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D6.3 - European cities market analysis

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Abbreviations and acronyms

Acronym	Description
4Ps	Marketing tool (Product – Price – Place – Promotion)
EPBD	Energy Performance of Buildings Directive
ER	Exploitable Result
NGO	Non-Governmental Organisation
PED	Positive Energy District
PESTEL	Marketing tool (Politic – Environment- Social – Technology – Economy – Legal-
SET	Strategic Energy Technology
WP	Work Package

Abstract

The work presented is part of the Horizon 2020 project MAKING-CITY. The Positive Energy District (PED) concept is the core of the MAKING-CITY project. A PED is defined as “a district with annual net zero energy import and net zero carbon emissions, working towards an annual local surplus production of renewable energy” in the European Strategic Energy Technology Plan (SET Plan).

Within the MAKING-CITY project, the development of PEDs is based on the integration of various technologies, ranging from buildings’ energy retrofitting and integration of renewable sources to the design, adaption and upgrade of heating and cooling systems and the deployment of storage & transfer systems. Altogether, the use of these technologies should allow the district to have an annual net zero energy import and net zero carbon emissions, working towards an annual local surplus production of renewable energy. Interactions between stakeholders involved in the district is also a key aspect to be taken into account to reach the objectives of a PED. Societal innovation, social entrepreneurship and citizen participation are also key to spur the deployment of PEDs within an integrated urban transformation process.

Exploitation and business modelling activities address how the outputs of this research project will be exploited and replicated beyond the project’s lifetime.

This deliverable D6.3 *European cities market analysis* focuses on identifying opportunities and barriers to replication activities.

Many expectations are placed on cities to become more sustainable; they are seen as both the problem and the solution. The study of the environment (conducted with the PESTEL tool) shows that cities seek to stand out from other cities to attract new investments and satisfy their citizens. The technologies exist but the right regulations and funding must now be combined for these solutions to be implemented. The techno-centric approach is not recommended, as initiatives taking social aspects into account have a better chance of success.

The use of a PED-readiness indicator tool developed within the project allows identifying the European cities with the highest potential to develop PEDs. 201 cities have been identified as potential targets for PEDs, and among them the 28 cities which score the highest shall be targeted in priority.

The benchmark carried out shows that the PED methodology has the highest energy ambition compared to other methodologies for supporting cities in their sustainable development. There is an opportunity to create a service offer associated with Beyond MAKING-CITY methods and tools or to create partnership with existing powerful market actors.

1 Introduction

1.1 About the MAKING-CITY project

Launched in December 2018 and coordinated by the CARTIF Technology Centre, MAKING-CITY addresses and demonstrates advanced procedures and methodologies based on the Positive Energy District (PED) concept for 60 months.

A PED is defined as *“a district with annual net zero energy import and net zero carbon emissions, working towards an annual local surplus production of renewable energy”* in the European Strategic Energy Technology Plan (SET Plan). Derived from the Positive Energy Block (PEB) definition established by the European Innovation Partnership on Smart Cities and Communities (EIP-SCC), a PED is a delimited urban area composed of buildings with different typologies and public spaces where the total annual energy balance must be positive. Therefore, the district will have an extra energy production that can be shared with other urban zones. The total energy balance is the energy taken from outside the district minus the energy delivered inside the district. In line with the previous definitions, MAKING-CITY has adopted the following definition of a Positive Energy District: *“A Positive Energy District is an urban area with clear boundaries, consisting of buildings of different typologies that actively manage the energy flow between them and the larger energy system to reach an annual positive energy balance”*.

Even if all energy carriers can be considered as potential energy inputs and/or outputs, only primary energy units make a suitable calculation of energy flows to establish the total energy balance. Finally, achieving PEDs means that the amount of energy delivered by the district must be higher than the amount of energy supplied from outside.

The implementation and/or replication of the PED concept developed by the MAKING-CITY partners include the following applications, besides the social innovation and citizen engagement activities organised in the cities:

- ❑ Initiate retrofitting buildings to maximise infrastructure performance;
- ❑ Increase renewable sources to produce self-sufficient green energy,
- ❑ Design, adapt and upgrade heating and cooling systems,
- ❑ Deploy storage & transfer systems to anticipate energy demand peaks,
- ❑ Set up public charging stations to boost electric mobility.

They will be applied in two Lighthouse cities (LHCs), Groningen (NL) and Oulu (FI), and 6 Follower cities (FWCs), Bassano Del Grappa (IT), Kadikoy (TR), Leon (ES), Lublin (PL), Trencin (SK) and Vidin (BG).

1.2 Purpose of this deliverable and target group

The present report presents a market analysis to identify cities and conditions for replication and deployment of MAKING-CITY solutions. The work on market analysis uses indicators to identify European cities with high replication potential that benefits and have the most favourable climate for MAKING-CITY solutions.

The target group of this public deliverable includes:

- ❑ MAKING-CITY partners, especially those involved in Lighthouse and Follower cities, and more generally in replication activities,

- ☐ Sister projects (other smart cities and communities' projects), in particular those working on the PED concept,
- ☐ All stakeholders wishing to have an insight on the cities' needs in terms of sustainable development and tools and services that are already existing to support them.

1.3 Link with other MAKING-CITY WPs

The present deliverable D6.3 is part of the work package 6 (WP6) of the MAKING-CITY project "Exploitation and Business Models".

Given its cross-cutting nature, WP6 is linked to all other WPs in the project, as illustrated by Figure 1 - Activities in WP6 and links with other MAKING-CITY WPs. WP6 intends to support and serve other WPs towards effective delivery and exploitation of the project's results.

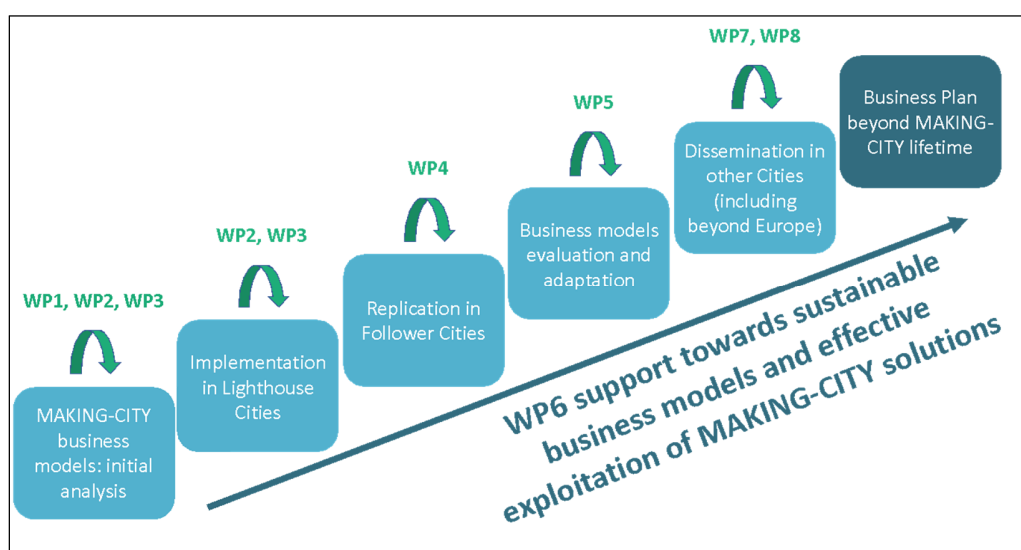


Figure 1 - Activities in WP6 and links with other MAKING-CITY WPs

This report has close links with the following public deliverables:

- ☐ D6.1 – Ecosystem analysis for Positive Energy Districts
- ☐ D6.2 – PED-readiness indicator tool
- ☐ D6.4 – MAKING-CITY business model implementation handbook
- ☐ D6.8 – MAKING-CITY exploitation plan and operations
- ☐ D6.9 – Beyond MAKING-CITY business plan

2 The Beyond MAKING-CITY offer

2.1 Mission - vision - strategy

In strategic development, the highest level of abstraction to define a project is the description of the Mission – Strategy – Vision. In collaborative projects, like MAKING-CITY, it is very important to define these three aspects, to be sure that all partners are aligned and are working towards the same goal.

This description is fully detailed in the report *D6.11 Beyond MAKING-CITY Business plan* [1]. We will only present a summary here in order to contextualize this report.

Mission: to stimulate the uptake of PED

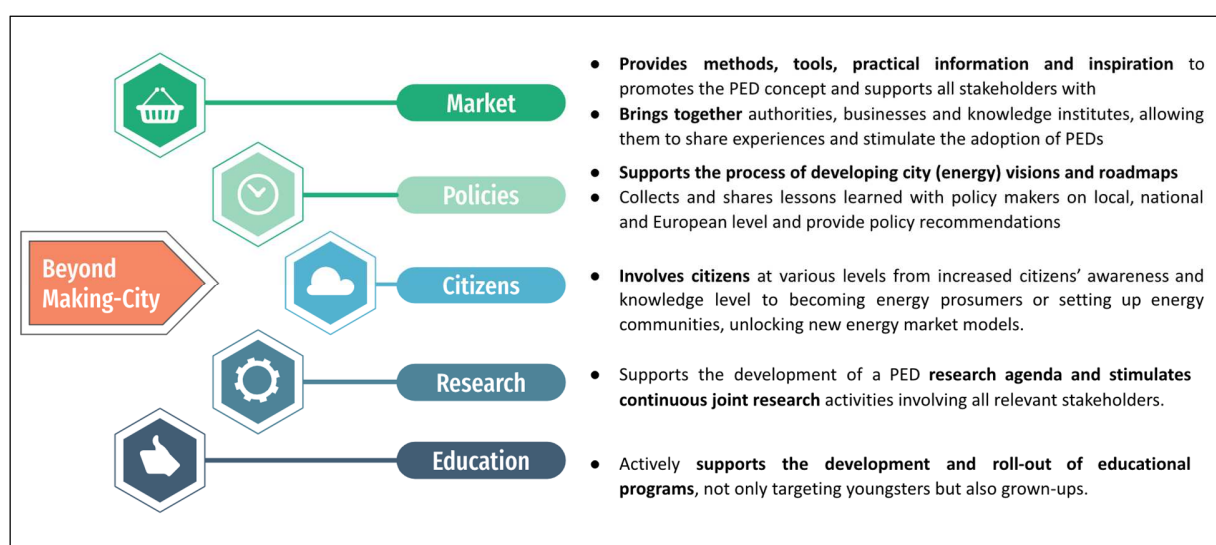


Figure 2 – Beyond MAKING-CITY mission

Strategy: We do this by:

- Promoting the adoption of the PED concept and long-term energy planning strategies
- Supporting the implementation and replication of PEDs in our lighthouse and follower cities

Vision: The definition of the goals and objectives has not been finalised, below is the list of proposed goals for Beyond MAKING-CITY.

