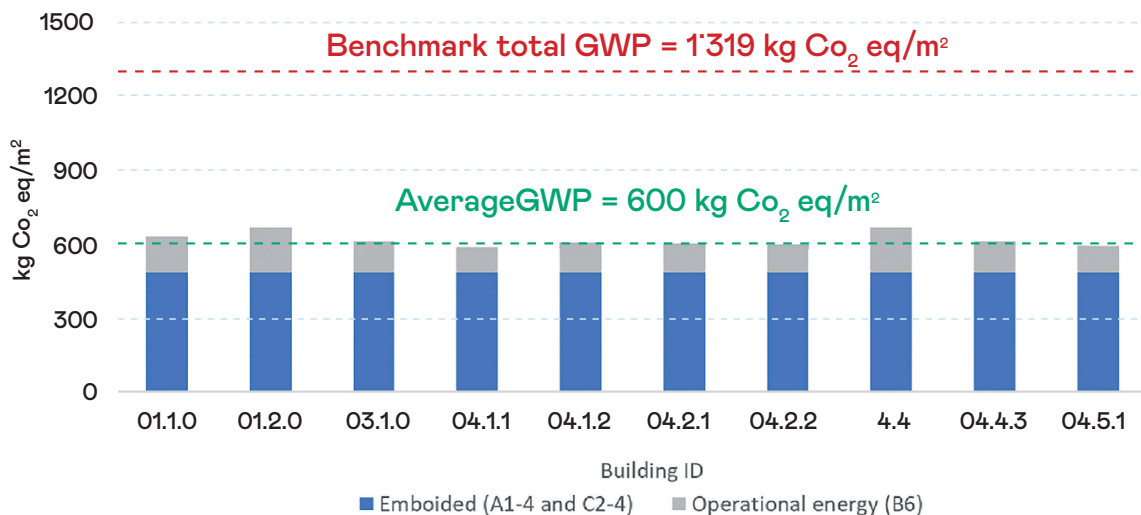
The value was assessed considering:

- the amount of renewable energy used by the heat pumps installed in the ectogrid (5GDH network – E.ON); renewable energy to the evaporator from the external environment: 66% is space cooling and domestic hot water mode;
- the amount of electricity from photovoltaic panels that supply the ectogrid (approximately 10%), based on the energy strategy report (version May 2022);
- the amount of renewable energy from Renewable Energy Certificates (RECs) declared by Lendlease: 100% renewable electricity by 2030 (as declared in MIND-Renaissance I, Business plan, page 12);
- the amount of renewable energy in the national electricity grid, approximately equal to 19%.

### 3.8 Conclusions

This report provides the overview, methodology, and results of the Life Cycle Assessment of buildings in Renaissance I in the Milan Innovation District (MIND), evaluating the area's CO<sub>2</sub> equivalent emissions generated during its building life cycle. The assessment was performed uti-

Figure 17 - The total CO<sub>2</sub> eq emission of each building in Renaissance I, including embodied and operational impacts over the building life cycle with a life span of 50 years.



lizing the EN 15978 (2011), a European standard for assessing the environmental performance of buildings, and deploys data from the Ecoinvent 3.8 database and the IPCC 2013 (100 years, presented in the EF 3.0 method EN 15804 version) methodologies to complete the evaluation. It also elaborates on the primary data provided by Lendlease concerning the typology and quantity of construction materials and the energy demand for the operational phase. The result obtained was equal to 600 kg CO<sub>2</sub> eq/m<sup>2</sup> of gross external surface area, selected as a functional unit over a time horizon of 50 years.

With the aim of evaluating the sustainability performance of buildings in terms of CO<sub>2</sub> equivalent emissions (potential effect on climate change), the result was compared with a benchmark developed by PoliMi, representing Business As Usual (BAU) in construction in the Lombardy Region (Northern Italy). The BAU was calculated utilizing data provided by the Joint Research Center of the European Commission and the data from the CENED 2.0 database for the emission linked to the operational phase of buildings. The benchmark was defined as equal to 1,319 kg CO<sub>2</sub> eq/FU. The estimated benefit for the whole buildings evaluated in Renaissance I can be calculated as the difference between the benchmark (1,319 kg CO<sub>2</sub> eq/FU) and the average value for buildings (600 kg CO<sub>2</sub> eq/FU), equalling 719 kg CO<sub>2</sub> eq/FU.

The results show that the buildings in Renaissance I had a high level of environmental performance compared to the benchmark, thanks to the high operational energy efficiency of the designed buildings. The environmental performance of the buildings of Renaissance I was approximately 55% lower than the benchmark selected: best buildings in the Lombardy Region, corresponding to the median of the buildings with best performances considering the operational energy consumptions (class A) and construction technology.

However, these buildings can achieve higher environmental performance by applying low-impact refrigerant gas in all heat pump units<sup>46</sup>. Moreover, the share of the carbon dioxide equivalent emissions linked to the construction materials (embodied carbon) is significant (approx. 79% of the total). It can be reduced by considering low-impact materials or further improving the building design. The results show that the structural elements – predominantly concrete and steel – contribute significantly to environmental impact. The monitoring and continuous environmental assessment in the subsequent phases of the project is a critical task to evaluate the project's environmental footprint accurately and dynamically to ensure the attainment of the decarbonization targets that are the basis of MIND's green strategy.

