



MISTA

Metropolitan Industrial Spatial Strategies & Economic Sprawl

Targeted Analysis

Final Report

Final Report

This targeted analysis activity is conducted within the framework of the ESPON 2020 Cooperation Programme.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

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Contact: info@espon.eu

ISBN: 978-2-919795-77-2

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Metropolitan Industrial Spatial
Strategies & Economic Sprawl

Version 23/03/2021

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Abbreviations

AA	Agglomeration Areas
ARDECO	Annual Regional Database of the European Commission
COVID-19	Coronavirus disease 2019
DASTU	Department of Architecture and Urban Studies
DG REGIO	Directorate General for Regional and Urban Policy
EC	European Commission
ELFS	European Labour Force Survey
ESPON	European Territorial Observatory Network
ESPON EGTC	ESPON European Grouping of Territorial Cooperation
EU	European Union
EU 15	European Union countries that were member states prior to 2004 (incl. UK)
EU 13	European Union countries that joined after 2004
FDI	Foreign Direct Investment
FUA	Functional Urban Area
GDP	Gross Domestic Product
GVA	Gross Value Added
HR	Human Resources
IAB	Institut für Arbeitsmarkt- und Berufsforschung, Die Forschungseinrichtung der Deutschen Bundesagentur für Arbeit (Institute for Employment Research, The Research Institute of the German Federal Employment Agency)
ICT	Information and communication technologies
ISTAT	Istituto Nazionale di Statistica (Italian National Institute of Statistics)
JRC/EC	Joint Research Centre of the European Commission
LAU	Local administrative units
KIBS	Knowledge intensive business services
LQ	Location quotient
MISTA	Metropolitan Industrial Spatial Strategies & Economic Sprawl
MR	Metropolitan Regions
NACE	Nomenclature of Economic Activities for Statistics
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Co-operation and Development
POLIMI	Politecnico di Milano
R&D	Research and Development
SME	Small and medium-sized enterprises
SBS	Structural Business Statistics
SWOT	Strengthens, Weaknesses, Opportunities and Threats
US	United States
WIFO	Austrian Institute of Economic Research
WIOD	World Input Output Database
1 st Metros	First-tier metropolitan regions

Executive summary

This final report presents the methodological development and results of the MISTA research project which aims to provide new insights into the complex relationship between the city and industry (in particular the manufacturing sector). In order to facilitate knowledge transfer, the report also introduces policy recommendations, based on exploring inspirational cases, which offer actions and strategies that cities can carry out in exploring if and how the industrial activities can be more effectively embedded into the contemporary urban economy and life.

The first chapter provides a comprehensive literature review covering a) existing empirical research, b) best-practice reports and evaluations and c) policy documents and discussion papers. This review found that the industrial sector has changed considerably over the last three decades, 'hybridising', moving closer to the services sector, focusing on high-tech activities or highly customised products. Furthermore there is an increased recognition of the importance of industrial activities for urban areas and evidence of growth of some industrial activities in urban agglomerations across Europe. This chapter also defines key analytic concepts and nomenclatures about the nature of contemporary industrial activities and manufacturing and cities.

Chapter 2 builds upon a baseline data analysis of major past and current spatial trends related to the locational preferences of the productive sector bases in European city regions. The objective is to provide new empirical insight trends over the last three decades. Due to the limited availability of comparable and sufficiently detailed datasets, the team combined EU scale data with local databases. This second step of the analysis focused particularly on the seven urban stakeholders and has resulted in a baseline analysis for each city and their functional urban areas, regarding spatial trends and the locational preferences for industrial activities. The results of the baseline analysis highlight the need to adopt new lenses when trying to grasp the nature of contemporary manufacturing. It showed how city-regions are an important scale for industry and production. The analysis also showed how a series of activities that are not traditionally considered part of the production cycle are particularly crucial for industrial activities (such as services) and for the functioning of large urban areas. The report is supplemented by a scientific background report (see Annex 1) produced to present in full detail the methodology used under T1.

To complement the analytical research, and better understand the local political and economic drivers for change, a qualitative analysis was conducted in each of the seven cities. Chapter 3 summarises the results of interviews that were held with local actors between January and February 2020 which included site visits, an analysis of policies and planning documents, but also a comparative analysis of the seven cities. This step helped to highlight factors driving deindustrialisation and reindustrialisation. The Case Study reports (Annexes 3) highlight quite different conditions among the stakeholder cities, both in experiencing and perceiving the changing relationship between production and the city. This articulated the conflict between different potential land uses, the poorly understood role of the public sector, the impact on or

with local communities, the links with training and the local labour markets, the link with economic visions, the capacity for public authorities to act at a metropolitan scale of so forth.

Considering that industry in the city, or urban manufacturing, is one of the most complex and poorly understood economic activities in urban areas, there are a vast range of variables that could come into play. One of the first questions regards the role of the public sector. The presence of industrial activities depends heavily on a combination of urban policy, land use planning and public support of local networks and entrepreneurship. Therefore, some trends and forecasts will require concerted efforts to be made by policy makers to confront market forces. Chapter 4 looks at four scenarios related to how cities could address their productive sector. The scenarios address two key questions. Firstly, what is the role of the public sector. Secondly, at what scale should action be taken? The scenarios are a useful exercise to explore ambitions and actions.

Against this background, the quantitative and qualitative analysis (chapters 1-3) allowed the MISTA team to structure the in-depth exploration of current spatial trends, technical and production forecasts and future planning and policy conditions (chapter 4). In fact, drawing on the knowledge generated, the project includes two further steps for developing strategies for industrial areas and to manage economic sprawl. These are: the *Futures Workshops* (chapter 4) and the *Atlas of Inspirational Cases* (chapter 5). The *Futures Workshops* were intended as exploratory and reflective processes for the cities to review how their planning policy, plans, regulation and technical capacity reflect their ambitions. It constituted a fundamental learning experience for both the MISTA team, and the stakeholder cities involved. On the one hand, these events enabled the research team to get feedback on the empirical research, namely the hypotheses regarding the spatial location of manufacturing, the effectiveness of governance and planning processes and the potential applicability of inspirational cases. The workshops also provided the context and methodology for the local stakeholders to confront their views and build partnerships around collaboration (amongst the public sector and beyond). Chapter 4 presents a summary of the outcome of the workshops which helps cities to build their own visions for urban industry.

Policy makers and planners can be convinced by the idea of strengthening their industrial capacities yet lack the capacity to get started. Chapter 5 showcases an Atlas of 26 Inspirational Cases (Annex 4) that has been produced as a strategic resource to portray a wide range of options and help experiment and support design and planning processes. Chapter 5 presents an overview of the inspirational cases which are categorised according to four families: 1) visions and strategic frameworks, 2) plans and policies, 3) tools and programs and 4) projects. The Atlas (Annex 4) includes the full description of all the inspirational cases along with the elaboration of the final reflections generated by the research project addressing the impact on policy making.

The final objective of the MISTA project is to provide recommendations for cities engaged in planning and policy for industrial land use, manufacturing and productive activities. This report

concludes with a set of policy-recommendations that emerged through dialogue between the stakeholders' cities, research on the Atlas of Inspirational Cases and discussion that emerged from the *Futures Workshops* and *Inspirational Cases Workshops*. Four problem statements have been identified. Firstly, more precise data and knowledge is needed to provide clear insights on industrial processes and their impact. Secondly, spatial foresight is required to address problems both to the core city level and metropolitan scale. Thirdly, metropolitan leadership is required in the light of the global processes (such as digitalisation, the 4th industrial revolution, etc.) affecting production processes and requires metropolitan governance to embrace new technology or support local technical. Finally, strong collaboration is fundamental to address urban and metropolitan challenges and requires capacity building.

The last chapter of the report presents the conclusions of the research project within a post-COVID perspective. Some preliminary considerations about the impacts brought in by the pandemic in restructuring society and reframing the relationship between the city and the industry. This exposes the urgency of further and more detailed research in order to transform this crisis into an opportunity to strategically rethink many urban planning trends that have been taken for granted. Arguably, this reflection constitutes a crucial step to direct future research (see Chapter 6).

1 Approach and definitions.

1.1 Introduction and overview of the literature

Since the end of the 1970s, the production of physical goods in developed countries has lost considerable importance in terms of output and employment. The extent of this erosion of industry is quite impressive as the industry shares of value added at current prices fell from around one third in the mid 1980's to around one fifth in the mid 2010's in most European countries. Furthermore, this weak manufacturing development was particularly noticeable in urban areas although these areas recorded more favourable employment dynamics overall. *Helper et al.* (2012a), for example, calculate clearly above-average rates of shrinkage in manufacturing employment for the 366 largest US metropolitan regions and the period 1980-2011. Thereby, the disadvantage compared to the other US regions was considerable at -8.8 percentage points for all metro regions and -10.0 pp for the 100 largest ones.

Recently, however, the experience that countries and regions with a strong industrial base seem to have been more resilient to the "Great Recession" (*Fingleton et al.*, 2012) has led to a reassessment of the role of manufacturing in highly developed countries and regions: while previously de-industrialisation and tertiarisation have been seen as an unavoidable side effect of economic development and a large manufacturing sector as more or less obsolete in a fundamental change towards a post-industrial, service-oriented economy, a dynamic manufacturing sector is now again seen more as a prerequisite for innovation and growth in countries and regions, but also cities (e.g. *Van Winden et al.*, 2011).

Furthermore, a growing body of empirical evidence suggests that some parts of industry may be returning to urban agglomerations in Europe. This literature, however, also suggests that the nature of this returning industry differs substantially from the industry traditionally located in the regions. As shown in the Annex to the Final Report (Annex 2) the literature finds that:

1. **Interlinkages between industry and services are increasing.** In general, de-industrialisation is a process that affects all developed economies, to varying degrees. While the literature mentions a variety of factors driving de-industrialisation, there is a broad consensus that increasing service shares seem to be particularly important in consumption, technological progress and globalisation (trade and outsourcing). While there was a very clear trend at the end of the 20th century to decouple production and consumption, the 21st century is showing that services and production are becoming increasingly interlinked.
2. **Incompatible industrial activities have already left European cities.** While the mechanisms for de-industrialisation in cities are basically the same for cities as at the global level, cities are particularly affected by high land and labour costs. Furthermore, the burden for relocation at the regional level (from the city to the periphery) is lower than at the national level (from a highly developed to a developing economy). Accordingly, employment-intensive, land-intensive and emission-intensive production companies have largely moved away from the big cities. In this way, a close functional relationship has developed between large cities and their surrounding regions.
3. **The new urban production is mainly focusing creative, knowledge intensive and customised production.** In general, knowledge-intensive tasks (such as

headquarters, R&D, design), creative industries and consumer-oriented (individualized, high quality, hand-crafted) small-scaled production have remained or are even growing in cities. So did industries with local supply functions. In addition, there are also historical qualities of particular industries growing in specific cities.

In terms of economic policy, this increased recognition of the importance of industrial activities for urban (respectively regional) development and of the important structural shifts in production has manifested itself in a renaissance of concepts that aim for a turnaround in manufacturing development ("re-industrialisation"). At the EU-level, the *EU-Commission* stated that "a vibrant and highly competitive EU manufacturing sector can provide the resources and many of the solutions for the societal challenges facing the EU, ..." (2010, p. 4), and subsequently launched the target to bring back the industry share in GDP to 20% in 2020 (*European Commission*, 2012). Although this target is clearly ambitious also the recently published industrial strategy of the new Commission (*European Commission*, 2020) assigns a central role to industry in leading the change that Europe embarks on its twin transition towards climate neutrality and digital leadership, while coping with increasing global competition.

Implementing this goal at the urban level, implies that cities must take a pro-active policy stance to the development of productive activities on their territory and also need clear tools for managing productive activities. In the past manufacturing and industrial land operated with relative independence of public planning regimes and were driven by standard market dynamics, only requiring support for the development of new infrastructure. More recently, however, due to the changing nature of productive activities, increasing competition for land in cities and the increasing interdependence within urban regions requires sectorally and spatially more integrated strategies and more complex planning approaches, that focus on providing an economically healthy environment for the total local economy that fosters innovation and entrepreneurial activities and is also conducive to productive activities in the long run.

It also highly requires place-based approaches that are based on an understanding of the nature of the manufacturing that has remained in a specific city and why it has done so. In most cases this requires city-specific solutions based on intensive dialogue between policy makers, businesses, economists and urban planners, and a change in perspective from factories, capital equipment and technology towards a people-based view of cities as productive platforms.

1.2 Data and method

Against this background one of the aims of the MISTA (Metropolitan Industrial Spatial Strategies and Economic Sprawl) project was to provide an empirical overview of the development of industry in European urban agglomerations over the last 30 years. In this respect the project set out to address the issues of how industry developed in urban agglomerations over the last 30 years. To what degree the general trend to de-industrialisation has differed across different types of cities and time periods and whether different sectors of industry have shown different development trends in the major European agglomerations. Furthermore, the project also set out to analyse to what degree the more recent trend to a

reindustrialisation of cities is visible in the data and which of the industrial sectors are most strongly affected by changing trends in the location of productive activities in Europe.

Ideally, an empirical analysis of these issues would require statistical information with the following characteristics:

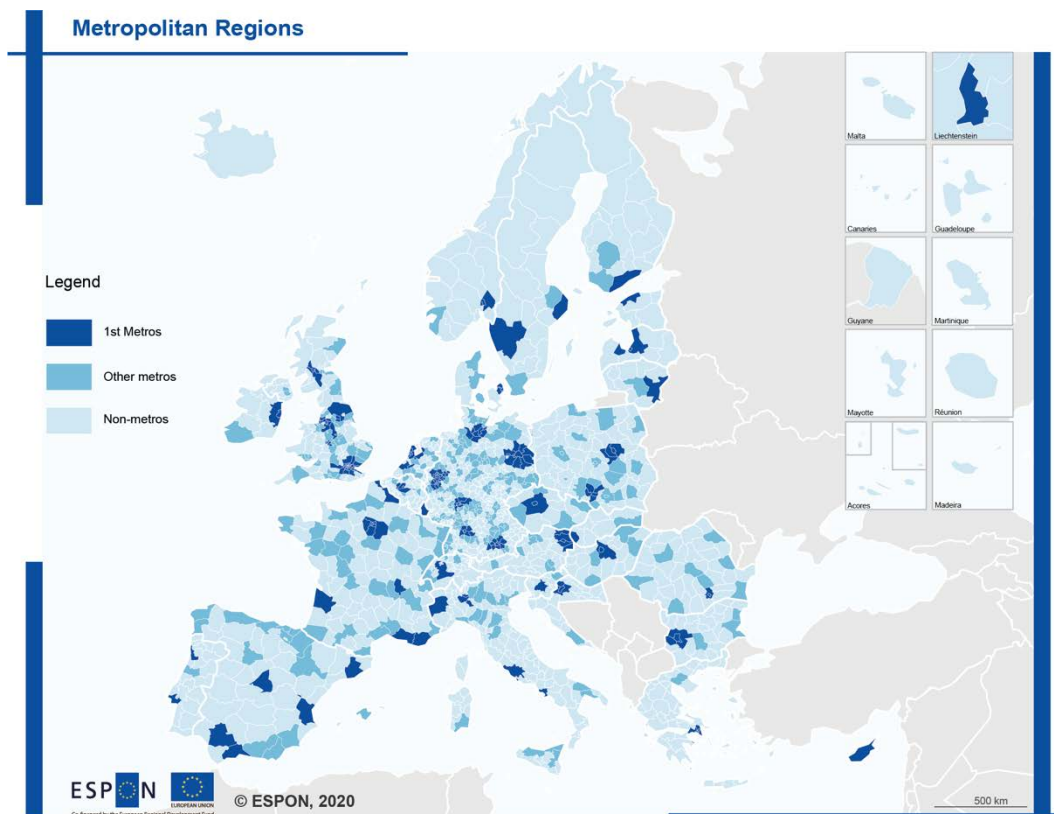
1. **Data at a regionally disaggregated level for functional metropolitan regions:** to account for the increasing spatial mismatch between the administrative boundaries and the economic extension of urban areas often documented in the literature and to ensure comparability across metropolitan regions that differ substantially in their administrative definition.
2. **Data at a disaggregated sector level:** to account for the substantial change within production that according to previous literature is based on new business models, a progressive fragmentation of value chains and the rise of "hybrid" goods based on manufactured and service content lead.
3. **Longitudinal data for the medium and long term:** As structural change is a long-term phenomenon, time series data for a longer time span are needed to understand its nature.
4. **Data comparable across EU-countries:** To ensure comparable results for the case study cities as well as for all European cities analysed.

As could be expected no database available and/or "ready to use" meets all these requirements. As a consequence, the MISTA project team decided for a flexible use of different data sets at different regional aggregation levels according to the specific research topics analysed.

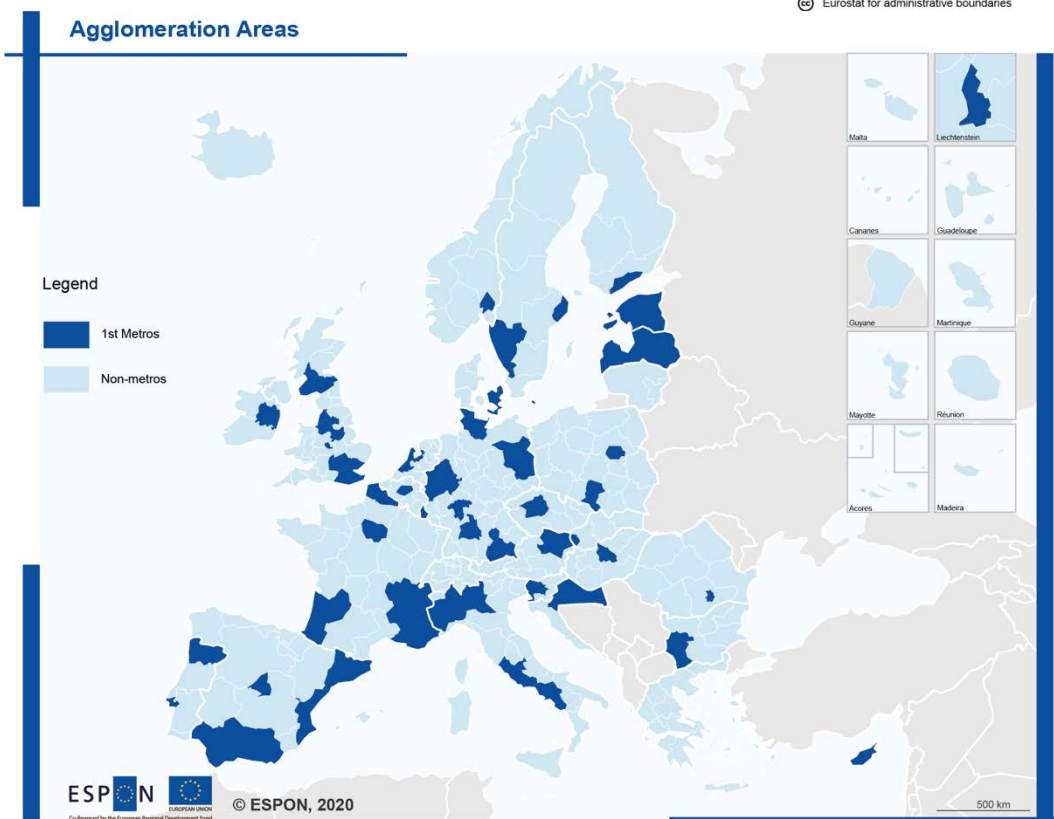
In particular as a starting point for an EU wide comparison the focus was on harmonised data from the Regional Accounts and Regional Business Demography for employment and GVA that are available in a rather broad sectoral delineation. These data were combined with a large longitudinal data set from the EC Joint Research Centre, to allow for track sectoral evolutions in the Metropolitan Regions for the period 1995 - 2017.

By contrast, for analyses at a disaggregated sectoral level, aside from the databases mentioned above data from the European Labour Force Survey, the European Structural Business Statistics (SBS) were used as they allow for a larger information base on employment. In particular the SBS provides employment data for the disaggregated NACE 2 sectoral level, while the ELFS offers information on the educational and occupational structure of employment in production.

Map 1.1: Metropolitan Regions and Agglomeration Areas in the EU and Norway.



Territorial level: NUTS 3 (version 2016)
 Source: ESPON MISTA Project, 2019
 Origin of data: Eurostat, 2016; ESPON 2016
 © Eurostat for administrative boundaries



Territorial level: NUTS 2 (version 2016)
 Source: ESPON MISTA Project, 2019
 Origin of data: Eurostat, 2016; ESPON 2016
 © Eurostat for administrative boundaries

Source: ESPON MISTA (2020).

