Guidance for STEP 7 Template 'Analytical framework'

This document sets out guidance for cities interested in analysing potential innovative projects using an Analytical Framework tool developed and tested during the STEP UP project. The tool was developed by STEP UP partner SP Technical Research Institute of Sweden.

This document provides a brief introduction to the tool, followed by step by step guidance for its use. For those interested in understanding how the tool was developed, the research background for the framework is also described.[1]

The aim is that a city, with the help of the framework, analyses a number of pipeline projects and then uses the results of this analysis (by way of the scores each project achieves) to select which projects to further develop and transform into 'innovative projects'. The template can be found in a separate Excel sheet.

1. Introduction to the STEP UP Analytical framework

The STEP UP Analytical framework is based on a field of research called 'Technological Innovation Systems' (TIS).[2] It uses a scoring system that is centred on seven 'functions' that affect – or have the potential to affect – the likelihood of an innovation to succeed. Those functions are:

1) F1 – Entrepreneurial activities;
2) F2 – Knowledge development;
3) F3 – Knowledge diffusion;
4) F4 – Guidance of the search;
5) F5 – Market formation;
6) F6 – Mobilisation of resources;
7) F7 – Support; legitimacy creation.

These functions are divided into several sub-functions, set out in the 'STEP UP Analytical framework' tab on the Excel sheet. The framework consists of a number of questions (see column C in the 'Questions' tab in the Excel sheet) connected to and based on one or several functions and sub-functions. Therefore, by answering the questions, it is possible to get a better view of how well a particular project fulfills the different functions.

The questions in the Excel sheet (Column C) are also aggregated into five criteria that are important for innovative projects, especially those developed with a Sustainable Energy Action Plan (SEAP) in mind. These criteria have been identified through STEP UP and are as follows:

- Replicability
- SEAP opportunity (ie contribution to opportunities identified in the SEAP)

[1] Please note that there is no need for detailed knowledge of this research in order to use the tool; the background information is provided for those who are interested in developing a deeper understanding.
[2] For more information, please see the section 'Research background' below.

- EU 2020 targets
- Integrated approach
- Window of opportunity

The responses to the questions in the analytical framework contribute to scores which are awarded to each project, corresponding to the seven functions of innovation systems and the five key criteria for innovative projects. These scores are displayed in two Radar Charts (see the 'Radar Chart' tab in the Excel sheet), providing a visual aid which helps you easily compare how different projects perform against the different functions and criteria.

Whilst a high score doesn't necessary and automatically mean a successful innovation project, the framework functions can serve as a useful checklist for the necessary socio-economic/organisational preconditions for the innovation to be successful in the long term.

2. How to use the tool

2.1 Structure of the sheet

The Excel sheet contains:

- Questions about the project (in the 'Questions' tab);
- A radar chart (in the 'Radar Chart' tab), which consists of an analytical diagram that visualises the 'strengths' and 'weaknesses' of the project based on the functions presented under the 'STEP UP Analytical Framework' tab;
- Analytical framework based on innovation studies (the 'STEP UP Analytical Framework' tab);
- Glossary (in the 'Glossary' tab) that explains theoretical concepts used in the questions.

2.2 To do

1) For a thorough analysis, it is advisable to choose a minimum of five pipeline projects to analyse.[3]
2) Make a copy of the Excel file for each of the projects that you want to analyse.
3) The 'Questions' tab consists of seven initial questions relating to the selected pipeline project, with instructions provided for each question. These initial questions are quite general in their nature and contribute to the *radar chart* that is divided into five categories, based on key criteria for innovative projects that have been identified through the STEP UP project: Integrated approach, contribution to EU2020 goals, replicability, Window of Opportunity, and SEAP opportunity.
4) The initial questions are followed by 24 quantitative questions that should be answered with "yes"; "no" or "irrelevant" (1 = Yes, 0 = No and 2 = irrelevant). These questions are analysed through the analytical framework and thus contribute to the first radar chart, which is divided into seven functions/categories (see the 'STEP UP Analytical Framework' tab in the Excel sheet for more detail).

[3] A pipeline project is a project that is already being developed within the city but has the potential to be enhanced and turned into a more innovative project.