<sup>46</sup> The share of renewable energy sources foreseen is considered to be sufficiently high enough to be further increased, reaching 100% from 2030 onwards.

## 4. ECONOMIC IMPACT ASSESSMENT

This analysis aims to perform an assessment of the financial and economic impacts of the investment project Renaissance I, implemented by Lendlease Italy SGR S.p.A. (henceforth SGR). The analysis is made by integrating the financial appraisal with the economic assessment of the project in order to account for the wider economic effects generated by the project.

### 4.1 Financial appraisal

Financial appraisal is based on the Discounted Cash-Flow Method, in compliance with EU regulations. The evaluation of the financial profitability is carried out based on the computation of the Financial Rate of Return (FRR), computed as the discount rate that determines a Financial Net Present Value (FNPV)<sup>47</sup> equal to zero, according to the formula:

$$\sum_t \frac{FCF_t}{(1 + FRR)^t} = 0 \quad (1)$$

where  $FCF_t$  are the financial cash-flows generated at year  $t$ .

Table 7 shows whether (Yes/No) and how (+/-) each item impacts on the computation of cash-flows in the financial appraisal. The input data of the analysis are collected from the financial-economic plan “Project Renaissance Business Plan” release 2021/06/24 disclosed by the SGR.

Overall, cash-flows for the financial appraisal of the project are computed by subtracting items not associated with real cash-inflows or outflows (as described in Table 17) from the values of items (A), (B), (C), (D) and (E).

In particular, annual financial cash-flows are computed according to the following formula (thus completely excluding allowances of items C and D and other contingencies):

$$Financial\ CF_t = (A)_t + (B)_t + (E)_t - Design\ Contingency_t - Development\ Contingency_t - Lost\ Rent_t - Lost\ Service\ Change_t \quad (2)$$

Table 8 shows the estimated annual financial cash-flows for the financial appraisal of the project.

<sup>47</sup> The FNPV is computed as the difference between the discounted value of expected project revenues and the discounted value of expected project expenditures (expressed in financial terms), according to the following formula:

$$FNPV = \sum_{t=0}^T \frac{FCF_t}{(1+i)^t} = \frac{FCF_0}{(1+i)^0} + \frac{FCF_1}{(1+i)^1} + \dots + \frac{FCF_T}{(1+i)^T}$$

where  $i$  is the financial discount rate and  $T$  is the life of the project.

Table 7 - Description of individual items considered in the financial appraisal

Item	Financial Appraisal
<b>Total Development Cost Excl. VAT</b>	
Land & Infrastructure Cost (A.1)	
Land Purchase	Yes (-)
IMU (Pre-construction)	Yes (-), it is a tax related to business activities. It is not refundable
Existing Infrastructure Assets Reimbursement Contribution	Yes (-)
Master Site Minimum Infrastructure Works	Yes (-)
Plot Minimum Infrastructure Works	Yes (-)
Site Preparation Contribution	Yes (-)
Development & Construction Cost (A.2)	
Private Construction	Yes (-)
Design Contingency	No
Professional Fees (Pre Start on Site)	Yes (-)
Professional Fees (Start on Site to PC)	Yes (-)
CCC Taxes	Yes (-), it is a tax related to business activities. It is not refundable.
Development Contingency	No
Development Management Fee	Yes (-)
Project Management Fee	Yes (-)
Leasing Cost (A.3)	
Rent Free	Yes (-), it is a missing revenue which contributes to reduce cash-inflows.
Lost Rent	No
Lost Service Charge	No
Capital Contributions	Yes (-). It is a negative cash-flow sustained by the SGR to support the early phases of tenants' business.
Marketing & Mobilisation Costs (BtR)	Yes (-)
Other Letting Costs	Yes (-)
<b>Net Operating Income</b>	Yes (+). It is the operating revenue of the project.
<b>(C) Operating Allowances (Vacancy/Capex/Leasing)</b>	No
<b>(D) Other Operating Allowances</b>	No
<b>(E) Notional Sale: Asset Value (Post Disposal Costs) at Plot Completion</b>	Yes (+). It is the residual value of the project.

**Table 8 - Annual financial cash-flows. Values in table are reported in million euros (€M). The FRR is reported in percentage (%).**

Year	Cash-flows
2020	0.00
2021	-98.09
2022	-205.35
2023	-172.41
2024	-67.31
2025	24.21
2026	38.51
2027	39.92
2028	40.92
2029	41.53
2030	42.17
2031	919.35
<b>Total</b>	<b>603.45</b>
<b>FRR</b>	<b>9.93%</b>

Based on Equation

$$\sum_t \frac{FCF_t}{(1 + FRR)^t} = 0 \quad (1)$$

and assumptions of Table 17, the **FRR of Renaissance I project is equal to 9.93%**.

#### 4.1.1 Sensitivity Analysis

We hereby the financial profitability of the project in case all the provisions and contingencies are assumed as real cash-outflows. This corresponds to evaluate the project in a scenario in which a set of negative cash-flows are considered in addition to those which are expected in the most likely scenario foreseen by Lendlease SGR.

Consequently, the annual financial cash-flows are computed according to the following formula:

$$Financial\ CF_t = (A)_t + (B)_t + (C)_t + (D)_t + (E)_t \quad (3)$$

Table 9 shows the estimated values of annual financial cash-flows.

