GreenFORCE

Torino Summer School

Final report of team 1

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Torino Digital Renaissance Initiative

Fostering Digital Progress and Sustainable Urban Evolution in Torino

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1 ABSTRACT

The project's focal point is the rejuvenation of Torino's post-industrial sites, strategically located in the heart of the city and of considerable size, drawing significant attention from the municipal authorities. With an eye toward the digital future, this initiative unfolds across three pivotal dimensions:

- **Museum of the Future**: This facet functions as a vibrant showcase space, bringing together companies in the digital urban solutions sector. Here, they can exhibit prototype products, engaging the general public to gather real-time feedback for product refinement. Furthermore, this space generates revenue through registration fees and data access, fueling innovation in urban technology.
- **Digital Low-Skill Worker Hub**: Recognizing the evolving employment landscape, the project identifies the demand for low-skill digital workers. The hub offers training in tasks like data entry, document formatting, and social media management, catering to that group of people that is often marginalized or cannot integrate into the workforce.
- **Monitoring Office for Autonomous Cities**: In response to the ongoing global shift toward autonomous cities, this component addresses the absence of comprehensive monitoring. It develops essential indicators to assess the integration, effectiveness, durability, functionality, and societal implications of digital technologies in urban settings. This data-driven approach empowers informed decision-making, fosters sustainability, and advances urban research.

By repurposing these post-industrial sites, the project not only catalyzes digital transformation but also stimulates economic growth, education, and research, making Torino take the first steps toward a pioneering city in the digital age.

2 THEORETICAL AND METHODOLOGICAL FRAMEWORK

2.1 Aim of the project

The project's objective is **to spark Torino's digital transition** in line with the EU's just green transition policy. This will be achieved by repurposing the city's post-industrial sites and establishing the necessary physical infrastructure to initiate this transformation. The division of the space into three primary components is designed to address this transition from three distinct angles.

The Museum of the Future seeks **to establish a closer connection between businesses, the general public, and the city by facilitating interactive and creative data exchange**. The Digital Low-Skill Worker Hub aims **to facilitate the shift from low-skill industrial workers to low-skill digital workers,** with a particular focus on marginalized groups, the unemployed and other similar groups. The Monitoring Office for Autonomous Cities aims **to confront the challenge of the absence of data and unreliable data in the context of a city-wide digital transition**.

In summary, the project aims to foster Torino's digital transformation in alignment with the EU's sustainability goals, leveraging post-industrial sites to create the physical infrastructure necessary for this shift. The three components aim **to foster innovation, empower marginalized populations, and ensure data reliability, positioning Torino as a leader in the digital age.**

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2.2 Literature review on Just Green Transitions

"A Just Green Transition (JGT) is defined as a process of fer-reaching sociotechnical change leading to a sustainable future, implying a more climate-neutral region, while preserving biodiversity and ensuring social justice" (Cedergren, Tapia, Sánchez Gassen, & Lundgren, 2022). The JGT is a concept, but also a notion that has political significance.

The concept

Concept - The JGT is a multidimensional concept which unites three individual concepts: transition, green economy and social justice (Imami & Bejko, 2023). This means that this concept unites ecological, social, economic, technical, institutional and law dimensions.

Transition is defined as the dynamic, continuous and conflictual process of change from one state (socio-technical regime) to another. The goal is overall progress. For progress to be possible, the process of change must include everyone and everything (social, technological, economic and institutional elements in the organisation of a system) (Cedergren, Tapia, Sánchez Gassen, & Lundgren, 2022).

A green economy requires low levels of carbon and efficient use of resources. A green economy aims to achieve economic growth. This growth simultaneously contributes to reducing spatial inequalities and increasing the standard of living, health of people and the environment. The essence of the concept is growth and development following the planetary boundaries of sustainability. A green economy relies on the use of renewable energy sources, promoting energy efficiency, implementing sustainable transport systems, and embracing circular economy principles. The transition to a green economy involves changes to all sectors, production and consumption patterns (Cedergren, Tapia, Sánchez Gassen, & Lundgren, 2022).

Social justice was reflected in the development of a justice-based political discourse. In the context of transition, forms of justice are present: distributional, recognitional, procedural, cosmopolitan and spatial. Distributional justice describes where the key impacts are located, taking into account temporal variations of impacts. Recognitional justice describes which groups or sections of society are recognised or neglected in transition processes. Procedural justice entails formal and informal forms of involvement in decision-making processes. Cosmopolitan justice - principles of justice should apply universally to all human beings. Spatial justice includes two aspects: the locational aspect of physical infrastructure and the definition of policies in accordance with space. These types of social justice are interconnected and as such should be analysed in relation to one another (Cedergren, Tapia, Sánchez Gassen, & Lundgren, 2022).

The notion of the JGT can be viewed from both a narrower and a wider perspective. In the narrower sense, the focus is on the needs and concerns of marginalized communities and workers in transition-affected industries. The second approach addresses transition processes that build on social justice to advance the climate agenda (Cedergren, Tapia, Sánchez Gassen, & Lundgren, 2022).

Policy background

The notion of JGT gained political momentum after the approval of the Paris Agreement (Imami & Bejko, 2023). The one of the most comprehensive efforts to incorporate the just transition into policy-making and public funding in a European context is the Just Transition Mechanism, which forms one

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of the pillars of the European Green Deal. The JTM addresses the social and economic effects of the transition, through three pillars:A new Just Transition Fund, Invest EU "Just Transition" scheme and A new Public Sector Loan Facilit. There are also other examples of formulationsat the global level that have a less territorial focus, such as the "Leave No-one Behind Principle" of Agenda 2030 (Cedergren, Tapia, Sánchez Gassen, & Lundgren, 2022).

The goals of these policies should be translated into clear actions. Which means that it is necessary to establish coordination at different levels of government. Vertical coordination, between different levels of government - supranational, national and subnational authorities. And horizontal coordination, between different across policy areas - energy, transport, agriculture, etc. Each country also has its own national goals for achieving sustainability, preserving the environment and tackling climate change (Cedergren, Tapia, Sánchez Gassen, & Lundgren, 2022).

2.3 Mapping Turin's Strategic Development Priorities

According to Paolo G., in Turin, the pursuit of titles like "the city of patents," "of artificial intelligence," and "of the Olympics" has been marked by a lack of common vision and shared reasoning among its actors. Amid the pandemic, the urgency to address issues such as poverty, employment, health, education, and gender equality has become paramount, necessitating active citizen involvement. However, the efficacy of initiatives is hampered by the absence of clear priorities, planning, and competence in resource management, emphasizing the need for objective analyses to contribute meaningfully to public discourse (Giovine, 2019).

