



ANNEX I. CHALLENGE DESCRIPTION

The following specifications of the unmet need are purely indicative. These specifications may evolve as the state of the development in each of the fields is updated.

THE PROJECT “VALENCIA, A CLIMATE-NEUTRAL CITY IN 2030; PPI STRATEGIC LINE 2: ENERGY MODEL”, FOCUSES ON:

THE IDENTIFICATION OF INNOVATIVE TECHNOLOGIES AND SOLUTIONS THAT CONTRIBUTE TO THE TRANSFORMATION OF THE CITY'S ENERGY MODEL TOWARDS A SCENARIO OF PRODUCTION AND CONSUMPTION OF RENEWABLE ENERGY WITHIN A CONTEXT OF A FAIR AND INCLUSIVE TRANSITION TOWARDS CLIMATE NEUTRALITY.

1. BACKGROUND

The Valencia City Council has proposed a framework for strategic reflection with a city planning vision for the year 2030. This long-term vision pursues a transition towards a more sustainable, healthier, more shared, and more prosperous and entrepreneurial city, and involves identifying and implementing solutions for the great urban challenges.

To this end, and in collaboration with numerous entities within the Valencian science, technology and innovation system, in 2020 it launched the Missions Valencia 2030 research and innovation governance model. This model places people, the relationships between them and their interactions with the urban environment and the environment that surrounds them at the centre, and proposes the development of innovation oriented towards missions that improve people's lives, fundamentally serving their needs and in line with their expectations. In short, innovation with a tri-fold purpose and impact: economic, social and environmental.

With this humanistic vision, the Valencia City Council is developing its Valencia 2030 Urban Strategy where it merges its public policies inspired within the framework of the 2030 Agenda and the sustainable development goals with the innovation missions launched from Missions Valencia 2030. Thus, the Valencia Urban Strategy is structured by uniting the 2030 Agenda and innovation, in order to solve the greatest complexities that society and cities face. This strategy is based on 6 Visions aimed at achieving a Healthier, more Sustainable, more Shared, more Prosperous and Entrepreneurial, more Creative and more Mediterranean city for its citizens, while following a roadmap to generate and improve capacities in its Local Public Administration in order to ensure its role of support and key instrument for the realisation of the desired city model.

Within this strategic context, in 2021, with a broad social and political consensus, the city of Valencia approved its first innovation mission: the Valencia 2030 Climate Mission, which aspires to make Valencia a climate-neutral city by 2030 within the context of the European mission to reach 100 climate neutral and smart