Based on Equation

$$\sum_t \frac{FCF_t}{(1 + FRR)^t} = 0 \quad (1)$$

the FRR under this specification of Renaissance I project is equal to about 8.77%. The FRR becomes about 8.90% when the counterfactual scenario costs (€620,000 per year) are included in the appraisal.



Table 9 - Sensitivity analysis of annual financial cash-flows. Values in table are reported in million euors. The FRR is reported in percentage (%).

Year	Cash-flows
2020	0.00
2021	-99.07
2022	-215.49
2023	-184.18
2024	-74.33
2025	21.80
2026	37.72
2027	38.74
2028	39.53
2029	36.99
2030	39.78
2031	898.70
<b>Total</b>	<b>540.19</b>
<b>FRR</b>	<b>8.77%</b>

## 4.2 Economic appraisal

The economic appraisal aims to provide a reliable estimate of the project value, benefits and costs, from the perspective of the society at large, including the economic conversion of project cash-flows and the economic evaluation of positive and negative externalities encompassing wider economic, social and environmental effects.

The evaluation of the economic profitability is carried out based on the computation of the **Economic Rate of Return (ERR)**, calculated according to the European Investment Bank (EIB) accounting standards (release 2020). More specifically, the ERR is computed as the discount rate that determines an **Economic Net Present Value (ENPV)**<sup>48</sup> equal to zero, according to the following formula:

$$\sum_t \frac{ECF_t}{(1+ERR)^t} = 0 \quad (4)$$

where ECF<sub>t</sub> are the economic cash-flows generated at year t.

<sup>48</sup> The ENPV is computed as the difference between the discounted value of expected project revenues and the discounted value of expected project expenditures (corrected in economic terms), according to the following formula:

$$ENPV = \sum_{t=0}^T \frac{ECF_t}{(1+i)^t} = \frac{ECF_0}{(1+i)^0} + \frac{ECF_1}{(1+i)^1} + \dots + \frac{ECF_T}{(1+i)^T}$$

where  $i$  is the financial discount rate and  $T$  is the life of the project.

### 4.2.1 Economic appraisal of project cash-flows

To reflect the social opportunity cost of goods and services, we consider the conversion of market prices to shadow prices. Sources of market distortions may indeed be present and cause prices not to fully reflect the economic costs for society. The perimeter of Renaissance I is a site near the city of Milan, in the Italian region of Lombardy which is considered among the most efficient areas in Europe.<sup>49</sup> We assume that the economic context for the provision of inputs is thus referring to efficient and competitive markets, where project cost components are assumed to be adequately priced and distortions can be considered marginal. As an example, we recall that the outflow for *Land Purchase* refers to a competitive tender procedure at international level. For these reasons, we opt to rely on a simplified approach with a conversion factor of 1 for all inputs that are considered in the economic analysis. Similarly, the Willingness-To-Pay (WTP) is employed to assess the maximum

<sup>49</sup> See, for instance, the results of the "European Regional Competitiveness Index" ([https://ec.europa.eu/regional\\_policy/sources/docgener/work/2019\\_03\\_rci2019.pdf](https://ec.europa.eu/regional_policy/sources/docgener/work/2019_03_rci2019.pdf)), and in particular the scores related to the Efficiency pillar (page 10). A further analysis of NUTS 2 regions that are overperforming with respect to national regions is presented in the European Commission report [https://ec.europa.eu/regional\\_policy/sources/docgener/work/201707\\_regional\\_development\\_matters.pdf](https://ec.europa.eu/regional_policy/sources/docgener/work/201707_regional_development_matters.pdf).

amount consumers are willing to pay for a unit of a given good or service. This is instrumental to estimate the direct benefits associated to the use of goods or services rendered by the project. *Net Operating Income* of Renaissance I project mainly refers to rents from tenants referring to hotels, offices and retail activities. Typically, techniques such as revealed preference, stated preferences and benefit transfer methods are employed to estimate the WTP. A commonly accepted practice also refers to the estimation of avoided cost for users to consume the same good from an alternative source of production. The SGR informed us that the associated pricing reflects competitive and efficient market conditions which also benchmarks similar uses in comparable activities. In particular, the SGR performed a careful market analysis to estimate the future demand, considering reasonable values for rent requests from tenants in terms of volumes and competitive contracts at market prices. We thus opt not to correct the financial values associated to the project revenues.

We apply the same rationale about conversion factors and WTP also for the economic benefits, net of economic costs, for item *Notional Sale*.

As for the financial analysis, all types of contingencies and allowances are excluded from the main economic appraisal. The item *Rent Free* reflects lack of demand, and it is maintained in the economic analysis as it represents vacancy in the first stage of the project.

Table 10 shows whether (Yes/No) and how (+/-) each item impacts on the computation of cash-flows in the economic appraisal. The input data of the analysis are collected from the financial-economic plan “Project Renaissance Business Plan” release 2021/06/24 developed by the SGR.

#### 4.2.2 Economic Appraisal Application

In this section, we perform the economic appraisal of the Renaissance I project. According to assumptions provided in Table 10, the annual economic cash-flows are computed as:

$$\begin{aligned}
 \text{Economic } CF_t = & (A)_t + (B)_t + (E)_t - \text{Design Contingency}_t \\
 & - \text{Development Contingency}_t - \text{Lost Rent}_t \\
 & - \text{Lost Service Charge}_t \\
 & - \text{IMU (Pre - Construction)}_t \\
 & - \text{CCC Taxes}_t \quad (5)
 \end{aligned}$$

Table 11 shows the estimated values of annual economic cash-flows.

