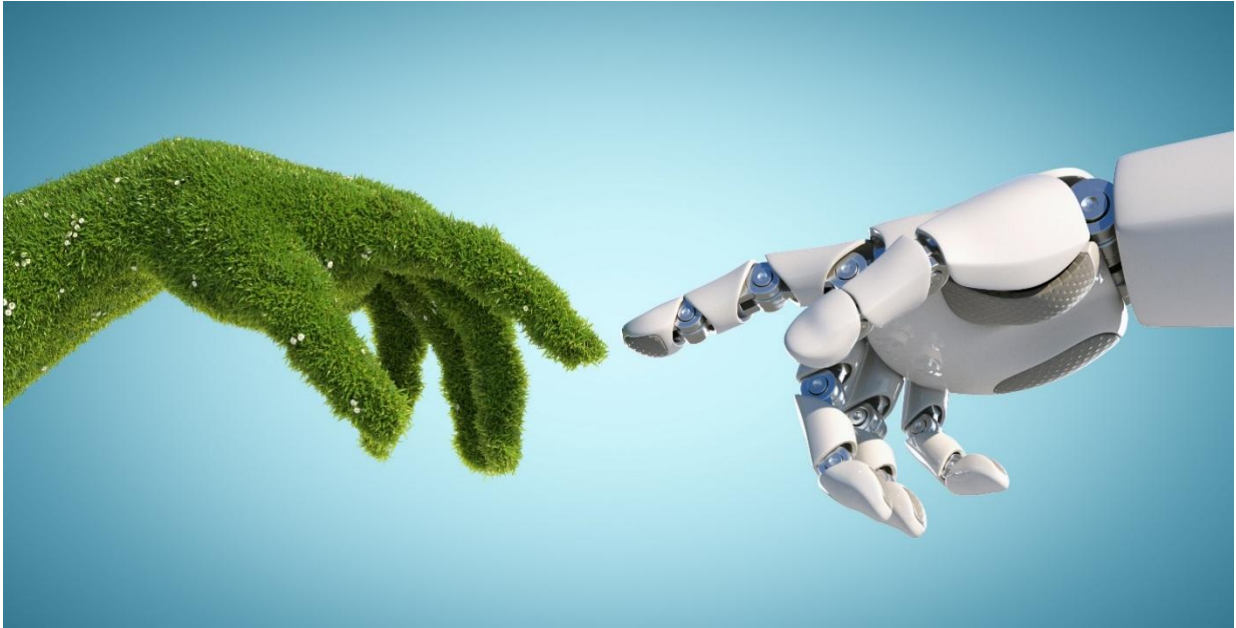


Multiplex Governance in the EU Mission Cities programme: *How much and how twin transition?*



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Abstract

The title of the EU Mission “100 climate-neutral and smart cities by 2030” suggests that it connects the green and digital transition. This paper explores to which extent and how this is conceptualised and realised, - hence how much and how the concept of a twin transition is pursued. As exploratory research it investigates questions not previously been studied in-depth, in our case in particular links of different governance and policy elements relevant for the twin transition, to inspire possible follow-up research. To this end, it analyses the developments of EU policies in the green/climate and digital domains, and how this has found its way in the Missions. With a multiplex governance lens, it explores the implementation of the Missions in the German Mission cities and takes a deeper dive in the city of Mannheim, including the related peer learning networks. It is found that the digital dimension and a focus on twin transition has been lost over time in the course of this Mission’s implementation. This seems as a missed opportunity: synergies are not optimised and negative impacts from digitalisation on the green transition are not adequately addressed as trade-offs that need to be solved. On the positive side, the Mission Cities programme and in particular the case study on the city of Mannheim show that a twin transition is possible and pursued, and that there are innovative supporting tools developed, including for the improvement of citizens’ ownership and action. This also has the potential to be turned into the necessary “true twin transition+”.

Keywords: Twin transition; digitalisation; green transition; European Green Deal; multiplex governance; Mission cities

Contents

Abstract	2
1. Introduction	5
2. Analytical framework: multiplex governance and twin transition	7
2.1 Multiplex governance for sustainability	7
2.2 Interlinkages between the two transitions: parallel, dual or twin?.....	10
3. EU policies for twin transition and the EU Mission ‘Climate-Neutral and Smart Cities’	16
3.1 EU policies for green, digital and twin transition: a timeline	17
3.2 The EU Mission ‘Climate-Neutral and Smart Cities’ and the twin transition	21
4. EU Mission cities in Germany and approaches in Mannheim	24
4.1 The EU Mission Cities process as rolled-out in Germany.....	25
4.2 Mannheim: Strategies and approaches for sustainability, climate & digital, governance and democracy	30
5. Initiatives for knowledge & learning	35
5.1 Concepts in the EU Cities Mission for knowledge and learning.....	35
5.2 German network “stronGER cities”.....	35
5.3 Networking and peer learning projects by Mannheim.....	37
6. Discussion and Conclusions	39
7. References	44

List of Figures and Tables

Figure 1.	The multiplex governance situation for the twin transition	8
Figure 2.	The eight Principles of Policy Coherence for Sustainable Development of the OECD and the multiplex dimension	9
Figure 3.	Strategies for the green-digital nexus (Source: World Bank 2024)	11
Figure 4.	Five levels of 'twinning' the green and digital transitions (own composition)	13
Figure 5.	How to stimulate policy coherence between sustainability and digital policies (Source: Santarius, Bieser, et al., 2023)	15
Figure 6.	The five actions of the Climate-Neutral and Smart Cities Mission (Source: European Commission 2024)	23
Figure 7.	(Interactive) Climate Transition Map for the EU Mission Cities (Source: https://netzerocities.app/ClimateTransitionMap)	27
Table 1.	Timeline twin transitions in EU policies and the Cities Mission (own composition)	17
Table 2.	Timeline of the EU Mission Cities in relation to the participation of German cities, and developments in Mannheim (own composition)	24
Table 3:	Timeline of the German Mission cities – the CCC process (climate), and participation in the Federal program ‘smart cities’ (digital) (own composition)	28
Table 4:	EU Mission Cities - Pilot, Twinning and Enabling Programmes (own composition)	29

1. Introduction

Five EU “Missions” were introduced as novelty in the EU’s research and innovation programme Horizon Europe in 2020, running until 2027, and using about 10% of the total Horizon funds. As conceptual idea they are meant to stimulate mission-oriented research (Mazzucato, 2018) and support broader policy goals and programs of the European Commission, like the European Green Deal (European Commission, 2019b), Europe fit for the Digital Age¹, the Climate Adaptation Strategy (European Commission, 2021c), or the Beating Cancer Plan (European Commission, 2021e). In governance terms they are designed

- 1) to increase coordination on the Commission side,
- 2) to mobilise a wide range of actors on the recipient and implementing side - EU Member States, regional and local authorities, research institutes, farmers and land managers, entrepreneurs and investors, as well as
- 3) to engage with citizens to “boost societal uptake of new solutions and approaches”.

One of the five Missions is “**100 Climate-Neutral and Smart Cities by 2030**”², with the goal as addressed in the title, and the addition “- by and for the citizens”, which is meant to underline the importance of the involvement and engagement of citizens.³ The inclusion of “smart” in the title of the Mission suggests that this Mission is meant to pursue two aims - what had earlier been coined as “twin green and digital transition” in the EU (European Commission, 2020b) – or short “twin transition” (Schiphol & PA, 2022).

As part of the Horizon project Public Administration Capabilities for Digital and Sustainable Transition (PADST)⁴, this paper provides an explorative policy analysis in the now eight “EU Mission Cities” (European Commission, 2024) (or “Net Zero Cities”⁵ as called in the related EU Horizon project) in Germany on the questions: How much and how is the aim of a twin transition pursued? Which role does ‘the digital’ play for the aim of enhanced citizen participation and bottom-up action, as well as for enhanced networking and learning? How have the concepts evolved in the overarching EU policies, and in the subsequent steps of the Mission Cities process?

¹ https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en

² https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/climate-neutral-and-smart-cities_en

³ https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/climate-neutral-and-smart-cities_en; the addition “by and for citizens” later disappeared again.

⁴ <https://padst.eu/>

⁵ <https://netzerocities.eu/the-netzerocities-project/>

Are there considerations of the negative environmental effects of digital transformation (Meijer, 2024, Rayner et al., 2024)?

The paper explores these areas with a multiplex governance lens (combining multi-sector, -level, and -actor⁶) and with a framework for the different intensities of the two transitions (parallel, dual, twin, true twin and true twin+) (section 2 – analytical framework).

To these ends it conducts desktop research of relevant policy documents, presentations of programs and projects on the website of the city(ies) and the related research project NetZeroCities. The selection of the documents follows the multiplex lens, starting with the level dimension at the EU level, there the two sectors (plus research policy), moving to the concrete research program and how this was further conceptualised in the subsequent steps of the implementation process, and how it has then been translated in the cities, again following the two sectors as well as concepts and activities in the multi-actor dimension. Furthermore, insights from events are included (like at the European Week of Regions and Cities (EWRC)) as well as from a few interviews at EU level, in the German city of Mannheim, and with a network convener. For the city of Mannheim, the main relevant policy documents were identified via analysis of the city's website as well as the NetZeroCities website and confirmed or complemented in interviews⁷.

The paper looks at the EU policy level (the policy priorities European Green Deal and Digital Age) and the concept of this EU Cities Mission with the guiding question: How much 'twin transition' is in there, i.e. green and digital transitions linked and seeking synergies ("digital *for* green" and the other way around), as well as tackling trade-offs (environmental problems of digitalisation), versus just parallel strategies? How has this been translated in the requirements for the CCC (Climate City Contracts)? How does this compare with the (binding) spending targets for climate/green (30%) and digital (20%) in the so-called 'Recovery and Resilience Facility' (RRF) and 'Recovery and Resilience Plans' (RRP)? (section 3 – policy analysis).

The paper then gives an overview about the EU Mission cities in Germany (section 4): How have the 9 (later 8) cities developed with respect to the foreseen steps in the EU Mission Cities' program? For a deeper dive it draws on insights from the city of Mannheim, which was a frontrunner among the German Mission cities and has remained a very active player, including

⁶ See also similar: Bridging silos through governance innovations: the role of the EU Cities Mission (Buylova et al., 2025).

⁷ Three interviews with policy officers in Mannheim for the Local Green Deal, climate policies and the Missions, one interview with a policy officer for climate policies and the missions in Munich, one interview with a partner of the NetZeroCities project, as well as various written contacts with the respective secretariat.

the question of how the ‘smart’ aspect has been tackled, for which purposes have applications been developed, like data collection/monitoring – for which demands/needs? How have digital tools played a role with respect to processes for enhanced participation and democracy?

We finally look at the aspect of **knowledge input and learning**: How this is tackled in the design of the EU Mission cities, like the Cities Mission Mayors’ Advisory Group⁸, the twinning program and the pilot cities? How does it work in groupings of Mission managers as set up in several countries, including in Germany? (section 5).

The paper closes with a **discussion and conclusions** on these multiplex governance questions and with some suggestions for further research in this area (section 6).

2. Analytical framework: multiplex governance and twin transition

2.1 Multiplex governance for sustainability

The EU Mission of (100) climate-neutral and smart cities by 2030 represents the three dimensions of what we propose to call **multiplex governance for sustainability**:

- It is **multi-level**: with being an EU policy that is implemented at local level, with some impact of the national level policies, governance and finance framework, and this dimension comes with vertical coordination needs.
- It is **multi-sector**: with the two areas of twin transition – climate/green and digital – at the core, but many others concerned when building a strategy and implementing it, most notably people-related (consumption and behaviour related) areas like energy/housing, transport and tourism, food, products & waste/circular economy, and this dimension comes with horizontal coordination needs, which is reflected, for example, with the goal at EU policy level that the Missions are meant to increase the coordination on the Commission side.
- It is **multi-actor**: as transitions towards sustainability, as well as the twin transition of green and climate, can not be done by governments alone, improved participation and engagement of stakeholders and organised civil society, as well as grassroot initiatives and (individual) citizens has been at the heart of governance for sustainability from the beginning, both of which is picked up in the EU Missions with the dedicated intention “to mobilise a wide range of actors on the recipient and implementing side” as well as “to engage with citizens to boost societal uptake of new approaches and solutions”.

