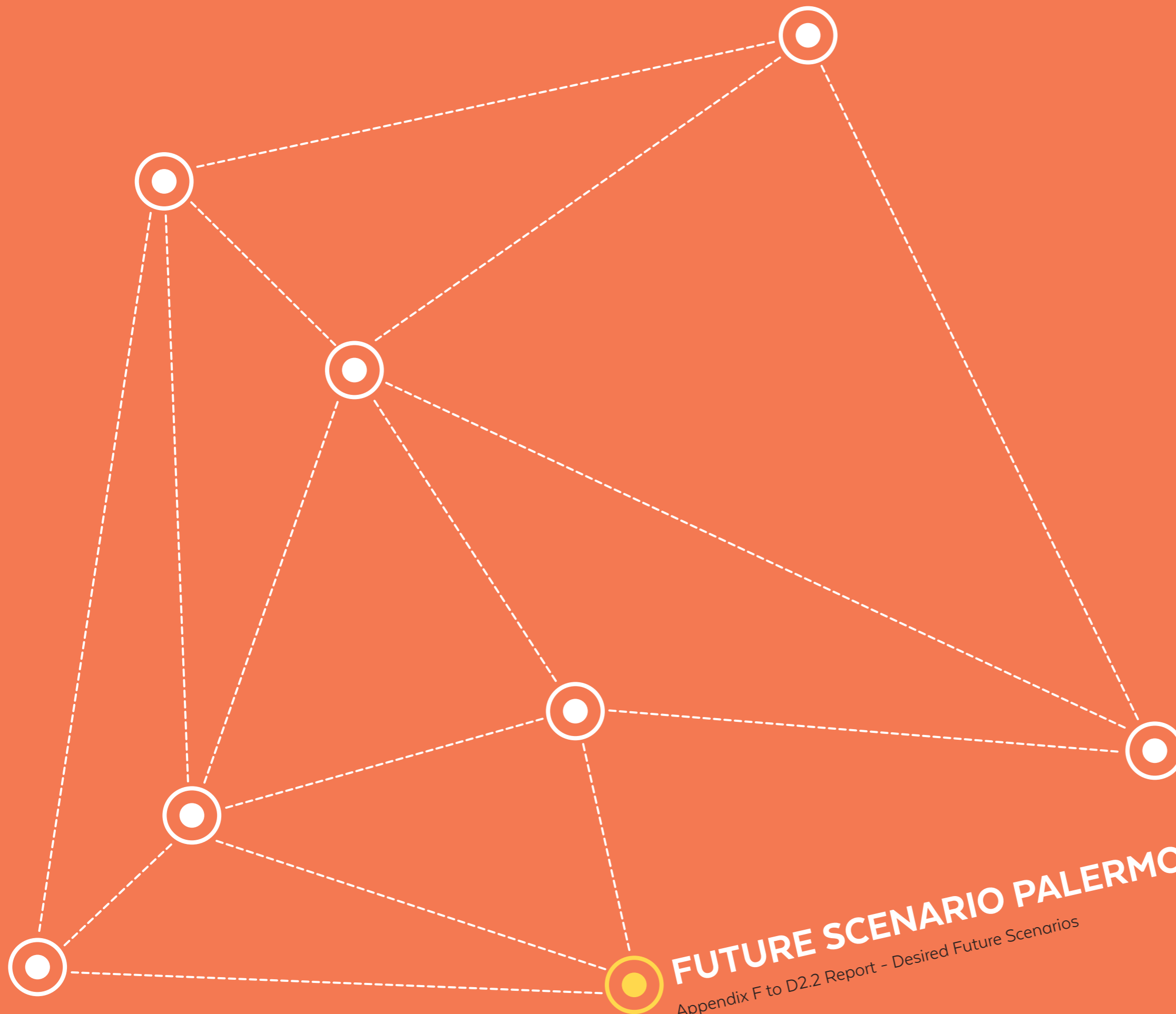




This project received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649397



# FUTURE SCENARIO PALERMO 2050

Appendix F to D2.2 Report - Desired Future Scenarios

15 June 2015

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ROADMAPS  
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This appendix is part of the D2.2 Report - Desired future scenarios - and contains all results of the vision development activities held in the city of Palermo.



The R4E project received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649397.

Disclaimer: This report presents the views of the authors, and do not necessarily reflect the official European Commission's view on the subject.

**Versions of this report:**

- |                  |  |
|------------------|--|
| 20 November 2015 | Concept for internal check in the city (limited distribution)  |
| 15 May 2016      | Final version for public distribution                          |
| 15 June 2016     | Final version for public distribution - with minor corrections |



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- Desired future scenario Smart Buildings & Smart Mobility
- The making of the desired future scenario
- Ambition: Cultural and social harbour Palermo 2050
- Drivers for change for the future of Smart Buildings in Palermo 2050
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## CULTURAL AND SOCIAL HARBOUR PALERMO 2050

In 2050, the city of Palermo values smart, ecological buildings, spaces and mobility.

Palermo values being a social harbour, open and friendly to all, as well as a cultural harbour, enriching people's lives and helping to make good citizenship and sustainable behaviour second nature for everyone.

Innovation and new technologies are embraced to become energy-neutral. Circular systems are implemented to enable sustainable behaviour and businesses. There is an integrated, connected, wireless data and energy network and a green mobility network connects the city and its various centres.

The core of city life is the people of Palermo, with their social interactions and their enjoyment of the city's buildings, spaces and cultural features. Technological solutions are demand-driven and can be personally adjusted. Cultural exchanges enrich people's lives in the city.

