D5.3 Smart City Manager Certificates (Profile: Urban Energy)

30 September 21

Gretel Schaj[1], Hannah Emeraghi[1]

[1] BABLE GmbH, Germany

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

Deliverable administration

No & name	**D5.3 Smart City Manager Certificates (Profile: Urban Energy)**				
Status	Released	**Due**	M24	**Date**	2021-09-30
Author(s)	BABLE GmbH				
Description of the related task and the deliverable. Extract from DoA	**T5.2 Fellow City Training Mission (FHG) M1 – M60** *Subtask 5.2.3 Certified Professional Training for Smart City Project (BABLE) [M1 – M18]* Each city will send up to four staff members to join a comprehensive smart city professional training and become Certified European Smart City Managers in their respective specialisation area to a course certifying Smart City Managers with a Profile of Urban Energy. The courses will have a length of approx. 6 months and comprise distance learning modules as well as three best-practice visits. The conveyed contents and methods will go beyond the insights and expertise gained within SPARCS and include best-practice knowledge in the field of smart city developments with a focus on energy projects on the European scale. As a blended learning format, it will enhance the cooperation between city and company employees and provide a platform for international and interdisciplinary exchange. An exploitation plan will make sure that the training and certificates developed via SPARCS can be offered as a standard training to city and business representatives on a large scale after the successful delivery of the first certifications.				
Participants	**BABLE**, VTT, ESP, LPZ, CMM, RVK, KLD, KFS, LVIV, FHG.				
Comments					

V	Date	Authors	Description
0	17/09/21	Gretel Schaj, Hannah Emeraghi	Deliverable checked by Deliverable Reviewes and released to the Coordinator and the Quality Manager for quality check and subsequent submission to the EC.
1	30/09/2021	VTT	Coordinator submits the deliverable to the EC

Dissemination level

PU	Public	X
CO	Confidential, only for members of the consortium (including the Commission Services)	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

About SPARCS

Sustainable energy Positive & zero cARbon CommunitieS demonstrates and validates technically and socioeconomically viable and replicable, innovative solutions for rolling out smart, integrated positive energy systems for the transition to a citizen centred zero carbon & resource efficient economy. SPARCS facilitates the participation of buildings to the energy market enabling new services and a virtual power plant concept, creating VirtualPositiveEnergy communities as energy democratic playground (positive energy districts can exchange energy with energy entities located outside the district). Seven cities will demonstrate 100+ actions turning buildings, blocks, and districts into energy prosumers. Impacts span economic growth, improved quality of life, and environmental benefits towards the EC policy framework for climate and energy, the SET plan and UN Sustainable Development goals. SPARCS co-creation brings together citizens, companies, research organizations, city planning and decision making entities, transforming cities to carbon-free inclusive communities. Lighthouse cities Espoo (FI) and Leipzig (DE) implement large demonstrations. Fellow cities Reykjavik (IS), Maia (PT), Lviv (UA), Kifissia (EL) and Kladno (CZ) prepare replication with hands-on feasibility studies. SPARCS identifies bankable actions to accelerate market uptake, pioneers innovative, exploitable governance and business models boosting the transformation processes, joint procurement procedures and citizen engaging mechanisms in an overarching city planning instrument toward the bold City Vision 2050. SPARCS engages 30 partners from 8 EU Member States (FI, DE, PT, CY, EL, BE, CZ, IT) and 2 non-EU countries (UA, IS), representing key stakeholders within the value chain of urban challenges and smart, sustainable cities bringing together three distinct but also overlapping knowledge areas: (i) City Energy Systems, (ii) ICT and Interoperability, (iii) Business Innovation and Market Knowledge.

Partners

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

EXECUTIVE SUMMARY

1.1 Deliverable description

This deliverable gives an overview of the Smart City Manager training developed and presented to the SPARCS cities via BABLE's structured Smart City Manager course with a focus of urban energy. To better prepare the cities for knowledge transfer and replication opportunities, an initial online survey was conducted at the beginning of the project to identify the knowledge gaps and needs. The survey included questions related to training content that would be most beneficial for the cities; areas of interest for knowledge transfer; interventions by the lighthouse cities; and systemic areas of data governance, smart city management, innovation, systems integration, business models, and finance needs.

The questionnaires were completed by city representatives. Based on the responses from the city representatives, 16 modules were developed for the training. They are as follows:

1. Smart City as an urban development approach
2. Financing a Smart City & Procurement
3. Smart City policies
4. Stakeholders in the urban environment
5. Open systems
6. Data and privacy
7. Living labs & co-creation
8. Digital Planning
9. Introduction to Positive Energy Districts (PEDs)
10. Energy Regulations
11. Sustainable Energy & Climate Action Plans (SECAPs)
12. Generation and Storage
13. Energy efficient buildings
14. Smart and flexible grids
15. Cross-sectoral integration of energy and mobility
16. The future of urban energy

1.2 Timeline and collaborators

The training kicked off on 16 October 2020 and lasted until 9 April 2021. It was conducted over Microsoft Teams, with one module given per week and each module lasting for 2- 3 hours. The contents of the modules were developed through a collaboration between BABLE, Fraunhofer FOKUS, Fraunhofer ISE and VTT. In addition to the training sessions, three best practice visits to the cities of Stockholm, Cologne, and Vienna had also been organised. However, due to COVID, the city visits were converted to online events. Details of the timelines for all modules and city visits are given in Figure 1 below, while Figure 2 gives an overview of the distribution of the modules into two competences: *Smart City* competences and *Urban Energy* competences.

