

GRETERE

Green Terra Development: EU policy and the best practices

Smart city planner – part 2 (EU smart cities)

«Устойчивое развитие территорий:
Европейская политика и практические решения»,
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Management layers

European projects which are funded by the European commission, European council or other authorities of EU.

National projects, which are funded by state programs for smart-city and digitalization purposes.

Regional and municipal level projects leaded by mayors and governors.

This is not case by case, there is the system

EU community presupposes exchange of data, experience and know-how to collaborate on the creation of smart cities and an energy-efficient urban environment.

So each hint which was discovered in one town may be replicated in other city without costs for development of it from the ground.

Development of such a system is a responsibility of Smart Cities Information System (SCIS) which is applicable for EU funded projects.

Also R&D and private participation

Most Smart City initiatives have the potential to support innovative growth and R&D. They are funded by a variety of sources, including government and private companies, which share a common interest in progress in this area.

To contribute to the innovation and R&D target by further stimulating private sector R&D investment, it is essential that projects are evaluated and lessons learnt from them to enable further development.

Overall EU smart city goals

The Europe 2020 target could be addressed through initiatives that focus on:

- Smart Environment
- Smart Mobility
- Smart Economy
- Smart Governance
- Smart Living
- Smart People

Comparison of smart cities

You cannot compare smart cities since they all have different problems, scale of those problems and the solutions to them based on infrastructure specifics, social behaviour and historical background.

Barcelona smart city

The city of Barcelona has got the ambition to become a model Smart City for the whole world. Its vision is to:

- ☐ integrate the information technologies in the city,
- ☐ relate the different areas and sectors,
- ☐ find synergies and added value,
- ☐ generate transversely and cooperative knowledge.