Elements of the desired future scenario are:

### A social harbour

Palermo is an open and friendly city, welcoming to all, while retaining its unique characters. A city for the people, that is lighter, in the sense of fewer cars, less pollution and lower noise. With buildings and spaces that are comfortable for people and that exploit Palermo's beauty, with its attractive views and sound scape.

### A cultural harbour

Palermo cherishes its historical city centre and cultural heritage. These are enriched by new technologies and innovation to create comfortable, energy-efficient housing and neighbourhoods. Innovative solutions are used to maintain historical buildings and to make them energy efficient. (Re-)location of public service buildings and re-purposing of old buildings supports sustainable living.

### Circularity

Palermo greatly values new technologies as a means to become an energy-efficient and circular city. Especially in the outlying areas, new technologies are used for energy generation, storage and charging of 'sweet mobility' solutions. Circular systems are used, for example for food: from urban farming, markets, joint cooking and enjoying local food, as well as organic waste recycling. Or for the business of natural materials: from green roofs, natural materials for isolation, local entrepreneurship in printing isolation materials from waste of local food production. School buildings serve as demonstrators of new solutions and behavioural change.

### An integrated, connected, wireless data and energy network

The city of Palermo is connected and accessible through a network of infrastructure for energy systems and open data. An energy network connecting the whole city based on renewable energy sources ensures energy-neutrality at city level. Energy production (PV, buildings), storage (cars and batteries) and usage (where needed) are balanced through the network.

Open data is the norm, and enables new entrepreneurship based on services for people. The connected data is valued by citizens because of the improved affordable and reliable information on mobility and public transport. Citizens support this principle of data sharing by providing access to their own data. The connected data is valued by information management experts for the interconnection of mobility modes and the integration with other functionalities, such as measuring air quality, pollution or congestion.

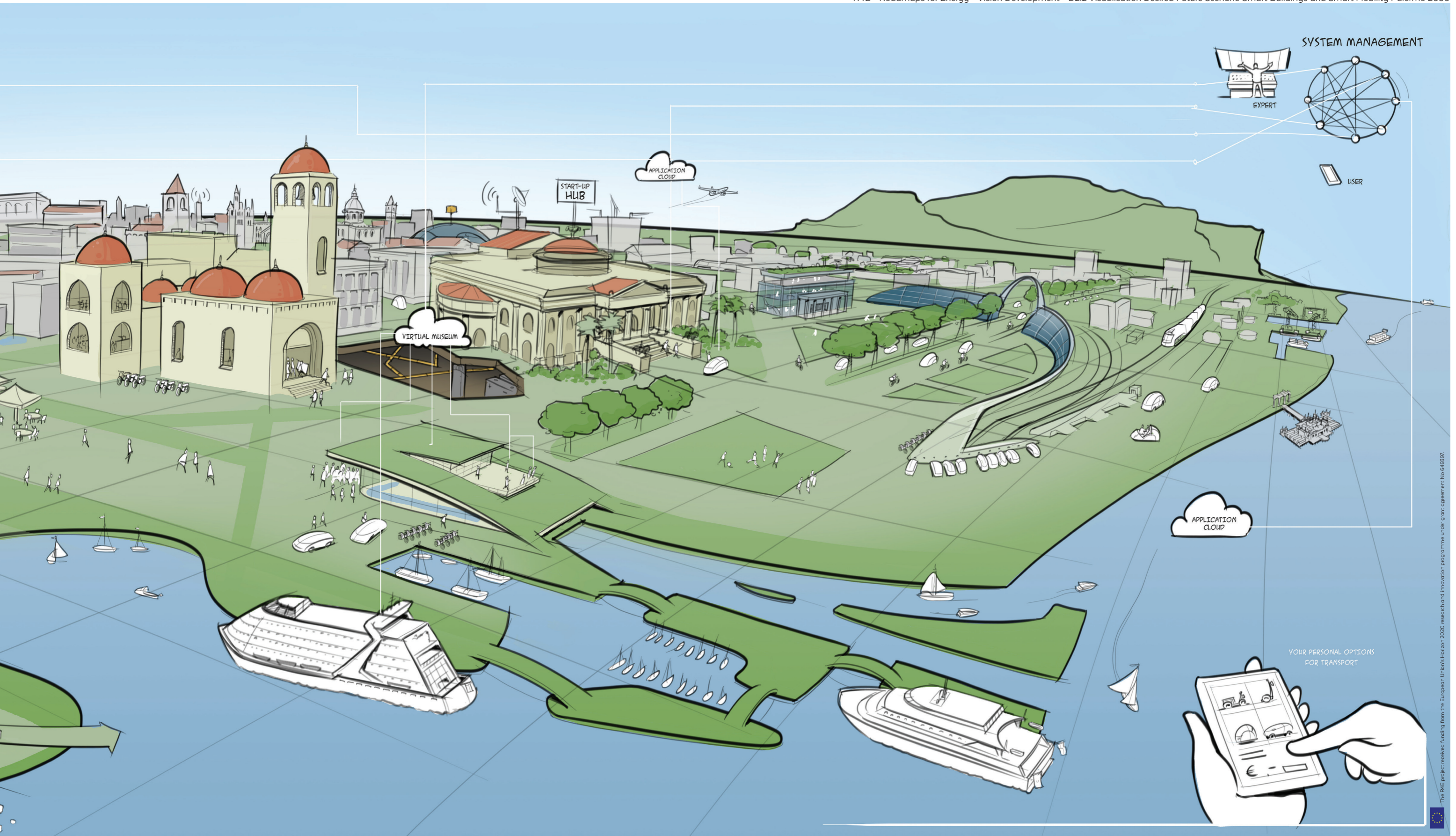


### City for the people of Palermo

The heart of the city of Palermo are its people, enjoying social interactions and the city's buildings and spaces. These spaces have been given back to the people, so they can enjoy them in comfort and safety. Children can play outdoors, and can walk to school. The urban space is used by citizens, developing cultural activities and by local entrepreneurs to create awareness and change. Tourists also value the city's cultural history, which they can experience both physically and virtually.