1.3 Delineation of metropolitan regions and the production sector

Next to this, the definition of urban regions and of production are central to the project. As explained in detail in the Annexes to the MISTA Final Report (Annex 2), a comparative analysis of urban trends in Europe cannot build on cities in a purely administrative logic: urban regions (whether defined by settlement or interdependence parameters) usually cross political-administrative boundaries or sometimes fall short of them. Since this is the case to a very different extent from city to city, comparisons based on the usual regional nomenclature can be massively distorted. Therefore, our analyses refer to city regions in a functional delineation, which include the city as local administrative unit as well as the surrounding travel-to-work-area (commuting zone). In addition, the search for a meaningful delineation of the metropolitan areas must therefore consider that the MISTA project aims to compare the 7 urban areas involved in the study (Berlin, Oslo, Riga, Stuttgart, Torino, Wien, Warsaw) with each other, but also with (all) other comparable urban areas in the European Union and Norway. Thereby an urban area is classified as "comparable" if it is either a capital city and/or a city region with more than 1.5 million inhabitants in the agglomeration area. This leads to a sample of (58) "major" metropolitan regions in the EU, which will be the benchmark in our comparative analyses. Against this background, only delineations of metropolitan areas can be considered, which can be applied in a harmonised form to all these urban regions.

The standard Functional Urban Area (FUA) delimitation used for such purposes in many studies places great demands on data availability and is also not available for all regions by far and can thus only be approximated in the in-depth analysis of individual stakeholder-cities. Due to these data limitations at the small-scale level, we therefore must rely on two different delineations to approximate the city region, depending on the research question and thus data requirements: First, the comparative analyses of general long-term developments production are implemented at the NUTS 3 level (based on the metropolitan region (MR) definition). Second the detailed industry specific analysis of all productive activities must be carried out at the NUTS 2 level (AA definition). The regional manifestations of the MR and AA level are illustrated in map 3.1.

Finally, with respect to the delineation of production activities, the project team - based on a discussion with the stakeholder cities and a review of the European data situation - decided to focus on the following sectors (and NACE groups): Transport and logistics (NACE H), wholesale and storage (NACE 46 + 45), competitive production (NACE C), production for local markets (NACE C), material services including building sector (NACE F), general workshops, repair services (NACE 95). They suggested that these groups can be well analysed on the level of the AAs for all European cities, but that their analysis at a smaller regional level hinges on the collection of additional data from the stakeholder cities.

2 Industry in the city: Trends, Forecasts and Scenarios.

Implicitly, recent policy concepts emphasizing the importance of industry for regional development are based on the idea that certain characteristics of the industrial sector make it particularly important for growth and transformation (also) in highly developed economies. As far as this idea is connected with the hope of a "re-industrialisation" – and thus a reversal of a structural trend that has dominated the last 30 years – it is therefore based on the assumption of new technological and organisational possibilities that make industrial activities viable in highly developed and high-income countries and regions. The first task of the MISTA project therefore consisted of an empirical analysis of industrial development in European cities that addressed the following questions (see Annex 2 for detailed results).

1. Why is the development of the production sector relevant for metropolitan regions?
2. Does the empirical evidence support the idea that de-industrialisation is an unavoidable by-product of urban development or is there indication of a possible "new alliance" between production and cities?
3. What is the empirical evidence as to which sectors and functions within the production sector are likely to be growing in urban areas in the future?

Based on this analysis, the project aimed at developing scenarios on future possible policy approaches to the support of manufacturing in urban regions.

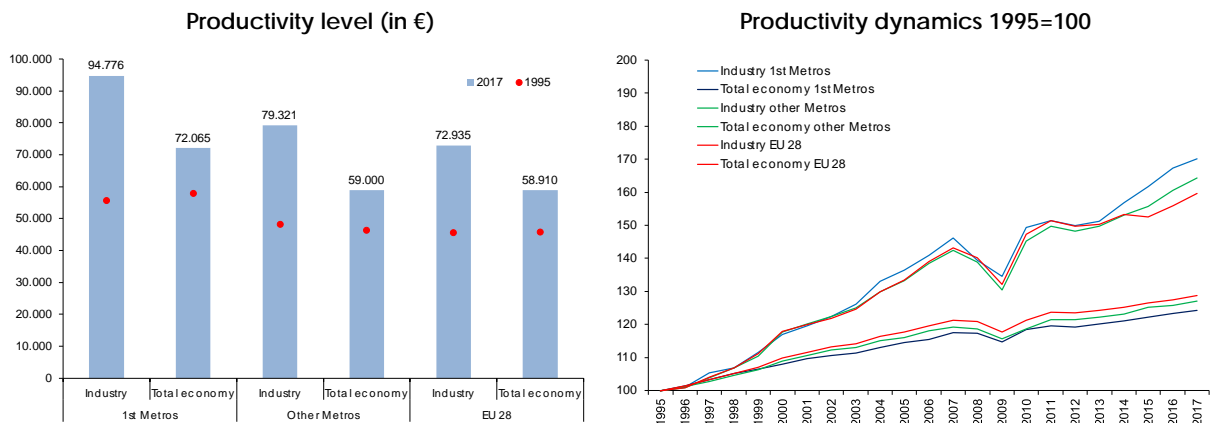
2.1 Why is the production sector important for metropolitan regions?

With respect to the first question one of the main findings of the MISTA project is that there are a number of theoretically well-founded economic arguments that suggest that industry is an important sector for economic development in urban centres. Among these, the special role of industry in the innovation system and in triggering productivity and thus wage growth, as well as the strong forward and backward (input-output) linkages provided by industry, are arguably the most important arguments.

The production sector as defined in the MISTA project is an important nucleus for research and innovation in cities and Europe overall. For instance, in 2018, manufacturing alone accounted for over 60% of total business R&D in the EU and Norway, which means that the R&D share in manufacturing exceeded its value-added share by a factor of 4 (see Figure 2.1).

Related to this also labour productivity levels were by far higher in industry than in the European economy total in 2017 and the compensation of employees in industry was some 31% higher than in the economy total. Productivity and wage advantages of industry also increase with metropolisation, and from a dynamic perspective industrial productivity in constant prices rose by between 70% (metro regions) and 60% (all EU regions) in the EU in the period 1995 to 2017, while productivity growth in the total economy ranged from +29% (all EU regions) to +24% (metro regions) – see Figure 2.1.

Figure 2.1: Productivity Levels and Productivity dynamics in EU Industry and the European Economy total. GVA per employed person, constant prices



Source: ARDECO database (JRC/EC); ESPON MISTA (2020).

In addition, industry is also of importance in easing balance-of-payments restrictions in 'open' urban economies and in facilitating service exports as for instance according to data from the OECD TiVAT database value added in services accounts for between 30% and 40% of the content of manufacturing exports in most EU countries

Finally, production in metropolitan regions is also important from a European perspective as (even abstracting from inter-sectoral spillovers and externalities) urban regions play an important role in the production system of the EU in general. More than half (54%) of the workforce in European industry (or 19.8 million people) is employed in metropolitan regions and almost two thirds (64%) of the industrial output of the whole European Union is generated in these regions.

2.2 Is de-industrialisation unavoidable?

With respect to the second research question, the empirical research undertaken in the MISTA project corroborates previous results indicating a substantial decline in the employment and GVA share in cities since the 1970's. It however adds to these results by documenting that:

1. Trends in employment and GVA have been markedly more stable since the mid-2000s than before. In particular, in the period 2008 -2017, the negative impact of "real de-industrialisation" lost much of its significance and made hardly any negative contribution to industry employment change in the metro regions. For instance, Figure 2.1 shows the development of employment and GVA at constant and current prices in industry (NACE sectors B-E) in the (58) major metropolitan regions (1st metro regions), all (289) metropolitan regions and all (1348) EU (NUTS-3) regions since the mid-1990s with the year 1995 normalized to 100. As can be seen from this figure, irrespective of the regional level considered, since 1995 there has been a clear long-term de-industrialisation trend for employment in industry but not for gross value added. As of the mid 2000s, however, the downward trend of industry has flattened out both in terms of GVA and employment and has ultimately been largely stable since the mid-2000s, except for the years of the "Great Recession".

Figure 2.2: Development of Industry in European (metro) regions due to different performance indicators; 1995-2017; Index 1995 = 100



Source: ARDECO (JRC/EC); ESPON MISTA (2020).

2. Despite the downward trend in industry employment in most European urban areas since the mid-1990s, developments in terms of GVA were much more favourable. As a consequence, a decomposition analysis of employment growth of industry in European metro regions, conducted in the project (see table 2.1) indicates that the bulk of the decline in employment in industry in the period 1990 to 2017 has been due to a substantial increase in labour productivity and thus industrial upgrading rather than “true de-industrialisation”. Indeed, productivity increases can explain the total employment loss in this sector, while the effects of “true de-industrialisation” (i.e. a decline of production GVA in cities) are often balanced out by additional effects stemming from the growth of metropolitan areas or countries in general.

This said, however, there are also important differences in the development of productive activities between and within metro regions. For example, within metropolitan regions, production has in general favoured the urban fringes, as industry developed more favourably in the wider metro environs than in the metropolitan core. Over time, therefore intra-metropolitan specialisation has increased alongside the advantages of the metro centres for knowledge-intensive services and of the wider environs for industry production.

Table 2.2.1: Components of employment change in metropolitan industry: 7 case study metro regions 4-way-decomposition, 1995-2017; cumulative change in %, contributions of the different components in percentage points.

	Employment Change (%)	Contribution to Employment Change of (percentage points)			
		Productivity growth	"Real" de-industrialisation	Performance of Metro Region	Country growth
Major Metros	-25.3	-49.2	-18.5	+8.2	+34.3
Berlin	-25.1	-42.9	-9.0	-3.2	+30.0
Oslo	-28.9	-62.0	-29.8	+24.0	+38.8
Riga	-14.4	-60.9	-65.3	+19.6	+92.3
Stuttgart	-0.6	-54.7	+15.4	+4.5	+34.1
Torino	-28.2	-15.7	-22.1	-2.4	+12.1
Warszawa	+37.6	-50.7	-35.3	+27.0	+96.6
Wien	-32.6	-40.3	-16.3	-11.4	+35.5

Source: ARDECO database (JRC/EC); ESPON MISTA (2020).

Despite this, core metro regions remain to be central locations for a modern industry. On the one hand, this is because of the increasingly integrated nature of service and manufacturing functions in industrial value chains, that increasingly use "hybrid" and servo-industrial production methods. This leads to a situation where although industry (and within industry in particular manufacturing) is increasingly located in the wider metro regions, it increasingly needs the complementary industry-related services located in the metro cores for market success.

On the other hand, this is due to changing tastes and lifestyles (such as e.g. increased environmental concerns in urban cores and increased tastes for customisation and individualisation through consumption) and the still growing population in urban cores. This leads to a larger demand for activities related to the implementation of the circular economy and supply of public goods in urban cores as well as to an increasing demand for largely small-scale customized productions in city centres, that also has to be satisfied by nearby producers.

With respect to differences between metro regions, by contrast – next to substantial variation between individual cities, that highlights the economic importance of institutions, history and policy– the patterns of industrial development differ markedly in smaller metro regions, as well as in regions that are not capitals or are located in EU13 countries. These different industry developments in different metropolitan areas reflect the different locational (dis-)advantages and suggest that:

- Small and medium-sized metropolitan areas did not experience declining employment in production as radically as large metro areas and thus they also provide a much broader industrial base (in terms of localised branches) than small cities.
- Metro regions that are not capitals have also been less strongly affected by employment losses and also differ markedly in terms of industrial specialisation from capital cities. In particular, capitals are much more strongly specialised on utilities (e.g. electricity, gas and water provision, remediation of waste materials) and logistics (e.g. wholesale trade, warehousing, water transport, air transport). By contrast, in metropolitan areas that are not capitals there is a disproportionately strong localisation of the machinery and

equipment industries as well as of car production and basic metals, textiles and leather products.

- Cities located in EU13 countries – in part for historic reasons and in part due to generally lower income levels as well as inflows of foreign investments – are much more “production affine” than cities located in EU15 countries and Norway. This is documented by a larger share of production (and manufacturing) in value added and employment in these cities, a larger number of localized branches in particular in manufacturing, and also by an occupational structure of the employed in industry that is much more strongly focused on medium qualification levels and above all on medium-skilled production occupations.

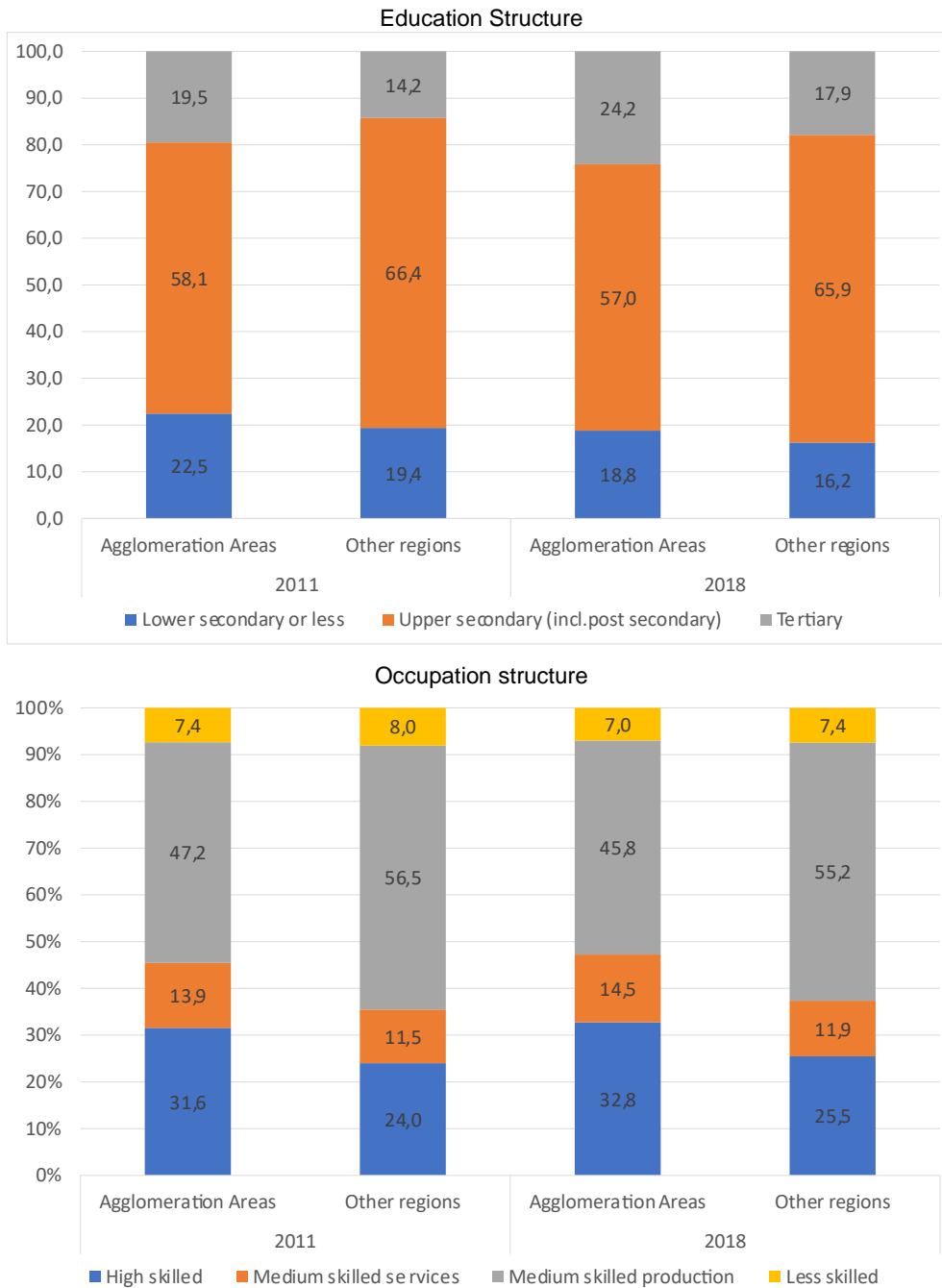
2.3 Which activities are likely to locate in cities in future ?

Next to these differences, within and between metro regions, also the heterogeneity of the production sector in metropolitan regions has to be considered as well. This is also because of the vast heterogeneity of this sector in terms of the products produced, geographic extent of markets, size of enterprises and technologies used. From a theoretical perspective, this leads to an expectation that cities in general are unlikely to present equally favourable conditions for the production of all of these parts of industry and may provide differentiated locational advantages for certain activities within production. It also leads to the expectation that there may be substantial heterogeneity among cities with respect to their locational advantages.

Indeed, according to the results of the MISTA project, there is some evidence of a return of certain forms of production to city regions, as recent growth trends suggest that some sectors of production activities have been growing more rapidly in urban regions than in the European average. Although this tendency starts from a rather low level (as more rapidly growing sectors account only for 14% of total employment), this return of production to cities is not restricted to logistics, utilities and some high-tech industries, but also applies to some divisions in consumer goods production and other less technology intensive sectors. These sectors are mainly affiliated with the hand-crafted, design-oriented, high-quality production for local high-income demand.

In addition, even within the remaining manufacturing sectors, results do not support a complete loss of locational advantages for metro regions per se. Rather, recent growth trends suggest substantial changes in the functional specialisation of urban manufacturing. Thus, manufacturing employment in metro areas has been more strongly affected than other regions by the general trend towards an increasing share of high-skilled employment in recent years, and an outstanding feature of the employment structure of urban manufacturing is a lower share of employed with a medium (upper secondary or vocational) education. As a consequence, in urban regions manufacturing is a more important employer for both high-skilled and low-skilled workers than in other EU regions.

Figure 2.3: Employment structure of production activities in European agglomeration areas by qualification and occupation (2011 and 2018)



Source: ELFS micro data. Figure excludes the following countries: Belgium, Bulgaria, Denmark, Ireland, Greece Spain, Hungary, the Netherlands, Portugal, Sweden, UK and Norway. Educational structure is classified as follows :High-skilled = ISCED 5 or more, Medium-skilled = ISCED 3 and 4, Low-skilled = ISCED 2 or less. Occupational structure is cited as follows High-skilled = ISCO 1-3, Medium-skilled Services = ISCO 4 & 5, Medium-skilled production = ISCO 6-8, low-skilled = ISCO 9.

In parallel, also the occupational structure of manufacturing in metro regions is much more tertiarized than in other regions. As a result of increasing functional specialisation, in the European cities employment in production is much more strongly focused on service occupations than in other regions.

Given these results, it can therefore be expected that the following sectors and branches are likely to experience notable growth rates in urban regions in the future:

1. **Utilities and logistics sectors**, whose development is mainly influenced by the growing urban populations and the increased desire of these populations for public services and mobility.
2. **High-tech and high skilled manufacturing branches**, whose development is mainly driven by the locational advantages of cities as high wage locations that, however, also provide strong location advantages for technological innovations.
3. **Consumer oriented branches with a high degree of product differentiation**, who also profit from population growth as well as the increased desire of consumers for differentiated but locally produced good.

In addition, even within manufacturing branches that do not fall into these categories, both an increased regional and functional specialisation within production activities can be expected. This on the one hand should lead to an increasing number of service and high skilled jobs in urban regions (and in particular in their urban cores). On the other hand, this should also lead to a continuously higher growth of most production activities in the environs of urban regions than in their core.

3 Exploring case studies

The comparative analysis of the seven stakeholder metropolitan areas is based on their detailed descriptions, called Case Study Reports (to be found in separate annexes). These reports include information from different sources: 1) desk research, 2) interviews with stakeholders in the course of November 2019, 3) NACE 3 based data analysis of the main trends of productive economy in the stakeholder regions, 4) extensive study visits to the cities in the course of January-March 2020, and 5) future workshops with local stakeholders in October-November 2020.

Although all the case study cities are affected by the same macro-trends of globalisation in the last decades, there are substantial differences in their earlier history of economic development. Stuttgart and especially Turin can be classified as cities dominated by one strong industry, where changes came with the difficulties of this dominating automotive industry. Berlin and Vienna have more diversified economies which also have gone through changes, partly due to the collapse of socialism – having a direct effect on East Berlin while changing the position of Vienna from marginally to a centrally located European city. The political change from socialism to capitalism had direct and dramatic effects on the development of Riga and Warsaw. Oslo is the only city which did not have such abrupt changes in city development.

3.1 Population dynamics and spatial development trends, the nature of the growth pressure

Most of the case study metropolitan areas (except for Stuttgart) are monocentric, dominated by the core city, which is surrounded by much smaller settlements. Suburbanisation can be observed in all of the cases; thus, the relative position of the case study metropolitan areas is very similar to that of their core cities in the comparison. However, the seven metropolitan areas have been affected differently by growth pressures and competition for land:

- The population development dynamics of the core cities shows very different patterns: in broad terms and with some simplification Oslo and Vienna are quickly growing; Stuttgart, Berlin and Warsaw are growing relatively moderately; Turin is around stagnation, while Riga is very different from the others with a decline in population. Population growth in most stakeholder cities (except for Riga and Turin) results in a push for rezoning industrial areas to residential use. In Warsaw the housing shortage inherited from the socialist past is an extra factor to crowd out industrial activities.
- Brownfield areas are extensive in Turin and Riga and are present also in other stakeholder cities (except for Oslo, Vienna and to some extent the Stuttgart region where there are no significant brownfield opportunities of sizable plots). These are the reserves for spatial development, which are, however, expensive to develop because of the densely built environment and contamination.
- Stakeholder cities and urban areas have different environmental protection regulations, which might lead to low share of buildable land against the strictly protected non-buildable areas (e.g. Vienna, Oslo and Stuttgart).