Table 11: Annual economic cash-flows. Values in table are reported in million euros. The ERR is reported in percentage (%).

Based on Equation and assumptions of Table 27,

$$\sum_t \frac{ECF_t}{(1+ERR)^t} = 0 \quad (4)$$

the ERR of Renaissance I project is **10.50%**. The ERR becomes 10.63% when the counterfactual scenario costs (€620,000 per year), for which we consider the same assumption of conversion factor equal to 1 as for the other costs, are included in the appraisal.

#### 4.3 Economic Appraisal: Sensitivity Analysis

We verify the robustness of the economic appraisal through a sensitivity analysis. In particular, we estimate the economic profitability of the project in the scenario that all provisions and contingencies are assumed as real cash-outflows. We now add as cash-outflows the following contingency and allowances items: *Design Contingency, Development Contingency, Lost Rent, Lost Service Charge, Operating Allowances* and *Other Operating Allowances*. For these items, given the nature of the related costs, we assume conversion factors equal to 1 as for the other costs.

Consequently, the annual economic cash-flows are computed according to the following formula:

$$\begin{aligned}
 \text{Economic } CF_t = & (A)_t + (B)_t + (C)_t + (D)_t + (E)_t \\
 & - \text{IMU (Pre - Construction)}_t \\
 & - \text{CCC Taxes}_t \quad (6)
 \end{aligned}$$

Table 29 shows the estimated values of the yearly economic cash-flows.

Based on Equation

$$\sum_t \frac{ECF_t}{(1+ERR)^t} = 0 \quad (4)$$

the ERR under this specification of Renaissance I project is equal to **9.30%**. The ERR rises to 9.44% when the counterfactual scenario costs (€620,000 per year) are included in the appraisal.

Table 10 - Description of individual items considered in the economic appraisal

Item	Economic Appraisal
(A) Total Development Cost Excl. VAT	
Land & Infrastructure Cost	
Land Purchase	Yes (-)
IMU (Pre-construction)	No, it is a transfer from one group in society to another.
Existing Infrastructure Assets Reimbursement Contribution	Yes (-)
Master Site Minimum Infrastructure Works	Yes (-)
Plot Minimum Infrastructure Works	Yes (-)
Site Preparation Contribution	Yes (-)
Development & Construction Cost	
Private Construction	Yes (-)
Design Contingency	No
Professional Fees (Pre Start on Site)	Yes (-)
Professional Fees (Start on Site to PC)	Yes (-)
CCC Taxes	No, it is a transfer from one group in society to another.
Development Contingency	No
Development Management Fee	Yes (-)
Project Management Fee	Yes (-)
Leasing Cost	
Rent Free	Si (-). È un costo per la società sostenere le prime fasi di nuove attività imprenditoriali.
	Yes (-). It is a cost for society for supporting the early phases of new business activities.
Lost Rent	No
<b>Lost Service Charge</b>	<b>No</b>
<b>Capital Contributions</b>	Yes (-). It is a cost for society for supporting the early phases of new business activities.
<b>Marketing &amp; Mobilization Costs (BtR)</b>	<b>Yes (-)</b>
<b>Other Letting Costs</b>	Yes (-)
(B) Net Operating Income	Yes (+). It is the operating revenue of the project.
(C) Operating Allowances (Vacancy/Capex/Leasing)	No
(D) Other Operating Allowances	No
(E) Notional Sale: Asset Value (Post Disposal Costs) at Plot Completion	Yes (+). It is the residual value of the project

Table 11 - Annual economic cash-flows. Values in table are reported in million euros.  
The ERR is reported in percentage (%)

Year	Cash-flow
2020	0.00
2021	-94.91
2022	-196.90
2023	-164.87
2024	-65.07
2025	24.21
2026	38.51
2027	39.92
2028	40.92
2029	41.53
2030	42.17
2031	919.35
<b>Total</b>	<b>624.86</b>
<b>ERR</b>	<b>10.50%</b>

Table 12 - Sensitivity analysis of annual economic cash-flows. Values in table are reported in M(€).  
The ERR is reported in percentage (%)

Year	Cash-flow
2020	0.00
2021	-94.91
2022	-196.90
2023	-164.87
2024	-65.07
2025	24.21
2026	38.51
2027	39.92
2028	40.92
2029	41.53
2030	42.17
2031	919.35
<b>Total</b>	<b>624.86</b>
<b>ERR</b>	<b>10.50%</b>

### 4.4 Wider Economic Effects

Wider economic effects consist of the broader effects that a project can generate on the national and local economy, by stimulating new economic activities in addition to increasing the competitiveness of the existing ones. Consequently, this section considers the wider economic impact of the economic activities that will be set up in the Renaissance I project area beyond the work of the SGR, thus involving third-party business entities. In particular, to quantify the wider economic effects we distinguish between the construction (CAPEX) and management (OPEX) phases, because they bring different types of effects and call for the definition of different quantification approaches (see Figure 18).