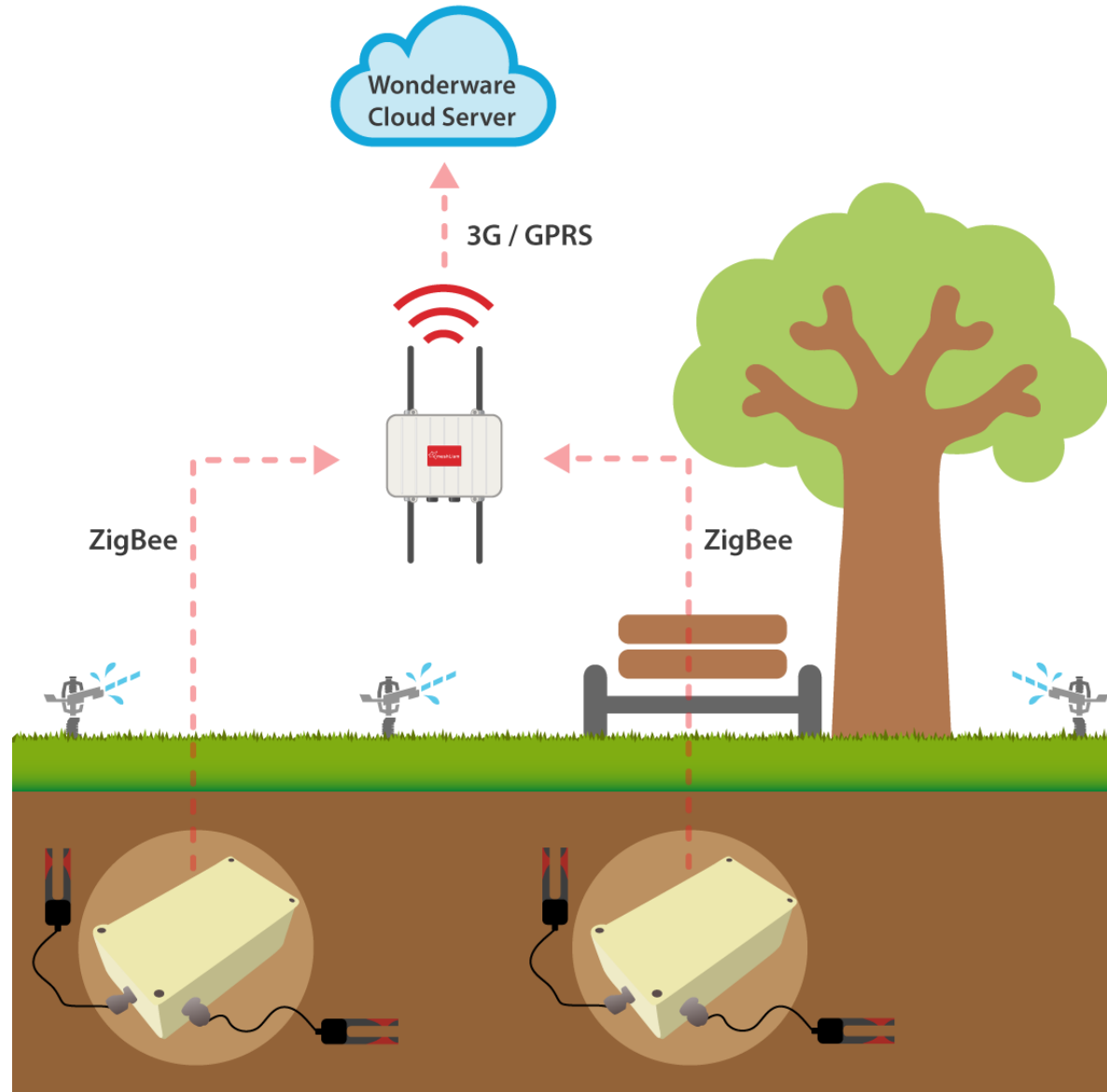
Barcelona smart city

Barcelona provides a best practice use case in the development of a platform-based architecture for its sensors and devices. Barcelona's Smart City platform, known as the Urban Platform, brings together data from the open source network of sensors and actuators, the city's information systems, and social networks, allowing it to solve urban challenges across silos. With the aim of overcoming the limitations of a vertical system, platform is designed as a horizontal platform that facilitates sharing information between heterogeneous systems and the easy integration of legacy applications.

The platform manages all the sensors installed in the city in real time, from traffic flow to ambient noise, and already processes 1 billion+ transactions that are received from the 14,000+ sensors with which it communicates.