Based on all of these factors there are different levels of competition for buildable land. Oslo may have the biggest problems with high growth pressure, limited amount of buildable land (due to strict protection rules) and practically non availability of brownfield areas. The other

extreme is Turin, where there is no substantial growth pressure while big areas are devoted for development and brownfield space is available, thus the competition for land is limited.

3.2 Main trends in the development of the economy and manufacturing and factors for location choices

The main trends affecting changes to manufacturing and the economy at large are rather similar in the stakeholder cities, following the global trends of deindustrialisation. In the course of that many manufacturing activities, especially those which are occupying large surface areas and/or are environmentally harmful, have left the cities, while ICT and knowledge-based activities have gained ground. These trends are also relevant to the automotive industry that have dominated Stuttgart and Turin, but manufacturing is still substantial in these metropolitan areas. According to the interviews, the internal restructuring of the whole manufacturing sector is leading towards more automated manufacturing processes, a focus on innovation and creativity and towards higher value-added activities which all require better educated labour force. Besides, there is an increasing mix between industrial and related logistics, services and office functions.

Looking at a more detailed picture based on the analysis of different sub-sectors of the productive economy at NACE 3-digit level, we may come to some important conclusions:

- In the generic de-industrialisation process it could be expected that the remaining part of manufacturing in the metropolitan areas is rather high-tech oriented with the highest R&D potential. However, as the following table shows, the highest share of employment is linked to productive type of services that are attributes of large cities based on their gateway role (e.g. passenger and freight transport, construction, public utilities).
- The seven stakeholder metropolitan areas can be divided into two types: 1) areas with a strong, rather monocentric manufacturing basis both in the core city and its surrounding areas (Stuttgart and Turin), 2) service oriented metropolitan areas with the growth potential in urban utilities and smaller niche branches in manufacturing (Oslo, Berlin, Vienna, Warsaw¹).
- The manufacturing profiles of the core cities and their surrounding areas are quite different in the second type, the service oriented metropolitan areas. While inside the city manufacturing as such is mostly less relevant than the national average, there are significant productive activities that have high importance in the surrounding areas, like logistics, wholesale, food processing.
- An analysis of sectoral strengths and opportunities based on the technological embeddedness (flow of labour force between branches) and localisation (higher share of employees than the national average) of sectors in the regional economic structures provides a rather differentiated picture across cities. In general, however, in monocentric manufacturing cities the strengths and opportunities are more strongly focused on manufacturing, while in the large cities based on their gateway function strengths and opportunities are often located in production close services (such as logistics or wholesale trade) and utilities. This suggests a high degree of path dependence in industrial specialisation patterns among cities. It also points to the need of place-based industrial development strategies.

¹ As no NACE 3 level data exists separately for Riga (only for Latvia), it would be misleading to categorize Riga from this perspective.

- Similarly, the list of technologically less embedded and localized sectors differs substantially across cities. Nonetheless, this list highlights that in all cities there are also a number of sectors which could profit from a closer networking of industries. Again, as a tendency, these branches are more often manufacturing in monocentric manufacturing cities and more often production-close services and utilities in other large cities.

Table 3.2.1: The most relevant productive sectors of the stakeholder metropolitan areas²

	Sectors with the highest number of employees	Sectors with a significantly higher share of employees than the national average	Strength or opportunities in local productive economies³	Sectors creating threat
Berlin	logistics, construction and wholesale trade	passenger and freight transport, utility and waste management,	freight rail transport, passenger air transport, courier activities	pharmaceuticals, manufacture of plastic, manufacture of machinery, repair of machinery
Oslo	construction, wholesale, transportation	wholesale of household goods, foods, air transport	wholesale of household goods, communication equipment, passenger rail land and air transport	construction of roads and railways
Riga (Latvia) ⁴	transportation, wood processing	transportation, wood processing, processing of fish	manufacture of wood and furniture, passenger and freight transport	manufacture of metal products, manufacture of dairy products
Stuttgart	manufacture of motor vehicles, construction materials, manufacture of machinery	manufacture of motor vehicles, manufacture of machine tools	freight rail transport, wholesale of communication equipment, passenger air transport, courier activities	manufacture of general and special purpose machinery, repair of metal products
Turin	manufacture of motor vehicles, construction, freight transport	manufacture of motor vehicles, manufacture of aircraft machinery	manufacture of cutlery and general hardware, manufacture of motor vehicles, manufacture of aircraft machinery	manufacture of medical instruments
Warsaw	wholesale, passenger and	passenger air transport, manufacture of domestic chemicals,	manufacture of dairy products, manufacture of bakery and food,	manufacture of metal products,

² The table contains sectors, where there are at least 2,000 employees.

³ We consider a sector as a **Strength** in case the sector has both higher share of employees than the national average and has also a good flow of labour force between the sectors (thus having the potential to be cross-fertilised by the skills and knowledge of the employees). **Opportunity** is identified in case a sector has a lower share of employment than the national average (thus the crucial scale of the work force may be missing), but the employees are fluctuating to other sectors, thus bring their knowledge and skills. **Threat** is the opposite phenomenon: when the sector has higher share of employment than the national average, but the labour force is not interchangeable between sectors.

⁴ Due to the lack of data available on NACE 3 level on Riga metropolitan area the analysis contains a comparison not between the metropolitan area and the national level, but the national (Latvia) level to the EU average. Consequently, the analysis reflects a national rather than a metropolitan profile.

	freight transport	manufacturing of pharmaceuticals	printing and service activities, manufacture of gas, waste collection, warehousing	sale of motor vehicles
Vienna	wholesale, construction, transportation	passenger air transport, manufacture of gas	wholesale of information and communication equipment, freight rail transport, passenger air transport	manufacture of plastic, manufacture of electricity distribution appliances, repair of machinery, wholesale of machinery

Source: NACE 3 level analysis, ESPON MISTA (2020).

As mentioned, the profiles of the core city and the agglomeration are usually different: the same sectors that are opportunities in the core city might be threats in the agglomeration or vice-versa. This means that in all seven metropolitan areas there is a potential to link the manufacturing activities operating inside and outside of the core cities, as together they will be able to encourage the flow of labour force and the interrelation between sectors, thus increase their knowledge base.

The shift of manufacturing from the core city to the agglomeration area was not directly mentioned as problem by most interviewees. The major problem with manufacturing may not specifically be the fact that it is moving out from the core city, the problems are rather with limitations for growth in the whole of the metropolitan area. These limits may be employee related (shortage of skilled or unskilled employees) and place related (not enough space for more efficient locations in some urban areas due to high price of land or zoning/administrative issues).

Interviewees in all seven stakeholder areas mentioned similar reasons for companies relocating from the city core to the agglomeration area, or to other parts of the country (or even to other countries). The reasons for relocation included high land prices in the inner areas, high costs of redeveloping brownfield sites, lengthy administrative procedures, problems with logistics in dense urban areas, rental insecurity or instability of long-term leases, higher cost of labour within the metropolitan area or due to the protests of residents.

In some of the cities, an additional factor is the lack of suitable land available for larger development projects. This can be a problem even at a metropolitan level, for example in the Stuttgart region, due to the resistance of smaller municipalities against rezoning land for industrial development. Another factor might be the stricter environmental regulation not only in urban cores but also in surrounding settlements, as a result of which polluting industries are leaving the whole metropolitan area.

3.3 Main challenges and conflicts of future development in manufacturing

All case study cities are concerned to a certain extent about the present tendencies of the development of industry and manufacturing. The reasons, however, are different:

- The dispersed location of manufacturing results in commuting that can cause traffic problems (all stakeholder areas).
- Regarding the foundational forms of manufacturing (manufacturing that the everyday life of the city depends on), their movement away from the city results in direct deficiencies (Berlin, Oslo).
- Strong population growth and related housing development are consuming industrial land which threaten with reduction of jobs and their diversity (Oslo, Vienna).
- Growth of larger businesses requires suitable space for new development, while contiguous developable land is limited (Stuttgart metropolitan area).
- Demand for and supply of labour in manufacturing do not match. This results in unemployment of low or unsuitably skilled labour on the one hand and a demand for specific skilled workforce on the other (all stakeholder areas).
- Industry has left, or has undergone a strong re-organisation of production, and the resulting abandoned brownfield areas are causing problems (Turin, Riga).

3.4 Public sector visions for the development of manufacturing

All interviewees noted that it is not easy to develop a well-defined vision for the future of manufacturing within the metropolitan areas. There is serious competition for scarce resources, such as available developable land, especially in growing cities. It is a matter of political consideration what priority the preservation of manufacturing gets. In addition, keeping manufacturing within metropolitan areas is not a political priority for leaders who usually prioritize residential/housing and office related functions over the existing forms of manufacturing. Often also residents are protesting against industrial use or even the development of mixed-use areas. Cities mostly support only clean and knowledge-intensive industrial activities (e.g. innovation hubs). Among the stakeholder cities Warsaw is the closest to this thinking and in a given period this was also the strategy of Turin.

There are, however, cities (Vienna and Berlin) where there is a growing recognition for the need to keep some manufacturing related activities inside the city, to support foundational forms of manufacturing, and facilities related to logistics and public services. Oslo has also embraced this position, emphasizing the importance of manufacturing jobs for lower skilled city residents.

3.5 Tools for the municipality to influence spatial development processes of manufacturing

In the majority of European cities, the main actors in industrial development processes are the (mostly private) landowners and the private entrepreneurs and developers. Municipalities usually do not interfere directly into the negotiations between these actors. However, there are some tools available for municipalities to influence development programs in urban areas.

Direct public ownership of land on a large scale is not common nowadays. Vienna still has land reserves (mainly for residential development), while Berlin and Oslo had already sold most of

these on the market. Recently the strategy of these cities has changed, and they started to purchase land. In Berlin land has been purchased for foundational activities, start-ups, and innovative hubs. The city offers land on a long-term lease basis to entrepreneurs, often below market rates. The Senate of Berlin recently introduced a rent cap for not only the housing sector but also for industrial land. This is seen as a radical tool and is highly contested.

A more indirect tool to regulate the dynamics of the real estate market is through planning and zoning procedures, linked to financial and taxation systems. All stakeholder cities have well developed planning systems, including strategic and binding/detailed planning regulations. Most commonly zoning regulations determine the possible functions in given areas, but these operate more as protecting areas rather than actively encouraging structural change. In some cities there are several legal possibilities for exemptions (as in Warsaw, where national legislation enables developers to ignore the local zoning plan in order to accelerate investments), in other landowners simply do not sell land or do not start investments until the land has been rezoned to a more profitable category. The interest of cities to rezone land might be constrained when national regulations limit the taxation of land value increase or make this impossible at a local level (as in the case of Oslo).

In many cities there are interesting experiments with more flexible land use categories, such as mixed-use zoning (Oslo and Berlin) or conditional zoning (Vienna). The development of local spatial frameworks (e.g. masterplans) within dynamic areas provides an opportunity to make planning more participatory and focused on the desired functions by involving potential stakeholders. Such or similar practices (e.g. planning guidance for public space) are experienced in Oslo, Vienna and in a bottom-up form in Warsaw.

The taxation systems, even if being determined mostly on national level, offer tools and also influence the motivations of local municipalities to intervene into the processes between private actors. There are huge variations in the regulations of the main taxation forms (such as personal income tax, real estate tax, business tax) and regarding the opportunities they create for local municipalities. For example, in Latvia municipalities cannot levy any local business-related taxes, thus municipalities' prevailing interest relates to the personal income tax of residents. In Poland municipalities can lower the local business tax to attract enterprises into their area. In Stuttgart local revenues are based on jobs, while in Oslo national taxation dominates, any forms of local tax revenues are insignificant. Depending on these taxation forms, in each city there are different attempts existing to sign development agreements with developers to get contributions directly from them.

There are some initiatives in the stakeholder cities to form bottom-up networks of local enterprises in order to represent their interests more efficiently. For example, the Motzener Strasse initiative in Berlin consists mainly of traditional trades and repair businesses which joined their forces to resist more efficiently crowding out effects. In Oslo, Paadriv is a more recent initiative, a social hub with enterprises and individuals networking for sustainable development. Such innovative tools can provide a more flexible framework to enhance desired

industrial activities, but experiences are varied to what extent the cities can achieve in reality the result wished for.

3.6 Potentials for metropolitan cooperation

The dynamics and strengths/efficiency of metropolitan cooperation is very different across the stakeholder areas. Stuttgart has a strong, directly elected metropolitan level government, but even in this case individual municipalities cannot be pressed for growth beyond their will. Turin, despite its strong legal metropolitan structure, does not function optimally in terms of delivering projects, due to its territorial differentiation and its limited competences and resources for implementation. Oslo previously had well-functioning cooperation between the city and its metropolitan area, which has changed due to the reorganization of the region. Berlin and Brandenburg have a joint planning authority (with limited competences) while the regional administrations are separated. Warsaw has only lately started metropolitan cooperation within the framework of EU Cohesion Policy funding, using the Integrated Territorial Investment (ITI) instrument. In Vienna co-operation across borders remains limited to individual practical projects, while the institutional framework for co-operation remains complicated and vague and overarching development strategies for the metropolitan region are missing. Riga and its surrounding area constitute one official planning region, however without proper spatial scale and competences, but with a hope that it will change for the favour of a more efficient metropolitan cooperation in the future in the course of the ongoing governance restructuring programme.

In case of weak or non-existent governance mechanisms for cooperation between the core city and the surrounding area, neither spatial planning nor economic development strategies are jointly elaborated. Even in those cases where the metropolitan area has greater competencies (e.g. Stuttgart), coordinated actions remain hard to enact. Even if the regional zoning plans allow for industrial development, municipalities usually do not support new industrial investments because of local opposition from residents. Furthermore, municipalities can have very different preferences in economic development supported by very different tools. If there are good examples for cooperation between municipalities in the metropolitan areas, these mostly concern transport systems and public services and less economic development.

It does not seem as realistic to change the generally fragmented governance systems of metropolitan areas in the near future. Even so, some examples show that common interests and smart incentives may lead to cooperation between the core municipality and the municipalities within the larger metropolitan area. A few strategies include:

- Municipalities in the metropolitan area can jointly develop future visions of specific industries which can be followed by planning and implementing concrete actions. A good example is the aerospace district in Turin metropolitan area, an innovation hub, which developed from a committee to an institutionalised cooperation. In the Turin region, the regional policy supported the I3P incubator to invest into an innovative industrial supply-chain.

- Within Berlin a good example on cooperation is the development of the area around the new *Berlin Brandenburg Airport* in Schönefeld. For this there was a joint development program that has been carried out by Berlin, Brandenburg and the Republic of Germany in order to establish an intercommunal enterprise zone. To realize the program Berlin even bought 120 ha land for industrial development.
- In the Stuttgart region, a strategic dialogue has been launched on the future of the automobile industry as a new form of institutionalised collaboration. Furthermore, the regional government has its own Stuttgart Region Economic Development Corporation which supports networks of SMEs in order to facilitate the development of clusters in the region.
- Vienna has established an organisation with a small group of managers (so called Stadt-Umland-Management), who are responsible for enhancing cooperation among its districts and surrounding communes through regular informal meetings and personal negotiations. These were also involved in the establishment of a joint enterprise zone of 8 municipalities in Lower Austria.
- In Poland, there are examples for establishing joint development agencies across municipalities in some metropolitan areas area. Such agencies, e.g. in Krakow, Wroclaw, do the marketing to attract new investments, which might be located in the surrounding communes, while the core city plays a key role in the provision of highly qualified professionals. Warsaw does not have such an agency but had positive experiences from the Integrated Territorial Investment cooperation which provided the framework for joint EU funded transport and infrastructure developments.

In the course of the interviewing process and the future workshops it became clear that in all of the case study areas there is a view that more metropolitan cooperation is needed to handle different problems related to the protection and development of manufacturing. Most cities also agree that besides joint metropolitan planning, a well-positioned, strong metropolitan agency is needed which could actively step up solving concrete problems. This could create a link between economic development and related infrastructure needs and promote economic development in privately owned areas. Stuttgart already has a strong metropolitan organisation, while in Oslo, Berlin, Turin and Warsaw there are discussions about the establishment of such agencies.

3.7 Concluding remarks

The stakeholder areas (being major metropolitan areas of Europe) are all undergoing similar restructuring process of their economies that result in decreasing share of manufacturing in employment. However, this restructuring process, under increasing growth pressure in most of the stakeholder areas, has different spatial and structural consequences, linked to the differences in the competition for industrial land. In those stakeholder cities where the growth pressure is lower and there are brownfield areas available (e.g. Turin and Riga), the major challenge is making the local industry more competitive and handle the problems of the mostly privately owned, expensive to develop brownfield areas. On the other hand, in cities where there are no land reserves and the growth pressure is intense, manufacturing may leave the urban core causing problems with regard to foundational activities and jobs for the lower skilled (e.g. Oslo, Berlin).

The manufacturing profiles of the core cities and their agglomerations are usually different. There is a potential of strengthening the links between the productive activities between the core city and its surrounding, leading to the strengthening of economic activities in the whole of the metropolitan area. There are different strategies to do that, either to strengthen the core activities of the metropolitan areas (what happens in Stuttgart or Turin) or create a more dispersed economic structure based on small scale manufacturing sectors with high growth potentials (as in Oslo or Vienna).

Seen from outside, metropolitan areas are the economically feasible territories of productive industries. From local perspective, the optimal distribution of activities, supported by proper land use, labour force capacity and infrastructure patterns, are of crucial importance. In reaching this local optimisation, even the metropolitan areas with official administrative structure and/or elected bodies tend to have problems, due to the lack of effective governance systems. The different interests of individual municipalities in the metropolitan space make the coordination on metropolitan level rather complicated – but a must in order to boost innovation and keep basic industrial functions in the metropolitan areas. As most of the stakeholder areas cannot expect having a stronger metropolitan governance in the near future it is important to strengthen cooperation on two levels: 1) bottom-up cooperation of local stakeholders, 2) creating strong linkages to the nation state in order to gain support for developing the major infrastructure and locate crucial branches.

Several good initiatives were revealed in stakeholder cities, also on the metropolitan level, to ensure more balanced development of different functions and modernisation of industry. Smarter use of financial incentives, planning and taxation tools and making the process of spatial planning and economic development more participative on local and metro level might lead to more favourable results in terms of keeping and modernising industry.

4 The role of the public sector: four policy scenarios

Sections 2-3 provide a portrait of industrial areas, manufacturing and productive activities across Europe. The MISTA project includes two steps to develop 'strategies' for industrial areas and to manage economic sprawl, namely: through the *Futures Workshops* held with the stakeholder cities (held between September and November 2020) and the development of an Atlas of Inspirational Cases (summarised in section 5). As each of the seven cities has very different spatial challenges, local economies and governance conditions, it was very challenging to define suitable but transferable recommendations. This section presents four scenarios developed by the MISTA team to help guide cities towards courses of action. The Atlas of Inspirational Cases is presented in section 5, offering specific courses of action.

4.1 Two key questions

The scenarios are based on two key questions regarding the role of the public sector and the scale of action.

4.1.1 What is the role of the public sector?

Should the public sector be providing leadership or aligning local actors defining missions? Or should the public sector be providing the most suitable conditions for leadership and initiatives from outside of the public sector to address these challenges by allowing the market to flourish?

Until recently, urban and metropolitan authorities played a light hand in developing industrial areas. It is uncommon for public authorities to actively support their urban manufacturers or to embrace productive activities. All cities stakeholder cities expressed the need to protect industrial land and support productive activities in the future. Many cities have tabled topics like circular economy, low carbon mobility and food resilience, all which depend in some way on industrial areas and the productive sector. In practice the MISTA project's stakeholder cities are finding this easier said than done as most are either struggling to fight hard-wired development trends that are focused on profitable short-term outcomes (such as housing and commercial development) or they instinctively invest available finance in improving public infrastructure (like schools, roads or healthcare) rather than boosting their local economy.

For core city public authorities, this tension is resulting in cognitive dissonance (Festinger 1957) which occurs when two or more conflicting beliefs, ideas or values are held. In many cases, because manufacturing activities and industrial land is far from the general public's concerns, other activities (such as housing or open space) have taken priority. The question here is what role can the public sector play in accommodating productive activities and manufacturing in urban areas?