Course materials were made available to the city representatives for each module in addition to the webinar. They included:

1. A reader (a summary of the most recent academic and professional literature in the field + links to other bibliography): ~15-30 pages;
2. 1-page summary of the module content;
3. Examples of experiences and implementations;

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

Date	Time CET	No.	Module name
16.10.20	11 am - 2pm	1	Smart City as an Urban Development Approach
23.10.20	11 am - 2pm	2	Financing a Smart City & Procurement
30.10.20	11 am - 2pm	3	Smart City Policies
06.11.20	11 am - 2pm	4	Stakeholders in the Urban Environment
20.11.20	1pm - 4pm	5	Open Systems
27.11.20	1pm - 4pm	6	Data and Privacy
4.12.20	11 am - 2pm	7	Living Labs & co-creation
11.12.20	11 am - 2pm	8	Digital Planning
			TEST
22.01.21	11 am - 2pm	9	Introduction to Positive Energy Districts
29.01.21	11 am - 2pm	10	Energy Regulations
5.02.21	11 am - 2pm		**Online city visit 1: Stockholm**
12.02.21	11 am - 2pm	11	Sustainable Energy & Climate Action Plans (SECAPs)
19.02.21	11 am - 2pm	12	Generation and Storage
26.02.21			**Online city visit 2: Cologne**
5.03.21	11 am - 2pm	13	Energy efficient buildings
12.03.21			**Online city visit 3: Vienna**
19.03.21	11 am - 2pm	14	Smart and flexible grids
26.03.21	11 am - 2pm	15	Cross-sectoral integration of Energy and Mobility
09.04.21	11 am - 2pm	16	The Future of Urban Energy
			Test

Figure 1: Training schedule and timeline

Modules

Smart City competences:

Smart City as an Urban Development Approach
Financing a Smart City & Procurement
Smart City Policies
Stakeholders in the Urban Environment
Open Systems
Data and Privacy
Living Labs & co-creation
Digital Planning

Urban Energy competences:

Introduction to Positive Energy Districts
Energy regulations
Sustainable Energy Action Plans
Generation and Storage
Energy efficient buildings
Smart and flexible grids
Cross-sectoral integration of energy and mobility
The future of Urban Energy

Figure 2: Module distribution into Smart City and Urban Energy competences

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

1.3 Participants

In the 6 months of the training, 18 people took part in the training regularly. In particular, they belonged to the following public administrations:

- Leipzig: 2 participants
- Espoo: 3 participants
- Maia: 4 participants
- Kladno: 4 participants
- Lviv: 4 participants
- Kifissia: 1 participant

At the end of the training, 17 certificates were issued. As compared to the number participants, there is one person less since this one only took the smart city modules and could not attend further webinars because of a job rotation. Number of certified managers (completed training) in each of the cities:

- Leipzig: 2 participants
- Espoo: 2 participants
- Maia: 4 participants
- Kladno: 4 participants
- Lviv: 4 participants
- Kifissia: 1 participant

1.4 Practical information about the training and best practice city visits

1. Structure of the class:
   - 2 - 3 hours
   - Sections: presentation, Q&A, and activity/exercise
   - Structure:

     Mandatory

     - 30-45 min presentation
     - 10 min active break (energizer): e.g., answer a short question or have a very short discussion
     - 15-45 min presentation
     - 20 min Q&A
     - 15 – 60min exercise/activity

     Module feedback survey

2. Tools:
   - Teams (Zoom or Remo), Mural, and Slido
   - Teams: post questions, open discussions (after webinar time)

3. Availability of learning material
   - All webinars were recorded and shared with the participants after the class with the goal of making available the class to those that for external or private reasons could not attend at the agreed time.
   - Readers and the results of the activities were also made available on the SPARCS Teams workspace managed by VTT.
   - All trainers had access to the Teams channels to answer questions from the participants after the classes.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