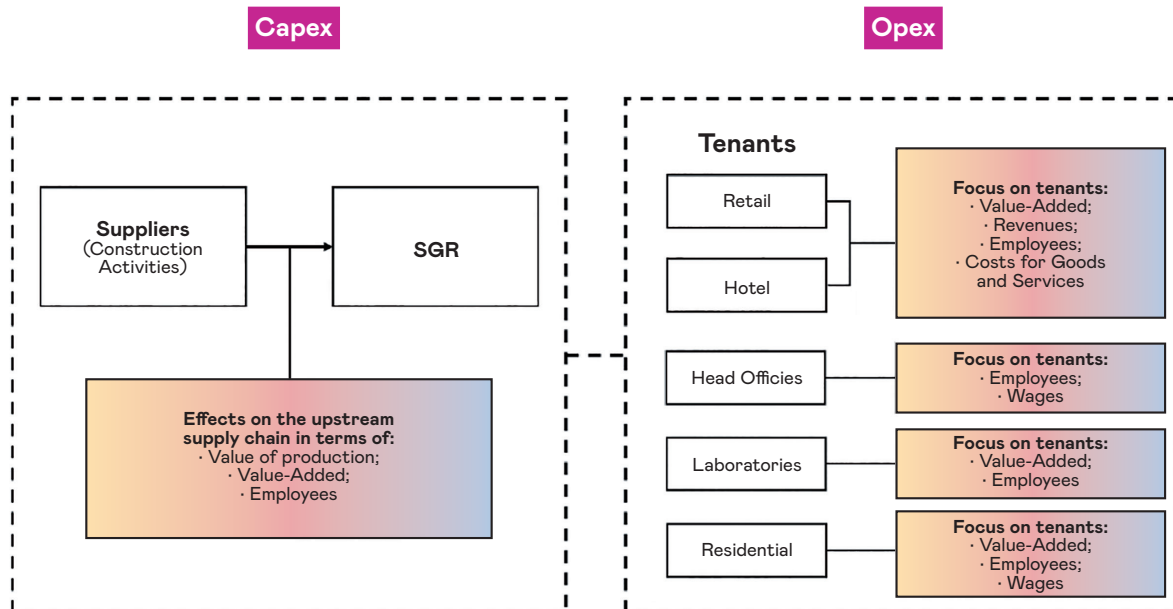
During the construction phase, the wider economic effects consist mainly of the economic activities stimulated along the upstream supply chain due to the construction of the facilities in the Renaissance I area. We quantify these wider economic effects in terms of Value of Production, Value-Added and Employees associated with the suppliers of construction activities.

During the management phase, the wider economic effects are related to the economic activities performed by tenants that are expected to

establish themselves in the Renaissance I area. To quantify these effects, we specifically focus on the Retail, Hotel, Head offices, Laboratories for R&D activities and Residential sectors. The broader economic effects need to be assessed over the life cycle of the project. We distinguish the economic effects during the construction phase (CAPEX) from those of the management phase (OPEX). The former are measured in terms of production value, employment (FTE) and value added generated by the project through construction activities in the investment period 2021-2024. These effects are estimated on the basis of input-output analysis, which is an established and widely used tool for ex ante assessment, both in sectoral and geographical terms, when it is not possible to study the effects of a project through an in-depth analysis of the companies involved in the project and their suppliers.

The economic effects of the OPEX phase, measured in terms of Revenues, Employees, Added Value and Costs for goods and services of existing tenants, are used as a proxy for the contribution that the activities that will be carried out by economic actors other than Lendlease within the perimeter Renaissance I will bring about the local economy.

Figure 18 - Wider economic effects framework



## 4.5 Wider economic effects during the construction phase

This section presents the estimation of the wider economic effects generated by the construction activities of the Renaissance I project. It is based on the input-output analysis and performed both at national and regional level. Section 4.5.1 illustrates the key methodological elements and data, including the main assumptions that shape different scenarios of analysis. Results are presented in section 4.5.2.

### 4.5.1 Methodology and data

We estimate the impact generated by Renaissance I along three dimensions:

- the impact on production, in terms of the total output produced within the national (or regional) economy due to the project;
- the impact on employment, in terms of the number of employees (Full Time Equivalent) mobilized by the project within the national (or regional) economy;
- the impact in terms of value-added, that is the project contribution to national (or regional) GDP. For each dimension, three levels of effects are estimated:
  - the direct effect that is strictly related to the initial investment activity sourced within the national (or regional) economy rather than elsewhere;
  - the indirect effect, which refers to the purchases of goods and services within the national (or regional) economy from the construction works of Renaissance I, including those at each subsequent supply-chain level;
  - the induced effect that is associated to the spending of the wages and salaries generated directly and indirectly by the construction activities.

Specifically, we implement the static input-output model, which is typically used to study the impact of exogenous changes of final demand on the economy, using output, employment and value-added multipliers to estimate direct and indirect effects. In this model, private consumption and consequently private household activities are exogenous. However, we provide an estimation of the induced effects considering the support provided by direct and indirect wages to other businesses in an economy. In this case, we assume that all wages are spent for private consumption on local goods and services according to the sectoral

distribution of the final consumption expenditure by households from the input-output tables and we compute their induced effect on production, employment and value-added<sup>50</sup>. To estimate the impact at national level, the input-output tables published by ISTAT in February 2021 and referring to the year 2017 were used, based on the taxonomy of 63 economic sectors as per NACE classification (Nomenclature statistique des Activités économiques dans la Communauté Européenne). The impact at the regional level is instead estimated using the regional input-output data provided by the Joint Research Center of the European Commission published in 2020 using reclassified 2010 data for 14 sectors. Information from ISTAT sources regarding work units by sector of activity was also used. In particular, results are indicated according to two different measures, the first includes both employees and self-employed workers showing the maximum potential employment effect. The second measure, on the other hand, only considers employees and is therefore more conservative. The main information provided by the SGR concerns the value and type of investments planned during the construction phase. For each investment chapter, the potential impact on the national production system was estimated on the basis of the percentage of purchases from Italian companies out of total investment spending, estimated to be 80% by the SGR itself.