Turin's diverse geographical features, including plains, hills, and mountains, are the foundation for its immense potential, meticulously outlined in the Metropolitan Strategic Plan 2021-2023. This plan addresses the city's social, economic, and territorial disparities by supporting digitalization, fostering innovation and competitiveness among businesses, promoting green initiatives, enhancing sustainable mobility, improving education and research, preserving cultural heritage, and strengthening the health system across the metropolitan area. Central to the plan is the objective of overcoming marginalities and driving a comprehensive ecological and economic transformation. The Metropolitan Strategic Plan (PSM) 2021-20234 envisions Turin as an "augmented metropolis" with a focus on ensuring equal rights and opportunities for all residents. Aligned with the Next Generation EU and National Recovery Plan, the PSM concentrates on six key objectives (Cotella, Brovarone, Staricco, & Casavola, 2021):

- Productivity and Innovation
- Green and Ecological Initiatives
- Enhanced Mobility and Connectivity
- Education and Learning
- Fairness and Attractiveness
- Health and Well-being

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2.4 Methods

To successfully achieve the project's ambitious goal of igniting the digital transition in Torino while adhering to the EU's Just Green Transition policy, a well-thought-out approach involving several key methods is essential.

Site Selection stands as a critical first step. This process involves an extensive evaluation of post-industrial sites throughout Torino, utilizing diverse indicators such as spatial, social, infrastructure, and accessibility criteria. These evaluations are pivotal in determining which sites hold the greatest potential for the project's objectives. These selected sites will serve as the physical infrastructure for the digital transition to take place. Simultaneously, the project engages in urban planning and redevelopment for the chosen sites. Architectural and design considerations play a pivotal role in transforming these spaces into functional areas conducive to achieving the project's digital transition objectives. Community outreach and engagement run parallel to this, emphasizing the importance of educating local communities about the project's purpose, advantages, and opportunities for involvement.

While these initial phases are underway, stakeholder mapping becomes a crucial method to understand the variety of those involved. From academia to civil society, government entities, industry representatives, and local community groups mapping these actors is essential for effective project management. Collaboration is facilitated through the method of building collaborative networks among stakeholders. By highlighting the specific advantages and benefits the project offers to each party, whether it's research opportunities for academia, market expansion for industry, or policy objectives for the government, these collaborative networks promote cooperation and mutual understanding among the stakeholders.

Specifically for the main three components of the project, the most effective methods are:

1. Museum of the Future component - Engagement with digital solution companies. These companies are engaged in partnerships and negotiations concerning the establishment of the interactive showcase space and how it aligns with their business objectives.
2. Digital Low-Skill Worker Hub - the development of curriculum and training programs. This includes selecting trainers and creating training facilities to ensure that low-skill workers receive the essential digital skills and knowledge they require for the evolving job market. A pivotal method for reaching marginalized populations, particularly the unemployed, who are the primary focus of the Digital Low-Skill Worker Hub, involves targeted outreach programs. Tailored outreach strategies, community partnerships, and marketing initiatives should be implemented to reach these individuals.

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3. The Monitoring Office for Autonomous Cities - a comprehensive framework for data collection and analysis. This involves identifying data sources, developing data collection methodologies, and seeking expert consultations to guarantee the reliability of data for monitoring the digital transition.

Furthermore, ongoing financial planning is a critical method to ensure the project's sustainability. Budgeting, fundraising, and revenue generation models should be continuously reviewed and adjusted as required to meet the project's financial demands. Also, throughout the project's implementation, a robust system for monitoring and evaluation should be continually maintained. By doing this, it is possible to assess the project's impact, guarantee that its goals are reached, and make any necessary revisions right away.

The success of the project is largely dependent on these key methods, which range from site selection to community engagement, stakeholder participation, and data analysis. They collectively pave the way for Torino to become a pioneering city in the digital age, emphasizing sustainability, inclusivity, and data reliability while adhering to the EU's just green transition policy. The project fosters a more integrated, innovative, and cooperative relationship among the city's stakeholders, redirecting Torino toward a digital future.

3 CASE STUDY ANALYSIS

3.1 Thematic Study Selection *(max 500 words)*

In the endeavour to ignite Torino's digital transition while adhering to the EU's Just Green Transition policy, the project places Thematic Issue 1 - Urban Regeneration (Spatial/Social Justice) at the forefront of its priorities. This thematic issue holds greater significance within the project due to its foundational role in reshaping the urban landscape and fostering spatial and social justice.

Urban Regeneration (Spatial/Social Justice): The project's central mission revolves around urban regeneration. The repurposing of Torino's post-industrial sites represents a substantial commitment to breathe new life into these spaces and promote spatial and social justice. The emphasis on addressing issues such as accessibility to the workforce and new employment markets underlines the project's dedication to ensuring that the benefits of the digital transition reach all segments of the population. These actions are not only vital for the project's success but also resonate with the broader European objective of delivering 100 climate-neutral and smart cities by 2030. These cities are envisioned as innovation hubs, and the project ensures that no one is left behind in the transition, aligning with the EU's Just Green Transition policy.

While Thematic Issue 1 stands as the top priority, the project does not exist in isolation; it addresses and aligns with other thematic issues as well:

Thematic Issue 2 - Energy and Digital Transition (Multiple and Simultaneous Transitions): The project is deeply engaged in the digital transition by creating the "Museum of the Future," reducing

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the digital divide, and enhancing digital accessibility. This ensures that the city evolves as a more sustainable and technologically advanced entity.

Thematic Issue 3 - Climate Change, Resilience, Green Infrastructures (Green Transition): The project underscores the "green" dimension of the Just Green Transition policy. It evaluates how climate change may affect the city's future growth and emphasizes strengthening the city's resilience. A key principle of the project's transformation of Torino's post-industrial sites is the integration of green infrastructures. By addressing these green transition elements, the project strengthens the city's ability to adapt to environmental changes while promoting sustainable development.

Thematic Issue 4 - Indicators and Their Spatialization: The project aligns with this horizontal thematic issue by focusing on identifying representative indicators. These indicators are instrumental for monitoring and assessing the project's progress and outcomes. The use of Geographic Information System (GIS) tools and instruments for spatialization ensures that data-driven insights are employed for comprehensive evaluation.

In conclusion, the project's overarching priority is Thematic Issue 1 - Urban Regeneration (Spatial/Social Justice) due to its foundational role in reshaping the urban landscape and ensuring that the benefits of the digital transition are inclusive and equitable. While this thematic issue takes precedence, the project is a comprehensive initiative that actively addresses other thematic issues, such as digital transition (the main selling point), climate change and resilience, and the use of indicators for spatialization. By encompassing these diverse thematic issues, the project advances the goals of the Just Green Transition policy, driving Torino toward a sustainable and digitally advanced future.

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3.2 Spatialisation of Just Green Transition Impacts

Title: Spatio-temporal variability of Just Green Transitions indicators

Subtitle: Estimating the percentage of the Torino population having physical access to green areas

Exercise's Objective and Methodology: Indicators represent an effective solution to monitor the status of the environment and to measure progress i,n respect to specific targets. Geomatics' techniques, mainly remote sensing and GIS, play a consolidated and scientifically recognised role in urban and regional planning and in implementing just and green transitions (JGT) policies and interventions. The objective of this module is to get a first overview of indicators representative of JGT and learn how to analyse and spatially them using:

- exploitation of geospatial data catalogues for retrieving relevant data to feed the indicators;
- organisation and pre-processing of the relevant input data data, with hints on possible methods for filling data gaps;
- Use of GIS methods and tools to generate value-added information by combining spatial and non-spatial datasets;
- data representation and communication techniques.

