AmsTErdam BiLbao cItizen drivEn smaRt cities

Deliverable 3.1: The PED Innovation Atelier Organisation Document

WP3, Task 3.1 REV

Date of document

30/11/2020 (M 13)

Deliverable Version:	D3.1, D1.1
Dissemination Level:	PU[1]
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Project Acronym	ATELIER
Project Title	AmsTErdam and BiLbao cItizen drivEn smaRt cities
Project Coordinator	Frans Verspeek (f.verspeek@amsterdam.nl) City of Amsterdam
Project Duration	01/11/2019 – 31/10/2024 (60 Months)
Deliverable No.	D3.1 The PED Innovation Atelier Organisation Document
Diss. Level	Public (PU)
Deliverable Lead	TNO
Status	- Working
	- Final Draft
	X Final version
Due date	30/11/2020
Submission date	30/11/2020
Work Package	WP 3 – PED Innovation Atelier
Work Package Lead	**TNO**
Contributing beneficiary(ies)	AMST, City of Bilbao, Tecnalia, CARTIF, Waag Society, AUAS, PSI, SEZ, MunBud, Matosinhos, Riga EnAg, COP, BRATISLAVA City, City of Krakow, UDEUSTO, CEPV , IBE, TELUR, EVE, Spectral, Republica, EdwinOostmeijer, AMS Institute, WATNL, CIVIESCO s.r.l.
DoA	Task 3.1 is dedicated to support the establishment, maturation, and stabilisation of the PED Innovation Atelier in each of the Lighthouse cities. The activities that are performed in these three stages are explained more in depth in the description of the PED Innovation Atelier in Excellence.

Date	Version	Author	Comment
12/10/2020	0.6	Marit	Complete draft for review internal
30/10/2020	0.8	Adriaan	Feedback and reflection
02/11/2020	0.9	CIVIESCO	Remarks and suggestions for improvement. Also contributed to a section on Public Funding, which is included in the final deliverable report.
29/06/2021	1.0	Marit	Review comments and additions included
26/11/2020	D1.0	Jeroen	Final deliverable
29/06/2021	D1.1	Marit	Final deliverable – revised

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Abbreviations and Acronyms

Acronym	Description
PED	Positive Energy District
IA	Innovation Atelier
PPP	Public Private Partnership
GA	Grant Agreement
RMA	Reflective Monitoring Action

0. Executive Summary

This is the first report published in the context of EU project ATELIER (part of the Smart City Communities [SCC] programme) on how to organize and establish a Positive Energy District (PED) Innovation Atelier in cities, as part of subproject 'PED Innovation Atelier'. This subprojects' prime objective is to involve the local innovation eco-system in tailoring and supporting the implementation of the smart urban solutions in the PED demonstrators. For doing so, PED Innovation Ateliers are being established in the Lighthouse cities now, and the Fellow cities will follow later. The PED Innovation Ateliers are to be organized in a self-sustaining way, which enables them to endure after the lifetime of the EU project ATELIER itself. However, the main question remains, *how to organize a PED Innovation Atelier?* In the underlying report, support is offered to partners and stakeholders by means of stepping stones and tools for organising and formalizing the Innovation Ateliers.

A PED Innovation Atelier depends on collaboration with partners, participants and stakeholders. Having a clear ambition, a goal and envisioning an ideal that appeals to the target group can help attract and bind future members to the organization. For this purpose, a vision and mission statement can be propagated, supported by one or more strategies to put them in action. With a vision, the partners of the Innovation Atelier can communicate their dream – what they believe, are the ideal conditions for the Innovation Atelier community.

Alongside an innovation-management perspective, stakeholder-management is considered a crucial element in establishing the Innovation Ateliers. Stakeholders possess unique knowledge. A well- designed collaborative knowledge production processes can help to generate meaningful results for the involved policy makers, scientists and stakeholders by joint production of documents, models, fact finding etc.

A central challenge of an Innovation Atelier is to achieve it's (long term) economic and societal objectives. Potential value creation can be defined by mapping the (ecosystem, technology and business) services and activities that Innovation Ateliers can offer and what they yield in financial or non-financial contributions. However, these incomes are often insufficient to cover the costs over all the three stages of the Innovation Atelier. Important element is to identify the so called initial and structural funding gaps, and seek for potential funding strategies (incl. public funding schemes).

To manage resources and help partners to understand their positions, line of interactions, responsibilities or liabilities to each other, organizational models are crucial. They govern and establish collaborative linkages among organizations and partners. Potential organization models which can fit Innovation Ateliers are network organization, virtual organization, membership association, open innovation platform.

The PED Innovation Atelier approach requires a new way of collaboration and organisation for most partners in the PED demonstrator sites. Allowing participants of Innovation Ateliers to continuously monitoring progress, and learning in practice, will enable to adjust or intervene in the process, and prepare better guidelines for replication and upscaling. A Reflective Monitoring in Action framework is elaborated to allow this monitoring take place, and encourage stakeholders to reflect upon the impact and collaboration in action.

1. Introduction

ATELIER focuses on developing citizen-driven Positive Energy Districts (PEDs) in the two Lighthouse Cities Amsterdam (Netherlands) and Bilbao (Spain). Their successful implementations will then be replicated and tested for feasibility in the six Fellow Cities Bratislava (Slovak Republic), Budapest (Hungary), Copenhagen (Denmark), Krakow (Poland), Matosinhos (Portugal), and Riga (Latvia).

PED Innovation Ateliers play a central role in this ambition, realising, tailoring and implementing the innovative solutions in the PEDs. The PED Innovation strengthens the local innovation ecosystem and is aiming at removing legal, financial or social barriers to the implementation of smart solutions. The PED Innovation Ateliers develop in three phases and will become self-sustaining, continuing for a long time after the project has ended. They will thus become engines for the upscaling and replication of solutions within the ATELIER cities and beyond. Citizens will be deeply involved in the PED Innovation Ateliers as well to create a maximum impact for the PEDs.
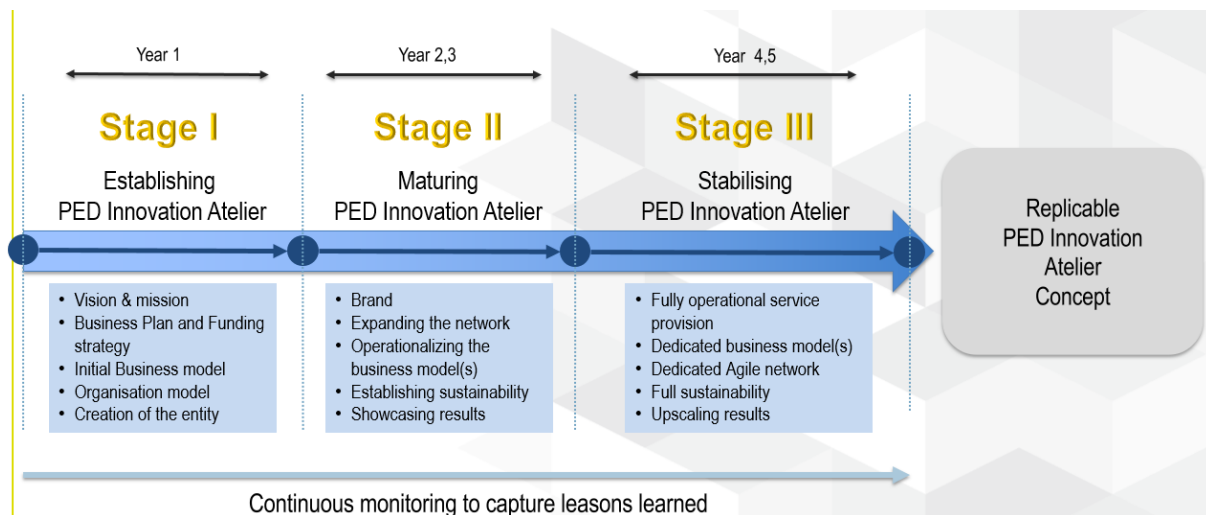
Figure 1: Development stages of PED Innovation Atelier

By bringing together the relevant stakeholders and partners having a role in the implementation of the smart urban solutions, early identification of obstacles for implementation is possible and consequently they can be discussed. If necessary, actions can be taken to adapt or tailor the solution, or select an alternative solution. Organising meet ups between the main partners and stakeholders, representing the industry (suppliers, contractors, developers), public authority (local, city, region, national), residents (end users, neighbourhood) and research organizations, will foster the dialogue and observation of the implementation process. This approach will enable to bring in lessons and experience from outside the district, and will result in collective understanding of particular issues and obstacles, as well as initiate the road for collaborative problem solving efforts.