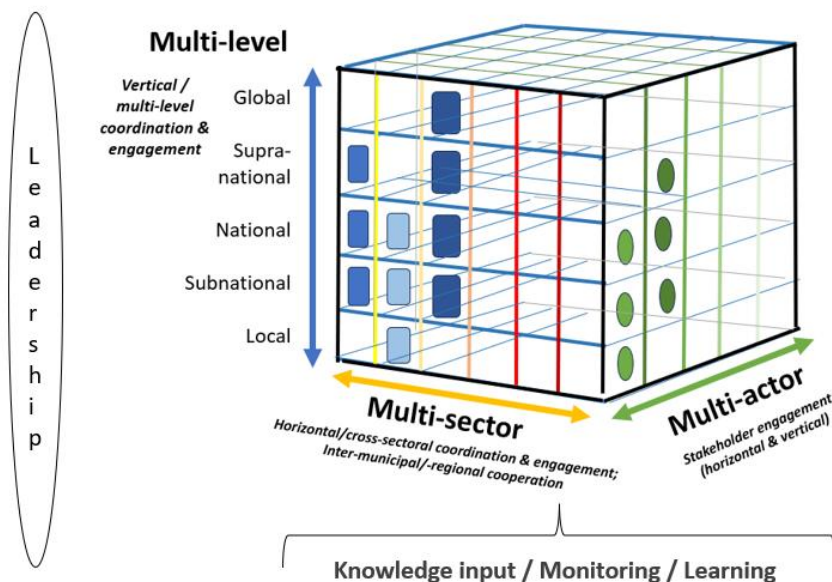
⁸ <https://netzerocities.eu/cities-mission-mayors-advisory-group/>

Silo-thinking hampers effective governance in each of these three dimensions. Bridging silos and ‘teaching silos to dance’ is considered a more useful approach than breaking silos down (Niestroy & Meuleman, 2016). Multi-level governance requires mutual understanding and appreciation of each level of administration, to overcome silo-thinking. The multi-sector dimension includes strategies to bridge sectoral silos – in the context of this paper the institutional and mental silos of green and of digital policies – and make them learn from each other. The multi-actor aspect has to address tensions or lack of cooperation between different stakeholder groups who may be formally independent from each other but may be self-contained in mental silos with biased assumptions about other groups.

Next to these three dimensions there are also the important ones on **knowledge / monitoring / learning** as well as on **leadership/strategy** (Niestroy et al., 2019). The knowledge dimension is represented in the design of the Missions’ program (e.g. through the fact that for the EU Mission Cities there is an own Horizon project established for it, with 33 partners⁹), and there are several incentives and formats for **peer learning**.

Together, the multilevel, -sector and -actor dimensions constitute key elements of governance for sustainable development, now depicted as multiplex governance (see Figure 1).

Figure 1. The multiplex governance situation for the twin transition¹⁰



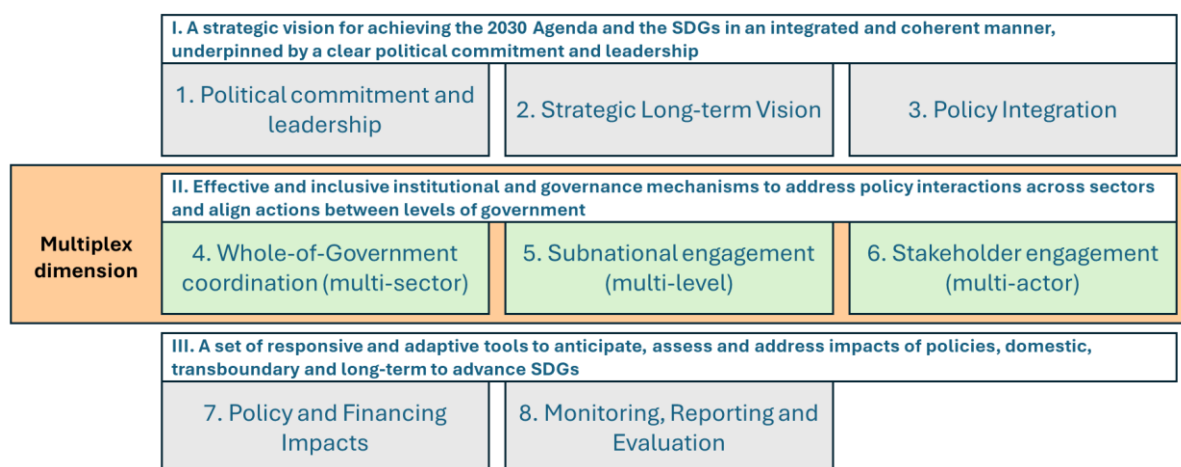
⁹ NetZeroCities - Accelerating cities' transition to net zero emissions by 2030, <https://cordis.europa.eu/project/id/101036519/results>

¹⁰ Source: Council of Europe 2023, Report on Multi-level governance (p.6). Figure adopted from Europe’s Approach to Implementing the Sustainable Development Goals (Niestroy et al., 2019).

The term multiplex governance has so far been used mostly in the context of global governance and multilateralism, where it points at interrelations and interdependencies in complex governance systems, as we are doing with a focus on sustainable development and at a somewhat lower level of granularity (see e.g., Higgott, 2020; Kim, 2020; Sun & Li, 2023).

The OECD clusters the three governance dimensions under the term ‘effective and inclusive mechanisms to address policy interactions’, principles 4-5-6 (Figure 2) (OECD, 2024).

Figure 2. The eight Principles of Policy Coherence for Sustainable Development of the OECD and the multiplex dimension¹¹



Managing the various linkages represented by multiplex governance in a dynamic and currently turbulent policy environment requires contextual sensitivity, understanding of different governance styles – top-down (hierarchical governance), collaborative (network governance) and bottom-up (market governance) – and a managerial approach to diversified governance, usually called metagovernance (Meuleman, 2008; Meuleman & Niestroy, 2015). Metagovernance plays an important role in the multi-level governance processes of the UN (Derks, 2013) and in particular in European Union governance (Jessop, 2008; Candel & Biesbroek, 2016). It is being applied to the green transition (Sørensen & Torfing, 2017) as well as to the digital transition (Ten Oever, 2021), where the European Commission typically designs packages with measures from each of the three basic governance styles.

¹¹ Own composition, after Unleashing Policy Coherence to Achieve the SDGs. An Assessment of Governance Mechanisms (OECD, 2024).

2.2 Interlinkages between the two transitions: parallel, dual or twin?

It takes two to tango

The term ‘twin transition’ refers to the aim of the European Commission to combine its green (in particular climate) and digital ambitions and transformative actions. In the Political Guidelines from incoming President of the European Commission Von der Leyen for the period 2019-2024, published in July 2019 (Von der Leyen, 2019a), the two transitions are still addressed as separate objectives: “*Europe must lead the transition to a healthy planet and a new digital world*” (Von der Leyen, 2019b). The concept of a ‘twin transition’ first appeared in November 2019 in her speech to the European Parliament introducing the Political Guidelines, when she mentioned the “*transformative power of the **twin digital and climate transition** to strengthen our own industrial base and innovation potential*”. A few months later, in the European Green Deal adopted in December 2019, the scope was broadened from climate to green (European Commission, 2019b) and digital but the interlinkage (‘twin’) was missing: “*Europe must leverage the potential of the digital transformation, which is a key enabler for reaching the Green Deal objectives*”. In the Annual Sustainable Growth Strategy 2020, published one week after the European Green Deal, the framing was again slightly different but the ‘twin’ part came back: the Green Deal must “*drive and accompany the **twin digital and climate transition***” (European Commission, 2019a).

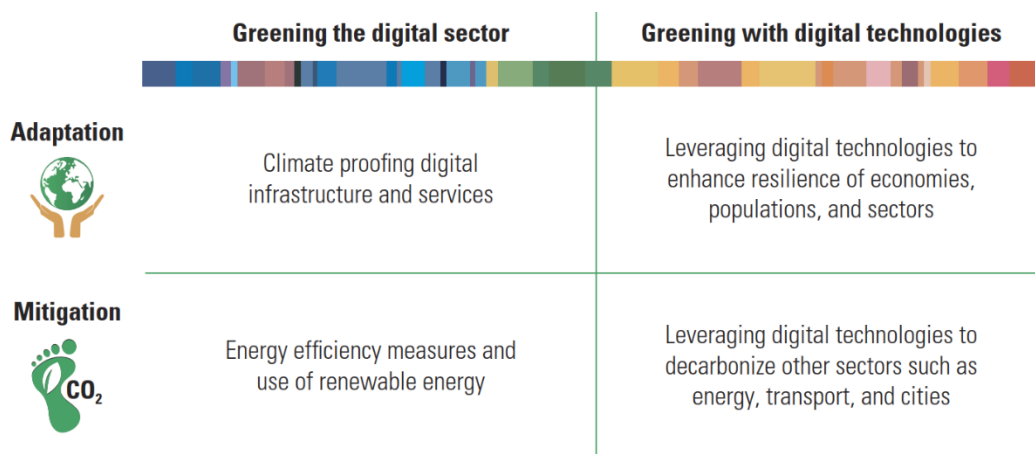
Two months later, in February 2020, the European Commission launched its digital strategy, with a series of thematic and legislative initiatives in the digital field. The Communication on ‘Shaping Europe’s digital future’ highlights “*the need for Europe to lead the transition to a healthy planet and a new digital world. This **twin challenge of a green and digital transformation** has to go hand-in-hand. It requires, as set out in the European Green Deal, an immediate change of direction towards more sustainable solutions which are resource-efficient, circular and climate-neutral*” (European Commission, 2020a).

The concept of the twin transition also became a political frame for communicating that green and digital would be key priorities in the EU programme to support recovery from the Covid-19 pandemic, the **Recovery and Resilience Facility (RRF)**. The Recovery and Resilience Facility would create “*European flagships with tangible benefits for the economy and citizens across the EU, which should address issues that are common to all Member States, need significant investments, create jobs and growth and are needed for the **twin transition***”.¹²

¹² The Recovery and Resilience Facility. Questions and answers. European Commission (online), https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_1870.

A recent World Bank report (World Bank, 2024) concludes that a green and digital twin transition is imperative. Its main messages are that climate change is unfolding amid a digital revolution; that digital technologies are necessary to accelerate climate action; that the digital sector needs to be greener and more resilient; and that achieving a green digital transformation needs a push from industry and a pull from government. The report offers guidance for greening the digital sector itself, as well as leveraging digital technologies for climate action across sectors (Figure 3).

Figure 3. Strategies for the green-digital nexus (Source: World Bank 2024)



The connections between the two transition areas have for many years only been discussed in niches, but the debate has caught up meanwhile, among others through a number of public and policy events on this nexus (Barth et al., 2023). Still, it seems that the impact of digitalisation on green and climate challenges is underrepresented in research (Santarius & Wagner, 2023). Some researchers have criticised the twin transition because negative environmental effects of digitalisation such as energy demand, resource use, and waste generation, were not sufficiently taken into account (Meijer, 2024). In addition, the social, human and generational aspects of the polycrisis were not given enough attention to (Dixon et al., 2022)– although the just transition aspect is also part of the RRF.

Parallel, dual, or twin?

What we can see based on the short history of the twin transition concept above, and other publications, is that there are in practice several operational forms. The term ‘**twin transition**’ suggests strong interlinkages and interdependencies between the two transition objectives and assumes that digitalisation amplifies sustainability (Vihma, 2025). Vihma describes a “‘sweet spot’ of twin transition where digital amplifies sustainability”. This has not been maintained consistently by the European Commission. One of the strongest texts highlighting the

interlinkages between the green and digital transitions can be found in the afore-mentioned digital strategy Communication ‘Shaping Europe's digital future’. Five key examples of synergies between the digital and green transitions are mentioned (Box 1). In addition, it has been argued that the digitalisation of the green transition needs dedicated funding, e.g. for analysing the whole value chain, for innovative digital tools, and for digital literacy (Mihu & Crompvoets, 2024).