5) Repeat steps 2-4 with all of the chosen pipeline projects, each using a different Excel sheet.
6) When you have analysed your pipeline projects, review the different projects and the results they have achieved in the radar chart (see the 'Radar Chart' tab in the Excel sheet). It may be helpful to do this with colleagues so that you can share ideas and gain different perspectives on what the results mean. Ask yourself questions such as: Have some projects achieved a better result than others? Why is this? What can you learn from the analysis? Are there certain dimensions that you need to focus more on when defining your innovative projects?
7) Based on the discussions within your organisation and the results that the projects have achieved using the analytical framework, decide which pipeline projects should be selected to further develop and transform into innovative projects for your city.

3. Additional reading: research background

3.1 Short description of the different research fields that have inspired the framework

The *STEP UP analytical framework* first and foremost draws from the research fields of Technological Innovation Systems (TIS), Strategic Niche Management (SNM), Multi-level perspective (MLP), Science & Technology studies (STS) and Transition Management (TM).

The overall structure of the framework is inspired by research papers by Kamp (2010) and Meelen & Farla (2013). Kamp (2010), on the one hand, combines TIS with SNM as a framework for understanding the existing drivers and barriers in innovation systems. Meelen & Farla (2013), on other hand, develop an "integrated framework for analysing sustainable innovation policy" by combining research insights from TM, SNM and TIS.

Kamp (2010) structures the analytical framework on categories that stem from TIS studies: more specifically, seven functions[4] that affect – or have the potential to affect – the likelihood of an innovation to succeed. Those functions are:

1) F1 – Entrepreneurial activities;
2) F2 – Knowledge development;
3) F3 – Knowledge diffusion;
4) F4 – Guidance of the search;
5) F5 – Market formation;
6) F6 – Mobilisation of resources;
7) F7 – Support; legitimacy creation.

Kamp (2010) calls this approach FIS (Functions of Innovation System approach).

Both Meelen & Farla (2013) and Kamp (2010) also draw heavily from a research approach called Strategic Niche Management (SNM). This approach deals with studying and strategically managing so-called "niches": spaces where new radical innovations are developed. More specifically, SNM can

[4] A 'function' can be defined as an activity that takes place in an innovation system and contributes to the development and diffusion of an innovation (Meelen & Farla 2013; Bergek et al. 2008; Hekkert et al 2007; Johnsson 2001).

be defined as "the creation, development and controlled phase-out of protected spaces for the development and use of promising technologies by means of experimentation, with the aim of (1) learning about the desirability of the new technology and (2) enhancing the further development and the rate of application of the new technology" (Kamp 2010 referring to Kemp et al 1998). Three important processes are considered crucial within the SNM framework (Raven 2005): the voicing and shaping of expectations, network formations and learning processes (Kamp 2010).

3.2 The connection between the research fields and the framework

We argue that the process used to develop new projects by cities across Europe can be seen as a "niche" of the kind described above, since the focus is on providing a space for developing new innovative projects that have the long term aim of supporting a transformation of energy systems in European cities.

The STEP UP Analytical framework is structured according to the seven functions of Technological Innovations Systems presented in Kamp (2010). These functions can then be divided into several sub-functions; this is done with inspiration from Kamp (2010) and other sources (as shown in the STEP UP Analytical framework tab in the Excel sheet).

Jacobsson & Bergek (2004) state that the importance of each function is expected to vary in time depending on the development phase of the innovation. With this in mind, and given the complex nature of urban innovation systems, each function in the STEP UP Analytical Framework is treated equally: it is not so that some functions give a higher score than others.

Moreover, the functions are interlinked, and thus influence each other (Kemp 2010). For example, resource mobilisation assists knowledge development and/or market formation (ibid). Following Kemp (2010) and Hekkert at al. (2007), this type of "positive feedback" may occur when functions influence each other in a circular way. Given this condition the scoring system in this proposed framework is built on an "*adding mechanism"* in Excel, which means that the more functions a particular project fulfills the better its final score.

Although all functions in the STEP UP Analytical Framework are seen as equally important, the questions have been weighted differently, which means that some questions are given higher value than others. This has been done by looking at research and interpreting the types of activities that have been especially important within the STEP UP project. The weighting is apparent in the questionnaire (Column H) and is thus open for interpretation and further analysis.

Finally, the process of aggregating the questions into five key dimensions identified through STEP UP is done by interpreting the specific sub-function related to the question. For example function F6 (mobilisation of resources) and sub-function 6.1.1 deal with financial capital. Sub-function 6.1.1 corresponds with question FMR1 in the questionnaire and deals with the city's financing capacity for the project. The allocation of finance is one of several questions that are connected to the 'Window of Opportunity' category, since the allocation of finance is a necessary economic precondition and should therefore result in a higher overall score.