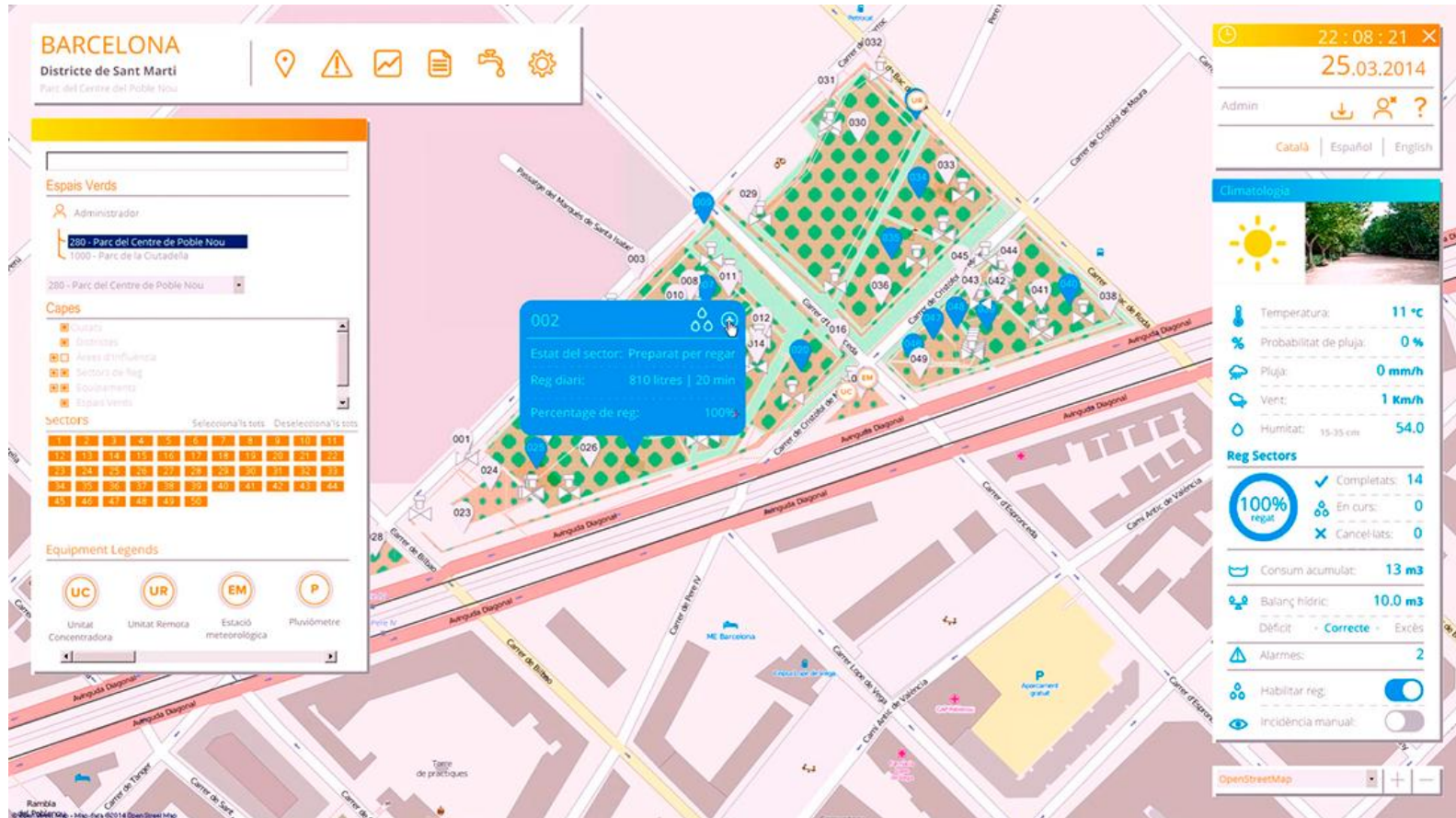
Barcelona smart city. Irrigation system management

The deployment is based on sensors technology and consists in allowing remote control of the irrigation system to facilitate the management of the water network.



Barcelona smart city. Irrigation system management

The information collected can be visualized in a platform which concentrates and allows knowing the state in each zone. Two departments of Barcelona Council, Urban Services and Computing to carry out the application which can be controlled with computers, smartphones and also tablets.