Reading guide

The underlying report describes the concept of the PED Innovation Atelier and is aimed at assisting the Lighthouse cities Amsterdam and Bilbao, and the Fellow Cities in establishing and developing the PED Innovation Ateliers in the coming years. The chapters describe the main elements and building blocks for establishing and maturing the PED Innovation Atelier, along the questions: why, what and how. In chapter 2, the rationale for having a PED Innovation Atelier is provided. In the following chapter (3), the need and preparatory steps to formulate a shared vision and mission statement are given, as well as a strategy. These are important for committing future members to the organization of the PED Innovation Atelier and its main objectives. This is followed by guidance on how to involve relevant stakeholders in a PED Innovation Atelier in chapter 4. A detailed description of business models, reflecting the need for a joint value proposition, in which sources of income and financial flows are managed is given in chapter 5. This chapter is especially important for sustaining the activities beyond the lifetime of the project, as it supports thinking in terms of 'who is your audience?', 'what is your product or service?', 'where is funding coming from?', and 'how can you sustain the actions after ATELIER project ends?'. Chapter 6 provides an overview of various organization models for a PED Innovation Atelier, and assists the city actors in choosing one that fit best to their purposes.

The activities in the PED Innovation Ateliers should be monitored closely, to identify any bottlenecks early in the process and to capture lessons learned. Chapter 7 presents a framework for monitoring and impact assessment, to enable progress monitoring of establishing the PED Innovation Ateliers, but also to support the cross over learning between cities and their respective Innovation Atelier activities. The last chapter (8) identifies the next steps for formalising the PED Innovation Atelier establishment.

2. The innovation atelier: what, why and how?

2.1 Towards climate neutral cities

Europe wants to become the world's first climate-neutral continent by 2050, in accordance with the goals of the Paris Agreement on climate change (European Commission, 2019). The EU Green Deal aims to transform the EU into a modern, resource-efficient and competitive economy while making the transition just and inclusive for all. Cities have an important role to play in the transformation to climate neutral areas as they are "the ´melting pot´ where decarbonisation strategies for energy, transport, buildings and even industry and agriculture coexist and meet" (Directorate-General for Research and Innovation & European Commission, 2018). Cities have a huge potential to develop and deploy innovations for climate mitigation, but face many challenges such as the cross-sectorial integration between separate sectors in the city, having adequate governance and finance structures available to support the technical solutions, and seeking support of citizens for the solutions.

The realization of Positive Energy Districts in cities fit within the ambition of becoming climate-neutral cities, as these districts deliver more energy than they use. The European Strategic Energy Technology Plan (SET Plan) guides the development and deployment of low-carbon energy technologies. A specific publication of the SET-Plan on the realization of PED-districts[2] reasons that the development of Positive Energy Districts requires an open innovation model for their planning, deployment and replication, and a cooperation within the city with different types of stakeholders, from industry, service providers and investors, to citizens. Cities need to align the PED's with their long term visions on sustainability and accommodate PED's in their urban planning. Industries such as real estate developers, construction companies, network operators, utility companies and many others, will play a vital role as solution providers, while citizens will take on a new role as prosumers with active participation in energy trading. Knowledge institutes and "academia will provide robust documentation, monitoring and evaluation, will develop planning tools and technology solutions for the medium-to-long term, and will secure capacity building and education of the next-generation positive energy professionals and citizens" (Chesbrough, 2003).

This context sketches the main reasons why cities should aim at realizing PED's. The innovation ateliers play an important role in the development, deployment and upscaling of the PED's in cities.

2.2 The PED Innovation Atelier

The PED Innovation Ateliers are designed to enable the city's actors to develop and deploy Positive Energy Districts and to learn how to realize PED's in the specific context. They fit to the SET-Plan recommendations. PED Innovation Ateliers build upon the concept of open innovation in the city and apply a mixture of two main methodologies for open innovation: Living Lab's and Innovation Public-Private Partnerships (PPPs). The main characteristics of the PED Innovation Atelier are: a) stimulating open innovation in the Quadruple helix, b) co-creation of solutions and supporting measures, c) sustaining partnerships.

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[2] Europe to become a global role model in integrated, innovative solutions for the planning, deployment, and replication of Positive Energy Districts, SET-Plan ACTION n°3.2, Implementation Plan, June 2018

Stimulating open innovation in the Quadruple helix

Since the beginning of this century the concept of open innovation has quickly risen. It indicates the disappearance of the former siloed and closed way of innovation in which companies kept the development of innovation and its revenues within the boundaries of the company. Open innovation originates from the idea that capital for innovation (venture capital), knowledge for innovation (intangeble assets), and further development of the innovations, are sometimes better positioned outside the boundaries of the company. Central in the concept of open innovation is to jointly create value. Adequate business models are then needed to divide the revenues between the cooperating actors that work on the open innovation. Open Innovation is described as combining internal and external ideas as well as internal and external paths to market to advance the development of new technologies (Chesbrough, 2003). Open innovation blurs the demarcation between research and practice, and between practice and policy (Bogers, Chesbrough & Moedas, 2018) and requires forms of cooperation between actors that formerly didn't cooperate. Especially innovations for societal challenges (wicked problems), such as climate change and other sustainability issues, are thought to require open innovation models (Arnord & Barth, 2012; Elia, Margherita & Petti, 2020).

In the local PED Innovation Ateliers the actors from the (local) quadruple helix collaborate to create and implement solutions that jointly built to the Positive Energy District. With this aim the following actors from the local innovation ecosystem contribute to the Innovation Atelier: city's administrations, industries, businesses, SMEs, network operators, energy providers, utilities, NGO's, knowledge institutes, representatives from civic organizations, and citizens (see figure 2).
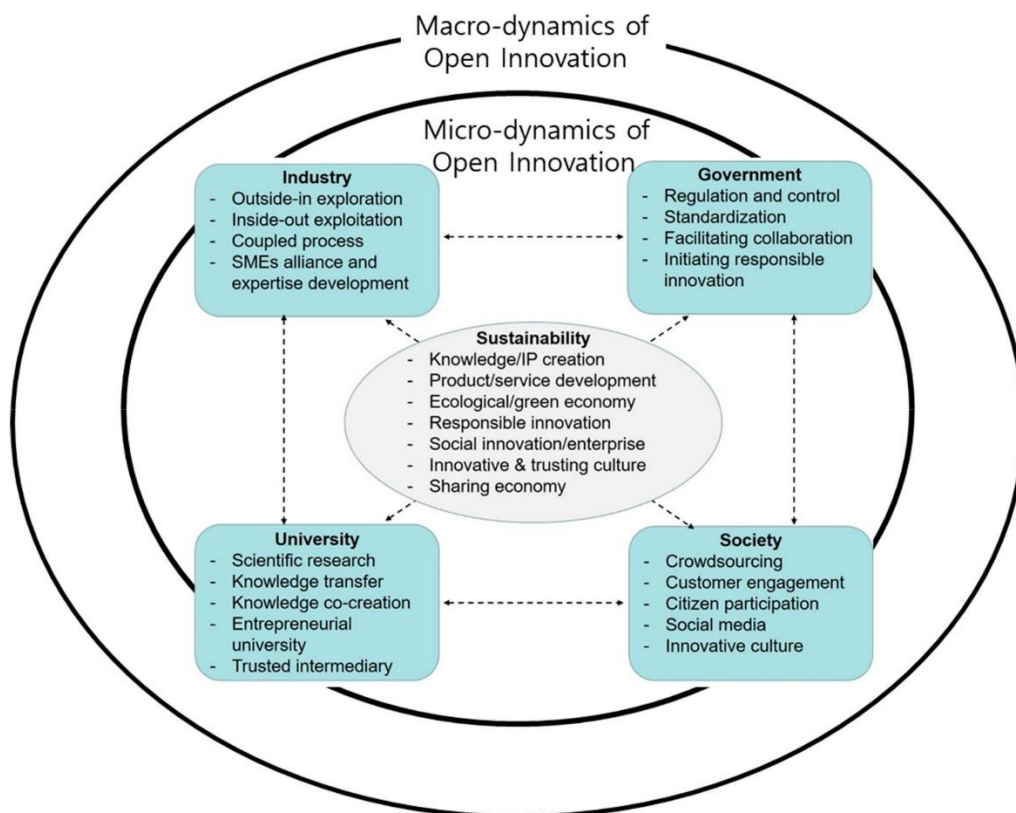

Figure 2: The Quadruple helix in an open innovation system (Yun & Liu, 2019)

In the Innovation Ateliers these actors jointly develop, tailor, deploy, and upscale the solutions that jointly enable the Positive Energy District. The development and deployment of different technical solutions together with implementation of measures to support these solutions, is not a mere straightforward exercise. It will require a solid cooperation among all contributing actors and dedicated processes for co-creation of PED-solutions, and tailoring these to the local situation.