4. Trainers:

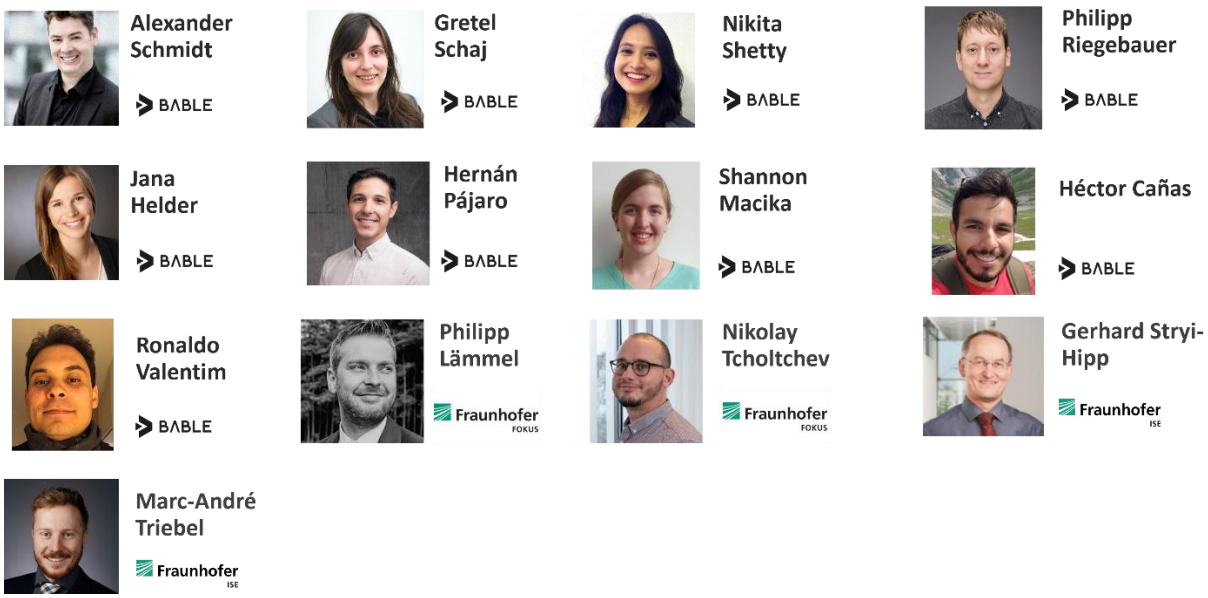


Figure 3: Trainers involved in the modules

5. Best practices - on-site/online visits
   The purpose of this was to share:
   - Best practice knowledge in the field of smart cities and energy;
   - Enhance cooperation and knowledge exchange across Europe

6. Tests & certifications:

   Two test sessions comprising multiple-choice questions were conducted. The first session was held in December 2020 to test the Smart City competences of the city representatives, while the second session held in April 2021 to test the Urban Energy competences of the city representatives.

   Following the results from the test, a final certificate of completion was issued to successful participants. Figure 5 below shows the template for the final certificate.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

