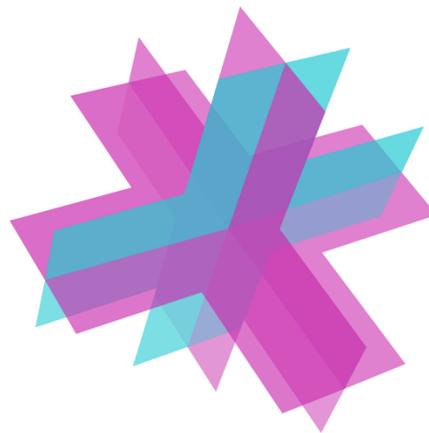


D3.1 Framework for Bold City Vision, Guidelines, and Incentive Schemes

(SDG City Transition Framework)

+CityxChange | Work Package 3, Task 3.1
Final delivery date: 07-04-2020



+CITYXCHANGE

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Article 29.5 Disclaimer

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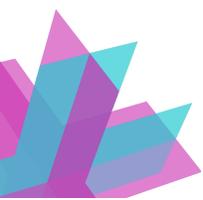
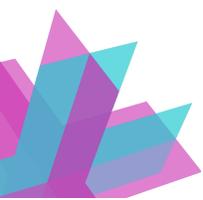


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List of Acronyms

Term	Definition/explanation as applied in the project
UN SDG	United Nations Sustainable Development Goals
LHC	Lighthouse Cities
FC	Follower Cities
NPF	National Planning Framework (Ireland)
KPI	Key Performance Indicator
BCV	Bold City Vision
EED	Energy Efficiency Directive
EPBD	Energy Performance Building Directive
DOA	Description Of Action
LAAS	Leadership as a service
FDI	Foreign Direct Investment
L2030DAC	Limerick 2030 Strategic Development Designated Activity Company
LUCROC	Limerick Urban Center revitalisation – O’Connell Street
ICLEI	Local Governments for Sustainability
U4SSC	United for Smart and Sustainable Cities

1 Executive Summary

The +CityxChange Bold City Vision (BCV) *Framework, Guidelines and Incentive Schemes* helps cities identify and address key opportunities and actions on their way towards becoming smarter and more sustainable. The framework incorporates the process of creating a city *vision* and *goals* that situate the actions aimed at creating Positive Energy Cities firmly within the cities' overarching planning and management process. The focus on smart energy needs to be aligned with a broader concern with sustainable development, covering social, financial, technical, and urban aspects, and linking to the overall European Strategies for 2050 as well as the United Nations Sustainable Development Goals (SDGs). For this reason it carries the action-oriented subtitle *SDG City Transition Framework*.

The role of cities is growing in importance with 68% of the world's population estimated to live in cities by 2050, according to The 2018 Revision of the World Urbanization Prospects (United Nations, 2019). They are the engines of growth accounting for 80% GDP. However, main parts of our anthropogenic CO₂ emissions occur in cities, thus cities also present one of the sources of the greatest threat to the future of the planet. Managing the growth and development of our cities in a sustainable manner is therefore critical to the future of the planet. The UN Sustainable Development Goals (SDGs) set out on a global scale targets for the future development of the planet. Cities have the most important role in meeting these targets; if they are to transition and meet these targets, we need to leverage smart and sustainable innovation.

The Bold City Vision Framework connects the global goals of the SDGs to local policy development with a strong emphasis on citizen engagement and citizen driven open innovation and business development. One important question still remains: How can cities prioritise their goals within the global framework of the SDGs in an open and participatory manner? Each city must align itself to the SDGs and establish its own priorities. In doing so the city must first review its current policy objectives and compare these to the outcomes of an evaluation of its own SDG performance and potential. The United for Smart Sustainable Cities (U4SSC) KPIs¹ afford cities the first truly global set of KPIs for evaluating and monitoring progress, at the city level.

This first version of the Bold City Vision Framework has been developed by drawing on the combined insights of work done in +CityxChange Lighthouse Cities Limerick and

¹ <https://www.itu.int/en/ITU-T/ssc/united/Pages/default.aspx>



Trondheim, as well as input from the Fellow Cities. The continued development of the framework will happen as Lighthouse and Follower Cities develop their respective Bold City Visions. The Framework comprises and ensures a continuous and iterative process, beyond the time period of the prevailing +CityxChange project period, to provide future, improved BCVs in cities.

When structuring the Bold City Vision Framework, and in order to handle the inherent complexity of moving entire societies in a smarter and more sustainable direction (transition process), the Framework has been optimised to deal with the following questions:

- How can cities maximise their ability to identify and share local high potential solutions to the rest of the city, and beyond, in order to meet their agreed goals? Cities are becoming increasingly aware that they are investing in large numbers of research and pilot initiatives that may lack both the ambition and the conditions conducive to large scale impact.
- How can cities identify and connect to the financial, social and human capital needed to realise large scale socio-technical interventions. There is a risk that ambitions are scaled down to fit local constraints instead of creating opportunities to mobilise the resources needed to truly scale the solutions to match the SDG-related challenges facing the city.
- How can cities best manage the complexity, and thus the opportunities, involved in SDG-planning and action? A fragmented approach could undermine both local impact and the potential for large scale innovation, productive partnerships and investments.



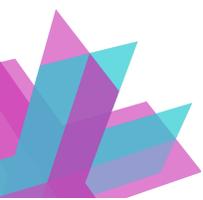
	Engage	Design	Activate	Accelerate	Support
 Standardisation	Evaluation	Visualisation	Simulation	Funding	Sharing
 Policy development	Review	Revision	Planning	Budgeting	Analysis
 Innovation partnerships	Appointment	Linking	Collaborating	Prioritising	Portfolio management
 Organisational development	Identification	Leadership	Intrapreneurship	Self organisation	Twinning
 Citizen engagement	Acknowledgement	Deliberation	Localisation	Connection	Amplification
 Project development	Pitching	Prototyping	Delivering	Capitalising	Storytelling

BOLD CITY VISION FRAMEWORK FOR 2050

Figure: The Bold City Vision Framework, with 6 main processes and 30 dimensions/sub-processes.

The dual purpose of this document is to present the Framework, as well as illustrate how the Framework itself opens a multitude of windows of opportunities to identify and share potential contributions that may add value to the transition process. Each process, and sub-process, offers an array of opportunities to plug in new ideas and solutions.

The Framework will be further developed in common learning processes with cities. For example, the municipality of Asker has, in cooperation with the City of Trondheim, already made a Norwegian edition which will also be used together with the Norwegian Association of Local and Regional Authorities to develop and make this available for all municipalities in Norway (Asker Municipality, 2019). This will again be input for the implementation of the Bold City Vision in the +CityxChange Lighthouse and Fellow cities.

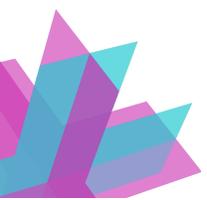


2 Shared Understanding of the Task

The +CityxChange Bold City Vision Framework and associated guidelines and incentive schemes will enable cities to align strategic and operational activities when formulating visions, (political) goals and actions related to smart and sustainable transitions. Additionally, the framework allows for open innovation and business development by embracing a systematic approach to citizen engagement and public-private partnerships. Lastly, the Bold City Vision integrates, across 30 sub-processes in the framework, high level guidelines and espoused examples and tools allowing for an inclusive process where both citizens, industry partners and local leaders are seen as part of a whole.

The target groups for this deliverable are politicians, city officials, city planners, as well as others engaged in social and technological issues related to sustainable urban development. The framework output is an actionable roadmap for smart and sustainable transitions, integrated into the planning and governance systems of the cities, and compatible with forging strong multi-helix partnerships.

One of the most common challenges with citizen engagement activities is that you invite citizens into a framework you have already created; you are not actually allowing citizens to co-create (Arnstein 1969). By introducing several levels of actions, from the strategic planning actions all the way down to the different workshops and use of digital tools, one can start planning for multi stakeholder (private and public enterprises, NGOs, citizens, and citizen groups) activities in the right context and time. This model also makes it possible to combine stakeholder engagement actions across planning processes and projects, to share resources and prevent single stakeholder lock-ins, and participatory exhaustion in target groups.



3 Introduction

Past work on the replication of smart and sustainable solutions have demonstrated that the replication is not only a matter of implementing the required technologies at scale (Vandevyvere 2018). The transition process needs to account for the role of a multitude of processes, functions and resources, including constraints imposed by users, financing and regulatory bodies, to mention but a few.

A number of guidelines and / or cookbooks for developing and applying an integrated approach in planning and implementation of smart city projects have been developed (e.g. Borsboom-van Beurden et al. 2016). A challenge with many of the guidelines have been that they present idealised versions of the planning process that leaves practitioners with the question of how to actually map current institutionalized practices and functions onto the suggested “best” practices. For the development of the BCV framework the practitioner perspective was given priority by developing the framework through a consultative process whereby existing practices, functions and resources were mapped into the framework by the practitioners themselves and then used to challenge the relationship between the constitutive elements.

The Bold City Vision Framework, Guidelines and Incentive Schemes connects the UN Sustainable Development Goals (SDGs) (United Nations 2015), the UN United for Smart and Sustainable Cities Key Performance Indicators (KPIs) (U4SSC 2017) or other globally/nationally recognised standards for evaluating and monitoring sustainability or “smartness” to locally situated policy development with a strong emphasis on multi stakeholder engagement, and development of sustainable business partnerships. It is important to note that the BCV framework is KPI-agnostic in that it can take as its input an array of emerging global standards to inform the need to review and revise policy and action. Different KPIs will inform different aspects of the transition process, such as input, process and/or output (Huovila, Bosch and Airaksinen 2019).

Most cities will already have more or less specialised functions dealing with different aspects of this transition process (e.g. budget officers, statisticians, city planners, HR, community managers etc.). However, there may be gaps and missing links in the transition process that can ultimately impede the speed and quality of policy development, as well as the ensuing action and impact. The use value of the BCV framework is linked to its usage by interrelated stakeholders as a navigation tool to recognize and relate to adjacent functions and processes likely to have a bearing on effective goal attainment.



This deliverable provides a framework for how cities can create a dynamic and evolving Bold City Vision towards 2050; visions for sustainable development that will cover both urban, technical, financial, and social aspects. It integrates processes linked to accounting for and including city officials, citizens, business partners and other stakeholders as part of an integrated set of guidelines for managing a societal transition towards smarter and more sustainable cities.

While the framework helps cities pave the way from Positive Energy Blocks to Positive Energy Cities, the Bold City Vision framework has been designed to address smart sustainable city transitions more broadly. This is important because cities will have to deal with a multitude of solutions at any given time and understanding what it takes to choose and develop further solutions along means taking stock of the whole.

The Bold City Vision Framework is flexible in that it outlines the overall steps to be followed by any city, all the while allowing for local variations at the operational level. The framework will thus be a generic support tool making it easier for Limerick, Trondheim and the Fellow Cities to create their respective visions, guidelines and roadmaps.

The Bold City Vision Framework is also designed to allow for BCVs to connect naturally to citizen participation and the Citizen Observatories, as well as Innovation Playgrounds, as visualized below. Details on these are forthcoming as Deliverables D3.2, D3.3, D3.6.



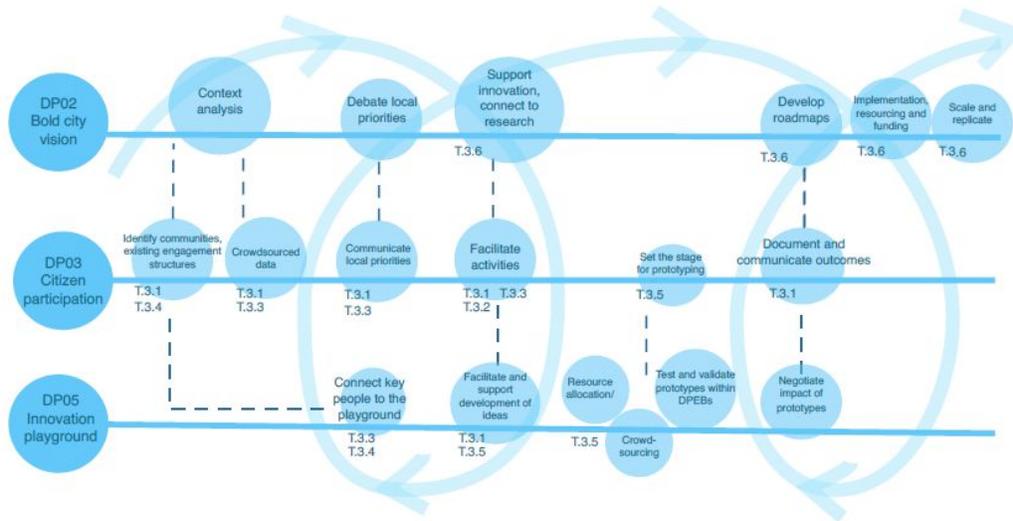


Figure 3.1: Interconnection between BCV, citizen participation and Citizen Observatories, and Innovation Playgrounds.



Enabling DPEBs/DPEDs

of politically-approved Bold City Visions with guidelines, roadmaps, and action plans

7

The project KPI for Bold City Visions is that all seven cities will have their Bold City Vision, including guidelines, roadmaps and action plans, politically approved in their city. This is identified as KPI 6 for +CityxChange, which is outlined in Deliverable D7.1: *Approach and Methodology for Monitoring and Evaluation*.

Task 3.1 and the making of this report production has been led by the City of Trondheim (TK) in collaboration with other cities and partners. Each of the seven cities in the consortium will over the next two years test the Bold City Vision framework by facilitating processes locally, documenting and exchanging their experiences for collective learning.

It is important to note that the current version of the BCV framework is still a work in progress. The continued development or adaptation of the framework will happen as Lighthouse- and Follower Cities continue developing their respective Bold City Visions, and the framework will henceforth be used to continue tracking and capturing the practices and shared experiences by stakeholders identified as contributing to the 30 sub-processes. Based on the accumulated data the framework will be updated to better capture both current as well as potential future best practices.

3.1 Methodology

The overall goal for the +CityxChange project is to design and demonstrate Positive Energy Blocks (PEBs) within the timeframe of the project, i.e., between November 2019 and October 2023. In order to move beyond a limited demonstration and create a more significant impact, the solutions developed need to scale from the block level to the city level, and beyond. In other words, the +CityxChange project needs to anticipate what happens after 2024, when the first Positive Energy Blocks will have been delivered, and account for conditions and dimensions that may be addressed both post and pre 2024, up to 2050, as part of the European Energy Transition.

The basic +CityxChange solution to this is embedded in the +CityxChange vision of *Co-creating the future we want to live in* (Fig. 3.2). Co-creation in a multistakeholder setting is at the core of +CityxChange, and is at the core when the cities were jointly developing a BCV framework, and the evolving BCVs.