Co-creation of PED solutions and supporting measures

In the Innovation Atelier, the local PED innovation ecosystem is involved in the joint development, assessment and review of technical solutions. The Innovation Atelier is dedicated to develop and review supportive measures, and to remove obstacles coming from "old structures" that are in competition with the development of a PED. It has an important task in developing and reviewing new institutional arrangements, new forms of cooperation and governance, new business models, new financing schemes and funding opportunities that support the technical solutions. The Innovation Atelier, furthermore, researches and reviews (potential) obstacles, such as old regulations, funding mechanisms, etc. with the aim to (develop proposals how to) remove and/or adapt these. Last but not least, the PED Innovation-Ateliers monitor the applied solutions to check whether any new obstacles appear and whether the deployment and implementation of solutions are developing according to plan.

The co-creation of innovations extends, thus, beyond the technical domain and is integrated with innovations of institutions, financial instruments, and policy. Following topics are examples of co-creation of innovations that support the realization of PED's:

Integrated smart energy systems and electro-mobility
Innovations on this topic include the design and optimization of dedicated measures for reaching energy efficiency goals that are 'beyond existing codes' for buildings, implementation of positive energy systems, deployment of E-mobility solutions and integrated operations and management. Furthermore, models are used to assess under which conditions PED-solutions will have the desired impact. The innovation work should also entail collaboratively designing pathways/ scenarios for upscaling the PED solutions and measures to the city level.

Governance, Integrated Planning and Law
Innovative governance models are explored that enforce the implementation of PED measures and appropriate models are implemented in the local PEDs. Measures to align or even integrate different planning mechanisms for energy, mobility and urban planning in the cities are also developed. An inventory is made of the laws and regulations that (could) hamper the implementation of PED-measures, not only energy legislation, but also legislation that has a direct effect on the operation of a PED, such as real estate- and tax legislation. Options to remove obstructing laws and regulations are discussed in the PED Innovation Ateliers. Formulation of so called sand box experiments with temporary exemptions of the relevant laws, is one option for this.

Innovative financial instruments
Innovative business models are developed with the aim to increase the profitability for all actors investing in the innovations in the PED. Actions are formulated and designed to increase the financial revenues and economic feasibility of PED measures by rethinking the value chain of energy efficiency solutions, including perspectives like TCO and ESCO

approaches. The identification of a set of applicable business cases help cities to attract and aggregate private finance. Innovation is also dedicated to customize the central role of the prosumer in emerging business models related to the local renewable energy communities; with the specific objective to engage citizens and stimulate green investment with deployment of the "blockchain transactions" and of the "as-a-service models".

Data, data platforms and privacy
Data use and data platforms activities aim to allow collection of local user-data, apply queries and ICT applications for smart energy management, balancing local supply & demand; and ultimately enable automated demand response programs to further increase energy efficiency and impact of PEDs. Data collection, processing and representation should follow the GDPR and ePrivacy Directive.

The co-creation activities of the Quadruple Helix actors in the PED Innovation Atelier fit to the five key characteristics of a Living Lab (Voytenko, McCormick, Evans & Schwila, 2016): geographical embeddedness, experimentation and learning, participation and user involvement, leadership and ownership, and evaluation and refinement. However, the sustainability of (the results of) the Living Labs is a known challenge (Gasco, 2017).

Sustaining partnerships

The sustainability of the Innovation Atelier itself is an important issue as the Innovation Atelier should play a key-role in upscaling of the PED-innovations in the city and replication to other cities for a long time. Sustaining the partnership of the Quadruple Helix actors to guide the PED innovations is therefore a crucial task when establishing a PED Innovation Atelier. This is supported by the recommendations of a European report on Living Labs in cities (Santonen, Creazzo, Griffon, Bódi & Aversano, 2017). To sustain the established partnerships in the Innovation Ateliers, the PED Innovation Ateliers are provided with an organization and use cases which are inspired by those of Open Innovation Public-Private Partnerships (PPPs).

The Ateliers will require detailed business and investment plans for the different phases of operation. It is required to think about joint activities generating operational revenues for the Innovation Atelier, such as delivering innovations and services. The Innovation Ateliers should also deliver added value, for instance services, to the Quadruple Helix partners of the PED Innovation Ateliers. Nevertheless, it can be expected that incomes from services and innovations will not entirely cover the funding gap for the PED Innovation Ateliers, and thus additional funds should trigger and used where available. Apart from a business and investment plan for the short term, a long-term strategy for the funding of the PED Innovation Ateliers is therefore needed.

2.3   Monitoring of the PED Innovation Ateliers and lessons learned

To monitor the progress of the PED Innovation Ateliers, the development of the partnership, and the impacts on the PED, all activities of the PED Innovation Ateliers are continuously monitored. This will require an ex-durante monitoring of the process in the Innovation Ateliers, and a technical monitoring of the impacts of the PED-measures. The results of the ex-durante monitoring are discussed with the partnership to determine whether certain

adaptations are needed (for instance in organization or knowledge management). This is to ensure an iterative process that is based on the needs of the participants from start to finish.

From this monitoring activity, lessons learned should be captured about the setup and development of PED Innovation Ateliers and should reflect on the applied organization and business model(s). Lessons learned should also be captured about the (innovation) processes in the Innovation Ateliers, for instance on how certain innovations are supported, or how they are tailored to the local context. These lessons learned should then be disseminated to other EU-cities as to foster the replication of PED Innovation Ateliers in other European cities.

In the context of the Smart Cities and Communities programme multiple projects like ATELIER have already been finished and are still in process.[3] The projects within this programme are expected to cooperate with each other and to learn from each other (European Commission, 2018).

Lessons learned from other SCC projects, regarding to organization, collaboration and supporting learning processes, projects will be integrated in the ATELIER project as well as within the establishing, maturing and stabilizing of the Innovation Ateliers.

The monitoring of the Innovation Atelier is further elaborated in chapter seven.

3. Vision, mission and strategy

A PED Innovation Atelier depends on collaboration with partners, participants and future members. Having a clear shared ambition and goal and envisioning an ideal that appeals to the target group can help to attract and bind future members to the organization. For this purpose, a vision and mission statement can be propagated, supported by multiple strategies to put them in action. The next paragraphs explain in detail what a vision statement, mission statement and strategies are and how to use them. Furthermore, the section helps to formulate the vision, mission and strategy for the PED Innovation Atelier in a city (context).

Figure 3 shows how the vision, mission and strategies are interrelated with each other and with the (external) market and the (internal) organization.

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[3] https://ec.europa.eu/inea/en/horizon-2020/h2020-energy/projects-by-field/879
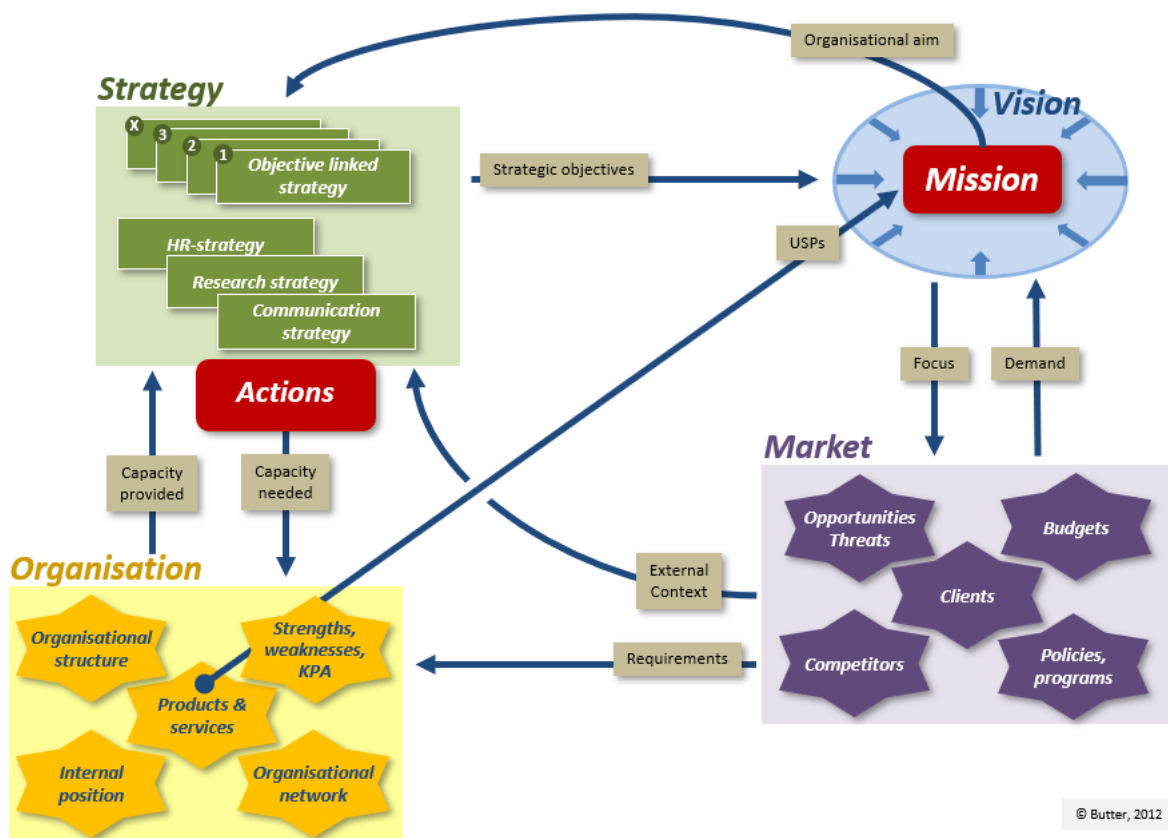
Figure 3: Interrelation of vision, mission and strategies

A good understanding of what the partners collaborating in the PED Innovation Atelier want to achieve form the basis of the development of the vision, mission and strategies. Instruments to attain this understanding can include elaborated discussion and consultation with participants of the audience/target group; interviewing; addressing the questions, discussions and issues at hand.