Operative steps

The exercise is structured along the main steps below described:

- access to relevant high-resolution land/landcover dataset (i.e. Urban Atlas) and generation of visualisations (maps) and statistics about the presence of green areas;
- exploitation of road network datasets to perform physical accessibility analysis to green areas;
- combination of the physical accessibility with socio-demographic (census) datasets to estimate social equality/inclusion.

Students will have access to step-by-step instructions to complete the task and guidance to further elaborate on the spatialisation of just and green transition indicators.

Links/References

https://geografiemetropolitane.it/

https://www.torinovivibile.it/

https://land.copernicus.eu/local/urban-atlas

https://opentransportmap.info/

https://ghsl.jrc.ec.europa.eu/index.php

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Title: Transforming Torino's Post-Industrial Sites: Fostering Digital Transition

According to the concept devised for transforming Torino's post-industrial sites into hubs of digital innovation, a comprehensive set of indicators has been meticulously crafted. These indicators are paramount, serving as the guiding principles and metrics to gauge the success and impact of this transformative initiative. They not only reflect the ambitious vision of Torino as a hub for digital transition but also ensure that this vision aligns with the practicalities of urban planning, social integration, stakeholder participation, and ongoing monitoring.

Spatial Indicators:

By the concept, spatial indicators play a pivotal role in selecting suitable sites for transformation. The emphasis on areas exceeding 1000 square meters ensures the availability of substantial space to accommodate the envisioned activities. According to researchers, a 15-minute walk typically covers about 3/4 of a mile (Duany & Steuteville, 2021), highlighting the significance of proximity to public transportation and green infrastructure within this radius for enhanced accessibility, thereby promoting a sustainable approach to urban development. By situating these hubs in areas with high population density, especially among young residents and foreigners, the initiative becomes inclusive, catering to diverse demographics. These spatial indicators serve as the foundational criteria, ensuring that the selected sites are not only spacious but also strategically located for maximum impact and accessibility.

Social Indicators:

The social indicators outlined in the concept encapsulate the human-centric approach of the initiative. By tracking the number of training programs conducted, the initiative ensures that digital skills are disseminated widely, empowering individuals from various backgrounds. The count of registered digital low-skill workers and subsequently employed low-skill workers acts as a testament to the program's efficacy, highlighting its ability to bridge the gap between demand and employment opportunities in the digital landscape. These indicators underscore the initiative's commitment to social empowerment, transforming not just spaces but also lives by equipping individuals with the skills needed for the digital age.

Stakeholder Inclusion Indicators:

Stakeholder involvement is pivotal for the success of any community-oriented initiative. The number of interested enterprises investing in smart urban technologies demonstrates the initiative's appeal to tech-driven businesses. The count of tech products displayed within the transformed spaces signifies active industry participation, fostering an environment of innovation and product showcase. Moreover, the number of visitors provides tangible evidence of public engagement, indicating the initiative's resonance with the city's residents. These inclusion indicators not only promote collaboration between public and private sectors but also ensure that the initiative remains dynamic and responsive to the evolving needs of both industries and citizens.

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Monitoring Activity Indicators:

The concept recognizes the importance of continuous monitoring to ensure the seamless integration of digital technologies into urban spaces. The creation of a comprehensive database for monitoring the transition into the digital city serves as the backbone of this initiative. By systematically collecting data on the effectiveness, durability, and social implications of implemented technologies, Torino can make informed decisions for future developments. These indicators not only facilitate the real-time assessment of the project's progress but also lay the foundation for evidence-based urban planning and policy formulation. In addition to the mentioned indicators, the concept also underscores the need for assessing the social impact of digital transition, ensuring that spatial justice is maintained, and addressing any social inequalities that may arise due to technological advancements.

These indicators, as per the conceptual framework, should be considered indispensable in shaping Torino's transformation into a digital hub. They not only provide a strategic roadmap for selecting appropriate sites and fostering social inclusion but also ensure active industry participation and continuous monitoring, thereby guaranteeing the initiative's sustainability and long-term impact. Through the meticulous consideration of these indicators, Torino can emerge as a model for other cities, showcasing the successful integration of digital innovation into the urban fabric. This holistic approach, encompassing spatial, social, and stakeholder inclusion, and monitoring activity indicators, ensures that Torino's digital transition is not just a technological evolution but a societal transformation that benefits all its residents, fostering a truly inclusive and sustainable urban future. Figure 1 illustrates a snapshot of the current situation in Torino city, offering a visual representation of its existing urban landscape and demographics.

The map showcases certain buildings strategically positioned within a mere 15-minute walking reach from tram stations. It presents them as ideal candidates to serve as pivotal hubs, potentially evolving into tech centres or innovation hotspots. While the city's population sprawls across various areas, industrial zones are notably concentrated in specific pockets, primarily situated in the northern and southern regions. The proximity of these industrial structures to transportation hubs offers a promising opportunity for their transformation into vibrant centres for technological advancement and innovation, catering to the needs of their surrounding communities. Despite some buildings lying outside this optimal 15-minute walking distance, their adjacency to the neighbourhoods still benefits residents. Furthermore, leveraging other public transportation systems can bridge these sites to main transit lines, augmenting their connectivity and opening doors to broader community engagement and development opportunities.