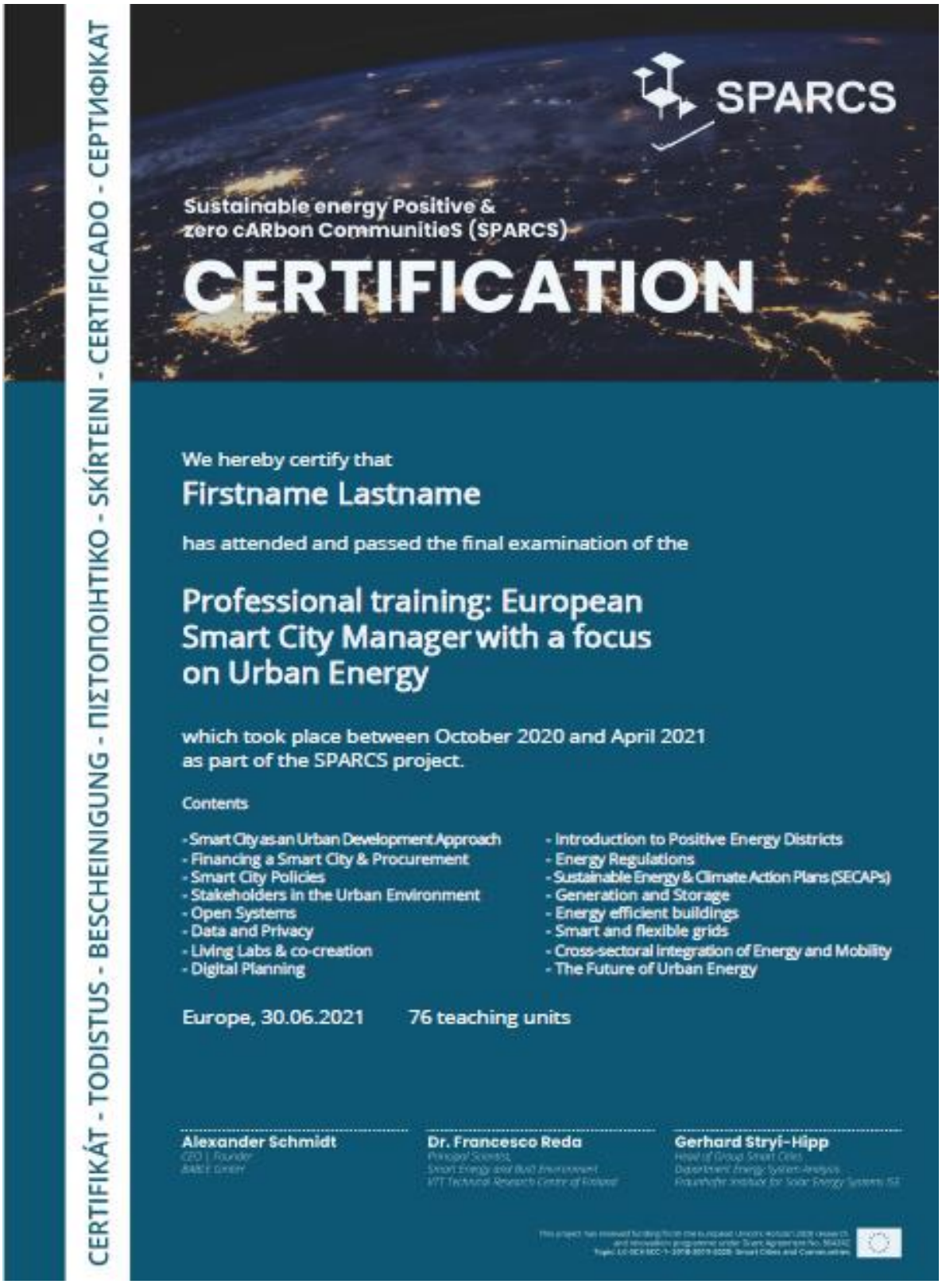


Figure 5: European Smart City Manager Certificate Template

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

1.5 Learning targets of each of the modules

Learning targets have been specified for each of the modules. They are detailed in the next sub-sections. At the end of the module the participant should be able to:

1.5.1 Smart City as an urban development approach

- Being able to describe the societal challenges and changes that cities are facing
- Being able to discuss the complexity of urban systems
- Being able to recognize how technology and innovation is shaping the city scape
- Being able to discuss different approaches to sustainable urban development (e.g. reducing environmental footprints)
- Being able to interpret the implications of the Smart City and Society approach as a holistic framework for urban transition
- Being able to compare best practices for Urban Developments in leading smart cities

1.5.2 Stakeholders in the urban environment

- Being able to describe the changing roles and drivers of the different actors in the city system (city administration, companies, politicians, universities and citizens)
- Being able to describe how companies, cities, knowledge institutions and citizens engage in urban development / the smart city market
- Being able to compare different city development histories and their implications for future developments
- Being able to discuss the multiple helix concept in practice

1.5.3 Living labs & co-creation

- Being able to recognize the importance of need finding, citizen engagement and demand driven urban development
- Being able to describe different types of co-creation processes (with different stakeholder groups)
- Being able to compare different processes of co-creation for different purposes
- Being able to design a co-creation process for visions and roadmaps for smart cities
- Being able to describe the benefits of living labs for different stakeholders (e.g. the city, companies and citizens)
- Being able to compare best-practice examples based on prerequisites, organisation, marketing and engagement
- Being able to communicate and apply the concept of a living lab

1.5.4 Financing a Smart City & Procruement

a) Procurement

- Being able to recognize the role of procurement in smart city development
- Being able to name the legal framework and applications of procurement processes in Europe for cities (e.g. European Procurement Directives)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

- Being able to compare traditional and innovative procurement procedures (e.g. Procurement of Innovation, Competitive Dialogue, joint procurements)
- Being able to discuss stakeholder involvement in the procurement process

b) Financing a Smart City

- Being able to identify the value proposition and diffuse benefits of smart city solutions
- Being able to recognize why conventional financing mechanisms often fail in the smart city market
- Being able to compare examples of alternative financing options for smart city projects (e.g. green bonds, funds, EU programmes)
- Being able to describe examples on how to leverage private capital for public goods / PPPs

1.5.5 Smart City policies

- Being able to recognize the difference between different types of goods (e.g. private and common goods)
- Being able to recognize the importance of smart policies regarding jointly used goods in cities
- Being able to identify the different levels of policy making (e.g. European, national and local)
- Being able to discuss example processes of how insights from science and market development can inform policies
- Being able to discuss different (successful and failed) policy examples
- Being able to adapt principles on how to develop smart policies

1.5.6 Open systems

- Being able to discuss the problem and necessity of open systems (business vs municipality perspective)
- Being able to recognize the role and current state of standards and standardization in the smart city area
- Being able to recognize the process of creating standards for open systems
- Being able to name important examples for standards in the smart city area
- Being able to recognize quality assurance issues for Smart City Infrastructures
- Being able to describe the concept of ICT Reference Architectures

1.5.7 Data and privacy

- Being able to identify good practice in terms of strategies and action for data-driven projects
- Being able to discuss privacy rules and the reasoning behind
- Being able to compare the benefits and problems for different use cases for urban data
- Being able to identify the quality of urban data

1.5.8 Digital planning

- Being able to recognize the benefits and challenges around digital planning tools for cities
- Being able to recognize different examples of digital planning tools and processes
- Being able to discuss strategies for the transition towards digital city planning

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

1.5.9 Introduction to Positive Energy Districts

- Being able to describe the role(s) and define Positive Energy Districts (PEDs)
- Being able to discuss the role of PEDs in Urban Planning
- Being able to name components (smart city solutions) that jointly form PEDs
- Being able to discuss benefits of PEDs
- Being able to interpret calculations on energy positivity and energy balance more generally
- Being able to discuss local influencing factors (e.g. climate, topography) and their influence on PEDs

1.5.10 Energy regulations

- Being able to interpret the Renewable Energy Directive 2018/2001/EU (RED II).
- Being able to discuss the roles and responsibilities of different stakeholders (including energy community members) in the Renewable Energy Directive 2018/2001/EU (RED II).
- Being able describe some good practices of energy regulations across the EU.
- Being able to discuss local differences in energy regulations across the EU on specific examples.

