
# Work Package 3

Executive Summary:

D3.4+3.5 Inventory of pipeline projects and windows of opportunity in each focus district & List of innovative projects for common development across the partner cities


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# Executive Summary


**Deliverable aims and objectives**

Deliverable D3.4+3.5 combines two deliverables from the STEP UP Description of Work: D3.4, 'Inventory of pipeline projects and windows of opportunity in each focus district' and D3.5, 'List of innovative projects for common development across the partner cities'. The deliverable is part of Work Package 3, 'Development of innovative projects'. In this work package the STEP UP partner cities are developing a number of innovative projects based on an integrated approach.

The goal of this deliverable is to select innovative projects for further development within the remainder of Work Package 3: D3.6, 'Full description of each project', and D3.7, 'Show for each project that the integrated approach achieves better energy and climate impact'. The projects have been identified with the help of the cities' cross-sectors opportunities identified in D2.5, enhanced SEAPs which will be presented in D2.7 and challenges and opportunities which were identified in D3.3. The analysis of pipeline projects is a way for the STEP UP partners and the learning network to learn more about innovative project development in their own cities and also presents an opportunity for the cities to learn from each other and identify potential opportunities to work together on the development of projects. As a result, this deliverable feeds into the learning process within Work Packages 4 and 5, by enabling the companion cities and the learning network to learn from innovative projects in the STEP UP partner cities. Furthermore, this deliverable feeds into D5.8 within Work Package 5, which focuses on the dissemination of the two pipeline projects selected by each of the cities in this deliverable, connecting with the dissemination strategy for the cities' enhanced SEAPs.

**City approaches**

In this deliverable the cities were given the mandate to select five innovative pipeline projects and then evaluate them using a common questionnaire and scoring system, in order to select two projects for further development in Work Package 3.

A large amount of research was conducted into academic publications for innovation studies in order to understand what makes projects innovative and successful. This research provided the basis of a unique STEP UP analytical framework which was then used to develop a structured questionnaire. The questionnaire focused on issues such as stakeholder engagement, EU2020 targets, windows of opportunity, innovation, replication potential, and each pipeline project's link to key challenges and priorities addressed by the city's SEAP.

It is important to note that as a pre-requisite for projects to be considered as pipeline in the context of the STEP UP project, they must at least meet the following three criteria: integrated approach, contribution to the city's SEAP and EU2020 targets. If this was not the case, then the project was not considered as part of this research.

The cities' responses to the questionnaire fed into a scoring system, and the results were displayed on a radar chart for each project. The cities also provided additional qualitative information on their projects, based on key priority areas for the SEAPs as set out by the Covenant of Mayors. Whilst this additional information did not directly feed into the scoring system or radar chart, it provided further justification for the selection of projects, and also ensured that the information required by the Covenant of Mayors for SEAP templates was gathered at this stage, with any gaps in the information identified and addressed where possible.

By reviewing the radar charts, the scores each project achieved, and relevant qualitative information about their projects, the cities were able to decide which two projects to select as innovative projects for further development later in Work Package3, and for further discussion with other cities to look for shared experiences and opportunities to work together going forward.

The scoring serves as an analytical tool and as a checklist for crucial factors that should be considered for innovative projects to be more successful in fulfilling their objectives. The final scores – illustrated in radar charts in the cities' Excel sheets and in the results section of this report – should not therefore be seen as a comprehensive performance measurement of the innovative projects, but rather as a guideline for cities to decide which projects to select for further development, and therefore to further analyse.

**Key findings**

The table below gives an overview of the 20 pipeline projects (five in each city) that have been reviewed in this deliverable, their scale, the sectors that are covered, the innovation of the project, each project's time frame and who is responsible for delivering the project. The two innovative projects that each city has chosen for further development within the STEP UP project are marked in light blue in the table below.