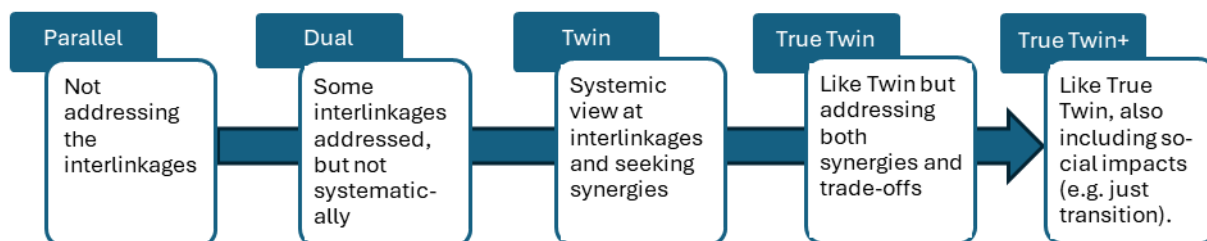
Box 1. Synergies between the green and digital transitions (Source: ‘Shaping Europe's digital future’ (Mihu & Crompvoets, 2024)).

- As powerful enablers for the sustainability transition, digital solutions can advance the circular economy, support the decarbonisation of all sectors and reduce the environmental and social footprint of products placed on the EU market. For example, key sectors such as precision agriculture, transport and energy can benefit immensely from digital solutions in pursuing the ambitious sustainability objectives of the European Green Deal.
- Digital solutions, and data in particular, will also enable a fully integrated life-cycle approach, from design through sourcing of energy, raw materials and other inputs to final products until the end-of-life stage. For example, by tracking when and where electricity is most needed, we can increase energy efficiency and use fewer fossil fuels.
- The ICT sector also needs to undergo its own green transformation. The environmental footprint of the sector is significant, estimated at 5-9% of the world’s total electricity use and more than 2% of all emissions. Data centres and telecommunications will need to become more energy efficient, reuse waste energy, and use more renewable energy sources. They can and should become climate neutral by 2030.
- How ICT equipment is designed, bought, consumed and recycled also matters. Beyond the energy efficiency requirements of Eco-design, ICT equipment must become fully circular - designed to last longer, to be properly maintained, to contain recycled material and to be easily dismantled and recycled.
- A strong digital presence in the EU’s enlargement, neighbourhood and development policy will enable growth and drive sustainable development, including the uptake of green ICT in partner countries and regions, in accordance with Europe’s commitment to the 2030 Agenda for Sustainable Development.

While the post-Covid Recovery and Resilience Facility (RRF) (European Union, 2021) explicitly aims at a **twinn** concept, the Green Deal’s approach (European Commission, 2019b) looks more like a **dual** approach, and the 2023 Communication on Public Administration (European Commission, 2023) considers green and digital as two **parallel** priorities. Also, in the example

of the Mission Cities we will see (section 3.2) that in practice the interlinkages may not be so explicit: in some cases, it would be more appropriate to talk about a dual transition – and when interlinkages are not addressed at all, ‘parallel transitions’ would reflect it better. We can even distinguish **five different levels** of coherence between the green and digital transitions

Figure 4. Five levels of ‘twinning’ the green and digital transitions (own composition)



How to move from parallel transitions towards true twin transitions?

As introduced above, in a “twin transition”, the digital would amplify sustainability – a connection that we often do not find when “**twin transition**” is used. Furthermore, no policy analysed addresses the trade-offs cause by digitalisation (Meijer, 2024, Santarius, Dencik, et al., 2023), why we define this as “**true twin**”. And finally, “**true twin +**” would also include the social dimension.

A 2022 study for the European Commission’s Joint Research Centre examines how the European Union could ensure that the green and the digital transitions mutually reinforce each other (Muench et al., 2022). The report mentions social, technological, environmental, economic, and political barriers to overcome for the twin transitions. JRC emphasises in the study that the ultimate goal should be to reach what we have called a **True Twin+ level**: *“A just transition is crucial for widespread acceptance of green-digital solutions. Social awareness could avoid rebound effects, such as increased consumption as a result of efficiency gains and cost savings”*. Another argument for the True Twin+ approach is that the two transitions might have negative implications for the most vulnerable groups in societies, which makes the call for a ‘just transition’ important (Meijer, 2024).

An argument from a social impact perspective is that digitalisation can hamper the green transition through its **blind faith in technology**, its emphasis on growth and the focus on short-term gains (Meijer, 2024). A concrete example mentioned by Meijer is that non-usage of digital technology is generally considered as a non-rational choice, although non-use can make perfect sense for the green transition, especially when long-term considerations are included.

Last but not least, some scholars have suggested that **digital sufficiency** should become a basis for the twin transition. According to Santarius et al. (Santarius, Bieser, et al., 2023), digital sufficiency could need strategies and policies on (a) hardware sufficiency (fewer devices needing to be produced and their absolute energy demand being kept to the lowest level); (b) software sufficiency (ensuring that data traffic and hardware utilization during application are kept as low as possible); (c) user sufficiency (users applying digital devices frugally and using ICT in a way that promotes sustainable lifestyles); and (d) economic sufficiency (digitalization supporting a transition to an economy characterized not by economic growth as the primary goal but by sufficient production and consumption within planetary boundaries).

Policy coherence requires aligning governance frameworks of the twin transition

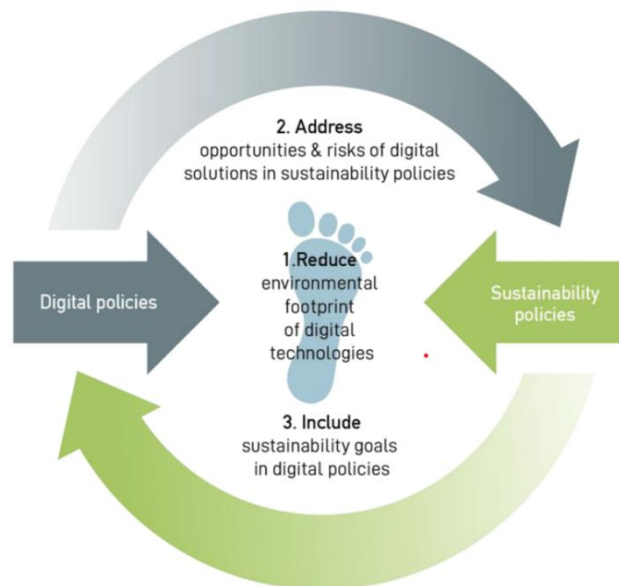
What governance would be needed to achieve, at all levels, a high level of ‘twin’? Broadly spoken, **governance for sustainable development** must focus on three key requirements: effectiveness, accountability and inclusiveness (UNCEPA, 2018). *Effectiveness* is about using digital tools for efficient management and control, for example. *Accountability* benefits from having an open data policy and budget transparency. *Inclusiveness* links to, among others, data disaggregation and online public consultation. Digitalisation can support participation of large parts of the population. Using digital tools to increase transparency of government plans, actions and data can help reinforce trust in government, which is one of the pillars of effective democratic institutions.

A key governance target in the UN Sustainable Development Goals (SDGs) is 17.14 on **policy coherence** for sustainable development (PCSD) (Santarius & Wagner, 2023). To increase and ensure policy coherence throughout the twin transition, **trade-offs** need to be addressed, such as between sustainable energy and high digital energy use, where energy efficiency measures are among the possible solutions. Other trade-offs involved in the green transition are about the negative impacts of digitalisation like cybersecurity risks and environmental pressures, for example (Rayner et al., 2024). In addition, there is a need to identify and create **synergetic effects** such as digitalisation of environmental permitting. UNDP’s SDG Digital Acceleration Agenda offers a tabular overview of all SDG targets, showing that digital technologies can contribute to advancing 119 of the 169 SDG targets (UNDP, n.d.).

To be able to address the trade-offs and build synergies, adequate **governance frameworks** are important.¹³ One obstacle here is the difference in maturity of governance systems for the green, respectively digital transition. Governance of environmental sustainability (‘**greening**’) has a relatively long history and is well-established – not only in practical terms but also because it has the UN 2030 Agenda with its 17 Sustainable development Goals, as well as National Sustainable Development Strategies as common framework (Meuleman, 2018; Niestroy & Meuleman, 2022).

Governance of **digitalisation** concerns the whole internal organization, and can change the bureaucratic and organisational culture, as well as relationships to stakeholders (Mergel et al., 2019). It is generally less developed than governance of greening, although it is catching up (Tan & Cromptoets, 2022). The EU’s broad policy portfolio on climate and energy action uses an e-platform for EU countries to submit information on their climate and energy progress.¹⁴ A ‘digital green deal’ has been suggested to ensure policy coherence between sustainability and digital policy initiatives (Figure 5) (Santarius, Dencik, et al., 2023). This would cover (1) reduction of the environmental footprint of digitalisation, (2) addressing opportunities and risks of digital solutions, and (3) including sustainability goals in digital policies.

Figure 5. How to stimulate policy coherence between sustainability and digital policies (Source: Santarius, Bieser, et al., 2023)



¹³ A governance framework can be defined as “the totality of instruments, procedures, and processes designed to tackle a societal problem. They should be adapted to legal, cultural, and physical conditions of the problem environment and internally consistent” (Governance Frameworks (Meuleman, 2014)).

¹⁴ https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting_en

Digitalisation as support for participation and democracy of the green transition

Digitalisation is also more and more seen as tool for supporting citizen participation, citizen empowerment, and with this it can contribute to the implementation of democratic principles (Mergel et al., 2019). Indirectly it may also support the green transition. Digital solutions can support top-down as well as bottom-up methods of citizen involvement, such as citizen climate assemblies and online citizen's activism. A 2024 discussion paper argues that engaging citizens as both beneficiaries and active agents in combating climate change is vital; deeper participation helps to mitigate costs while promoting a more inclusive approach to the green transition (Rayner et al., 2024).

To conclude this chapter, in section 2.1 the multi-level, -sector and -actor lens ('multiplex') was introduced to discuss the twin transition concept. In section 2.2 we looked at interlinkages between the two transitions: are they parallel, dual, thin twin or true twin? Based on 2.1 and 2.2 we can conclude that it is important to consider the green and digital transition as 'true twins (plus)', as there is a large potential for synergy and well-addressed trade-offs, at all levels of administration (multi-level), in terms of policy coherence (multi-sector), and regarding engagement of societal stakeholders (multi-actor).

3. EU policies for twin transition and the EU Mission 'Climate-Neutral and Smart Cities'

At EU level, the linkages between the green and digital transition areas are supported with policies, legislation and very substantial financial means, not only for national policy reforms but also for public administration reforms.¹⁵ We first look (section 3.1) at the wider the EU policy framework (the policy priorities linked to the European Green Deal and the Digital Age) with the questions:

- How much 'twin transition' is in there, i.e. green and digital transitions linked and seeking synergies ("digital *for* green"), as well as tackling trade-offs (environmental problems of digitalisation), versus just parallel strategies?

¹⁵ The revised Toolbox Quality of Public Administration of the European Commission (forthcoming, 2025) reflects this by including aspects of the twin transition in its extended governance section, and in two cross-cutting sections that are called, respectively, 'Becoming a green public administration' and 'Becoming a digital public administration'.

- How does this compare with the (binding) spending targets for climate/green (30%) and digital (20%) in the EU's 'Recovery and Resilience Facility' (RRF) and the national 'Recovery and Resilience Plans' (RRPs)?

We then move to the EU Cities Mission with the same question about how much twin transition is to be found and its implementation at local level (section 3.2):

- How much and how in the concept of this Mission and the requirements of the two transitions (parallel) or their synergetic combination (twin)? Addressing the trade-offs (see above)?
- How has it developed from the Mission Board report to the selection of cities, to the implementation plan, to the requirements and evaluation criteria for the CCCs (Climate City Contracts) – see timeline of the policies?

3.1 EU policies for green, digital and twin transition: a timeline

The Green Deal and the Digital transition were two of the six priorities of the 2019-2024 European Commission¹⁶. The **green transition** ambitions in both areas have resulted in numerous proposals for EU legislation, policy and funding, most of which are meanwhile (in 2024) adopted and in force. Since 2020, a series of policies and legal initiatives have been adopted that together are meant to shape a **digital transition**, with the first Communication, 'Shaping Europe's digital future' often being referred to as the '**digital strategy**' (European Commission, 2020a). To understand this better, our timeline (**Error! Reference source not found.**) looks back at **three Commission periods**, and forward at one.