### 4.5.2 Impact at national level

Table 14 details the impact on production, value-added and employment at national level of the main analysis.

The main results show a total direct and indirect effect on national production estimated at around €684 million. Considering the induced effect, the estimated total impact reaches €877 million and a yearly average effect of €219 million. These results are increased by 5% when the technical contingencies are included in the sensitivity analysis.

In terms of Value Added (VA), we observe direct and indirect effects that represent about 38% of the effect on production, while this share increases to about 46% for the induced effect. Therefore, the total impact of the Renaissance I project

<sup>50</sup> It is a strong assumption. Although the income earned by private households is spent to a large extent for private consumption, it should be also considered that part of the income is subject to taxation, some of the money will be saved and not all that is spent will be spent on local goods and services.

Table 14 - Impact at national level – Main analysis

	Impact on production		Impact in terms of VA		Impact on employment			
	Total M (€)	Yearly Avg M (€)	Total M (€)	As share of the Impact on production	FTE Employees		FTE Total (employees + self-employed persons)	
					Total	Yearly Avg	Total	Yearly
Direct effect	316.28	79.07	120.09	38.0%	1,273	318	2,514	628
Indirect effect	367.67	91.92	139.04	37.8%	1,375	344	2,224	556
Induced effect	193.12	48.28	88.30	45.7%	916	229	1,352	338
<b>Total</b>	<b>877.07</b>	<b>219.27</b>	<b>347.44</b>	<b>39.6%</b>	<b>3,564</b>	<b>891</b>	<b>6,090</b>	<b>1,523</b>

Table 15 - Impact at regional level – Main analysis

	Impact on production			Impact in terms		Impatto sull'occupazione					
	Total M (€)	Yearly Avg M (€)	As a share of the Impact at national level I	Total M (€)	As share of the Impact on production	FTE Employees			FTE Total (employees + self-employed persons)		
						Total	Yearly Avg	As a share of the Impact at national level	Total	Yearly Avg	As share of the Impact at national level
Direct effect	242.99	60.75	76.8%	141.73	58.3%	972	243	76.4%	1,945	486	77.4%
Indirect effect	78.18	19.54	21.3%	44.21	56.5%	366	92	26.6%	543	136	24.4%
Induced effect	93.59	31.20	48.5%	52.38	56.0%	564	141	61.6%	786	196	58.1%
<b>Total</b>	<b>414.76</b>	<b>138.25</b>	<b>47.3%</b>	<b>238.31</b>	<b>57.5%</b>	<b>1,903</b>	<b>476</b>	<b>53.4%</b>	<b>3,274</b>	<b>819</b>	<b>53.8%</b>

in terms of value-added is about €347 million for the main analysis and it is the 6% higher when the technical contingencies are considered.

Finally, the main analysis estimates the direct employment effect within the range between 1,273 and 2,514 FTE over the period 2021-2024, considering only employees and/or self-employed persons, respectively. The indirect employment effect varies between 1,375 and 2,224 FTE and the induced effects between 916 and 1,352 FTE. That means a total impact ranging between 3,564 and 6,090 FTE and a yearly average impact between 891 and 1,523 FTE. These results are increased by 5% when the technical contingencies are included in the sensitivity analysis. Table 12 details the impact on production, value-added and employment at regional level with respect to the main analysis.

The main results show a total direct and indirect effect on regional production estimated at around €321 million. Considering the induced effect, the estimated total impact reaches €414 million with a yearly average of €138 million, which is around 47% of the impact at national level. When the technical contingencies are included, the results are 6.5% higher.

In terms of value-added, we observe a direct and indirect effect that is about the 58.3% and 56.5% of the effect on production, respectively. Also, the induced effect in terms of value-added is estimated around the 56% of the effect on production. Therefore, at regional level the total effect of the Renaissance I project in terms of value-added is about €238 million for the main analysis and is 6% higher when the technical contingencies are considered.

Finally, the main analysis estimates the direct employment effect at regional level within the range between 972 and 1,945 FTE over the period 2021-2024, which is 76% of the impact at national level. The indirect employment effect is lower and varies between 366 and 543 FTE, while the induced effects is between 564 and 786 FTE. At regional level, the total employment impact is estimated to be between 1,903 and 3,274 FTE and has a yearly average impact between 476 and 819 FTE, which means about 53% of the national impact. These results are increased by around 6% moving to the sensitivity analysis.

#### 4.5.3 Hotel & Retail

In MIND there will be one big hotel with 290 rooms in the Renaissance I area. We estimate that €10.5 million of revenue, €4.5 million in value added, a cost of €5.7 million for goods and ser-

vices and 88 employees. In addition, there will be a vibrant retail environment with 38 tenants large and small. We observe a larger concentration of small and medium firms (19 firms in the range 0-9 employees and 18 firms in the range 10-49 employees). Note how the SGR expects only one firm with dimension in the range 50-249 employees and no firm with more than 250 employees.