In the past, national level governments have been most actively involved in industrial policy. The public sector in cities has long supported industry and manufacturing through funding education and providing basic infrastructure (roads, sewers, water pipes, electricity...). At the advent of formalised land use planning, industrial zoned land helped to separate 'incompatible land uses' while creating protected areas where production and manufacturing could occur

according to the demands of the market. During the aftermath of the second world war, an innovation partnership became increasingly common, where public authorities financed research organisations to develop knowledge which could be commercialised by the private sector. This was referred to officially in the 1990's as the triple-helix model (Etzkowitz & Leydesdorff 1995) and led to new types of hybrid knowledge and production spaces including science parks university technology campuses.

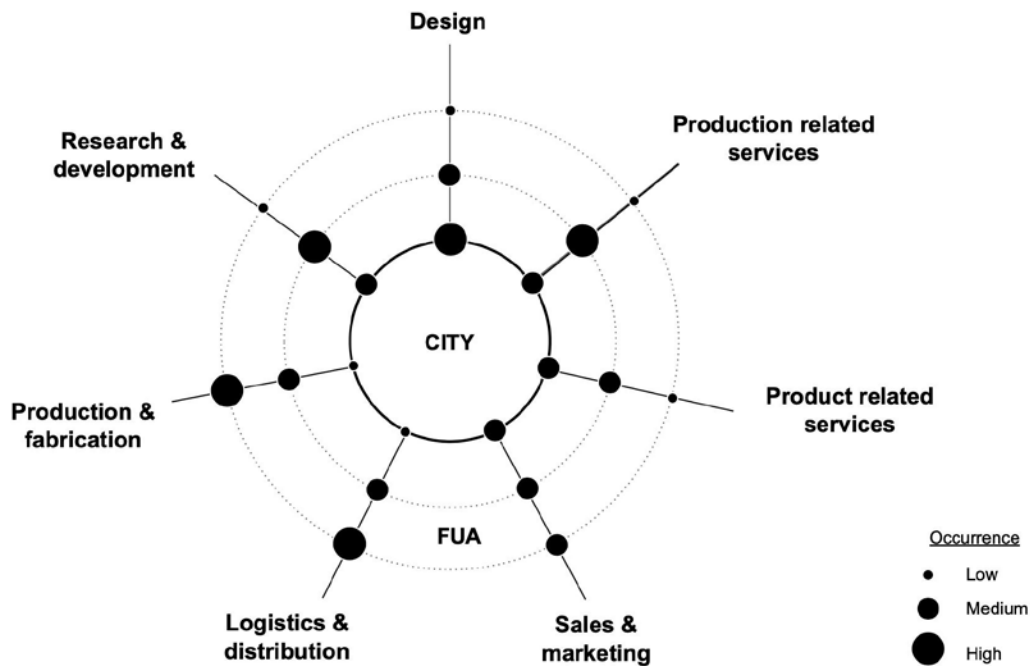
In recent years, cities have shown a more active role in supporting manufacturing and industrial areas in a range of other ways. For example, public investment has been used to stimulate business development of local start-ups, funding research and innovation that suits local clusters (Tierlinck & Spithoven 2018), subsidising low skilled job creation and investing in space for foundational manufacturing businesses that the city depends on. This shows that some public authorities are prepared to 'correct' the market and diversify local economies. The challenge is to refresh the possible roles and tools available to public administrations in addressing ambitions for industrial areas and manufacturing. Should the public sector focus on creating the best conditions for the market to act? Or should the public sector be actively involved in agenda setting?

4.1.2 What is the scale of action?

Should action be driven by strong city cores that can align their tax base, their high-skilled workers and research organisations? Or should the focus embrace metropolitan regions, where space is more affordable, where accessibility and transport costs are lower, where labour costs may be more affordable and where there is a lower likelihood of conflict between land uses?

The scale of action can impact the level of influence over the production cycle. As shown in Figure 4.1, the production cycle contains some seven steps. Some of these steps are more inclined to be located closer to the core city, in other cases activities are more inclined to be located in the metropolitan or functional urban area. For example, research and development is often located in or around universities or science parks which are often located on the edge of cities. Designers, by contrast, are often located closer to the city centre. Logistics and the actual production process often have a preference to be located closer to access routes, on affordable land that is not affected by neighbours. Considering this diagram, it is possible to see how some parts of the production process would be less attractive to certain businesses in the core city.

Figure 4.1: Seven steps within a production process and their likely occurrence within a functional urban area.



Source: Based on Bryson 2009, interpretation ESPON MISTA (2020).

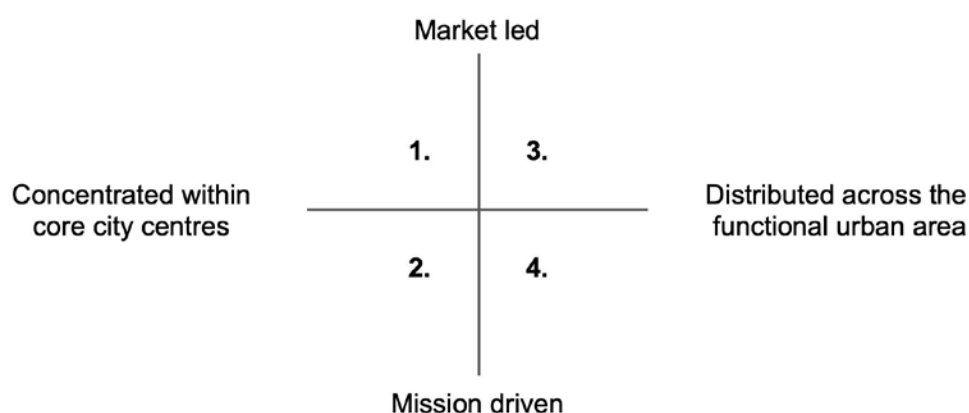
4.2 Four scenarios

Using these two simple questions, cities that are interested in addressing their productive sector will be presented with four scenarios and four distinct courses of action. As noted in Figure 4.2.1, the vertical axis refers to the question of the role of the public sector. *Market led* refers to providing space and conditions for action, without stipulating rigidly the kinds of activities that the market (or non-public actors) would respond with. *Mission driven* refers to an articulated agenda for the local economy which can be translated into a mix of: land use planning, investment in infrastructure, space, research and education programs, stimulus packages for businesses, instrumentalization of taxation, business development and so forth (see Mazzucato 2013). In Europe, both market-led and mission driven conditions require the public sector to make some determined decisions regarding land use; the key difference is the level of active participation from the public sector.

The horizontal axis refers to the scale of action. At one extreme is the *city core* which often involves a large local public authority which is far more powerful and richer than the surrounding municipalities, it may contain many important institutions like universities, hospitals and good public transport systems yet is also home to far more complex challenges (such as poverty, inequality, waste treatment issues, pollution, property prices, congestion and so forth). The surrounding municipalities or even region(s) may have very different priorities, histories and mindsets from the core city which ultimately creates tension. Some of the cities researched in this project, such as Berlin, Vienna and Oslo, are in this situation. Others, like Turin, Stuttgart,

Warsaw and Riga to a different extent, suffer from the same problems but have different levels of formalisation of metropolitan governance aimed at mediating these tensions.

Table 4.2.1: The two axes that define the policy scenarios.



Source: ESPON MISTA (2020).

Focusing policy at the core city may allow policy ambitions to move faster, but ultimately the cost of land, the possible land use conflicts, the congestion, the environmental regulation and inefficiencies in working in urban areas can outweigh the benefits for businesses (see figure 4.2.1). Businesses that decide to leave the urban core may not find attractive conditions outside of the city and may be more inclined to move a part or all of their operations offshore. By contrast, governing at the metropolitan scale or functional urban area (refer to section 1.3) space may be available to allow businesses to locate on a site that is most affordable, accessible and attractive while not losing access to a larger urban production system. Metropolitan scale governance has the downsides of involving many organisations and local authorities with very different interests and political priorities while being challenging to provide alignment between the winners and losers.

Governance options may be very limited while in other cases there may be opportunities to adapt priorities. The following four scenarios provide distinct opportunities for policy and planning.

4.2.1 Scenario 1: Creating space for activities in well protected zones

In this scenario, space should be made available for production and manufacturing, allowing the market to define functions.

Table 4.2.2: Scenario 1: Creating space for activities in well protected zones.

Opportunity:	Secure space for businesses based on the strongest demands of the market.
Policy:	Protection of industrial land. Definition of conditions for mixed use and industrial intensification. Ensure space is flexible and in suitable supply.
Public investment:	Zoning and planning documents. Financial instruments that stimulate but also help to shape the market.

	Policing of space to ensure that it fits within the scope of certain activities.
Challenge:	Ensuring that space is used for production. Ensuring that any form of densification remains suitable for productive activities. Ensuring mixed use zones work.

Source: ESPON MISTA (2020).

4.2.2 Scenario 2: Sustaining foundational productive activities & services

Focusing on creating space for foundational activities and services that the city depends on, on a daily basis. This can include food, waste management and construction. It could also include activities related to specialist knowledge clusters that are hard to detach from the city.

Table 4.2.3: Scenario 2: Sustaining foundational productive activities & services.

Opportunity:	Solve the city's basic needs locally to help boost resilience.
Policy:	Define the kinds of activities that are 'city-oriented' and stimulate them. Public ownership or control of land to ensure the capacity to define missions and set ambitions.
Public investment:	Public investment in securing a limited amount of space to protect foundational functions. Support & stimulation programs.
Challenge:	There is not sufficient critical mass of manufacturing for it to be viable. Spaces need to be fiercely protected and businesses need to be screened to benefit the most suitable actors. Finding the most suitable activities linked to the local needs. Possible conflict with state-aid.

Source: ESPON MISTA (2020).

4.2.3 Scenario 3: Providing a patchwork of land for production

By ensuring a wide variety of spaces or land is available in the metropolitan area, the most suitable activity will naturally find its place. Zoning is required to ensure that suitable conditions are available. The key point is to ensure that a suitable amount of land is available.

Table 4.2.4: Scenario 3: Providing a patchwork of land for production.

Opportunity:	Market driven. Flexible.
Policy:	Ensure land is available (through zoning). Ensure that land is being used for the zoned uses. Support businesses to find a site, particularly a site that is most attractive to the business' activity.
Public investment:	Zoning plans. Possible investment in sites for development. Facilitation services to link businesses to a site.
Challenge:	Poor coordination and piecemeal action can lead to a lack of a network.

	Poor influence of metropolitan scale competitiveness.
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Source: ESPON MISTA (2020).

4.2.4 Scenario 4: Developing an integrated maker region

Production and manufacturing are seen to have a strong role in the metropolitan scale economy. Mechanisms ensure that the metropolitan area can take advantage of its resources and competencies while distributing the profits fairly across the metropolitan area.

Table 4.2.5: Scenario 4: Developing an integrated maker region.

Opportunity:	Define and facilitate missions supported by public and private actors based on the strengths and competencies of each actor. Align local authorities.
Policy:	Clear open opportunities for collaboration. Using financial stimulus, marketing and communication and land ownership to orient markets.
Public investment:	Investment in real estate. Subsidies, (R&D) funding and finance. Communications. Tightly linked education and research actors.
Challenge:	Costly and time-consuming before results are evident. If there is a lack of trust of buy-in, it may not have huge (directly visible) pay-offs compared to some classic market-oriented development.

Source: ESPON MISTA (2020).

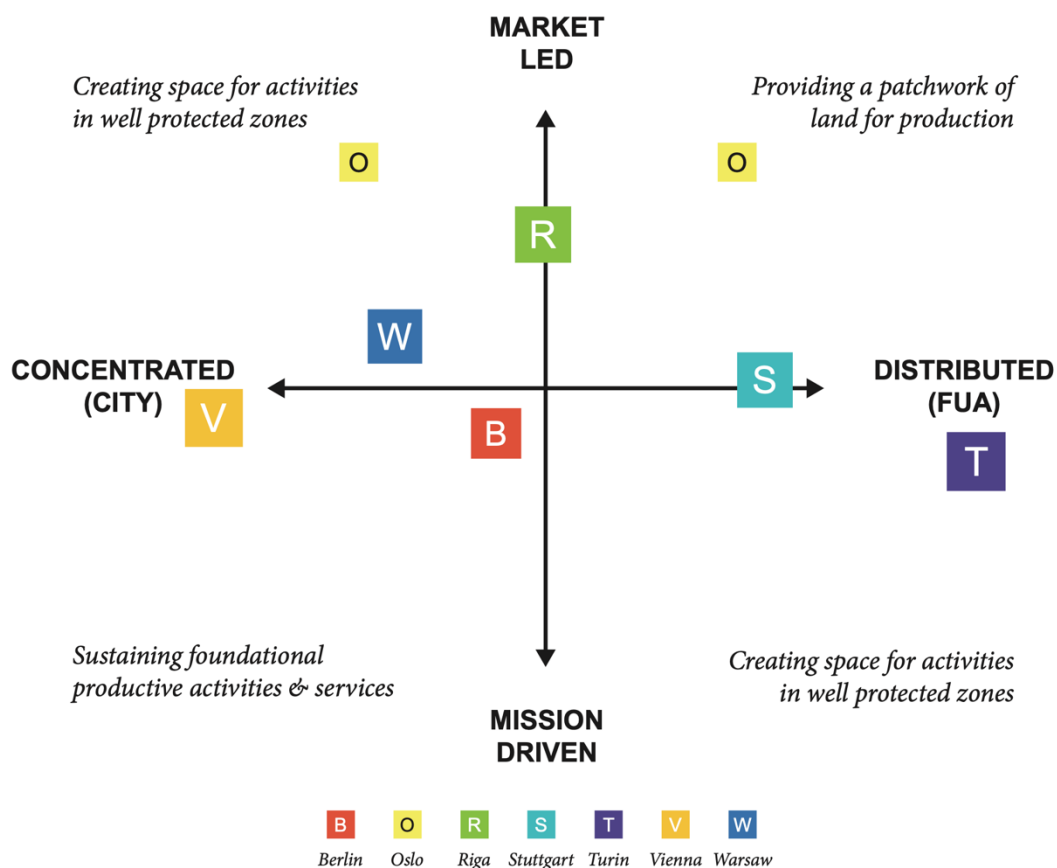
4.3 Reflection on the stakeholder cities

The scenarios presented above proved to be a very useful tool for interpreting what local stakeholders considered was the status quo and the ambition of the city or metropolitan area. The following interpretations emerged from a series of workshops conducted within the MISTA project between September and November 2020.

- **Berlin** is a large city-state. Covering a large surface but the larger Functional Urban Area is located in the neighbouring Brandenburg. Berlin has a range of policy that occupies various quadrants; however, its mission driven approach focuses on its own territory primarily. In practice due to political differences, Berlin focuses on its own territory. This makes it city oriented and between market oriented and mission driven, aiming to sustain foundational productive services and safeguard manufacturing in well protected areas. Considering the circumstances, its ambitions will remain this way.
- **Oslo** is a city which recently has lost its metropolitan planning scale. The city is strongly market oriented and functions most effectively at the city scale but has good relations with the neighbouring municipality. Interestingly, Oslo has ambitions to become far more mission oriented yet considering the topography and planning conditions in the city, it will remain active in the same zone.
- **Riga** has been increasing metropolitan cooperation for some two decades and is beginning to see the fruit of its efforts through a form of metropolitan cooperation. Over the last three decades, development has been very market driven and therefore their area of action sits between the city and metropolitan scales.

- **Stuttgart** is the only city with a strong functional metropolitan area and governance framework (the Verband Region Stuttgart) and a very dynamic industrial sector making it both mission oriented and operating on the metropolitan scale. This is an ambition that is intended to be kept.
- **Turin** follows Stuttgart in operating at the metropolitan scale (CMT0). Yet unlike Stuttgart it has a far more diffuse governance platform and the mission focus on the automotive sector is waning. Likewise, there is a diffuse perception of the need to find a new metropolitan leadership to build alliances in the metropolitan area. Regardless, Turin is oriented to reinforcing the metropolitan governance, to building upon vehicles or associated sectors, but also on some new emerging sectors.
- **Vienna** follows Berlin in the sense of having a strong and relatively large city-region with strong policy regarding the productive sector, but poor cooperation with municipalities in the larger metropolitan area. However Vienna does have ambitions to take a mission-oriented approach while operating at the metropolitan scale.
- **Warsaw** is in some ways in a similar situation to Riga. Currently the focus is market driven and focused on the city scale. Yet metropolitan cooperation is growing and could provide opportunities to become more mission oriented.

Figure 4.2: How the stakeholders from the seven cities positioned their city's current approach to planning.



5 Atlas of inspirational cases

Task 4 of the MISTA research project aimed at contributing to enhance stakeholders' and places' capacity to develop forward-looking strategies, innovative policies, effective tools, as well as governance frameworks to deal with the changing nature of the industrial sector and its role in the city. In order to enhance decision makers' and policymakers' place-based capacity in confronting the changing role and nature of the industry in the city, an Atlas of inspirational cases has been developed. This latter is conceived as a selection of "inspirational stories" able to stimulate knowledge transfer in supporting stakeholder cities in the development of potential strategies, effective tools and innovative policies. Therefore, the final aim is the development of a database that will be easily accessible for consultation. It should be recalled that the rationale behind the selection of cases is not picking up good examples or ready-to use solutions that can be transferred (copy-paste) but rather produce usable knowledge able to create discussion and reflection defining what are the pre-conditions for the implementation of these cases.

5.1 Seeking inspiration to produce a reflective learning cycle

Industrial areas, urban manufacturing and productive activities in European cities are exposed to similar trends and challenges, as described in Chapter 1 and 2. However, the strategies required to support and strengthen local economies and business dynamics are often unique to a city's history, culture, urban form, and financial health.

The role of the public authority in addressing this topic is evolving. The spatial strategies that can be employed depend on a range of variables such as political ambition and leadership, the competency and resources of the city's institutions, the capacity for collaboration from the private sector, available infrastructure and the intensity and density of collaboration among the networks of its industrial businesses and public actors, the governance and government structure supporting territorial cooperation (see Chapter 4).

Within a wide set of solutions and experiments developed and adopted by cities and metropolitan areas to tackle the dynamics described in this report, some of them have the potential of working as "inspirational cases", for their capacity to stimulate the production of a reflective learning cycle. Rather than a list of best practices, the project has identified "inspirational cases" selecting among those projects and solutions which seem to be able to produce not merely a process of knowledge transfer, but a process of innovative, situated, strategic and place-based cycle of knowledge co-production. In this respect, inspirational cases have been identified primarily subject to the relevance and application to the specific features and conditions of the seven stakeholder cities. However, they have been identified and studied to be relevant to a vast range of other European cities experiencing similar problems and trends.

Drawing from existing scientific literature and policy documents, as well as from case studies results and through the interaction with the project stakeholders, the project has identified and explored 26 inspirational cases based on the four following criteria:

Table 5.1.1: Protocol for selecting inspirational cases: foundational principles.

<i>Usable knowledge</i>	Relevance and transferability Policy mobility and knowledge exchange cannot take place simply out of the blue: what general conditions are necessary to start a knowledge co-production cycle? Inspirational cases are a levy of action-research.
<i>Situated and differentiated knowledge</i>	Appropriateness Policy mobility and knowledge exchange are possible, if solutions are identified in relation to the characteristics of the context interested in them. Inspirational cases" have been selected in relation to the specificity of their contexts and in relation to the specificities of the stakeholders' cities contexts.
<i>Integrated policy approach</i>	Capacity to support an integrated and sustainable development approach. Solutions must be as complex as the problems they are going to tackle. A special focus has been assigned to the spatial nature and impact of solutions, where space is conceived as a crucial integrator of policy dimension. Space-aware innovation is considered a crucial resource to generate integration beyond sectoral policies.
<i>Place-based approach</i>	Capacity to activate a wider place-based policy innovation cycle. Policy mobility and knowledge exchange cannot take place top-down; a place-based approach is the one that counts on the knowledge and resources embedded and available, or further to be built in places. Solutions shall be based on an active and dynamic involvement of stakeholders and society at large.

Source: ESPON MISTA (2020).

Based on these four criteria, an Atlas of Inspirational cases has been produced (see Annex 4) and tested during the Future workshops; then used in the occasion of the Inspirational cases workshops in order to start the knowledge production cycle, create a common language to tackle the problems and opportunities presented in this report, feed a policy design process.

5.2 Four families of inspirational cases

The inspirational cases have been clustered into four categories in order to be selected and discussed.

- **Visions and strategic frameworks.** To create momentum or to galvanise a movement, a vision is vital. A vision may be translated into governance framework and/or policy. A mission-oriented approach (Mazzucato, 2018) may target specific issues such as the circular economy or low carbon mobility, within a more general vision, trying to provide a new definition of a problem, elaborate new ideas of the future, produce new spatial imaginaries, and generate consensus. Visions generally depend on soft power and therefore require stakeholders to sign up to the vision for it to be enacted, which may be politically challenging to achieve. If vision documents are credible, they can replace official policy. A vision may result in plans or concrete projects. Strategic planning processes try to channel stakeholders towards shared or at least in common definition of the problems and possible spaces for cooperative focussed action, often entering in the economic development sphere.