- Goal 1: Increase awareness of the PED concept
 - Objective: Engage with 25 new cities per year during the first two years after the end of the project. The cities targeted in priority will be those which obtain a high score at level 1 of the PED readiness tool as will be explained later in this report.
 - Objective: Attract 250 users of the PED-readiness tool per year. A user could be define as follows: all people (outside or within a municipality) who complete level 2 of the PED readiness tool (which answers all the questions to obtain their assessment).
- Goal 2: Increase the number of PEDs
 - Objective: Start 10 new PED projects in the lighthouse and follower cities per year
 - Objective: Start 2 new PED projects in other cities per year

□ Goal 3: Improve long-term energy plans of cities

- Objective: Train 150 urban planners per year on long-term energy planning.

2.2 MAKING-CITY exploitable results

The offer linked to the Beyond MAKING-CITY ambitions is made up of exploitable results (ERs) of the project. Those ERs are still under development. For more details the report D6.10 - *MAKING-CITY exploitation plan and operations* [2] can be consulted. A quick summary of the key points is provided:

ERs have been positioned on a customer journey which consists of four phases: awareness, interest, decision, and action. MAKING-CITY has developed, or is developing, the tools and instruments that support cities in each of these four phases, as shown in Figure 3. It is the task of the MAKING-CITY ecosystem to create a coherent set of solutions that meet the needs of cities interested in adopting the PED concept from the individual ERs created by the MAKING-CITY project.

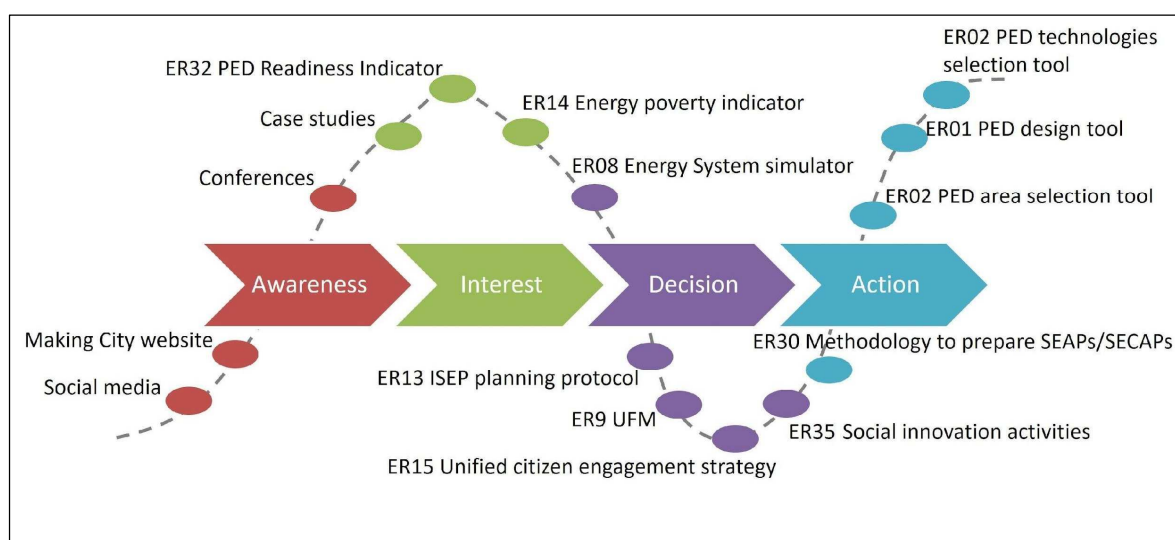


Figure 3 - Mapping of MAKING-CITY ERs on the first steps of a city's customer journey

35 exploitable results have been collected. 75% of the project's ERs are still under development – which is in line with expectations at this stage of the project, as the project will still run for two years.

Figure 4 helps understanding exactly what the Beyond Making city outputs are: half of the project's ERs are processes. The other half is mainly formed by products and consulting services.

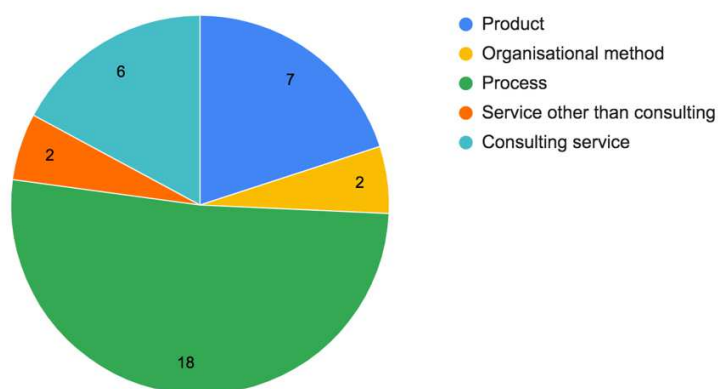


Figure 4 - Types of innovations in MAKING-CITY [INNOVATION RADAR]

Figure 5 shows all Exploitable Results as sticky notes on a board structured according to the categories identified in MAKING-CITY.

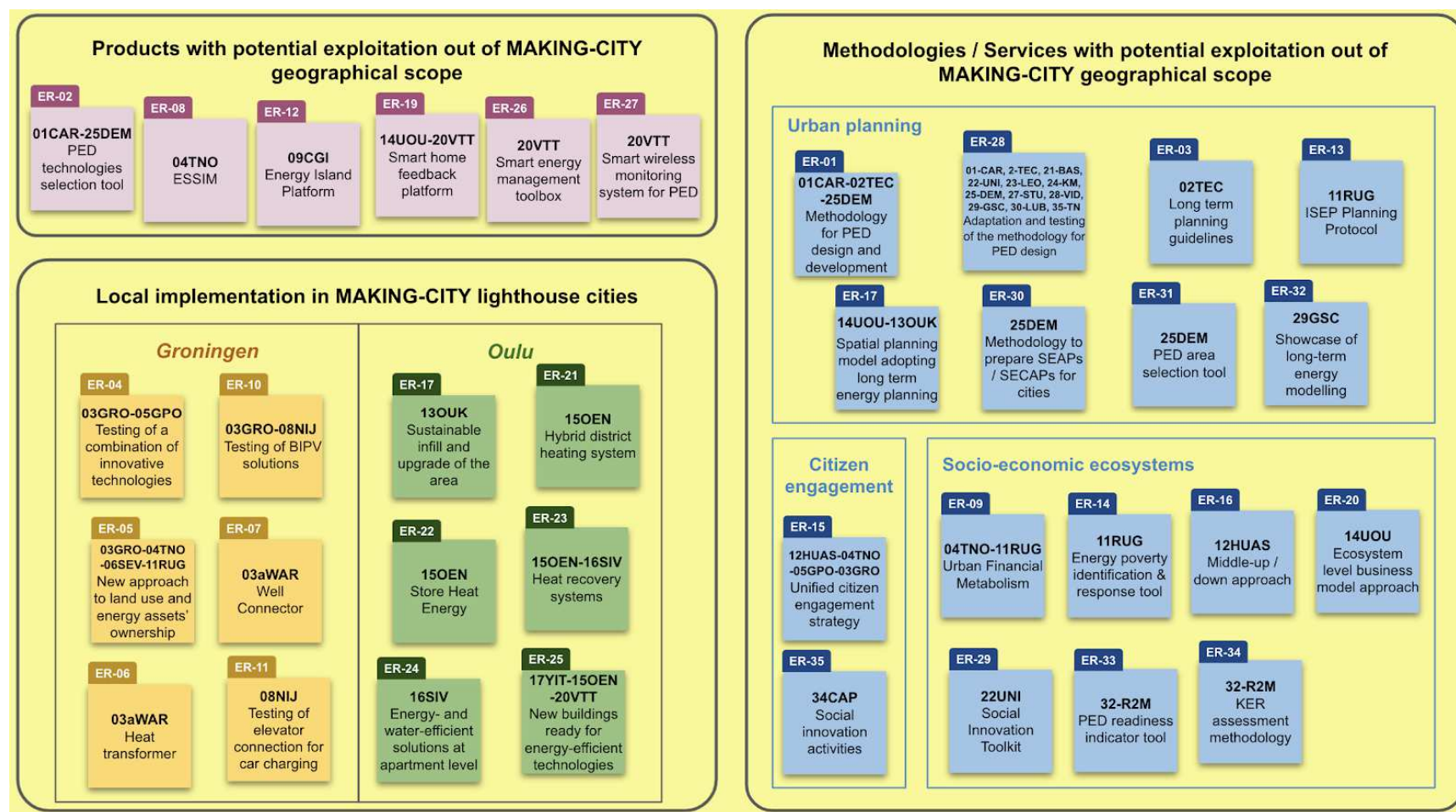


Figure 5 - Overview of MAKINCITY's Exploitable Results

3 Beyond MAKING-CITY market analysis

For this market study, we will consider **municipalities** as the end customers of the Beyond MAKING-CITY offer. Multiple actors are involved in the PED methodology and could benefit from the Beyond MAKING-CITY services, however municipalities remain the main prescribers and therefore serve as a baseline for estimating the market size.

The purpose of these market study is to provide first orientation for the early exploitation of Beyond MAKING-CITY offer that will occur in the second half of the project.

3.1 PESTEL analysis

Innovative city projects are developed in a complex legal-political matrix and must cover a range of policy instruments to be efficient to overcome market failures, produce democratic consensus, strengthen economic growth, and move towards sustainable objectives. This chapter is trending and mapping legal, political, planning, acceptance, financial conditions using the PESTEL framework.

PESTEL analysis is a tool that helps identify external macro forces that can influence the development prospect of a new service. The acronym PESTEL (Figure 6) refers to the factors analysed: political, economic, social, technological, environmental, and legal.