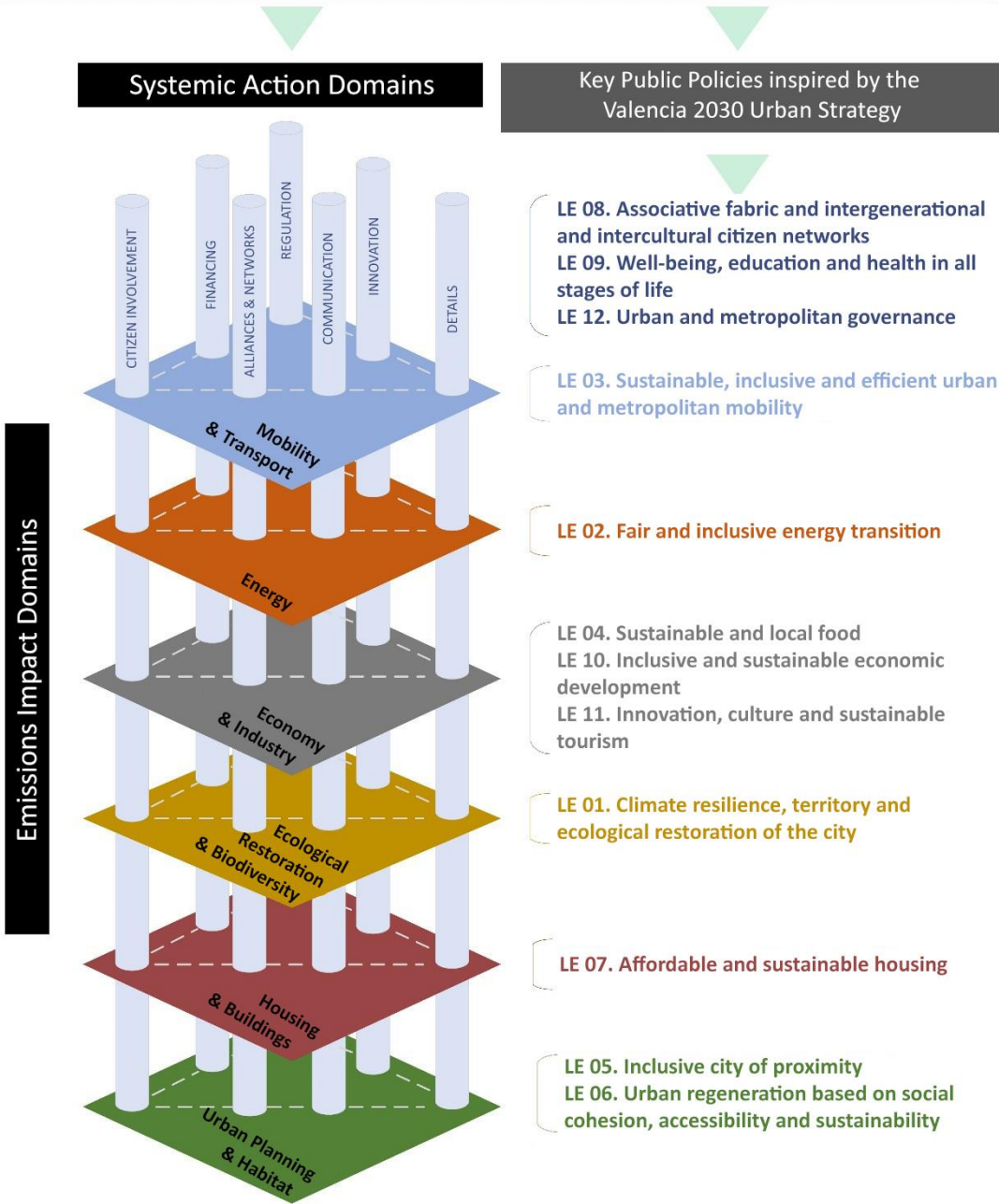
cities by the end of the decade. The following image identifies the domains with the greatest impact on emissions and the domains of systemic action necessary for the success of the Valencia 2030 Climate Mission.



VALENCIA 2030 CLIMATE MISSION

Valencia, a climate neutral city by 2030, by and for the citizens

IMPLEMENTATION PLAN OF THE VALENCIA 2030 CLIMATE MISSION Systemic Transition and Innovation towards climate neutrality in Valencia





This exercise is enabling the development of an action plan adapted to the specific urban, climatic, social and economic characteristics of the City of Valencia under the vision of progress led by its City Council. A plan that proposes responses adapted to large-scale challenges, many of which are global in nature, and which are progressively being included in the urban development agendas of major cities around the world.

But adequately addressing these challenges is not an easy task or an immediate solution. It will require a very large and prolonged effort to transform the city model, both at the public and private levels and on the social level, and it will not be possible to face them by mobilising only the solutions and technologies available today. Making it happen, and on time, will require the massive development and deployment of innovative technologies and solutions, many of which are still in the pipeline.

The Valencia City Council is aware of this reality, of the magnitude of the challenges that the city inescapably has to face, of the need to do so according to a social agenda that enables it to achieve the minimum negative impact on its entire population, mainly among the most disadvantaged, and of the importance that technological innovation will have throughout the process.

For this reason, it has decided to resort to Public Procurement of Innovation (PPI) in order to stimulate the development and initial deployment of new adapted solutions and technologies within the city that support this transformation effort. Innovative technologies and solutions that can be subsequently scaled up in the Valencia area, both through public and private initiatives, and that can also be applied in other urban centres with similar characteristics, with the consequent pull effect of this initiative.