The mission and vision statements can best be broad and enduring, wide in scope with a sense for continuity with the community's history, traditions, and broad purposes. Good vision and mission statements can help to guide efforts both today and tomorrow.

In this chapter we elaborate on how to formulate and use vision and mission statements and strategies for the PED Innovation Atelier. Further practical guidelines and suggestions for developing the vision, mission and strategy for business and community are furthermore available through the Community Toolbox developed by the University of Kansas (Nagy & Fawcett, n.d.).

3.1 Using a vision statement

With a vision (Nagy & Fawcett, n.d.), the partners of the PED Innovation Atelier can communicate their dream – what they believe, are the ideal conditions for the PED Innovation Atelier community.

The dream can be articulated by one or more *vision statements*, which are characterised by short phrases or sentences that convey the Innovation Atelier community's hopes for the future. By developing a vision statement the Innovation Atelier clarifies its beliefs and governing principles, first for themselves, and then for the PED and the wider community.

There are certain characteristics that most vision statements have in common. In general, vision statements should be understood and shared by members of the communities of the PED Innovation Atelier; broad enough to include a diverse variety of local perspectives; inspiring to all participants and easy to communicate.

It often takes several vision statements to fully capture the dreams of those involved in a PED. There does not have to be only one "perfect" phrase. It can be inspiring to let people write their ideas and suggestions down. After a list of suggestions has been made, the next questions might help to estimate which mission statement(s) fit best.

- Will it draw people to work?
- Does it give hope for a better – sustainable – future?
- Will it inspire members of the PED to realize their ambitions through positive, effective action?
- Does it provide a basis for developing the other objectives and goals of the demonstration district?

The vision statement describes how the PED would be planned, developed and operate under the perfect circumstances, including the role of the Innovation Atelier community and its members in the process of planning, developing and operating the PED's.

> Example of a PED Innovation Atelier's Vision statement:
>
> - Contributing to a cleaner, healthier and greener city for next generations by realizing a positive energy balance through using social and technological innovations.

The amount of vision statements for the PED Innovation Atelier is not important. What matters is whether the statements together provide a holistic view of the PED Innovation Ateliers dreams.

3.2 Using a mission statement

A mission statement (Nagy & Fawcett, n.d.) is the vision in more practical terms. An Innovation Ateliers' mission statement describes *what* is done to achieve the vision.

Just like vision statements, mission statements look at the big picture. However, they're more concrete and "action-oriented" than vision statements. Where a vision statement inspires people to dream; a mission statement inspires them to action.

The mission statement can refer to a problem, such as greenhouse gas emissions, or a goal, such as providing collaboration of partners to realize complex objectives. And, while they are not very detailed, they hint - very broadly - at how the Innovation Ateliers might fix these problems or reach these goals.

The process of writing a mission statement is like developing vision statements. The same brainstorming process can help to develop to set a basis for the mission statement After brainstorming possible statements, the following questions can help:

- Does it describe the what and why of the PED Innovation Atelier?
- Is it compact? Mission statements generally get their point across in one or two sentences.
- Is it outcome oriented? Mission statements clarify the fundamental goals the Innovation Ateliers are working to achieve.
- Is it inclusive of the goals and participants who may become involved in the PED Innovation Atelier? Together, the partners of the PED Innovation Atelier can decide on a statement that best meets these criteria.

Mission statements make very broad statements about the Innovation Atelier partners key goals. Good mission statements are not limiting in the strategies or sectors of the community that may become involved in the Innovation Atelier.

Example of a mission statement suitable for an Innovation Atelier:

- Promoting implementation of Positive Energy District measures by organizing Innovation Ateliers in which key stakeholders collaboratively contribute to establising, maturing and stabilizing of the Innovation Atelier.
- Involve the local innovation eco-system in tailoring and implementing the smart urban solutions in the PEDs.

3.3 Using and developing strategies

Strategies (Nagy & Fawcett, n.d.) can be developed to focus the efforts of the Innovation Atelier in order to achieve the vision of the PED Innovation Atelier. Being a Public Private Partnership, a PED Innovation Atelier can benefit from the resources of the public as well as the private sector. Developing strategies can help to take advantage of these resources and emerging opportunities in an efficient way and to respond effectively to resistance and barriers.

A strategy is the way the mission is used to achieve the vision. It describes how things will get done but is less specific than an action plan. Existing barriers and resources are considered in developing a strategy to get from the status quo to the desired situation. Multiple strategies can be used to achieve the goals of the PED Innovation Atelier, for example: financing strategies, communication strategies and social media strategies.

Developing strategies involves a brainstorm process with the core group partners of the PED Innovation Atelier. To develop the most beneficial strategy, inventories can be made of resources, assets and funding opportunities which can help achieve the vision and mission (and how to use them), obstacles and resistance which can hinder the achievement of the vision and mission (and how they can be minimized) and what partners and participants are willing to do to serve the mission. Strategies can involve but are not limited to the following subjects: business model, RDI strategy, organization and government, access to funding, access to market, budget and financing, connection to the policy framework.

A good strategy meets the following criteria:

- It provides an overall direction of the PED Innovation Atelier, without dictating a narrow approach;
- It fits resources and opportunities of the public as well as the private partners;
- Resistance and barriers are minimized; it attracts allies and deters opponents;
- It reaches those who are affected by the PED (partners, participants, future members, the community).

Examples of strategies for a PED Innovation Atelier:

- Bringing together key stakeholders of the innovations demonstrated in district x, to identify barriers potentially hampering the implementation process, and collaboratively design and construct the best way to solve the issues.

- Starting and sustaining partnerships with local actors who are committed to contribute to the development of sustainable neigbourhoods.

3.4   Obtain consensus on your vision, mission and strategies

Once the partners of the PED Innovation Atelier have developed their vision and mission statement and strategies, the next step is to learn what the wider community members think of them before the statements are used regularly.

The official launch of the PED Innovation Atelier (or any dedicated follow up meeting) can be used to reach consensus on the vision, mission and strategies by presenting the vision and mission statements and strategies and letting people react on it. If the vision and missions statement and strategies are sent around afterwards they can be further reflected and contemplated. The community and stakeholders can make suggestions for improvement to sharpen the vision, mission and strategies.

4. Stakeholder involvement

Stakeholder management alongside an innovation management perspective is crucial. An important argument to involve stakeholders is that they possess unique knowledge and other resources which can be of relevance for the PED Innovation Atelier. Well-designed collaborative knowledge production processes help to generate meaningful results for the involved policy makers, scientists and stakeholders by joint production of documents, models, fact finding etc. People who can combine different fields of knowledge and can attach to different communities play an important role in the processes that guide the activities (Slob, 2010).

Stakeholder knowledge can be distinguished in procedural knowledge (knowledge about which laws and regulations are applicable, the procedural stages of these laws or regulations and the timing of them); scientific knowledge (the formal knowledge, most of the time encoded in reports or models, which can be used to understand problems and find solutions) and local knowledge (tacit knowledge of the people living in the area that resembles specific knowledge about certain aspects of the environment) (Slob, 2010).

In this chapter we elaborate how relevant stakeholders can be identified and involved (Slob, 2010).

4.1   Stakeholder analysis

In order to identify the relevant stakeholders, a stakeholder analysis can be performed. In this stakeholder analysis one should make a list of all people and organizations, who can influence (positive as well as negative) the PED Demonstrator and the PED Innovation Atelier organisation. After identifying the most important stakeholders, the interests and goals/ objectives of the stakeholders should be identified and mapped, for example through interviews. The following questions can contribute to gaining a complete overview of the stakeholder field and respective interests:

- What will the stakeholders contribute to the PED demo and PED Innovation Atelier?
- What kind of knowledge do the stakeholders possess?
- What are the relevant interests and goals of the stakeholders?
- How do the stakeholders interpret the vision, mission and goals of the PED Innovation Atelier?
- How well informed are the stakeholders about the vision, mission and goals?
- What are the (possible) motives for these stakeholders to participate, or not to participate?