Figure 6 – PESTEL Analysis

The PESTEL analysis in this report only considers external factors at the **European scale** that will have an impact on the Beyond MAKING-CITY services.

Political

Global UN concern: In September 2015, UN Member States adopted the 2030 Agenda for Sustainable Development, broken down into 17 Sustainable Development Goals (SDGs). Among these 17 SDGs is Goal 11 “Sustainable Cities and Communities” [3].

From the thematic approach to the geographical approach: The European has changed how it structures its work, based on geography rather than issues. The hope is that this will lead to more integrated projects and programmes, with closer partnerships between stakeholders in particular countries as well as with the EU. “We need to give local and regional authorities the strongest possible say,” said Martin

Seychell, Deputy Director-General of the European Commission's Directorate-General for International Partnerships [4].

PED program: the EU launched the “Positive Energy Districts and Neighborhoods for Sustainable Urban Development” program in the framework of the Strategic Energy Technology (SET) Plan Action 3.2 “Smart Cities and Communities” in 2018. The program aims to support the planning, deployment, and replication of 100 Positive Energy Districts (PED) by 2025 for sustainable urbanization.

Environmental

Cities at the heart of the problem and the solution: Currently, urban areas occupy only 3% of the earth's surface, but they emit nearly 72% of greenhouse gases. By 2050, almost 80% of the world's population will live in an urban area. Cities are ideally placed to promote the reduction of energy consumption and CO₂ emissions, but urban sprawl and congestion due to commuting is increasing in many of our cities. Cities generate huge amounts of waste and pollution and are rapidly encroaching into natural habitats. Urban sprawl is leading to poor living conditions, making cities highly vulnerable to climate change, and threatening the biodiversity surrounding cities.

Social

Energy consumption for domestic uses is increasing: Despite increasing energy efficiency, carbon emissions also grow with economic wealth as shown in Figure 7 (source TU Wien). Indeed, energy consumption for domestic use is increasing sharply, in particular due to the large increase in internet use.

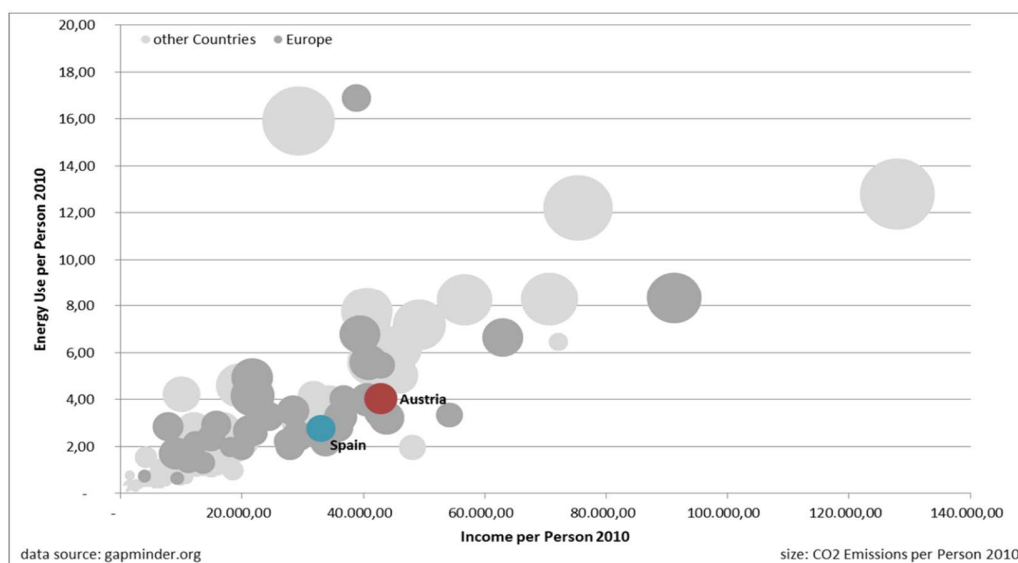


Figure 7 – Strong relation between the economy, wealth and individual energy consumption basic understanding of ‘development’ since industrialization

As the urban population has increased, so has the pressure on land. Our present economies cannot provide jobs for all, and social problems associated with unemployment accumulate in cities. In even the richest of our cities, spatial segregation is a growing problem

Where people fit in sustainable cities: According to Saffron Woodcraft, Director of Social Life, the social dimensions of sustainability are largely ignored in debates, policies, and practices around sustainable urbanism. Environmental issues dominate thinking and ecological and technological solutions dominate

practice. Much effort, thinking and investment is focused on reducing energy consumption, developing sustainable transport and renewable energies, greening buildings, using smart grids, networks and data to manage energy use on a city-wide basis. Citizen engagement can be a good start but sometimes it is only used as a social washing tool to support tech-centric projects. In particular, the themes of homelessness, joblessness and gentrification should be better considered. According to the Nordic corporate bank SEB [5], there is a strong correlation between high ratings on social sustainability and ecological sustainability, possibly because social exclusion generates resistance towards changes, so to sustain a green transition, cities have to be inclusive enough that each citizen takes ownership of the common space.

Economic

European global support for cities: The European Commission announced at the *Cities and Regions for International Partnerships forum* in December 2021 that it has funding of €500 million that it can allocate directly to regions and cities between 2021 and 2027. It will also try to raise €300 billion in public and private funds by 2027 to finance infrastructure projects abroad, including projects and programmes to support a green and sustainable recovery from the pandemic.

Virtuous circle: Donal Cannon of the European Investment Bank (EIB) declares at *the Cities and Regions for International Partnerships forum* in December 2021 that there is now significant potential to develop a “virtuous circle” for sustainable urban infrastructure and environmental goals. Indeed, a recent €1.5 billion bond issue by the EIB to support biodiversity had been 15 times over-subscribed. Thanks to this strong enthusiasm for this investment fund cities can do no better than to focus on the Sustainable Development Goals.

Sustainable procurement: At city level, one of the main instruments with an impact on financial aspects is sustainable public procurement, which integrates social and environmental considerations into procurement policy. Many cities are already using public procurement to shape more sustainable and inclusive markets.

Smart cities market: According to the Global view research market study [6], the global smart cities market size is expected to reach USD 676.01 billion by 2028. The demand for smart cities is anticipated to increase primarily due to factors such as rising urban population, growing necessity to efficiently manage limited natural resources, and environmental sustainability. The aging infrastructure, rapid urbanization, and adoption of the latest technology, coupled with the demand for improved quality of life, are driving the market growth.

Financing sustainability: According to Alanus von Radecki from Fraunhofer Morgenstadt Initiative, the key challenge that we are trying to overcome is that the public sector alone doesn't have enough resources to finance the transition towards climate-neutral cities. One of the concluding remarks of the Smart City Business Event workshop state that cities need to move beyond the existing model of doing everything on their own [7]. Partnerships with private investors can bring in new funding but also expertise in several areas that can support city capacity. Different cities have different levels of competency on these issues.

Technological

ICT development: The rise of ICT tools has favored the emergence of the concept of *Smart City* in which the strategic use of digital must lead to an optimization of planning and urban management, with the aim of increasing the quality of urban services or even reducing their costs, and ultimately of promoting the emergence of sustainable cities. Indeed, in 2007, Rudolf Giffinger [8], an expert in analytical research on

urban and regional development at the Vienna University of Technology, set out six criteria to define the Smart City: Smart Economy, Smart Governance, Smart Mobility, Smart Environment, Smart Living, Smart People. A big effort still to be done to integrate and harmonize all those ICT tools (collect, compute, communicate...)

Artificial Intelligence: The PED concept requires a very good knowledge of the energy consumption and production. It is possible to automatize the inventory of its infrastructures and better understand its flows thanks to AI.

Low-tech cities: The energy consumption of smart cities worries some specialists and encourages them to take an interest in the Low-tech city concept. Low tech is often defined in opposition to high tech: an alternative based on so-called “lower intensity” technologies. More broadly the low-tech cities include digital frugality, sustainability, circular economy, urban agriculture, collaboration, resilience...

However, according to Jean-Philippe Lens a bioengineer in land use planning, the low-tech city concept doesn't work well with a high population density [9]. Beyond human infrastructure, it also requires a large surface area dedicated to natural facilities which play a role in regulating our resources and waste. If the smart city is necessary to support the galloping densification of our cities, it must not take up all the space either, at the risk of generating soulless cities and relegating low tech pros outside its borders, in ZADs or rural areas. To avoid such a divide, so that each city is inclusive, original and surprising, we must know how to take advantage of the best of what these two visions have to offer us. Combine the two forms of intelligence, artificial and human, without one serving the other. This is the key to a desirable city, both human and organized, both lively and rational, both resilient and facilitating.

2 Legal

The European Union does not have a direct policy competence in urban and territorial development, but the last two decades have witnessed an increasing importance of the European level in both urban and territorial development.

EPBD directive: A major steppingstone in this direction of PED was the revision of the Energy Performance of Buildings Directive (EPBD) aiming at transforming Europe's building stock to be “highly energy efficient and decarbonised [...] by 2050, facilitating the cost-effective transformation of existing buildings into nearly zero-energy buildings. The purpose of the EPBD is mainly to provide a common basis for calculating the energy performance of buildings and to establish minimum requirements for the energy performance of new and existing buildings. It is furthermore specified that after 2020 all new buildings must be nearly zero energy buildings (nZEB).

Needs to adapt regulatory framework: Among others the following aspects need to be covered by future national/local legal and regulatory frameworks to safely enable mass deployment of IoT: Citizens' personal data protection; Cyber Security, democratically controlled IoT... mass deployment of renewable energy: energy flexibility and demand side flexibility [10]: aggregation framework, system requirements, active management of the distribution... Many existing reports detail all these aspects, we can cite for example the Pocityf project report Building & Grid Retrofit Regulatory Framework [11].

PED regulation in the broader context: Bellantuono Giuseppe professor at the university Degli Studi di Trento held an efficient workshop on Comparing Regulatory Frameworks for Positive Energy Districts in 2020 [12]. Below are the key findings:

When implementing PEDs, attention must be paid to the interactions between the local institutional level and the national, EU and international levels.



Renewable Energy Communities and Citizen Energy Communities are likely to become the main legal form for PEDs.

PEDs could represent an ideal context to implement local energy and flexibility markets, but attention must be paid to the impact these local markets could have on the people living in the PED. For example, P2P energy trading should be carefully designed to ensure that individual interests do not take over community interests.