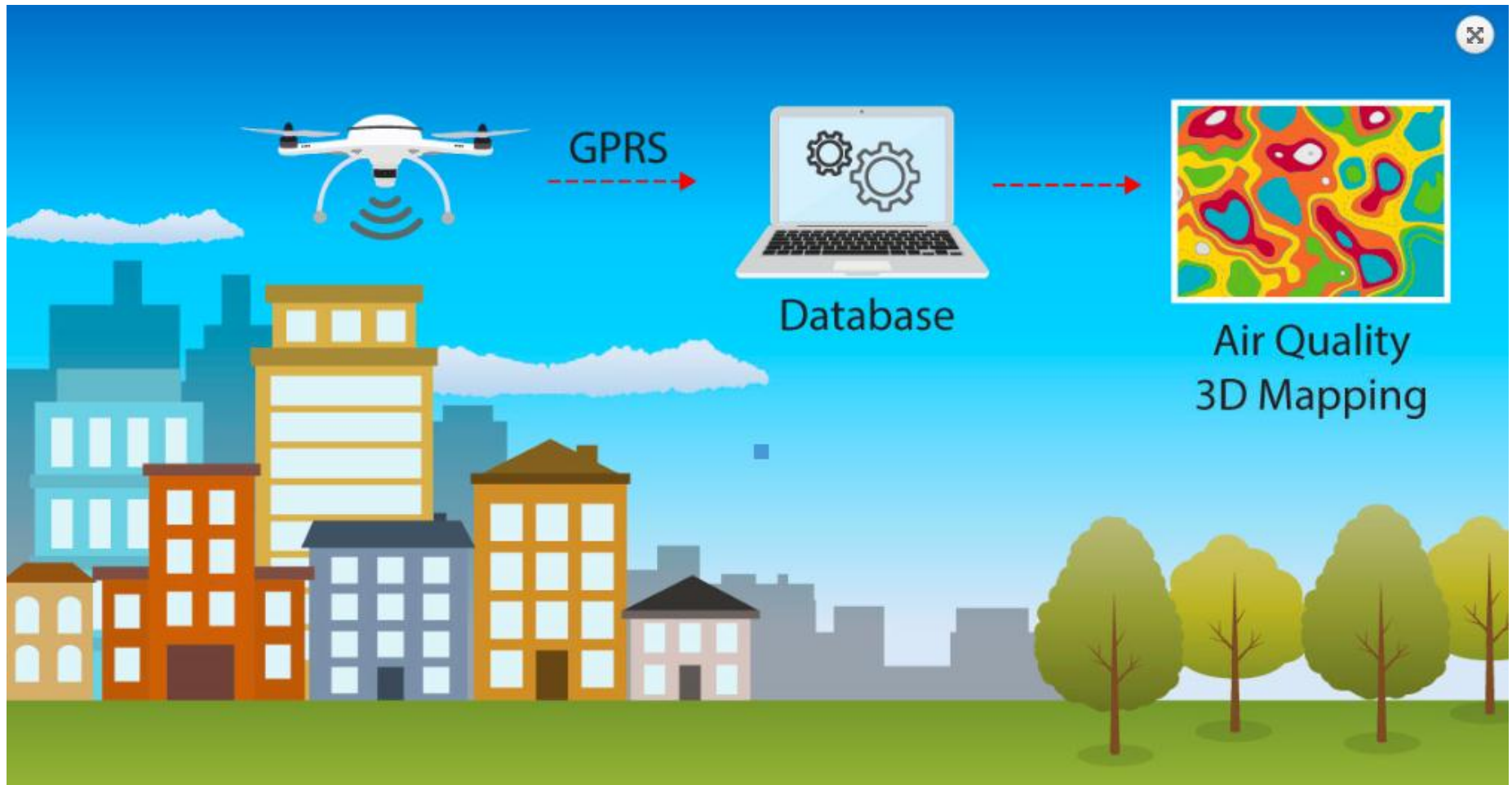


Crete 3D air quality modeling with sensor drones

The evaluation of air quality and pollution has been traditionally conducted by ground based monitoring. Complexity of the terrain and physical barriers usually complicate data collection, augmenting costs and decreasing efficiency and performance.



Create 3D air quality modeling with sensor drones



Copenhagen smart city

Copenhagen has a vision to become the world's first carbon-neutral capital by 2025. Therefore, the city is currently implementing a range of new and innovative solutions within the fields of transport, waste, water, heating and alternative energy sources to support this aim and improve sustainability, in many initiatives. By testing these solutions, the city hopes to attract innovative companies, which will in turn support the economy through the process of becoming greener and smarter.

Copenhagen has the objective to increase the number of people 'cycling to work and education from 35% in 2011 to 50% by 2050' and to reduce 'each Copenhagen citizen's (water) consumption from 100 litres per day to 90 litres per day in 2025'

Copenhagen smart city. Cycling

Copenhagen has an extensive network of cycle lanes, which is still being expanded. In 2011, 35% of commuters went to work by bicycle. Urban planning takes cycling infrastructure into account as a crucial parameter of the city's traffic concept.