Table 1. Timeline twin transitions in EU policies and the Cities Mission (own composition)

	Missions	EU policies	Institutions: Commissioners / VP/ EVP	Institutions: DGs
2009 - 2014		Comm. President Barroso (II) Political Guidelines	Digital Agenda (Neelie Kroes)	DG DIGIT, DG CNECT [from 2012, replacing DG INFSA]
2014 - 2016		Comm. President Juncker Political Guidelines	Digital Economy and Society (Guenther Oettinger)	DG DIGIT, DG CNECT
2017 - 2019			-Digital Economy and Society (Maryia Gabriel) -VP Digital Single Market (Andrus Ansip)	DG DIGIT, DG CNECT No DG
July 2019		Comm. Pres. VDL Political Guidelines. 6 priorities, incl. EGD and	-No more separate Commissioner for Digital; -M. Gabriel becomes Comm. for Research, end of 2019	DG DIGIT -> to Comm. Budget and Admin.

¹⁶ https://commission.europa.eu/strategy-and-policy/priorities-2019-2024_en.

2019 - 2024		Europe fit for the digital age	(and receives the Mission Board reports one year later) -EVP Margrethe Vestager “Europe fit for the Digital Age”	DG CNECT -> to Comm. Internal Market DG COMP
11 Dec. 2019		COM (2019) 640 final: The European Green Deal. Announcement of ... policies... “to address the <u>twin challenge of the green and digital transformation</u> ”	Executive Vice-President Frans Timmermans	Several DGs
Febr. 2020		COM (2020) 67 - Shaping Europe's digital future (“ <u>digital strategy</u> ”)	Executive Vice-President for A Europe Fit for the Digital Age, Margrethe Vestager, and Commissioner for Internal Market, Thierry Breton	DG CNECT
Sept. 2020	Report of the Mission Board for climate-neutral <u>and smart</u> cities, entitled “Proposed Mission: 100 Climate-neutral Cities by 2030 – by and for the Citizens”	SOTEU (the first VDL): “... new industry strategy (March) to ensure industry could lead the twin green and digital transition.”		
Febr. 2021		Regulation (EU) 2021/241 Establishing the Recovery and Resilience Facility.		
Febr. 2021 March 2021	Mission Managers appointed	COM/2021/118 final: Digital Compass: the European way for the Digital Decade		
Missions				
Sept. 2021	COM(2021) 609: European Missions Climate-Neutral and Smart Cities mission (“Mission Cities”): Implementation Plan			
Oct 2021	Start of the Horizon project NetZeroCities = support to the cities			
Nov. 2021	Call for Expression of Interest: 377 cities handed in EOI, incl. 30 from Germany			
April 2022	112 cities selected, incl. 9 from Germany			
Oct. 2023	First batch of Mission labels (10 cities, incl. MA)			
March 2024	Second batch of Mission labels (23 cities, incl. Heidelberg)			
Oct. 2024	Third batch of Mission labels (20 cities, incl. Aachen & Muenster)			

Green and digital under Commission Presidents Barroso, Juncker and Von der Leyen

Attention for digital transition increased at the European Commission in 2009 when President Barroso started his second term, with the designation of a special Commissioner for the digital

era (Kroes), and the creation of corresponding directorate-general in the Commission (DG CNECT).

In 2014, President Juncker's Political guidelines stated that Europe was ill-prepared for global challenges ahead, such as the digital age, scarcity of natural resources, and the impact of climate change. He focused on ten priorities, including a 'Connected Digital Single Market' and a 'Resilient Energy Union with a Forward-Looking Climate Change Policy'. The words transition, transformation, or 'twin' did not yet appear.

Although the twin transition was launched in the Political Guidelines of Von der Leyen in 2019, there was no separate Commissioner anymore for Digital. In this period, Vestager was Vice-President for a "Europe fit for the Digital Age". Although this was kind of levelling up the issue, it bore at the same time the risk that the competition portfolio would dominate over the digital agenda.

The first Von der Leyen Commission (2019-24) published in its first weeks the **European Green Deal** which would "address the twin challenge of the green and digital transformation". An Executive Vice-President (Timmermans) came in place to oversee the work of a range of DGs, as well as an Executive Vice-President for A Europe Fit for the Digital Age (Vestager) with a Commissioner for Internal Market (Breton) who also covers the digital dimension. Shortly after the Green Deal, a Communication was adopted on Shaping Europe's digital future, which is often referred to as the "digital strategy". In the President's State of the EU speech in 2020, she commits to add to the green and digital focus a new industry strategy "to ensure industry could lead the twin green and digital transition".

Since the Covid-19 crisis, the EU financial framework that glues the green and digital transition together, is the **Recovery and Resilience Facility (RRF)** of February 2021. The RRF is a temporary instrument with unprecedented financial means. It started as a response to the Covid-19 pandemic but has meanwhile developed into a tool to address the whole polycrisis the EU countries are facing. The RRF aims to make the EU's economies and societies more sustainable, resilient and prepared for the green and digital transitions. The RRF Regulation announced the availability of maximum amounts EUR 338 billion as grants and EUR 385 billion as loans (European Union, 2021).

In order to benefit from the Recovery and Resilience Facility, the EU Member States' governments had to adopt national **Recovery and Resilience plans (RRPs)**. The plans had to allocate at least 37% of their expenditures to measures contributing to climate objectives and at least 20% of the expenditure to digital objectives. The Commission's Recovery and Resilience

Scoreboard shows that per mid-2024, the reforms and investments proposed by Member States have exceeded its targets. For the RRF as a whole, estimated climate expenditure amounts to about 42% and digital expenditure to about 26%.¹⁷ In Germany, these numbers are even higher, namely 53% and 48%.¹⁸

Overall, the RRF applies, systematically, a dual approach to the green and digital transitions, with some hints to creates synergies (which is ‘twin’), but not yet what we have called ‘true twin’.

In 2021, the Digital Compass was adopted, “the European way for the Digital Decade”¹⁹ (European Commission, 2021a). This Communication has little about the twin transition. One synergy aspect is mentioned, namely that using Green Public Procurement criteria can boost demand for a green digital transformation.

Public administration reforms for the twin transition

The Commission’s 2023 Communication ‘A Europe that supports: towards a modern and effective public administration’ (**ComPact**) (European Commission, 2023)²⁰. This Communication should guide public administration reforms which are financially supported by the **Technical Support Instrument (TSI)**.²¹ The ComPact has three priorities: capacity building in general, capacity for the digital transition, and capacity for the green transition.

The new Commission 2024-29

The Political Guidelines for the second Von der Leyen Commission (2024-2029) mention the twin green and digital transitions again as a priority, with as new aspect boosting productivity with digital tech diffusion. In this Commission team, Executive Vice-President Ribeira is responsible for the green transition, while Executive Vice-President Virkkunen leads the digitalisation agenda. The Mission Letters to all new Commissioners mention green and digital transitions (but not as interlinked). Ribeira’s Mission contains on digital that she should address the challenges and dynamics of digital markets. Virkkunen’s Mission’s only green aspect is the notion that the digital transformation has proven to be a game-changer for society’s ability to tackle major challenges such as fighting climate change.

¹⁷ https://ec.europa.eu/economy_finance/recovery-and-resilience-scoreboard/index.html.

¹⁸ The total can be higher than 100% when some measures contribute to both the green and the digital transition.

¹⁹ https://commission.europa.eu/document/e2aa7a8e-f3d1-45d6-a115-bab5177f2dc2_en

²⁰ https://commission.europa.eu/document/9ecd5276-df34-41ec-a328-ad51d1190300_en

3.2 The EU Mission ‘Climate-Neutral and Smart Cities’ and the twin transition

After having seen in section 3.1 that the twin transition concept has lost some of its strengths as regards EU policies, we take the analysis one step more concrete: How is the twin transition concept integrated in the **Climate-Neutral and Smart Cities Mission**²², a research programme under Horizon Europe, the EU’s key funding programme for research and innovation.

EU Missions are a coordinated effort by the European Commission to pool the necessary resources in terms of policies and regulations, as well as other activities. They also aim to mobilise and activate public and private actors, to create real and lasting impact.²³ The EU Missions concept is **multiplex** by design like virtually all EU policies. It is **multi-level**: the Cities’ Mission is implemented largely by cities, supported by the EU, and accompanied by researchers who observe and analyse the process ‘in action’, and already this makes it collaborative or **multi-actor**. At all levels, it is also about **multisector** coordination – between the green and digital sectors, and where needed, broader. High-level ‘Mission managers’ were appointed within the Commission to oversee the programmes, and each Mission has a Mission Board.

The title ‘Climate-Neutral and Smart Cities’ suggests that this Mission aims at supporting the twin transition. But how much ‘twin transition’ is in there: are the green and digital transitions linked and seeking synergies (“digital for green”), as well as tackling trade-offs (environmental problems of digitalisation), versus just parallel strategies?

In September 2020, a Report of the Mission Board for Climate-neutral and Smart Cities, entitled “**Proposed Mission: 100 Climate-neutral Cities by 2030 – by and for the Citizens**” was published. According to the Mission Board, the mission is fully anchored on the European Green Deal strategy to make Europe climate neutral by 2050, through a multi-level and co-creative process formalised in a climate city contract, adjusted to the realities of each city (Gronkiewicz-Waltz et al., 2020)²⁴. The report states that the 100 cities signing Climate City Contracts “will spearhead the leveraging of the synergies of Europe’s twin green and digital transformations”. Moreover, “making our cities and communities climate neutral and smart is an absolute need for achieving the ‘twin green and digital transformation’”. However, the twin transition is not operationalised in the aim and objectives of this Mission, leaving it hence to the cities to create green-digital synergies.

²² https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/climate-neutral-and-smart-cities_en

²³ https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe_en

²⁴ <https://data.europa.eu/doi/10.2777/46063>

All documents published online at the Mission’s website focus on climate. Digitalisation only appears where it can help addressing climate challenges. How a general digitalisation of cities (e.g., e-Government strategies) can also support the green transition, does not seem to be prioritised.

In September 2021, an **Implementation Plan** (European Commission, 2021d) was adopted, followed by the start of the Horizon project **NetZeroCities**, based on the Horizon call ‘Towards Climate-Neutral and Socially Innovative Cities’. In the description of the call²⁵, digital tools are mentioned as supporting local climate actions, but other ‘twin’ aspects are missing. The call was clearly focusing on climate action, as part of the green transition, and not on the twin transition.

The Mission’s Implementation Plan suggests a dual approach: “The purpose of this Implementation Plan is to describe the rationale and feasibility of the objectives, activities and process for the Mission on Climate-Neutral and Smart Cities (hereinafter “Cities Mission”), how it plans to bring innovation more directly to the service of the *twin digital and green transitions* and in particular to demonstrate how the planned Mission meets the assessment criteria in full.”²⁶ However, digitalisation is treated, across the Plan, as a *means* to reach the *objectives* of climate action, and not as a transformation objective itself. It is about digitalisation *for* climate action. The Implementation Plan states that “*Since climate mitigation is heavily dependent on urban action, we need to support cities in accelerating their green and digital transformation*”.

In addition, the negative impacts of digitalisation on the environment (mainly through energy use) are not mentioned. Moreover, none of the seven ‘specific objectives’ of the Mission mention the digital transition. A Factsheet published in 2021 by the European Commission presents the five main actions of the Mission (European Commission, 2021b), but the digital dimension is absent (Figure 6).

This is much less than in, for example, the EU’s digital strategy Communication on ‘Shaping Europe’s digital future’ (see Box 1 in section 2.2), where not only the main negative environmental impacts of digitalisation are listed, but the Commission also states that the ICT sector needs to undergo its own green transformation.