### A green mobility network

The city of Palermo has been (re-)designed with a green mobility network, connecting the city and its various centres, adding value to the poly-centric city and integrating the qualities of the different areas into a harmonious whole. The Golden Valley 2.0 connects green roofs and walking areas to make walking and biking into obvious choices for people. All areas are easily accessible and safe, with a closely-knit transport network throughout the city.



The R4E project received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 644397.

### 'Sweet and green' mobility

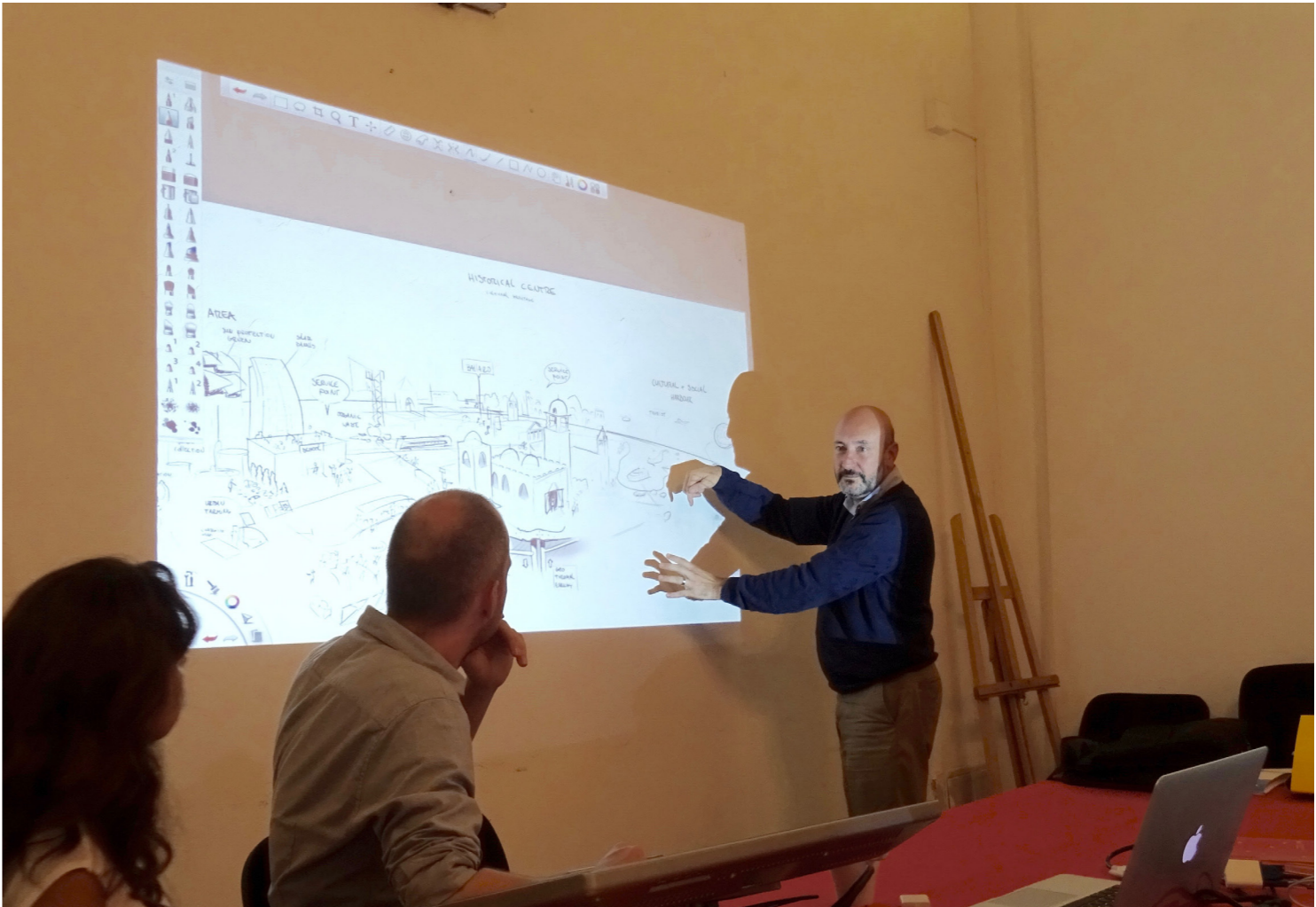
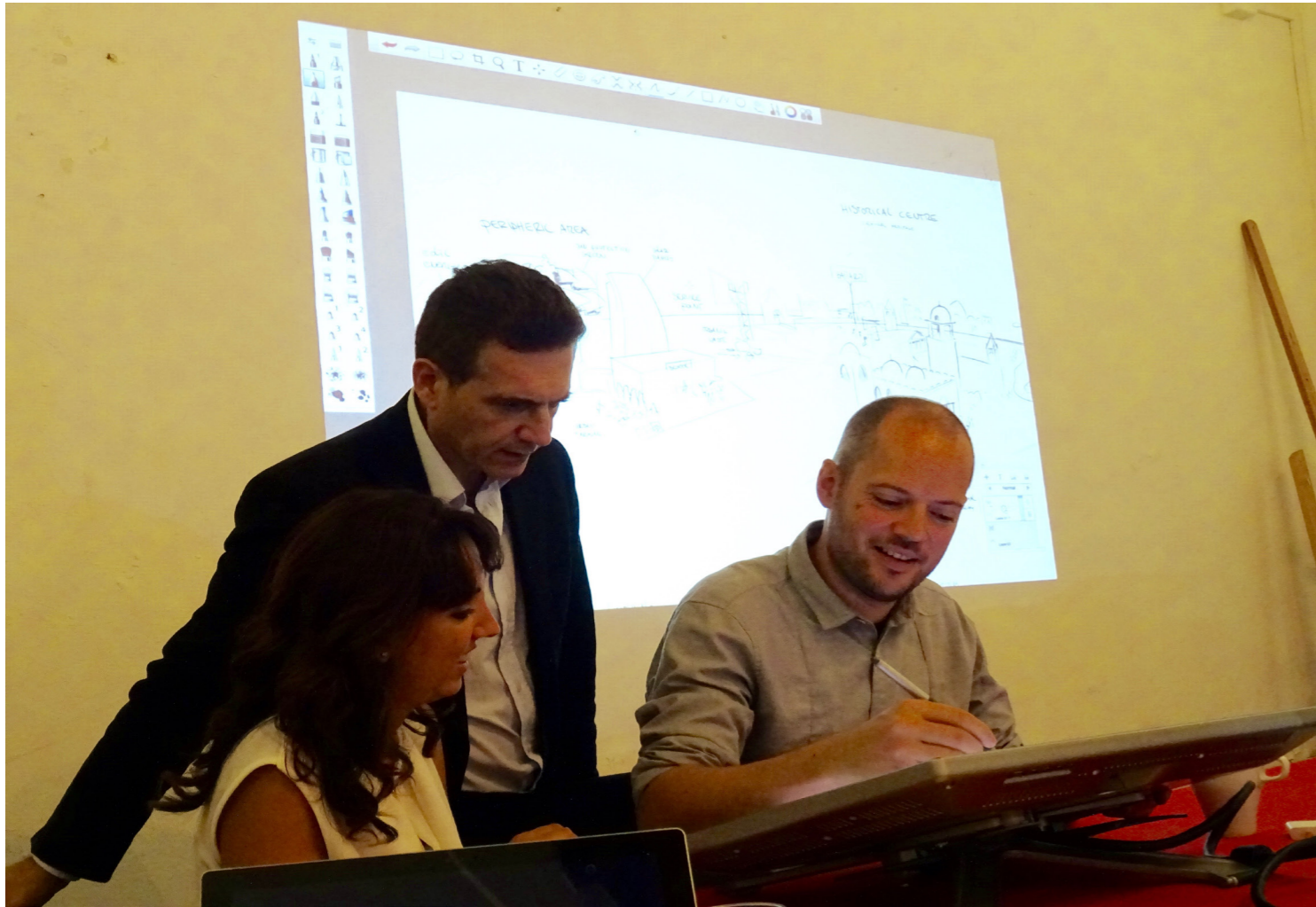
A range of mobility solutions provide a dense network of mobility modes. This demand-driven diversity includes walking, bike, scooter, and car sharing, as well as tram and metro connections to the outlying areas. Individual solutions are accessible and affordable for all, supported by local entrepreneurs, new business models and both public and private investments.