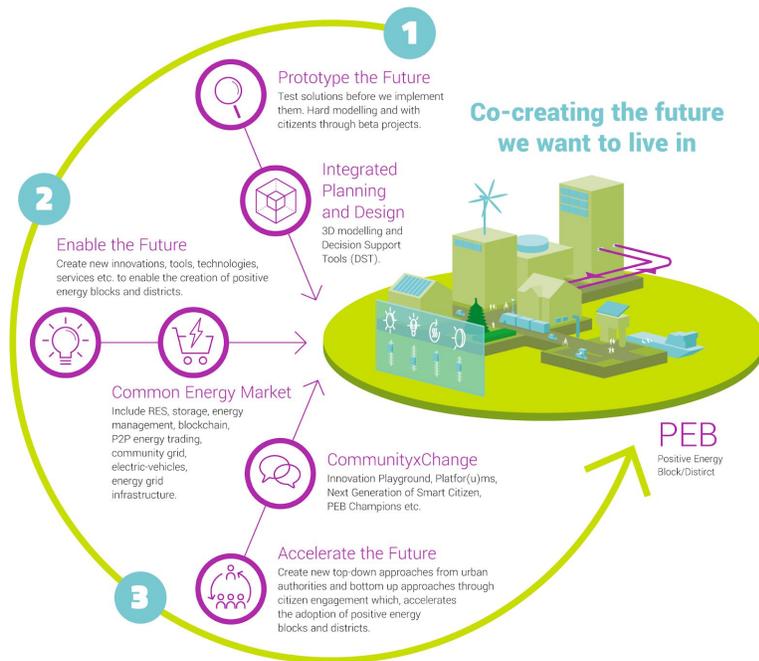


Figure 3.2: +CityxChange vision and the foundation in co-creation.

This co-creational process on scaling from PEBs to Positive Energy Districts, and then aim for Positive Energy Cities (PECs) consists of 3 main steps: Design and prototyping, Enabling, and Accelerating. Based on literature and experiences from our cities, these 3 main steps were then during the work in Task 3.1 detailed into 5 steps – or

subprocesses – that are necessary to scale from PEBs to PECs: Engage - Design - Activate - Accelerate - Support (Figure 3.3).

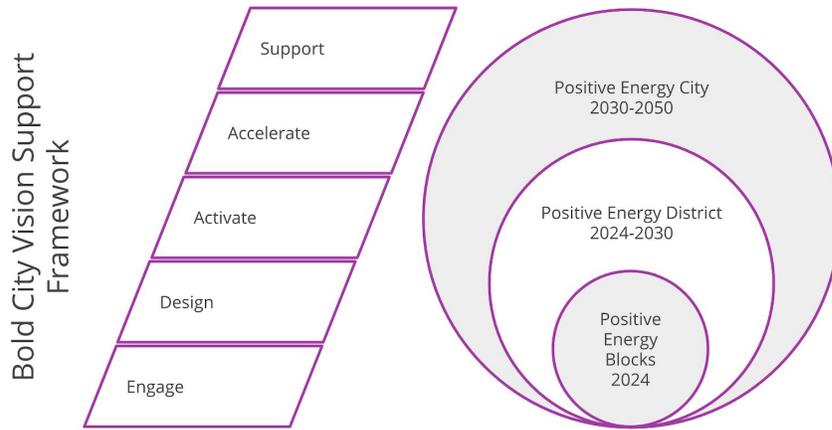
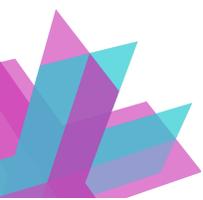


Figure 3.3: The +CityxChange 5 subprocesses for the BCV Framework to facilitate and drive scaling of PEBs to PEDs and PECs.

A Bold City Vision has both a strategic and a practical dimension. International work and experience on these types of visions in a broad co-creational setting is sparse. Thus testing and experimenting and engaging and involving core stakeholders is of utter importance in order to gain knowledge and experience, to develop and further develop a multi stakeholder based BCV. Bridging the gap between the strategic and practical level is thus important in this sense; which has been an important part in developing the +CityxChange BCV Framework. An example of a visualization of this is shown in Figure 3.4. This will be driven as an iterative process, where outcomes and results are brought back into further development of the Framework, creating a positive feedback loop.



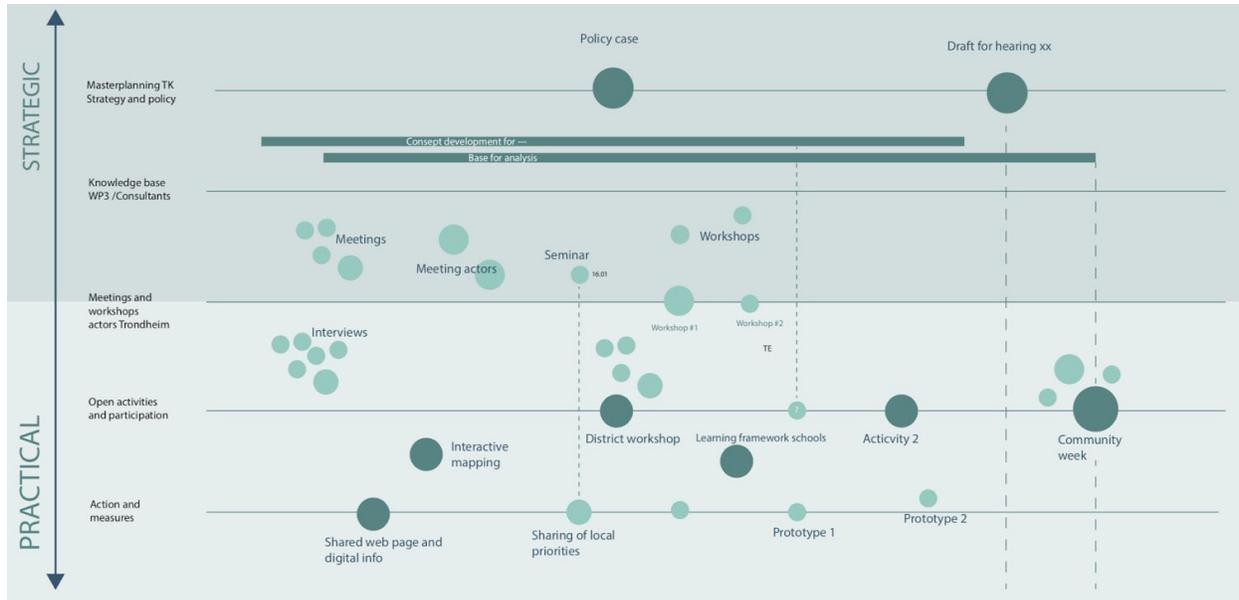
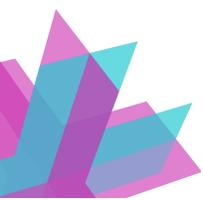


Figure 3.4: Bridging the gap between strategic and practical level interventions and activities across time.

Using the Bold City Vision Framework to elaborate a city specific roadmap for transition begins with a policy review and subsequent revision. This review and revision will include global, national, regional and local policies relevant to the emerging roadmap. Once the city has clarified its current policy objectives, these can be compared to the results from the city evaluation (using local, national and international KPIs), and later to the feedback generated through an open and inclusive process with relevant stakeholders.

The Framework is predicated on the assumption that a roadmap for realising smarter and more sustainable societies needs to build on both a strong civil society platform, as well as an open innovation platform creating strong public-private partnerships. Open Innovation is also one of the main approaches for collaboration within +CityxChange (+CityxChange D9.1, 2019). Both sectors, together with academia, represent important insights, solutions and resources that may be mobilised and integrated in order to make the desired impact.

Six main processes were then identified, on the basis of the 17 UN Sustainable Development Goals (SDGs). Figure 3.5 below gives an overview of these 6 main processes comprising the Bold City Vision Framework, covering all aspects from data to policy, action, and not least impact by way of large scale projects and project portfolios.



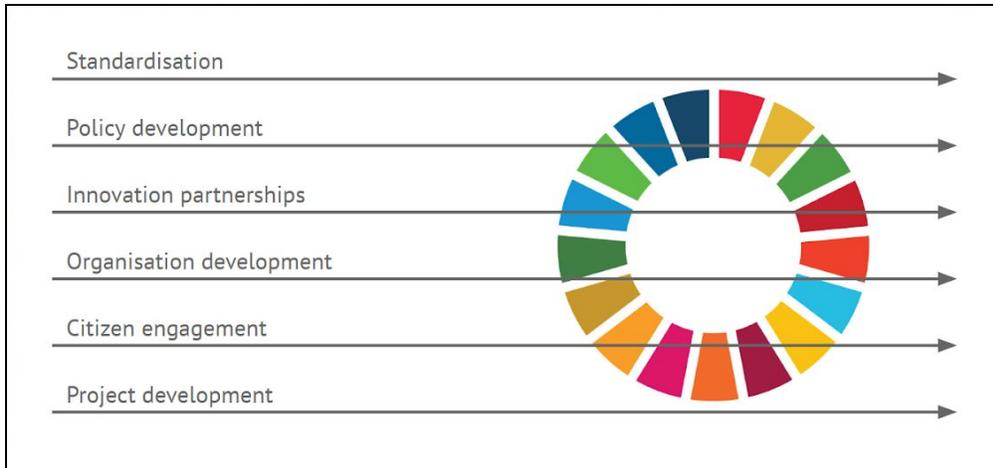


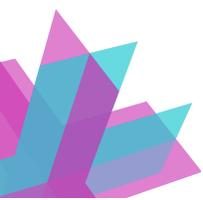
Figure 3.5: Six main processes in the Bold City Vision Framework, on the background of the UN SDGs.

The main processes outlined in Figure 3.5 were then combined with the 5 sub-processes shown in Figure 3.3 to produce the +CityxChange BCV Framework matrix, including the 30 dimensions developed through Task 3.1 (Figure 4.1).

The structuring of the main processes emerged over a period of 2 years as the result of consultations with leaders and key stakeholders involved in city planning and development. This process of consultation was organised as part of a leadership development program of Trondheim Kommune where more than 700 leaders were presented with versions of the framework and asked to reflect and report on its fit with current practices, as well as possible implications for new practice and partnerships.

The specific development of the BCV framework used a multi-stakeholder and multi level analysis of Sustainable Development as a process. This first version of the Bold City Vision Framework has been developed by drawing on the combined insights of work done in Limerick and Trondheim as outlined above, as well as input from the Follower Cities. This took the iterative processes over previous years and condenses them and their learnings into a unified frame, mapping resources and processes in relation to each other. The participants in this joint development have backgrounds in urban planning, sustainability, innovation, citizen and stakeholder engagement, organisational changes, organisational learning, policy development, finance, etc. Contributors are coming from municipal and university backgrounds.

The target groups for this document are politicians, city officials, city planners, as well as others engaged in social and technological issues related to sustainable urban development. These target groups were identified on the basis of existing and ongoing



political and organisational processes as well as the coming challenges of implementing the UN SDGs.

Inspired by the work of Otto Scharmer on system theory and system innovation (Scharmer 2016), we began by assuming that societal change is a process of becoming a community where individual, group and organisational actions are mutually constituted across time and space. We mapped Scharmer’s system innovation process on to a generic version of the cities’ own enterprise management processes, recognising that all cities have a more or less routinised way of dealing with planning, risk management and performance management. We wanted to understand what functions and practices were prevalent at the intersection between these processes, as illustrated in Figure 3.3.

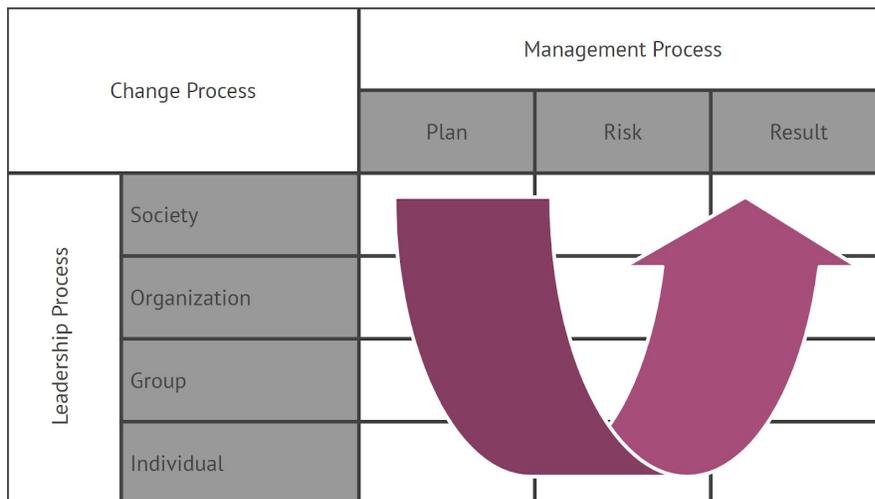
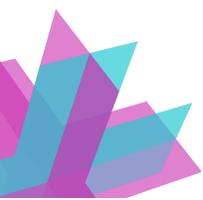


Figure 3.6: Initial TK framework used to engage and prepare municipal leaders for innovation processes.

Even though the enterprise management perspective in itself does not fully capture the complexity of the change process, and covers up many of the practical differences across diverse entities, this approach at least allowed us to include domains of action widely recognised as having a bearing on the management of available resources. The 2030 UN Agenda, with its strong emphasis on a triple bottom line (people, profit, planet), lends itself to this type of resource based analysis of decision making. Over time the findings from these consultations were used to further subdivide the main processes into the 30 sub-processes currently identified.

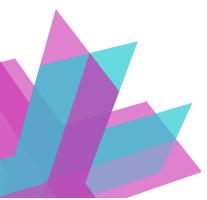


While the work so far has put great emphasis on the needs and role of the cities themselves, comparatively less attention has been paid to the experience of other stakeholders (city partners). The continued application and testing of the framework will allow for the inclusion of the experience, in use, of stakeholders from other sectors. This data collection will in part be done in collaboration with e.g. business associations and their members as the framework is offered as part of an emerging training program aimed at informing businesses on how to use the findings from ongoing KPI-evaluations (e.g. U4SSC) to position themselves as cities begin updating their policy objectives, action plans and budgets using the city profiles².

The questions structuring the incentives scheme, high level guidelines as well as examples of urban processes and solutions are outlined in greater detail in section 4, Bold City Vision Framework.

² Example of U4SSC city profile:

https://www.itu.int/en/ITU-T/ssc/united/Documents/U4SSC-Snapshots/City_Snapshot_Alesund_Norway.pdf



4 The Bold City Vision Framework

This section offers an overview as well as a more systematic presentation of the main processes and sub-processes and high level *guidelines* covered by the Bold City Vision Framework. Where available, relevant *urban processes and tools* are mentioned, some of which are detailed further in the appendix Urban Processes and Tools. The urban processes and tools are linked to key questions in the *incentive schemes* in order to make such schemes pertinent to the desired process outcomes. It should be pointed out that the incentive schemes in question are in fact an *array* of schemes suited to promote the creation of shared value across the multiple processes and sub-processes outlined in the Bold City Vision Framework. In the concluding section 4 we link the Bold City Vision Framework to the concept of *roadmap* indicating how the framework is used to create an amalgam of *politically approved* guidelines, roadmaps and action plans, in accordance with the +CityxChange KPI for Bold City Visions. The political approval of roadmaps and action plans is expected to take anywhere between 12-24 months, and getting the right guidelines, roadmaps and action plans in place within this timeframe is seen as critical for cities to respond to the UN 2030 Agenda.

Overview

A lot of people, knowledge and systems need to come together in order to make a large scale positive impact at the society level, and there is no simple blueprint, no *one size fits all*. However, many of the challenges cities face when transitioning to smarter and more sustainable societies are quite similar. The local context may vary, but the systems that need to change have a lot in common. This suggests that a support framework for creating a Bold City Vision can indeed be useful, as long as it remains flexible.