²⁵ <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/LC-GD-1-2-2020?isExactMatch=true&status=31094501,31094502,31094503&callIdentifier=H2020-LC-GD-2020&order=ASC&pageNumber=1&pageSize=50&sortBy=identifier>

²⁶ Implementation plan: https://research-and-innovation.ec.europa.eu/document/download/d2eb2069-3b4a-4015-9801-7daab749d31b_en?filename=cities_mission_implementation_plan.pdf

Figure 6. The five actions of the Climate-Neutral and Smart Cities Mission (Source: European Commission 2024)



The weak digital dimension of this Cities Mission is surprising. Cities are the level of government where ‘twinning’ between green and digital objectives seems the easiest to realise, compared to the national level. In a municipality, policymaking and implementation are much closer than in a national government. Moreover, the Commission strongly promotes the digitalisation of local services. A smart city is “a place where traditional networks and services are made more efficient with the use of digital solutions for the benefit of its inhabitants and business”.²⁷

How has this been translated in the requirements for the **Climate City Contracts** (CCC)? The requirements for the CCCs do not include integration of the twin transition. A CCC is an agreement (‘contract’) on a collaborative and iterative learning process led by cities and involving multiple stakeholders at various governance levels. It aims to gather all actors to explore the most effective pathways to climate neutrality by 2030, and in joining forces on a common agenda to get there.²⁸

The CCC evaluation report takes the Mission even further away from its original twin focus on green and digital: the **evaluation criteria** do not mention the digital transition, or digitalisation, as supporting the green transition (Müller & Nikolai, 2022).

²⁷ https://commission.europa.eu/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en

²⁸ <https://netzerocities.eu/climate-city-contract/>

4. EU Mission cities in Germany and approaches in Mannheim

This section gives an overview about the participation of German cities in the EU Mission Cities program, from application to selection to implementation (section 4.1), and takes a deeper dive in the city of Mannheim, which was an early mover and continues to be active in all related aspects of the twin transition (section 4.2).

The following Table presents the timeline of the EU Mission Cities in their relation to the participation of German cities, as well as the developments in Mannheim, starting with earlier activities (Table 2).

Table 2. Timeline of the EU Mission Cities in relation to the participation of German cities, and developments in Mannheim (own composition)

	EU Mission Cities timeline	Mannheim journey in sustainability, climate policies and governance, as well as digital transition
2010 - 2020		Climate Concept 2020 (running 2010 – 2020)
Since 2016		Leitbild/Vision Process of localising the 17 SDGs
March 2019		City Council adopts overarching “ Leitbild (Vision) Mannbild ” incl. climate neutrality by 2050
2019	Sept. 2019: Mission Boards were set up (EU Research and Innovation Days)	Mannheim selected for the program Smart Cities model projects (as part of 73 German cities and local communities) ²⁹
Aug. 2019		City Council adopts an urgency plan as answer on the climate crisis and to accelerate towards climate neutrality
Sept./Oct. 2020	Sept: Report of the Cities’ Mission Board with a Proposed Mission for cities	Oct.: Eur. Conf. of Sustainable Cities and Towns: Mannheim Message - Call for Local Green Deals (LGD) (ICLEI)
Jan. 2021	Deadline Horizon Call “Towards a Climate-neutral and Socially Innovative Cities”	Decision to start with a project on LGD
July 2021		City Council Mannheim decides to become pilot city for LGD, and to apply with this approach as EU Mission City
Sept. 2021	COM(2021) 609: European Missions; Mission Cities: Implementation Plan	
Oct 2021	Start of the Horizon project NetZeroCities = support to the cities	
Nov. 2021	Call for Expression of Interest: 377 cities handed in EOI, incl. 30 from Germany	
April 2022	112 Mission cities selected, incl. 9 from Germany, incl. Mannheim	
Sept. 2022	First call of the Pilot Cities program	Mannheim handed in the proposal for CoLAB, together with Aachen and Muenster
Nov. 2022		City Council adopts the Climate Strategy (KSAP 2030)
2023	Network “stronGER cities” of the 9 German Mission cities	

²⁹ Programme of the German Federal Ministry for Housing, Urban Development and Building. <https://www.smart-city-dialog.de/programme-und-projekte/modellprojekte-smart-cities>

April 2023	First batch Pilot Cities	Pilot Cities proposal CoLAB successful (06/2023-05/2025) ³⁰
Oct. 2023	First batch of Mission labels (10 cities, incl. Mannheim)	
March 2024	Second batch of Mission labels (23 cities, incl. Heidelberg)	
Oct. 2024	Third batch of Mission labels (20 cities, incl. Aachen & Muenster)	New project confirmed: GreenDEMO: on enhancing democracy in transition process and a focus on public administration (2025-2027) ³¹
Fall 2024 – Jan. 2025	Four other German Mission cities hand in draft CCCs (Dortmund, Dresden, Leipzig, Munich)	New pilot project successful: COLLECT, as part of the “Enabling city transformation programme”
Jan. 2025	Deadline for the fourth and last batch of CCCs	

4.1 The EU Mission Cities process as rolled-out in Germany

The EU Mission on Climate-Neutral and Smart Cities started off in October/November 2021 (see Table 2) with

- a) the Call for the Horizon project (to the researchers) and
- b) the Call for Expression of Interest (EOI) to the cities.

The former was rewarded to the proposal “Accelerating cities' transition to net zero emissions by 2030 (NetZeroCities)”³² by a large consortium with key partners including EIT Climate KIC, ICLEI and Eurocities. The EIT Climate KIC is also the lead.³³

The latter was extremely successful with 377 cities handing in an EOI, incl. 30 from Germany.³⁴ The Commission had originally intended to run the program with 30 cities but decided to top it up to 100 (plus a small number of cities from Horizon Europe associated countries). It also had to increase the funding for the related Horizon project.³⁵ In April 2022, 112 selected cities were announced, including 9 in Germany: Aachen, Dortmund, Dresden, Frankfurt am Main, Heidelberg, Leipzig, Mannheim, Munich, and Münster.

The Horizon project **NetZeroCities** is meant to help cities overcome structural, institutional and cultural barriers that they face in light of the Mission. It works as a service-oriented platform and is providing the Mission cities with the support and solutions they need in order to achieve

³⁰ CoLAB: “Committed to Local Climate Action Building”.

³¹ [“Making green transitions more democratic and democracies greener: Paving the way for innovative public administrations in European Cities \(GreenDEMO\)”](#)

³² <https://cordis.europa.eu/project/id/101036519>

³³ <https://www.climate-kic.org/spotlight-initiatives/netzerocities/>

³⁴ https://research-and-innovation.ec.europa.eu/document/download/ed6373ab-d190-4b3c-8615-498fffea7388_en?filename=ec_rtd_he-mission-public-eligible-applicant-cities.pdf

³⁵ See Specific Grant Agreements No.1 and No.2 <https://cordis.europa.eu/project/id/101121530>, <https://cordis.europa.eu/project/id/101139652>

climate neutrality by 2030 in a socially inclusive way³⁶. It provides an **online portal**³⁷ for new and existing tools, resources and expertise, as well as dedicated services. The project runs, in several batches, a series of **Pilots**³⁸ to help drive rapid learning, and a **Twinning Learning programme**³⁹ to enable peer-learning.

The next step in the process foreseen in the Mission Cities program is to hand in a draft “Climate City Contract (CCC)”, which is reviewed by the Commission and NetZeroCities, possibly revised in iterations, and in the end the city receives the so-called “Mission label”. Mannheim was an early mover in handing in a draft CCC and was among the first 10 cities to receive the so-called “Mission label” in October 2023.

The Climate City Contracts (CCC) entail the commitment of the cities in three parts:

Part A – Current State of Climate Action

Part B – Pathways towards Climate Neutrality by 2030 (- the action plan)

Part C – Enabling Climate Neutrality by 2030 (-the investment plan)

The “Mission label” is at the heart of the program and gives the cities some advantages, including better access to Horizon Europe and other programmes⁴⁰ and to financial tools. The most recent of those was the access to Climate City Capital Hub, an international finance resource set up in June 2024.⁴¹ Its particular focus is on engagement with private capital. Cities also qualify for a lending envelope of €2 billion, put in place by the European Investment Bank.⁴²

Figure 7 shows the concept for the process, with a phase prior to the CCC comprised of building a strong mandate, understanding the system and co-designing a portfolio, all of which is consolidated into the CCC with its 2030 Climate Commitments and an Action & Investment Plan. The phase after the endorsement of the CCC consists of “Take action, Learn & reflect and Make it the new normal”.

³⁶ <https://netzerocities.eu/the-netzerocities-project/>

³⁷ <https://netzerocities.app/signin>

³⁸ <https://netzerocities.eu/pilot-cities-programme/>

³⁹ <https://netzerocities.eu/twinning-learning-programme/>

⁴⁰ It is planned to have a group of calls in the 2 years Work Programme of Horizon with exclusive access to Mission cities, as well as providing system of extra points on other EU programmes such as LIFE (Background conversation).

⁴¹ <https://netzerocities.eu/capital-hub/>

⁴² https://ec.europa.eu/commission/presscorner/detail/en/ip_24_3482

Figure 7. (Interactive) Climate Transition Map for the EU Mission Cities (Source: <https://netzerocities.app/ClimateTransitionMap>)

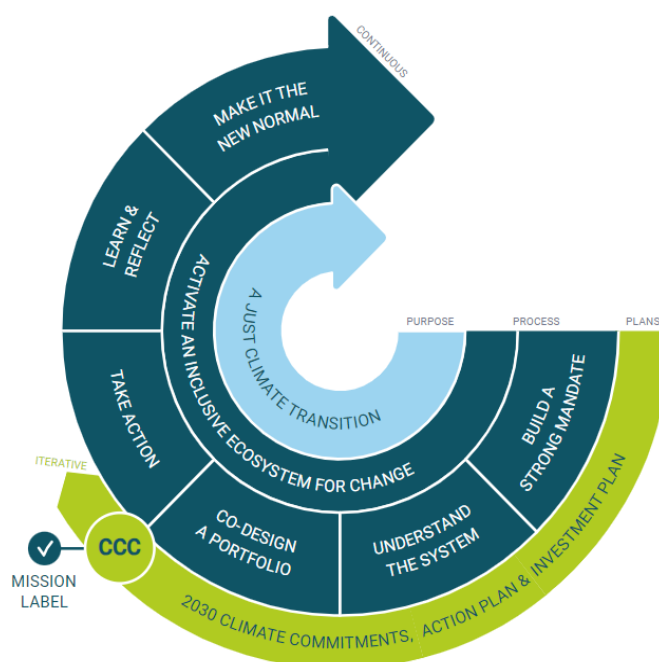


Table 3 shows the timelines of the 9 (now 8) Mission cities in Germany, from the time of handing in the draft CCC to the awarding of the Mission label, as well as their participation in the program ‘Smart city model’ (a program of the Federal Ministry for Housing, Urban Planning and Construction (BMWSB)⁴³).

The next city among the Germans to come in was Heidelberg, whose CCC was awarded with the second batch of 23 cities across Europe in March 2024, followed by Aachen and Muenster who were awarded with the third batch in October 2024. Meanwhile, there was also one drop out: As a quite unusual move, the city of Frankfurt withdrew from the EU Mission cities process in May 2024⁴⁴.

From the remaining cities three more handed in a draft CCC (Dortmund, Dresden, Leipzig) during fall 2024, and Munich is about to doing so. The deadline of the fourth and last batch for CCC is January 2025.

⁴³ <https://www.smart-city-dialog.de/programme-und-projekte/modellprojekte-smart-cities>

⁴⁴ <https://www.stadtvonmorgen.de/news/europastadt/klimaneutral-und-smart-frankfurt-verlaesst-eu-mission-143488/>

Table 3: Timeline of the German Mission cities – the CCC process (climate), and participation in the Federal program ‘smart cities’ (digital) (own composition)

	Federal region	CCC draft handed in (info from indiv. Cities’ communications)	EU Mission label awarded	Smart model city (BMWSB) / strategy
Aachen	NRW	2024	Oct. 2024	
Dortmund	NRW	Fall 2024 – Jan. 2025		Yes / yes
Dresden	Saxony	Fall 2024 – Jan. 2025		Yes / yes
<i>Frankfurt/Main</i>	<i>Hesse</i>	<i>withdrawn</i>		
Heidelberg	Baden-Wuerttemberg	2023	March 2024	
Leipzig	Saxony	Fall 2024 – Jan. 2025		
<u>Mannheim</u>	Baden-Wuerttemberg	Early 2023	Oct. 2023	Yes / yes
Munich	Bavaria	Fall 2024 – Jan. 2025 [#]		
Muenster	NRW	2024	Oct. 2024	Yes / yes

[#] The deadline for the fourth and last batch of CCCs, i.e. by then all cities are expected to hand in their draft CCC.