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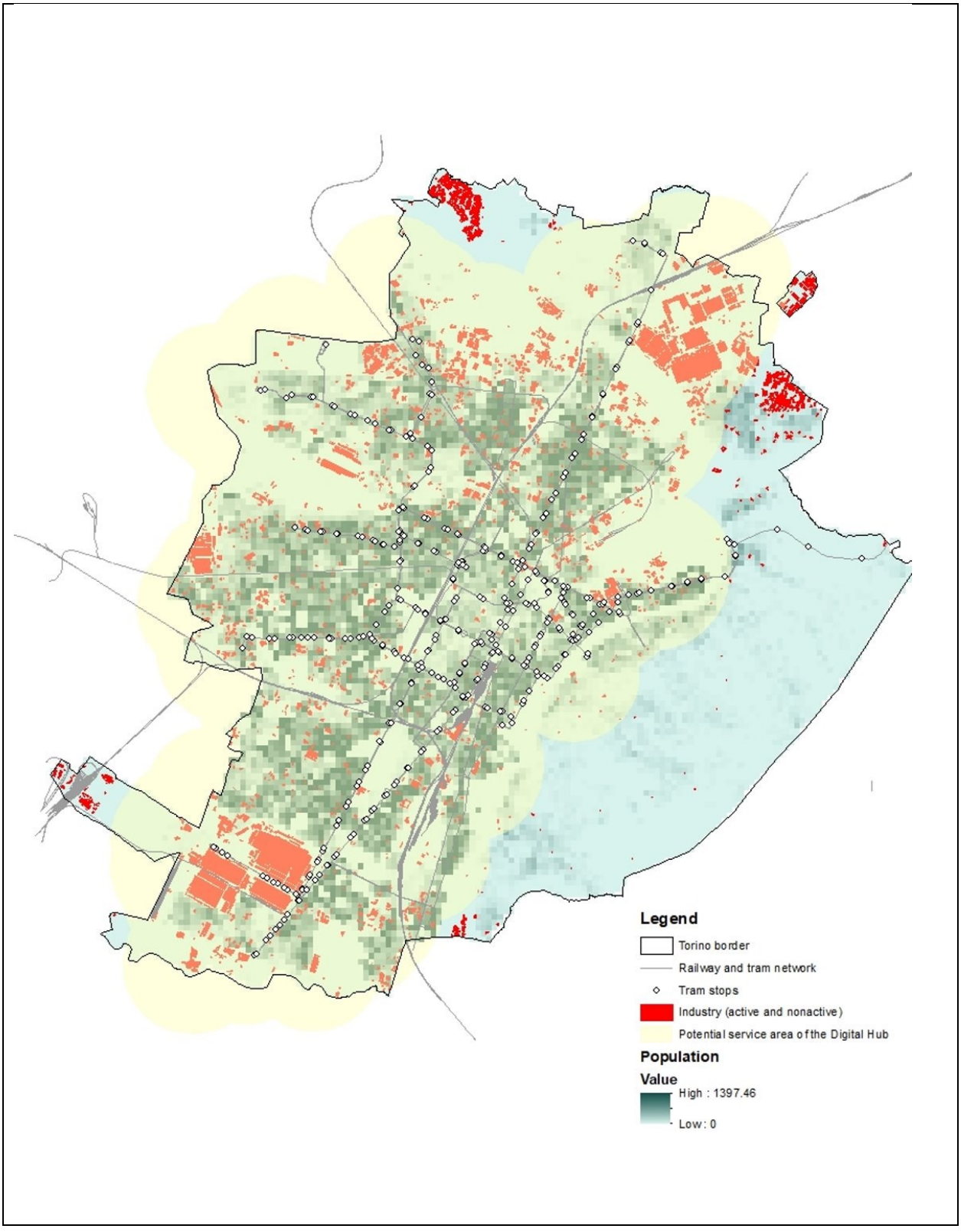

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3.3 Cost-Benefit Analyses to measure Just Green Transitions

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Title: Environmental and Social Cost Benefit Analysis (SE-CBA) – Case Study

Subtitle: SE-CBA of Urban Regeneration Program in Prishtina, Kosovo

- **Exercise's Objective and Methodology:** The objective of the exercise is to enable participants to set up a SE-CBA for any investment project, building on the flexibility and logic of the instrument. Using the Prishtina Urban Regeneration Project as a case study, the participants will assess the program's economic, environmental, and social impacts, providing valuable insights for policymakers, urban planners, and other stakeholders. Through the case study, students will be able to:
- Design a SE-CBA (a simplified version) for any investment project;
- Identify the economic, social and environmental benefits and losses (costs) deriving from the project implementation;
- Quantify and/or provide a qualitative description of the identified economic, social and environmental benefits and losses (costs);
- Compute economic indicators (NPV, IRR, BCR c ratio);
- Recommend optimising benefits, mitigating negative impacts, and promoting sustainable urban development practices.

Operative steps to set up the SE-CBA:

- Step 1. Read carefully the Case Study provided (a document will be provided to the students to introduce them to the case study, the intervention logic and additional information);
- Step 2. Open the Excel Template of the SE-CBA (an Excel template will be provided to the students) and familiarise yourself with it (the content of the file will be explained in detail step by step for a better understanding);
- Step 3. Data collection process. Based on what you learned from the case study, conduct a quick research related to the information that might be needed to set-up the SE-CBA;
- Step 4. Stakeholder identification and engagement. It is necessary and facilitates the activity in Step 5 and Step 6 to preliminarily identify stakeholders who might have a say in the program implementation. In addition, based on legal provisions, consultation processes might take place to present and discuss the study's outcomes and solicit feedback.
- Step 5. Identification of economic, social and environmental benefits associated with program implementation;
- Step 6. Identification of economic, social and environmental losses (costs) associated with program implementation;
- Step 7. The monetisation of the benefits and costs. For the identified economic, social and environmental benefits and costs associated with program implementation, try to provide monetary quantification (over a defined period per time), if possible;

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- Step 8. Calculate net present value (NPV), benefit-cost ratio (BCR), and internal rate of return (IRR) to assess the economic feasibility of the intervention (in the Excel Template provided, the formulas are linked so that results show automatically);
- Step 9. Risk and sensitivity analysis. Identify potential risks and uncertainties associated with the program's implementation and impacts. Develop sensitivity analyses and scenarios to account for different risk factors (e.g. what happens if there is a change in social discount rate or any other of the factors considered critical for the project);
- Step 10. Compile the findings and recommendations into a comprehensive report with clear data visualization and supporting evidence (a sample **Report Table of Contents** will be provided preliminarily to the students).

References:

EC (2015). Guide to Cost-Benefit Analysis of Investment Projects – Economic appraisal tool for Cohesion Policy 2014-2020. European Union. doi:10.2776/97516

EC (2015). Economic Appraisal Vademecum 2021-2027. General Principles and Sector Applications.

*The students must have a PC (laptop), installed Word and Excel programs, and an internet connection.

In the context of this project, in general, the most heavy costs related to the transformation of the physical space of the post-industrial sites comply with the objectives of the project. In a lot of cases, post-industrial sites are degraded areas, abandoned and unused and are considered brownfields, implying a certain level of contamination and pollution. Requalifying such areas for other purposes requires capital and experience. Regarding experience, the city of Torino has a lot of case studies to capitalize upon for such endeavours. Even in the case of property disputes in those areas, Torino has adequate experience for collaborating with the private sector. For the capital component, the city can channel financial programs from EU funds or construct financial schemes where they can include the private sector in the initial investment.

Identified costs:

- Costs of construction include those associated with building infrastructure, constructing post-industrial sites into usable spaces, and establishing the Museum of the Future, the Digital Low-Skill Worker Hub, and the Monitoring Office for Autonomous Cities.
- Operational Costs refer to ongoing costs for the upkeep, administration, and staffing of the project's parts, as well as utilities and other operational costs.
- Costs associated with training and skill development, specifically for the hub for low-skilled workers in the digital sector, which involves preparing people for a range of digital tasks.
- Monitoring and data collection costs related to gathering, evaluating, and reporting data on the digital transition for the Monitoring Office for Autonomous Cities.
- Environmental Costs which means making sure the project complies with only green transition policies may necessitate investments in sustainable practices and green infrastructure.