The Bold City Framework needs to address both the local, national and global contexts, integrate key processes, and demonstrate an ability to mobilize resources across sectors.

The framework sets out 6 main interlinked processes presented in the figure below, each highlighting important considerations and opportunities for cities as well as for city partners, current and future. The framework enables cities to anticipate the multi-dimensional and complex transactions and transitions involved, drawing the attention of politicians, city planners, external partners and even citizens to conditions



and dimensions that might otherwise be ignored. This includes the questions framing incentive schemes, as well as a catalogue of successful urban processes and solutions.

It should be pointed out that while the framework approach might appear overwhelming, most of the prescriptions and actions suggested by the framework will already be covered in some way by the cities, making this just as much a question of timing and composition as a question of doing additional work .

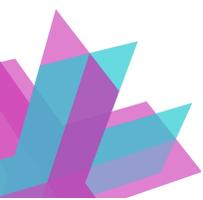
	Engage	Design	Activate	Accelerate	Support
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 Organisational development	Identification	Leadership	Intrapreneurship	Self organisation	Twinning
 Citizen engagement	Acknowledgement	Deliberation	Localisation	Connection	Amplification
 Project development	Pitching	Prototyping	Delivering	Capitalising	Storytelling

BOLD CITY VISION FRAMEWORK FOR 2050

Figure 4.1: The Bold City Vision Framework, with 6 main processes and 30 dimensions/sub-processes

Guidelines Process 1: Standardisation

The purpose of the Standardisation process is to create a basis for open innovation by drawing on available global standards for mapping, assessing and improving SDG-performance. Several national, regional as well as global standards exist or are



under development, such as the United Nations' United for Smart Sustainable Cities KPIs (U4SSC 2017), which are geared specifically towards the evaluation of and reporting on SDG performance at the local (city) level. Besides the standard itself, the Standardisation Process responds to a need for urban processes and solutions that help cities visualize and even simulate the local implication of future SDG interventions. It is worth pointing out that there is a need not only for standardised KPIs. There is also a need for standardised frameworks such as the Bold City Vision Framework, to guide cities on their way from data to action and impact. A city evaluation using e.g. the U4SSC KPIs constitutes the initial step of the city's transition towards a smarter and more sustainable society, and is closely linked to the review of policy objectives (see Guidelines Process 2) .

Table 4.1: Bold City Vision Framework – Guidelines and Incentive Schemes for Standardization (Process 1).

Sub process	Incentives Scheme Framing	Urban Processes and Solutions (<i>examples</i>)
1.1 Evaluation	How is the city performing in terms of the SDGs? Measuring using standard (global KPIs) that allow for benchmarking across cities and regions	<p>United for Smart Sustainable Cities (U4SSC) KPIs, UN Habitat Prosperity Index etc. (see appendix on urban processes and solutions for more info.)</p> <p>Limerick's has e.g. utilised the Sustainable Connected Cities Capability Maturity Framework (Kenneally et al. 2013) and the <i>Smart City Maturity Model</i> to measure its digital maturity</p>
1.2 Visualisation	How can different stakeholders in a city begin to interpret the available data? Developing dashboards to spark	U4SSC Smart Sustainable City Dashboard (see Appendix 1 on urban processes and solutions for more info.)

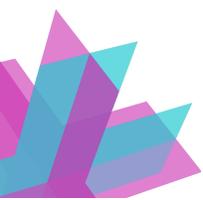


	conversations about possible implications and enabling engagement	
1.3 Simulation	How can politicians, businesses and citizens understand the consequences of future policies and actions? Using simulation tech to identify potential and mitigate risk.	AugmentCity ³ applies simulation technology developed for subsea operations to the built environment
1.4 Funding	How can the SDGs be framed as a business opportunity? Standards for evaluating and monitoring SDG-performance, and potential, that help stakeholders identify needs, incentives and markets	Impact Investment Platforms and incentive schemes (physical and virtual) e.g. Green bonds, ESCOS, Financial Instruments i.e. Jessica Fund. For more details, see (+CityxChange D2.4, 2019)
1.5 Sharing	How can knowledge, opportunities, solutions and funding be connected? Creating an open and transparent marketplace for cities as well as knowledge and solutions providers.	Smart City Solutions Platforms (physical and virtual)

Guidelines Process 2: Policy Development

Access to data, knowledge and solutions will add little value at the local level unless linked to policy development. The policy development process proposed within the BCV, begins with a review of existing SDG and smart city policies within the municipality. Many, if not all cities have already developed and partly implemented

³ <https://augmentcity.no/>



policy objectives and frameworks that will go at least some way towards addressing new requirements linked to the 2030 Agenda. Only by linking to the local political landscape and opportunities can potential be realized, e.g. Energy Positive cities. Following a review of existing policies the city has a solid base, drawing on the available data (process 1) as well as existing objectives, to assess the need for adjustments and amendments to existing policy objectives. The process then deals with the political implications of policy updates (Reframing Sub-Process) and actions needed to ensure that the updated policy objectives are reflected in the budgeting and accounting processes. Reframing is closely linked to Process 3, Innovation Partnerships, as the Reframing Sub-Process alerts local policy makers to which type of solutions and partners to look out for. Assuring an alignment between policy objectives and the local finance system is key to leveraging local resources, and an integral part of gauging the merits of emerging investment opportunities (Process 3, Innovation partnerships)

Table 4.2: Bold City Vision Framework – Guidelines and Incentive Schemes for Policy Development (Process 2).

Sub process	Incentives Scheme Framing	Urban Processes and Solutions (<i>examples</i>)
2.1 Review	What (local, national and international) policy objectives have already been agreed that are relevant to the SDG-agenda? Building on existing ambitions and strengths and acknowledging local context	Example of adaptation for Asker municipality to be aligned with UN Sustainable Development Goals (Asker, 2019)
2.2 Revision	Which local policy objectives need to be revised and amended to be SDG compliant and align to national and international targets? Align policies to SDGs progress to prioritise and establish local KPI framework	Reframing process and methodology for big design (ReframingStudio 2011) (see appendix on urban processes and solutions for more info.)



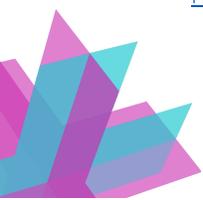
2.3 Planning	What does the updated smart sustainable roadmap for the city look like? Agreeing actions and measures to realise the SDGs.	Example of a roadmap for Helsinki 2019 ⁴
2.4 Budgeting	How are policy objectives linked to budget allocations? Linking objectives to financing to realise the SDGs	Ghana's SDG Budget Baseline Report 2018 ⁵ (PDF) One of the first holistic examples on SDG budgeting in the world.
2.5 Analysis	How can cities account for the impact of SDG action and investments? Linking SDG budget to SDG performance review	Trondheim kommune SDG accounting model (see appendix on urban processes and solutions for more info)

Guidelines Process 3: Innovation Partnerships

Cities cannot realize the SDGs without cross-sector collaboration. Both academic and business partners are critical for cities to attract both the knowledge, solutions and financing they need to realize the SDGs. Developing sound partnerships takes time, and many cities are not oriented towards new potential partners or investment opportunities. A reorientation is very much linked both to incentives as well to leadership more generally (Process 4). This is a challenge that applies to the way cities operate in general, not only for BCV processes. The innovation partnership process is predicated on a capacity for listening in, acknowledging the existence of initiatives beyond oneself, and mitigating risk by supporting such initiatives instead of creating competing ones. The first step on the way is clarification of mandates. One hurdle to overcome in setting up new partnerships is making sure there is someone in the organisation with a clear mandate to evaluate and invest in alternative solutions. Many new solutions, if not all, come with implications for established work processes and

⁴ From Agenda to Action – The Implementation of the UN Sustainable Development Goals in Helsinki 2019, <https://www.hel.fi/static/helsinki/julkaisut/SDG-VLR-Helsinki-2019-en.pdf>

⁵ Ghana's SDG Budget Baseline Report 2018 <https://www.mofep.gov.gh/sites/default/files/news/Ghana's-SDG-Budget-Baseline-Report-Aug-09-18.pdf>



divisions of labour. If there is no one around to advocate for changes to the status quo, chances or new solutions will never be able to prove themselves in practice. The Innovation Partnership Process also includes steps to connect to new entities (Learning Journey⁶), digital marketplaces, steps to assess the merits and cost-benefit of new solutions, as well as guidelines for innovative procurements and portfolio management of partner initiated or supported projects. The Innovation Partnership Process is closely linked to the emerging concepts such as *Learning Societies*, *Open Innovation*, and *Societal innovation*. While it is readily accepted that people and organisations learn, and consequently change, less work has been done to account for learning and innovation at the societal level. The Bold City Vision, with concepts such as *Learning Journeys*, acknowledges the need not just for innovative solutions but also for system innovations.

Table 4.3: Bold City Vision Framework – Guidelines and Incentive Schemes for Innovation Partnerships (Process 3).

Sub process	Incentives Scheme Framing	Urban Processes and Solutions (<i>examples</i>)
3.1 Appointment	How are new solutions to be introduced into the existing organisation? Paving the way for change initiatives originating outside the organisation and creating entities to support the organisational change needed to realise the potential of such solutions	Setting up a dedicated budget and team to scout for existing solutions to be tested locally. Separate from procurement department and existing line management
3.2 Linking	How can local needs and local action be linked across time and space? Creating a shared <i>learning journey</i> .	Developing a shared calendar and map of events, bringing together interesting entities (e.g.

⁶ As an example: The Nordic Learning Journey is a method for developing a deeper understanding of how different cities and universities interact, and the effects on the local innovation ecosystem. <https://sites.google.com/trondheim.kommune.no/universitetskommunen/!%C3%A6gringsreise>

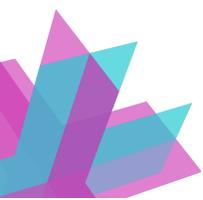


		startups, impact investors etc.)
3.3 Collaborating	How will the proof-of-concept be carried out? Making sure solutions are relevant, important and workable	Clearly stating conditions, as well as expected results and effects, before a test or prototyping process. Coordinating testing at regional level. Using small business innovation research challenges.
3.3 Prioritising	How are high potential solutions worked into the budget? Handing the process over to the line management	Innovative procurement process e.g. national program for Norway ⁷ with one municipality leading the process on behalf of several interested
3.5 Portfolio management	How can the line management and organisation support a multitude of simultaneous projects? Managing complexity	Establishing a system for portfolio management of e.g. IT-systems according to sound portfolio management standards

Guidelines Process 4: Organisational Development

A significant portion of public resources are tied up in human capital. When geared towards the SDG Agenda these human resources will make a significant impact across sectors, not least in terms of opening up the cities for innovative partnerships and solutions. In fact, without the knowledge, insights and support of public sector organisations, their (administrative) leadership and unions, solutions that might otherwise have made a significant positive impact might remain a fringe phenomenon and never penetrate the core of public sector operations, either because innovative SDG-policies are not put forward, or because policy objectives are ignored or poorly implemented. In some respects the Organisational Development Process is the key

⁷ <https://www.innovasjon Norge.no/>



constituent of the Bold City Vision Framework, as the process involves initiating the whole framework by creating the core team needed to get the rest of the processes moving. Also, the Organisational Development Process points to the importance of creating effective political bodies, as well as accommodating other institutional stakeholders to make sure SDG-management is not fragmented into sectors and professional domains. In order to realise the SDGs, all leadership is important, and the leadership development advocated within the framework focuses on situating not just the SDGs, but also the leadership development programs themselves. Ideally the training recruits leaders cross-sector and takes place at the community level, asking critical questions like: What leadership theories and practices are likely to make this community more sustainable? A pivotal component of the training involves enabling the leaders to listen in for entities and initiatives that are likely to add value to the SDG agenda, which in turn translated into a need to familiarise oneself with local stakeholders and one's own effect on the local ecosystem. Finding ways of amplifying local resources ties in both with Process 3, Innovation Partnerships, as well as with Process 5, Citizen Engagement. The Organisational Development process extends to all employees, focusing particularly on the link between innovation and intrapreneurship, where building an intrapreneurial spirit is believed to contribute towards the opening up of the organisation. The Bold City Vision Framework builds on a leadership platform that emphasises empowerment and trust based approaches to organisational development, allowing for self-organisation necessary to drive a perpetual exploration and practical assessment of new partnerships and solutions. The final sub process identified as a key constituent of the Organisational Development process involves the systematic transfer of personnel through e.g. twinning programs, shared positions between cities and universities⁸ etc. Sharing ideas and solutions will not be enough. The flow of ideas needs to be supported by a flow of people across and beyond the cities.

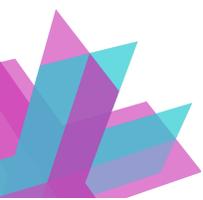
Table 4.4: Bold City Vision Framework – Guidelines and Incentive Schemes for Organizational Development (Process 4).

Sub process	Incentives Scheme Framing	Urban Processes and Solutions (<i>examples</i>)
4.1 Identification	Who will coordinate the SDG transition locally? Identifying who at both the	Capacity building for key stakeholders structured so as to give an overview of

⁸ Some of these activities are for example done in Trondheim through the Strategic University-City agreement TRD3.0, <https://sites.google.com/trondheim.kommune.no/universitetskommunen/>



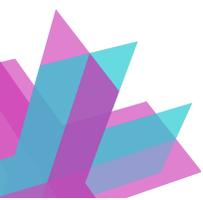
	political and administrative level will lead the way	<p>the Bold City Vision Framework. Collaboration between +CityxChange and UN Centre of Excellence on SDG City Transitions (see appendix on urban processes and solutions for more information.).</p> <p>Some cities have created a special committee for the SDGs. Others will prefer to convene the Executive Committee, depending on the local political system.</p>
4.2 Leadership	How is the leadership aligned to the SDG-agenda? Designing and delivering a leadership development program	Community based cross-functional programs, where cohorts of leaders consider what will take a particular neighbourhood in a smart sustainable direction and implications for own leadership practice e.g. NTNU-Trondheim Relational Welfare Program as part of TRD3.0
4.3 Intrapreneurship	How are all employees, and their unions, involved in the SDG effort? Affording everyone a chance to pursue and realise relevant initiatives	Spin-Off Accelerator: methodology for bringing together internal problem-owners and external solutions providers.
4.4 Self organisation	How are ways of organising work kept	Building a capacity for organisational



	purposeful? Allowing for the emergence of a division of labour that allows new solutions to create value	development into the organisation e.g. Lade Elderly Care. (2018 Project “Læringslivet”)
4.5 Twinning	How can cities build on the experience of more advanced cities? Sharing knowledge by sharing people.	Setting up twinning programs linked to specific aspects of the SDG transition framework and/or particular solutions implemented locally

Guidelines Process 5: Citizen Engagement

In the context of the BCV framework, the Citizen Engagement process is seen as an extension of process 4, the Organisational development process, as organising will only be successful in so far as the inner condition of the organisation resonates with the social and material conditions under which the city operates. The process of engaging citizens critically involves the monitoring of local conditions and aspirations, as well as an emphatic acknowledgement and celebration of local initiatives likely to add to the growing portfolio of people, passion and action driving the SDG Agenda. All cities are hotbeds of activities, and understanding what to listen in for requires sound methodology and meticulous training, e.g. in the practice of Reframing (sub-process 2). Some forms of engagement will be more conducive to long term success, and knowing what behaviours to amplify will make public resources go a lot further. Cities traditionally tend to be more geared towards democratic innovations as ways to legitimise top-down change, and make sure the change process is inclusive. While this is indeed important, the Bold City Vision Framework also emphasises the need to embrace the democratic process as a vehicle for *resource mobilisation*. Key sub-processes involve new forms of deliberation and localisation of the democratic process, anchoring the conversation in local action, focusing on how citizens themselves can play a major part in creating the communities they would like to live in. While there is no shortage of textbooks and guidelines on more engaging ways of conducting the democratic process, there still seems to be a disconnect between the use of e.g. citizen juries and the overall planning process of cities. The BCV framework strongly advocates the integration of new democratic tools, making them part of the core operation of planning and running the city. Ideally the city will develop an annual



cycle where politically challenging SDG-related issues are routinely handed over to a citizen panel for systematic deliberation.