TURN ON
YOUR LIFE
TURN ON
THE CITY

THE COPENHAGEN WHEEL



*"Transform your ordinary bicycle into a **hybrid E-BIKE** that also provides feedback on pollution, traffic congestion and road conditions in real-time!"*

This allows bicycles to become Smart by equipping them with sensors in their wheels. These sensors measure environmental data like 'noise pollution, congestion and road conditions'. The collected data are sent anonymously to the city in order to analyse environmental factors and measure the impact of traffic on the city infrastructure; furthermore the data may be fed into the decision-making process when environmental or transportation issues are on the agenda.

Vienna smart city

Solutions deployed in the Smart City Vienna included:

a) Integrated mobility concept 'SMILE' Smart Mobility Info and Ticketing System Leading the Way for Effective E-Mobility Services (SMILE) is the prototype of a multi-modal mobility platform. The platform aims to cover all public and individual mobility services for customers, providing comprehensive Information on the various options for getting from A to B. It is developed in a joint research project by two cityowned enterprises (public utility company Wiener Stadtwerke and public transport operator Wiener Linien) and the Austrian Federal Railways (ÖBB)

b) Mobility solution 'eMorail' eMorail is a demonstration project, which aims to produce a blueprint for an innovative, costefficient and environmentally friendly mobility solution for commuters. Core elements of the project are an integrated transport service and an intermodal e-car sharing and e-bike service. Additional services such as information and repair are intended to complete the package. eMorail maintains a smart phone application, which increases accessibility for customers.

Amsterdam smart city

Amsterdam set out its sustainability targets in the Structural Vision 2040 (CoA, 2011) and the Energy Strategy 2040 (CoA, 2011(a)). In these documents they stated the ambitions of:

- ☐ climate-neutral municipal organisation in 2015,
- ☐ 40% reduction in CO2 emissions in 2025, compared with 1990 levels,
- ☐ 75% reduction in CO2 emissions by 2040.

ENERGY EFFICIENCY IN BUILDINGS

Retrofitted area	m ²
Newly built area	m ²
Investment	€/m ²
Payback period	number of years
Final energy demand (baseline)	kWh/m ² /yr
Final energy demand (after)	kWh/m ² /yr
CO ₂ emissions reduction	tCO ₂ /yr
Energy supply	list of technologies used to supply the building