- **Plans and policies.** Plans are developed to structure or channel investment into a particular site or to address a particular issue. Neighbourhood development programs an urban design plan could focus on an area or on a piece of infrastructure like a road and will define proposed interventions. Urban plans can introduce specific attention to the preservation of a specific function or to support new development. Programs may focus on rolling out a particular issue.
- **Tools and programs.** Public authorities often develop plans that are executed through private investment and controlled by zoning regulation or development conditions; sometimes they can play a direct public role, also based on partnerships. Programs may also be attached to financial instruments such as taxation or special investment into projects. Regulative tools, incentives (financial), coordination tools and agencies are crucial to make plans operative and feasible.
- **Projects.** Public investment is often needed to cover essential infrastructure, to pioneer new technology and showcase new development approaches. Projects can involve services such as training, education, research and development in order to activate spaces. Projects may be public or private. Concrete interventions that could address hardware (space and technology) or software (capacity building, skills and management). They can be part of a larger framework (plans and policies) or standing alone pilots (i.e. new building typologies, infrastructures and incubators).

Based on these four families, 26 inspirational cases have been identified:

Table 5.2.1: List of the inspirational cases analysed divided by category (see Annex 4 for the cases' full description).

Visions and strategic frameworks	Plans and policies
2.1 Berlin Urban Development Plan (UDP) Economy 2030	3.1 London Industrial Intensification Study
2.2. Brussels Circular Economy Plan	3.2 Planned Manufacturing Districts (Chicago, USA)
2.3 Greater Manchester Local Industrial Strategy	3.3 Salzburg: data collection
2.4 Wirtschaftsförderung Region Stuttgart GmbH (WRS) – Stuttgart region economic corporation	3.4 Strijp-S, Eindhoven
	3.5 The strategic plan of Hovinbyen (Oslo)
	3.6 Vienna Business Districts
Tools and programs	Projects
4.1 APEA - Aree Produttive Ecologicamente Attrezzate (Eco-Industrial Parks), Italy	5.1 Brussels' Abbatoir
4.2 Berlin Initiative for New Municipal Craft and Trade Centers	5.2 EETGS & Guardians of the Arch
4.3 Bouwmeestar Maitre Architecte	5.3 Hotels industriel, Paris
4.4 Citydev.brussels	5.4 Ile de Nantes, France
4.5 Fiscal compensation at Metropolitan Level, Bologna	5.5 I3P business incubator (PoliTo), Turin
4.6 Małopolska Regional Development Agency	5.6 Lageweg, Antwerp

4.7 Strategic Dialog on the Automotive Industry (SDA, Germany)	5.7 Lavazza Headquarters, Turin
4.8 Vienna Adult training and Labour market policy agency - waff	5.8 RDM, Rotterdam

Source: ESPON MISTA (2020).

5.3 Being inspired

The collection and analysis of the Inspirational cases has highlighted a consistent series of considerations and reflections for stakeholder cities and Eu metro cities at large.

1) The need of new analytical lens and monitoring tools.

The first consideration speaks up to a wider public - policymakers and institutions, academics and entrepreneurs - and basically concerns the growing and shared awareness of the need to develop new analytical approaches. We need to restructure the way data is collected to grasp the nature of the contemporary manufacturing sector. The discussion with the stakeholder cities and local actors, together with the methodological approach conducted in the MISTA Project confirm the mismatch between the changing nature of the manufacturing system and the official portrait produced by national and local statistics. The selected inspirational cases highlight on the one hand how actors are striving to identify the new and differentiated nature of the manufacturing activities, to feed a new generation of policy and plans able to support, consolidate, feed a new relationship between the city and the industry. Nevertheless, there are still consistent blocks to developing new analytics.

- Innovative local experiences like that of **Salzburg: data collection** (see annex 4, case 3.3.), show the efforts needed to move from statistical analysis towards a qualitative and updated analysis of the dynamics. Faced with increasing conflicts over land use the City of Salzburg decided to develop and finance a land use monitoring tool that allows for an analysis of the changing land use patterns within the city. The process involved analysing actual activity through onsite observation. This approach ensures that policy makers know what is happening on the ground rather than relying on the shortcomings of statistical data which can easily overlook multiple occupancies on a site or discrepancies (such as retail on industrial land). For cities experiencing increasing conflicts over land use, the lack of reliable data and objective information often prove to be a major impediment to conflict resolution as well as to planning processes. Existing readily available administrative data sources are often either unsuitable for the needs of the city or characterised by important weaknesses that make their interpretation difficult. Originally run in 2004, the survey was repeated in 2011 and 2019 on occasion of the updating of the spatial development plans. These updates therefore resulted in a database that also allowed for tracing the evolution of actual use of areas in the city over a one-and-a-half-decade period and to link these changes to zoning regulations. The analyses conducted with these data allowed for a number of important insights into the effects of zoning laws on the actual use of buildings over time.
- **The Greater Manchester Local Industrial Strategy** (see Annex 4, case 2.3) was instituted in 2011, based on powers and resources to be agreed on through individual, bi-lateral intergovernmental deals and governed by a local elected major. It is now operating with strong competencies, supported by large scale functional bodies. Its functioning heavily depends on the 'city deals' signed with the nation state: six agreements were

signed between Greater Manchester and government between 2014 and 2017, mainly related to transport, economic development, the labour market, and the built environment. In 2019 the Greater Manchester Combined Authority elaborated its Industrial Strategy. The strategy is based on a careful investigation of the local situation in all 10 districts (Prosperity Review), which concluded that, despite a consistent process of restructuring of the economy, the Greater Manchester has still a strong manufacturing base, but the share of low-paid jobs in foundational economy is growing, so does the internal inequalities of economic potentials among the 10 districts that compose the Greater Manchester. In order to reverse this process, the Industrial Strategy aims at increasing the innovation potential in different fields and stimulating territorially balanced growth. A consistent effort to create evidence-based statements, a wide partnership between the different actors to contribute to the planning and implementation of the strategy, strong lobbying power towards the national government are crucial elements for such an initiative, which is not easy to replicate, but can be adapted to less structured governance frameworks.

2) Visions, problem setting and a metropolitan governance: generating new awareness and capacity to react.

A second consideration moves from the idea that a metropolitan/regional perspective, together with a new understanding of the manufacturing sector can consistently contribute to a better awareness of the problem and guide the formulation of new visions. Indeed, cities are not all the same and are experiencing different situations, from deep crisis to high competition for economic functions, from strong actors' collaboration to high fragmentation and competition. The process of conceptualising the situation is a crucial one, it needs momentum, capacities and leadership. The four inspirational cases analysed represent the potential displayed by a regional/metropolitan governance framework in developing an integrated territorial strategy, as well as the fragility and complexity of developing a shared vision of the problems to be addressed. Despite not being representative of the whole range of situations, they ideally move from a more structured governance framework able to support integrated strategies and visions, to more voluntary, incremental forms of mobilization based on a tactical approach. In all cases, the public sector is playing a major role in trying to put forward looking frameworks based on a future prospect of the city-industry vision. Transcalar alliances are evidently crucial, but at the same time, also at city level, visioning and strategic planning can be elaborated and shared with stakeholders.

- Further to the above mentioned case of The Greater Manchester local industrial Strategy, that also highlights the role of strategic planning, and in the absence of a form of metropolitan government, an interesting process of visioning supported by strategic dialogue among stakeholders is the **Strategiedialog Automobilwirtschaft “Strategy Dialogue on the Automotive Industry” (SDA)** in Baden-Württemberg (see Annex 4, case 2.4), an institutionalised collaboration to foster strategic dialogue within the automotive sector in the Baden-Württemberg context with politics, industry, universities, employee associations, consumer organisations, environmental associations and civil society. This initiative established by the state government of Baden-Württemberg is essentially directed at mobilizing projects and policies capable of projecting the automotive industry into a “new climate-friendly age of mobility” (Baden-Württemberg, 2018, p.5). The rise of e-mobility in fact, represents both an opportunity and a threat for the car industry.

Therefore, discussing the future of the automotive industry, which is the dominant sector in the region, is paramount. The SDA initiative, which involves all the relevant stakeholders in the region, is structured according to “six main topics covering the entire value-chain” (ibidem, 2018). Working groups have been discussing the state of the art and the future trends of the industry in the next 7/10 years in order to implement targeted strategies and projects which are aimed at easing and supporting the disruptive changes affecting the automotive sector.

- A similar but different case is provided by the **Brussels Circular Economy Plan** (referred to as BeCircular) see annex 4, case 2.2: it is a framework developed by the Brussels-Capital Region to "encourage the transformation of a linear economy (extract - produce - consumer - dispose) into a circular economy (reclaim - produce - consumer - reuse) within the Brussels-Capital Region". Lacking a strong metropolitan government structure, as well as aiming at providing a new vision among stakeholders, it has adopted a solution heavily founded in diplomacy. Essentially, the format allows progress without getting stuck on political nuances that may impact more traditional spatial planning. The decentralised approach, which included over 100 distinct actions, has allowed for a vast range of different actors to get onboard. In this sense, the concept BeCircular offers is a model that could be easily transferable to other contexts, particularly where governance is less fragmented than in Brussels. It increased awareness and communicated the general ambitions of the circular economy. It has given smaller and ambitious businesses the opportunity to take risks. It has created a space for inter-institutional collaboration and put Brussels on the map as one of the forerunners of circular economy policy. While not necessarily stipulated, it has created a ‘mission driven’ policy approach that has cascaded into other areas such as agri-foods (the Good Food plan) and mobility (the Good Move plan).

3) The role of spatial planning: reinventing planning to reinvent the manufacturing city.

A third bundle of considerations is related to the role that spatial planning can play in fostering a new dialogue between the city and the industry in contemporary societies. The inspirational cases selected under this perspective present different interpretations of the role of spatial planning, ranging from a strong regulative approach based on traditional planning functions like land use regulation and zoning, to a design reflection on new spatial patterns to host the industry in the city, passing from the experimentation of urban regeneration strategies and the design of new industrial functions in the fringes of the urban region. Finally, cities also look for a new dialogue between spatial planning and economic actors, in order to reduce the communication and knowledge gap and reinforce the co-production of knowledge as the basis for a more efficient planning process. All in all, the inspirational cases show the effort that spatial planning is doing in order to reinvent itself in relation to the need to support a new economic base for the city.

- **Integrating industrial development strategies in the spatial development strategies of a city.** The development of spatial development strategies for the production integrated into a general spatial development strategy is a challenge for many European cities, in the face of an increasing scarcity of land. Berlin has rapidly moved from being a place with ample free space and demographic decline to a demographically growing city with an increasing shortage of land in face of competing economic functions. In consequence the existing spatial development objectives on industrial land formulated in 2011 were becoming increasingly outdated and contested by many stakeholders. During elaboration

of the new planning framework on industrial land, a broad participation of key stakeholders in economy and politics led to an acknowledged consensus on future requirements. Agreed on by the Berlin Senate in 2019, Berlin's Urban Development Plan (UDP) Economy 2030 (see Annex 4, case 2.1) establishes the planning prerequisites on a city-wide level, especially for a strategic safeguarding of industrial land, a rapid activation of potential new sites and a more efficient use of the existing industrial land through intensification. On account of its clear political commitment to production in the city and the clear definition of the areas for future development, it has also contributed to increase planning security for enterprises and investors. It is now clear that keeping and developing production in Berlin are key priorities for the city and it is also clear how and where the city intends to implement this priority.

- **Preserving land use for industrial activities.** in the 1980's, Chicago took a radical decision towards strict zoning which essentially allowed fifteen zones to follow a different evolution from the market. Many cities have industrial zoning however Chicago's rigid zoning has ensured that only a narrow range of activities can occur in those zones. The objective of Chicago planned manufacturing districts (see Annex 4, case 3.2) was to define clear land use activities, to ensure that a mix of business types and production can still occur in an expensive centre such as Chicago, to avoid temptation for speculation. This is by no means unique to Chicago but represents a condition that many cities under development pressure are increasingly encroaching on and therefore impacting the capacity for industrial zones to remain refuges for noise, odours, heavy vehicle traffic and other activities that are not compatible with residential areas. There are two particular types of actors involved. Firstly, the City of Chicago which is responsible for administering and protecting the zoning. Secondly each PMZ has its own community structure which in some cases has been formalised through a community-oriented organisation responsible for supporting local businesses or business development. This offers useful insight for policy and planning to ensure that the 'hardware' defined through land use planning can be stimulated through 'software' provided by place-based organisations.
- **Industrial intensification, with new urban typologies economically viable solutions.** With less than 3% of London's employment working in industrial activities, the city still contains the largest number of industry related jobs for a UK city. Over the last 50 years, industrial land has been rezoned or appropriated in an often-piecemeal fashion. Public authorities have begun taking industrial land-loss seriously. The Mayor of London has committed to 'no net loss' of industrial land to manage future losses. The **London Industrial Intensification Study** (see annex 4, case 3.1) was commissioned to provide guidance on the acceptability of industrial intensification and co-location with residential activities and to test the viability of various proposals. The innovative idea is that developers can intensify industrial activities (such as stacking activities vertically) which opens the possibility also to provide a number of benefits of integrating other land uses on the same site (such as housing). The net result could be both intensification of industrial activities, more effective use of land and additional space for other land uses (such as housing). The study consisted of five key aspects: *defining and measuring industrial intensification*; *providing Specifications for development and indicative construction costs*; *Urban scale guidance*. To provide guidance on the development of industrial intensification and associated co-location with residential, beyond the individual site boundary. *Testing proposals*. Through a 'research by design' approach, four sites were tested to show industrial intensification could occur in practice in London. *Synopsis on viability*. This provides general feedback on feasibility issues and potential barriers. It also considers opportunities for investors and developers while considering how public sector intervention may be required.

- *Rethinking the industrial past, through innovative regeneration approach*: The city of **Eindhoven** constitutes a remarkable case for rethinking its industrial past. The **Masterplan Strijp-S 2002** (see Annex 4, case 3.4) is the strategy to redevelop the former industrial areas Strijp-S as a creative and cultural area and to promote its (inter)national reputation, and rediscovery as industrial heritage. The aim of the project is to transform a declining post-industrial area owned by Philips into a vibrant innovative district. The regeneration scheme builds on the close synergy and cooperation among various institutional actors: regional and local, and a strong collaboration between the public and private sector. The area hosts a mix of uses - cultural and innovative industries, offices, residential and commercial spaces, public amenities, etc. The purpose of urban design is to preserve industrial heritage while also looking at the evolving future. This has been achieved through the close synergy and collaboration among different governance levels (regional and local). The redevelopment scheme builds on flexibility and adaptability, which allows the masterplan to be incrementally adjusted over time through an experimental approach in the planning process. Moreover, knowledge and technology, quality of place, and organizational capacity play a key role. Strijp-S has become the largest urban redevelopment area in the NL and has gained international recognition as part of the Brainport region, internationally recognised as a leading “smart region”. The city in connection with its surrounding region has successfully reinvented itself as the major technology node of the Netherlands. Its successful economic development is not only based on technology but has been carefully supplemented and merged with activities linked to creative design, considered indispensable for economic competitiveness.
- *The inner fringe as a crucial planning resource for a new industrial revolution*. The case of the **Strategic plan of Hovinbyen (Oslo)** – see annex 4, case 3.5 - introduces the example of a special planning tool developed by the Oslo Municipal Agency for Planning and Building Services, to frame spatial transformation on an urban fringe as a pillar of a wider spatial perspective. The plan provides non-binding policy guidelines for public space as a framework for public investment in infrastructure, green/ blue space, to be followed by private developers. Oslo is one of the fastest growing cities in Europe and the city has limited expansion opportunities, due to its topography and the protected forests around the city. For these reasons Hovinbyen, the urban fringe between the inner city and the largest post-war urban enlargement in Norway (Groruddalen), is proposed as a key development area for Oslo's growth. The 2015 municipal plan of Oslo has set the target of building 100 thousand additional housing units by 2050. Hovinbyen has been considered as a prioritised area for transformation and urban development, developing the area incrementally from being an underutilized mono-functional barrier between the city and the suburbs, to becoming a denser, multi-functional part of the urban fabric. However, the city recognized that if residential use will become possible, sooner or later the industry will be pushed out. Therefore, a strategic plan was prepared in 2016 for Hovinbyen, to secure functions which would not otherwise be built under a purely market-led transformation. In the course of developing the plan in 2015 an architectural and idea competition and an international conference were organized, followed by a comprehensive information and participation scheme to strengthen the knowledge and understanding of the area's potential and the central elements of the plan. The plan approved in 2018 shows how the municipality can become a driving force of the transformation process, use more resources in collaboration both with private stakeholders and between the municipal agencies, and see municipal interest and investments as an opportunity to facilitate and create innovative pilot projects that can provide role models for private developers.

- *Linking spatial planning to entrepreneurs.* The case of **Vienna Business Districts** (see Annex 4, case 4.8), shows how it is possible to develop new relationships between spatial plans and enterprises in order to keeping local policy makers well informed about the day-to-day problems of urban producers and supporting networking among decision makers and ensuring a high degree of information on planned policy initiatives dedicated to economic actors, in particular, small and medium sized enterprises. At the same time policy makers often regretted the poor connection and embeddedness of enterprises to their locality and the lacking networking among local enterprises. The Viennese Chamber of Commerce (Wirtschaftskammer Wien) and the Vienna Business Development Agency have established a system of district managements that is known under the umbrella brand name "Vienna Business Districts". They support companies operating in the enterprise zones defined by the Vienna spatial development plan in establishing themselves locally. In addition, they offer a platform for networking between companies and are also tasked with networking the companies with one another and with the political decision makers at the district level and/or with the city administration. District managers act as contact persons on site and are in continuous contact with all active stakeholders: they are expected to facilitate and accelerate the settlement process of newly founded enterprises, to help enterprises moving to Vienna in their search for suitable locations and to provide existing enterprises with information on funding opportunities. They are also expected to provide local information on the day-to-day problems of existing enterprises to local decision makers.

4) Innovative tools to operationalising the new relationship between the city and the industry.

A wide range of tools have been designed and implemented Europe-wide to represent a viable solution to address problems: public and private agencies and incubators, as well as fiscal tools and models of business parks are interpreting in different ways the need to develop operative spaces able to implement visions and strategies and to support spatial planning decisions. The public actor in this respect is particularly investing on these kinds of initiatives, at different scales and with different models of public action.

- *Providing space for small and medium enterprises at affordable prices in the city.* Faced with rapidly increasing rents and land prices many craft and trade enterprises located in Berlin's inner city find it impossible to find affordable space for new locations or expanding their sites. In consequence, many of them relocated to the outskirts of Berlin in recent years. As now a subsequent shortage of services provided to the population by such enterprises in the inner city occurs, the Berlin Senate Department for Economy in cooperation with the Berlin Chamber of Crafts and WISTA (a municipal site developer) started an initiative to build new municipal crafts and trade centers ("Gewerbehöfe"). Its aim is to provide affordable rental space for in particular small and medium sized craft enterprises (for "Berlin Initiative for New Municipal Craft and Trade Centers" see Annex 4, case 4.2). It is a concept with a long tradition in Berlin, dating back to 1965 when the city purchased its first Gewerbehof and founded a municipal company that later owned dozens of centers. Unfortunately, due to Berlin's debt crisis in 2001, the city sold most of its shares in the company. Over 50 formerly state-owned Gewerbehöfe still exist but operated under private management with market-oriented principles they do not fully satisfy the demand, inter alia because only few of the tenants in these premises belong to the crafts. Berlin's "Initiative for New Municipal Craft and Trade Centers" now addresses the problem.

Currently plans for three city-owned locations are being scrutinized. The new Gewerbehöfe, are planned to provide affordable space not only for the crafts, but also for other socially beneficial uses in need (e.g. Kindergarten) and to be differentiated according to the concrete advantages of their respective location.