**Table 1. The pipeline projects and their characteristics**

| Project | Scale | Sectors | Innovative approach / technology | Time frame | Responsible body |
|---|---|---|---|---|---|
| **Ghent** | | | | | |
| Liveable streets | District | Transport, energy, green spaces, youth | Urban planning: experiments to encourage modal shift and alternative use of space | 2012-2017 | Local authority, NGOs, community groups |
| St Amandsberg Dampoort | District | Energy, transport, buildings, green spaces | Urban planning: combination of transition management for bottom-up projects with top-down infrastructure and renewal projects; pilot for city's climate neutrality goals | 2013-2025 | Local authority |
| Optimisation of district heating network | District | Energy (tertiary, residential and industry sectors), ICT | Technological: increasing efficiency through CHPs and use of waste heat | 2013-2024 | EDF Luminus, BEE-power, Eandis |
| Old Docks | District | Energy, transport, waste, water | Technological: new nearly zero energy buildings, including social housing | 2014-2021 (first phase) | Public/ private partnership (developer as responsible body) |
| Ghent Port Company use of waste streams | District | Energy, transport, waste, materials | Technological: increasing efficiency using residue and by-products from the port area for heat production | Ongoing facilitation | Port of Ghent |
| **Glasgow** | | | | | |
| District heating schemes and ESCo | District | Energy, waste | Technological: creation of energy services company (ESCo) to enable development and expansion of district heating schemes; integration of CHP and use of energy from waste | 2014-2015 and onwards | Local authority |
| Demand side management (public sector buildings) | District | Energy, ICT | Technological: demonstration of smart grid environment and smart building energy management | 2013-2014 | Local authority |
| Electric vehicles | District | Transport, energy | Technological: municipal fleet and public transport | 2013-2015 | Local authority |

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| | | | upgrades; expansion of city charging network for private cars | | |
| iTree - valuing urban trees | City | ICT | Technological: use of international tree cataloguing model to develop urban forest inventory | 2013-2014 | Local authority |
| Online virtual building energy model | District | Energy, ICT | Technological: online energy modelling tool to encourage behavioural change and compile city wide data on building stock | 2013-2014 (first phase) | Local authority |
| **Gothenburg** | | | | | |
| Smart urban logistics | District | Energy, transport, waste, ICT, consumption | Urban planning: development of micro-terminal and city delivery options, linked to waste management and recycling | 2014-2021 | Local authority |
| Planning for sustainable urban lifestyles | District | Transport, energy, consumption, behavioural science | Urban planning: using planning to create conditions for behavioural change in energy and transport use | 2014-2021 | Local authority |
| Cableway | District | Transport & potential for integration of renewables | Technological: demonstration of a new, more efficient type of public transport | Project development during 2014 | Local authority |
| Jubilee Park | District | Energy, water, transport | Urban planning: enabling city residents to be close to recreation and green spaces; re-use of rain and storm water | 2014-2021 | Local authority |
| Smart energy storage | City | Energy, ICT | Technological: demonstration of efficient control of heat production and supply to buildings and neighbourhoods | Still in development phase | Gothenburg Energy |
| **Riga** | | | | | |
| Energy efficiency database for multi-apartment residential buildings | District | Energy, ICT | Technological: provision of accurate heat consumption data and comparison to renovated housing stock; inclusion of all buildings connected to the district heating system | 2013-2020 | Riga Energy Agency (municipal) |

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| Smart meter data remote reading and transmission | District | Energy, ICT | Technological: use of smart meters for precise data collection and provision of accurate information to customers to encourage energy saving measures | 2013-2030 | JSC Sadales tīkls (network operator); local authority |
| Heat pumps with thermoprobes for buildings heat supply | District | Energy, ICT | Technological: demonstration of use of heat pumps with automatic operation and remote control to increase efficiency | 2012-2020 | Riga Energy Agency (municipal), Riga City Property Department |
| Electric vehicles - procurement and charging stations | District | Energy, transport | Technological: additional procurement of municipal electric vehicles; installation of fast charging stations to encourage modal shift among the public | 2014-2015 | JSC Latvenergo and Zero Emission Mobility Support Society; local authority |
| Waste water heat recovery from multi-apartment residential buildings | District | Waste water, energy, ICT | Technological: demonstration of waste water heat recovery device with built-in heat exchanger and heat pump to increase efficiency, reduce waste and consumption; data monitoring using separate heat and electricity meters | 2014-2020 | Local authority |

As set out in the table above, the projects can be divided into two themes in terms of the innovative approach taken to move towards more efficient, low carbon energy projects; those that focus on technological solutions and those that focus on urban planning solutions. Four of the selected pipeline projects (in light blue in the table above) are focused on technological solutions, namely those in Glasgow and Riga. Four projects have more of a focus on urban planning, namely those in Ghent and Gothenburg.

Table 2 below provides a summary of the performance of all the innovative pipeline projects analysed by the cities against the five key STEP UP criteria, based on the results from the deliverable questionnaire. For windows of opportunity and replicability, projects have been given a high, medium or low score, based on responses to the relevant questions in the analytical framework and their corresponding scores (see Table 3 in the methodology).

For EU2020 targets, the contribution to the SEAP and the integrated approach, whether these criteria were met was determined by a single question in the questionnaire, for which cities were given the choice 'yes' or 'no'. Therefore, it is not possible to achieve a high, medium or low score but in the table below the colour green is used to show that the cities have responded 'yes' for all projects.