### Sea motorway and central distribution centre

Palermo is a capital city and an important sea port which serves as a logistics and transport hub, connecting the hinterland with other Italian cities. The sea will be further exploited as a mobility option to reduce traffic volumes on the roads, with a logistics platform based on new technologies. Good transport management also allows smaller-scale ecological solutions, such as smart individual delivery of (personal) goods in the city.

Version 15 June 2016





Creating the visual of the desired future scenarios



# The making of the desired future scenario

## The approach

In the Roadmaps for Energy (R4E) project, the partners work together to develop a new energy strategy: their Energy Roadmap. The difference between the regular energy strategies and action plans and these new Energy Roadmaps is the much earlier, better developed involvement of local stakeholders. These include not only those who will benefit from the new strategy, such as the citizens themselves, but also relevant research and industry partners. They offer a much clearer view of the future potential of the city in terms of measures and technologies, as well as of the challenges presented by today's situations in the cities. The aim is to create a shared vision containing the desired, city-specific scenarios and the dedicated roadmaps to be embedded in the context of each city.

The R4E project follows a four step approach:

1. Set the ambitions of the participating cities on sustainable energy and Smart Cities, as well as their choice of three Smart Energy Saving focus areas: 1. Smart Buildings; 2. Smart Mobility; and 3. Smart Urban Spaces.
2. Develop scenarios for the selected focus areas.
3. Create the roadmap. Identify existing and future technologies and other developments – these will enable the desired future scenarios. Plot the opportunities and developments on a timeline, showing the route and milestones towards the desired scenarios. The roadmaps contain common parts for all the partner cities, as well as specific parts for the individual cities.
4. Create a portfolio of new projects and initiatives to achieve the ambitions, visions and roadmaps of the cities. This portfolio shows the shared and individual projects, and includes a cross-city learning plan and a financial plan.

## Step Two: Vision development

The aim of Step 2 is to develop visions for the cities in the selected focus areas. A vision is based on a long-term perspective on the world – in this case we are focusing on 2050. Two main activities are taking place in this step: Future Telling research and the development of desired future scenarios.

