



# Innovate and replicate

## Lessons learned by follower cities in the STARDUST Smart Cities project

### Abstract

In Smart Cities projects, the primary goal is to replicate innovative solutions beyond the initial demonstration cities. Lighthouse cities (LHC) collaborate to develop and test solutions, which are then adopted and adapted by follower cities for their own use. The following covers some of the main lessons learned by the STARDUST project [follower cities](#) – Cluj-Napoca (Romania), Kozani (Greece) and Derry (UK). The [lighthouse cities](#) are Pamplona (Spain), Tampere (Finland) and Trento (Italy).

### Key points

Follower cities on their way to carbon neutrality by 2030&2045

Capacity building activities and knowledge exchange between LHCs and followers

Local stakeholder engagement in replication plans

Making decisions, nudging interventions, and drafting financial plans for adapted replication

### The set-up for replication

To transfer the LHCs' solutions to the follower cities, deployment desks were set up. These act as an interface between the project and the local stakeholders. Capacity building activities in form of workshops were carried out in order to design and consolidate replication plans. These plans were crafted using the insights and expertise gained from the project's activities in the lighthouse cities and drawings on lessons learned from other Smart City projects. Additionally, local market players and citizens actively contributed to the development of jointly agreed replication strategies.

### Brief summaries of lessons learned by follower cities (FC)

#### Derry

In **Tampere**, we gained insights into the significance of utilising biogas derived from biowaste, particularly in their refuse trucks. Additionally, we gathered valuable lessons on the difficulties associated with **integrating PV systems into buildings**.

In **Pamplona** we learned about the potential of **district heating (DH)** as a viable heating source – which has inspired a feasibility study for potential DH in Derry. Pamplona's system demonstrates that biomass is sustainable only when obtained locally and when forests are managed sustainably. Also, we learned a lot about the value of the new **BEMS** software platform that controls & manages all data for a set of public buildings.

From **Trento**, we gained insights into

the challenges associated with building ownership in renovation projects, emphasizing the importance of thoroughly exploring potential issues at the beginning of the feasibility process. Additionally, we found their e-mobility projects quite intriguing.

Involvement as a follower city has highlighted the need for close cooperation with the LHCs – to maximise knowledge transfer. We firmly believe more 'virtual' seminars and workshops are needed for follower cities to gain 'meaningful' insights.

#### Cluj-Napoca

In **Tampere**, we discovered that to finalize public contracts for innovative solutions, it is crucial to allocate sufficient time for understanding and finding jointly agreed solutions. This ensures the development of a feasible contract leading to well-running services in the end.

In **Pamplona** we learned that it is wise to conduct **financial efficiency simulations and calculations before implementing** innovative technical solutions.

In **Trento**, we gained **insights into how changes in local constraints** can impact planned implementation activities. It is advisable to have a contingency plan in place, establish a robust relationship with the local administration, and consider potential legislative options that might affect the city plans.

## Kozani

In **Tampere**, we discovered that **procurement processes for renovating municipal buildings** were extensive and time-consuming, a situation similarly noted in Kozani. To mitigate this, it is crucial to allocate sufficient time and provide precise solutions before initiating a public contract for innovative solutions.

In **Pamplona**, we gained insights that **biomass sourced from nearby forests is climate-neutral and renewable** when obtained close to the point of consumption and derived from sustainable forest management. Regarding pricing policies, it's essential for the energy sales rate to be competitive with existing market rates.

In **Trento** we learned that **changes in local environmental conditions** have an impact on project activities, making it advisable to have a contingency plan in place beforehand.

## Becoming climate-neutral by 2030

The STARDUST follower cities are all aiming to become climate-neutral in the coming years. Cluj-Napoca and Kozani have been selected for the EU Mission of being **two of 100 climate-neutral and smart cities by 2030**. Derry aims to achieve climate-neutrality by 2045.

This goal will be achieved through a series of actions that include:

- Energy saving measures in municipal buildings, in street lighting, as well as in the residential and tertiary sectors.
- Energy saving measures in the transportation sector.
- Increase in the percentage of electricity from Renewable Energy Sources.
- Savings measures in the agricultural sector.
- Awareness raising and information actions for the citizens and especially for the young generation.

## Derry

Carbon reduction measures are addressed within Derry's 'North West Regional Energy Strategy' and 'Net Zero Roadmap Analysis'.

To achieve the goal of net-zero by 2045, Derry will implement the following measures:

- Smart Energy Management of regional energy assets to minimise energy bills & unlock new revenue streams.
- RES & storage – maximise green renewable generation coupled with energy storage technologies.
- Low Carbon Transport reduces carbon emissions & improves air quality.
- Low Carbon Heating enables the transition to low carbon & emission free solutions.
- Energy Efficiency measures across the region to reduce consumption & CO2 emissions.

Inspired by Pamplona's new biomass district heating (DH) system, work has begun on a feasibility study into DH for **Derry** – with identification of a potential waste heat source, and anchor loads/customers.

## Cluj-Napoca

The municipality of Cluj- Napoca pursues seven key interventions:

- Integrated urban regeneration of apartment building blocks (77% of residential homes).
- Deep renovation of public and commercial buildings (responsible for half of GHG emissions of buildings) and brownfields re-developments.
- Improvement of public spaces quality.
- Extension of the infrastructure of electric charging stations and of benefits for electric car users.
- Extension of the Walkable City Program & update of the parking area policy.
- Enriching the green transport infrastructure.
- Continuous expansion of green areas in the city.

## Kozani

Kozani serves as municipal building manager, energy system operator and energy community. It thus investigates and supervises the following:

- Categorisation of yearly municipal energy and maintenance costs.
- Prioritisation of refurbishment, construction and investment plans.
- Local capacity building / brainstorming workshops.
- Initiating, planning, designing and implementing.
- Tenders & contracting selected

enterprises.

- Socio-economic surveys.
- Awareness raising and informing via municipal communication channels.

### Challenges and solutions

- Local and STARDUST experts identify local challenges through questionnaires and analysis, before offering scenarios and potential solutions
- For their integration, smart city measures need more affordable intelligent technologies, and also business models that draw on economic appraisals.
- The preservation of building heritage can pose a challenge as in certain cases in the past.
- Traffic jams are an issue for all citizens. Therefore, much effort and investment are being put into relevant measures with short and medium-term benefits.
- Charging spots need to be identified in dense collective housing neighbourhoods.

### General Conclusions

In cooperation with key stakeholders, the following conclusions have been drawn:

- At the **municipal level**, energy efficiency should be increased, and renewable energy sources integrated into buildings.
- **Socio-cultural** inclinations will play a pivotal role in shaping the future **of the transport sector**, influencing vehicle preferences and usage patterns.
- **ICT is the glue of “smart” attributes of cities**, encompassing sensor deployment, analyses of large datasets, and widespread internet utilization to enhance accessibility and user-friendliness of services.
- **Financial dimensions** are pivotal in ensuring the feasibility of replicating interventions, especially in the neighbourhood of the same city and its surrounding.

From the early stages of proposal development, more **time and resources** should be allocated **to facilitating exchanges of ideas and experiences** among peers. It is evident that **fostering a consistent dialogue** among the project participants is essential for steering the project in a positive direction.

### Authors

Anne Artt (Derry)  
Athanasios Labropoulos (Kozani)  
Melania Blidar (Cluj-Napoca)  
Michael Heidenreich and Laura Nieto  
(Greenovate!Europe)

Learn more about  
STARDUST project:  
[www.stardustproject.eu](http://www.stardustproject.eu)  
[communication@stardustproject.eu](mailto:communication@stardustproject.eu)



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