This recourse to Public Procurement of Innovation is not conducted with a narrow vision, addressing only one or several specific challenges. It is proposed in a comprehensive format, in order to obtain a broad vision of the potential solutions to support this necessary urban transformation, and then invest progressively, depending on the availability of resources, in those that have a greater potential to have an impact on the city. The goal of this is also to have a justified Strategic Plan for the PPI, including a “pipeline” of projects consistent with the municipal strategy, which guide a consistent activity of raising complementary funds that multiply the action capacity of the Valencia City Council.

To this end, and thanks to the involvement of a large group of representatives from public and private entities, and from Valencian civil society, the Valencia City Council has co-created and published its Valencia 2030 Early Demand Map (EDM), which identifies a total of 54 challenges and 305 public needs not met efficiently by the market, and which will probably require the development of new products and services to meet them, and thus maximise the generation of public value.

A prioritisation of these 54 challenges and these 305 needs has been carried out with an eye on the Valencia 2030 Climate Mission, and the result has subsequently been reviewed and improved with the support of researchers and



technical and legal experts. This prioritisation has operated on the Sustainable Vision as the backbone of the entire PPI strategy, and has applied three assessment factors: the City Council's ability to act according to its competence framework, the potential to create value from technological innovation, and its specific weight in the city's transformation and decarbonisation goals.

As a consequence, a Strategic PPI Plan has been developed, which is structured around 8 lines of work:

PPI strategic line 1: Sustainable mobility

Transformation of the city's internal mobility and logistics model towards a scenario of minimum energy consumption and climate neutrality.

PPI strategic line 2: Energy model

Transformation of the city's Energy Model towards a scenario of production and consumption of energy from renewable sources within a context of a fair and inclusive transition towards climate neutrality.

PPI strategic line 3: Urban planning and sustainable habitat

Adaptation and renovation of infrastructures, equipment, buildings and homes, public and private, in order to optimise their energy efficiency, minimising the city's energy demand and emissions in a scenario of climate neutrality.

PPI strategic line 4: Circular and sustainable Valencian economy

Minimisation of city waste; paradigm shift in the management of solid and liquid waste towards a scenario of zero waste and climate neutrality. Green transformation of the economic and cultural activities of the city.

PPI strategic line 5: Ecological restoration

Maximising the ecological restoration of public and private spaces within the city and the use of sustainable solutions based on nature, in support of the Valencia 2030 Climate Mission.

PPI strategic line 6: Resilience and adaptation

Adaptation of the city to deal effectively with the adverse effects that may arise from Climate Change. Optimising its resilience capacity in a climate neutrality scenario.



PPI strategic line 7: Smart governance

Strengthening of the Valencia City Council with those public capacities necessary to be more efficient and to monitor and intelligently govern the systemic transformation of the municipality towards climate neutrality, and towards a city model adapted and resilient to climate change.

PPI strategic line 8: Education and social involvement

Maximisation of education, awareness, participation and involvement of citizens, public and private entities, and civil society in achieving the systemic transformation of the City of Valencia in accordance with the goals of the Valencia 2030 Climate Mission.

In Article 115 of Law 9/2017 of 08 November, regarding Public Sector Contracts, which transposes the Directives of the European Parliament and of the Council 2014/23/EU and 2014/24/EU, of 26 February 2014, Articles 40 and 41 – hereinafter referred to as the LCSP–, it is established that the contracting authorities may carry out preliminary market consultations in order to prepare the possible procurement and inform the economic operators about their plans and the requirements that will need to be met in order to take part in the eventual award procedure, as well as the rest of the aspects that must be taken into account in a process of this nature.

In this sense, the Decree of 03 November 2016 of the Delegate of the Government Department of Economy and Finance, approving Instruction 4/2016 regarding the processing criteria for conducting preliminary consultations of the market within the scope of municipal public procurement, the goal of which is to establish common and general processing criteria that must be taken into account by the contracting authorities for conducting preliminary market consultations, is also key.