Stakeholders can have different views and perspectives. Gaining insight in the actual perspectives of stakeholders is necessary to understand the actions and position of different stakeholders in the course of the project. In a process of interaction, people with different perspectives can bring different point of view to the table to enrich ideas. Therefore it should be ensured that the different perspectives are present and considered in the process (Slob, 2010).

4.2   How to involve stakeholders

Before you involve stakeholders, it is recommended to know which role you want to give them, for example: do you want them to have a permanent role - become a member of the PED Innovation Atelier, invite them as an expert, or do you just want to inform them?

Arranged from low to high stakeholder involvement, the following kinds of involvement can be arranged (Gerrits & Edelenbos, 2004):

- Information: information is provided to the stakeholders.
- Consultation: stakeholders are consulted about what they think that must be done.
- Advising: stakeholders are asked for advice about policy or measures. Recommendations are taken into account.
- Co-producing: stakeholders are considered equal policy makers, however, decision-making remains in the core team.
- Co-deciding: decision-making power is carried over to stakeholders.

A well-designed stakeholder involvement process is open and transparent, facilitated by professionals who are used to design and facilitate these processes, and should be divided into logical steps (for the stakeholders) and contain stakeholder meetings. This process design should be communicated and presented to the stakeholders in the beginning of the process. To create transparency and fairness, the process requires "rules of the game". These rules of the game contain rules for entering and leaving the process, how decisions

5. PED Innovation Atelier business model

5.1 Introduction

A central challenge of a PED Innovation Atelier is to achieve it's (long term) economic and societal objectives. Innovations should be developed, marketed and implemented and achieve scale, and the designated impact should be monitored. The latter requires participation and resources (in cash and kind) of various parties (TNO, 2020).

This chapter drafts guidelines on the development of a business model for a PED Innovation Atelier, how to finance an Innovation Atelier and how to address financing gaps with the help of additional investments by public as well as private actors. In other words: how to enable the functioning of the Innovation Atelier over the years, as a sustainable, self-supporting entity. An important notice in this regard is to look beyond the conventional business models, and seek for elements of Sustainable Business Model Innovation, in which the revenues are not solely financial, but include also societal and environmental returns (Geissdoerfer, Vladimirova & Evans, 2018).

In previous years, several socio-technical transition challenges (among others the energy transition), have resulted in novel sustainable business models being initiated and explored by communities and cooperatives to foster the provision of new services or products. (See for some examples of detailed business models: Report STEM – Sustainable business model innovation [TNO, 2015]).

Considering the time to deal with or support in systemic changes or transitions often takes for many years, or even decades; designing a business model for a PED Innovation Atelier, should cover a multi-annual budget plan. A multi annual budget plan constitutes income for the PED Innovation Atelier (by products or services) on the one side, and indicates the costs of running it (operational costs) on the other side. In the next reference framework, we highlight the investments necessary to establish the Innovation Atelier, next to the operational costs during the functional life time, and indicate the sources of income to cover the costs (fig. 4). Further elaboration on the different cost categories, investments as well as the various sources of income for a PED Innovation Atelier will be touched upon. The balance between costs on the one side, and income on the other, will vary per life cycle stage: from establishment up to stabilizing.

A comprehensive structure for detailing a multi annual financial plan is provided for in the Appendix A.
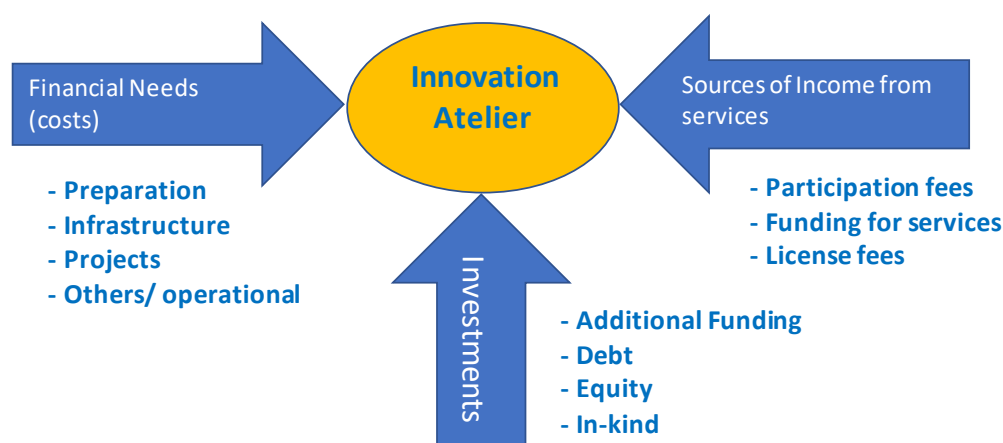
Figure 4: Structure of the multi-annual budget

In order to map the various costs and sources of income, and to identify options for addressing the financing gaps, the investment plan canvas (appendix B) can be used. We specifically draw attention to sources of income by creating and capturing value from services and activities, different client(groups) and their financial or non-financial contributions; costs and funding the financing gaps with private and/ or public equity.

5.2   Sources of income

Based on the characteristics of a PED Innovation Atelier, we define how it can create value, and subsequently capture (monetise) this value. Note that not all revenues will be able to monetise, certain gains are non-financial, but supply a societal or environmental result (TNO, 2020). One way to identify the values within the network of partners in the PED Innovation Atelier is to perform a Value Network Analysis (Allee, 2008).

With a **Value network analysis**, relationships between members of a network are visualised by mapping the important relationships and transactions that take place between different points of each network (generally individuals, groups, business units and even individual businesses in an industry) in a chart or web.

The value network analysis allows for an evaluation of participants of the network, both individually as of the benefits they bring to the network. The organization as a whole is analysed, including financial and non-financial aspects of operations.

The value creation of the PED Innovation Atelier can be mapped by composing a business model canvas (as included in annex B) and further elaborate on an integral value proposition.

The services and activities of the PED Innovation Atelier that add value to partners, participants and the wider community are mapped. Examples of services and activities the PED Innovation Atelier can offer are set out in figure 5 (services and activities).

Service	Activities
Ecosystem	
Community building	Scouting, brokerage, awareness creation, dissemination, ecosystem building
Strategy development	Market intelligence, market assessments, roadmapping, technology watch
Ecosystem learning	Workshops, seminars to share knowledge and experience
Representation, promotion	Representing interests during meetings & conferences, organizing (country) visits, roadshows
Technology	
Strategic RDI	Joint, pre-competitive R&D, secondment from companies
Contract research	Specific R&D, technology concept development, proof of concept
Technical support on scale-up	Concept validation, prototyping, small series production
Provision of technology infrastructure	Renting equipment, low rate production, platform technology infrastructure, Lab facilities
Testing and validation	Certification, product demonstration, product qualification
Business	
Incubator/accelerator support	VoiceOfCustomer, market assessment, business development, legal, IPR, location, sales strategy
Access to finance	Financial engineering, connection to funding sources, investment plans
Skills and education	Courses, bilateral mentoring, workshops, technological infrastructure for education, secondment
Project development	Identification of opportunities, creating consortia, development of proposals
Offering housing	Office space and space for experimentaton and pilot manufacturing

Figure 5: Services and activities

Different clients have different rationales for collaborating with or within the PED Innovation Atelier. Based on the offered services and activities (table 1). The tables below sets out a few examples of financial and non-financial contributions.

Services / client (group)	Industry / Business	RTOs/ academia	Multi-level Government	Community residents
Ecosystem services				
Community building	Participation fees Memberships	In-kind partner Contribution	Co-funding	In-kind contribution
Strategy development	Memberships In-kind	In-kind partner Contribution	Co-funding	In-kind contribution
Ecosystem learning	Project funding			In-kind contribution
Representation/promotion	Memberships	In-kind partner Contribution		
Technological services				
Strategic RDI	Memberships	In-kind partner Contribution	Institutional Funding	
Contract research	Project funding Memberships		Co-funding (SMEs)	
Technical support on scale-up	Project funding Memberships		Co-funding (SMEs)	
Provision of technology infrastructure	Project funding	In-kind partner Contribution	Institutional Funding	In-kind contribution
Testing and validation	Project funding			Test labs contribution

Business services				
Incubator/accelerator support	Memberships Project funding		Institutional funding Co-funding (SMEs)	
Access to finance	Memberships Project funding		Co-funding (SMEs)	
Skills and education	Memberships Participation fees		Institutional funding Project funding	In kind contribution
Project development	Project funding	In-kind partner Contribution	Project funding	In-kind contribution
….				

Table 1: Incomes from various services

In addition to gain value through the various kinds of services the PED Innovation Atelier delivers, crowdsourcing (RVO, n.d.) can be considered to gain access to (in kind) contributions for example.

> **Crowdsourcing** can be another way to gain access to resources – mostly in kind – is crowdsourcing. Crowdsourcing enables individuals to collectively contribute, with ideas, time, expertise or funds, to a project or cause. With crowdsourcing a good or service is obtained from an outside supplier, which can be another business, or an individual. A 'crowd' or group is engaged in a common goal; i.e. innovation with the means to use knowledge and power of the crowd to enable or speed up a process. Crowdsourcing is mostly but not always done online, powered by social media and growing connectivity.