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- Costs associated with obtaining permits, complying with environmental laws, and paying regulatory and compliance fees.

The benefits in the case of this project have a wide range. The initial benefit is about creating a digital /innovation spark in the city of Torino in the same place it once stood, the historical industrial sites. Its three dimensions help the creation of reliable collaboration networks between the main actors that operate in the city and international ones. From a business perspective, through this project, the city offers an interactive space for tech businesses (that operate on a city scale) to showcase and test their products. From the perspective of the general public, the projects offer a place where such technologies are introduced to the people and where the people can give immediate feedback by using the product. This is done through the component of the Museum of the Future. Through the second component of the project, the Digital Low-Skill Worker Hub, the contribution goes directly to the workforce. In this digital era, there are a wide range of tasks or jobs that require low skills to perform (social media; data entry; creating templates; formatting a document etc). However such tasks are not easily accessible to all, as a result of digital disparities which are more evident for marginalized groups, elderly people, and refugees. Through simple training and the provision of used devices (smartphones, laptops, PCs) the hub aims to address those disparities. The last component contributes to research on different aspects of digital transition through the monitoring activities of the so-called autonomous technologies and cities.

Identified benefits:

- Economic benefits could include increased revenue for the Museum of the Future, better employment prospects in the digital industry, and perhaps even a rise in real estate prices.
- Social benefits might be increased digital inclusion and opportunities for underrepresented groups, skill development, and better life quality thanks to digital services.
- Benefits for the environment include decreased carbon emissions, better air quality, and an increase in green space as a result of contributions to the just green transition policy.
- Economic growth, job creation, and innovation are all facilitated by the project, which has the potential to draw digital businesses and startups.
- Through the Museum of the Future, the project can foster cultural exchange and education while offering a distinctive platform for discussing technological advancements.
- Urban planning and development should be based on data-driven decisions, and the Monitoring Office can supply useful information in this regard.

The stakeholder engagement part is the flexible component of the project. Since it targets all the post-industrial sites of Torino, the city can replicate the project in different sites and test different modules of stakeholder engagement. In one scenario the local government can be the lead partner and decide to which tech businesses they can lease the space of the Future Museum component, decide the training curricula with the collaboration of universities and local businesses and set the goals of the monitoring activities. In another scenario, the city can lease the whole space to the private sector for a long period, and in this case is the private sector that manages the space, the curricula and the monitoring activities. In another, the lead partner could be the university or even the local communities themselves. However, to ensure the success of the project, in each scenario, all the main actors have to be present in the space (the government, the private sector, academia, university, civil

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society and local community). Their relevance on the other hand is flexible and can change case by case, making the project resilient and adaptable to the local context.

Stakeholder identification and engagement:

- Municipal Authorities: The city's government and local authorities are essential to the project's approval, adherence to land use laws and general success. Close cooperation with them is essential because they may influence how the project is carried out.
- Local Community: The modifications may have an immediate impact on locals and members of the community who live close to the project sites. To address their issues, get their input, and make sure the project reflects their needs and values, it is important to interact with them.
- Business Community: The project can be advantageous for regional companies, particularly those in the digital industry. Getting involved with companies, big and small, can result in investments, collaboration, and economic growth.
- Universities and other academic institutions: Can offer knowledge, resources for research, and training. The Digital Low-Skill Worker Hub and the Monitoring Office for Autonomous Cities can both benefit from collaboration with them.
- Civic groups and NGOs: Both of these types of organizations frequently promote social and environmental causes. Engaging with these groups can help ensure that the project complies with green transition and social justice policies.
- Industry representatives: Expertise and valuable insights can be offered by representatives of the project's related industries, such as technology and urban planning. They might be involved in decisions regarding the Museum of the Future's design, for example.
- Labour Unions: In the project's employment and training aspects, particularly in the Digital Low-Skill Worker Hub, unions and worker organizations may have a say.
- National Government: Depending on the project's specifications, the national government may have policies, incentives, or rules that have an impact on how it is implemented. Support and cooperation from them are essential.
- Banks, investors, or organizations that offer grants are examples of potential financial backers who may be able to fund the project.
- Local cultural institutions could be potential partners or collaborators, particularly for the Museum of the Future.
- Media and Communications: To ensure effective communication and public awareness of the project, work with regional media outlets and communication specialists.

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3.4 Land-Based financing for Climate Solutions

Title: Calculating Land Value Capture for Green Interventions

Exercise's Objective and Methodology

This exercise is designed to help students grasp the fundamentals of assessing the feasibility of green interventions within urban development areas. The primary goal is to gain insight into how development costs are allocated among developers, landowners, and the local municipality. This ensures that the financial responsibility for green, public investments is shared rather than solely shouldered by local governments. Throughout this exercise, students will:

- Choose a development area from PRG Torino.
- Analyze key land development indicators.
- Select from various land-based instruments discussed in class.
- Propose a nature-based solution to enhance climate resilience in the chosen area, drawing inspiration from examples provided on day 2 of the course.
- Understand the dynamics and interactions among stakeholders in this scenario.

A brief description of the operative steps

Step 1: Students will be divided into groups and each of them will choose an area proposed for development as per the Piano Regolatorio Generale for the city of Turin

Step 2: By analyzing the 'development passport' from the area, the students will analyse the proposed built volume, based on FAR, coverage ratio, setback distance, density, etc.

Step 3: The students will vote on a Nature-Based Solution (in the area or close to the area) that would contribute to general climate resilience for the community

Step 4: Students will do a quick desk-research on the main costs / prices applicable for the case studies and come up

Step 5: Discuss on the feasibility of the intervention based on the resulting findings

Links/References

- UN-Habitat (2016): LEVERAGING LAND: LAND-BASED FINANCE FOR LOCAL GOVERNMENTS-A READER, GLTN

http://geoportale.comune.torino.it/web/governo-del-territorio/piano-regolatore-generale

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Land value depends on different factors like infrastructure, amenities, public services, green areas, accessibility and many others. The proposed project targets those areas of the city that are more peripheral, with a high concentration of young population and foreigners but with high accessibility from a public transportation perspective. Such areas commonly have a relatively low land value compared with other areas of the city. The only component of the project that could potentially impact the land value in the area of implementation is the Museum of the Future. This component could become a landmark in the area and attract the interest of different stakeholders, which would eventually impact the land value of the area. Of course, this argument is mostly hypothetical since there are many factors at play. Those factors vary from the specifics of the project to macro trends of the market that can impact the city of Torino. On the other hand, there are plenty of examples around the world where the construction of a museum or landmark in a given area has drastically increased or impacted the value of land in that area.