This document addresses PPI Strategic Line 2: Energy Model: Transformation of the city's Energy Model towards a scenario of production and consumption of energy from renewable sources within the context of a fair and inclusive transition towards climate neutrality.

2. STATE OF THE DEVELOPMENT

The transition of urban and national energy models towards scenarios based on the use of renewable energies and the smart use of resources is an essential part of most of the plans to combat climate change and urban environmental plans throughout the world.

To this end, together with a global effort to transform the energy generation model that supplies cities to ensure its renewable origin, the main cities around the world are including in their decarbonisation plans, actions aimed at maximising the



exploitation of their renewable generation potential and optimising their energy management.

Among other measures, there are those related to the use of green hydrogen as a vector in electricity and heat generation systems, the development and deployment of smart systems for the integration of renewable energies within the urban network, the implementation of community energy models and the use of electric vehicles as decentralised storage systems. All of these solutions are being researched, developed and trialled worldwide.

In the case of green hydrogen, we find ourselves with a valuable energy vector that can play a relevant role in the urban decarbonisation process, mainly within the logistics sector, but also for energy storage. Its use is being explored for the decarbonisation of heat generation at the residential level, using stationary generation fuel cells that enable the thermal demand to be followed and also generate electricity, achieving an efficiency close to 80%. This is of interest in those cases where electrification is not the most competitive solution.

In reference to smart systems for the integration of renewables, as well as energy communities, relevant research can be easily found that seeks, mainly, to achieve the decarbonisation of energy production through the optimisation of distributed generation, intensifying the use of local renewable thermal energies (such as shallow geothermal energy and biomass), applying solutions related to energy communities and with the development of smart management methodologies for energy generation and distribution. This smart use of resources, together with a properly distributed decentralised generation, can play a relevant role in a generation mix that enables the problem of energy poverty to be tackled efficiently.

The use of digital systems that bring together the accounting of domestic green energy generation is under development as a useful resource to generate and market green energy “tokens” that can be sold to those CO₂ emitters who need to acquire emission rights. In this way, the installation of local renewable energy production systems is promoted, while at the same time making these types of facilities profitable.

Finally, the normalisation of the use of electric and hybrid vehicles, vehicles that include a battery system, has raised various questions. One of them is the potential use of these battery systems as distributed storage systems. These models seek to use electric vehicles as storage points for the excess electricity produced at renewable energy production peaks, enabling the use of the energy stored in the vehicles at times when these energy-generating technologies are not operating; this measure must be accompanied by a rigorous operating model that guarantees the security and stability of the network, which could be compromised in the event of a strong expansion of electric mobility.



3. UNMET NEEDS

Within the framework of the Missions Valencia 2030 programme, and the Strategic Plan for Public Procurement of Innovation described above, this proposal is motivated by the need to implement solutions related to PPI Line 2: Energy Model: Transformation of the city's Energy Model towards a scenario of production and consumption of energy from renewable sources within the context of a fair and inclusive transition towards climate neutrality.

For this reason, it launches the Preliminary Market Consultation phase aimed at companies and organisations that intend to collaborate with the Valencia City Council in response to this challenge, developed more extensively in “Section 5 Specific Goals” of this same document, providing information that improves the definition and scope of the potential Public Procurement of Innovation projects to be tendered.

4. GENERAL GOAL

The general goal of this project is to collect the necessary information to prepare a Framework Agreement on the Public Procurement of Innovation, with different batches, provided that the result of the Preliminary Market Consultation (PMC) is in the terms provided for the Public Procurement of Innovation. This Framework Agreement on the Public Procurement of Innovation will give rise to the different contracts as provided for in the Public Sector Contracts Law.

It should be noted that, depending on the state of the development and the solutions proposed, it may give rise to other types of bidding, whether they are ordinary public procurement tenders, because the market is sufficiently mature, or pre-commercial public procurement procedures, as well as partnership procedures for innovation, if the results of the PMC were in very early stages, far from commercial solutions.

Additionally, another of the goals set out in this project is to inform economic operators about the plans and contracting requirements of the Valencia City Council.