### Future Telling

The first part of the vision development activity is to identify Drivers for Change that influence the future of Smart Cities in general, as well as Smart Buildings, Smart Mobility and Smart Urban Spaces in particular. The Future Telling research method is an approach to create context-related possible future scenarios in a creative, imaginative way. Future Telling research consist of a structured method to map expertise and ideas of thought leaders from the Smart Cities domain. Through interviews and analysis leading to the Drivers for Change for liveable and smart cities in 2050. This research and the 18 Drivers for Change are described in the report Future Telling 2050 D2.1 Report – Drivers for Change.

### Developing desired future scenario's

Out of the 18 Drivers for Change for smart and sustainable cities, the cities have chosen the most important Drivers for Change to be included in their further vision development. Together with the Ambitions, which the cities set in Step 1, the desired future scenarios for the focus areas will be developed in city scenario workshops. The ambitions are described in the Ambition Setting D1.1 Report – Specific ambitions of the R4E partner cities.

## City scenario workshops

The desired future scenarios for the selected focus areas in the cities are created in a series of workshops held in each of the partner cities. These Scenario Workshops consist of a 3-day programme in each city, and include sessions with policy-makers and stakeholders to develop a rich, contextual scenario for the city. Local stakeholders (companies, citizens, public and private organisations and knowledge institutes) are invited to take part in the workshops through the networks in the cities. The results of the Scenario Workshops are reported in the same format for each of the city, facilitating cross-learning between the cities.

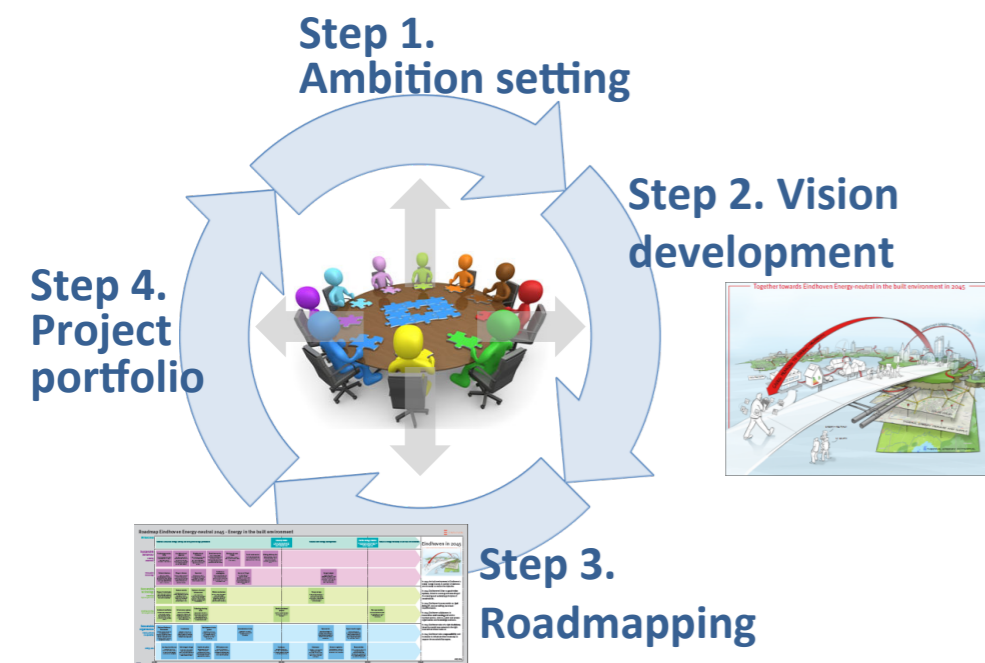
Two sessions are held for each focus area. In the morning session the outline for the vision and the desired future scenario is developed. The main stakeholders work with the set ambition for the focus area and the selected Drivers for Change to understand their impact on the city in 2050. Together, the participants define the main elements of the vision. Then, in the afternoon session a broad spectrum of stakeholders are invited to enrich the desired future scenario with specific additions. Based on the outlined vision they carry out a further in-depth exploration of the main elements of the vision in-depth.

In all the sessions, the participants will interactively build a visualisation of the desired future scenario. See also the pictures of the workshops.