At the European Week of Regions and Cities (EWRC) 2024 some of the Mission Cities who were part of the third batch of Mission labels presented their plans, including Aachen.⁴⁵

Pilots, Twinning and Enabling City Transformation programmes

As described above, the Pilot and Twinning programmes were the first funding streams to cities, based on a process of applications and awarding. The total funding to be cascaded is about 100 Mio Eur.

A) Pilot program⁴⁶

First batch in 2022: a total of 159 cities applied (in 103 proposals), and 53 were awarded (from 21 countries); the pilots running until from June 2023 to May 2025. The funding amount was EUR 32 million, with the individual funding ranging from EUR 0.5 million to EUR 1.5 million (for combined projects).⁴⁷

From the German Mission cities **Mannheim, Aachen and Muenster** together were successful in the first batch of pilots in 2022, with a project called “CoLAB” (Committed to Local Climate Action Building), which focusses on behaviour change of citizen, inter alia by developing digital tools (see section 5.3).⁴⁸

⁴⁵ <https://regions-and-cities.europa.eu/programme/2024/sessions/37144>

⁴⁶ <https://netzerocities.eu/pilot-cities-programme/>

⁴⁷ <https://netzerocities.eu/2022/09/05/cities-as-a-test-bed-for-climate-neutrality-e32-million-in-support-for-eu-cities-mission-pilot-cities/>; <https://netzerocities.eu/wp-content/uploads/2023/03/Pilot-Cities-Announcement-Press-Release-Mar-2023-Final.pdf>

⁴⁸ <https://netzerocities.eu/germanys-pilot-activity-colab-committed-to-local-climate-action-building/>

A second batch of 26 cities from 16 countries was awarded in January 2024 with a total of EUR 15 million (no participation from Germany)⁴⁹, and the third and last batch awarded 25 cities from 21 countries (with the total funding amount not yet known)⁵⁰. Here the other German Mission cities were successful with two proposals that both have a digital focus:

- **Munich, Dortmund and Heidelberg** with “Climate City Dash 2.0”, for creating data-driven climate governance processes with stakeholders and change agents from the private sector and civil society around user-friendly and interactive climate dashboards⁵¹;
- **Leipzig and Dresden** with “EnAct4CleanCities”, developing a digital toolbox for informing, activating and involving relevant target groups in the energy transition in order to increase knowledge and acceptance among citizens and stakeholders⁵².

Table 4: EU Mission Cities - Pilot, Twinning and Enabling Programmes (own composition)

	Pilot program		Twinning program		Enabling program	
	no. of cities	EUR	no. of cities		no. of cities	EUR
1 st batch	53	32	37			
2 nd batch	26	15	19			
3 rd batch	25	<i>Not yet known</i>				
Additional					26	22
Total	104	<i>(47 plus ...)</i>	56	-	26	22

B) Twinning Learning Program⁵³

Complementing the Pilot Programme, a Twinning Learning Programme was set up as a 20-month programme for knowledge sharing and transfer of good practices, meant to “twin” Pilot cities with one selected Twin City, which is either a Mission city or any other eligible city.

In September 2023, the first cohort of 37 Twin cities were selected (of which 27 non-Mission cities) were matched with 25 Pilot cities or group of cities. One of them was the Aachen/Mannheim/Muenster Pilot CoLAB, matched with Jyväskylä (FI).⁵⁴ In September 2024 another 19 cities were selected as second cohort of Twin Cities (no participation from

⁴⁹ <https://netzerocities.eu/pilot-cities-cohort-2-2023/>

⁵⁰ <https://netzerocities.eu/pilot-cities-cohort-3-2024/>

⁵¹ <https://netzerocities.eu/germanys-pilot-activity-climate-city-dash-2-0/>

⁵² <https://netzerocities.eu/germanys-pilot-activity-enact4cleancities/>

⁵³ <https://netzerocities.eu/twinning-learning-programme/>

⁵⁴ <https://netzerocities.eu/twin-cities-cohort-1-2023/>

Germany)⁵⁵, and the third call for Twin Cities was open until 14 November 2024; selected cities were meant to be announced in December 2024.

C) ‘Enabling City Transformation programme’⁵⁶

This additional program means to build on the Pilot programme and is aspiring to advance “from experimentation to the creation of innovation enabling conditions”.

More than 40 applications were received, and finally 26 awarded (from 24 countries), with 48 cities participating; a total funding of EUR 22.6 million is provided, ranging from EUR 0.6 million to EUR 1.5 million (for combined projects with more than two partners).

Mannheim was successful also in this programme, this time with an individual project called COLLECT (Collectively Enabling Effective Climate Investments).

4.2 Mannheim: Strategies and approaches for sustainability, climate & digital, governance and democracy

As introduced above, Mannheim was a forerunner among the German EU Mission Cities, and the first being awarded with the Mission label in October 2023. This was largely possible because of wide-spanning strategy activities since 2016 in the areas of sustainability and climate. Most notably, there was already a Climate concept in place from 2010 -2020 (“Sustainable Energy Action Plan 2020”⁵⁷ (Stadt Mannheim/IFEU, 2009), which in 2019 was about to expire and needed a successor. During the preparations for a new Climate strategy in 2020 the Missions came into play and Mannheim saw this as opportunity to modify this new strategy and turn this also in an application as Mission city. Key difference and new challenge were the aim of the Cities Mission to be climate neutral by 2030.

The different tracks leading to the fortunate starting position were:

- **Leitbild Mannheim 2030 (Vision Mannheim 2030)**

All individual strategies and programs or projects are referring back to the overarching strategy “Leitbild Mannheim 2030” (Vision Mannheim 2030)⁵⁸. This framework was developed in a participatory process since 2016 and adopted by the city council in March 2019. It was driven by the adoption of the UN Sustainable Development Goals (SDGs) in 2015. The 17 SDGs were

⁵⁵ <https://netzerocities.eu/2024/09/16/19-more-european-cities-will-pair-up-with-eu-mission-cities-to-find-new-urban-climate-solutions/>

⁵⁶ <https://netzerocities.eu/2024/12/11/48-european-cities-to-advance-climate-neutrality-transformation-via-e22m-programme/>

⁵⁷ https://mannheim-gemeinsam-gestalten.de/archiv/sites/default/files/unit/files/klimakonzeption_2020_final.pdf

⁵⁸ <https://www.mannheim.de/de/stadt-gestalten/leitbild-mannheim-2030>

translated to 7 strategic goals and 33 objectives for Mannheim in a comprehensive way (in principle no “cherry picking”).

One of the seven strategic goals is Goal 6 Climate neutrality by 2050, for which progress is assessed with a number of indicators. In August 2019 the City council adopted an urgency plan to accelerate towards climate neutrality.⁵⁹ With this the political basis was created for the climate neutrality goal of 2030 in the Cities Mission.

The Vision Mannheim also includes the action area ‘digitalisation’, which was again beneficial for this track:

- **SMART city strategy**

A smart city strategy had been developed since 2019, when Mannheim was selected for the federal program “Smart Cities model projects” (as part of 73 German cities and local communities)⁶⁰. This was included as asset in the development later of the CCC, most notably as one of the five strategic objectives in the smart city strategy is “an ecological city”:

This objective clearly serves a “twin transition”, as it aims at synergies: It is aimed to use “innovative digital applications to reduce climate emissions, to use resources like energy, water and heat more efficient and to increase tidiness of the public space. Other aims are the reduction of inner city heat islands and to reduce heat damage of public green areas and by this increase their capacity to take up CO₂⁶¹. In the CCC and Mission implementation the digital component largely has the role of measuring and data provision. Apart from this, the Local Green Deal and Climate teams are developing various digital tools (see below).

- **Local Green Deal**

Mannheim had applied and was selected to organise the major ICLEI conference in October 2020, which endorsed the “Mannheim Message” - a call for **Local Green Deals (LGDs)**⁶². After the conference it decided to start with a project on LGDs, to become a pilot city for LGDs, and eventually (July 2021) to also use this approach in the application as EU Mission city⁶³.

The LGD concept is meant to translate and support THE European Green Deal (EGD) at local levels. It calls for systemic changes and key policy shifts needed to bring about transformation

⁵⁹ <https://buergerinfo.mannheim.de/buergerinfo/getfile.asp?id=8130437&type=do>

⁶⁰ Program of the Ministry BMWSB <https://www.smart-city-dialog.de/programme-und-projekte/modellprojekte-smart-cities>

⁶¹ <https://www.smartmannheim.de/themen/smart-city-strategie/>, p.26

⁶² <https://www.mannheim.de/sites/default/files/2021-02/Mannheim%20Message.pdf>

⁶³ <https://www.mannheim.de/de/stadt-gestalten/local-green-deal>

for a sustainable Europe⁶⁴. It also underlines the importance of improved **multi-level** action (vertical), as well as better **multi-sector** (horizontal) coordination:

At the core of the Local Green Deal in Mannheim is a **multi-actor** approach: Against the background that the CO2 emissions of the city itself, i.e. activities under the responsibility of the city administration, is at a max. 1/3 of the total emissions, it had been considered from the onset to as very important to involve and engage citizens as much as possible. According to the LDG concept in Mannheim a “deal” hence means that everybody is asked to make a contribution and to implement a concrete and tangible measure and action. It is assumed that everybody can do this in his/her own context. With the label “**iDEAL**” is meant that it is “iDEAL” for Mannheim if and when a very liveable (“ideal”) city is created.⁶⁵

- **Climate Strategy**

The decision to apply as EU Mission city was fuelled by the situation that Mannheim had just started (in 2019) to work on a new Climate Strategy to run with the same time horizon as the Cities Mission, namely 2020-2030. While this work was meant to be finished by 2020, it was decided by the City Council to extend this to the more challenging task in the Mission to reach climate neutrality by 2030 and to elaborate a Climate Strategy that follows the criteria of the Cities Mission. The preparation was then merged with the idea to apply as EU Mission city with the LGD concept, which was decided by the City Council in July 2021.

Becoming an EU Mission city

Early 2022 Mannheim handed in the application as EU Mission city and was selected in April 2022. In November 2022 the new Climate Strategy (KSAP 2030) was adopted by the City Council.⁶⁶ This strategy represents the main part of the Climate City Contracts CCC (Part B, see above). In addition, an investment strategy was to be developed (Part C of the CCC). The draft CCC could then be finalised and submitted not long thereafter. The Mission label was awarded in October 2023.

⁶⁴ <https://sustainablecities.eu/mannheim-message/about-the-mannheim-message/>

⁶⁵ <https://www.mannheim.de/de/stadt-gestalten/local-green-deal>

⁶⁶ <https://mannheim-gemeinsam-gestalten.de/archiv/dialoge/klimaschutzaktionsplan.html#uip-1>

Becoming an EU Mission city is considered as additional support for the goal of the city to become climate neutral. Both the opportunities arising from being part of such a forerunning group of cities as well as opportunities for financial support are seen as beneficial.⁶⁷

Pilot project CoLAB: developing digital tools for engagement

Next to the CCC process also the pilot project CoLAB (Committed to Local Climate Action Building) was developed and handed in (September 2022) and was successful in April 2023. Within the multi-actor focus of the LGD concept this now focusses on how to trigger behaviour change on the side of citizens.⁶⁸ The pilot has been flanking the CCC process and is conducted together with Aachen and Muenster, who work on the same focus on stakeholders and citizens, in a collaboration and knowledge exchange approach (see also section 5.3).