1.5.11 Sustainable Energy and Climate Action Plans (SECAPs)

- Being able to describe the content of a Sustainable Energy and Climate Action Plan (SECAP).
- Being able to discuss the process of developing a SECAP.

1.5.12 Generation and storage

- Being able to interpret application areas, benefits and supporting factors for solutions such as
    - Energy storage systems
    - Decentralised local energy production and storage systems
    - Power to X (including power to gas)
- Being able to discuss the application of such solutions in specific areas, such as:
    - Condominiums
    - Ports/docks
    - Offices and administration buildings
    - Waste heat from energy-intensive industries and datacentres

1.5.13 Energy efficient buildings

- Being able to interpret application areas, benefits and supporting factors for solutions such as
    - Building energy management systems
    - Smart home systems
    - Organizational and financial mechanisms of energy modernization of old high-rise buildings
    - low energy buildings/passive houses

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

- Energetic retrofitting programmes
- Automated energy accounting systems for industrial enterprises

- Being able to discuss the application of such solutions in different building types, such as:
  - Residential buildings, such as detached houses, townhouses, apartment buildings, social housing
  - commercial and industrial buildings
  - special purpose buildings, such as schools, swimming pools
  - science and technology parks
- Being able to interpret strategies on influencing and forecasting energy demands on a building level.
- Being able to interpret the possibilities of circular economy practices in the building sector.

1.5.14 Smart and flexible grids

- Being able to interpret application areas, benefits and supporting factors for solutions such as
  - Smart micro grids
  - Virtual power plants
  - Decentralised local energy systems
  - Peer-to-peer energy systems
  - Development and implementation of "night rate"
  - Development of municipal energy saving systems
  - District cooling/ heating systems
- Being able to interpret the technology and equipment required to actively manage energy systems (e.g. smart meters, gateways, controllable consumers).
- Being able to interpret strategies on influencing and forecasting energy demands on a city/district level.
- Being able to discuss strategies and processes for the transitions from legacy infrastructure systems to actively controllable systems.

1.5.15 Cross-sectoral integration of energy and mobility

- Being able to interpret application areas, benefits and supporting factors for solutions linking energy and mobility services, such as
  - Private charging systems for electric vehicles (EVs)=
  - Public charging systems for EVs
  - Electric bike sharing systems
  - Electric bus systems
  - Bi-directional charging models for EVs and connected energy storage systems
  - Hydrogen-powered bus systems

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

- Being able to interpret strategies on influencing mobility behaviour with a combination of energy and mobility practices focussed on the district level.
- Being able to discuss the role of public space in PEDs.