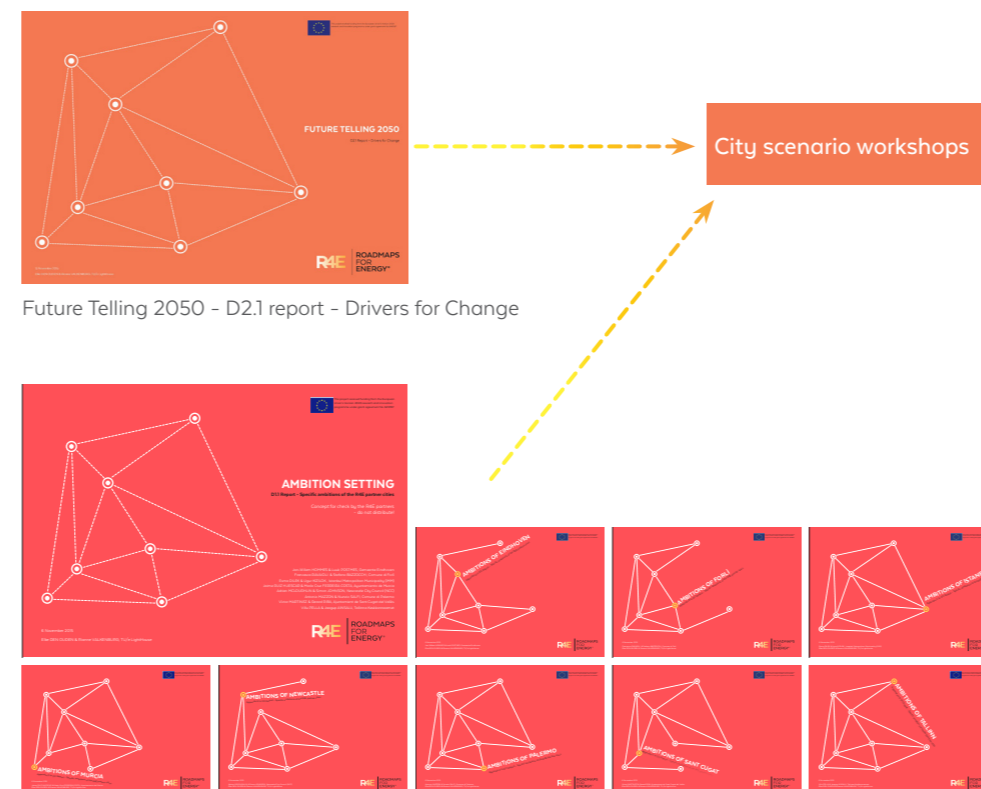
Day 1 - Focus area 1	Day 2 - Focus area 2	Day 3 - Reporting
<b>Outlining the vision</b> <ul style="list-style-type: none"> <li>Exploring the Drivers for Change in relation to the future of the city</li> <li>Selecting the main elements of the vision</li> </ul>	<b>Outlining the vision</b> <ul style="list-style-type: none"> <li>Exploring the Drivers for Change in relation to the future of the city</li> <li>Selecting the main elements of the vision</li> </ul>	Project team working session to prepare the report of the Scenario Workshop
<b>Enriching the desired future scenario</b> <ul style="list-style-type: none"> <li>Exploring the future of the city and the main elements of the vision</li> <li>Enriching the vision with specific additions</li> </ul>	<b>Enriching the desired future scenario</b> <ul style="list-style-type: none"> <li>Exploring the future of the city and the main elements of the vision</li> <li>Enriching the vision with specific additions</li> </ul>	

Program of the ambition workshops

The result of the vision development step is a visualisation of the desired future scenario. The visual is explained in this report and the main elements of the vision are described. The following pages also provide the background of the scenario: the ambition of the focus area, copied from the Ambition Setting D1.1 Report – Specific ambitions of the R4E partner cities and the selected Drivers for Change for each focus area, copied from the Future Telling 2050 D2.1 Report – Drivers for Change.



Four step approach of R4E



Ambition Setting - D1.1 report - Specific ambitions of the R4E partner cities

# Ambition: Cultural and social harbour Palermo 2050

1

## Smart, ecological buildings

In 2050, the city of Palermo values smart, ecological buildings and spaces. All buildings (both historic and new) use renewable energy and sustainable solutions for their architecture. (Re-)location of public service buildings supports sustainable living in the city. All waste is re-used completely, so it is no longer a cost but a valuable resource in itself.

### Strategic ambitions

- In 2050 public buildings in Palermo are sustainable & energy efficient.
- In 2050 new buildings are zero-emission compliant.
- In 2050 services for citizens, such as schools, health care, etceteras, are located along public transport lines to decrease mobility.
- In 2050 there is regulation for the use of renewable energy systems in the historical centre.
- In 2050 all buildings in Palermo are smart & ecological, including energy and waste management.
- In 2050 all buildings in Palermo use smart technology, including technology for the full re-use of waste.

2

## Integrating new and historical knowledge

In 2050, Palermo's cultural heritage enriched with new technologies is greatly valued. Palermo builds on its historic strengths to design comfortable, energy-efficient houses and neighbourhood areas. The city explicitly using its mild climate, as well as its past knowledge (such as the building of Palazzos and villas), enriched with today's technology solutions.

### Strategic ambitions

- In 2050 Palermo uses its historical strength to built comfortable and energy efficient houses and neighbourhoods.
- In 2050 the mild climate of Palermo is used to its full extend for sustainable buildings & energy production.

3

## Cultural hub

In 2050, people in Palermo value their city as a hub for meeting each other and for all kinds of social activities. Cultural exchanges enrich people's lives in the city. Behavioural change is achieved by incorporating the city's cultural and artistic heritage in education.

### Strategic ambitions

- In 2050 Palermo is a cultural hub: a harbour for cultural exchange where people meet and bring in their own culture.
- In 2050 Palermo uses culture and art in education to improve the quality of life by stimulating behavioural change.



## Drivers for change for the future of Smart Buildings in Palermo 2050

### Better buildings

In 2050, new buildings combine historical qualities and new technologies, creating maximum comfort and functionality for their users. Historical expertise in building for specific local climates is used to design solutions for new buildings, and for thoughtful upgrading of those already existing. The latest technologies and materials are applied to make buildings self-sufficient or even energy positive, contributing to abundant of renewable energies in cities. Policies aim at improving the quality of neighbourhoods and strengthening the sense of community, and not only at reducing energy consumption.