EU rules promoting the improvement of the energy performance of buildings and electromobility can be extended to PED projects, provided that national implementation rules consider the district perspective.

Energy justice concepts should be applied to PEDs. The provisions requiring the inclusion of low-income and vulnerable consumers in the Renewable Energy Communities, as well as the national energy poverty plans, should be exploited to ensure that PEDs become one of the main tools to manage the distributive impact of the low-carbon transition.

3.2 Analysis of potential demand for PED

In marketing terms, the potential demand is defined as all the players (buyers / applicants) likely to acquire or use one of the products or services from Beyond MAKING-CITY ERs.

To fully understand this notion of potential demand, Figure 8 represents the scope of theoretical demand compared to other components of the market:

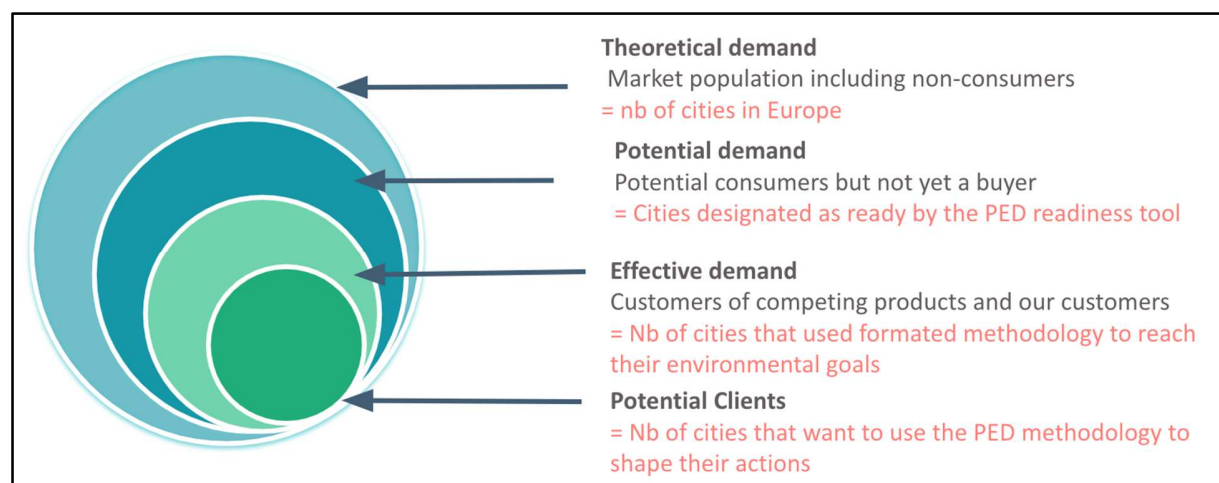


Figure 8 – The different components of a market

To be able to identify the potential volume of this demand, we will study the needs expressed by municipalities in terms of sustainable urban development, then we will classify cities according to their intrinsic characteristics via a methodology developed within the framework of Beyond MAKING-CITY, the PED-readiness indicator tool [13].

Perceived needs from cities

Based on a literature review, the current trends in terms of cities' sustainable needs are gathered below:

□ Important role attributed to cities in terms of climate change mitigation

Cities have an important role to play in reducing CO₂ emissions and fighting climate change. Buildings are the most energy-intensive sector in the EU and offer the most profitable economic leverage. Cities can

mitigate climate change by reducing energy consumption during the construction, maintenance, and renovation phases of buildings, with the rationalization of energy production and energy flexibility, but also by providing a framework for life promoting the energy sobriety of its inhabitants.

Increasing demographic pressure on cities

According to the United Nations, by 2050, 68% of the world's population is projected to be urban [14]. For the leaders who govern cities, the challenges are tough and will grow bigger:

developing countries must cope with urbanization on an unprecedented scale

developed countries will wrestle with aging infrastructure and stretched budgets.

All those cities are fighting to secure or maintain their competitiveness and hence the livelihoods of residents while ensuring the quality of life and environmental legacy. Cities are the future. They're where people live and work and hubs for growth and innovation. But they're also poles of poverty and, much too often, centres of unemployment [15].

Growing competition between cities

Many international city rankings now exist and create an atmosphere of competition between cities. The comparison of cities can support investors in their choice of location, and it can also be an important guide for future city development. According to the *Rankings and networks – global cooperation and competition* paper, city rankings increasingly attract public attention, supported by the media, and serve as “flagship” for city marketing.

Indeed, cities face increasing competition for economic activities due to significant economic and technological changes over the past decades. This has a direct impact on urbanization, cities try to improve their environment and the services provided by the city. This trend reinforces the importance of specific local characteristics, which provide competitive comparative advantages for increasingly mobile and mobile global companies, investors, tourists and capital. [15]

Need to score high in the sustainable ranking systems

According to *The Lisbon ranking for smart sustainable cities in Europe* studies [16]: the demand for city rankings and assessment studies that address sustainability issues have increased over the past decade because cities are now seen as a leverage point in the quest for global sustainability due to the agglomeration of population in them (Grant & Chuang, 2012). City rankings help policy makers to understand how globalization and urbanization affect our urban spaces (Grant & Chuang, 2012). It is an important tool to help cities understand how they performed in the different dimensions of urban sustainability compared to other cities within the same region and identify areas for improvement. In the past, multiple city rankings have been developed to benchmark European cities. These include the European Smart Cities ranking, the European Green Capital Award, the European Green City Index [17], the European Green Leaf Award, European Soot-free City Ranking, Europe Quality of Life Index and Urban Ecosystem Europe. Although these studies have contributed to the developing discourse on sustainable strategies of cities within the European Union, they are still plagued by some methodological gaps.

Market potential: Target markets

To identify the target cities, the PED-readiness indicator tool was developed within MAKING-CITY [13]. The PED-readiness indicator tool helps European cities who want to **evaluate their readiness** to implement a PED project and get advice by providing an easy and fast multi-criteria analysis of their energy business ecosystem and giving business models advice based on a consistent methodology and benchmark.

The main objective of the PED-readiness indicator tool is to size the readiness of cities to launch a PED project. As such, it can be seen as the “Phase 0” of the PED design methodology [18] (see Figure 9).

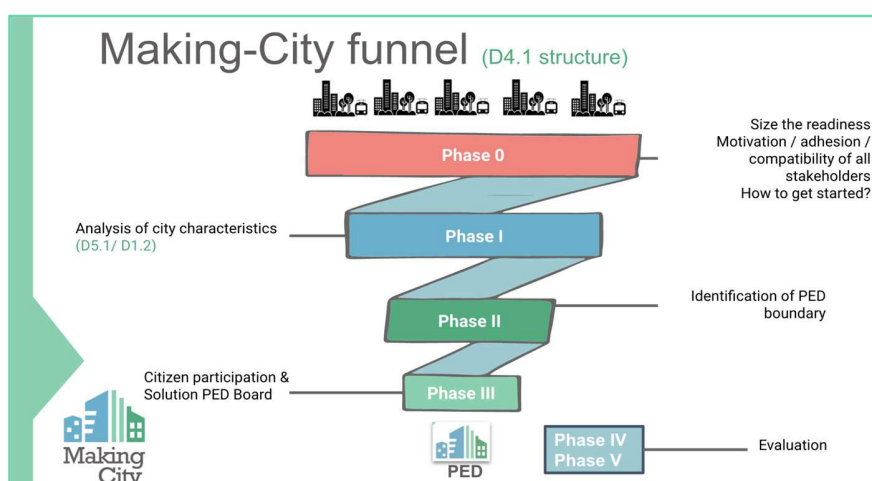


Figure 9 - Positioning the PED-Readiness tool in the MAKING-CITY methodology landscape

The PED-readiness indicator tool is structured around a 3 level-funnel, allowing to progressively identify the cities which are the readiest for the PED concept:

Level 1 consists in a pre-evaluation of cities characteristics based on country- and city-specific indicators that can be calculated thanks to information publicly available on the web. This pre-evaluation can be conducted for every European city. The result is a single score (calculated out of 10) expressing the level of maturity of the city for PED (see below).

For the cities preselected by level 1 (reaching a score higher than 5 / 10), **level 2** consists in the assessment of cities against key success factors for PED, based on two dimensions: the city’s energy approach and the city’s team dynamics. This assessment can be conducted thanks to a questionnaire to be filled in by a city representative. The result is the identification of the city profile among nine possible profiles. Cities with a high-performing profile can be considered as PED-ready and have the potential to undertake the PED design methodology.

For the cities having a low-performing profile according to level 2, **level 3** consists in tailored workshops to raise awareness upon one of the following key success factors, depending on the city’s needs: Team motivation, Business ecosystem, Stakeholders’ engagement, Energy mapping.

The level 1 of the PED-readiness indicator tool analyses key factors that correspond to a stimulating environment for launching PED projects. These factors are:

At country level:

- ❑ CO-1. Level of competition in energy markets
- ❑ CO-2. Effectiveness of RES support schemes
- ❑ CO-3. Existence of a national building renovation strategy
- ❑ CO-4. Existence of a market for demand response
- ❑ CO-5. Level of development of energy performance contracting
- ❑ CO-6. GDP per capita

At city level:

- ❑ CI-1. Size of the city population
- ❑ CI-2. City's commitment with a sustainable energy action plan (SEAP)
- ❑ CI-3. Presence of a university or research centre active in the energy sector
- ❑ CI-4. Previous participation in SCC projects Innovation

The level 1 of the PED-readiness indicator tool combines these factors in order to calculate a score for each country and for each individual city, and finally, a single score combining both (out of 10: 0 (not ready at all) and 10 (fully ready)). Such score has been calculated for 6,238 cities in Europe (exact geographical coverage: EU-27, Turkey, Norway and UK). The threshold for preselection by the PED-readiness indicator tool is set at 5 out of 10.

Table 1 shows the number of cities in each country that are preselected by the PED-readiness indicator tool. All countries are represented except Luxembourg, Lithuania and Malta.

In total, according to the tool, 201 cities, out of 6,238 considered, are preselected (corresponding to 3% of all cities considered). These cities represent the potential demand (target market) for PEDs.

Table 2 presents those 201 preselected cities, presented by country, together with their score. Country scores are also indicated. The 28 cities that score higher than 8 are highlighted. During exploitation activities, these cities will be contacted as a priority (excluding those which are already working on the PED concept, as a lighthouse or follower cities in one of MAKING-CITY's most recent sister projects).