More precisely, the specific goal of the project is to stimulate R&D&i activities in the private sector through the PPI to generate solutions for the main needs currently existing in the City Council within the scope of the Valencia 2030 Climate Mission.

5. SPECIFIC GOALS

To identify innovative solutions and technologies, of any nature, with potential application within the City of Valencia, which enable its City Council to promote the transformation of the current model of residential, commercial and public energy supply towards a zero emissions model, supporting its strategy to combat energy poverty and guaranteeing the right to energy for all citizens, within a context of climate neutrality promoted by the Valencia 2030 Climate Mission.



Within the scope of impact of this PMC, the City Council's interest in also identifying technologies and solutions that specifically affect some of the key economic sectors for the success of the Valencia 2030 Climate Mission (tourism, agri-food, culture and leisure, commerce and services) is emphasised, promoting its transformation towards a sustainable economic model in a scenario of climate neutrality. Likewise, the City Council wants to highlight its interest in identifying proposals that contribute to promoting the economy of knowledge and entrepreneurship within the city.

In a non-exhaustive way, the aim is to identify innovative technologies and solutions that enable it to:

- a. Promote the deployment of public and private renewable generation systems, both in thermal and electrical generation.
- b. Explore the potential of green energy digital “token” generation and trading systems.
- c. Deploy generation aggregation systems, and consumption aggregation, linked to renewable generation systems, in order to avoid the discharge of the energy generated into the grid and to reduce the cost for users.
- d. Implement new business models linked to the flexibility of the system, optimising the operation of the distribution network through the aggregation and management of demand, the use of storage (batteries and EVs) and decentralised production.
- e. Decarbonise the heat generation systems of public and private buildings, through thermal energy communities (including in public-private collaboration) or centralised air conditioning systems, in an optimal integration with renewable generation.
- f. Deploy photovoltaic generation systems with architectural integration in buildings and urban spaces, and photovoltaic generation systems integrated into buildings with a double-insulating and generating effect.
- g. Deploy management systems for shared energy grids (electricity and heat) at the level of the community of neighbours, blocks or districts, encouraging their adoption, the participation of users, and including price fixing and traceability.
- h. Explore the use of green hydrogen as an energy vector in optimised electricity and heat generation models in energy communities and public infrastructures with high heat consumption (schools, sports infrastructures).
- i. Deploy and promote the adoption of accumulation systems associated with renewable generation, including considering electric mobility as an element of distributed accumulation and V2X technology as a method of taking advantage of this distributed accumulation.



- j. Monitor the indicators associated with the transition of the energy model, the impact of the measures and the planning and use of available local energy resources (solar, biomass, geothermal, wind, etc.).
- k. Contribute to the implementation and efficient management of a potential integration in the ordinances of the decarbonisation goals of energy systems in public and private housing and, where appropriate, of the associated municipal taxation to incentivise its application.
- l. Mitigate energy poverty within the city and defend the right to have enough energy to live a decent life, through, for example, collaborative renewable production models that include the participation of vulnerable populations (social energy communities).
- m. In general, contribute significantly to the goal of transforming the city's energy supply model towards a zero emissions scenario within a context of fair and inclusive transition promoted by the Valencia 2030 climate mission.

6. EXPECTED RESULTS

As a result of this consultation, the aim is to obtain the necessary information to activate the bidding processes that are considered appropriate as described in section 4 “General Goal” of this document.

The Valencia City Council will study the proposals for solutions that are submitted and may use them, in accordance with the provisions of Article 126 of Law 9/2017, of 08 November, regarding Public Sector Contracts, to define the detailed functional or technical specifications that can be used in the contracting procedures for goods or services that, subsequently, can be summoned, fundamentally, although not exclusively, through the Public Procurement of Innovation (PPI) procedure.

The Valencia City Council will record, in a report of conclusions, the actions carried out within the framework of the Preliminary Market Consultation. The list of entities participating in the consultation will appear in said report and the next actions to be carried out by the entity will also be established. This report will form part of the eventual procurement files that derive therefrom.