Museum/Landmark	Location	Land value		Reference
		Before	After	
Guggenheim Museum	Bilbao, Spain	relatively low (1990)	substantial increase, 300% in some areas (1997)	(Guggenheim BILBAO, 2011)
The High Line	New York City, USA	were steadily rising	103% rise (2003-2011)	(6sqft New York City, 2023)
Louvre Abu Dhabi	Abu Dhabi, United Arab Emirates	relatively low	50% rise (2008-2011, large-scale transformation)	(Meistere, 2017)
Tate Modern	London, UK	low (industrial character)	500% (large-scale transformation, 1990-2010)	(TATE, 2001)
The Getty Center	Los Angeles, USA	low land values (rugged terrain)	increase in land values (attraction of visitors, enhancement of cultural appeal)	(Getty, 2023)
Rijksmuseum	Amsterdam, Netherlands	rising property prices (cultural significance)	Property values continued to rise (renovation process)	(Fallon, 2018)
Acropolis Museum	Athens, Greece	historical significance but in need of modern amenities	enhanced the cultural appeal of the area	(Acropolis Museum, 2023)

The table above shows some examples from the world where landmarks have impacted significantly land prices in their vicinity. Those cases are mostly macro-scale transformations or projects of high importance and cannot be applied directly to the context of Torino and the proposed project. Even so, they still give us a glimpse of the positive impact such projects can have. On the other hand, it is important to keep a close eye on potential negative impacts on land value that such projects can create. Some factors that should be taken into account in this regard might be gentrification concerns, environmental and social impacts, urban planning challenges and market sensitivity.

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In the city of Torino, there are approximately 5 million mq post-industrial site areas (Lucchini, 2023) which can be repurposed in accordance with the needs of the new generation. The majority of those areas belong to the city (Lucchini, 2023), making them public property. In a hypothetical scenario, for the sake of the exercise, let's presume that the project will be implemented in one of those sites located in the neighbourhood 'A'. The neighbourhood has adequate coverage from public transportation and other basic amenities. In this area, people with low to average income and a high concentration of foreigners and youth can be found. The average land price in the area varies from 500-700 EUR/m2 for housing and 1,000-1,500 EUR/m2 for businesses. Let's pretend that in this area are located 10,000 apartments and 3,000 businesses. Now presuming that the project is implemented by the city of Torino in this area, the land value will be impacted positively thanks to the component of the museum which will attract the interest of different stakeholders.

Based on similar cases around the world, presumably, the increase in land value will be 10-15% in the next 10 years, given the fact that the Museum of the Future is not a museum in the traditional sense, the area of implementation has no cultural significance and the land market in Torino is quite stable. In this context, the housing prices would increase to 575-805 EUR/m2 and for the businesses to 1,150-1,725 EUR/m2. In total, the added value would be 810,000 EUR for housing (80% 500 EUR/m2, 20% 700 EUR/m2), while for businesses would be 525,000 EUR, together amounting to an added value of 1,335,000 EUR.

This added value comes as a result of a public investment, the other parties that benefit from it do not contribute to the project. Hypothetically speaking, the city could try to capture some of it through the use of financial instruments for land development. In this specific case, the best instruments for the task could be Betterment Fee or Tax Increment Financing. Below we will explore only the possible implementation of one instrument.

Betterment fees are levied and collected by a local government because its investments in roads, water lines, or other services have made the private property in question "better" for development. They are one-time charges that can be collected either before or after investments are made, or while the development process is in progress (USAID Albania, 2016). In the framework of the exercise, let's say that the city chooses to apply this instrument to capture a portion of the added values of land that came as a result of the project implementation. The amount that the city should target needs to be appropriate to the income of the families in the area. In this hypothetical area live low-average income families, and are located mostly SMEs.

Added value from the project	Betterment fee		Betterment fee per family	Betterment fee per business
1,335,000 EUR	100 %	1,335,000 EUR	100 EUR	111 EUR
	75 %	1,001,250 EUR	75 EUR	83 EUR
	50 %	667,500 EUR	50 EUR	56 EUR
	25 %	333,750 EUR	25 EUR	28 EUR

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	10 %	133,500 EUR	10 EUR	11 EUR
	5%	66,750 EUR	5 EUR	6 EUR

*Businesses 25% of the added value, households 75% of the added value

The average income in Italy is 3,650 EUR/month, the average household size is 2.3 individuals, and the poverty line for 3-member households is 1,400 EUR/month (I.Stat, 2023). Those are all data that the city of Turin must take into consideration for the implementation of the betterment fee instrument. Other data should also be included. The city can use the collected amount to mitigate some of the potential negative impacts on land value, such as gentrification.

Having said that, let's keep in mind that the results shown above are based on a hypothetical scenario, while reality might be quite different. Different betterment fees have been used by many, if not most, nations around the world, with varying degrees of success (USAID Albania, 2016). In the case of this instrument, public opposition is common. Hence public engagement in the process is e key element for success.

3.5 Just Green Transition: between carbon-neutrality and re-industrailisation

Title: Just Green Transition: between carbon-neutrality and (re)industrialisation

Exercise: Rethinking industrial cities in the green transition: the case of Skellefteå

Exercise's Objective and Methodology: This session, and exercise is meant to challenge two mainstream ideas: 1) that the green transition is a new phenomenon, and; 2) that the green transition necessarily leads to de-industrialisation. We invite students to look at the green transition from the perspective of transformation and reorganisation of global productive systems, with uneven impacts across different territories (countries, regions, cities) and their inhabitants. Territories gain and lose economic activities on a continuous basis. There is nothing new with that, it is the nature of global competition and the impact of emerging disruptive technologies.

The key issue now, with the green transition, is that disruptive technologies are leading to a shift in technological regimes in many sectors, and the cumulative effect of this process is leading to systems change. As with previous industrial revolutions, technological systems changes will result in a profound transformation of the social and economic systems as we know them today. This brings both challenges and opportunities at different levels: individuals, businesses, territories. In the green transition, some territories (e.g., regions, cities) in Europe will experience (are experiencing) an industrial boom. The way we govern this transition will determine how the costs and benefits will be distributed in society. Alternative transition pathways differ in their degree of social inclusiveness and fairness.

Operative steps

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- **Step 1:** Students will be presented with the case of Skellefteå, in North Sweden, its industrial trajectory and the sudden arrival of a new battery gigafactory. The planning challenges related to the rapid process of transformation will be presented (e.g., housing, mobility, labour market, skills, attractiveness, etc).
- **Step 2:** In an open discussion, students will be invited to reflect about Skellefteå's challenges, and to brainstorm about possible measures that should be taken to ensure the success of its industrial development while safeguarding social justice and environmental sustainability.
- **Step 3:** Based on the session's objective and lessons from North Scandinavia, students will gather in their teams and work on their specific group topics. The task is to re-formulate the challenges and strategies ahead (re. teams' specific topics), e.g. assuming that the development path of Torino is not necessarily doomed to an industrial decline but to a process of 'green transformation', innovation, and re-industrialisation, where social justice will be at its core.
- **Step 4:** incorporate these perspectives in your course final report (After the lecture).