It can be observed that countries that score the highest are Denmark, Germany and the Netherlands. Logically, several cities in these countries score also high. However, some countries with lower scores (for instance Finland, France, Italy, Spain) have numerous cities scoring high.

Table 1 - Number of PED-ready cities in Europe per country

Country	Country score	Cities	City level score												Total score (city & country)												201
		6,238	0	1	2	3	4	5	6	7	8	9	10	0	1	2	3	4	5	6	7	8	9	10	>5		
Germany	9	602	321	216	24		27	6		4	3		1			321	216	24	27	6	4	3	1		41		
Spain	5	400	63	121	109		82	11		6	5		3		63	121	109	82	11	6	5	3			25		
Netherlands	9	400	312	56	12		10	4		1	4		1			312	56	12	10	4	1	4	1		20		
Italy	3	146		18	24		89	7		6	2				18	24		89	7	6	2				15		
UK	7	400	97	273	5		14	6		1	1		3		97	273	5	14	6		1	1	3		11		
France	6	389	199	124	25		31	3		5	1		1		199	124	25	31	3	5	1	1			10		
Belgium	6	400	72	107	194		18	6		1	1		1		72	107	194	18	6	1	1		1		9		
Finland	6	208	186	8	2		3	3		3	2		1		186	8	2	3	3	3	2		1		9		
Denmark	9	22	2	6	6		6	1					1			2	6	6	6	1			1		8		
Sweden	7	271	216	25	18		6	3		2			1		216	25	18	6		3	2		1		6		
Ireland	8	136	121	8	2		2				3				121	8		2	2			3			5		
Poland	3	400	256	110	18		11	1		3			1	256	110	18	11		1	3		1			5		
Turkey	4	253	88	144	12		4	1		2	1		1		88	144	12	4	1	2	1	1			5		
Bulgaria	1	136	85	28	13		5	1		3			1	85	28	13	5	1	3		1				4		
Czech Rep.	5	279	243	24	5		3	3		1					243	24	5	3	3	1					4		
Norway	6	92	76	8	3		1	1			3				76	8	3	1	1		3				4		
Greece	1	144	58	32	22		26	3		3				58	32	22	26	3	3						3		
Portugal	2	400	280	38	67		10	2		1	2			280	38	67	10	2	1	2					3		
Austria	7	191	166	15	8			1					1		166	15	8			1			1		2		
Croatia	1	81	46	7	20		6			1			1	46	7	20	6		1		1				2		
Estonia	4	25	15	4	3		1	1		1				15		4	3	1	1	1					2		
Hungary	2	281	227	29	15		8			1	1			227	29	15	8		1	1					2		
Romania	2	400	298	40	29		28	3		2				298	40	29	28	3	2						2		
Cyprus	3	22	13	2	4		2	1						13	2	4	2		1						1		

Latvia	1	83	61	6	13		2					1	61	6	13	2				1				1
Slovakia	2	110	89	11	6		3					1	89	11	6	3					1			1
Slovenia	4	213	162	26	23		1	1					162		26	23	1	1						1
Lithuania	2	71	47	9	12		1	2					47	9	12	1	2							0
Luxembourg	5	17	15	1	1									15	1	1								0
Malta	1	66	40	12	14								40	12	14									0

Table 2 - Detailed list of cities preselected by the level 1 of the PED-readiness indicator tool

City	TOTAL	City	TOTAL	City	TOTAL	City	TOTAL
Austria (score 7,1)		Germany (score 8,8)		Italy (score: 3,3)		Spain (score: 5,4)	
Vienna	9,27	Dresden	9,69	Bari	7,26	Barcelona	8,85
Graz	6,06	Hamburg	8,62	Trento	7,26	Valencia	8,85
Belgium (score 6,3)		Stuttgart		Milan		Zaragoza	
Brussels	9,06	Essen	8,62	Palermo	6,19	Sevilla	7,78
Essen	7,99	Berlin	7,54	Parma	6,19	Bilbao	7,78
Seraing	6,92	Leipzig	7,54	Cesena	6,19	Valladolid	7,78
Gent	5,85	Hannover	7,54	Lecce	6,19	Pamplona	7,78
Namur	5,85	Aachen	7,54	Bassano del	6,19	San Sebastian	7,78
Leuven	5,85	Munich	6,47	Genoa	5,12	Madrid	6,71
Mons	5,85	Cologne	6,47	Bologna	5,12	Vitoria-Gasteiz	6,71
Hasselt	5,85	Bremen	6,47	Florence	5,12	Granada	6,71
Genk	5,85	Dortmund	6,47	Catania	5,12	Santa Cruz de	6,71
Bulgaria (score: 0,8)		Duisburg		Modena		Sabadell	
Sofia	7,71	Karlsruhe	6,47	Latina	5,12	Palencia	6,71
Burgas	5,57	Bielefeld	5,40	Pisa	5,12	Malaga	5,64
Gabrovo	5,57	Bonn	5,40	Latvia (score: 1,3)		Murcia	5,64
Asenovgrad	5,57	Mannheim	5,40	Riga	7,81	Palma	5,64
Croatia (score: 0,8)		Halle		Netherlands (score: 8,8)		Latina	5,64
Zagreb	7,71	Oberhausen	5,40	Amsterdam	9,69	Mostoles	5,64
Riieka	5,57	Rostock	5,40	Rotterdam	8,62	Santander	5,64
Cyprus (score: 2,9)		Hagen		Utrecht		Tarragona	
Nicosia	5,01	Mainz	5,40	Eindhoven	8,62	Leon	5,64
Czech Rep. (score: 5,4)		Heidelberg		Groningen		Telde	
Brno	6,71	Herne	5,40	Alkmaar	7,54	Girona	5,64
Prague	5,64	Pforzheim	5,40	The Hague	6,47	Santiago de	5,64
Ostrava	5,64	Wolfsburg	5,40	Delft	6,47	Sweden (score: 7,1)	
Litomerice	5,64	Bottrop	5,40	Helmond	6,47	Stockholm	9,27
Denmark (score: 9,2)		Erlangen		Hasselt		Lund	7,13
Copenhagen	9,79	Kaiserslautern	5,40	Tilburg	5,40	Umea	7,13
Aalborg	6,58	Hanau	5,40	Breda	5,40	Goeteborg	6,06
Aarhus	5,51	Ludwigsburg	5,40	Nijmegen	5,40	Eskilstuna	6,06
Odense	5,51	Worms	5,40	Enschede	5,40	Lulea	6,06
Kolding	5,51	Rheine	5,40	Haarlem	5,40	Turkey (score: 4,2)	
Horsens	5,51	Bocholt	5,40	s-Hertogenbosch	5,40	Kadikoy	8,54
Roskilde	5,51	Dormagen	5,40	Zoetermeer	5,40	Antalya	7,47
Naestved	5,51	Herten	5,40	Heerlen	5,40	Izmir	6,40
Estonia (score: 3,8)		Friedrichshafen		Heerhugowaard		Gaziantep	
Tartu	6,29	Greifswald	5,40	Zwiindrecht	5,40	Bursa	5,33
Tallinn	5,22	Willich	5,40	Norway (score: 5,8)		United Kingdom (score: 6,7)	
Finland (score: 6,3)		Frankenthal		Oslo	7,89	London	9,17
Helsinki	9,06	Melle	5,40	Trondheim	7,89	Nottingham	9,17
Espoo	7,99	Greece (score: 1,3)		Stavanger	7,89	Glasgow	9,17
Oulu	7,99	Ioannina	5,67	Bergen	5,74	Bristol	8,10
Tampere	6,92	Kifissia	5,67	Poland (score: 2,9)		Manchester	7,02
Turku	6,92	Kozani	5,67	Warsaw	8,23	Birmingham	5,95
Vaasa	6,92	Hungary (score: 2,1)		Krakow	6,09	Liverpool	5,95
Lahti	5,85	Budapest	6,95	Gdansk	6,09	Leicester	5,95
Jyvaeskylae	5,85	Miskolc	5,88	Bydgoszcz	6,09	Edinburgh	5,95
Lappeenranta	5,85	Ireland (score: 7,5)		Wroclaw	6,09	Leeds	5,95
France (score: 5,8)		Dublin	8,30	Portugal (score: 2,1)		Cardiff	5,95
Lyon	8,96	Cork	8,30	Porto	6,95		
Grenoble	7,89	Limerick	8,30	Evora	6,95		
Paris	6,82	Waterford	5,09	Lisbon	5,88		
Nice	6,82	Derry	5,09	Romania (score: 1,7)			
Nantes	6,82			Botosani	5,77		
Bordeaux	6,82			Alba Iulia	5,77		
Dijon	6,82			Slovakia (score: 2,1)			
Toulouse	5,74			Bratislava	8,02		
Strasbourg	5,74			Slovenia (score: 3,8)			
La Rochelle	5,74			Liubliana	5,22		

3.3 Analysis of existing offers

There are many concepts aimed at supporting municipalities wishing to reduce or minimize carbon emissions or the energy consumption of a set of buildings. In this part we will analyse and compare the main ones thanks to the literature review.

Popularity of the PED terminology

In the scientific literature, many different terms are used to name strategies aimed at reducing energy consumption or GHG emissions in neighbourhoods. In September 2021, a team of Norwegian researchers wrote a paper presenting a systematic review of scientific publications on zero emission neighbourhoods [19]. They categorised and analysed 144 papers according to their concept terminology, topic, location, used methodology, publication type, year, citations, and keywords. Thanks to this work we can know the level of notoriety of the PED concept for municipalities that want to reduce their energy consumption.