We estimate that tenants may generate aggregated yearly revenues around €68.5 million. About 55% of these revenues are expected to be generated by the sub-sectors 4711 “Retail sale in non-specialised stores with food, beverages or tobacco predominating” (€22.9 million) and 4511 “Sale of cars and light motor vehicles” (€15.0 million) (see Table 38). Additionally, the sub-sector 4711 “Retail sale in non-specialised stores with food, beverages or tobacco predominating” with 92 employees is expected to generate the highest impact in terms of local employment. Moreover, tenants in the sub-sector 5610 “Restaurants and mobile food service activities” are expected to generate 54 employees (see Table 39).

Overall, we estimate a total amount of 354 employees, €13.5 million of value-added and a cost of €56.1 million for goods and services across tenant activities (see Table 40 and Table 41). Moreover, through the robustness check we compute an expected number of employees equal to 450 (see Table 42). This result confirms that Lombardy is a business area with a higher concentration of business firms with respect to the Italian average.

#### 4.5.4 Head offices

Renaissance I will host the Head office of corporate companies in an area of 81,000 sqm, belonging to different business sectors (e.g., life sciences, energy, telecommunications, insurance, commercial, publishing activities and technology and engineering sectors).

Based on the standard floor area (10 sqm per employee), we estimate a total number of 8,100 employees in the head offices. Considering an average wage per capita for middle management/clerical staff in the sub-sector “Activities of head offices” for Italy in 2021 of about €30,900 (Istat data)<sup>51</sup>, we

51 This national average is based on the National Collective Labor Agreements (CCNL), including additional monthly payments. The treatments established by firm or territorial agreements, by individual agreements or by unilateral decision of the employer are excluded; the same holds for wages in kind and wages not of a general and continuous nature (overtime, individual bonuses, etc.).



Figure 19 - Employees and Total wages estimates in the Head offices sector



estimate a total amount of wages of the head office employees of €250.29 million (Figure 21).

#### 4.5.5 Laboratories for R&D activities

An area of 15,000 sqm will be occupied by the laboratories of large, high-tech companies conducting R&D activities in automation engineering and advanced industrial robotics. In addition, medium-sized tenants belonging to the R&D sector will set up in a com-

bined Office and Lab area of 5,000 sqm.

Based on the floor area requirement (35 sqm per employee), the total estimated number of employees in the R&D activities is around 571.

Considering the sectoral value-added per employee of about €0.128 million (source: Istat), we estimate a total value-added of the R&D activities that will be performed in the Renaissance I area of €73.13 million (Figure 20).

Figure 20 - Employees and value-added estimates in the Laboratories sector



#### 4.5.6 Residential

The Property and Facility Management activities of the Renaissance I residential buildings will be carried out by a specialized firm, which will employ 2.5 employees. The SGR estimates that these services will cost circa €340,000 per year.

Based on the €340,000 estimated tenant revenue and considering that, for the Real estate sector, Italian data shows a share of value-added over total output of about 87.4% (Istat data), we estimate a total value-added related to the Property and Facility Management activities of €0.3 million (Figure 21).

Figure 21 - Value-added estimate in the Residential sector



We can also estimate the total wages by multiplying the 2.5 employees by €26,122, the average wage per capita for middle management/clerical staff in the sub-sector “Management of real estate on a fee or

contract basis” for Italy in 2021 (source: Istat)<sup>52</sup>. For the Property and Facility Management activities, we estimate a yearly amount of wages of €65,305, that is the 22% of the total value-added (Figure 22).

<sup>52</sup> See previous footnote

Figura 22 - Total wages estimate in the Residential sector



#### 4.6 Conclusions

The assessment of the financial and economic impacts of the Renaissance I project consists of the appraisal of the financial and economic flows of the project and the quantification of wider economic effects during the construction and management phases.

The appraisal of the financial and economic flows has been performed based on yearly cash-flows collected from the financial-economic plan “Project Renaissance Business Plan” release 2021/06/24 disclosed by the SGR.

The financial appraisal estimates for the Renaissance I project a **FRR equal to 9.93%** in the standard scenario and 10.06% when maintenance costs of the counterfactual scenario are taken into account. A sensitivity analysis, assuming that all the provisions and contingencies are real cash-outflows, leads to a FRR equal to 8.77% and 8.90%, respectively.

The economic appraisal provides evidence that the Renaissance I project has a positive impact on social welfare. The ERR is equal to 10.50% in the standard scenario (10.63% when counterfactual scenario costs are included in the analysis and 10.53% in case we apply a conversion factor equal to 0.99 for the manpower component of direct costs). Finally, the sensitivity analysis taking into account all the provisions and contingencies as real cash-outflows, leads to an **ERR equal to 9.30%** (9.44% in case we consider counterfactual scenario costs).

The wider economic effects generated by the construction activities have been estimated at national and regional level over the period 2021-2024, in terms of value of production, value-added and employment.

At national level, the main results show total impact on production of €877 million (€219 million on a yearly average) and a total impact on VA of €347 million (39.6% of the impact on production). The employment impact varies between 3,564 and 6,090 FTE, considering only employees or employees plus self-employed persons, respectively (between 891 and 1,523 FTE on a yearly average).