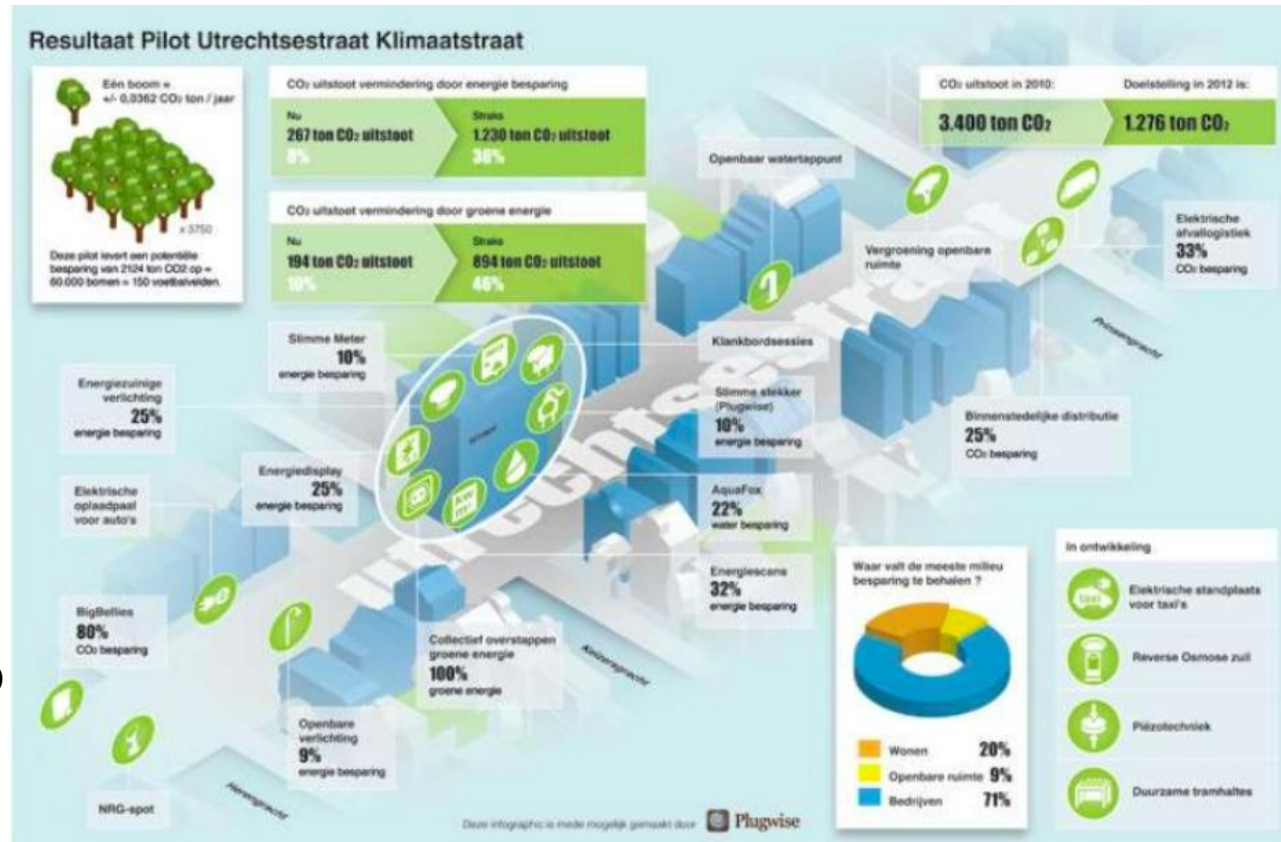
- **Retrofitted area:** net floor area of the energy-efficient building(s) renovated within the project.
- **Newly built area:** net floor area of the energy-efficient building(s) built within the project.
- **Investment:** total amount of money allocated for the intervention of the buildings reported.
- **Payback period:** time in which the initial cash outflow of investment is expected to be recovered from the cash inflows (savings) generated by the investment.

- **Final energy demand (baseline):** delivered energy to end users that is demanded to provide desired services within the building (e.g. comfort levels), taking into consideration the energy consumption from the reference situation (according to the normative or to business as usual). The total final energy demand is calculated as an addition of the thermal (heating or cooling) energy and electricity. In case more than one building is involved in the intervention, the average for the buildings is given.
- **Final energy demand (after):** delivered energy to end users that is demanded to provide the same services after the intervention. The total final energy demand is calculated as an addition of the final thermal (heating or cooling) energy and electricity delivered to the building. In case more than one building is involved in the intervention, the average for the buildings is given.
- **CO₂ emissions reduction:** this KPI indicates the tonnes of CO₂ that are saved yearly thanks to the intervention carried out in the buildings. It is calculated according to the CO₂ factors either reported by the project or found in literature. In case more than one building is involved in the intervention, the average for the buildings is given.
- **Energy supply:** list of technologies used to supply the building.

Amsterdam smart city

The 'Klimaatstraat'

Objectives of the Klimaatstraat Project, as defined by Smart Stories, include the reduction of CO2 emissions and energy consumption in Utrechtsestraat. This was to be achieved through a combination of sustainability initiatives (sustainable waste logistics, energy displays, LED lighting, smart meters and energy management systems) and the related changes in user behaviour.



Amsterdam smart city



Houthaven used to be a harbour and timber handling area, situated close to Amsterdam city centre, where many wood factories and related companies were located. After a long history of industrial activities, Houthaven is being transformed into a residential area. In total, seven islands are under development, providing space for 2200 dwellings, 70 houseboats and 50 000 m² facilities. In the NEXT-BUILDINGS project, 30 000 m² of net zero-energy buildings were realised within Houthaven in the area named Blok 0.

Links and references

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