5.3 Costs

The distribution of costs over the lifetime of the PED Innovation Atelier is distinguished in the three phases of the Innovation Atelier, all with their own specific corresponding cost structures. Figure 6 displays the distribution of costs over the lifetime of the Innovation Atelier.
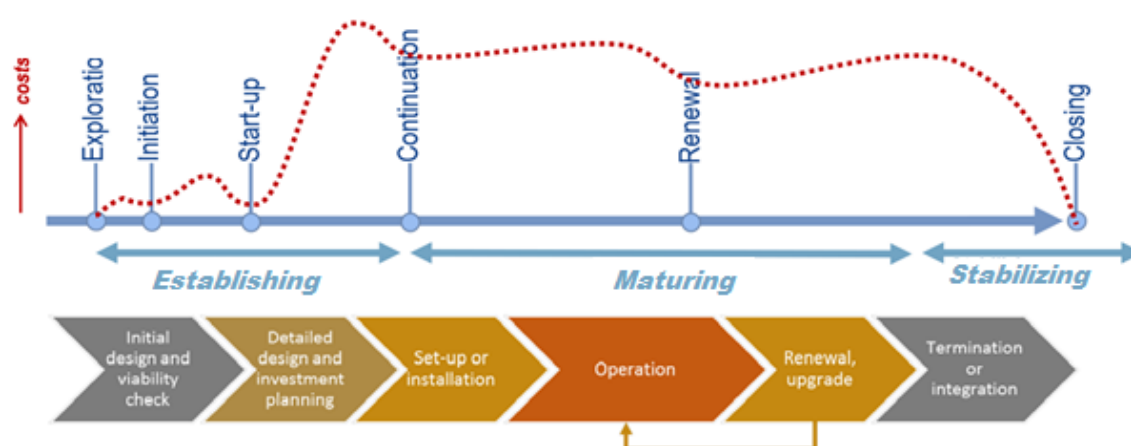
Figure 6: Distribution of costs over the lifetime of an Innovation Atelier

Various examples of (categories of) costs which are made during the three phases of the Innovation Atelier are mentioned in the investment model canvas (see appendix B).

5.4   Identifying the financing gaps

Experience with entities like Innovation Ateliers suggest that - especially in the initial years - the income generated does not meet the costs of setting up and running the organization. We define this shortfall as the initial funding gap: As the PED Innovation Ateliers currently being established are part of the ATELIER research project, which are subsidized by the European Horizon 2020 program and therefore receiving funds from the European Commission, this initial gap can be considered covered by the grant from the European Commission. Having assessed the start-up phase's funding gap, the challenge and the short-term objective is to close the structural financial gap of the PED Innovation Ateliers, that might arise after the end of the ATELIER project.

Also, earlier experience suggests that there is a structural funding gap between income and costs, during the entire lifetime of an Innovation Atelier. This results from the fact that conducting research on innovation is hindered by specific forms of market failures. This aspect provides a rationale (a legitimization) for additional public intervention and / or financial support. The rationale is to consider the financial structure and balance sheet of the PED Innovation Ateliers as similar to an undercapitalised innovative start-up, dealing with a societal challenge, hence justifying the public (or philanthropist) financial aid.

5.5   Access to funding

Access to funding is essential for the Innovation Atelier to grow alongside the three stages. This refers to the ability to gain public loans or government subsidies when the IA is not yet self-supporting due to market failures. To gain access to funding, an overview of funding needs and funding opportunities (private and public) can be set up. The different services can be supported by various (government) funding instruments.

Governments, banks and venture capitalists each wield their own principles for funding, financing and investing in an Innovation Atelier. As the scale of local Innovation Atelier is probably too small to ask for dept financing by banks or investments with private equity, further information about this is left out of the argumentation. However, crowdfunding might

be a way to attract financing. With crowdfunding the Innovation Atelier could be directly connected to those who can give, lend or invest money to finance the Innovation Atelier. Usually, crowdfunding is done through public online calls for the contribution of finance to specific projects.

The market for crowdfunding in the European Union is underdeveloped as compared to other major world economies due to a lack of common rules for this subject across the European Union. However, a proposal for a regulation on crowdfunding service providers is published in 2018. This regulation will improve access to crowdfunding and investors on crowdfunding platforms will be protected and guaranteed on a higher level. The Commission' proposal only applies to those crowdfunding services entailing a financial return for investors, such as investment and lending based crowdfunding (European Commission, n.d.).

Public funding through key partners

A specific key partner can be subsidized by the municipality to structurally contribute (in kind) knowledge, based on experiences, to the PED Innovation Atelier with the aim to continuously contribute to the development of the PED.

5.5.1 Addressing the financing gaps

To address the initial financing gap, we suggest the possibility for dept financing and equity financing as displayed in table 2.

	Industry	Univ./RTOs	Government	Other
Debt financing, to address immediate financing needs	(subordinate) loan, guarantees	(subordinate) loan, guarantees	(subordinate) loan, guarantee	Banks (loans)
Equity financing, to address immediate financing needs	Participation	Participation	fund / seed facility, participation	VC (skills and investments), Private equity (investments), Angels / Seed Capital (investments), crowd funding

Table 2: Addressing the initial financing gap

To address the structural financing gap of the IA we suggest the possibility (financial) support which is not linked to services (table 3).

	Industry	Univ./RTOs	Government	Other
(Financial) support not linked to services, to address structural financing gap	Grants and in-kind / equipment / basic (membership)		Additional funding (addressing societal challenges such as the energy transition,	

			employment, eco-system building, etc.)	

Table 3: Addressing the structural financing gap

5.5.2 Principles for public funding

Public support is delivered by ad-hoc intervention, goes beyond RDI, and does not refer to specific services provided by the PED Innovation Atelier. As such, it is fundamentally different from institutionalized support (in modality, delivery, actors involved, etc.).

With respect to research and innovation conducted in the context of the Innovation Atelier: market failures should be leading (in design and delivery), and the actual intervention is (also) bound by the State Aid rules.

Examples of EU public subsidy schemes:

Under the current **Horizon 2020** Research and Innovation programme, substantial budget is allocated to support research and development in local demonstrators and innovations. Various topics and specific call scopes make it viable to find a connection somewhere. Recently published **Green Deal** research programme, offers interesting research funding where it comes to decarbonisation of the EU economy, supporting key enabling technologies, and initiatives like the renovation wave in Europe.

Next years' successor will be the **Horizon Europe** programme (2021 – 2027), with new missions and calls, offering a great number of funding opportunities again, to support climate actions on resource efficiency, energy, built environment and societal transformation.

For entrepreneurs, SMEs, large enterprises and Research institutes, through the platforms of **European Investment Bank**, and the **European Investment Fund**, support is offered to different target groups to get access to funding. Ranging from loans to guarantees, and from grants to equity funding, supporting European Innovators to make the next step.

Many of these platform have regional or national funding agencies (**RVO** in the Netherlands) in Europe to distribute the funds, but offer also help with the application process.

See for further details and links to the various programmes, networks and platforms Appendix D.

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Enhanced EIC pilot

In some Innovation Ateliers it will be possible to fund the so called "breakthrough innovation" through the European Innovation Council, which co-invest in equity, instrument dedicated to innovative SMEs. Measures are both grant and equity investment. The equity investment has a range between 0.5M€ and 15M€ blending grant and equity. The due diligence process on the evaluation will be performed by the EIB.

https://ec.europa.eu/research/eic/index.cfm?pg=investing

As well, when looking at EIB it is possible to investigate InnovFin a scheme suitable for SME and LE but also for research institution. InnovFin has available a set of schemes to be ad-hoc tailored and will provide direct aid or via intermediary (banks or funds).

https://www.eib.org/en/products/mandates-partnerships/innovfin/index.htm

National and regional authorities each wield different rationales for intervention in this context Impact (of knowledge on the economy) is on a national (global) level (i.e. spill-over effects), and therefore national governments should support conducting of RDI (including management). Immediate effect (of conducting RDI on employment, economic activity) is on regional level (i.e. re-spending / rippling effect), and therefore regional (local) government should contribute to infrastructure.

5.6 Stepwise approach to an Innovation Atelier business model

In brief, to enable the functioning of the Innovation Atelier over the years, as a self-supporting entity, the following steps can be taken:

- Define value creation, for example by using a value network analysis. Map the services the Innovation Atelier delivers, and what they yield in cash and kind.
- Analyse the costs that come up during the three stages of the Innovation Atelier, and define the structural and initial financing gaps, by comparing the costs and incomes, for example with a business model canvas.
- Address the financing gaps by gaining access to public or private funding, for example through EU public subsidy schemes or crowdsourcing. Plan joint meetings with (regional) policy makers to discuss and explore possibilities for funding.