At regional level, the main analysis shows a total impact on production of €414 million (€138 million on a yearly average; about 47% of the impact at national level) and a value-added impact of €238 million (57.5% of the impact on production). The total employment impact is estimated between 1,903 and 3,274 FTE (between 476 and 819 FTE on a yearly average).

Finally, the wider economic effects generated during the management phase are mainly related to activities of the tenants in the Retail, Head office & Laboratories and Hotel sectors.

For the Retail sector, value-added generated by tenants’ activities is estimated around €13.5 million, with the involvement of 354 employees per year;

For the Hotel sector, value-added is estimated around €4.6 million, with the involvement of 88 employees per year;

For the Head offices, the component of the value-added related to the compensation of employees is about €250.3 million, with a total number of around 8,100 employees per year.

For the Laboratories value-added is estimated around €73.1 million, with the involvement of 571 employees per year.

Table 16 - Wider economic effects in the management phase by type of industry

	Value-added M (€)	Employees n.	Revenues M (€)	Cost for goods and services M (€)
Retail	13.5	354	68.5	56.1
Hotel	4.6	88	10.5	5.7
Head offices	250.3	8,100		
Laboratories	73.1	571		
Residential (Property/ Facility/management activities)	0.3	2.5		

# FINAL CONCLUSIONS AND AN INVITATION

MIND is an ecosystem created to support and accelerate collaboration between research and business and public and private actors, with the aim of improving the well-being and health of people and the planet, building a resilient and inclusive model city neighborhood. The district's ambition is to become a global innovation hub in biotechnological and health research, **by combining life sciences and deep tech**, and leveraging the high quality of biological, pharmacological, medical and clinical research in Milan and Lombardy. MIND means a major investment in research, medical, academic, residential infrastructure to **attract, create and nurture human talent and attract the companies that revolutionize the world of health thanks to the use of technology**, from robotics to nanotechnologies to biomaterials, in order to become leaders in emerging sectors with high development potential such as digital medicine, nanomedicine, cellular and genetic therapies. At the same time, the district proposes itself as a living lab where new technologies, services, products and processes can be experimented that improve the quality of urban life.

Despite the pandemic crisis, to date the district has shown great resilience and cohesion: thanks to the effective collaboration between public and private actors, MIND has obtained full approval of the integrated intervention plan in a record time of 18 months, starting immediately the construction works and inserting a temporary district, the Village, in the masterplan, to respond to the request for immediately available spaces where companies and research institutions could immediately interact, and where to experiment with spaces and services that can be scaled up in the rest of the district. The market has given a strong

signal, with 38 companies already consortium members of Federated Innovation @MIND, the spaces of the Village immediately sold out and were activated by companies strongly engaged in research and co-operative innovation: from the Illumina Solution Center - the first in Southern Europe, to the health projects developed by Rold and Bio4Dreams, up to the ambitious program of strengthening and expanding the research activities of Astrazeneca. If we look only at the PNRR, grants have been raised for over €200 million for projects that could really **change the quality - and duration - of life of the next generation**. The projects that are being born within Federated Innovation that brings together leading companies and the anchors of MIND are another example. All together, MIND players will make available more than half a million square meters dedicated to R&D infrastructure and services. If we look at the attraction of investments, the CPPI fund entered the Italian market for the first time with an investment of €100 million in equity, and if we look at the early stage funds, the **TT biotech fund of Cassa Depositi e Prestiti** is already at MIND, as well as the complementary **Indaco fund**, and of course **SkyDeck** which opened the first office outside California with a European mandate.

We are pioneers in **proposing new city models**, spaces in which life and work can be reconciled, in which there is complete permeability between public and private agents, between built and green areas, where the research that is produced also aims to have a direct impact on the well-being and health of those who live and visit this new part of polycentric and hyper-connected Milan, where we want to achieve all together the increasingly challenging goal of reaching zero carbon well before what is required by the European institutions.

In a time of global crisis and instability, MIND actors believe it is more important than ever to strengthen investments in research, innovation and sustainability, by building a place and a community where people can always feel at the center and always supported and valued in the common mission of building a greener and more inclusive world. Hence the importance of monitoring the economic, social and environmental impact of the project over time, sharing and renewing the objectives and the path towards their attainment.

Faced with rising prices of raw materials and energy, increasing inflation and a situation of strong political instability, the goal of the district's actors is to further increase investment and shorten the completion time of the district, without derogating from the environmental and social objectives that we have set for ourselves, nor from the attention to quality of the public and private spaces we are building. Above all, we want to invest even

more and in a more focused way research, innovation and talent, making MIND the first European district specialized in convergence processes between life sciences and deep tech, from new materials to nanotechnologies, from VR/AR to robotics, from AI to microelectronics, making research labs and business corporations work together by breaking disciplinary and sectoral silos.

We realize that to achieve these goals, the community of MIND must grow: we need more companies and research institutions that share our mission and our ambition, and it is in this sense we invite all our readers to talk to us about all the the topics covered by this report on the xxxx website. Most of all, we invite you to **come visit us at MIND**, to build a kind of city and a society that can be left to future generations, by developing **an authentically European model of innovation** which can be really globally competitive.

Contacts:

**Lendlease**

ItalyCommunications@lendlease.com

---

At a time of global crisis and instability, it is more important than ever to monitor MIND's economic, social and environmental impact over time, strengthening investments in research, innovation and sustainability and building a place and community where people can feel supported and valued.