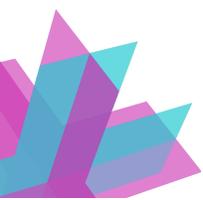
Table 4.5: Bold City Vision Framework – Guidelines and Incentive Schemes for Citizen Engagement (Process 5).

Sub process	Incentives Scheme Framing	Urban Processes and Solutions (examples)
5.1 Acknowledgement	What are the burning SDG-related issues? Mapping the local landscape	Using citizens' observatories, surveys etc. to continuously monitor how people are doing / coping. E.g. "Ducky" (Ducky 2019) as a platform to visualise personal climate footprint or use of mapathons and engage weeks such as the yearly City Engage Week in Limerick ⁹ .
5.2 Deliberation	What strategic directions or actions have popular support? Asking citizens for their opinions and advice before setting policy objectives	Integration of deliberative mini-publics into the planning process and annual cycle. Using systems such as e.g. Consul, MyPoint ¹⁰ or similar citizens platforms to manage the flow of people and ideas (cf. +CityxChange Deliverable D3.2)
5.3 Localisation	How is local (social, intellectual, financial) capital activated?	Creating "Innovation districts" with local process facilitators and local

⁹

<https://www.limerick.ie/smart-limerick/programme-1-engagement-participation/city-town-engage-programme>

¹⁰ <https://mypoint.limerick.ie/>



	Mobilising and building on local resources to sustain positive impact	objectives / guidelines developed through the deliberative process
5.4 Connection	How do local stakeholders find relevant knowledge hubs, funding opportunities, incubators etc?	Participatory budgeting, crowdsourcing / -solving and matchfunding. E.g. "Borgerkraft" ¹¹ to support promising initiatives
5.5 Amplification	How do municipalities invest in societal innovation? Moving from SDGs as competition to SDGs as collaboration and mutual investment	"Pådriv" ¹² methodology as a way to nurture local networks and innovation ecosystems. Using "Learning Society" ¹³ (listen-link-learn) approach to move from deliberation to co-created action

Guidelines Process 6: Project Development

The final process has to do with developing tangible results, by way of new technological infrastructure, changes to the built environment etc. The results need to demonstrate not only a positive impact as assessed through e.g. the U4SSC city evaluation, but also have to be socially acceptable and represent a local return on investment that is politically and financially attractive. This is where the rest of the framework comes together. The main concern of the Project Development Process is to make sure the city has a pipeline of emerging investment and innovation projects, and deals with each project in ways that incorporate the Citizens' Engagement process, the Innovation Partnership process, as well as the Organisational Development process. Borrowing from design thinking, the process should allow for a wealth of ideas to present themselves, and rapid prototyping to verify what makes sense locally. The pitching works both ways. The city can communicate its needs based on the findings from the SDG-evaluation, making it easier for present and future partners to match expectations. Setting up localised City Labs, including social arenas that "eventify" (creating social events, both physical and virtual, to align ambitions and

¹¹ Citizen Jury project in Trondheim, <https://sites.google.com/trondheim.kommune.no/baerekraftmillionen/>

¹² Drive towards sustainable cities project <https://paadriv.no/>

¹³ UNESCO, <https://learningportal.iiep.unesco.org/en/glossary/learning-society>



resources) burning issues and potential solutions, allowing third parties and local stakeholders to find common ground.

Table 4.6: Bold City Vision Framework – Guidelines and Incentive Schemes for Project Development (Process 6).

Sub process	Incentives Scheme Framing	Urban Processes and Solutions (examples)
6.1 Pitching	What solutions are out there matching the SDG needs of the city? Creating opportunities to reimagine shared value creation.	Supporting the emergence of innovation hubs, coworking spaces, meetups etc. where people can meet, share ideas.
6.2 Prototyping	How can local stakeholders gain an embodied experience of likely future solutions?	Applying design thinking methodology and other forms of prototyping, like Fab Lab in Limerick . (Fab Lab 2019).
6.3 Delivering	How can a realistic test be carried out? Clarifying the likely return on investment	Cities will typically have multiple locations / units that can be used to benchmark new solutions against existing modes of operation
6.4 Capitalising	How is the local solution spread to new locations? Moving from smart sustainable communities to smart sustainable cities and regions	Based on the findings from the prototyping and delivery phase the city has solution / process specific knowledge to accommodate new solutions in future budgets, e.g. by using SBIR ¹⁴
6.5 Societal Learning	How are proven concepts linked back to the SDGs? Penetrating the global market for smart sustainable solutions.	Decomposing, and presenting the constituent elements of the innovation (guiding principles / SDGs, local context, systemic change, solution)

¹⁴ <https://www.enterprise-ireland.com/en/Research-Innovation/SBIR-Ireland/>

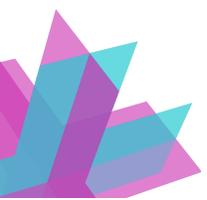


5 Conclusions

The dual purpose of this document is to present the Bold City Vision Framework as (1) an *inclusive (multiple helix)* approach to developing impact oriented politically approved city visions, roadmaps, and action plans, as well as (2) illustrating by way of a structured and expandable repository of urban processes and solutions how to examine existing policies, identify what works, what does not, and create new innovative urban policies and solutions that ultimately bring about energy positive cities and contributes to the realisation of the UN 2030 Agenda for sustainable development. More specifically, the framework deals with how cities may:

- improve their ability to identify and extend local high potential solutions to the rest of the city, and beyond.
- identify and connect to the financial, social and human capital needed to realise large scale socio-technical innovations.
- manage the complexity, and thus the opportunities, involved in planning smart sustainable societal transitions.

The Bold City Vision Framework is a work in progress, and will be tested and improved over the next 24 months as the lighthouse and follower cities develop and implement their respective visions, guidelines and action plans as part of a comprehensive roadmap stretching all the way to 2050, as illustrated in the figure below.



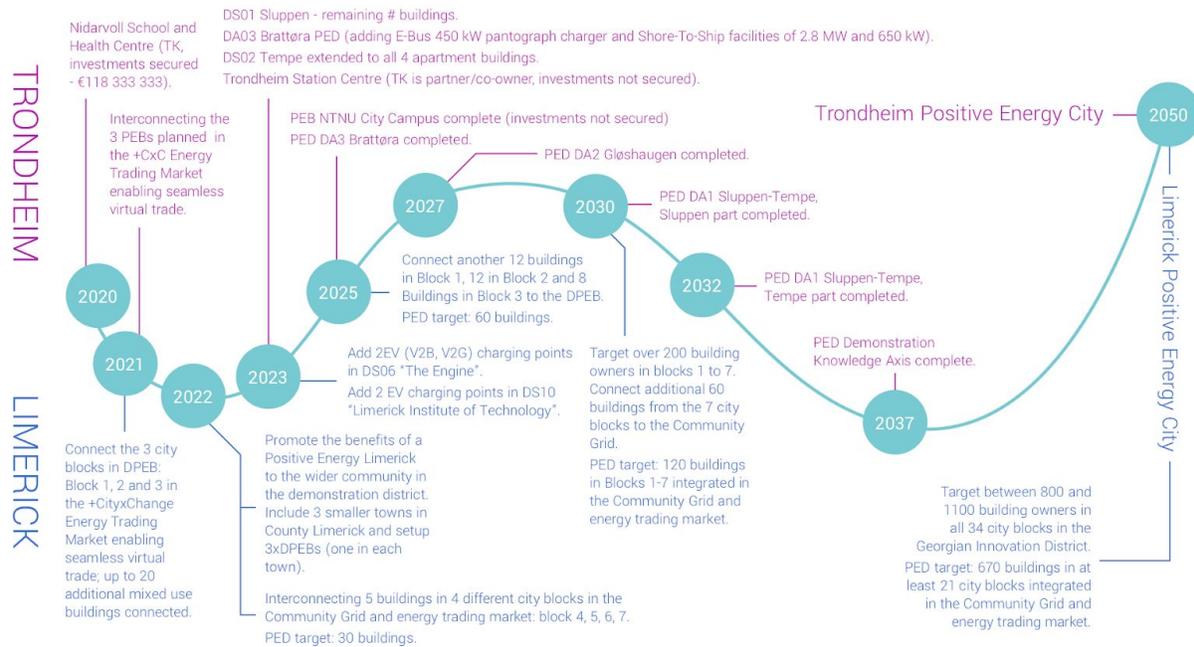
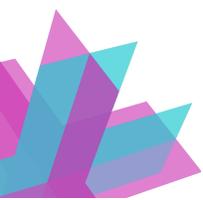


Figure 5.1: Proposed Replication Plans for the LHCs, based on preliminary Bold City Visions

The Framework should be viewed both as a set of overall guidelines to manage the flow of people, ideas, resources and solutions. It is also useful as a vehicle for open innovation in that the 6 main processes, as well as the 30 espoused sub-processes, point to concrete challenges faced by cities transitioning toward smarter and more sustainable societies. Each process represents a window of opportunity to create and deliver better urban processes and solutions.

We have suggested that the starting point for elaborating a city specific *roadmap* should be the existing body of policy objectives as well as an evaluation of the cities’ current performance using available local, national and international standards (KPIs) for localising and assessing how smart and sustainable the cities currently are. This first steps towards creating the roadmap (6 sub processes collectively referred to as “Engage”) also involves steps to assess popular opinion, needs and aspirations, as well as initial steps to set up activities to build an overview over available knowledge and existing solutions both within and beyond the city organisation.

The overall roadmap can be structured around the Policy Innovation Process, taking into account the guidelines, problematics, examples and tools suggested by sub-processes for each of the 5 sub processes. The result amounts to an amalgam of



politically approved guidelines, roadmaps and action plans, in accordance with the +CityxChange KPI for Bold City Visions. The figure below illustrates how the Bold City Framework can be used to integrate actions across processes, in this case between the Policy Development Process and the Citizen Engagement Process.

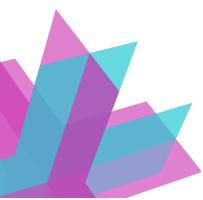


Figure 5.2: A way to integrate actions across the Policy Development Process and the Citizen Engagement Process

While most cities will have established frameworks and at least some capacity to deal with each of the sub processes in isolation, they will be less likely to integrate the processes as illustrated above. The Bold City Vision Framework has been structured in such a way as to cluster processes that are particularly interdependent. Take as a case in point the Leadership (Development) Sub-Process (part of Process 4: Organisational Development Process). In order to design and deliver a Leadership Development Program, the program designers should pay particular attention to how leaders see themselves in relationship to private sector entities (Innovation Partnership Process), citizens (Process 5: Citizen Engagement Process), and of course their own employees (Intrapreneurship Sub Process). More specifically the BCV Framework identifies what aspects of Innovation Partnerships and Citizen Engagement need to be addressed specifically when doing capacity building. Similarly, the individuals charged with following up any of the other sub processes need to be acutely aware of adjacent sub processes, the questions framing the incentive structure, as well as the espoused urban processes and solutions.

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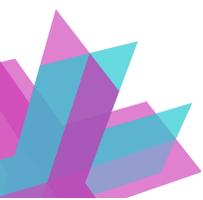
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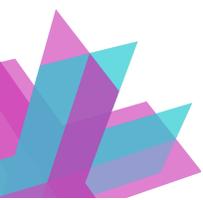
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Appendix 1: Urban Processes and Solutions (selected)

The examples and tools listed in this appendix expand on selected elements presented as part of the Bold City Vision Framework. The list is not meant to be exhaustive. Also, note that the tools currently linked to the 30 subprocesses of the framework are not intended to be exclusive. On the contrary, the framework is designed with the aim of allowing for new tools to be plugged in and made available for cities adopting the framework.

Capacity Building for Key Stakeholders

Organisational Development Process / Leadership Sub-Process

The first extensive capacity building session aimed at introducing the Bold City Vision Framework (also labelled SDG City Transition Framework) to key stakeholders in cities, both +CityxChange cities and others, is planned for September 25th-27th 2019 in connection with the Nordic Edge Expo and Conference¹⁵. This session gives cities an overview of the framework and a venue designed to allow cities to engage with one and other to mutually explore possibilities and pitfalls.

This session is co-hosted by the City of Trondheim, Asker Municipality, The United for Smart Sustainable Cities Implementation Program (United Nations Economic Commission for Europe - UNECE¹⁶, International Telecommunication Union - ITU¹⁷, Organization for International Economic Relations - OIER¹⁸), and Nordic Edge. United Nations Economic Commission for Europe

United for Smart Sustainable Cities KPIs

Standardisation Process / Evaluation Sub-Process

The Bold City Visions created as a part of +CityxChange will build on evidence-based data and insights to create a sustainable positive energy city, guided by the overarching goals and ethical standards of the UN Sustainable Development Goals

¹⁵ <https://www.nordicedgeexpo.org/conference>

¹⁶ www.unece.org

¹⁷ www.itu.int

¹⁸ www.oier.eu/



2030. For this to happen the KPIs and methods to measure impact need to work both on a local and a global level. The KPI framework for +CityxChange describes how to measure impact for the project itself, and how to connect this to global standards for the SDGs. If the cities are to link their Bold City Visions to the Sustainable Development Goals they need to use KPIs that also makes sense in a global context. The KPIs developed and managed by UNECE and ITU under the United for Smart and Sustainable Cities (U4SSC 2017) umbrella is fast emerging as the most important global standard for measuring and monitoring smart sustainable cities. Based on data collected, the cities are presented with an evaluation report and scorecards, such as the one presented in the figure below.