- *Supporting small and medium size business and municipalities to promote a new generation of industrial sites based on the principles of industrial ecology.* Instituted by national law in 1998 inspired by the experience of Ecological industrial parks, the **Ecologically Equipped Production Areas (APEA)** – see Annex 4, case 4.1 - have been implemented in different regions in Italy. Being based on the principles of industrial ecology they aim at “closing the cycles” of matter, water and energy, as well as at sharing main environmental services (water, energy, waste) among the industrial activities located inside a productive site and optimizing of the organization of activities that generate impacts on the environment. When settling in these areas, industrial activities can count on the most advanced infrastructures and systems necessary to ensure the protection of health, safety and the environment; at the same time, they can count on forms of unitary management and from the simplification in the acquisition of the authorizations to run their activities and use those services. APEA have been instituted in order to feed a new generation of manufacturing sites, as well as to support the rehabilitation of existing and out-dated industrial sites, with a specific attention to supra-municipal sites and initiatives and the reduction of land consumption within an integrated spatial vision. The aim of the institutive law was to reduce the complexity and costs of the settlement procedures for new businesses and activities. Special funds for the production of infrastructures and services were to reduce the settlement costs for companies, while the introduction of a unique management body, often in the form of a Consortium (public or private, local or supra-local) was to introduce coordination among private and public actors, especially trying to support small and medium size companies, as well as small and medium size municipalities, in the production of innovative and sustainable facilities, equipment and infrastructure provision.
- *Agencies for attracting industrial activities in the region.* Moving from the city to the metro-regional dimension, the **Citydev.brussels** initiative (see Annex 4, case 4.4) is a publicly owned development agency that operates at the scale of the **Brussels Capital Region**. It is a QuANGO – a quasi-non-governmental organisation, owned by the Region of Brussels, but functioning under a private structure with a public mandate. It is responsible for economic planning and is involved in area development, innovation, matchmaking opportunities, investment and to some extent community engagement. Cities that are interested in developing functional mixed-use activities need champions to showcase how mixed-use and new industrial intensification projects can be successfully developed in order to not only challenge market trends but also to show leadership. The aim of Citydev, a public-interest company, is to provide developers the vehicle for leadership and risk-taking. The latter are particularly experienced in housing or commercial space and interested in and most able to finance mixed use development projects. However, they generally have little experience with mixed use projects that involve activities with high potential for conflict and therefore are also most inclined to prioritise the most profitable and less conflictual project. Citydev works in three different directions. Firstly, it aims to provide space, particularly for key workers by developing affordable (subsidised) housing aimed at keeping key middle-income families within the region. Secondly, it aims to attract and retain industrial, semi-industrial, craft and service companies with high added value in the region by offering real estate infrastructure (land or buildings) at attractive conditions and prices. More recently, the company has begun developing mixed use projects based on new regulation allowing for mixed use in several key areas across the region. In this

respect, Citydev helps to enact government policy and best practice and provides a pioneering role in developing new building typologies and implementing new construction standards (for energy, water, waste...).

- A stronger example of Public Agency, with a consistent role of the public sector and acting at a regional level, is the **Małopolska Regional Development Agency** (see Annex 4, case 4.6), which has been active for 25 years, established to increase the competitiveness of entrepreneurs from the Małopolska Region (area surrounding **Krakow**). The agency provides both the hardware (space) and software for business development (skills, funding and support). It supports companies at every stage of their development. This includes comprehensive financial know-how, investment, consulting and training assistance, supports start-ups and established businesses to access an international network, while promoting the region's economic brand. It is a key institution for regional development. Also, it helps national institutions and regional governments to shape policy for innovative regional development.
- *Integrated policies to support the economic base of the city.* Dealing with the impact of structural change on urban labour markets is a central policy concern for policy makers in Europe. Most cities are experiencing a noticeable shortage of high skilled labour, while at the same time unemployment of mainly low skilled workers is soaring. To address these issues, the city of Vienna joined forces with the local social partners to fund an agency dedicated to the administration, development and organisation of city funded active labour market and adult training policies. The **waff (Vienna Adult training and Labour market policy agency)** – see Annex 4, case 4.8 - represents an example of an institution that administers, designs, and organizes tailor made active labour market and adult education policies in an urban context. The mission of the agency is to promote the professional development of employees in Vienna, who are seeking to enhance their skills. Specifically, the WAFF is the only organisation servicing both the employed as well as the unemployed in Vienna. According to the most recent annual report in 2019 it supported 844 enterprises and over 37.000 residents with training and other measures and had contacts and consultation with over 150.000 customers. Next to these funding activities it also analyses recent trends on the Vienna labour market, repeatedly commissions studies focusing on recent labour market trends and/or specific target groups among the employed or unemployed as well as conducting evaluations of its individual initiatives.
- *Fiscal tools to develop territorial cohesion and support small inner municipalities and territories in economic competitiveness.* **Città Metropolitana di Bologna**, in the process of developing its new territorial plan (currently in the phase of formal approval), has introduced the so called “**Fiscal compensation Fund**” (see Annex 4, case 4.5). This consists in the possibility to share at metropolitan level the fiscal revenues generated by urban transformation projects at municipal scale. It is based on the Territorial Equalization planning principle and aims at building equity and effectiveness in the territorial policies with wider territorial contexts, through an equitable distribution of the costs and benefits connected to the design of territorial policies and project, trying to reduce the negative effects of a blind competition between municipalities. The compensation fund is to be generated by the share of urbanization costs supported by private actors and tax revenues resulting from the implementation of the interventions agreed in the context of Territorial Agreements. The compensation fund will be managed by the Città Metropolitana and used to promote urban regeneration projects, infrastructural programs and policies in less competitive territories. Metropolitan cities are important recently established institutional bodies, but not supported by a fiscal levy. The fund, with an estimated value of 10 million euros a year, is meant to consistently support the capacity of action of the metropolitan government towards territorial cohesion. In particular, it will support new productive

settlements and strengthen inter-municipal cooperation. It aims at developing territorial cohesion and reducing the weakness of small inner municipalities and territories in economic competitiveness.

- *Contributing to a qualitative development for projects with high urban impact.* Cities with more market-oriented economies do not necessarily deliver projects that benefit the local economy, and which fit into the urban context. This is not necessarily a question of the developers, both public and private, not wanting to contribute to the economy. It is also a matter of decision-making and development often being decentralised and not having suitable guidance or support in the development process, from concept to implementation. Many cities have implemented solutions, such as design review bodies, which help protect scenic quality or help moderate urban design principles. Some cities have instituted Chief architects, which have the specific role of mediators in development processes for projects that have a considerable urban impact on the city. It is the case of the **Bouwmeester Maître Architecte (BMA), the Brussels' Chief Architect**. BMA (see Annex 4, case 4.3) provides a service, upon request, to both public and private developers in exploring design feasibility, defining briefs, providing competitive tendering and advocating for good policy related to design. The BMA has been contributing to translating political ambitions and legal conditions for new mixed-use buildings, industrial intensification projects and economic development sites. The BMA has a five-year term and is selected in a similar fashion to a festival curator with a vision the role should play for the upcoming term. The chief architect is financed publicly but retains independence from the mandate of public institutions and the opinion of elected officials. The role is supported by a team, in 2020 there were 16 staff predominantly consisting of architects and urban planners, who are employed through the regional planning agency (perspective.brussels) .

5) Innovative urban and architectural design solutions.

The design of innovative functional and spatial solutions is one of the major challenges to both the public and the private sectors. Single initiatives or pilot projects have been developed during the last decade in order to contribute to a new dialogue between the existing urban fabric and a manufacturing sector which is radically changing its nature and scope. Moving from large-scale infrastructures redevelopment to small and medium size neighbourhoods in the city centres or in the urban fringes, pilot projects experiment basically the reuse of abandoned spaces, trying to provide new conditions of coexistence between economic functions and liveability. Functional mix, quality of built up and open spaces, participation of local entrepreneurs and citizens are ingredients of pivotal experiences that are trying to subtract manufacturing spaces from traditional real-estate dynamics: the role of the public in this sense is still determinant, but the emergence of new actors, universities, foundational economy activities together with the new entrepreneurship of local business is producing a mix of initiatives that are managing to put forward innovative solutions.

- *Reinventing large scale industrial infrastructures.* **RDM Campus** (see Annex 4, case 5.8) is a hub for education, research and development and prototype, located in a former ship-building wharf on the south side of the Nieuwe Maas River, four kilometres west of the city centre. Where previously famous ships like the steamship Rotterdam were built, the former shipyard of the RDM now offers space for companies, education and research. The building brings together formal technical training, space for start-ups to carry out

research and development and facilities for events and showcasing work, particularly with a maritime focus. The building is part of a larger development program referred to as the Rotterdam Makers District which involves the redevelopment of a former wharf area with a focus on mixed-use typologies. Two main actors support RDM: the Havenbedrijf Rotterdam which is responsible for developing the site and the Hogeschool Rotterdam that provides the training and facilities which it refers to as the RDM Centre of Excellence and offers a range of learning experiences ranging from technical skills to research and development. A number of other actors have indirect interest in the site such as the City of Rotterdam, the Rotterdam Mainport Institute (offering a bachelor level university degree) located on the north side of the river and Ahoy (one of the Netherlands' largest events spaces, located in Rotterdam) which hosts events on the site.

- *High quality industrial buildings in the dense city.* Instead of accepting the manufacturing decline as a natural phenomenon of the post-industrial city, in 1978 Parisian authorities launched a program to retain existing production enterprises within the city and encourage new ones. The **Hôtels Industriels, Paris** (see Annex 4, case 5.3) were designed to host ateliers, workspaces, logistics depots, and office spaces within the city center. They allowed the creation of space for production and logistics in dense residential areas. They are privately financed, but with time-lease mechanisms to ensure that the land remains in public hands in the long-term. The buildings have remained oriented towards mixed-use, production, and logistics through strong planning controls. Moreover, Hôtels Industriels present a high-quality design, which means the facilities are functional and beautiful. The Bureau Municipal des Activités Economiques was mostly responsible for developing the program and acted as organizer-facilitator, bringing together investors, developers, and small producers. In many of the projects, the city provided parcels of land that it owned for development. In these cases, the developer had the land lease for free for seventy years, after which the land would revert to the city. In other cases, land taxes were structured to make development attractive to investors. The agency smoothed the way through permitting processes and other municipal regulations to facilitate development, and it took an active role in helping developers secure tenants. While developers selected their architects in early projects, later projects have often been awarded to joint-venture teams through architectural competitions. This process has resulted in high-quality architecture and urban design.
- *Flagship urban projects reconnecting the industry and the city.* The **Lavazza Headquarters, Turin** (see Annex 4, case 5.7) project is located in Borgo Aurora, a former industrial area of the City previously connoted as a working-class district. After the deindustrialization, the area has undergone a process of decline for years. The site is characterised by large empty factories. Over time many commercial activities shut down, while socio-demographic dynamics such as ageing population and social tensions between residents and migrants were exacerbated. The project consists of a massive intervention on the existing block which allowed to make the area accessible by opening the former industrial premises to the surrounding context. With such a project, the Lavazza group, one of the oldest coffee factories in the city, has established its new headquarters in the area occupied by a former ENEL electric power plant. After years of decline following the deindustrialization process that hit the neighbourhood, the private investment has restored urban quality by regenerating the urban fabric and revitalising the area's economy, and social cohesion. The regeneration project has been a catalyst stimulating further private investments able to enhance the area's attractiveness both in social and economic terms. Next to this, the redevelopment of the brownfield area gave impulse to the creation of new job opportunities. The project designed by Cino Zucchi Architetti draws upon a strong urban scheme encompassing architectural elements to create openness,

break down barriers and link the public and private realms. As such, the project develops a mixed urban area which integrates the main buildings with several public amenities (e.g. green spaces, parking spaces, public square, pedestrian zones and various facilities). At the same time, the project shows a new relationship between the city and industry: the Museum of Lavazza is built on the idea that high quality products, like Coffee, need the city as a constitutive part of the branding process

- *Contrasting real estate and preserving industrial heritage in the dense city, with new urban functions.* The story of **Ile de Nantes** (see Annex 4, case 5.4) is very well known in many European cities: after intensive industrial and port activities for decades, the use of the area changed quickly, as a consequence of the decline in shipyard and port productivity in the 1980s. The industrial part of the island soon turned into a vast wasteland, destined to be redeveloped by the market actors after decades of abandonment. The case of Nantes shows that even under market circumstances there are other ways possible for urban development: the public sector can actively influence the redevelopment of post-industrial areas. The political leaders of the city developed step-by-step the idea that industrial heritage has to be kept but used with new functions. In 2003 the public company SAMOA (Société d'Aménagement de la Métropole Ouest Atlantique) was established for the purpose of bringing new life to the area according to this principle. SAMOA is exercising the right of first refusal, buying land, rezoning and reselling it with fixed project ideas and predetermined conditions. The model can be understood as a public sector led real estate development strategy accompanied with value-increasing taxation – where the main goal is to upgrade the island along public interests through giving new functions to the industrial heritage. In 2007 the Machines of the Island of Nantes (Les Machines de l'île) project has been launched, as an artistic, touristic and cultural programme, in the old covered buildings of the former shipyards in Nantes that were at one time used for ship construction and later used as business sites. The success of this idea can be illustrated by the fact that les Machines de l'île received around 700.000 visitors in 2019.
- *Stimulating joint actions of private actors to revitalise the modern industrial periphery.* **Antwerp** is a dynamically growing city which faces increasing problems to find areas which could accommodate the need for new development. To protect the already densely built-in historic centre area of the city, the municipality aims to stimulate the redevelopment and densification of the transitory belt around the central area, The Lab XX project investigates the opportunities to make these neighbourhoods, built in the 20th-century, look more attractive and ready for more dense development. Lab XX is combining research by design with the experiences of the municipality in implementation processes. Lageweg is a 30-ha mixed area outside the historic city centre of Antwerp, having ten different private owners and almost no public property. **The Lageweg project** (see Annex 4, case 5.6) site is situated in a semi-industrial part of the Antwerp transitional belt, between the historic inner city and the outer fringe. The area is in decline for years and has become known as a no-go zone. It is characterised by large, empty factories, an inaccessible locked-in green space and rundown illegal houses. The area is very mixed, where different zoning categories (industry and housing) are touching each other. The Lageweg project is one of the experimental approaches of the city to dynamize a concrete area over which the city does not have direct control as not having ownership of any properties Stimulating joint actions of private actors. Instead of designing a top-down masterplan, the approach is to build up a coalition between the landowners in a bottom-up way. The aim is to dynamize the Lageweg area towards a new urban fabric in which housing and services can coexist with manufacturing.
- **I3P business incubator (PoliTo), Turin** (see Annex 4, case 5.4) is the public incubator of Politecnico di Torino university and is the result of a regional public policy. Established

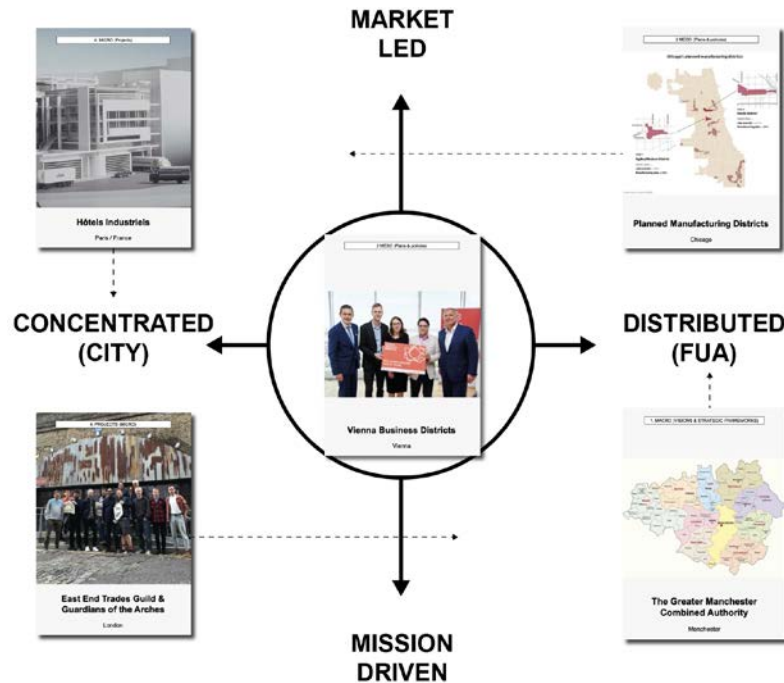
in 1999, the incubator aims at supporting innovative and technologically advanced start-ups. The services offered by I3P consist in incubation and pre-incubation programs – which are provided for free - designed to strengthen start-ups' innovation capacity, minimize uncertainty and maximize companies' growth. Recognized as a relevant center for innovation and business development, the incubator is specialized in hi-tech and deep-tech projects encompassing innovative industrial supply chains according to a B2B model. I3P is conceived as an enabling tool for university's departments to exploit intellectual assets by translating ideas into testable products/services to bring to market. On a larger scale, instead, the final goal underlying the long-term vision of this project is the support of the local entrepreneurial ecosystem by fostering technological innovation processes able to generate new employment opportunities in the field of innovative entrepreneurship. Recognized as a relevant center for innovation and business development, the incubator is specialized in hi-tech and deep-tech projects encompassing innovative industrial supply chains according to a B2B model.

- *Urban Spaces for the foundational economy.* The **Brussels' Abattoir** (see Annex 4, case 5.1) is one of the only remaining active urban abattoirs in a European city. The 10-hectare site has evolved into a hub for many kinds of food related activities including processing, sales and one of the city's largest open-air markets. The site is managed through a company established in 1983, invested in by many of the market holders on the site with a 50-year leasehold from the municipality of Anderlecht. This case offers an example of how a user-owned company responsible for a leasehold agreement can help protect foundational activities (such as food) within city centres. Many cities accept the importance of protecting foundational activities, to ensure that they remain healthy and affordable places to live. Foundational activities include food production and processing, construction, repair and maintenance and other essential activities which are hard to detach from the city. In cities with high real estate values, foundational activities often get pushed to the most affordable sites on the edge of the city. The case of Abattoirs shows that it is possible to contrast these dynamics: the site still contains a slaughterhouse but also is home to a number of other activities involving food generally. This includes a very affordable food market, open 3 days a week. It contains an innovative mushroom and microgreens business located in the cellar space (Champignon de Bruxelles). It contains one of the largest urban greenhouses in Europe, that is based on cradle-to-cradle principles (BIGH) and sells locally tomatoes, herbs and fish. It also hosts a very dynamic community building organisation, Cultureghem, which provides youth services to some of the country's poorest residents while helping activate the open space while the market is not operating.
- *Promoting community based urban business ecosystems.* Established in 2010, **London's East Ends Trade Guild** (see Annex 4, case 5.2) is a community-based initiative that emerged from the tension between established businesses and the market trends. It is an organisation representing around 300 small independent businesses and self-employed workers concentrated around East London. EETG provides local businesses with a collective voice, federating local interests, providing social spaces, sustaining relationships and networks and improving the quality and safety of the places they are located in. EETG is particularly active in areas that contain small traders that are heavily embedded in the neighbourhood. This is a quality that has made London's East End attractive for speculation and gentrification which in turn is pushing out these very businesses. In practice, local businesses contribute a small membership fee (at least £15 per month) to the EETG and are expected to uphold the organisation's values and principles based on inclusivity, reciprocity, collaboration, interdependence, creativity and pragmatism. The Guild prides itself on offering 'customers a human touch and meaningful

interaction'. This shows a clear distinction with classic chambers of commerce and considers that being small means being flexible and closely attuned to customer demand.

5.4 Linking the inspirational cases to policy scenarios

Figure 5.1: Linking the scenarios to the inspirational cases.



Source: ESPON MISTA (2020).

The inspirational cases can be paired with the scenarios (see Chapter 4) to explore how relevant they are according to the policy ambitions of a city or metropolitan area. For example, Paris' **Hôtels Industriels** are a sensible solution for market led core cities that have expensive real estate prices, little space and want to ensure there is sufficient space for a diverse range of economic activities within the city. Chicago's **Planned Manufacturing Districts** offer a strategic solution, for both market-led core cities and larger metropolitan areas, to preserve space for production while creating room for experimentation. **The East End Trade Guild** is a very practical organisational structure for cities and metropolitan areas looking to protect foundational activities. The **Greater Manchester Combined Authority** offers a very strong model for metropolitan planning governance which is mission driven but could also suit market led cases too. Finally, the case of the **Vienna Business Districts** is a transversal case and could be applied to any of the four scenarios.

6 Policy Recommendations

This section defines four groups of problems that have been identified throughout the MISTA project and provides policy recommendations for cities engaged in planning and policy for industrial land use, manufacturing and productive activities. The identification of the problem statements is the result of two key sources. The first source is the baseline analysis of industrial activity in functional and metropolitan regions at a European scale which included a comprehensive literature analysis (refer to Chapter 1). The second source is the targeted analysis of the seven cities (Berlin, Oslo, Riga, Stuttgart, Turin, Vienna and Warsaw) which included data analysis, stakeholder interviews, study visits and stakeholder workshops (refer to Chapter 4). Besides, also the Atlas of Inspirational Cases has been elaborated, the most relevant cases of which have been used in the Future Workshops in each of the seven cities and in the Inspirational Cases Workshop. Therefore, the elaboration of the policy recommendations is also in part the outcome of the interaction with stakeholder cities.

Despite the focus on seven cities, these recommendations are relevant to most cities in Europe. The seven stakeholder cities represent key actors in metropolitan regions and well amplify various conditions of growth and development pressure of European MR, as they include both medium-sized and large cities, they have both strong and weak industrial sectors, they represent both market-driven and mission driven policy dynamics and they represent a range of different relationships between the city and the metropolitan area.

The following pages use the conditions identified in the seven cities as typologies (see chapter 4) to help illustrate the policy recommendations. Furthermore, the inspirational cases (see chapter 5) will be used to provide opportunities or pathways forward. Finally, it must be noted that neither the recommendations nor the inspirational cases offer a one-size-fits-all solution or a recipe to be adopted by one city or another as such. The scenarios, based on the scale of action and the role of the public sector (see Chapter 4), will be used to offer the recommendations certain nuance regarding their application.