The novel idea in CoLAB was to fill the gap of the CCCs, which include action plans and investment plans, but no city was able to get commitments by citizens themselves. CoLAB hence wants to active all stakeholders and citizens to test non-technical ways of reducing emissions from consumer behaviour that cannot be directly reduced by the city. To this end Mannheim aimed to set up an online platform as one-stop-shop, a “House of change” that can be visited by citizens to explore their different areas of change. Those include the main challenges of the city regarding climate neutrality, namely greening the heating and electrical systems, increasing renewable energy uptake, and decarbonising the transport system.⁶⁹ The aimed platform was later integrated in the LGD platform “iDEAL” Mannheim⁷⁰. This so far includes commitments (“deals”) by civil society organisations, grassroots initiatives, enterprises, as well as the city administration.

Digital tools FOR engagement

For commitment and “deals” by citizens themselves there is currently a new digital tool being developed, called “**Deal-O-Mat**”, which is building on the existing “**Mitwirk-o-Mat**”. The latter

⁶⁷ <https://mannheim-gemeinsam-gestalten.de/archiv/dialoge/klimaschutzaktionsplan.html#href=..%2Fdialog%2Finformationen%2Ffeu-mission-100-klimaneutrale-staedte-bis-2030-mannheim-von-der-europaeischen.html&container=%23main-content>

⁶⁸ <https://www.mannheim.de/de/presse/mannheim-erneut-erfolgreich-als-europaeische-modellstadt-fuer-klimaneutrale-staedte-bis-2030#:~:text=Mannheim%2C%20M%C3%BCnster%20und%20Aachen%20geh%C3%B6ren,Stadt%20bis%202030%20zu%20schaffen>

⁶⁹ https://netzerocities.eu/2024/05/13/unlocking-citizen-empowered-transformation/?utm_medium=email&_hsenc=p2ANqtz-81LgIxDq0jIYf9A7QCUNA2wd9BNWMb3M0kCASA1Mz-HkbjpuEutI1mAe07vJxX1h6nI136IA-EekhXtwinQD1vWQIyQBxotMOIkuyyzzxfGtFQ&_hsmi=90894670&utm_content=90894670&utm_source=hs_email

⁷⁰ <https://mannheim-gemeinsam-gestalten.de/ideal>

was set up by the Department Democracy & Strategy and supports citizens in searching organisations in order to identify in an easy way those that match their areas of interest for voluntary commitment and activities.⁷¹

In the same way it is aimed that citizens can search and identify those areas where they can achieve a reduction of CO2 emissions in their daily lives, starting off from their current situation and simulating effects in different areas. Developing this tool has been more challenging than expected (including aspects of data protection), but it is expected to be finalized by the end of the pilot in May 2025.

It surely is an example for a ‘twin transition’ tool, which might include aspects of true twin transition including digital sufficiency (see section 2.2)⁷², and it is a promising tool for “true twin transition plus”.

GreenDEMO: Deepening activities in governance for participation and democracy

A new EU Horizon project (2025 – 2027) called GreenDEMO is meant to further deepen the aspect of participation, engagement and democracy.⁷³ It aims at enhancing democracy in transition processes with a focus on public administration for whom it is necessary to build up "transformative capacities". This is against the background that city administrations need to collaborate with stakeholders to set up LGDs, whilst trust in public institutions has been weakening (crisis of democracies), and establishing effective policies and actions for climate and green sustainability is complex already in a less challenging political climate. Hence, there is a double pressure on democracies to secure effectiveness and democratic legitimacy.

It is fortunate for better multi-sector governance (horizontal coordination) that the same staff in the city administration who had worked in the previous research projects for the LGD, including CoLAB, now continues in this new project. It will be desirable to continue working on a “true twin transition+”.

⁷¹ <https://mitwirk-o-mat.de/mannheim/>; <https://www.mannheim.de/de/stadt-gestalten/buergerbeteiligung/buergerschaftliches-engagement/mitwirk-o-mat>

⁷² Partner in the development of the tool is the IFEU institute, which has a long standing history and broad experience in measurement and modelling for environment and climate, <https://www.ifeu.de/en/methods-tools>

⁷³ <https://cordis.europa.eu/project/id/101178743>; <https://www.isi.fraunhofer.de/de/competence-center/politik-gesellschaft/projekte/GreenDemo.html#1208094010>

5. Initiatives for knowledge & learning

The three dimensions of the multi-plex governance model of Figure 1 are embedded in the need for knowledge and learning. This concerns all aspects of the science – policy – society relations, from knowledge building in general, to knowledge input in policymaking, and peer learning mechanisms. The continuous feedback loop between ideas and implementation is crucial in the Missions approach: “*Grand challenges are the difficult but important, systemic, and society-wide problems that do not have obvious solutions, while the missions are the concrete goals that, if achieved, can help to tackle a specific grand challenge*”⁷⁴.

5.1 Concepts in the EU Cities Mission for knowledge and learning

The key mechanism for knowledge input for the Mission cities is the Horizon project ‘NetZeroCities’⁷⁵ which functions as a service platform for the Mission. It provides an online portal delivering new and existing tools, resources and expertise for the cities in the Cities Mission.

The main mechanisms for the cities are:

The **Cities Mission Mayors Advisory Group**⁷⁶ aims to foster strategic advice, shared commitments, and guide Mission-related priorities. It comprises 17 mayors or deputy mayor from 15 EU member states and two associated countries.

The **Pilot Cities Programme**⁷⁷ tests and implements innovative approaches to rapid decarbonisation over a two-year period.

The main mechanism for knowledge exchange and learning is the **Twinning programme**.⁷⁸ It entails a 20 months program and matches pilot cities and non-pilot and non-mission cities. It guides ‘Twin Cities’ in their learning and replication efforts from ‘Pilot Cities’, with a practical focus on implementing the systemic transformation methodologies and innovative approaches demonstrated by Pilot activities, on the journey to climate neutrality.

5.2 German network “stronGER cities”

One of the Mission cities, Munich, took the initiative and set up regular meetings of the 9 German Mission cities 2023. This was first for the purpose to help each other and learn from each other

⁷⁴ Theory meets practice: Getting missions right (Mazzucato, 2024).

⁷⁵ <https://netzerocities.eu/the-netzerocities-project/>

⁷⁶ <https://netzerocities.eu/cities-mission-mayors-advisory-group/>

⁷⁷ <https://netzerocities.eu/pilot-cities-programme/>

⁷⁸ <https://netzerocities.eu/twinning-learning-programme/>

for the development and writing of the CCCs, which has remained an important function over time. It also followed the role model of countries that already had established such a platform (e.g. Sweden, Spain⁷⁹). It gave itself the name “**stronGER cities**”.

As second purpose the desire and need emerged to establishing an open dialogue with the Federal Ministries related to the EU Cities’ Mission, in order to enable discussions in two areas:

- 1) Regulative Framework
- 2) Financing

The Ministries participating are

- Federal Ministry for Education and Research (BMBF)⁸⁰ – as responsible for the EU research programs,
- Federal Ministry for Housing, Urban Planning and Construction (BMWSB)⁸¹ – as responsible for many issues that concern cities.
- The Federal Ministry for Economic Affairs and Climate Action (BMWK)⁸² is considered as desirable to participate, as policies for local climate protection are developed there and as it manages most climate-related instruments for the local level⁸³.

Ad 1) The discussions around the regulative framework concern issues of multi-level in the sense of practice giving feedback to policymaking, a lot of multi-sector issues in the sense of policy incoherence, and the connection between the two.

Ad 2) The main issue in the financing discussion is the cities aim at moving away from the current approach of project after project to a framework financing. For this the City Mission’s CCC is a good role model and a stepping stone: It forces the cities to comb through all existing and relevant policies, programs and projects of the cities, and provide a graspable overview and summary, combined with an investment plan. This could serve a role model for a framework financing approach. It would also serve to overcome the first hurdle in financing: the regulatory burden. The focus should be in how to mobilise funds, how to overcome the nitty-gritty of

⁷⁹ Project CapaCITIES: Mapping of governance actors and core elements in core countries, D 3.1, 2023, <https://dutpartnership.eu/wp-content/uploads/2023/12/D3-1-Mapping-of-Core-Countries-3.pdf>; NetZeroCities: National/Regional CCC Engagement Cluster Situation Report (Johansson et al., 2023), https://netzerocities.eu/wp-content/uploads/2023/11/D1.7_National-Regional-CCC-Engagement-Cluster-Situation-Report-1.pdf

⁸⁰ https://www.bmbf.de/EN/Home/home_node.html

⁸¹ <https://www.bmwsb.bund.de/Webs/BMWSB/DE/startseite/startseite-node.html>

⁸² <https://www.bmwk.de/Navigation/EN/Home/home.html>

⁸³ Like “CCFD” - Carbon Contracts for Difference <https://www.bmwk-energiewende.de/EWD/Redaktion/EN/Newsletter/2020/11/Meldung/direkt-account.html>

regulation, as well as more attention on developing multi-stakeholder approaches⁸⁴. For all aspects improvement is needed in the multi-level governance dimension.

All in all, while the peer learning purpose continues, the focus of the network “stronGER cities” has shifted to policy advocacy. The next steps aimed at are enhancing the network, formalising the platform with the Ministries (ideally run by the Federal government) and expanding the available meeting time. All this includes to also looking out for existing institutions that might serve as anchor⁸⁵.

5.3 Networking and peer learning projects by Mannheim

Next to driving its own sustainability vision, strategies and plans, Mannheim has also sought networking with other cities for peer learning purposes. It has been (a) part of a couple of projects around the LGD concept, it was (b) among the first to hand in a group pilot project under the Cities Mission, and it is (c) part of a new Horizon project that deepens the governance and democracy path.

(a) Local Green Deal

The commitment for the LDGs and this dedicated multi-actor approach had been prepared by two earlier EU projects:

- Evergreen (2021 – 2023), which aimed at identifying specific measures within Europe the action areas of the LGD. It also wanted to enable sharing insights and experience through international networking, most notably with the city of Espoo (Finland)⁸⁶.
- Alliance - Alliance for Local green dealS and Innovative Action for resilient Cities and Enterprises (2022 – 2024): Here Mannheim, Espoo and Umeå (Sweden) got together to develop LDGs as new governance approach on the principles of good governance, policy integration and partnerships with local stakeholders.⁸⁷

(b) Pilot project CoLAB: Mannheim, Aachen and Muenster:

As introduced above, the pilot proposal by Mannheim together with Aachen and Muenster was a collaborative initiative with the aim to build a strong coalition of change with the focus on

⁸⁴ For example, bringing together the 10 or 20 largest producers of excess heat.

⁸⁵ Such as the IBA Munich <https://iba-m.de/>; https://en.wikipedia.org/wiki/Internationale_Bauausstellung

⁸⁶ <https://www.mannheim.de/de/stadt-gestalten/local-green-deal/projekt-evergreen-2021-2023>; which is part of a programme “Future City goes Europe” within the “Research for sustainability (FONA)” program of the Federal Ministry for Research & Education (BMBF), <https://www.fona.de/de/zukunftsstadt-goes-europe>

⁸⁷ <https://www.mannheim.de/de/stadt-gestalten/local-green-deal/projekt-alliance-2022-2024>

supporting and triggering direct behaviour change and climate friendly actions on the side of stakeholders and, most notably, citizens themselves.

While Aachen was planning to set up a 2030 Climate Agency, serving as a focal point for all actors and a management unit, facilitating access to information and hence supporting stakeholders and citizens in decision-making, both Mannheim and Muenster were aiming from the onset on to developing a digital tool.

They experimented with different approaches, both conceptual and technical, Mannheim first focussing on a platform, then moving to a tool, and Muenster from the onset had a digital tool in mind to support climate-friendly lifestyles, at the same time making the 2030 climate goal visible as community task⁸⁸. Now both tracks are planned to be merged into the tool Deal-O-Mat, which will in the end be used by both cities (see section 4.2).

The three cities have been in regular contact about the challenges along the way, with Mannheim and Muenster being closer given the more related digital products aimed at, and in the end most likely a promising tool and success for both.

(c) GreenDEMO

The new Horizon project GreenDEMO (see section 4.2) is another opportunity for peer learning in a Horizon project with three “Demo Cities” (Mannheim, Bristol, Aalborg) and five “Fellow Cities” (Glasgow, Aarhus, Bamberg, Schaerbeek, Poznan), together with five research organisations. The former will work on organisational innovations in the city administrations for better implementation of the Local Green Deals and increasing trust in public institutions. The Fellow Cities (Glasgow, Aarhus, Bamberg, Schaerbeek, Poznan) will work on replication activities and roadmaps for their own organisational change process.