**Table 2. Comparison of the performance of all pipeline projects against key STEP UP criteria**[1]

| Project | EU2020 targets | Contribution to SEAP | Integrated approach | Windows of opportunity | Replicability |
|---|---|---|---|---|---|
| **Ghent** | | | | | |
| Liveable streets | | | | High | High |
| St Amandsberg Dampoort | | | | High | High |
| Optimisation of district heating network | | | | Medium | Medium |
| Old Docks | | | | High | High |
| Ghent Port Company use of waste streams | | | | High | High |
| **Glasgow** | | | | | |
| District heating schemes and ESCo | | | | High | High |
| Demand side management (public sector buildings) | | | | High | High |
| Electric vehicles | | | | High | Medium |
| iTree - valuing urban trees | | | | High | Medium |
| Online virtual building energy model | | | | High | High |
| **Gothenburg** | | | | | |
| Smart urban logistics | | | | Medium | High |
| Planning for sustainable urban lifestyles | | | | High | High |
| Cableway | | | | Medium | Low |
| Jubilee Park | | | | High | Medium |
| Smart energy storage | | | | Medium | Medium |
| **Riga** | | | | | |
| Energy efficiency database for multi-apartment residential buildings | | | | High | High |

[1] Key: High (dark green) = project achieves the maximum possible score (100%) or city has responded 'yes' to dichotomous choice questions; High (light green) = project scores within the top third (66-99%); Medium = project scores within the middle third (33-66%); Low = project scores within the bottom third (0-33%).

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|---|---|---|---|---|---|
| Smart meter data remote reading and transmission | | | | High | High |
| Heat pumps with thermoprobes for buildings heat supply | | | | High | High |
| Electric vehicles - procurement and charging stations | | | | High | High |
| Waste water heat recovery from multi-apartment residential buildings | | | | Medium | High |

The fact that all cells for the first three key STEP UP criteria are green emphasises the fact that meeting these is a prerequisite for projects to be included in this deliverable, and shows that the cities are considering these key criteria when developing innovative projects, which should mean that the projects involve different sectors and actors, have a high impact at lower risks and costs, help to address city challenges and grasp potential opportunities for the enhanced SEAP.

However, the nature of the deliverable questionnaire means that the cities were not obliged to detail *how* their projects contribute to EU2020 targets. It can be seen from the additional information provided by the cities that for several of the selected projects the contribution that they will make to $CO_2$ emissions reductions is not yet known or estimated, or is difficult to quantify due to the nature of the project; this is an important gap in the analysis at this stage, and information on this will need to be gathered in the next deliverable (D3.6) as part of the development of detailed plans for these projects.

It can be seen in the table that most projects achieve a high score for both windows of opportunity and replicability. Only one project, Gothenburg's Cableway, achieves a low score for any criteria, as its replication potential is seen to be low. In most cases, the two selected pipeline projects in each city achieve a high score for all key criteria, with Gothenburg's smart urban logistics project as the only exception as it scores slightly less for windows of opportunity.

Achieving the highest possible score (100%) is clearly challenging for windows of opportunity and replicability, with only two of the selected projects (liveable streets in Ghent and district heating in Glasgow) achieving this score for either of these criteria. It is clear that when projects are still in the planning phase this presents challenges for the windows of opportunity, owing to the fact that subsidies or funding are not yet established or that relevant policymakers are not yet involved in the project. Gothenburg's smart urban logistics project is a good example of this, presenting lower

windows of opportunity compared to the other selected projects. Some projects have slightly lower replicability due to the solutions being bound to the city's physical or socio-economic context, as exemplified by the majority of the selected projects. However, even if projects are not replicable in their entirety, elements of them are likely to be relatively straightforward to replicate elsewhere, which may not be reflected by these scores.

Lower scores indicate areas for the cities to focus on and strengthen as they develop their projects further in the remainder of Work Package 3, in order to ensure they are truly innovative and offer greater benefits to the city and its inhabitants.