6.1 Recommendation 1: knowledge production

Cities and metropolitan areas need clear insights on industrial processes and their impacts

R.1.1 More in-depth data analysis is needed to underpin strategic decision making regarding the value of production activities within the local economy.

- *There is no clear view on the location of different economic activities, their interrelation and their impact on employment, transportation and housing.* Currently available statistical data is focused on jobs, employment density, turnover and land values. This offers a limited understanding of how the local economy works particularly how specific areas or neighbourhoods work. From a policy perspective, the available data favours services-oriented activities over production. The links between businesses, value-added and the multiplier effects are very difficult to quantify. This is particularly challenging in terms of analysing the benefit and impact of issues such as local food production, the circular

economy or social aspects of employment. Industrial activities and manufacturing depend heavily on informal business relationships, which are hard to see through available data sources. This is particularly evident in cities such as Oslo, Berlin, Vienna and Warsaw where real estate pressure and limited metropolitan scale collaboration renders non-financially competitive land use exposed to development.

Inspirational cases: the [Salzburg ICRA](#) data collection method offers a qualitative approach to understand business relationships. Through building relationships with businesses, [Vienna Business Districts](#) and the [Małopolska Regional Development Agency](#) can provide an insight of how businesses operate and are related.

R.1.2 - Cities and metropolitan areas must constantly remain engaged with the production activities and processes in order to help facilitate strategic knowledge production and exchange.

- *Manufacturing and production processes are in constant evolution and require a much more engaged and supportive public sector. Cities and metropolitan areas can support development processes through providing a space of exchange and interaction to foster healthy conditions for a productive city.* The boundaries are being increasingly blurred between production and services. For the productive city to be competitive and relevant, a wide range of stakeholders need to be in regular and constructive dialogue. This will ensure that cities are shaped to fit many different aspects of the production process to provide new types of spaces for manufacturing (such as office spaces mixed with production space, leisure spaces mixed with creative uses and activities related to the foundational economy). This concerns both the core city, and the larger metropolitan area, as new technology, markets and production processes are constantly changing how production systems operate (in some cases moving out of the centre to the metropolitan area, or moving closer to the centre, from urban fringes). Industrial heritage and industrial infrastructure have created path dependency which are sometimes complicated to change. A metropolitan perspective can help in dealing with these challenges, based on the construction of a forum of stakeholder collaboration, particularly amongst public and the private actors who can help adapt the requirements of the productive city.

Inspirational cases: [Wirtschaftsförderung Region Stuttgart GmbH \(WRS\)](#) provides an organisational structure for supporting and promoting the development particularly related to vehicle and machine production. Likewise, the [Brussel Circular Economy Plan](#) is a framework for enhancing institutional collaboration at the scale of a city-region on the specific theme of circular economy while stimulating bottom-up development from the private sector. The [Oslo Municipality Plan](#), is an example of promoting regeneration of a fringe area, within a wider territorial vision. The [Guardians of the Arches](#) is an example of a community led, bottom-up initiative to generate a dialogue between local economic activities, affected by similar place-based challenges, which could be applied to an area focused on production.

R.1.3 - Production systems are most effective at a metropolitan scale and metropolitan authorities can support territories and actors to better contribute to the wider value chain.

- *Metropolitan areas can play an important role in driving their local economies but public authorities within metropolitan areas must find ways to foster cooperation and integrated visions and knowledge frameworks to ensure their economies remain competitive.*

Strengthening local potentials and comparative advantages at a metropolitan scale is essential for the local economy as businesses are rarely concerned by institutional boundaries. The public sector must provide consistent terms and services to business and local authorities to avoid internal competition among territories while offering knowledge resources and capacity building between different sectors and specialisation. Metropolitan areas should be conceived as a network of clusters that integrate a range of related production and services. This will allow for metropolitan areas to address and promote mission-oriented challenges such as the circular economy. The fragmentation of governance, taxation and land use planning in metropolitan areas can create unnecessary competition, increase transport and logistics costs, reduce connections between research and production and so forth.

Inspirational cases: The Greater Manchester Combined Authority provides a very strong example of a metropolitan scale organisation that is committed to economic development. The Prosperity Review, based on the analysis of University of Cambridge helps clarify how this was done. The Brussels Circular Economy Plan provides a platform of ideas and initiatives for economic actors to take action.

6.2 Recommendation 2: spatial foresight

Industrial location factors and urban agglomeration are still partly dependent on the 20th century spatial planning principles, but both core cities and metropolitan areas can foster new spatial conditions for dialogue between the industry and the city.

City cores, typically the main local municipality in a metropolitan area, are typically also the location of the most densely occupied and expensive land. There has been a natural movement of production out of European cities since the turn of the Second World War. However, there are signs of a return of the industry to the city, for several reasons and within some specific sectors - as explained within this project. Metropolitan areas should carefully handle negative externalities, strengthen the links between businesses and sectors, help support urban design opportunities to accommodate production within inner-city areas and support new conditions of dialogue between the city and the industry. An important aspect is to reflect on the interface of production and housing in terms of possible tensions but also for travel-to-work patterns of different strata of society to allow workplaces to be accessible.

R. 2.1 - Core city level recommendations

R.2.1.1 - The core city should take a strategic position on the most effective use of its industrial land in order to embed manufacturing and productive activities within its local economy.

- *Define manufacturing and productive activities, like foundational economy, creative industries, R&D parts of industry, service-based economy, social enterprises (that are important for low skilled people) and so forth.* The flow of different production activities within and out of metropolitan areas is often driven by market forces. The public sector cannot clearly anticipate trends of industry but can define the kinds of activities it deems

most relevant while being reactive to market changes. Core cities are exploring opportunities for clustering and integrating manufacturing in urban areas through promoting industrial intensification and mixed-use zones. Innovative regulations based on new zoning principles are needed, in addition to other ways of reducing possible conflicts between industrial uses, avoiding environmental impacts and tension with residential areas.

Inspirational cases: [Berlin's Urban Development Plan \(UDP\) Economy 2030](#) and Chicago's [Planned Manufacturing Districts](#) provide an example of how specific areas of the city can focus on specific kinds of activities, which helps to moderate market forces and cluster complementary businesses. The [Vienna Business Districts](#) and [Citydev.brussels](#) provide useful examples of how to support and facilitate business development through to find the most suitable location so that they remain local but well connected. Industrial intensification, as showcased with Paris' [Hôtels industriels](#) and as elaborated in London's [Industrial Intensification Strategy](#), provide models for development on expensive land with efficiently used sites and developing multi-storey buildings that are technically capable of handling productive activities.

R.2.1.2 - Core cities should be able to enhance a joint dialogue with other municipalities and develop partnerships to facilitate innovation processes in industrial relocation.

- *Encourage policy makers and public administrations to collaborate on finding an optimal location for businesses looking to relocate within the metropolitan area.* Businesses may be encouraged to move outside the core city to places where planning decisions are made quickly and where environmental conditions are more flexible. This can be problematic if the business is an asset for the city or a key part of a larger business network. Relocating the business to a site within the metropolitan area but accessible to the core city can avoid loss of jobs, skills and services. Better harmonization of administrative procedures across the local public authorities is needed

Inspirational cases: Business facilitation can be an effective method either to retain important businesses on accessible sites or to ensure they do not move out of the metropolitan area. Both the [Vienna Business Districts](#) and [Citydev.brussels](#) provide databases of available land within the core city (in both cases they are regions) while the [Małopolska Regional Development Agency](#) operates on a regional scale.

R.2.1.3 - Local public authorities have limited tools to select and attract production activities that could be beneficial to the city but can have a role in preserving industry space and land in the city for production.

- *Protect and preserve available spaces for production for activities that are crucial for the city (either as part of the foundational economy or as working places for local low skilled).* Traditional spatial planning can aim to preserve land for industrial uses. But zoning is often not enough to deal with market forces present in cities undergoing urban growth. To ensure space is retained, public investment may be necessary or active supervision and policing to ensure space is being used according to zoning.

Inspirational cases: The Chicago [Planned Manufacturing Districts](#) provide clear zoning, which is difficult to change and means that land remains available in inner-city locations. Within the industrial zones, [Berlin's Urban Development Plan \(UDP\) Economy 2030](#)

defines well-protected areas, which go beyond zoning, and thus offers an additional possibility to exclude the influx of non-industrial uses (e.g. retail, office). Through encouraging more compact use of space, such as shown in the [London Industrial Intensification and Co-location Study](#), limited amounts of available land can attract larger volumes of activity. [Citydev.brussels](#) develops space for production which remains in public ownership. [Salzburg's ICRA data collection](#) is a useful way of learning about how areas are operating. In some cases, public authorities are not aware of the kinds of the potential of manufacturing and productive activities, simply because land is not available or unaffordable. Temporary use, such as [Ile de Nantes](#) strategically provides space for new businesses and activities to develop and show their potential, using slow-urbanism processes to steer production in a post-industrial area.

R.2.1.4 - Cities should use their capacity for dialogue and negotiation to activate or steer the market.

- *With most of the areas of the city in private ownership, the public sector must use its role as a facilitator and negotiator to look for practical solutions for issues that affect the city. Public authorities that do not own land, should not feel incapable of facilitating and activating private landholders contribute to a common vision. Zoning regulations, taxation tools and financing can be used in the negotiation process. In order to attract new investors, development agreements can be applied that allow for industrial intensification or co-location. The establishment of independent facilitators can be crucial when including a spatial development perspective where the public authority wants to be treated as an equal partner to achieve a common good.*

Inspirational cases: [Lageweg](#) Antwerp is an example of the public sector that had no land of capital and that adopted a negotiation role to coordinate the development of a large mixed-use site, based on public interest towards densification. The [Oslo Strategic Plan](#) for Hovinbyen used negotiations with the private actors to guide principles for future development. [Chicago's Planned Manufacturing Districts](#) have rigid zoning which can evolve through negotiation with the district's occupants. Brussels' [Bouwmeester Maitre Architecte](#) is a facilitator, using dialogue between private and public actors to achieve better quality urban design and public space.

R.2.1.5 - Pressure on rezoning industrial land should be relieved through intensification, mixed-use buildings and strong zoning controls.

- *In cities where there is competition for real estate, ensure land is used as effectively as possible for an activity that has clear value for the city. When intensifying land, ensure there are a range of spaces available to give businesses a choice of locations. The intersection of production activities and other sectors presents new opportunities for a mix between productive functions and other activities such as office spaces for creative industries, cultural activities and even residential and leisure spaces. Cities across Europe are reconceptualising spaces for production and going beyond the logic of 20th century zoning. Some forms of production and manufacturing will work more effectively than others in intensified or co-located industrial zones. For those activities that can be easily mixed with other land uses, they will gain through increased exposure to the general public and help communicate what is being produced in the city.*

Inspirational cases: Core city centres, particularly those with limited capacity to take advantage of the larger metropolitan area, intensification and co-location are generally the most feasible strategy. The [London Industrial intensification and co-location study](#) offers an excellent example of a feasibility study to explore new typologies of productive spaces. Berlin's Urban Development Plan (UDP) Economy 2030 illustrates how to differentiate spatial potentials for intensification with regard to their time dimension for realizing the potential.

Where good design is required to ensure that neighbouring land uses can co-exist, the Bouwmeester Maitre Architect provides a model as a facilitator to reach sensible design outcomes. Alternatively, the Hôtels industriels in Paris. is a very interesting example of how production and logistics remain located in inner-city areas, even adjoining housing, through good urban and architectural design.

R. 2.1.6 - Cities can develop tools to guarantee better quality productive spaces.

- *To enable suitable industrial intensification and co-location the design process should be suitably facilitated through expertise in design and mixed-use areas.* Industrial intensification and mixed-used areas may seem like a good idea on paper, but if poorly designed they can cause serious tension between future users and usages. Good architecture and urban planning can design out possible problems such as noise or possible conflicts between pedestrians and vehicles. A co-creation-based design process can help explore possible scenarios to identify ways of achieving a good result that addresses both opportunities and possible conflicts.

Inspirational cases: In many cases design is a critical factor in ensuring that mixed use areas remain functional. The [Bouwmeester Maitre Architect](#) offers a 'research by design' role to facilitate sensible design outcomes. In some cases, it is simply necessary to show the market good local examples of how a good project can be developed. [Citydev.brussels](#) as a public developer showcases good practice, in particular supporting both economic actors and the policy makers in enhancing design quality. Paris' [Hôtels industriels](#) is an interesting example of using financing instruments to enable the private sector to develop industrial sites in residential areas.

R. 2.1.7 - Redevelopment of brownfield industrial land can be used to modernise links to a city's industrial heritage local economy while also providing space for compatible demands for space.

- *Before gentrifying brownfield land, look for potential ways historically grown local economic activities can be strengthened through the redevelopment process.* Production processes have changed dramatically over the last century, with the distinction between production and services being increasingly blurred. The redevelopment of former industrial land can be used to strengthen this evolution while retaining a link to a site's heritage. Brownfield land can be developed progressively, concentrating on activities with high value added and their supplementary services. Decontamination of land can be a major hurdle for future real estate projects which is particularly the case for replacement with residential uses or office spaces. Redeveloped industrial activities may only require partial decontamination, which may limit the costs and ensure sites retain an industrial

character. Entrepreneurs in the manufacturing sector can also be attracted by the opportunity to invest in urban regeneration, based on new ideas and models of business.

Inspirational cases: where brownfield sites are centrally located, they can become levers for the local economy, if they address opportunities for local economic development. The private market may not have an interest in doing so. A public-private development structure, such as Eindhoven's Strijp-S, where the city was part of the development corporation, ensured that the development process and long-term use provided value for the city. In situations where brownfield sites are smaller and more distributed across the city, Citydev.brussels provides a model of public developer that takes risks to showcase good practice. The Lavazza Headquarters' site in Turin is also an example of a company promoting its new headquarter in a former industrial area and at the same time regenerating a neighbourhood with other functions.

R.2.2 - Specific metropolitan level recommendations

R. 2.2.1 - Metropolitan governance can play a crucial role in developing an integrated vision, strategy and services to attract businesses.

- *Attract businesses through a clear vision, simple public services and a wide choice of land at a metropolitan scale.* Metropolitan governance may be one of the most important yet most challenging issues to enable competitive and efficient productive regions. Governance can come in a range of formats. It may involve spatial and strategic plans, soft governance spaces, funding and development tools. It can be based on voluntary action or public-private cooperation platforms. Most importantly is to share a vision to base dialogue and align policy makers and public authorities (spatial planning, economic development, sustainability departments).

Inspirational cases: the Spatial framework in Greater Manchester Local Industrial Strategy ensures that businesses can move to the most suitable site across a larger metropolitan region. The Małopolska Regional Development Agency operates at a similar scale but is more focused on an operations level. Stuttgart's Wirtschaftsförderung Region Stuttgart GmbH (which is the region's economic corporation) provides metropolitan scale, public-private cooperation.

R.2.2.2 - Metropolitan areas should explore new tools to support economic development for industrial land, manufacturing and productive activities.

- *Enable the development of productive activities at a metropolitan scale through financial tools and business incentives.* There are a multitude of reasons why municipalities surrounding cities are often against industrial development, issues that include NIMBYism, lack of financial incentives (such as tax revenues) or a lack of interest in the kind of work that is being offered. It is therefore easier for local and metropolitan institutions to implement restrictions rather than providing incentives for industrial activities. This is not always effective and useful as the local economy is hard to disconnect at a municipal scale. In order to encourage industrial development, where it is needed, tools could be used which include direct funding to individual bargaining and territorial compensation. Municipalities in favour of new industrial development can also become over-enthusiastic

and over-dependent on powerful industrial companies which can also be unhealthy. Incentives can be important to steer industrial development towards sustainable principles and help municipalities in taking advantage of good economic opportunities. This means on the one hand providing funds to develop the infrastructure and services which are needed for sustainable economic development. But on the other, to reduce the burden of bureaucratic and administrative procedures on businesses.

Inspirational cases: The APEA (Eco-Industrial Parks) case offers an idea on incentives that can help small and medium size economic actors to afford the costs of a new industrial ecology approach. It also offers interesting hints on how to facilitate the implementation of new economic activities, based on the simplification of norms and management procedures. The Małopolska Regional Development Agency functions at a regional scale and supports businesses to find the most suitable site while also negotiating with local public authorities to adapt policy to improve economic development and competitiveness. The Vienna Business Districts is a concept for business facilitation that could be expanded to a metropolitan scale.

R.2.2.3 - Metropolitan areas should support small municipalities providing the knowledge, competencies and resources needed to interpret and implement metropolitan plans.

- *Enable local public authorities to achieve metropolitan scale plans or ambitions through technical assistance for evaluating projects, infrastructure development and acquisition of funds (either by own or state/EU resources).* Small and medium sized cities often have limited technical resources to manage economic planning and industrial development. Supporting municipalities with specific tools and incentives can help enable them with realising projects that align with a larger metropolitan strategy.

Inspirational cases: APEA in Italy provides support for the development of new industrial sites. This reduces the costs (technical and financial) of services that the local public authority often does not have in-house. They also support small municipalities in managing new projects with supra-local importance, where cooperation is needed in order to reduce bureaucratic obstacles that may affect business development. The Greater Manchester Local Industrial Strategy provides metropolitan scale planning and development of transport and economic infrastructure, in the interest of the ten member municipalities.

R.2.2.4 - Compensation or equalisation mechanisms are needed to reinforce territorial cohesion.

- *Avoid the consequences of 'winners' and 'losers' in metropolitan governance by providing compensation or clear proof of net benefits through supporting partnership in economic development.* New development can often impact areas well beyond such as through traffic, pollution, noise, loss or revenue or simply through development ambition. Metropolitan level regulations, incentives or fiscal levies are needed to deal with externalities, to share costs and benefits and create a basis for common development. Cities and towns in metropolitan areas might be attractive as locations for new productive activities due to the presence of infrastructure, services, education or other businesses.

Inspirational cases: Compensation and balancing mechanisms are useful to deal with the costs and benefits of development. Bologna's Metropolitan Fiscal Equalisation Fund allows a way to redistribute part of the revenues of processes of urban development between attractive and less attractive areas. At a regional level beyond Bologna, APEA provides technical services for local public authorities to reduce the costs on infrastructure development. The Greater Manchester Local Industrial Strategy provides transport infrastructure and standard metropolitan services which helps reduce administrative burdens on municipalities.

R.2.2.5 - Metropolitan areas should actively support brownfield regeneration, in order to reduce sprawl and urban blight.

- *Explore solutions for un- or under-used sites to ensure that available land is being used efficiently and greenfield sites are not being developed unnecessarily.* New development in peripheral areas may lead to unnecessary urban sprawl while brownfield regeneration in central areas can be costly to redevelop or maintain. Over-supply of land can affect land values at a metropolitan scale, undersupply can have negative effects on business development. Municipalities are unlikely to manage such complex decisions. They should be able to count on the support of metropolitan authorities and specific funds, in order to reduce both the opportunities of sprawl and the costs of renaturalization of brownfields and nature-based solutions, especially in those areas where productive functions cannot find any more the preconditions for settling. Innovative models are needed to take stock that available land is being used effectively. Planning is therefore most effective if conducted at a metropolitan scale. Land release or rezoning should be based on a metropolitan vision and supported by metropolitan policies. Municipalities need the support of metropolitan scale organisations and specific funds, in order to deal with development or conversion costs.

Inspirational cases: The Greater Manchester Local Industrial Strategy provides both a vision and a financial policy framework for distributing costs. Bologna's Metropolitan Fiscal Equalisation Fund can help balance costs across a metropolitan area. Strip-S provides a model of inner-city public-private real estate development that retains innovation at the heart of the project.

6.3 Recommendation 3: metropolitan leadership

Production activities are changing due to global processes (such as digitalisation and the 4th Industrial revolution). Metropolitan areas must guide the process of embracing new technology or supporting the transition of their local economy.

R. 3.1 - Well functioning metropolitan areas are built on a robust organisational structure based on commitment from its local public authorities.

- *Develop formal organisational competencies for metropolitan scale governance, economic planning and investment.* Good metropolitan governance is critical to support integrated territorial visions and multi-level dialogue. There are no standard solutions to this problem as each metropolitan area has different conditions and historical development. The availability of a kind of metropolitan governance is crucial to try to develop a new regional perspective, able to go beyond the traditional counter-position

between the central city and the outskirts, but also to promote new alliances between the local, the regional and the national levels

Within the MISTA project Stuttgart has a strong example of metropolitan regional governance, in particular also on economic development issues. The case of Turin shows the difficulties faced by metropolitan areas where powers are insufficient to take real action and the territory is too broad to have suitable impact. In all cases, new metro scale competencies require long term relationships in order to produce impact with Riga and Warsaw developing their metropolitan institutional competencies.