### Building business for social living

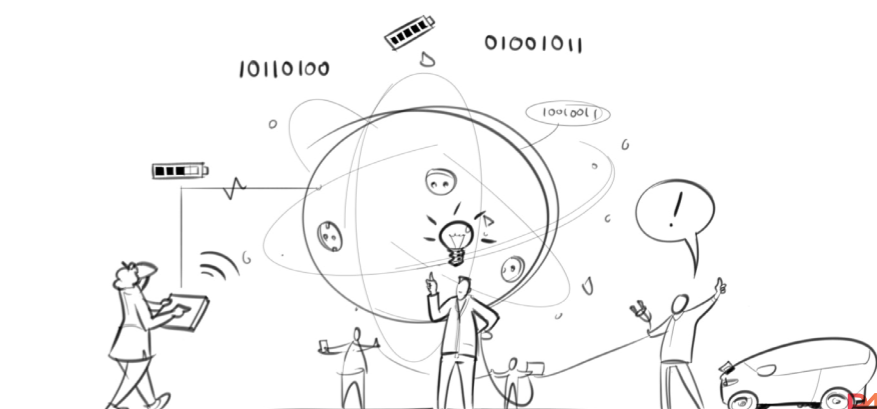
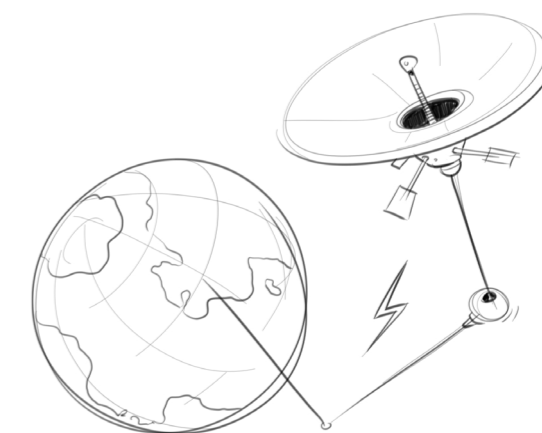
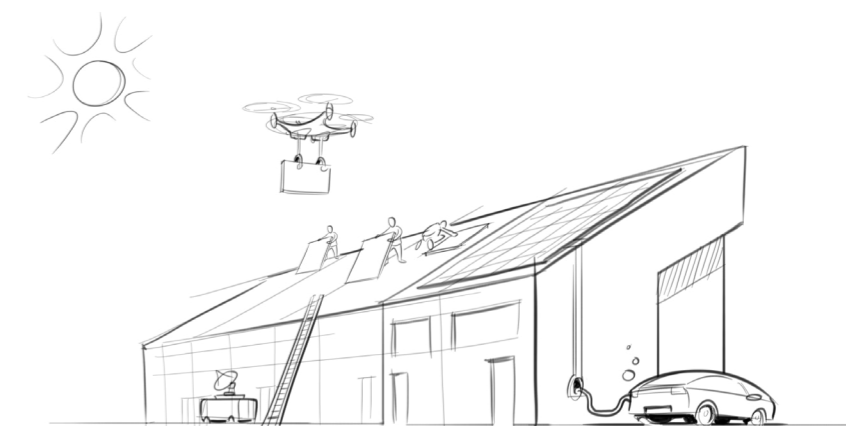
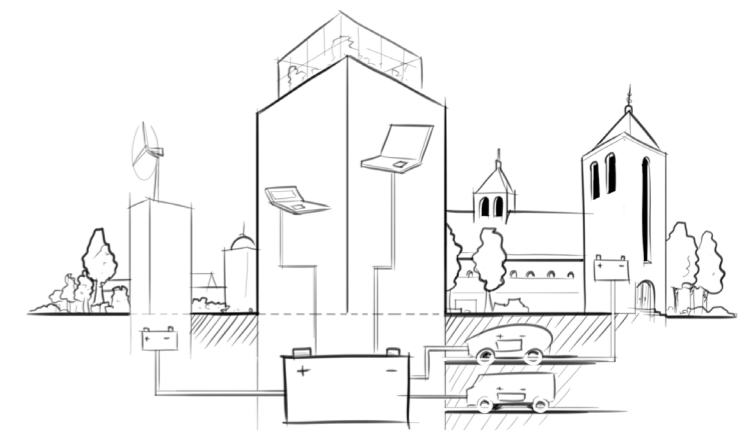
In 2050, suitable financing structures and revenue models are available, offering solutions that are affordable while also boosting the local economy. Both individuals and small communities act as entrepreneurs. They benefit from good infrastructure and technology options, so they can self manage and at the same time improve their lives and the living environment.

### Applying new technologies

In 2050, a range of new technologies are available and affordable. Some of them are already in development, others are still unknown. Cities apply those technologies in new solutions that contribute to the quality of life, and in particular to the creation of smart buildings, smart mobility and smart urban spaces.

### Democratised energy systems based on open data

In 2050, energy systems are open, bidirectional, multi-purpose platforms on which (renewable) energy and energy management services are open to all. Entrepreneurs have developed business models that provide value for them, for their users and for society at large. Citizens can choose freely from a range of available options. The system ensures privacy and security of users, who are always in control. Ambient energy networks provide connectivity for (wireless) access to data and energy. Increased computing power and artificial intelligence make system resilient: self-organising, self-sustaining and self-learning.





# Ambition: 'Sweet & green' mobility in Palermo 2050

1

## 'Sweet mobility'

In 2050, people in Palermo value 'sweet mobility': cycling, walking and sharing mobility services are obvious choices. These enable people to enjoy the city's green spaces to the full. All areas of the city are easily accessible by all.

### Strategic ambitions

- In 2050 Palermo provides safe mobility for all people: families, children, elderly, disabled, pedestrians and cyclists.
- In 2050 sweet mobility is an obvious choice: such as bike- and car sharing and walking.
- In 2050 the people of Palermo will use biking, because the foundation and infrastructure is available and accessible.
- In 2050 Palermo provides green areas and restricted areas for mobility to stimulate walking.
- In 2050 the coast and nature are preserved and more green areas in the city are realised.
- In 2050 the citizens of Palermo value walking and cycling as obvious part of life and mobility.