6. Organizational model

Organizational models are crucial to govern and establish collaborative linkages among organizations or partners that move towards a common vision (Ahuja, 2000). They are to manage resources and help partners to understand their positions, line of interactions, responsibilities or liabilities to each other.

Innovation Ateliers are Public Private Partnerships, formed by various partners (organizations, business, committee or community members, governmental bodies, NGOs etc.) to comply to a technical, social and economic mission, that goes beyond the information processing capabilities of a single partner. A proper organizational model can help to establish and formalize their relationships and responsibilities, to create a shared value and reach those values. It can help each participant to be in a well-maintained organizational structure which provides a roadmap for the advancement and achievement of individual and collective goals.

In practice it rarely occurs that a systematic approach is used to define a suitable organizational model designed for inter-organizational collaboration, particularly for multiple organizations involved in innovation trajectories. With this chapter we aim to pinpoint how a core team of a PED Innovation Atelier (*as group forming to network forming*) can govern itself and allocate responsibilities for actions within the PED Innovation Ateliers. Various organizational models, from formal to informal, are reviewed to their fit to an Innovation Atelier, namely the network organization, the virtual organization, the membership association and an open network platform.

6.1 Network organization

A network organization refers to a governance structure, in which three or more organizations assemble to produce a good or provide a service (Sobiya, 2020). These organizations can either get into a partnership for a particular venture, or one organization can hire others to handle one or more of its functions (outsourcing) (idem). This network form involves a select, persistent, and structured set of autonomous firms, engaged in creating products or services. They base on implicit and open-ended contracts to adapt to changes as well as coordinating and safeguarding such changes. In a network organization, there is often a core organization formed. This core defines the main strengths and characteristics of the network. The network structure, in contrast to hierarchical organizations, has a flat structure.

Fit to PED Innovation Ateliers

The ability to add new organizations, services or people to the network, either with formal bonding or outsourcing, fits the needs of a PED Innovation Atelier. The key organizations which initiate the Innovation Atelier could form a core organization.

6.2 Virtual organization

The virtual organization is a governance structure that forms a temporary consortium of partners from different organizations, established to fulfil a value adding task to a specific customer or a product or market (Jägers et al., 1998).

The organizations are not legally bonded in their collaboration. It is considered that when an organization assembles resources from a variety of firms, a virtual organization seems to have more capabilities than it possesses (Thomas, 2020). They are formed to provide a set of services and act as one entity. The lifespan of a virtual organization is restricted until the task is accomplished the organization becomes dissolved (Jägers et al. 1998).

The leading principle of this organizational type is that the collaboration relies on a digital process, with minimal physical presence. Virtual organizations necessitate associations, federations, relations, agreements and alliance relationships as they essentially are partnership webs of disseminated organizational entities or self-governing corporations (Camarinha-Matos et al. 2005).

Fit to PED Innovation Ateliers

The formation of any collaborative informal organizations that consist of multiple independent organizations should be based on a commonality among its members. This commonality can include sharing of common or compatible goals, having a level of mutual trust, having established common or interoperable computer infrastructures, and having agreed on some common policies, codes for practice and value systems, e.g. common policies for business practices in industry-based collaborative networks (Camarinha-Matos et al., 2005). Here the importance of the mission and vision statements become important as they can also serve such code of conduct. A key question becomes guaranteeing basic requirements in dynamism for PED Ateliers.

6.3   Membership Associations (Full and limited capabilities)

This organizational model is used to form a governance structure in order to achieve a given objective with other like-minded individuals to create a (legal) entity in the form of an association (KVK, 2020) .

A membership association has several requirements: It has to consist of at least two members, which all have voting rights; it needs to organize meetings in which members gain full power and authority; the association has to form a committee, a chair, a secretary and a treasurer (KVK, 2020).

There are various types of membership associations and they vary from having full legal power to a limited legal capacity. Moreover, the primary objectives of a membership association are to have detailed legal documentation which is necessary for a membership association to be established and registered by its country's government.

Fit to PED Innovation Ateliers

In PED Innovation Ateliers, A full-capacity membership association seems suitable as the vision and mission statements create a main objective around the stakeholders. The challenge would be making suitable task groups and establishing efficient communication rules among them.

6.4   Open information and discussion platform (or loosely coupled organizations)

This organization model represents a system in which organizations compose autonomous elements that are often independent of each other, rather than rationally and hierarchically controlled (Orton et al., 1990). Part of this system, people and work are connected but there are no strict dependencies. The work flow is designed to be flexible.

Three conditions necessary for the 'optimum environment' for loosely coupled partnerships are: A strong experimental orientation, financial slack and managerial focus and attention (Orton et al., 1990).

These "loosely coupled" relationships, characterised by lower levels of interdependence, do not rely on the reciprocal exchange of knowledge. They lack the allocation of partner specific resources and the attention of dedicated scientists and managers to support the partnership (Klueter et al., 2014).

Fit to PED Innovation Ateliers

It is well known that shared knowledge and fresh ideas during experimentation significantly boost the innovation -and disruption process to generate new products or processes. In general, the tighter the commitments between research partners is, the more likely the partnership will result in ground-breaking inventions. to fit this model to the Innovation Ateliers, an optimum environment for organizations needs to be created.

6.5   Selection of the best fitting organizational models

As each PED Innovation Atelier will be depending on the city context depending, several appropriate organization models for shaping the (in)formal PED Innovation Atelier organization are mentioned. As the city context is different and network requirements will differ per Innovation Atelier network, we present a framework (table 4) to support the selection of the best fit organization model. It is important to identify the needs of the dedicated Innovation Atelier network. This can be prepared by a core group of participants, initiating the activities of the PED Innovation Atelier. The framework offers a number of criteria characterising certain qualities or needs a PED Innovation Atelier is looking for in an organizational model; across the various models as described earlier. Each of the organizational models is qualitatively assessed weather they match for a specific quality. As such, PED Innovation Atelier networks can find out the best fit organization model, matching most of the requirements specific for the needs of that PED Innovation Atelier.

	Network	Virtual	Association Full	Association Limited	Open Innovation Platform
Non-personal Liability					
Eligibility to apply funds/ incentives					
Contracting capacity					
Flexibility to add on member					
Functional Clarity					
Agility against changes					
Transparency among other partners					
Decision Making Style (e.g. Democratic)					

Table 4: A framework to assist the selection process of an organization model fit for PED Innovation Atelier

There might not be a one-fits-all governance structure to the stakeholder's network which is to be involved in the Innovation Atelier. Various forms can be considered, based on their stakes, resource contribution and end-beneficiaries of the innovations. This might help to determine what kind of organizational capacity the network needs. In that sense, choices can be made among a limited amount of organizations (e.g. for the core organization) in connection to a non-registered association (e.g. for the residents). The type of decisions that specific groups of partners need to take as well as the process of decision making gets essential when considering a governance structure (e.g. between flat to hierarchical ones). Moreover, it is also crucial to consider in case certain partners who need to finance, or benefit (directly and indirectly), invest in resources (beyond economic terms) find an optimal match given their financial (tax) structure.

In appendix C a more extensive definition is provided for all presented organizational models.

Tips to get organized (world economic forum, 2015)

Participating members and stakeholders of the collaborative innovation organisation all work in unique situations, which affect the collaboration. The changes of success for the collaboration can be improved by following the a strategy, adopted from 'world economic forum'. Divided in three stages, the strategy consists:

Prepare: Preparation is an important but often overlooked foundation for collaboration. A good preparation involves: Defining objectives, finding the right partners, preparing both organizations culturally and through incentives to support collaborations, and connecting with the right potential partners.

Partner: Partnering focusses on negotiating and tailoring the projects with partners to ensure that the benefits, risks and governance aspects are adequately defined.

Pioneer: With pioneering adaptation and thriving for the mutual and sustained benefit for all partners as they are executed and as the context changes is ensured.

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7. Monitoring and impact

7.1 Objective of Monitoring

The above discussed approach of PED Innovation Ateliers requires a new way of collaboration and organisation for most partners in the PED demonstrator area. In order to learn from the experience and be able to adjust or intervene in the process, it is important to monitor the progress of the collaboration in action. This chapter elaborates on a framework to help the PED Innovation Atelier partners monitoring the process and assess the impact of the Innovation Ateliers on the development of a PED.

7.2 Reflective Monitoring in Action

The monitoring of the Innovation Ateliers is based on the approach of Reflective Monitoring in Action (RMA), a method developed by the Wageningen University and VU Amsterdam in 2010. Specifically designed for monitoring projects working on system-innovations, and with a sustainable transition focus (van Mierlo et. al., 2010).

Sustainable transitions require changes on various levels of society, and in multiple domains. Governance and decision making will impact ordinary routines, uses, current relations and institutional structures. System-innovations are supported by ways of monitoring that is intended to tackle system barriers that are thwarting the objectives and to make the most of opportunities that may be available in the world beyond (idem). This helps to develop new ways of dealing and collaboration in which the institutional context changes along.