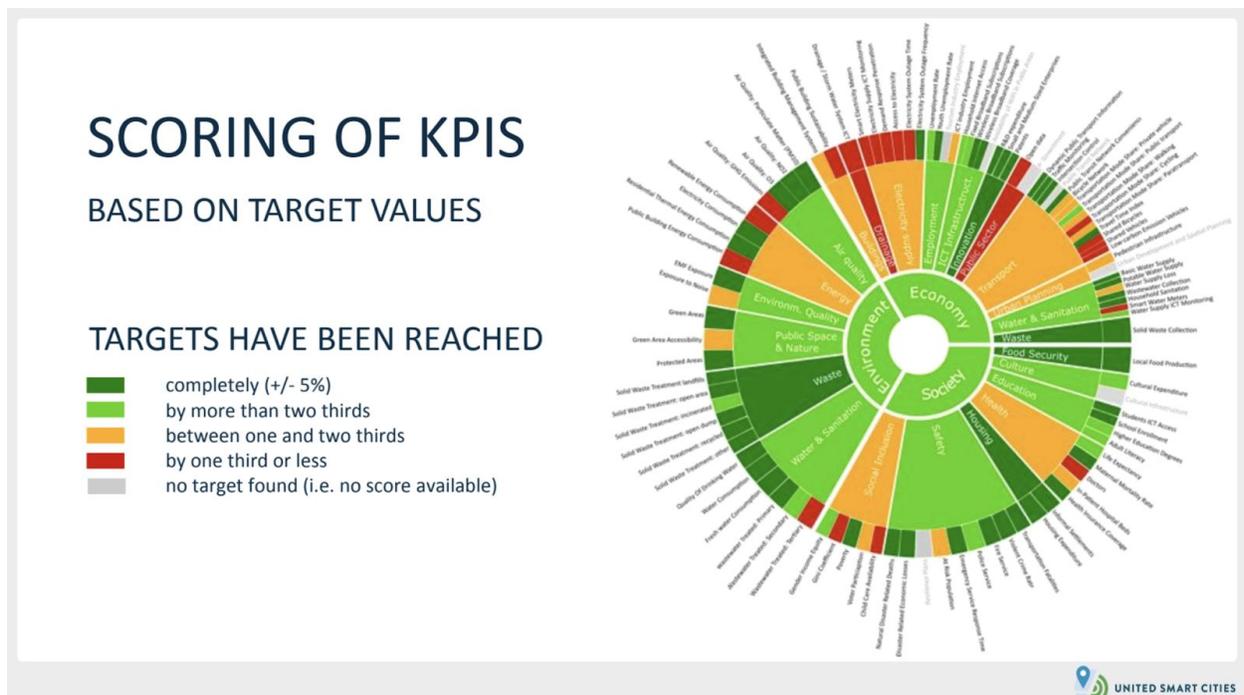


Figure A1.1: Example scorecard U4SSC KPIs (source: U4SSC)

Deliberative democracy and citizen juries

Citizens Engagement Process / Deliberation Sub-Process

Experience suggests that it takes time for citizens to fully embrace the deliberate forms of democracy. The Figure below illustrates an annual cycle where the city accommodates two major processes per year involving citizen juries and incorporating such juries as part of the planning process and annual cycle, both culminating (August

and January, respectively) in policy recommendations that have a popular stamp of approval.

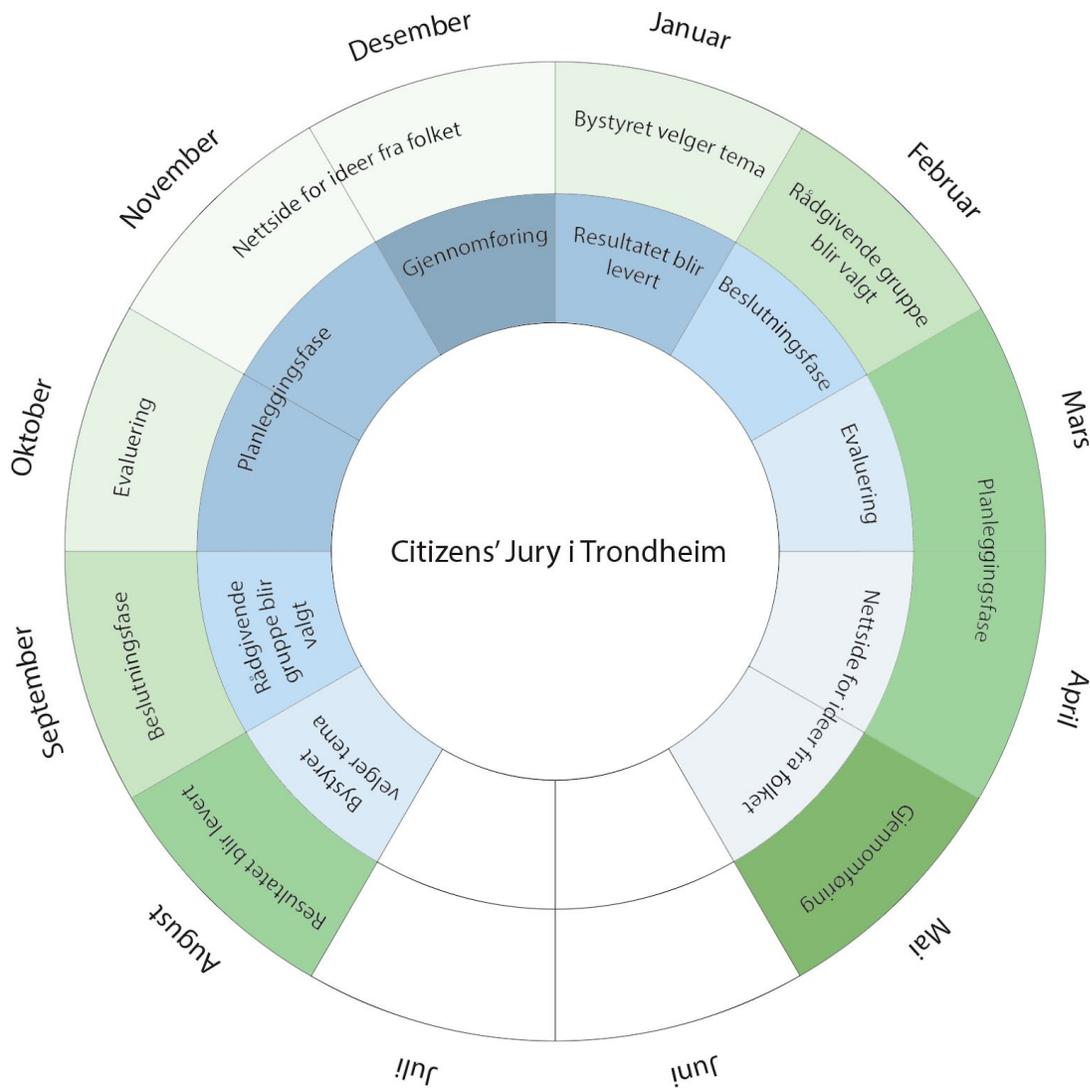


Figure A1.2: Citizen Jury annual cycle, and description of process. Source: Municipality of Trondheim

SDG Budgeting Model

Policy Development Process / Budgeting Sub-Process

Linking local policy objectives to the SDGs and U4SSC KPIs for evaluating the smart sustainable performance and potential of cities.





Figure A1.3: Illustration of SDG budgeting (Dashboard built with City budgets and SDG illustrations)

Reframing Process

Policy Innovation Process / Revision Sub-Process

The purpose of the Reframing Process is to provide politicians and city planners with a methodology to develop and maintain relevance for the future by analysing and reframing the likely future behaviours of citizens within a given domain (e.g. education). By anticipating future concerns, we develop products and services that are meaningful for both users and society. Reframing is a design thinking skill as well as a strategic skill (ReframingStudio 2019). Reframing enables designers to come up with fresh and compelling solutions that act upon a future world. Reframing enables strategists to map possible directions through strategic frameworks and identify future business opportunities. Based on a new frame of reference we translate future concepts into roadmaps and short term solutions that are attractive for people and society, profitable for companies and work in the real world. The reframing process goes through several phases and specific steps that provide a clear design trajectory for each project. The reframing process is based on the method Vision in Product design

(ViP)¹⁹, which has been developed at the Delft University of Technology by founding partner Prof. Ir. Matthijs van Dijk together with Prof. dr. Paul Hekkert.

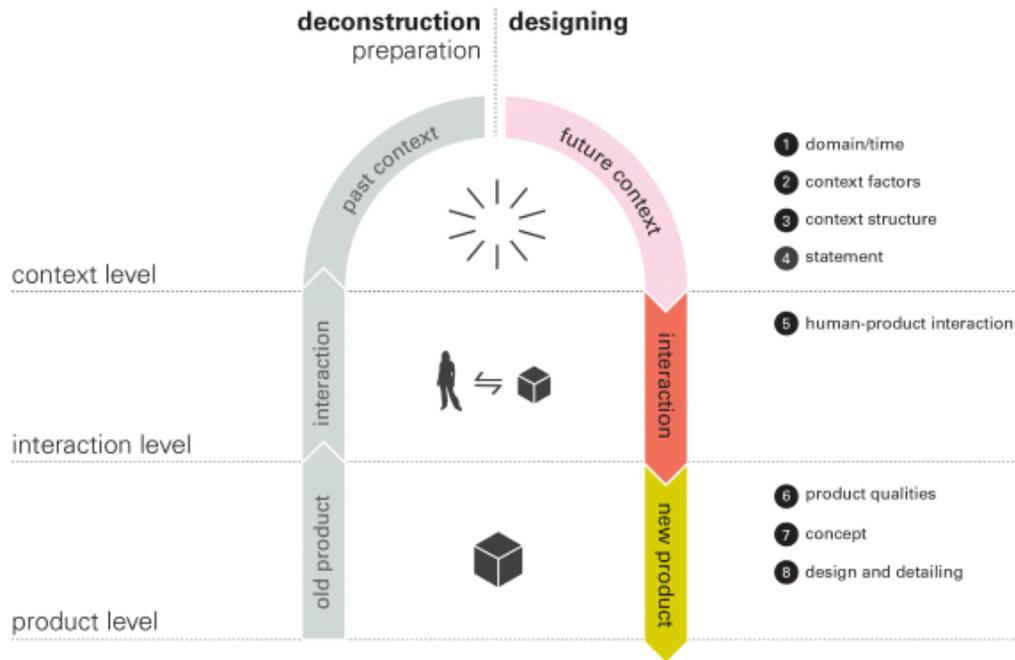


Figure A1.4: The Reframing Process developed by Reframing Studio, Amsterdam.

¹⁹ Hekkert & Van Dijk (2011) Vision in Design, a guidebook for innovators. Amsterdam: BIS publishers.

Appendix 2: Existing Policies

How the Bold City Visions can and should be implemented, depends on the local context. An important part of the context is about local policies and how they enable or limit smart sustainable development as defined within a broader national as well as international context. This section is also related to +CxC D2.1 Report on Enabling Regulatory Mechanism to Trial Innovation in Cities, and will give an overview of both international, national and local policy for the Lighthouse Cities.

International Policies

Smart cities - from EU Policies to the local level

Based on existing research (Haarstad, 2016), the discourse of smart cities has become successful in influencing policy-making for three reasons; technological solutions, governance innovations and political opportunities. By relying on the urban living lab, practical applications of potential solutions can be worked on and studied in situ, to generate empirical data for the benefit of practical planning (Evans & Karvonen, 2014). Thereby, conflicting policy ideals and agendas in urban policy-making can be reconciled through directing attention toward practical, mutually recognized problems that require different actors and stakeholders to take part.

It is politically difficult to be against a smart city project (who does not want to be smarter?); however, the smart city framing is used in different ways by different actors and in different contexts. Nevertheless, there is a need for an approach that examines these different framings and links them together. In order to examine existing plans and policies of the Lighthouse and Follower Cities, and identifying what works and what hasn't, we acknowledge that there is always an argument between universalizing knowledge (what works here, works everywhere) and the specific contextual conditions of particular cities (every place is different) (Vandevyvere 2018). The context-oriented approach should always be balanced with a view of how authoritative institutions at higher levels manage to shape policy agendas and discourses (Haarstadt, 2017; Schmidt, 2008). In other words, what works in a particular city is a mixture of national or international authoritative actors' discourses, and the way the local actors understand and experience them.

United Nation 2030 Agenda on Sustainable development

On 1 January 2016, the 17 Sustainable Development Goals (SDGs) of the UN 2030 Agenda for Sustainable Development came into force. The SDGs build on the



Millennium Development Goals (MDGs) and aim to go further to end all forms of poverty. The new Goals are *“unique in that they call for action by all countries, poor, rich and middle-income to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and addresses a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection”* (www.un.org)

EU-level framing of smartness and smart urbanism

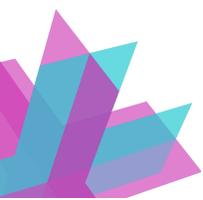
The EU Smart Cities and Communities agenda²⁰ was put into effect in the context of attempts to regain European competitiveness in the post-financial-crisis era. Smartness became a key framing for economic recovery aiming to find new industrial opportunities for Europe in knowledge-intensive and innovative industries (Cooke & De Propis, 2011). Smart growth is described as “developing an economy based on knowledge and innovation” (European Commission, 2010, p.10) and sustainability in an environmental sense is hardly mentioned at all. A key aim of the proposed agenda is to ‘accelerate market uptake of smart city solutions’. This is done by creating a number of ‘lighthouse initiatives’ that will deliver smart city solutions that can be scaled up to support wider implementation across the EU. Sustainability will be promoted by generating innovations in technology and governance that can be transferred (“scaled up”) across Europe. Environmental sustainability does not play a lead role here, but is an important supporting building block. Sustainability is largely an assumed result of more efficient, cost-effective urban systems and greater availability of data. It is not jeopardized by economic growth but is dependent upon it, as there is a need for new markets, products, and services to materialize smart cities in Europe.

EU energy and climate policies

EU energy policies and strategies are at the midst of succeeding on realising visions for sustainable development and growth, such as Bold City Vision 2050 within the lighthouse and fellow cities. Co-creation within a quadruple helix approach, as is a basis within the+CityxChange project, defines the scope and sets the agenda for working on a Bold City Vision and further on the realisation of the vision, and “bridging the gap” between international policies and the local level development and implementation work.

The EU Common Energy Market (clean, secure and affordable energy for all Europeans) defines furthermore a baseline for what is needed to aim for in terms of energy in this context.

²⁰ <https://ec.europa.eu/inea/en/horizon-2020/smart-cities-communities>



The Energy Union Strategy (European Commission, 2015) and its 5 mutually reinforcing dimensions is at the core in this context:

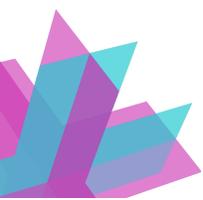
- Security, solidarity, and trust (incl energy security)
- Fully integrated internal energy market
- Energy efficiency
- Climate action, decarbonising the economy
- Research, innovation, and competitiveness

The Clean Energy for all Europeans package²¹, released in 2019, based on Clean Energy for all Europeans (European Commission, 2016) marks substantial steps towards the implementation of the Energy Union Strategy.

This package dubbed “Winter Package” of energy legislation (Hanscher and Winters, 2017) will provide the framework for energy policy in the European Union for many years to come. It contains proposals for a whole range of energy-related issues, including energy markets, energy infrastructure, renewable energy, climate policy and energy demand. The Regulation is built on the essential premise that Member States must create plans that are (a) integrated across these five areas, (b) individually and collectively comply with the Union’s goals for efficiency, renewables, and carbon reduction, and (c) satisfy additional goals, including energy security and cooperation, transparency, regional coordination, and energy innovation and economic competitiveness (Rosenow et al. 2017). Under the Regulation, Member State energy and climate plans will be reviewed by the Commission, which may, in various ways request or perhaps require Member States to take actions to ensure compliance with Europe’s top-level energy goals.