**Key recommendations**

This deliverable and its analytical framework have helped the cities to evaluate their pipeline projects. Several learning points have emerged, which have led to some key recommendations for STEP UP partners, as well as for other cities that are looking to develop their own innovative projects. These recommendations are set out below:

For STEP UP cities:

- **Use the results of this exercise to identify key characteristics of the selected projects for further development.** Whilst this exercise has shown the strengths of the selected projects, in terms of key STEP UP criteria and the functions of Technological Innovation Systems, it has also highlighted areas which could be improved, both in the selected projects and those pipeline projects which have not been selected but may well still be implemented by the cities. The cities should learn from this and focus on strengthening these areas as they continue to develop their innovative projects going forward.
- **Evaluate and improve the analytical tool.** During the work on this deliverable some weaknesses of the tool have been identified. For example, the cities could interpret the terminology used, and therefore answer the questions, in different ways. Whilst this has not caused any significant problems for this deliverable, improvements to this could make the projects more comparable.
- **Reuse the analytical framework when evaluating other integrated, innovative projects for further development.** The analytical framework gives a structure to the task of project analysis and enables comparisons between different projects. However, the tool might need some amendments to improve its functionality based on the learnings from this deliverable (see below).
- **Consider using the tool during the project planning phase as well as for project selection.** The analytical framework can also be used for one singular project during project planning. It gives

an overview of the project and it can help cities to reflect on how the project can be more innovative or more integrated. For example, if the project as it is planned scores low on integrated approach the results can start a discussion on how this element can be strengthened.

- **Do not restrict project appraisal to this tool only; other data and resources are valuable and required.** The tool is not capable of telling the user everything about a project, and the tool is never better than the work behind it. The cities still need to add information from key stakeholders or experts when analysing or developing project opportunities, including data on project economics and energy impacts, either in estimated or actual form.
- **Use the results of this exercise to identify opportunities for learning and the development of common innovative projects.** The deliverable has highlighted that a project that is seen to be innovative for one city may already be implemented in some form in another city. This presents the potential for cities to share their experiences and work together to help each other develop innovative, high impact projects. In addition, using this and earlier WP3 deliverables the STEP UP cities should work together to identify opportunities to develop common projects based on shared challenges and opportunities over the coming months.

For other cities:

- **Use a tool for project evaluating, such as the STEP UP analytical framework.** Using a tool when evaluating projects presents opportunities for valuable discussions and can help support decision-making in project selection.
- **When using tools like the analytical framework, be sure its purpose and potential is well understood first.** A tool can easily be misunderstood or misinterpreted, affecting the value and comparability of the results that emerge from it. Therefore, it is important that participants know what the tool is capable of showing, what it does not show and what weaknesses it has.
- **Do not restrict project appraisal to this tool only; other data and resources are valuable and required.** This is also a valuable recommendation for other cities outside the STEP UP project. A tool is not capable of telling the user everything about a project, and the tool is never better than the work behind it. The cities still need to add information from key stakeholders or experts when analysing or developing project opportunities, including data on project economics and energy impacts, either in estimated or actual form.

**Next steps**

The next step within Work Package 3 is to develop the projects selected in this deliverable ‘to the edge of implementation’. The next deliverable, D3.6 ‘Full description of each project’, will consist of

a project plan for each selected project that builds on the information that has been gathered in this deliverable. This includes a project description, stakeholder analysis, risk analysis and risk management, financial information and business models, key milestones in the project, time plan, impact analysis, replication potential, integrated approach, and learning and experimentation. The final WP3 deliverable, D3.7, will also focus on these selected innovative projects, showing that the integrated approach results in better energy and economic impacts, compared to traditional approaches. The projects selected in D3.4+3.5 will also feed into the cities' enhanced SEAPs, which will be presented in D2.7, the implementation plans (D2.8) and the documentation of the STEP UP approach in D2.9. Finally, communication and dissemination plans for the selected projects will be created in D5.8, in the context of the cities' wider SEAP dissemination strategies. These will include key actions and messages to reach a variety of stakeholders.

Further steps to take are to work with the companion cities, through WP4, on how the STEP UP cities select and develop innovative projects, and also to spread the information to the wider learning network. This could include promoting the use of the analytical framework to cities in the learning network that are looking to select and develop innovative projects of their own.

In addition, this exercise, along with the outputs from earlier Work Package 3 deliverables, such as the identification of best practice projects and lighthouse initiatives in D3.1 and D3.2 and the identification of challenges and opportunities in D3.3, should all serve to help the cities work together to share their experiences and learn lessons from each other, either to help one city develop a new innovative project in an area other cities already have experience in, or to identify project ideas that are new to multiple cities and could be developed together with pooled knowledge, experience and resources. Whilst the focus of this deliverable has primarily been on selecting innovative projects for further development within each city, discussions are continuing between the cities on opportunities to share ideas and experiences and explore the potential for common development further. This has included a workshop at the recent partners meeting in Riga, as well as ongoing discussions around the legacy of the STEP UP project and the opportunities for the STEP UP cities to continue working together.