2

## Safe, reliable public transport systems

In 2050, people in Palermo value safe, reliable public transport options. They enjoy a finely meshed transport network in the city and surrounding areas, all of which are easily accessible.

### Strategic ambitions

- In 2050 Palermo provides reliable public transport options for the people through a large network of railways that connect all parts of the town and a subway to connect the city centre.
- In 2050 energy consumption will be reduced for mobility, buildings and public lighting.
- In 2050 a profound public transport system is realised (rail & subway).

3

## A valued cultural heritage

In 2050, people in Palermo value their cultural heritage. They enjoy a good education that gives them ecological awareness. Good citizenship and sustainable behaviour come naturally to everyone.

### Strategic ambitions

- In 2050 Palermo will use education as a foundation for good citizenship and sustainable behaviour.
- In 2050 cultural and historical tourism will be a showcase for other cities.

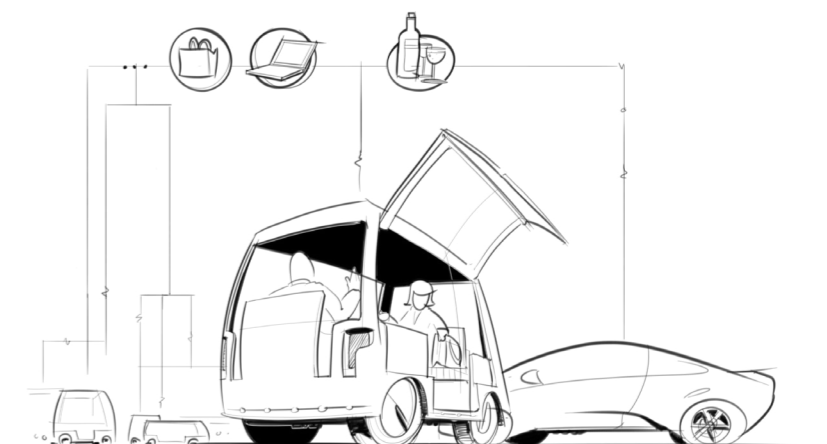
# Drivers for change for the future of Smart Mobility in Palermo 2050

SMART MOBILITY



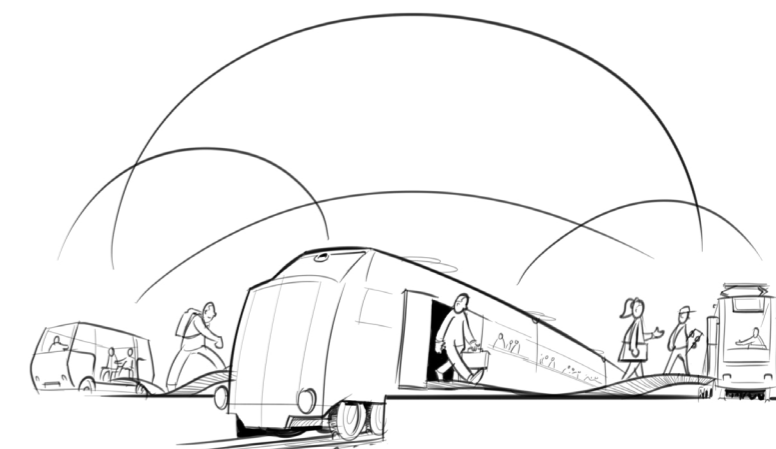
## Personal mobility as a service

In 2050, technology enables autonomous vehicles. These take affordable personal mobility to a whole new level. Technology makes sharing easy, so everyone has access to a vehicle whenever they need it. It also facilitates the transition to a circular economy, gradually replacing legacy systems with cleaner, safer options. Stakeholder resistance is overcome by the availability of complete, resilient system that meet the needs of city dwellers in full.



## Valuing public transport

In 2050, cities offer attractive, seamless mobility options: these give everyone access to everywhere. New investment structures and revenue models ensure that the city values (such as inclusiveness) are ingrained in system design. Cities actively influence operators to ensure high levels of customer satisfaction and service quality.



## Attractive cities with unique qualities

In 2050, cities have unique qualities that embody their own history and culture as an integral part of their DNA. The differences between them make the cities distinctive and attractive places for business and visitors. And people of different backgrounds find them good places to work and live. The cities offer a good balance in the quality of neighbourhoods and infrastructure, with affordable services for all income levels. Social needs drive city design, which is constantly and organically reshaped to meet people's changing needs. The use of spaces and buildings is always under review to deliver maximum value for users.



## Regenerating resources in a circular economy

In 2050, the circular economy ensures self-sufficiency of cities. Renewable energy is abundant, and this ensures a secure supply of vital resources for life (energy, water, food and clean air), although other resources may still be scarce. Cities have implemented circular systems to regenerate all the resources needed by their populations. These mechanisms are based on small-scale, local solutions, enabled by changed decision-making levels.







# Contributions

We would like to thank the participants for their contribution to the scenario workshops:

- Vincenza Conigliaro      Comune di Palermo
- Mario Ferrante          Universita' Di Palermo
- Patrizia Ferrante        Universita' Di Palermo -Dipartimento Energia
- Maria Stella Mangiarotti    C/Mare Golfo
- Antonio Mazzon          Comune di Palermo
- Ernesta Morabito        Italia Nostra
- Antonino Picone         Paradox
- Giulio Pirrotta          Arsnova - Italia Nostra - Comitato Ballaro' Significa Palermo
- Nunzio Salfi              Comune di Palermo



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