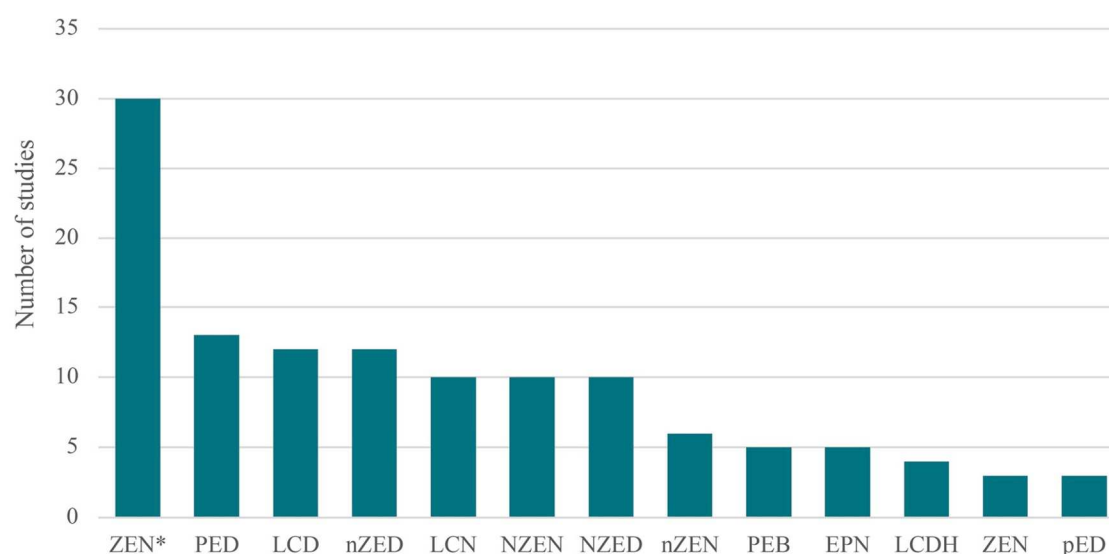


Figure 10 - Frequency of appearance of terms designating Climate Friendly Neighbourhood in reports

Table 3 - Terminology of Climate Friendly Neighbourhood used in at least three studies

Abbreviation	Full name	Abbreviation	Full name
ZEN	<i>Zero Emission Neighbourhood</i>	nZEN	<i>Nearly Zero Energy Neighbourhood</i>
PED	<i>Positive Energy District</i>	PEB	<i>Positive Energy Block</i>
LCD	<i>Low Carbon District</i>	EPN	<i>Energy Positive Neighbourhood</i>
nZED	<i>Nearly Zero Energy District</i>	LCDH	<i>Low Carbon District Heating</i>
LCN	<i>Low Carbon Neighbourhood</i>	ZEN	<i>Zero Energy Neighbourhood</i>
NZEN	<i>Net Zero Energy Neighbourhood</i>	pED	<i>Plus Energy District</i>
NZED	<i>Net Zero Energy District</i>		

Benchmark of Sustainable development initiatives

The objective here is to position the PED methodology, thanks to a benchmark analysis, in a general environment of competing initiatives which offer another sustainable development approach. This will allow better understand the different choices available to cities when they seek to be supported in their sustainable development.

Methodology

A descriptive qualitative analysis of the most relevant tools and services that are used to support cities in their sustainable development was conducted to understand their strengths and weaknesses. The information was gathered from desktop research (project descriptions and existing compilations and reports). The selection of tools and services considered in the analysis was based on the following key criteria:

- ☐ Currently active
- ☐ Provides robust tools or services
- ☐ Developed by well-known actors
- ☐ Representative of a tool or service in the category considered

The analysis was conducted by benchmarking the existing tools, methodologies and their services based on several performance parameters.

The benchmarking process involved three steps as shown in Figure 11. In the first step, the comparable aspects are identified for all tools and services. In the second step, performance metrics responsible for identifying performance gaps are identified. The third step integrates the result of the benchmarking exercise.

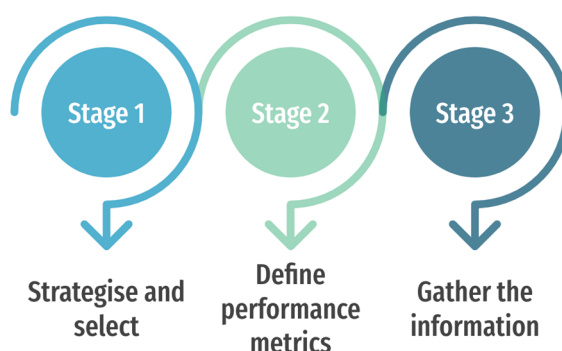


Figure 11 - The 3 stages of the benchmark methodology

The comparable aspects and the performance metrics are described below:

- ☐ **Name:** usual name of the initiative
- ☐ **Description:** brief description of the initiative
- ☐ **Type:** Type of action developed or carried out in this initiative: *Methodology / Consulting services / Software development*
- ☐ **Type of actions:** Type of urban planning action taken into consideration in the initiatives: *Urban Monitoring / Planning activities / Stakeholder engagement*
- ☐ **Origin:** Legal form of the body that developed this initiative: *Public / Private / Public-private*
- ☐ **Focus:** On which technical aspects of the sustainable development the initiative is focusing on: *Energy focus / Multi-benefit / Carbon*
- ☐ **Energy level:** Level of exigence regarding the energy criteria: *Positive / Neutral / Efficient*

- ❓ **Stage of development:** Estimated stage of development of the initiative: *Testing phase / Mature / In decline*
- ❓ **Identified barriers:** When it has been possible to collect information, we have indicated here identified barriers


At this stage of the project, it was decided not to spend too much time going into other aspects that could be interesting such as: the selling price of these services, their level of development by country, the detailed technical content (KPIs)... This work can be carried out as part of the development of the business model and the final version of D6.9 *Beyond MAKING-CITY business plan* (m60).

Description of the Sustainable development initiatives








Eleven initiatives were selected, in a first stage according to their status of activity (active/stopped) and the quantity of this activity; in a second step the selection was made by selecting the initiatives which are the most representative of the ecosystem. No sister project has been selected to be part of this benchmark because they are very similar to MAKING-CITY, but in a future report dealing with the exploitation of Beyond MAKING-CITY a detailed analysis could be carried out if considered necessary.

Agenda 21	
Description	It is a sustainable development project for a territory, a general approach initiated by a local authority, carried out with the population and local actors, with the collective ambition to make sustainable development the new model of regional development. Agenda 21 is both a shared diagnosis, a strategy based on clearly identified issues and a multi-year action plan.
Type	Methodology / Consulting service
Type of actions	Monitoring / Planning activities
Origin	Public The Agenda 21 program of actions was voted by 120 heads of state at the Earth Summit in Rio de Janeiro in June 1992.
Focus	Multi-benefit
Energy level	Energy efficiency Other: climate neutral
Stage of development	Mature (in decline?)
Identified barriers	n/a


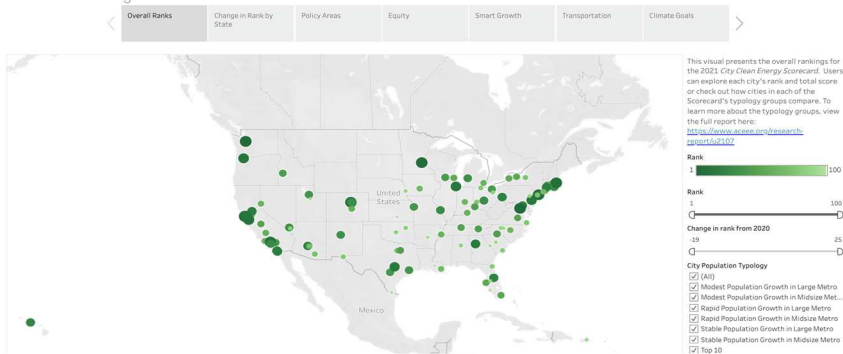
Agenda 2030	
Description	This universal action program is made up of 17 sustainable development goals (SDGs), broken down into 169 targets. The 2030 Agenda provides a frame of reference for territories wishing to initiate the transition to more sustainable practices. It offers a common language to foster partnerships.


	
Type	Methodology / Consulting service
Type of actions	Monitoring / Planning activities
Origin	Public In 2015, UN member states adopted the 2030 Agenda to address common challenges around the three dimensions of sustainable development.
Focus	Multi-benefit
Energy level	Energy efficiency Other: climate neutral
Stage of development	n/a
Identified barriers	n/a

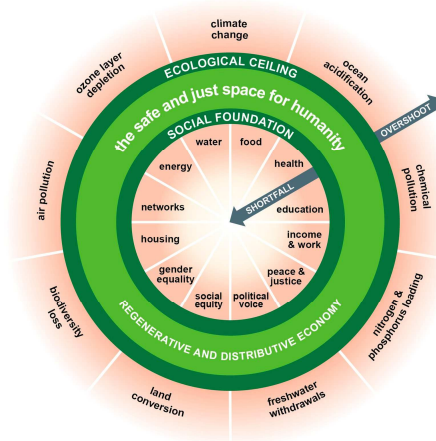
Other public initiatives exist: SECAP, ISO 37101... and will not be included in this report. The philosophy is the same: to provide municipalities with tools and best practices to support them in their more sustainable development.

Carbonn Center		carbonn-center.org
Description	Unified process for subnational climate action reporting. From 2019, local and regional worldwide municipalities will for the first-time report climate action data through one unified reporting system. They will give their permission to both CDP and ICLEI to use their publicly reported data and will receive in return the support of both organisations.	
Type	Methodology - And a platform for public reporting	
Type of actions	Monitoring	
Origin	Private - NGO CDP and ICLEI are partnering to present one unified process for subnational climate action reporting.	
Focus	Others (Carbon) - Energy efficiency	
Energy level	Carbon free	
Stage of development	<div><div><p>million</p><p>833</p><p>9% of the world population represented</p></div><div><p>1153</p><p>Number of entities registered to the cCR</p></div><div><p>91</p><p>Countries</p></div><div><p>1976</p><p>Climate Targets</p></div><div><p>7128</p><p>Mitigation and Adaptation actions</p></div><div><p>5.6</p><p>Committed GHG emission reductions by 2020</p></div><div><p>26.8</p><p>Committed GHG emission reductions by 2050</p></div></div>	









	9% of the population represented - Low to medium notoriety
Identified barriers	n/a

ACEEE Scorecard	
	
Description	Assigns grades to cities based on the extent of coverage of policy areas in local government operations, buildings, energy and water utilities, transportation, and community-wide measures.
Type	Methodology
Type of actions	Monitoring / US national roadmap
Origin	NGO
Focus	Energy Focus - multi-building / Others (Carbon..)
Energy level	Energy efficiency / Other: climate neutral
Stage of development	<p>Start in 2019 - Limited to the US</p> <p>City Scorecard 2021</p>  <p>Source: https://www.aceee.org/state-policy/scorecard</p>
Identified barriers	Not a tool to empower the municipalities but the state.