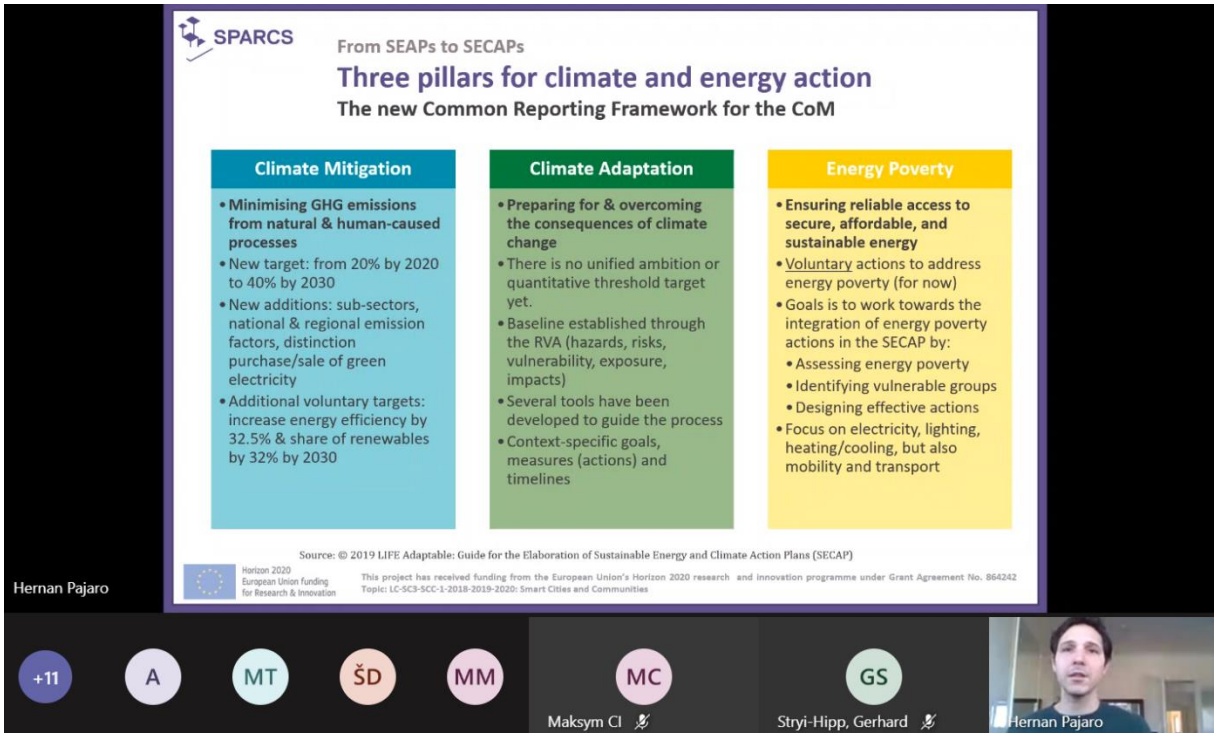
1.5.16 The future of urban energy

- Being able to interpret the megatrends for energy sectors with regards to urban energy developments :
    - Demographic change and urbanisation
    - Individualisation and local production
    - Digital transformation (including Blockchain and 5G)
    - New business and value creation patterns
    - Zero-carbon energy
    - Increased influence of politics

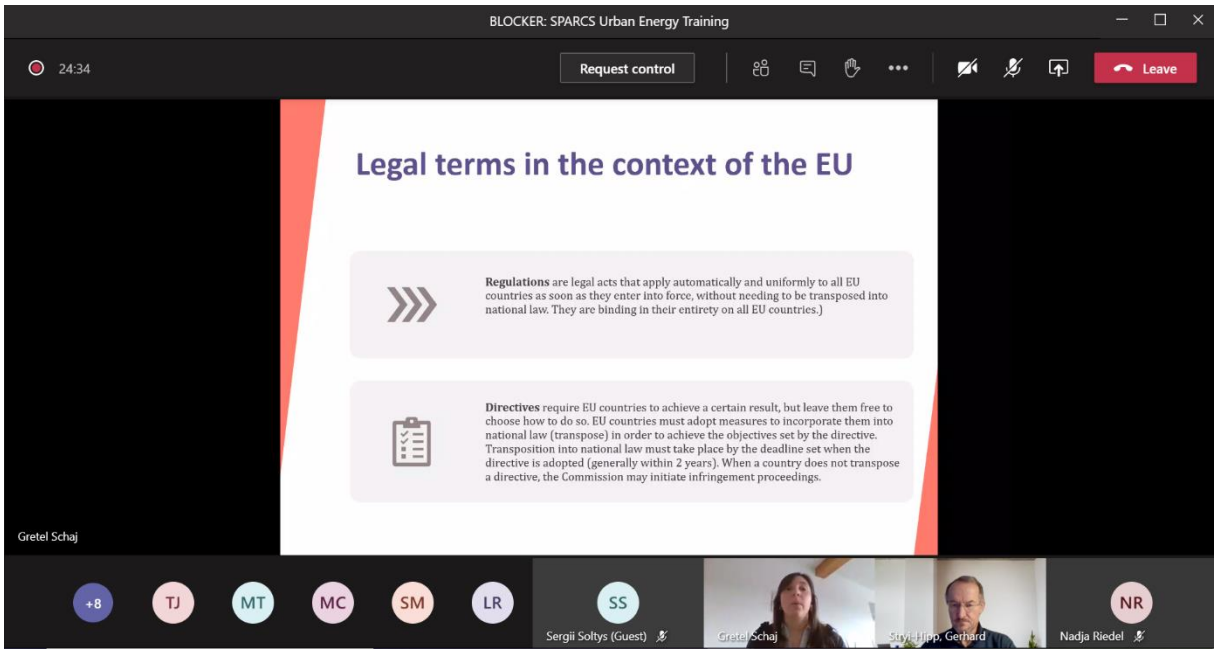
This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities

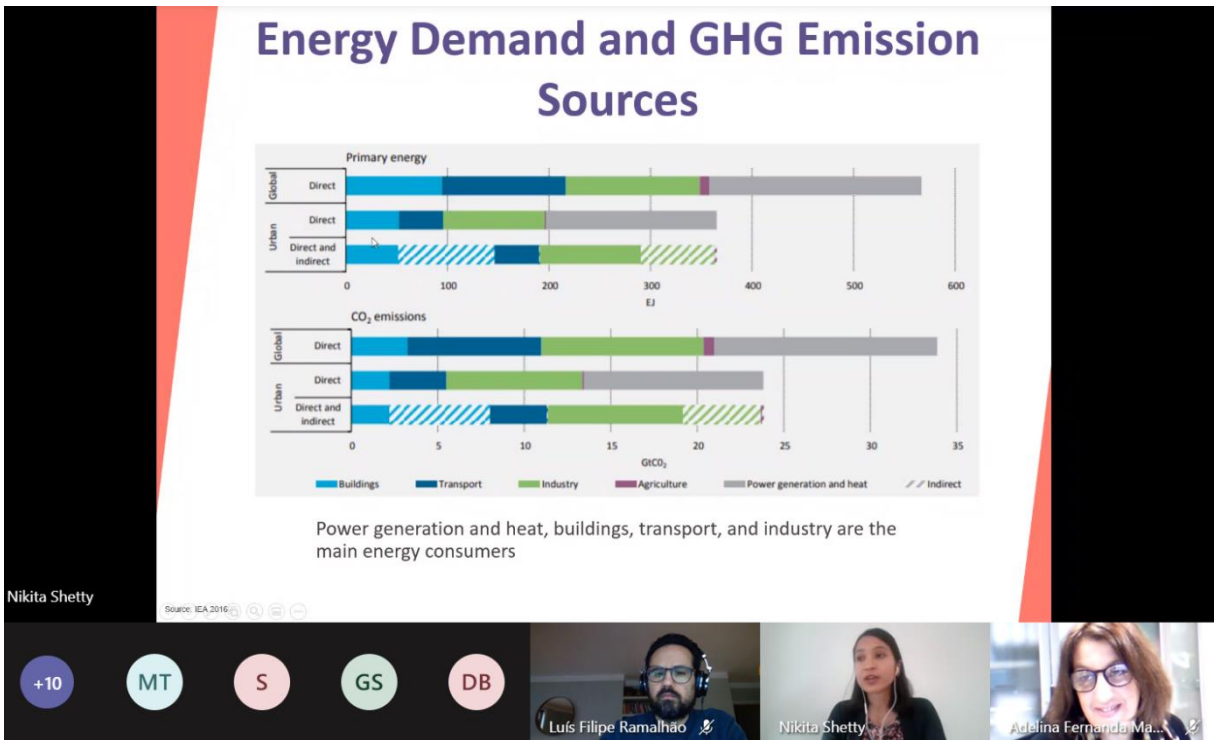
1.7 Additional photographs

Additional photographs from the modules and trainings:

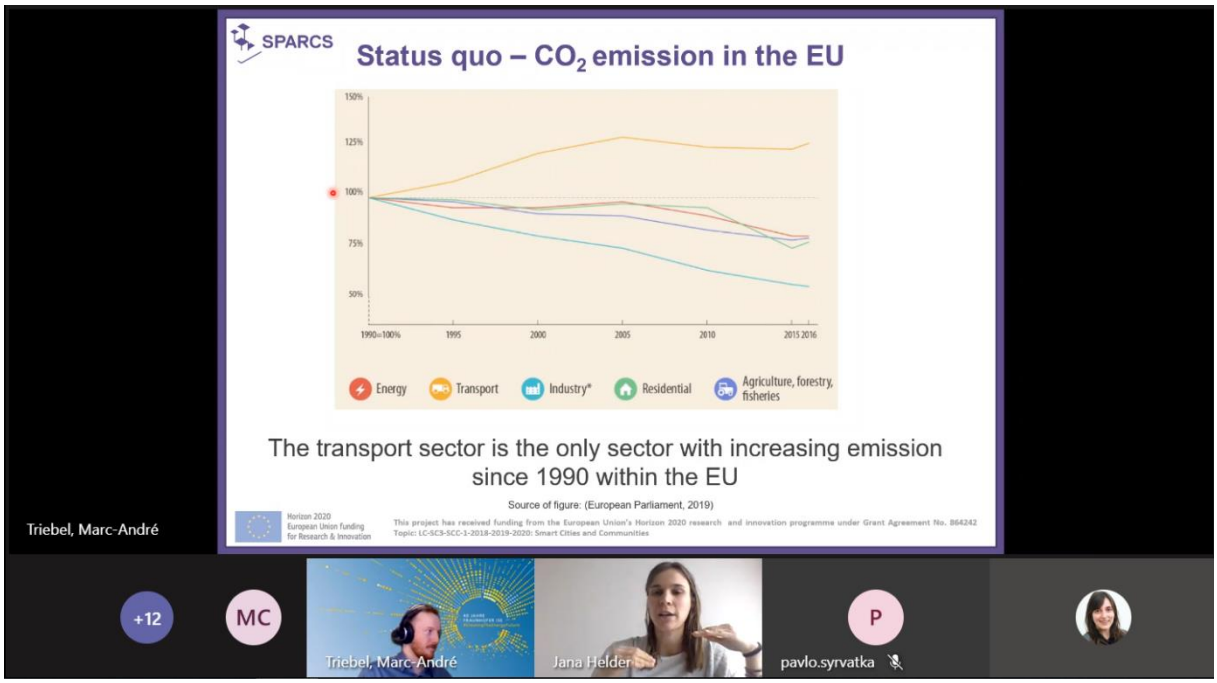


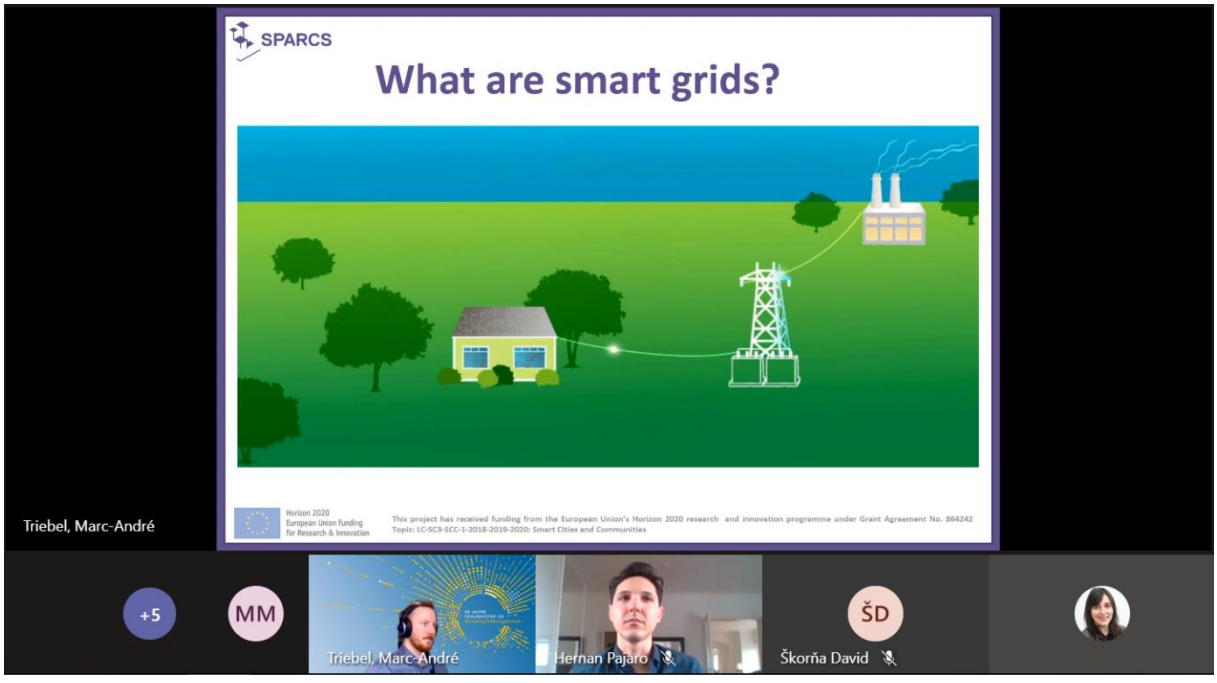
This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities



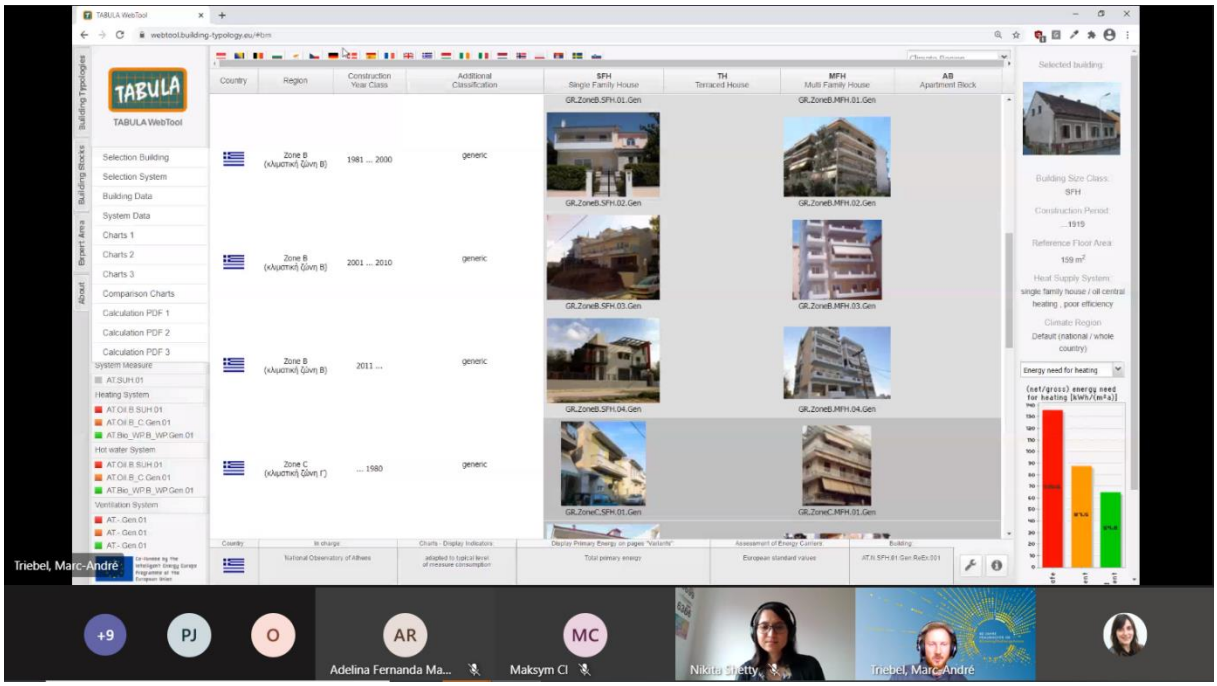


This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities





This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 864242
Topic: LC-SC3-SCC-1-2018-2019-2020: Smart Cities and Communities