⁸⁸ <https://netzerocities.eu/germanys-pilot-activity-colab-committed-to-local-climate-action-building/>

6. Discussion and Conclusions

After a strong start, the EU's twin transition concept has diluted to dual or even parallel

Conceptually, the twin transition is a strong idea, originally embedded in political documents and processes such as the European Green Deal, the Digital Strategy, the post-Covid Recovery Facility, and the European Semester. It has the potential to bring synergies and real-life trade-offs to the forefront. In addition, the interlinkages between the two dimensions are addressed well in technical guidance from the European Commission's Joint Research Institute (JRC) (Muench et al., 2022).

However, the term has not been used consistently in EU policy documents: the concept of twin transition has been pursued or was successful in different levels of intensity. It gradually shifted from a 'true twin' to expresses only a dual or parallel approach. How the two transition areas are connected makes a big difference in policy and practice. Therefore, we have suggested to explicitly identify these different intensities in a range from parallel to 'true twin+'. We added the category "true twin" (as "twin" should also address negative environmental/climate impacts) and "true twin+" (to represent the concept that there should be green *and just* transition).

In the realm of EU policymaking and institutionalisation, the twin transition concept seemed to be going down with the loss of a dedicated Commissioner. It seemed positive that the topic was then allocated to an Executive Vice-President – with the downside that the main portfolio was on competition, which de facto eats up all capacity of one person. And at the same time, the responsible Directorate-General at the Commission was allocated to the Internal Market Commissioner. The strategic policies were presented by both Commissioners.

The fact that the EU's 'Recovery and Resilience Facility' (RRF) and the national 'Recovery and Resilience Plans' (RRPs) have (binding) spending targets for climate/green (30%) and digital (20%) was not followed up by political guidance on how to connect the two dimensions. The RRF has conditionalities, but the concept is still only dual (two things together, but no synergies yet).

Ultimately, it seems that twin transition is for the EU rather a communication vehicle than a real policy objective. In the European Green Deal and the digital strategy rather parallel approaches can be observed, which are not yet dual or twin. New impulses on the twin transition are not to be expected from the 2024-29 Commission. **The challenge is now fully in the hands of national and subnational governments and stakeholders.**

Climate action dominates in the EU Cities Mission

In the EU Mission for Cities, the journey was a bit windy. Digital/smart was meant to be included (see title of the Mission Board), but the report of the Mission Board took “smart” out and added the focus “by and for citizens”. Then “smart” re-appeared in the title, and the subsequent process the implementation plan for the Mission covers “digital” quite widely.

In the next step, however, the digital aspect has apparently lost relevance: In the evaluation criteria for the CCC, the concepts ‘digital’, ‘smart’, or ‘twin’ strategies/transitions are not included.

In the Cities Mission, the green or climate dimension dominates over the digital dimension. On the one hand this is positive, given that there is a climate imperative. On the other hand, it seems to underestimate the potential of EU level digital policies and institutions to support local governments. In particular, it seems to neglect that the twin transition is a high, cross-cutting EU priority, which is reflected in the around EUR 700 billion made available through the Recovery and Resilience Plans, and by the fact that the twin transition is highlighted in the annual European Semester country reports.⁸⁹

This is not only a missed opportunity, but neglecting the ‘true twin’ even more is against the EU’s precautionary principle: It is important to try preventing developments that may go against major EU objectives, and to tackle the emerging or already existing trade-offs.

In the end, how the twin green and digital/climate transition is operationalised in the Mission cities is largely based on the own initiatives of the cities, and/or other funding schemes (like the “smart cities” in Germany). Successful cities seem to be capable to “navigate” different programs and funding sources, connect them to their own ideas, initiatives and strategies, as the example of Mannheim has shown. Being capable requires the capacity for having antennas out (identifying programs early enough) and the capacity and skills to writing proposals, including to know the legal and financial requirements. Overall openness between departments provides a good ground for multi-sector cooperation.

EU Missions as tool/incentives for cities

Based on the example of the Cities Mission it seems that EU Missions can be clearly beneficial for cities:

- Creating a group of ambitious and frontrunning cities and better access to finance/investments

⁸⁹ See e.g. the [European Semester Country report on Germany \(2024\)](#).

- Cities are forced to combing through the entire relevant spectrum of policies, programs, projects and providing a comprehensive approach geared towards achieving climate neutrality, and this in combination with an investment plan.
- The push and pull system: the Commission promised a “Climate City Capital Hub” and needs to deliver on this; needs to enhance what has been so far put into place, e.g. the conditions of the funds provided by EIB.

On the following aspect there seems room for improvement:

- It is beneficial to provide improved access to Horizon Europe through calls exclusively for the Mission cities, but more could be done.
- Providing extra evaluation points when Mission cities apply for other programs is a good idea that needs to be monitored well (and possibly readjusted).
- The TSI programme (Technical Support Instrument) is an EU programme that provides tailor-made technical expertise to EU Member States to design and implement reforms. It works on demand and does not require co-financing from Member States⁹⁰.

In all cases the above-mentioned project logic remains, and it will be a permanent and structural task, also for the new Commission and the work on the new MFF (Multi-annual Financial Framework), to be in place from 2028-2034⁹¹, to mitigate this⁹².

The EU Cities Mission in a multiplex governance perspective

From a multiplex perspective, the twin transition concept is in essence multi-sector because it connects two policy sectors and multi-level because it links EU, national and subnational levels. The weakest aspect of the twin transition is maybe multistakeholder engagement, which is not addressed explicitly.

The **multi-sector dimension** – linking green and digital – was well intended but seems to be rather weakly conceptualised and implemented. Other mechanisms are the drive for cities to do more on twinning the green and the digital transition, of working on digitalisation *for* sustainability. Overall, the relevance of the digital track has diminished over time, since the

⁹⁰ https://commission.europa.eu/funding-tenders/find-funding/eu-funding-programmes/technical-support-instrument/technical-support-instrument-tsi_en. It is the successor of the Structural Reform Support Programme (SRSP), a program that allowed the European Commission to coordinate and provided tailor-made assistance to EU countries, also upon their request, to support them in the design and implementation of institutional, administrative and structural reforms, and in making efficient and effective use of relevant EU funds (2017 – 2020). This again was a programme born out of the financial crisis, most notably in Greece.

⁹¹ <https://www.europarl.europa.eu/factsheets/en/sheet/29/multiannual-financial-framework>

⁹² See e.g. <https://www.coimbra-group.eu/future-eu-long-term-budget-all-bets-are-now-off/>

conceptualisation of the City Mission, at least in the steps after implementation plan. Key is that proposals or activities for twin transition were not part of the evaluation criteria of the CCCS, and this cannot be changed anymore:

The **multi-level dimension** is inherent, in different ways and not always throughout all levels. Like in other policy areas, the EU created a group of forerunning/ambitious cities. New is that the logics differ: the Covenant of Mayors (on climate action), for example, has had a focus on information gathering, awareness raising, and overall, an advocacy logic, while the logic of the Cities Mission is money: better access to other programs, better access investments; an investment plan is part of the Climate City Contracts. At the same time the cities in some countries, incl. Germany, use their position and try to improve the collaboration with other levels in the country (national/federal, subnational), including in the area of financing and investment (which is again an advocacy logic).

The **multi-actor dimension** runs through design, implementation plans and actions on the ground. It runs through all activities, both top-down, in the design of the Missions, the implementation plan and the CCCs, i.e. the actions in the cities, as well as in the additional activities within the countries (see multi-level).

At the time of writing of this paper, the fourth and last round of submissions for draft CCCs is going on, with a deadline end of January 2025. By then all missing CCCs need to be submitted. The evaluation and revisions of those CCCs need to follow the same criteria as before.

However, it would be desirable to pick up this original component of the City Mission concept and pursue where feasible, for example:

- **Preferred funding** for those proposals for the next rounds of pilots and twinnings that serve a ‘true twin transition’.
- The **assessment criteria** for pilot proposals would still need to be developed.

To this end the NetZeroCities consortium could provide a survey/study of good practice examples for a **true twin transition**, i.e. those with the “sweet spot”, where not only synergies between digital and climate transition are achieved, with taking the social component into account (**true twin transition+**), but where negative effects on the environment/climate are mitigated from the onset (e.g. a product/process design where the required additional energy is created by renewables in a local setting, a circular model is introduced in the life-cycle, etc.). An important element would be tackling structural changes versus an overly technical belief only, including considerations of “digital sufficiency” in light of, inter alia, the damaging environmental footprint. A “Digital FOR sustainability” should furthermore aim at synergies between digital

innovations for environmental sustainability and “connecting people” – the participation and democracy aspect.

In any case, it can be confirmed that for the approach taken in the Mission programme, namely a comprehensive programme combined with a focus on investments, it is important to maintain the element that both are data-based. This is a key role for the digital leg in the programme: providing data platforms so that cities are able to perform climate accounting.

Following-up this latter point: A ‘**true twin transition**’ as introduced here not only takes into account the environmental trade-offs (and mitigate them), and the social aspects that belong to the green transition (- a just transition), what we call ‘**true twin transition+**’, but also the even more fundamental aspect that digitalisation should provide **better data**, hence better knowledge, which again needs to be better made available for people. This is hence an approach of **democratising data and knowledge**, which requires developing and using respective tools for this (for example dashboards, apps, ...). In light of the current democracy crises such approaches underlining knowledge and participation, “**digital FOR democracy**” and tools should get a high priority in support, where this is foreseen in CCCs and in the future pilots and twinning calls. The digital tool Deal-O-Mat as emerging in the CoLAB project is an example of an innovative tool that has the potential for being testing and scaled in many other cities.

As regards the aspect of **knowledge sharing and peer learning** among cities, the support through the Cities Mission Mayors Advisory Group, the Pilot Cities Programme, and the Twinning Learning programme seems to work well, in the sense that it ensures that the cities are not working in isolation, and that peer learning is effective. A currently running study in Germany is looking again at the governance arrangements and requirements of the mission cities and other city support networks.⁹³

Preceding projects like CapaCITIES as well as the current supporting project NetZeroCities provide analyses on the **multilevel governance** arrangements in the member states, including the **multi-actor** perspective; the **multi-sector** aspect falls a bit short in the governance papers – it rather features in work on policy, where again governance typically falls short. A conclusion from the CapaCITIES project was that infrastructures to facilitate multi-level and multi-stakeholder collaboration are essential to the success of the EU Cities Mission. It also suggested that for

⁹³ <https://www.dfi.de/projekte/einzelansicht/studie-zur-eu-mission-100-klimaneutrale-und-intelligente-staedte-bis-2030>

countries where a national platform or network is missing or under development, assistance in setting up support structures that can be further developed should be prioritised.⁹⁴

On the aspect of **leadership**, it was mentioned that among the different types of mayors, ranging from more networking works styles, being rather open for proposals and actions from the ground, to more hierarchical styles, the former tends to be beneficial for accelerating things. In any case, the different styles require adaptation to it by staff and other actors. Regarding EU programmes it is beneficial when mayors keep a broader and long-term horizon, which provides a better basis for ‘smart’ puzzling and surfing programmes that makes out cities that successful over a longer time.

Further research

Relating well to ongoing research and studies as addressed above it would be welcomed

- to conduct a survey across all Mission cities, and similar city networks on climate (and/or digital) to identify good practice in (true) twin (+) transition (including successful approaches that are called differently,
- to take a deep dive in those and research the governance elements (or others, e.g. political) that bring about such successes, as well as overcoming obstacles, such as mental silos between green and digital parts of the respective organisation;
- to follow-up the development of ‘digital for democracy’, conduct a survey on such tools for citizen engagement and empowerment for the green transition, e.g. research the development and operation, both in practical terms and effectiveness;
- to further investigate the applicability of the multiplex governance framework and to regularly monitor/assess twin transition processes with this.

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⁹⁴ Mapping of governance actors and core elements in core countries (Moreno et al., 2023). <https://dutpartnership.eu/wp-content/uploads/2023/12/D3-1-Mapping-of-Core-Countries-3.pdf>

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