Article 3 of the Governance Regulation sets out the required contents of national 10-year climate and energy plans, beginning in 2019, which must include: a description of national targets for each of the five dimensions of the Energy Union ; a description of policies and measures to achieve the targets; and the Member State’s “methodologies and policy measures for achieving the energy savings requirement in accordance with” Article 7 and Annex IV of the Energy Efficiency Directive (EED) (European Parliament, 2012) as well as the “long-term strategy for the renovation of the national stock of residential and commercial buildings (both public and private)” in accordance with the Energy Performance in Buildings Directive (EPBD) (European Parliament, 2016). The Governance Regulation recognizes the crucial role that energy efficiency must play in meeting the Union’s 2030 and 2050 climate and energy goals and sets out a planning process that would chart a path to meeting energy efficiency

²¹ https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en



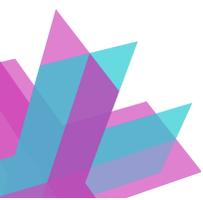
goals in each Member State. However, the Regulation reveals a striking gap between assessment and enforcement. It does not chart governance rules that would cause Member States, utilities, and system operators to invest in efficiency, where it is less expensive or more valuable than supply-side options; nor does it contain specific enforcement tools to pay for and deliver energy savings if Member State efficiency programs were to underperform (Rosenow et al. 2017). Since a failure to deliver cost-effective energy savings will make every other element of the Energy Union more expensive and harder to reach, the enforcement gap for efficiency is a serious problem that requires considerable attention as the Winter Package proceeds through the adoption process. When it comes to the means of ensuring that the Union's efficiency goals will be met, either in individual Member States, or collectively across the Union, still the governance structure remains indefinite and possibly compromised. Even though the new governance mechanisms are proposed by the European Commission in the "Winter Package", there is little or no reference to what currently passes for governance effectiveness. Therefore, there is a need for identifying the preconditions for an efficient governance, through a systematic and thorough analysis of evidence-based planning and decision-making processes in the European sustainable/positive energy projects.

Even though the Winter Package will provide an important part of the framework for energy policy in the EU, there are other crucial policies, directives, strategies, and plans that set the agenda for energy, governance concerning energy, and stretching towards a sustainable energy future. These are also important when defining guidelines and incentive schemes for Bold City Vision in the +CityxChange context: Policy Framework for climate and energy 2020-2030 (European Commission, 2014), Energy Roadmap 2050 (European Commission, 2011), On the Promotion of the Use of Energy from Renewable Sources (European Parliament, 2018), the Third Energy Package²², and the more of an enabler through the SET Plan²³.

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https://ec.europa.eu/energy/topics/markets-and-consumers/market-legislation/third-energy-package_en

²³ https://ec.europa.eu/energy/topics/technology-and-innovation/strategic-energy-technology-plan_en



Policies in Ireland and Limerick

National level

The structure of the Irish planning system is set out in the figure below.



Figure A2.2: Illustration of the National Planning Framework in Ireland

The National Planning Framework - Ireland 2040 (NPF)²⁴ was published in February 2018. It is the overarching policy and planning framework for the social, economic and cultural development of our country. It includes a detailed capital investment plan for the period 2018 to 2027, the National Development Plan 2018-2027.

The Irish national framework seeks to guide the future development of the country taking into account a projected 1 million increase in our population, the need to create 660,000 additional jobs to achieve full employment and a need for 550,000 more homes by 2040.

The framework identifies a set of goals for every community that are referred to National Strategic Outcomes as illustrated in the figure below.

²⁴ <http://npf.ie/>



Figure A2.3: National Strategic Outcomes from the National Planning Framework in Ireland

There is significant alignment between the UN SDGs and the National Planning Framework’s National Strategic Outcomes (NSOs) in areas such as climate action, clean energy, sustainable cities and communities, economic growth, reduced inequalities and innovation and infrastructure, as well as education and health.

The NPF states that transition to a low carbon economy from renewable sources of energy is an integral part of Ireland’s climate change strategy and renewable energies are a means of reducing our reliance on fossil fuels.

The Framework recognises that Limerick city is a part of a network of second tier cities under Dublin and is targeted to substantially increase its population (50%) in the period to 2040. To achieve this a number of “Growth Enablers” have been identified that will support the achievement of population target of 145,000 (min), these include:



- Implementation of the Limerick 2030 economic strategy to create modern, city centre office accommodation and a series of transformational city centre public realm projects;
- Complementary further development of the Limerick 2030 plan to include measures to encourage significant inner urban residential regeneration and development, to include the City's Georgian Quarter;
- Extending the ambition of the Limerick 2030 plan to include extension of the City Centre towards Limerick Docks;
- Provision of a Citywide public transport network, with enhanced accessibility from the City Centre to the National Technological Park, UL and Shannon Airport;
- Development of a strategic cycleway network with a number of high capacity flagship routes;
- Improving sustainability in terms of energy, waste management and resource efficiency and water, to include district heating and water conservation.

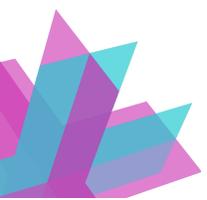
The Irish Climate Action Plan 2019²⁵ was published in June 2019 and states that *“The accelerating impact of greenhouse gas emissions on climate disruption must be arrested. The window of opportunity to act is fast closing, but Ireland is way off course. As economic recovery has taken hold, it is clear the link between prosperity and emissions has not been broken.*

Ireland has directly experienced the extreme weather events of flooding, drought and lock down by extreme snowfall. But many countries have experienced much worse. The shift in climate is bringing profound shifts of desertification, rising sea levels, displaced population, profound challenges to the natural world, and economic and social disruption. We are close to a tipping point where these impacts will sharply worsen.

Decarbonisation is now a must if the world is to contain the damage and build resilience in the face of such a profound challenge.

Under the Programme for Government, a Citizens Assembly was established to examine the challenge and it has signposted the way for radical reform. An All Party Committee was established..... This report has since been unanimously endorsed by the Dáil, while at the same time declaring a Climate and Biodiversity Emergency.”

²⁵ <https://www.mhc.ie/latest/insights/energy-climate-action-plan-2019-a-co-ordinated-action-plan?>



The Plan sets out specific targets and an implementation plan to achieve a net zero carbon energy systems for Ireland's and in the process, create a resilient, vibrant and sustainable country. The targets are set out in figure below:

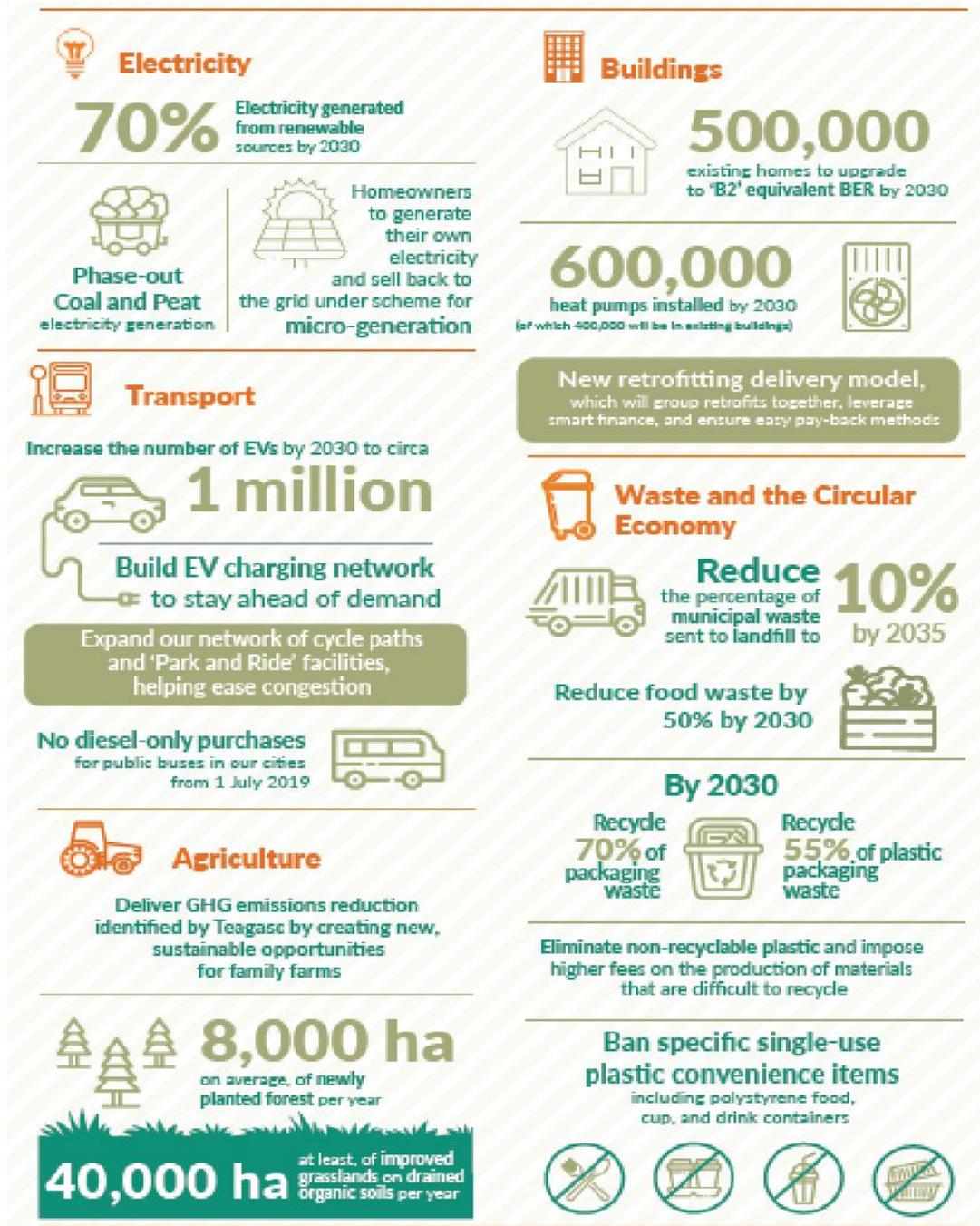


Figure A2.4: Targets from the Climate Action Plan in Ireland

Irish National Policy for Renewable Energy²⁶. The development of renewable energy is central to overall energy policy in Ireland, as set out in the Strategy for Renewable Energy 2012-2020. The Strategy is aimed at decoupling energy from reliance on fossil fuels, which are increasingly being sourced from outside the borders of the European Union. Use of indigenous renewable energy improves security of supply, reduces dependence on imported fossil fuels and reduces greenhouse gas emissions.

Each EU Member State was required, by the Renewable Energy Directive 2009/28/EC, to make a National Renewable Energy Action Plan (NREAP). Ireland's NREAP was produced in 2010 and sets out the actions to reach the legally binding targets for energy consumed from renewable sources, 16% in Ireland by 2020. This obligation is to be met by contributions of energy from renewable sources of 10% in transport, 12% in heating and 40% in electricity.

The Strategy for Renewable Energy 2012-2020²⁷, published by DCENR in May 2012, sets out broad policy for the sector, including reiterating the Government's firm view that:

"...the development and deployment of Ireland's abundant indigenous renewable energy resources, both onshore and offshore, clearly stands on its own merits in terms of the contribution to the economy, to the growth and jobs agenda, to environmental sustainability and to diversity of energy supply." (*The Strategy for Renewable Energy 2012-2020*, sec. 1.10, DCENR, 2012)

The Strategy for Renewable Energy (Sec. 3.1) envisages that Ireland's 2020 renewable electricity target can be met by onshore renewable generation, primarily from wind. The Strategy articulates the Government's high level policy goals and key actions to support the development of each of the renewable energy sectors. The Strategic Goals include:

- Progressively more renewable electricity from onshore and offshore wind power for the domestic and export markets;
- A sustainable bioenergy sector supporting renewable heat and power generation; Green growth through research and development of renewable technologies, including the preparation for market of ocean technologies;
- A more sustainable transport sector through biofuels and electrification; and

²⁶ https://www.dccae.gov.ie/documents/1_EnergyWhitePaper12March2007.pdf

²⁷

<https://www.dccae.gov.ie/en-ie/news-and-media/publications/Pages/Strategy-for-Renewable-Energy.aspx>



- Develop an intelligent, robust and cost efficient energy networks system.

The Ireland's Transition to a Low Carbon Energy Future 2015 – 2030 White Paper²⁸ sets out Ireland's overall policy at a high level, particularly in the period up to 2030. Strong emphasis is placed on the further development of the renewable energy sector.

In accordance with the EU objective of reducing greenhouse gas emissions by 80 – 95% below 1990 levels by 2050, Ireland is developing a National Low Carbon Roadmap, which will set out the strategy to be employed to meet these targets. The National Roadmap will encompass a number of sectoral roadmaps, including in respect of electricity generation, which will be undertaken by DCENR.

The Renewable Electricity Policy and Development Framework 2016 (Draft) aims to identify strategic areas for the sustainable development of renewable electricity projects of scale, in a sustainable manner, compatible with environmental and cultural heritage, landscape and amenity considerations. In the context of solar energy and micro generation, the draft framework is very limited, stating:

“Solar PV power was examined in 2008 in the All Island Grid Study, Workstream 1, Renewable Energy Resource Assessment, but “... it was concluded that there would be very low incremental generation from solar photovoltaic power at any 110kV node by 2020.”¹⁷ The 2010 NREAP does not envisage solar power making a contribution to Ireland's 2020 renewable electricity targets.

However, there has recently been a significant decrease in the cost of solar PV panels and this technology should offer some possibilities in Ireland in the medium term up to 2030. The recently published Green Paper on Energy Policy in Ireland, May 2014, DCENR, raises the question of the future role of solar energy.”

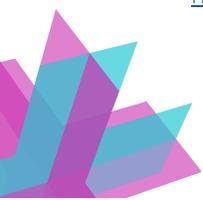
The National Adaptation Framework (NAF)²⁹ was published in January 2018 and sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. The NAF outlines a whole of

²⁸ The White Paper 'Ireland's Transition to a Low Carbon Energy Future 2015-2030' is a complete energy policy update

<https://www.dccae.gov.ie/en-ie/energy/publications/Pages/White-Paper-on-Energy-Policy.aspx>

²⁹

<https://www.dccae.gov.ie/en-ie/climate-action/topics/adapting-to-climate-change/national-adaptation-framework/Pages/default.aspx>



government and society approach to climate adaptation in Ireland. Under the NAF a number of Government Departments will be required to prepare sectoral adaptation plans in relation to a priority area that they are responsible for. Local authorities are required to prepare local adaptation strategies The NAF will be reviewed at least once every five years. The NAF also aims to improve the enabling environment for adaptation through ongoing engagement with civil society, the private sector and the research community.