Doughnut economy	
	
Description	<p>Doughnut economy is a visual framework for sustainable development – shaped like a doughnut or lifebelt – combining the concept of planetary boundaries with the complementary concept of social boundaries. It is an economic model.</p> <p>Source: [20]</p>
Type	Methodology / Consulting service








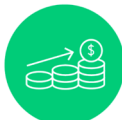

Type of actions	Monitoring / Planning activities / Stakeholder engagement Knowledge sharing / Network
Origin	NGO (methodology can be use by private company for profit)
Focus	Multi-benefit Others (Nature, Carbon..)
Energy level	Carbon free / climate neutral
Stage of development	<ul style="list-style-type: none"> 7655 members around the world logged into the DEAL Community Platform. It is a space for people worldwide to collaborate and learn how to turn Doughnut Economics from a radical idea into transformative action. The main cities that are following Amsterdam are, among others, Copenhagen, Brussels, Berlin, São Paulo or Kuala Lumpur, all using the doughnut model as an inspiration for their recovery plans. The concept, therefore, has a significant potential to shine in practice in the future and the COVID-19 crisis might become an unexpected opportunity for the transformation of today's world into one that is fairer, more sustainable and, in general, more prosperous [21].
Identified barriers	<ul style="list-style-type: none"> Does not include specific models related to markets or human behavior. Branko Milanovic, at CUNY's Stone Center on Socio-Economic Inequality, said that for the doughnut theory to become popular, people would have to "magically" become "indifferent to how well we do compared to others, and not really care about wealth and income" [22].

Urbact toolbox 	
Description	<p>Each tool in the Urbact toolbox is tailored to respond to 5 different stages of the public action-planning cycle, from the analysis of your challenge to the measurement of the impact achieved through the actions implemented. 2 cross-cutting sections also gather tools to engage stakeholders and share knowledge, throughout the action-planning process.</p> <p style="text-align: center;">ACTION PLANNING STAGES</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  ANALYSING PROBLEMS </div> <div style="text-align: center;">  PLANNING ACTIONS </div> <div style="text-align: center;">  RESOURCING </div> <div style="text-align: center;">  IMPLEMENTING </div> <div style="text-align: center;">  MEASURING RESULTS </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;">  ENGAGING STAKEHOLDERS </div> <div style="text-align: center;">  SHARING KNOWLEDGE </div> </div>
Type	Methodology
Type of actions	Stakeholder engagement
Origin	Public
Focus	Implement the policies - multi-benefit


Energy level	n/a
Stage of development	Urbact (20k followers on twitter)
Identified barriers	<ul style="list-style-type: none"> Municipalities have to empower themselves thanks to the toolbox








Energy cities	
	
Description	Energy Cities empowers cities and citizens to shape and transition to futureproof cities. They showcase concrete alternatives deployed by cities, they advocate to change political and economic governance at all levels and they foster a wide cultural change leading to a futureproofed society. Energy Cities' community is composed by local leaders of thousands of cities in 30 European countries.
Type	Knowledge sharing / Network
Type of actions	Monitoring / Planning activities / Stakeholder engagement
Origin	NGO
Focus	Multi-benefit
Energy level	Energy efficiency
Level of development	n/a
Identified barriers	n/a

City management private consulting (eg: BCG consulting group)	
Description	<p>Their expertise is based on an innovative, resident-centric approach that they have used to help city clients around the world. While residents remain at the core of their strategy and problem solving, their team is equipped to deliver a variety of solutions—such as planning for smart cities of the future—across governments, businesses, and institutions.</p> <p>BCG's Global Center for the Future of Cities is a platform that brings cutting-edge, multidisciplinary research to solve complex issues. They provide access to experts, tools, data, and insights gleaned from our extensive experience serving city clients across Asia, the Middle East, Europe, Africa, and the Americas.</p>

	 <p>Future city visioning</p>  <p>Smart city master planning</p>  <p>Resilient cities</p>  <p>Financing and commercialization</p>  <p>Mobility planning</p>  <p>Economic development</p>  <p>Infrastructure program management</p>
Type	Consulting service - Platform
Type of actions	Monitoring / Planning activities / Stakeholder engagement
Origin	Private
Focus	Multi-benefit / Energy focus - Single building / Energy Focus - multi-building / Others (Nature, Carbon..)
Energy level	Positive / zero emission / energy neutral/ Energy efficiency / Other: carbon free / climate neutral
Stage of development	High
Identified barriers	Expensive prices, not able to compare with other cities, no public data and methodology, no community of actors created

Others: Accenture, KPMG, EY, PwC, Mc Kinsey, Smart city consultants, Smart city consulting, City consulting, City gate associate...


City management public consulting - eg: Efficacity (FR)	
	
Description	<p>Efficacity is a research and development centre dedicated to urban energy transition, launched in 2014 with state support. It gathers over 100 researchers from backgrounds in industry, engineering and public research.</p> <p>Efficacity and its partners are developing a set of software to help design low-carbon neighbourhoods, intended for all city stakeholders: communities, planners, developers, engineers, energy companies and urban services in urban areas. project design phases. This set of tools makes it possible to optimize the energy and environmental performance of a new, renovation or mixed project.</p> <ul style="list-style-type: none"> ● Identifying sources of renewable and recoverable energy to evaluate their potential ● Identifying optimum energy strategies at district level ● Detailed dynamic simulation of various energy strategies at district level, including all energy vectors ● Optimising the scaling and management of a local energy network (smart grid) ● Multicriteria (energy & comfort) optimisation of a real estate project ● Evaluating a planning project's environmental impacts



Type	Methodology / Software / Consulting service
Type of actions	Monitoring / Planning activities / Stakeholder engagement
Origin	Public-Private
Focus	Multi-benefit - multi-building
Energy level	Energy efficiency Other: Low carbon
Stage of development	<p>7 high energy performance districts</p> <div>  <p>Energy sharing opportunity study for the Val-de-Fontenay SNCF/RATP station</p> <p>CLIENT SNCF R&I DATES 2016 – 2017</p> </div> <div>  <p>Support for energy optimisation of the future EOLE station at Porte Maillot (extension of RER line E)</p> <p>CLIENT SNCF EOLE DATES 2016 – 2017</p> </div> <div>  <p>Supporting the energy optimisation of future stations on the Grand Paris Express network</p> <p>CLIENT SOCIÉTÉ DU GRAND PARIS (SGP) DATES 2014 – 2018</p> </div> <div>  <p>Innovation support on producing a programming study for a water park</p> <p>CLIENT COMMUNAUTÉ D'AGGLOMÉRATION PARIS – VALLÉE-DE-LA-MARNE DATES 2015</p> </div> <div>  <p>Modelling the energy needs of the Inovel Parc business district</p> <p>CLIENT VERSAILLES GRAND PARC (VGP) DATES 2016 - 2017</p> </div> <div>  <p>Identification and evaluation of innovative energy initiatives for the La Défense business district</p> <p>CLIENT EPADESA DATES 2016 - 2017</p> </div> <div>  <p>Study of the potential for waste energy recovery from a refrigerated warehouse</p> <p>CLIENT SOFRILOG DATES 2017</p> </div>

Zero Emission Neighbourhood



Description	The ZEN Research Centre, together with its partners, has set out to create zero emission neighbourhoods (ZEN). A zero emission neighbourhood aims to reduce
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		its greenhouse gas emissions towards zero within its life cycle.
Type	Methodology	
Type of actions	Monitoring / Planning activities / Stakeholder engagement	
Origin	Public / private	
Focus	Multi-benefit - multi-building	
Energy level	zero emission Other: carbon free	
Stage of development	Testing phase - High level of research upon technical solutions	
Identified barriers	n/a	

Positive Energy District by MAKING-CITY		 
Description	Contributing to the ambitious targets of the European Strategic Energy Technology (SET) Plan (SET Plan Action 3.2), the programme “Positive Energy Districts and Neighbourhoods for Sustainable Urban Development” supports the planning, deployment and replication of 100 Positive Energy Neighbourhoods by 2025. It is joined by 20 EU member states and conducted by JPI Urban Europe. The programme involves stakeholders from R&I funding networks, cities, industry, research organisations and citizen organisations.	
Type	Methodology / Consulting	
Type of actions	Monitoring / Planning activities / Stakeholder engagement	
Origin	Public/Private	
Focus	Multi-benefit - multi-building	
Energy level	Positive Energy Other: carbon-free	
Level of development	Testing phase	
Identified barriers	n/a	

Analyse of the benchmark

Figure 12 is a matrix where these key examples of methodologies to support the sustainable development of cities and districts are positioned.

The axes used are:

Vertical axis: the emphasis on which the methods focuses

- ② Energy ambition: level of objectives in terms of energy efficiency - Positive, neutral, efficient.

- ❑ Multi-benefit: integration of multiple components, such as water, biodiversity but also the happiness of citizens.