Summary of the case study of Skellefteå

Skellefteå is a town in northern Sweden. The city is historically industrial, with mining being a large part of that industry. That is why the city is called the city of gold. The industry has been in decline since the 1990s. The city is entering the post-industrial phase. IT, the game industry, and services are developing in the city. Not all industry disappeared in the 90's, forestry, metal, and energy remains strong. Skellefteå is experiencing a new industrial boom in 2015. "Northvolt arrives as a meteorite" (Tapia & Giacometti, 2022).

Skelefea is suitable for the development of the lithium battery industry for the following reasons:

1. The city has a huge amount of cheaply available renewable energy, primarily hydropower, which enables the production of cheaper electricity.
2. The land is very affordable. Large areas of undeveloped land allow the cheap construction of large industrial plants.
3. The existing local infrastructure meets the needs of the new industry.
4. Highly educated and trained population.
5. The city has a great industrial tradition.
6. Strong local support and trust in the functioning of the system (Tapia & Giacometti, 2022).

The key problem of this city is the declining population. The new industry aims to attract the young population from the big cities.

Reindustrialization brought new opportunities to this city, but also new challenges:

1. Increase in demand and price of apartments;
2. Insufficient number of health and educational institutions;
3. For the city to attract the young population, it must provide attractive facilities;
4. It is necessary to improve the openness of the city for interregional and international cooperation;

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5. The speed of approaching new challenges is the biggest problem.

To make Skellefteå a "sustainable place for a better everyday life", the city has taken the following measures:

1. It is necessary to invest in the construction of attractive public spaces (parks, promenades, centres of culture);
2. Investments in new buildings from materials produced in the local industry (50% built-in wood);
3. Investments in the construction of public apartments, as the fastest solution, which will not occupy large areas.
4. Investments in modern transportation systems. Introducing electric public transport and increasing the number of electric cars;
5. Improve the traffic accessibility of the city with the regional environment;
6. Investments in education and training, through the opening of new universities, research support, and support for professional education (Tapia & Giacometti, 2022).

Skellefteå is a city that represents a good example of implementing a just green transition and reindustrialization. This city is still struggling with many challenges, especially in terms of housing, but its consistency towards achieving sustainability is a good example for Turin and other cities.

Title: Just Green Transition: between carbon-neutrality and (re)industrialisation

During the 20th century, Turin had the status of one of the most developed industrial cities in Italy and Europe in general. This city has gone trough severe economic and political crises in the end of the 20th century, which has a negative impacted on the industrial sector. As a result of the crises, a large number of abandoned industrial facilities – brownfield sites remained (Centre for Analysis of Social Exlusion, 2016). The reindustialization of Turin, in the time of collective concerns for environmental protection, represents a great challenge. However, the reindustialization of Turin is possible and certain.

The development of digital innovation hubs can contribute to the reindustrialization of Turin, in accordance with the policy of the JGT. Hubs of digital innovation will be locating in post-industrial locations. In this way, the process of urban regeneration and digital transition is encouraged. The process has multiple significance. And that:

Environmental Protection: Reindustrialization based on the uses of existing physical infrastructure (brownfield sites) prevents occupation and construction on unbuilt areas (greenfield sites). In this way, the expansion of existing industrial zones is prevented. Also, the urban form and the natural environment are preserved. By reusing the existing physical infrastructures, the need for additional resources (for the construction of new facilities and infrastructure) is minimized. Digital hubs and within them "Monitoring Office for Autonomous Cities", will be collecting relevant data on the state of the environment. In this way, a good

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information base is created for defining policies and taking action to strengthen the city's resilience, preserve biodiversity, and protect people and the environment.

Energetic efficiency: The reconstruction of the physical infrastructure, with the aim of reindustrialization, opens the possibility for the application of energy-efficient solutions. The existing physical infrastructures (abandoned industrial facilities) haven't been used for a long period. Because of this, these buildings have largely fallen into disrepair, so they require restoration and reconstruction. Green facades and new windows and doors can reduce the consumption of thermal energy in buildings. Also, they contribute to a more beautiful appearance of the urban environment.

Vertical greening can provide a cooling potential on the building surface. The cooling effect of green facades has also an impact on the inner climate of the building by preventing warming up the facade (Sheweka & Mohamed, 2012).

New windows and doors with improved insulation properties can also play a significant role in reducing heat energy consumption. Energy-efficient windows and doors are designed to minimize heat transfer between the interior and exterior of a building. Solar panels on the roofs or facades of these buildings can contribute to their energy independence.

Employment: The process of reindustrialization brings new jobs. The process of digital transition brings new jobs for digital workers with low and high qualifications. Low-skilled digital workers will perform tasks such as data entry. Also, new jobs are being created for highly qualified workers. They will be in charge of training and management. The revitalization of brownfield sites requires the engagement of a large number of workers from various fields. Such as: architects, engineers, construction workers, environmental protection experts and others. The creation of new jobs in digital and "traditional" industries contributes to poverty reduction and the economic well-being of the population.

Social inclusion: One of the advantages of the new reindustrialization is the promotion of social inclusion. Modern industry creates new jobs for members of different social groups (low-skilled, foreigners, young population, highly-skilled workers). All groups have an equal chance for retraining and acquiring new skills. By considering the needs and aspirations of diverse populations, digital hubs can help foster a sense of belonging and improve the quality of life for residents.

Accessibility: Brownfield sites are often located in urban areas with existing infrastructure and transportation networks. By redeveloping these areas, accessibility and connectivity can be improved. This can involve improving public transportation options, creating pedestrian-friendly environments, and integrating bike lanes. Enhanced accessibility makes it easier for people to access jobs, services, and amenities, reducing the reliance on private vehicles. In this

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sense, industrial facilities should be located at a distance of 15 minutes from public transport stations.

In order for the reindustrialization process to be successful, it is necessary to involve all interested parties. From residents, and workers, to politicians and governments. Their *cooperation* is necessary in order to define sustainable solutions, which will be acceptable to all. This involvement helps build trust and support for the revitalization efforts.

Government support has multiple significance. The government establishes policies and regulations to guide the reindustrialization of brownfield sites. This includes land use policies, strategies for achieving energy efficiency, environmental standards and others. Governments often provide financial incentives or grants, to attract businesses and investors to redevelop brownfield sites.

The reindustrialization of brownfield sites can have several potential negative effects. Rehabilitation and renovation of brownfield sites can be an expensive and technically challenging solution. In some cases, renovating brownfield sites can result in the displacement of existing communities, especially if revitalization efforts result in increased property values.

The reindustrialization of brownfield sites in the function of digital hubs can have potentially negative effects. Rehabilitation and renovation of brownfield sites can be an expensive and technically challenging solution. Renovation of brownfield sites can result in the displacement of existing communities, especially if revitalization efforts result in increased property values.

4 POLICY ADVICE AND RECOMMENDATIONS

Main Challenges

1. Social Dimension: Addressing inequalities in access to digital skills and opportunities, ensuring inclusivity in the transition.