Local level

The Limerick City Development Plan 2010-2016 is the Statutory Strategic Planning Framework within which the development of Limerick will take place. This plan is due to be reviewed over the course of the coming 3 years and it will incorporate the BCV. The process of preparing the plan is set out in law and has a 2 year development cycle as outlined in the figure below (Development Plans Guidelines for Local Authorities, DEHLG 2007):



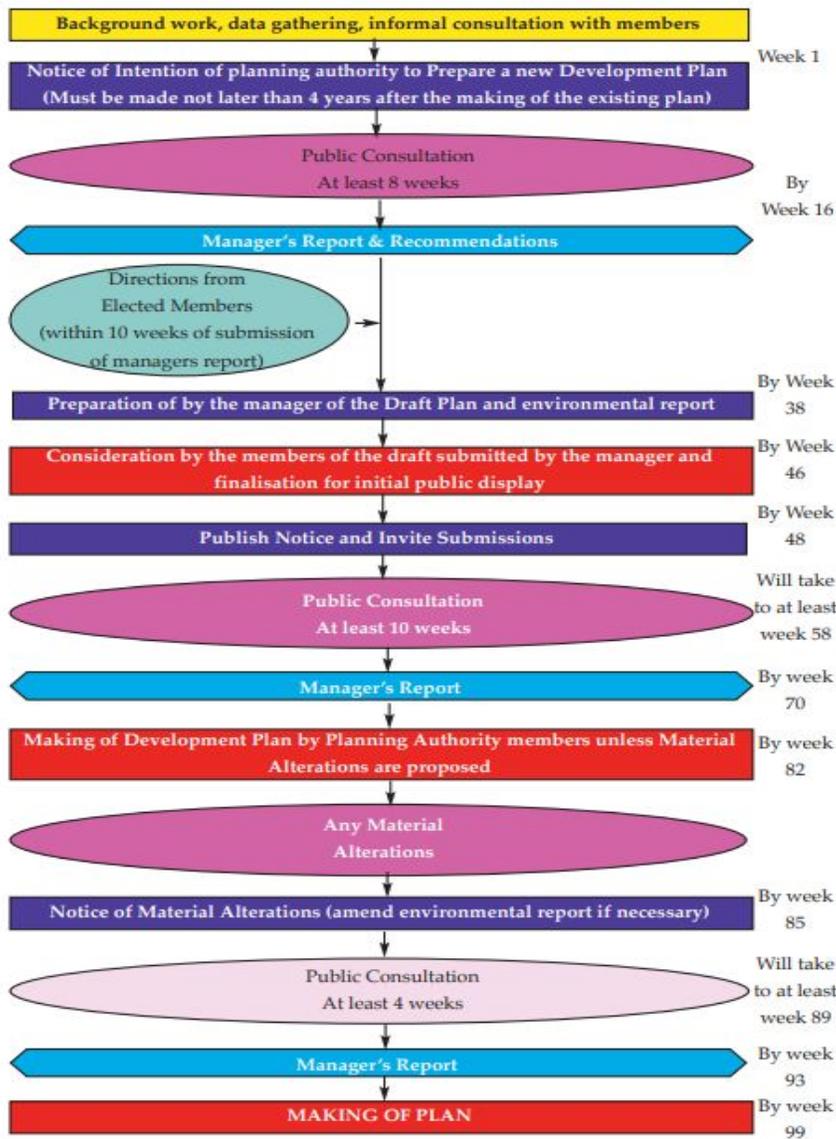
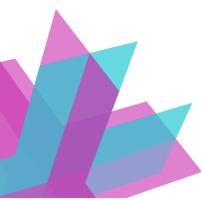


Figure A2.5: Illustration of Development Plans Guidelines for Local Authorities

Policies in Norway and Trondheim

The policies and plans in Trondheim and Limerick are made according to the national, regional and local planning policies. For that reason an overall understanding of the planning system is necessary to make sense of the policies that are relevant for the Bold City Vision framework.



The planning system in Norway has three levels; national, regional and city level. At the national level a lot of the expectations and strategies for how the city do their planning are decided. As an example, the Norwegian government decided on the 14th of May 2019 that all planning in Norwegian cities needs to build on the UN Sustainable Development Goals. Besides this decision the government hasn't provided a lot of guidelines, which means that the cities themselves need to translate this into a local level.

National level

At a national level, there are in particular three policies that are highly relevant for +CityxChange and the Bold City Vision framework:

Energy21 For the national strategy "Energy21"³⁰, the main function is to contribute strategic advice and recommendations to the authorities on research, development and demonstration activities aimed at developing new climate-friendly desktop energy technology. Energy21 will contribute to a comprehensive and unified strategy for the energy sector, through which stakeholders support common strategic goals and measures. Energy21 started in 2009 and the responsible Ministry is the Ministry of Petroleum and Energy.

National Transport Plan 2014-2023³¹ is put forward by the Ministry of Transport and Communications. The transport services are the Norwegian Road Administration, the Railway Directorate and the Coastal Administration. The last draft proposal is valid for the ten-year period 2014-2023.

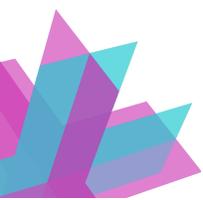
The purpose of the **National Planning Guidelines for Climate and Energy Planning in Municipalities**³² is to ensure that the municipalities are at the forefront of reducing greenhouse gas emissions, Ensure more efficient energy use and environmentally friendly energy conversion in the municipalities and ensure that the municipalities use a wide range of roles and instruments in their efforts to reduce greenhouse gas emissions. The plan belongs to the Ministry of Climate and Environment and is valid from 2009.

³⁰ Nasjonal forskning og innovasjonstrategi for ny klimavennlig energiteknologi <https://www.energi21.no/>

³¹ These pages deal with the transport and Avinor's work with the National Transport Plan (NTP). The transport services are the Norwegian Road Administration, the Railway Directorate and the Coastal Administration.

<http://www.ntp.dep.no/>

³² <https://www.regjeringen.no/no/dokumenter/planretningslinje-klima-energi/id575764/>



Regional level

On a regional level, the most relevant plan will be the Regional Plan 2015-2020 for Climate and Energy in Trøndelag County³³. It aims to reduce emissions of greenhouse gases in the county with 40% by 2030, compared to 2009. Trøndelag County will play a leading role in developing climate-friendly technology and facilitation of environmentally friendly businesses and ways of life. In terms of energy, the goal is to develop the region's advantages in the energy field in accordance with the principles for sustainable development

Local level

For the City of Trondheim, a lot of policies will be relevant for creating the Bold City Vision for Trondheim 2050. In 2020, Trondheim will create a new social chapter of the municipal master plan, which will build on the SDGs. In addition to the existing plans listed below, this will of course be highly relevant.

The Planning Strategy for the City of Trondheim 2016-2019 is aimed at strengthening the political governance of the municipal planning. Through the planning strategy descriptions of the municipality's changing operating conditions, challenges and development are identified.

The basis for the assessment of which planning tasks are to be prioritized by 2019 lies with three national guides from the national government:

- Good and efficient planning processes
- Sustainable area and community development
- Attractive and climate-friendly urban and urban areas

The **City of Trondheim Master Plan 2009-2020**³⁴ (no. kommuneplanens samfunnsdel) sets out the city's vision as "Big Little Trondheim":

- The learning and development capabilities of a large, globally connected city

³³ Develop Sør-Trøndelag's advantages in the energy field in accordance with the principles for sustainable development.

<https://www.stfk.no/Documents/klima/Regional%20plan%20for%20klima%20og%20energi%202015-2020.pdf>

³⁴

<https://www.trondheim.kommune.no/tema/bygg-kart-og-eiendom/arealplaner/kommuneplanens-arealdeldelplaner/kpa12-24/>



- The level of trust (social capital), participation and agility of a close knit community
- Technologies that bridge gaps (knowledge, social, physical) and bring people, ideas and resources together

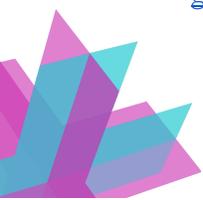
The Municipal Plan for Energy and Climate 2017-2030³⁵ sets forward the following vision: “The municipality of Trondheim will be an international pioneer municipality for the development of good climate and environmental solutions”, as well as the following overarching objectives:

1. In 2020, Trondheim is a model and a cooperation arena for green value creation and development of climate-friendly technologies and ways of life
2. By 2020, the direct greenhouse gas emissions in Trondheim are reduced by 10% compared to 1991
3. By 2025, Trondheim is robust to meet future climate change
4. By 2030, stationary energy consumption in construction and construction is at the same level as in 2013 (approximately 3.5 TWh). This corresponds to a 20% reduction in consumption per person
5. By 2030, direct greenhouse gas emissions are reduced by 80% compared with 1991

As well as a set of objectives aimed at the municipal organisation itself:

6. Trondheim municipality will start the phase-in of a climate-neutral vehicle park for heavier vehicles as soon as they are available
7. By 2020, energy consumption in owned business has been reduced by 7% compared with 2017
8. When updating the plan in 2020, target counts for indirect emission cuts are set.
9. The climate footprint for major investment projects in Trondheim municipality will be reduced by 30% compared to comparable reference buildings, provided that life cycle costs are not increased significantly
10. By 2030, the municipality of Trondheim is a zero-emission organisation.

³⁵ Municipal Plan for Energy and Climate 2017-2030
https://www.trondheim.kommune.no/globalassets/10-bilder-og-filer/10-byutvikling/miljoenheten/klima-og-energi/vedlegg-1---kommunedelplan-energi-og-klima- -171116_endelig.pdf



Appendix 3: Preliminary Bold City Visions

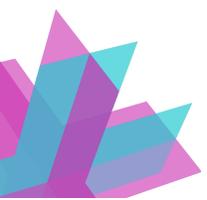
As a part of the Description of Action (DoA) all of the seven +CxC cities created a first draft for a Bold City Vision. These will act as inspiration and starting points when the cities create Bold City Visions in their respective Tasks 4.2, 5.2 and 6.2.

Trondheim Kommune in Norway and Limerick City and County Council in Ireland are two very different cities, each with a unique Bold City Vision and plan for how this can be achieved by 2050. However, each city has many complementarities with respect to the goals that they wish to prioritise. For example, Trondheim's key goal is to create a city that is happy, healthy, and regenerative. For Limerick, their key goal is the growth of Limerick and the surrounding region to be a Tier 2 city, which in turn will maximise the economic, social, cultural and environmental opportunities for the city. As such, both of these goals are intrinsically linked, with many different yet many similar methods to achieve them.

For Trondheim, their key objectives are centred around a zero-growth target for passenger car traffic, knowledge creation and transfer, climate and energy, new technologies and business models and most importantly, the citizen. This has many similarities with Limerick's key goals, which also place the citizen at the centre of all city change and encourage development of new technologies and business through an innovation ecosystem. Limerick, like Trondheim, wishes to collaborate with the university and exploit the knowledge base and capacity of the universities and knowledge institutes in the surrounding areas. Climate and energy change is core to both through designated Innovation Districts and the delivery of energy solutions. The following section provides a summary of each Lighthouse city's unique Bold City Vision; this will be further developed through the +CityxChange project. The Follower Cities will also build on this to develop their own Bold City Visions; in fact, they have already started examining this process through the investigation into different Demonstration Districts and Areas in their cities, as outlined in Section 1.3.5.

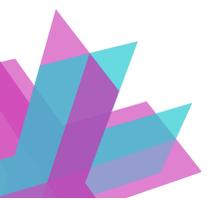
+Limerick 2050

Ireland operates within a global economy, and population growth must take place in locations where it can be of greatest benefit to the Country as a whole. Limerick City as the engine for the The Mid West Limerick City Region is best placed to achieve this ambition. The goal for +Limerick 2050 is to be Ireland's first positive energy city and provide better services and better quality of life for all stakeholders of the city. The aim



is to enable the growth of the Mid West Limerick City Region to a Tier 2 city, of a scale, which can exert critical-mass, have influence at an international level and maximise the economic, social, cultural and environmental opportunities in a manner for all those who live, work and visit the region. This will therefore create 'the future we want to live in'.

This will be achieved through the creation of an Innovation Ecosystem for Urban Commons/Civic Tech/Civic Participatory Design and co-creation of processes and services related to shared public spaces and services. This cooperative living model will enable a greater understanding of how shared resources (energy, environmental, social and economic) are used and where they are conserved. It will allow new working models to be easily proposed, developed, trialled and tested and revised to suit. Digital platforms and tools, linked to active design and co-creation processes, will provide the openness and transparency required to incorporate feedback loops. These will be accessible to the maximum number of participants in order to efficiently generate knowledge regarding optimal ways of living and hence guide actions to manage change in the natural and built environments through bottom up actions supported by top down structures. Further to this, a joint City and University/Academic Institutions led approach of a Lab model of partnership with local government and industry, centred around local communities, and involving communities of interest will be adopted. This will lead to a digitally literate city/Living Labs approach. Finally, a distributed, open government approach will be enabled by city design processes and e-government to build the structure for self-organization of citizens and for an adaptive form of government to emerge in the city and its surrounding region. Limerick will achieve this by defining an Innovation District in its historic Georgian City Centre as a concentrated location for Innovation companies and Living Labs, which would benefit from accelerated regulatory processes and innovation playgrounds. The initiative builds on the development of an ecosystem of suitable premises for fostering start-ups and indigenous SMEs together with the strong concentration of business support services and establishes the governance structures, processes and platforms to enable a connected and collaborative citizenry, which can organize to realize sustainable development objectives. A specific Innovation Zone, i.e. playground, within the designated area will concentrate the use of CivicTech (e.g. Internet of Things (IoT) sensors, Digital Platforms etc.) and linked Community Design Processes (e.g. City and Town Engage) to promote participatory urbanism practices, e-mobility and the enabling of a positive energy district in the city. The third level academic institutions are seen as key partners in this process as well as active local community groups and communities of interest.



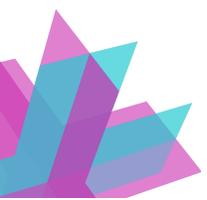
This Innovation District will become the focus of activities supported by an open community engagement process to assist the city and its citizens to develop an inclusive vision for Public Realm Projects, Public Life of the City and Liveability. It involves the establishment of a regular and continuing calendar of events including community mapping and auditing events to activate crowd sourcing of both quantitative and qualitative data, listening and learning days and lightning talks and civic conversations to build up collective intelligence and agree common aspirations. It includes ideation days and co-design workshops to imagine with specificity the shape of the future to make the path toward that goal more easily achievable. These processes and tools create the conditions for the emergence of peer-to-peer distributed networks and even more importantly, allows for the generation of networks and trust. The Innovation Zone provides a preferential environment to support urban prototyping, a practice aimed at allowing sustainable development solutions to emerge, to be trialled and tested, and to collect feedback to refine those solutions.

Further to this, as Limerick's renaissance under the Limerick 2030 plan is building momentum, the objective will be to exploit digital technologies, transform the way we work at local and regional level, enable better citizen engagement through digital channels, double the number of digital start-ups in Limerick, double the number of SMEs trading online, double the use of data, create equal opportunities for all citizens and accelerate the development of a Sustainable Smarter Limerick that can grow to become Ireland's 2nd largest city at the centre of a strong region. This will lead to a new level of digital maturity and set a focal point on enabling 1,000 smart homes, 100 smart buildings and a Smart Energy District.

+Trondheim 2050

In order to bring about 'the future we want to live in' it is important to be highly open-minded, attentive, participative, and curious about how this future is designed. Futures cannot be predicted, but they can be invented. As such, the ongoing rethinking of strategies for city urban development in the central areas of Trondheim will be an important tool for the +Trondheim 2050 to come alive.

The overarching vision for the bold city vision for Trondheim, aka '+Trondheim 2050', is global regeneration: helping people everywhere leave their communities in a better state socially, financially, and environmentally. As such, Trondheim will emerge as a city that is happy, healthy, and regenerative. The goal of this visionary work is to provide an overall concept for urban development in the central areas, with clear visualisation of urban Trondheim in 2050.