Horizontal axis: the content of the offer/services provided by the methodology:

- ❑ Empowers municipalities: provide a lot of tools, case studies, best practices to empower municipalities
- ❑ Support municipalities: consulting services to support the municipalities in their development

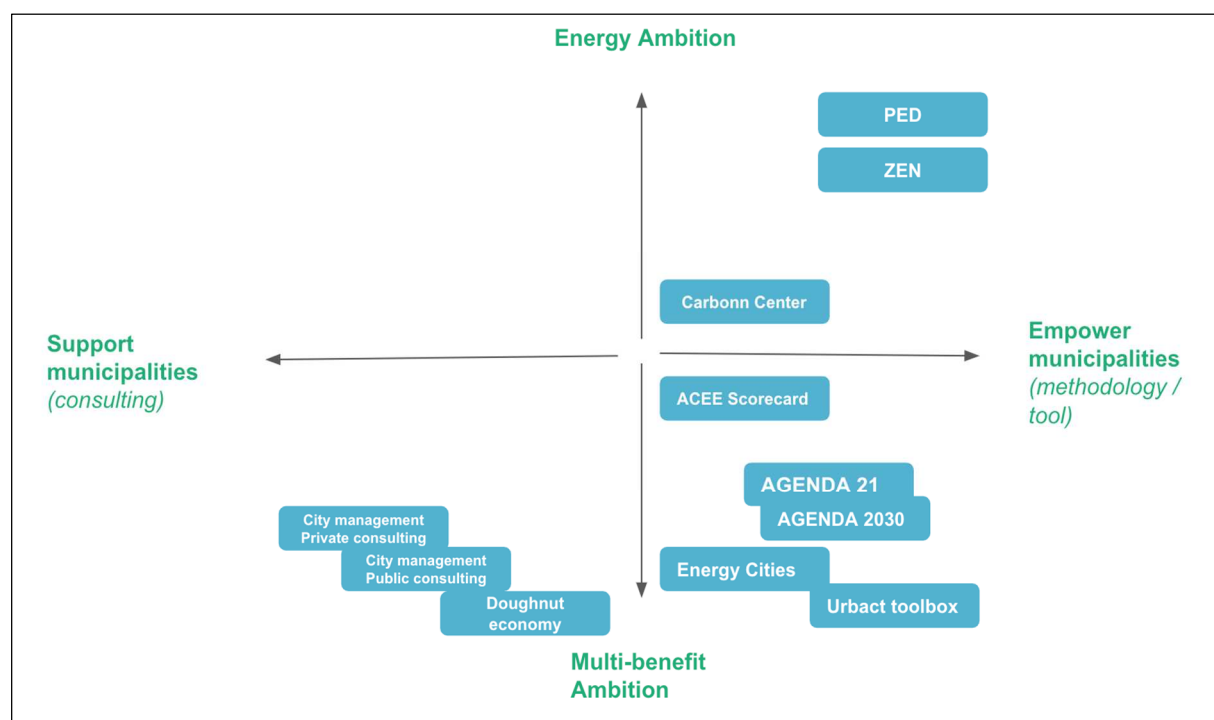


Figure 12 - Positioning of methodologies to support cities in their sustainable development

The PED methodology has a very high energy ambition and is therefore positioned in the highest upper part of the graph, slightly above the ZEN initiative.

It is a methodology that aims to empower municipalities, so it is positioned to the right of the graph, just like the ZEN methods, Urbact ToolBox, Agenda 2030...

From the point of view of energy ambitions, the PED methodology therefore seems more advanced. However, it will be necessary to verify whether the value perceived by the municipalities confirms that this differentiation does indeed provide a differentiation from above (If the municipalities perceive the interest of having such energy ambitions (Positive energy district)).

On the left of the diagram, the consulting offers offered by large or smaller consulting firms generally focus on multi-factor approaches. The strength and presence of some consulting firms is very large. A direct competition is not possible with these large consulting firms; however, partnerships can be envisaged with them in a win-win logic. They bring the power of their networks and Beyond MAKING-CITY brings its robust and ambitious energy methodology. This would allow to conquer the upper left corner of the diagram.

The possibility of creating bridges with the initiatives that are in the lower right corner of the diagram is also interesting. Indeed, the multi-benefit approach remains the most inclusive, so our Beyond MAKING-CITY tools must be compatible with the main multi-benefit initiatives. This is not easy because initiatives are flourishing. MAKING-CITY will deal with this point by having multiple contacts with actors outside the project to stay informed and inform them in return.

4 First market positioning ideas

The 4 P's of marketing are place, price, product, and promotion (Figure 13). They are the key factors that are involved in marketing. Also referred to as the Marketing mix, the 4 P's are constrained by internal and external factors. The 4 P's are used to identify key factors for business, including what consumers want, how a product or service meets or fails to meet those needs, how a product or service is perceived in the world, how providers stand out from its competitors, and how they interact with their customers.

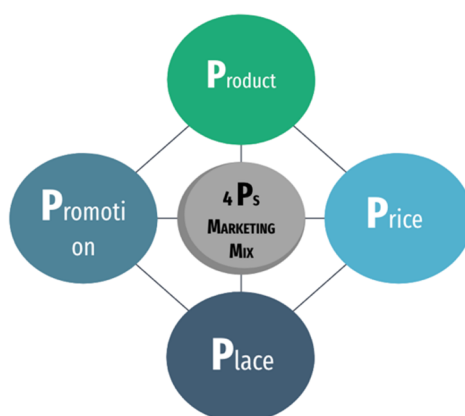


Figure 13 – The four P's of marketing

Products: The Beyond MAKING-CITY Products are methodologies and tools that empower municipalities and key stakeholder to achieve high energy savings & production ambition (see Figure 5 for an overview). Thanks to the benchmark analysis we see that there is room for linked consulting services as so far there is no well-known consulting services that provide services for high energy savings ambition. Indeed, the consulting services are more generic. Even though the high energy ambition is the strength of the PED methodology, it should be compatible with more multi-benefit approaches like biodiversity, social inclusion, and resilience.

One of the keys to the beyond MAKING-CITY offer is to offer networking with ambassador cities who share their experiences and best practices.

Place: Thanks to the developed PED-readiness indicator tool, the Beyond MAKING-CITY activities have a targeted list of cities across Europe (+ Turkey, Norway, and UK). Figure 14 shows the cities that have obtained top scores using the PED-readiness indicator tool level 1. We see a large concentration of cities in the center of Europe. Beyond MAKING-CITY could use a concentric deployment strategy: starting from the densest regions in terms of potential cities. The cities that have obtained a score of 5 to 7 will be contacted in a second step.

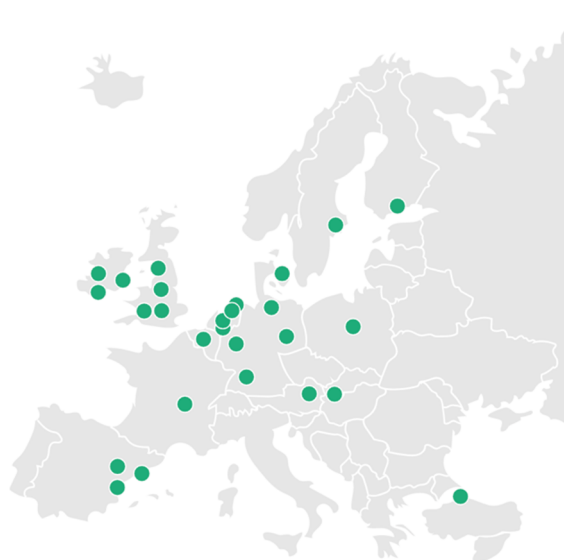


Figure 14 - Mapping of cities that scored 8 or 9 at the PED readiness tool level 1

Price: This study has not explored budget issues in depth. We can however estimate that the Beyond MAKING-CITY activities must align their price with those present in the benchmark.

The design of the Beyond MAKING-CITY products and services needs to consider the context in which the solution will be deployed. Two important factors impacting the value proposition are:

1. **Level of digitalisation of the targeted cities:** Smartness of the energy grid and communication infrastructure in the cities and level of digital literacy of citizens.
2. **Region and culture of the targeted cities:** Level of citizen engagement, ambitions of policy makers, level of trust in government and institutions and innovation culture of cities.

Promotion: Some of the cities exposed in the above mapping (score from 8 to 10) and those with a score above the threshold of 5 (which will also be contacted for replication activities) have already implemented methods and tools for their sustainable urbanization. Before contacting them, it will be necessary to carry out a brief analysis of these aspects to know how to position the Beyond MAKING-CITY offer in their context. Indeed, it is necessary to create a tailored communication strategy for each different city. Thus, quick web research can be carried out for each municipality before having an interview with them. Nevertheless, the idea will sometimes be to exchange as much as possible with the municipalities to find out their opinions, needs and expectations with regards to Beyond MAKING-CITY products. This first phase of exploration will enrich our knowledge, then we will be able to refine our marketing strategy.

The promotion of the Beyond MAKING-CITY will also rely on a network of ambassador cities (Oulu, Groningen, Lublin, Trencin, Vidin, Leon, Bassano del Grappa and Kadikoy; potentially, lighthouse and follower cities from other PED projects could join as ambassador cities as well).

5 Conclusion and next steps

The first two years of the project have defined the positioning of the Beyond MAKING-CITY offer and the appropriate way in which this offer will reach customers.

This document presents the market analysis of the first effective ways of replicating and deploying the MAKING-CITY solutions with a particular focus on the PED methodology. Although the results that will be exploited within the framework of Beyond MAKING-CITY have not yet been precisely identified, it is already possible to establish the main trends of the PED methodology.

The environmental and demand analysis has shown that there are many expectations for cities to become more sustainable. Cities are looking for levers to improve the quality of life of their citizens and also to stand out from other cities. Indeed, the rankings of cities lead to competition between them.

Many regulatory and financial constraints weight on cities. These constraints can in part be lifted thanks to partnerships and the networking of the experiences of each of the cities. The implementation of PEDs should be based on close collaboration between different actors such as industry, citizens, municipalities, technology providers and public services. All actors involved must trust each other for a PED to be effective. Especially when the municipality is the initiator of a PED project, the citizens must have confidence in their municipality and in their institutions so that they participate in it. The establishment of a PED district requires a strong interaction and integration between many systems such as buildings, building users, local and regional energy systems, mobility and ICT systems.

The existing offer of methods to support cities in their sustainable development is already dense. The initiatives selected for this benchmark were positioned on a matrix whose horizontal axis according to their energy ambitions or their multi-benefit approach, and on the vertical axis according to the autonomy left to the municipalities within the method (empower/support). The core value proposition of MAKING-CITY Ecosystem is to provide information and support on PEDs to cities in Europe and its high energy ambition. None of the other initiatives present in this benchmark have such high energy ambitions. However, the major consulting firms already present on the municipality support market have much greater marketing power and a powerful network against which it is difficult to compete. It may then be a question of establishing win-win partnerships with them mixing high energy requirements and the free tools of the PED methodology with their multi-benefit approach and their customer portfolios.

The energy ambition of the PED methodology is its strength (which gives it a competitive advantage) but also its weakness. Indeed, as we have seen, methods with little social relevance tend to be less successful.

The PED methodology implemented as part of the MAKING-CITY project makes use of participatory methods of co-construction. Ideally, these practices should also be part of the Beyond MAKING-CITY offer to enhance the links with social aspects. Beyond MAKING-CITY tools should as much as possible be compatible with other multi-benefit approaches.

Market analysis activities will be pursued until the end of the project, through the elaboration of the final version of the Beyond MAKING-CITY Business Plan (deliverable D6.9).

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