Inspirational cases: The Greater Manchester Local Industrial Strategy is a formal institution that was developed over 30 years and shows how the foundations required gradual development and capacity building.

R.3.2 - Metropolitan areas should be frontrunners of (technology) change and develop strategic visions based on new transcalar alliances.

- *Functional urban regions, the urban scale in which a production system operates, rarely have the institutional capacity to play a decisive role in strategic decision-making processes at regional, national and international level. This is impacting on the capacities for urban economies to attract and embrace change and new technologies. Cities and urban regions are witnessing uneven benefits or impacts of technological change which is rapidly restructuring local and global economies. Urban regions are crucial in supporting sustainable technologic uptake at an appropriate scale of action. Recent innovations provide technology-enhanced solutions to improve urban life, as well as an inclusive and participatory urban governance (referred to as Smart City 3.0). These innovations require active co-creation and steering at a metropolitan level, as well as in relation to the national and international scales – otherwise the technology and industrial players may provide little or any local community value.*

Inspirational cases: The Greater Manchester Local Industrial Strategy is a formal organisation ensuring that technical innovation can be spread out across the local municipalities to ensure that businesses have access to suitable sites which suit the demand/availability of employment and skills. This may not be feasible for all metropolitan areas where governance barriers are impossible to reconcile. Stuttgart's Strategiedialog Automobilewrtshaft ("Strategy Dialogue on the Automotive Industry in BW") offers an alternative solution to metropolitan scale governance, providing a strategic alliance between economic and public actors, reflecting on technological innovation from different perspectives across a regional level. For market driven economies that need to provide suitable space, the Planned Manufacturing Districts in Chicago use zoning regulation to encourage clustering which could occur at a metropolitan scale.

R. 3.3 - The economic success of urban regions and metropolitan areas will heavily depend on the prosperity of new manufacturing cycles.

- *The metropolitan scale is crucial for promoting a more diversified and integrated vision of the industrial system, particularly through promoting green technology and social benefits of production. Metropolitan areas can benefit from specialisation but should also be careful not to focus on a single market which could expose the local economy to possible shocks. To turn the historically embedded sectors into new resources, there is a strong need to*

develop dialogue between the public sectors and the economic actors able to help diversify the economy and encourage industrial knowledge transfer to other sectors. Public sector actors could support by steering this new dialogue, focusing on the strengths of metropolitan areas, favouring the development of forward-looking relationships among differentiated and specialised economic clusters.

Inspirational cases: Brussel's Circular Economy Plan is an interesting and powerful example for aligning actors, through the prospect of Circular Economy; Berlin's Urban Development Plan (UDP) Economy 2030 provides ideas on how a spatial plan can provide a link between action and places. Stuttgart's Strategiedialog Automobilewirtschaft is a model helping to facilitate technology transfer and adaptation at a regional scale.

R.3.4 - Metropolitan areas should assist citizens to cope with economic change by gaining new skills and knowledge.

- *Industrial changes require quick adaptation of the labour force. The public sector can become more reactive to the changing needs of industry, as well as facilitating innovation through linking production processes with numerous forms of education that could be feeding the workforce (and primary/secondary school education, technical colleges, tertiary education and practical professional skills development training). Education and training struggle to adapt to industry demands. For this reason, most businesses expect some form of training process while most large industrial players have their own internal training programs. While internal training is often unavoidable, it is important to have public, or publicly accessible, forms of training that ensure workers have a transferable education. Furthermore, businesses (particularly SMEs) avoid training due to costs, which ultimately can reduce a business' competitiveness and also mean workers are less capable of adapting to new processes or trends. The public sector should be able to align its own efforts with industrial and education institutions (formal and informal education/training and low and high-skilled), building on the Quadruple Helix model.*

Inspirational cases: Vienna's waff, provides programmes for supporting people in developing skills needed in a changing labour market, bridging the gap between formal institutional education and informal on-the-job training. Rotterdam's RDM Campus & Sheffield's Advanced Manufacturing District both include training and education centres that are integrated into business parks, attached to incubators that encourage active collaboration with businesses. Both of these sites are also well connected with technical universities, which allows for collaboration between technical and theoretical knowledge production. The Małopolska Regional Development Agency offers a range of courses and training, particularly oriented at management and organisational competencies, to ensure businesses remain competitive.

R.3.5 - Industrial development requires suitable conditions for innovation.

- *Innovation needs both a market and a context for it to be applied. Suitable conditions for innovation are difficult to define but public policy and public services have a clear role in supporting it. Innovation should be facilitated at a metropolitan scale, supporting research and development, setting ambitions, reducing bureaucratic and administrative barriers and offering space for experimentation and long-term operations. Cities have always been the cradle for innovation, being at the same time the places in which innovation is generated and used. More and more cities today are trying to embrace innovation and*

'enable' it, with mixed outcomes. Examples of efforts include enabling spaces for innovation, providing opportunities for maker spaces, supporting social enterprises, funding research and launching space for experimental temporary use. Metropolitan governments can play an important role in reducing barriers and obstacles to innovation, reinventing normative design and policy making beyond boundaries and sectoriality.

Inspirational cases: Incubators and business hubs are an attractive way for policy to help shape the local economy, but public investment should be strategic with investment without forcing results. Rotterdam's RDM Campus, Turin's I3P business incubator in Turin and Sheffield's Advanced Manufacturing District provides publicly subsidised space for education, business incubation and start-ups that help link technical and theoretical skills development with business or pathways to local employment in technology businesses. The Vienna Business Districts & Małopolska Regional Development Agency offer business facilitation which particularly benefits established businesses in adapting to change. An alternative solution is to provide accessible space. Eindhoven's Strijp-S and the Ile de Nantes are both in a transitional development phase, but during this period provide very affordable space for small and ambitious companies on the basis of the temporary use principle. Another option is to use a financial instrument to provide incentives to help steer the market. The Brussel Circular Economy Plan uses annual funding calls to encourage business to take risks.

6.4 Recommendation 4: collaboration

Financial, technical and strategic tools are important success factors for local/metropolitan level strategies for industrial land and productive activities.

R.4.1 - Local stakeholders should be involved in planning and development to build institutional capacity.

- *Build conditions for stakeholder participation and collaboration such as through shared projects, co-created visions and advisory boards.* Capacity building and momentum can be developed through enabling a wide group of stakeholders. Traditional stakeholder collaborations for industrial development were built around the Triple Helix (public authorities, research organisations and business), which now has been extended to the Penta-Helix (including also the third sector and actors representing capital). More specifically, chambers of commerce and universities have increasingly important activators for innovative metropolitan scale partnerships: fostering technological innovation, building relationships with scientific research, local entrepreneurs, policymakers and society at large. Incubators are playing an important mission to support new productive activities in several EU cities.

Inspirational cases: Stuttgart's region economic corporation (WRS) and their Strategiedialog Automobilwirtschaft help to stimulate business development and drive competitiveness through collaboration with representatives of private interest groups, policy makers and researchers. This helps to ensure that private development and public policy are well aligned. The elaboration of Berlin's Urban Development Plan (UDP) Economy 2030 was accompanied by a broad participation of key stakeholders from local authorities, corporate bodies, politics and the economy to gain commitment for common development goals.

R. 4.2 - Mission driven projects and alliances can help achieve common goals or vision.

- *Concretely activate a broad range of actors to address urban and metropolitan challenges.* Momentum is needed to enable change; particularly where societal challenges are concerned. The public sector may not be the initiator of such projects but is often the most effective enabler. Collaboration with concerned stakeholders is crucial to drive long-term visions and cooperation. This is particularly important in order to turn from shared principles into concrete action.

Inspirational cases: The Berlin Initiative for New Municipal Craft and Trade Centers shows how a common goal brings together different stakeholders from public authorities and private-sector institutions for a strategic project.

The Brussels Circular Economy Plan is a strong example of a public mission driven program to develop circular economy activities within the region, which drew together a broad range of actors from across the public and private sectors. London's East Ends Trade Guild shows how a bottom up, non-governmental organisation can help support the local economy. Antwerp Lageweg shows innovative methods to create stakeholder involvement which could be applied at the metropolitan level.

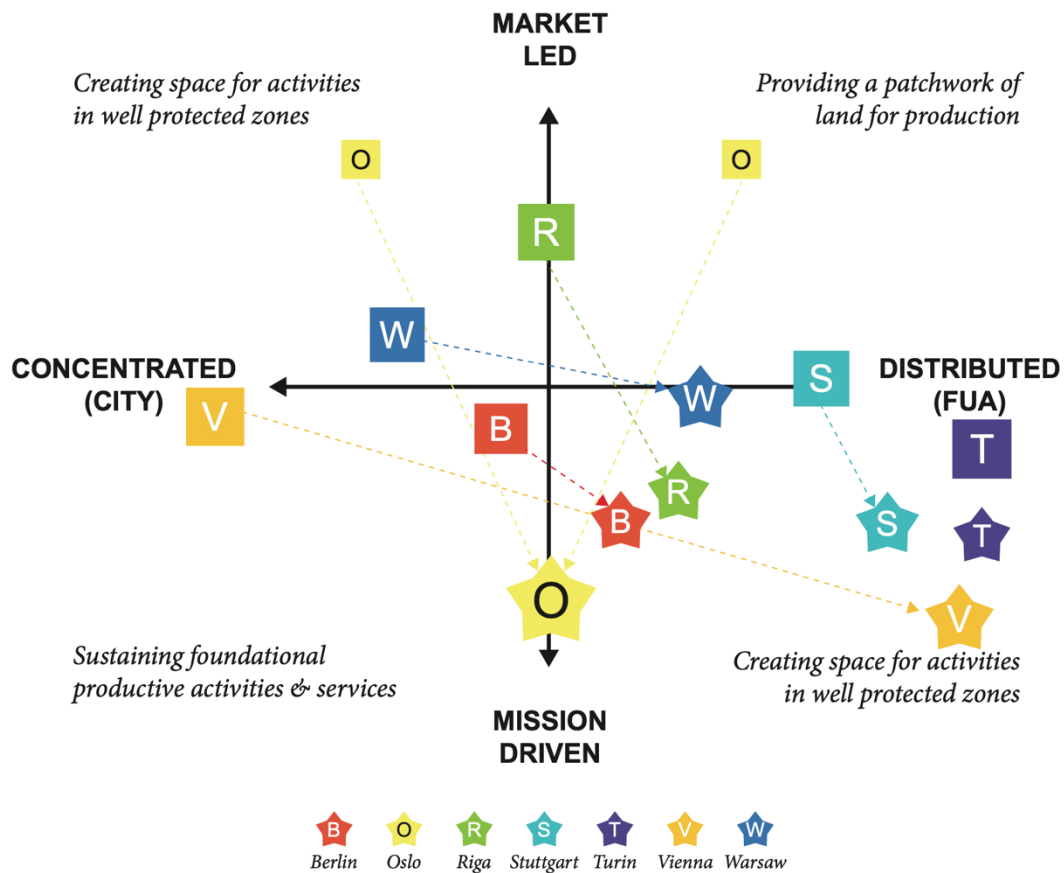
R.4.3 - Public-private partnerships and agencies can play a pivotal role in developing competitive market ready projects.

- *Launch fair and well-balanced public-private partnerships and industry support agencies to ensure results are relevant to the market and businesses remain competitive.* Public-private partnerships have been viewed with some concern by policy makers due to problematic outcomes particularly related to large development projects. Both at a city metropolitan level, agencies supporting businesses are important in order to build networks, improve skills and develop stronger relationships between industry and the city. Public actors may not be able to find the best way to support the local economy, therefore it can be useful to develop forms of public-private partnerships where visions and strategies can be implemented, based on shared governance.

Inspirational cases: The Malopolska Regional Development Agency, I3P Turin business incubator, the Vienna Business Districts and Citydev.brussels are agencies that are closely connected to business and the market and must provide a healthy interface between public good and the needs of the market. Strijp-S provides an example of a public-private development company that is necessary to ensure that the future development process addresses a public good. In the case of Strijp-S, a transitional development project has allowed an experimentation process to occur.

6.5 Translating recommendations into action

Figure 6.1: How the stakeholders from the seven cities positioned their city's current approach to planning.



Source: ESPON MISTA (2020).

During the workshops, representatives from the seven stakeholder cities also considered the ambitions that planning had for the city. Figure 6.1 above shows where the stakeholders positioned the current policy perspective and the ambition. In most cases, cities were looking to expand their governance towards the metropolitan scale and from simply providing space for the market to becoming more mission driven. Of all the stakeholder cities, Berlin was the only city to consider that the policy landscape was far too complex to take a single position.

Such ambitions will have an impact on the kinds of policy and planning actions to prioritise. As described above, **Recommendation 1** could be applied to all four scenarios and is relevant to all cities and metropolitan areas alike. **Recommendation 2** has been split into two parts as this will depend largely on the availability and price of land. In some metropolitan areas, compact development is an attractive option to create conditions for innovation or simply may be the only option (such as for Stuttgart or Oslo where land is very limited). **Recommendation 3** addresses the ambiguous question of metropolitan scale which will vary in each context subject to the available legal conditions. In some cases, metropolitan governance can only occur through collaboration but not through creating a public institution or a new layer of

government (as is the case for Stuttgart or Turin). Finally, **Recommendation 4** offers some hints for developing Recommendation 3 and is particularly relevant for mission-oriented cities and metropolitan areas.

7 Conclusions

7.1 The productive city concept in the EU integration project

The New Leipzig Charter, approved in December 2020, provides an update to the Charter that was first adopted in 2007 and confirms the role of cities for the future of European Union. The main results of the MISTA project are aligned with the main principles of this new act of engagement signed by the ministries of the EU member states. According to the new charter cities accept their “transformative power” to support sustainable development, through developing an integrated approach to “just, green and productive dimensions”. These dimensions provide cities with pathways to deal with social, economic and ecological challenges. The MISTA project results particularly can contribute to developing a solid approach to the ‘productive dimension’, where it is argued the need to develop a diversified economy, that ensures “a sound financial base for sustainable urban development” and provides urban and regional environment with conditions favourable to production, based on an approach to economic development integrated in urban planning.

The new productive city base draws from the emergence of new sectors that are more digital, service oriented, low carbon, knowledge based and connected to their cultural-industrial context. These are revealing new opportunities for the re-integration of production into cities and urban areas, based on the production of new attractive multifunctional spaces and mixed-use neighbourhoods, where people can live, work and recreate. These manufacturing spaces are fully integrated, rather than rejected by cities and urban areas that need their support to grow and work on an everyday basis. The Productive city dialogues, naturally, with the Just city and the Green city. On the one hand the Productive city is a pillar to provide citizens opportunities to access jobs, resources and a decent life. On the other hand, it contributes to reducing the environmental impact of urbanisation by investing in new technologies for both production and consumption and promoting a circular economy.

The New Leipzig Charter stresses the need to think about cities simultaneously at different scales: building viable and integrated neighbourhood scale; investing in the role of local authorities; and at the city scale to provide leadership through coordination and cooperation. In this respect, governance is the central issue to develop new legal frameworks and conditions, new investment capacities, new expertise and skills to steer material and immaterial infrastructure.

Finally, the Charter stresses the role of a renewed “active and strategic land policy and land use planning” and “actively shaping digital transformation”. This requires support from the national and European level through funding, policies and programs concerning urban issues. On a more general and methodological level, the Charter supports the idea of the EU as a learning platform, built through networks and initiatives that enable knowledge exchange and co-production built on good practices and innovative approaches.

The MISTA project can provide an important contribution to enabling the New Leipzig Charter in terms of providing an interpretation of the 'productive city', including: fresh research showing the link between the city and productive activities; a new awareness of the role of the public sector; and in particular a synopsis of innovative approaches for policymakers and spatial planning.

This project shows how cities across the EU offer a wide variety of examples of how to create a "productive city". The inspirational cases in this report showcase how cities and urban policies can contribute to that "transformative power of cities for the common good", as noted in the 2020 Leipzig Chart. The integrated, place-based, participative, multilevel nature of the reflections and considerations noted in this research project present both challenges and possible opportunities.

7.2 The productive city from a post-COVID perspective

The MISTA Project has been developed during the COVID-19 pandemic, an event that has shaken the globe. This has not only affected the project in terms of organisation of the research activities but has also highlighted some of the challenges and benefits of local production chains. The interaction with cities and metropolitan areas from different EU countries has given the research team the opportunity to observe the impact of COVID-19 on work, local production and urban policy. Experiencing such an intense global crisis, the role of the public sector, particularly cities and metropolitan authorities, has changed. Three main points emerged quite clearly to the research team and the stakeholders.

Firstly, the pandemic accelerated the role of technologies to support distance and smart working and learning. Whatever the interpretations have been locally, the reactions to COVID-19 in the organisation of working, living and consuming has further embedded technologies that were already available but became crucial to allow societies to adapt to exceptional health precautions. The city, as a place of interactions, has been under serious attack.

Secondly, we have first-hand experience of how society can react and re-organise based on distance and isolation. Cities have tried to accommodate a new idea of proximity in order to contain the pandemic. The role of the foundational economy has become increasingly visible. Cities depend on the availability of goods and services that straddle between the local and the global.

Finally, what has been clearly visible are the limits of administrative boundaries. The functional integration within metropolitan areas has appeared in all its force when the data of contagion have become visible. But also, in all its weakness of actions: regions and state have gained the scene, leaving small space to the role of this important intermediary actors in dealing with important challenges as the need to react to the economic crisis, the need to restructure the transport offer/demand, the need to reorganise of health services on a new territorial base.

From these considerations, the results of the MISTA project can help shape the reflection on the role of the productive city in the post-COVID society. We have sketched a picture of those productive activities that are most prone to reinvigorate their relationship with the city. A city where mixed uses are not only licit but promoted, a city in which technology allows the production of new forms of working, allowing the same opportunities to all the population; a city where the production chains are strongly integrated and embedded in the local context, as well as the global organisation of economy; a city able to leave space to innovation, providing flexibility; a city prepared to work with uncertainty and change. The MISTA project also clearly raises the point of the important role of metropolitan governance to support territorial cohesion and reduce the growing disparities and inequalities that local societies are experiencing. Public actors can play a strategic role in producing visions and frameworks to address complex problems as well as economic actors to find supportive dialogue and interaction.

As a final consideration, COVID-19 has brought about an imbalanced impact on society and the systemic impact will take a long time to analyse. The MISTA project was only able to observe some of the effects of COVID-19 pandemic in restructuring the society and the perception and conceptualisation of the relationship between the city and the industry. There are clear signs of the urgency of an in-depth investigation, in order to transform this crisis into an opportunity to strategically rethink many of the principles of planning that have been taken for granted.

7.3 The productive city concept and the challenges to research

Finally, the core challenge of the MISTA project was to develop a new understanding of the current complex relationship between the city and the production sector. It is true that the industry has left the city or will leave in the immediate future? One major hypothesis the project has built upon is that manufacturing is still a crucial pillar of urban economy, but less visible than in the past, and probably in different forms. As the project has tried to highlight that we are experiencing an increasingly blurred relationship between secondary and tertiary sectors. The secondary sector produces more and more service activities and values, identities, lifestyles, rather than simple products, while the tertiary sector depends on advanced forms of industrial activities.

The project aimed at producing an updated and critical understanding of how manufacturing has changed during the last decades all over Europe and in particular in large urban areas in Europe. In order to do that, the MISTA project has worked upon innovative data mining, trying to capture industry and manufacturing activities in reality, and trends, frictions and conflicts associated with them at different levels.

It is important to highlight that despite the efforts this research project has made to develop a portrait of contemporary production activities and services they are based upon, the impact on cities and the demands and challenges to policy making remain difficult to conceptualise. Data available at EU and national level do not allow to provide empirical evidence of the complexity

of the sector and how it relates to the larger economy. There is a large gap between observations, subjective data and statistical data which can be creating confusion. This is a second plan on which the MISTA project has highlighted the research gaps, the new research should be promoted, supported and developed.

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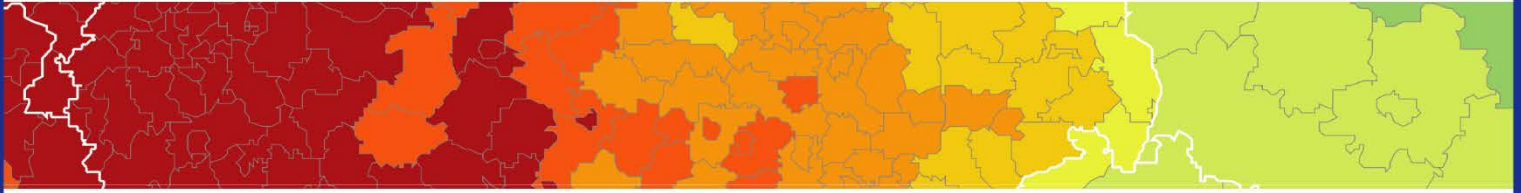
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ISBN: 978-2-919795-77-2

ESPON 2020 – More information

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The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.