Trondheim municipality has defined four main objectives in alignment with +Trondheim 2050 bold city as follows:

1. Zero-growth target for passenger car traffic: This objective will lead to a city in which the population gains better public health through increased daily physical activity and less pollution from the transport sector as well as ample opportunities for social integration. To achieve this, the following strategies are considered:

- Stricter parking regulations for passenger cars
- Closer networks for pedestrians and cyclists
- Developing a new metro bus and E-Bus system

2. Knowledge creation and transfer: This objective supports the generation and transfer of knowledge and experiences and is achieved through the following strategies:

- City lab (Knowledge Axis): Trondheim offers itself as a city lab (Knowledge Axis) for several, specific research and development activities. The city benefits strongly from the internationally recognized technology and knowledge centres.
- University City Trondheim 3.0: Trondheim municipality and NTNU have signed (in January 2018) the first, truly comprehensive University City agreement, University City Trondheim 3.0. Isolated cooperation within sectors and on individual projects will not help cities deal with their future need for knowledge and competence. University City Trondheim 3.0 will enable an integrated governance model, sharing of personnel and knowledge and opening the city up as a living lab.

3. Climate and energy: In 2017, Trondheim adopted the Climate and Energy Action Plan, which runs to 2030. The city of Trondheim has set the vision of being an international pioneer in the development of highly efficient and future-proof climate and environment solutions. This will enable the generation of more domestically produced renewable energy in Norway, which can be used in the industry and transport sector and the European energy market. As such, +Trondheim 2050 will contribute to the realisation of the adopted Climate and Energy Action Plan to 2030, the Norwegian goal of climate neutrality by 2030, the EU climate goals of 100% reduction of greenhouse gas emissions by 2050, EU Energy Strategy 2030 and supporting the Energy Roadmap 2050³⁶. To cut emissions and develop solution, five main strategic dimensions are considered:

³⁶ https://ec.europa.eu/energy/topics/energy-strategy-and-energy-union_en

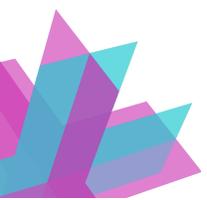


- Facilitate solutions that make climate friendly living easy
- Cooperation for technological and social innovation
- Placing restrictions on car use and ban fossil fuels for heating
- Development of new technologies and business models for local, renewable energy production

4. Citizen: Citizens must be at the centre of achieving +Trondheim 2050. Solutions must be co-created with the citizens in order to address complex societal challenges. As such, the objective is to involve close collaboration with the public sector, private sector, and research institutions to develop future-proof technology and solutions for the city. In general, Norwegian society is characterised by a high level of trust between citizens, government and NGOs, that often work together towards common goals. In Norwegian companies and public administration, it is often a goal to make decisions at the lowest possible level in order to have efficient and responsible organisations. These traditions will make a base for further involvement. With this in mind, +Trondheim 2050 has already identified the following strategies, which can help meet these goals:

- TRD Playground: Trondheim municipality's political leadership has ambitious objectives for the development of the city through the TRD Playground that has been developed as a way to frame important issues and enable citizens to become part of the solution. In order to succeed, the city must act as an open, complex and adaptive system. Only at the city level, solutions which address the totality of daily life in modern societies can be addressed, e.g. transportation, education, public health, etc. The Playground is also an ideal platform to educate citizens and enable them to take ownership of their city.
- Augmented Democracy and Impact Journeys: Trondheim have started the development of pilots for augmented democracy and impact journeys; these tools will be used to develop how the citizens can contribute to prioritize and decide the best way of using the city's resources. By 2050, social capital and participatory budgeting will be an integrated part of the overall city budgeting process.

The +Trondheim 2050 Bold City Vision will be realized through new service models of governance, planning, and implementation where open digital platforms will be co-designed, co-developed, and co-implemented by citizens, public sector, private sector, and research organisations to support a happy, healthy, and regenerative city. The experiences from TRD Playground and University City Trondheim 3.0 and



integrated governance and budgeting models will also be transferred and used in cooperation with other organisations. Business models and systems that have been developed, will be shared with the industry in the city, universities and citizens.

To communicate the bold city vision, +Trondheim 2050 will be translated into practical use through digital guidebooks (social, finance, urban, technical). To ensure that the guidebooks for +Trondheim 2050 have effect and will be leading us to 'the future we want to live in', it is important to monitor the strategic impact, but also ensure that the digital guidebook is agile so that it can be adapted if necessary. One of the key stakeholder groups will be the children at our schools, so we can ensure that the voices of the future are helping us in the right direction.

City of Alba Iulia (FC)

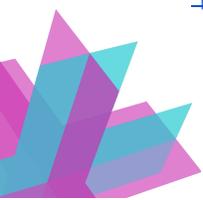
With a population of almost 74,000 and an urban area of 104km², Alba Iulia has a population density of 713 per km². Alba Iulia is located by the Mureş River in the heart of Transylvania in central Romania. Cultural heritage and tourism are of significant importance for Alba Iulia. The historical centre is the core of the urban organisation. The Alba Carolina Citadel, the most representative Vauban Citadel in Romania, highlights the city of Alba Iulia. After a series of large renovation projects over the last decades of more than €70m, financed by EU funding (ESIF)³⁷, the Municipality has enhanced the city's cultural heritage and provides the opportunity for both citizens and tourists to explore the area.

Alba Iulia won the title of European Destination of Excellence in 2012 by the European Commission through the Ministry of Regional Development and Tourism. The most important city strategies are the 'Integrated Urban Development Plan 2009-2015' and 'Alba Iulia Project Prioritisation for 2014-2020'. The vision of Alba Iulia is to "become a more attractive city to live, work, and invest in by 2020". 'Digital Alba Iulia' is part of this vision that links seamlessly to the +CityxChange project. In collaboration with the Ministry of Communications and Information Society, 'Alba Iulia Smart City 2018 has been established as a pilot project.

Alba Iulia Municipality is managed by a dynamic administration with an open and welcoming approach to private investors. The Municipality and Orange Romania signed a protocol to establish close cooperation for urban IT infrastructure and other smart

37

https://ec.europa.eu/info/funding-tenders/funding-opportunities/funding-programmes/overview-funding-programmes/european-structural-and-investment-funds_en



solutions. Alba Iulia is also included in Siemens' global research project 'Smart Cities Research'. In 2010, Alba Iulia Municipality became a member of the Covenant of Mayors in collaboration with the Alba Local Energy Agency (ALEA). The main objective is to create an integrated coherent policy with respect to the sustainable development strategy, by reducing energy consumption by 24% up to 2020. The Sustainable Energy Action Plan (SEAP)³⁸ was updated and approved by the Local Council in 2016. The city also has a Sustainable Urban Mobility Plan (SUMP) in accordance with the specific European legislation, national legislation and financing schemes. The SUMP was subjected to a process of public consultation where the citizens were invited to express their proposals and recommendations.

Sestao (FC)

Sestao City has a population of approximately 28,300 (2016) with an urban area of 3.5km² and a population density of 8,085 persons per km². Sestao is located in Bizkaia, one of three provinces of the Basque Country. Situated on the left bank of the Nervion River, Sestao belongs to the shared conurbation of Bilbao, Barakaldo, Portugalete and Santurtzi. The city is very well connected to the surrounding communities through road, rail, metro, and a future tram development, which will connect the city to the Leioa University Campus of the Basque Country, making commuting more efficient and sustainable through an intermodal station.

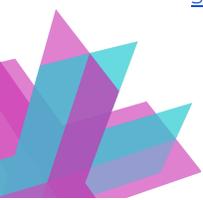
Sestao has played a relevant role in the industrialisation history of the Basque Country, which has also resulted in prolonged problems since the industrial crisis in the 1980s. In 2005, after ambitious urban regeneration in Bilbao and Barakaldo, the Basque Government recognised similar needs in Sestao to cope with its social, economic and environmental problems. Sestao has hence been prioritised in the Operative Programme of the Basque Country³⁹, under the European Regional Development Fund (ERDF) 2014-2020.

Instead of transforming industrial areas to residential and tertiary use, Sestao aims to keep industry as the main economic driver. In order to deal with urban challenges and improve municipal services based on citizen demand, the city has developed the Integrated Sustainable Urban Development Strategy of Sestao (ISUD Strategy, 2014), which integrates the Smart Sustainable City paradigm with already existing regeneration plans and projects. This ISUD Strategy has provided a thorough diagnosis

³⁸ <https://www.covenantofmayors.eu/plans-and-actions/action-plans.html>

³⁹

https://ec.europa.eu/regional_policy/en/atlas/programmes/2007-2013/spain/operational-programme-basque-country



and identified main challenges such as a degraded building stock, a high unemployment rate and demographic decline. The ISUD Strategy also recommends actions such as upgrading municipal services through ICT deployment, fostering sustainable urban mobility and increasing energy efficiency in regeneration of degraded areas.

In 2005, an agreement between the Basque Government and Sestao Municipality resulted in the creation of Sestao Berri, the 100% publicly owned body which will represent Sestao in +CityxChange, with the main goal to drive the urban regeneration process while engaging local community.

Písek (FC)

The Municipality of Písek has a population of approximately 30,000, an urban area of just over 63 km² and a population density of 475 per km². Písek is a mid-sized city situated in the South-Bohemian Region of the Czech Republic, with approximately one hour travel time to Prague. Its economy has been significantly strengthened by foreign direct investment (FDI) in the industrial zone north of the city, with strong influences from the automotive industry and electro-technics. The Technology Centre Písek and Centre of Low Energy Buildings are two innovation centres built as 'brownfield site investments' at a total investment cost of €40m.

Písek is a flagship of a 'smart city' innovation in the Czech Republic. Písek was the first of all Czech cities to officially adopt a comprehensive 'smart city' concept plan, called the "Blue-Yellow Book" (named after official colours of the city), which was approved by the City Assembly in 2015. This concept is in clear alignment with the +CityxChange vision and activities, establishing priorities in areas of smart mobility, energy efficiency, ICT and integrated infrastructures. Písek is already implementing smart city projects in the areas of e-mobility, water management, and building energy management. Písek has established official cooperation with the national government, signing a memorandum with the Ministry of Environment, and preparing for a similar memorandum with the Ministry of Spatial Development. This makes Písek an ideal 'smart city' follower to test innovative solutions. Písek is the domicile of the 'Czech Smart City Cluster', an association of private and public sector actors, including Atos, eON, Schneider Electric, Česká Spořitelna, Czech Technical University. This association strongly supports smart city activities in Písek, and its members were among those to start the 'Smart Písek Concept'.



Smart Písek has received very high levels of attention nationwide in Czech media, and the city is regularly visited by representatives from other Czech cities. Písek Municipality has established a 'Smart City Coordinator' along with experts in ICT, energy, and mobility, an expert coordination unit working on further smart city development and ensuring necessary cross-sectoral cooperation. This unit reports directly to the City Council and will be accompanied by the 'Smart Písek Committee' with representatives from academics, ministries and NGOs (such as the Czech Smart City Cluster) to engage important stakeholders.

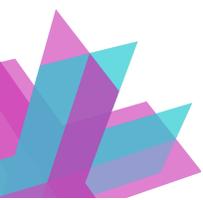
Písek has excellent opportunities in securing access to Czech and EU structural and investment funds through adopted comprehensive strategies and signed memorandums. The newly created 'Smart City Coordinator' is a result of the European Structural and Investment Funds (ESIF) financed project "Development of Smart City Písek" (Operational Programme Employment, Specific Goal 4.1 – 'Effectiveness of Public Administration', with approximately €200,000 of funding from 2017-2018). Throughout the Czech Republic over €24b has been allocated for sustainable development and growth for the period 2014-2020, and specifically for Písek this will be directed towards the dedicated implementation of 'smart' technologies, cloud technologies, data management and open data, under the Integrated Regional Operational Programme (IROP)⁴⁰. Under the Operational Programme Enterprise and Innovation for Competitiveness⁴¹ (OPEIC, Priority 3) in association with the national budgetary programme EFEKT, funds are set aside to test 'smart grid' solutions consisting of utilising connections with smart street lamps, and also the roll out of electric cars, e-buses and the development of real-time passenger data.

Smolyan (FC)

The Municipality of Smolyan is situated in a mountainous region in South Bulgaria on 1000m above sea level, in the heart of the Rhodope Mountains, near on the Greek-Bulgarian border. The area is 854km². The population of the City of Smolyan is 28,160 and the Municipality is 37,607 people, as per 31.12.2016 (<http://www.nsi.bg>). It is a regional centre for the Smolyan Region and an important touristic and environmental site. Smolyan is 250 km away from the capital Sofia and 100 km from the second largest city in the country - Plovdiv. The cross-border checkpoint with Greece (Zlatograd-Thermes) is situated only 55 km from Smolyan. The opening of another point in the near future – Elidge border checkpoint, only 30km away from

⁴⁰ https://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/czechia/2014cz16rfop002

⁴¹ <https://www.ceps.cz/en/operational-programme-enterprise-and-innovations-for-competitiveness>



Smolyan, is on the way, which will be the fastest link with Xanthi and the Northern Aegean coast.

The municipality developed an SME based economy, preserving its traditions, culture and natural resources and building a vision for a modern regional centre, attractive to the locals and the investors. Major objectives for the municipality are sustainable urban development, utilising local energy resources, encouraging the local economy, promoting a thriving social community and welcoming business and social innovation. Within these, the municipality has identified 5 main priorities:

- sustainable economic growth,
- improved infrastructure,
- effective cooperation, improved educational system,
- health and social services
- increasing the employment rate and overcoming the migration of the young people from the area

Since 2013 Smolyan is a signatory of the Covenant of Mayors⁴²; in Mayors Adapt, it presented its action plan in 2014 with a reduction target of 20%. The city has participated and is participating in numerous European projects, most recently the URBACT network SmartImpact⁴³ where together with Manchester, Dublin, Zagreb, Stockholm, Eindhoven, Porto and others, the partners are focusing on how to develop models of adapting administrative structures to smart development.

Võru (FC)

Võru aims to become an active town where citizens have the opportunity to do their business according to their interest. With its idyllic living environment, Võru is an excellent place for children to grow. Young people feel that it is an interesting place to live for them and their families. People in communities are caring and helping each other. People of Võru are proud of its cultural heritage and its local dialect is proudly spoken. Võru town is a strong centre of the region around Võru. Võru town is a regional leader in providing jobs and services and initiating joint activities.

A problematic issue for Võru is that people are moving out from Võru town to surrounding municipalities or bigger cities in Estonia. Also the centre of Võru and the heritage area are weak with poor activities. People are moving from the city centre to live in the suburbs. As there are no universities in town, young people move to other

⁴² The Covenant of Mayors is the world's largest movement for local climate and energy actions <https://www.covenantofmayors.eu/en/>

⁴³ Cities, people and the promotion of smart, sustainable development <https://urbact.eu/smartimpact>



towns in Estonia or abroad. There is insufficient public transport. There is an urgent need to bring people and life back to the city centre, to make the heritage area an attractive place to live and have business and to reconstruct buildings to make them more energy efficient.

For a bigger and more integrated approach Võru town aims to build the bold city vision which includes a general plan of the Võru town, analysis about Võru heritage and visions for the heritage area, linked with technical documents for innovative solutions, 3D approaches, and intelligent energy systems especially for the heritage area. A new plan for Võru town will focus on how to bring life back to the city centre (includes citizen participation, innovation, energy efficiency etc.) and include analyses, visions, and virtual plans for the historical area in the frame of energy efficiency, innovation and positive or neutral energy blocks, where technical reconstruction documents for the houses and quarters of the energy blocks will be created.