In order to address the social dimension, different socioeconomic groups in Turin must work together to close the skills and access gaps in digital technology. Ensuring that marginalized communities and individuals have equal access to digital education and resources is crucial to prioritizing inclusivity in the digital transition. This will allow them to participate in and enjoy the benefits of the rapidly changing digital landscape. By concentrating on narrowing the gaps in digital literacy, Turin can create a more empowered and inclusive community that promotes social cohesion and equitable opportunities for all citizens.

2. Economic Dimension: Facilitating the shift from traditional industries to a digital economy while supporting job creation and economic growth.

The transition from traditional industries to a growing digital economy represents a critical challenge in Turin's quest for economic transformation. In order to support a mutually beneficial relationship between established industries and growing digital businesses, this shift necessitates strategic alignment. Turin can leverage digital advancements to promote job creation and sustainable economic growth by fostering an innovation-centric

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environment through industry, academia, and local government collaborations. In addition to easing this transition, putting a high priority on funding digital infrastructure, skill-development initiatives, and innovation-incentive policies will establish the city as a thriving center for the rapidly changing digital landscape.

3. Environmental Dimension: Balancing urban development with environmental sustainability, mitigating the ecological impact of the transition.

Turin's environmental transformation emphasizes how important it is to balance urban expansion with environmental conservation. The goal is to reduce the ecological impact of urban development by integrating sustainable practices and green infrastructure. Turin can guarantee a more sustainable future, protecting its natural resources and cultivating a healthier, environmentally conscious cityscape for future generations, by carefully balancing development and environmental conservation.

Overarching Objective

The overarching objective is to orchestrate a seamless transition in Turin towards a digitally advanced and environmentally sustainable city while prioritizing social inclusivity and economic resilience.

The primary objective of Turin is to seamlessly oversee the shift to an environmentally conscious and technologically sophisticated urban landscape. Achieving this goal requires putting social inclusivity first and ensuring that every segment of the community has equal access to opportunities. In addition, digital innovation is essential for fostering economic resilience. By striking a balance between the advancement of technology and environmental sustainability as well as social equity, Turin hopes to become a model city that promotes innovation and an inclusive, resilient society.

Specific Objectives

- Digital Inclusion: Ensure equitable access to digital education and opportunities for all socio-economic groups.
- Economic Diversification: Facilitate the shift from traditional industries to digital sectors while creating new job opportunities.
- Environmental Resilience: Implement green infrastructure and practices to mitigate environmental impacts and enhance sustainability.

Strategies

- Skill Development Programs: Establish comprehensive digital skill development programs accessible to diverse demographics.
- Industry Collaboration: Foster partnerships between digital industries, educational institutions, and local communities to drive innovation and job creation.
- Green Infrastructure Implementation: Integrate green spaces and sustainable technologies into urban development plans.
- Policy Alignment: Ensure policies align with the principles of social equity, economic growth, and environmental sustainability.

Actions

- Develop Digital Learning Centers: Establish centers offering free digital training and certification programs for residents of all ages and backgrounds.
- Create Innovation Hubs: Establish collaborative spaces where digital startups, established companies, and educational institutions can innovate and develop digital solutions for urban challenges.
- Implement Green Initiatives: Introduce policies incentivizing green building practices, renewable energy adoption, and urban green spaces.

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- Conduct Impact Assessments: Regularly assess the social, economic, and environmental impact of the transition to refine strategies and policies.
- Community Engagement Campaigns: Initiate campaigns to educate and engage communities in the transition process, encouraging active participation and feedback.

These policy recommendations and associated actions aim to tackle the multi-dimensional challenges of Just Green Transitions in Turin while steering the city towards a sustainable, inclusive, and digitally advanced future.

5 REFERENCES

Imami, F., & Bejko, A. G. (2023, Septrember 1). Just Green Transition in the Western Balkans: Overcoming 'Transitions Fatigue'- Policy Brief. Found in Green Force: https://greenforcetwinning.net/wp-content/uploads/2023/10/POLICY-BRIEF_1.pdf

6sqft New York City. (2023, June 21). High Line. New York, USA, USA.

Acropolis Museum. (2023). *Acropolis Museum*. Found in https://www.theacropolismuseum.gr: https://www.theacropolismuseum.gr/en

Centre for Analysis of Social Exlusion. (2016). *Torino City Story .* Turin, Italy: LSE Housing and Communities.

Cedergren, E., Tapia, C., Sánchez Gassen, N., & Lundgren, A. (2022, September 30). Just Green Transition – key concepts and implications in the Nordic Region. doi:http://doi.org/10.6027/WP2022:2.1403-2511

Commission), D.-G. f. (2015). *Guide to cost-benefit analysis of investment projects - Economic appraisal tool for cohesion policy 2014-2020.* Publications Office. doi:10.2769/97516

Commission, E. (2015). *Guide to Cost-Benefit Analysis of Investment Projects – Economic appraisal tool for Cohesion Polisy 2014-2020.* European Union. doi:10.2776/97516

Cotella, G., Brovarone, E. V., Staricco, L., & Casavola, D. (2021). TARGETED ANALYSIS // METRO - The role and future perspectives of Cohesion. Politecnico di Torino, DIST. Turin: ESPON. Found in October 10, 2023, from https://www.espon.eu/sites/default/files/attachments/5%20ESPON%20METRO_CS%20Metropolitan%20City%20of%20Turin.pdf

Duany, A., & Steuteville, R. (2021, Februery 8). Defining the 15-minute city. Found in https://www.cnu.org/publicsquare/2021/02/08/defining-15-minute-city

Fallon, J. (2018, November 6). How the renovation of a world renowned art museum is inspiring a sector in digital transformation. Netherlands.

Getty. (2023). About the J. Paul Getty Museum. Los Angelos, USA, USA.

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Giovine, P. (2019). Building a Sustainable City. (Torino 2030) Found in October 11, 2023, from https://torino2030.it/torino-2030/

Guggenheim BILBAO. (2011, December 30). Study of the Economic Impact of the Activities of the Guggenheim Museum Bilbao – Estimation for 2011 . Bilbao, Spain, Spain.

I.Stat. (2023). *I.Stat il tuo accesso diretto alla statistica italiana*. Found in dati.istat.it: http://dati.istat.it/Index.aspx

LSE Library Services. (2023). *LSE Research Online*. Found in LSE Research Online: https://eprints.lse.ac.uk/

Lucchini, C. (2023). *TORINO dopo l'industria.* Turin, Italy: Torino Urban Lab.

Meistere, U. (2017). The art market is increasing in transparency. Found in https://www2.deloitte.com/lt/en/pages/finance/articles/art-market-increasing-transparency.html

Sheweka, S. M., & Mohamed, N. M. (2012, December 18). Green Facades as a New Sustainable Approach Towards Climate Change. doi:https://doi.org/10.1016/j.egypro.2012.05.062

TATE. (2001, May 11). The Economic Impact of Tate Modern. London, UK, UK.

USAID Albania. (2016). *Instrumentet Financiare për Zhvillimin e Tokës, Dokument Politikash.* Tirana: USAID Albania.

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