For projects with ambitions to realise system-innovations, it requires to include elements of learning and reflection in operation for structural change. Reflective Monitoring in Action encourages stakeholders to keep reflecting on the impact of project actions and activities in relation to ambitions of the project. This further includes reflection on the project's environment, like current practices; institutional embeddedness. The prior helps to identify the opportunities in the system with the goal to realize structural change and innovation to happen.

The RMA approach is action oriented. Ideally, it is an integral part of the project development process. Results and insights of the monitoring will guide and fuel new activities in the project, and help project participants to learn along the way, to realise system-innovations.

The design, development and operation of PED Innovation Ateliers in Amsterdam and Bilbao, will be monitored using the methodology of Reflective Monitoring in Action (RMA). According to a dedicated 4 step approach.

The above explains that *learning* on its own is not the end in itself. It is about *learning to tackle* the challenges that come up during the innovation processes and to be able to adapt it by jointly developing possible solutions to tackle these challenges. In order to do so, the reflective monitoring is embedded in the project and is actively part of the process. The MRA methodology identifies an iterative cycle of four steps as illustrated in figure 7:

Figure 7: The cycle of Reflective Monitoring (Credits: RMa Handbook by WUR)
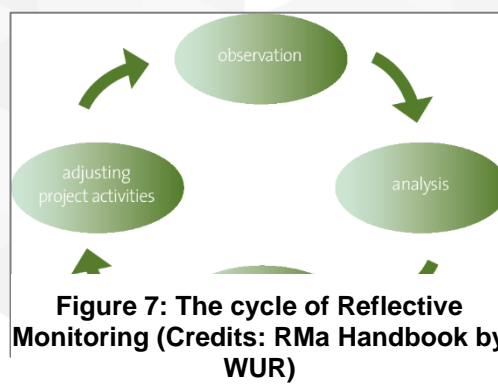
1. Observe
2. Analyse
3. Reflect
4. Adapt

For use within the ATELIER project, a fifth step (5. Report) is added to the RMA monitoring cycle that focuses on reporting the lessons learned, see figure 8. A more elaborate framework to report on the lessons learned in the Innovation Ateliers will be developed based on observations and findings gathered throughout the monitoring process. The monitoring framework will therefore be continuously updated in a living document (available on request). Herein it is the aim to include experiences and lessons learned from other SSC projects to develop and update the monitoring framework.
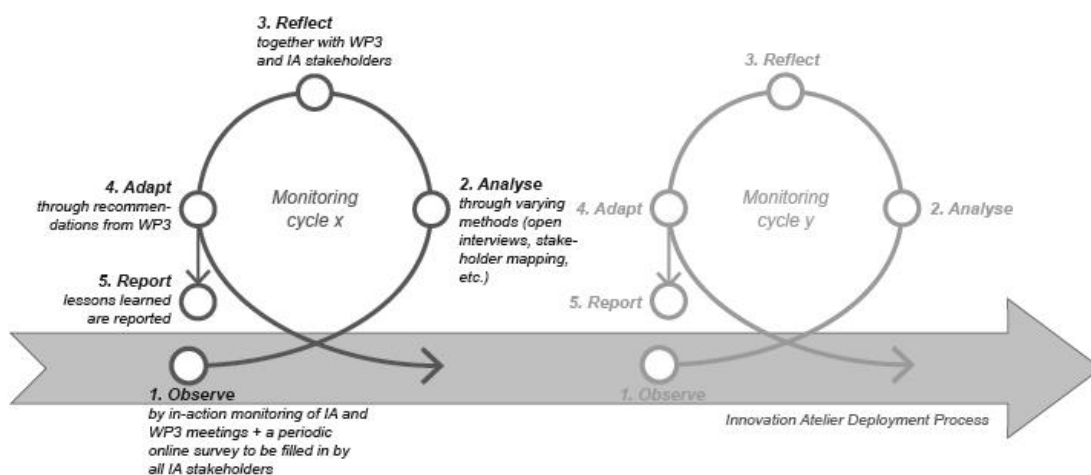

Figure 8: A visual representation of two RMA-Cycles in an Innovation Atelier deployment process

The emphasis of the RMA cycle is on flexibility, rather than on a strictly structured methodology or a rigid sequence of steps: "*Monitoring for system innovations is customised work: the challenges of the moment determine the best way to implement such monitoring.*" "*The methodology of RMA is a coherent but not rigidly defined body of basic starting points, principles, attitudes and tools. It also comprises a large number of 'interventions' for stimulating the learning processes within a project.*" (RMA Guide) Interventions can be anything from a phone call or email suggesting a specific approach or sharing an insight, to organising full co-creative design sessions. In defining the interventions, experience from other SSC projects will be explored and included or exchanged when relevant to the specific observation made during the project process.

Cross City Learning
To share the lessons learned, **Cross-City Learning Events** will be organised to exchange best practices and lessons learned amongst participating Cities (in case of ATELIER, the 8 EU cities, 2 Lighthouse and 6 Fellow Cities). A dedicated format for cross city learning is

under development. The most important element is to support an open dialogue between the cities, without judgement, or peer pressure that might prevent cities to share the 'bad' things too. It is crucial to create an open and safe space, to share experience and process learning between and among cities – and fuel further steps for improvement.

Other SCC projects can be involved with and informed about the exchange of best practices and lessons learned within ATELIER.

8. Next steps to formalize the PED Innovation Atelier

Looking back on the first 12 months of work in the context of the ATELIER project, demonstrator activities having started, and also the work for establishing PED Innovation Ateliers have kicked off. By design (according to the Project Proposal [GA no 864374][4], the first 12 months working on establishing the PED Innovation Ateliers in Lighthouse cities, would have been reinforced by reporting on formal stepping stones like mission and vision statements, selection of an organization model and first outline of business model and financial plan. In reality, over the past 12 months Lighthouse cities have been much more focussed on pragmatic application of the PED Innovation Atelier concept instead. In order to support the partners in the demonstrator projects for example. Notwithstanding cities have worked mobilizing the local eco-system, by identifying the key stakeholders and partners and start collaborations. This partner collaboration is organised in a specific shape (both Amsterdam and Bilbao), including a structure with a core team and decision making mechanism. Until this moment, none of the cities was ready to make a decision on a formal organisation model yet.

Due to the COVID-19 outbreak in Q2 2020, and restrictions on physical meetings and traveling, it took a while to get going for project partners with the early collaboration in just established networks. By means of virtual support and organising meet ups, the past and coming months are dedicated to collectively map and take the steps which are necessary for formalizing the Innovation Atelier organisations in cities.

8.1 Next steps

In order to support the PED Innovation Atelier communities in Amsterdam and Bilbao in progressing on the formalisation of the PED Innovation Atelier organisation, a number of actions are described here to follow up on.

In the coming months, it is recommended to dedicate time and attention (within the core team of partners) on:

1. Reflecting on experiences from past and ongoing SCC projects (Chapter 2);
2. Stating a vision, mission and developing strategies (reflected in Chapter 2 & 3);
3. Developing a strategy for stakeholder involvement and network (Chapter 4);
4. Designing a business model and financial plan, by addressing value propositions, identify sources of income, costs and additional funding (Chapter 5);
5. Selecting an organizational model that fits the PED Innovation Atelier characteristics given a specific urban context (chapter 6);
6. Exploring the link between the work done in the PED Innovation Ateliers, and the progress reporting needs for monitoring and impact assessment as is reflected in the monitoring framework (chapter 7);
7. Sharing PED Innovation Atelier results with other SCC projects (chapter 7).

Each step is requiring a co-creation process with and between the stakeholders and partners within the PED Innovation Ateliers. The core team members will need to understand the

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[4] Grant Agreement number: 864374 — ATELIER — H2020-LC-SC3-2018-2019-2020/H2020-LC-SC3-2019-ES-SCC

value and use of the various elements and need to work on a shared vision to reach consensus with the final decision and reported content eventually.

Important to notice here, is that the partners of this subproject are in position to help in this process, as most ATELIER partners have at least a minor contributing role assigned. For helping the PED Innovation Atelier communities not only in sessions dealing with specific Demonstration project related content, but some of the partners are very well attributed to support the community in shaping the shared vision on the formalisation content as well. Considering the expertise from the wide variety of partners in the consortium for their potential contribution should help the progress. And not in the least, TNO – lead of this subproject– masters a lot of experience with setting up Innovation Atelier type of initiatives and organisations alike in the Netherlands and Europe wide (Butter & Karanikolova, 2017).

A dedicated outline for organising a support session to help the PED Innovation Atelier community with formalisation of the 5 steps, is difficult to provide, as it is strongly related to the experience and state-of-the-art knowledge being present with the respective core teams in Amsterdam and Bilbao. Please feel free to reach out to TNO or fellow partners in this task, if your PED Innovation Atelier community is in need of support on the way of formalisation of the above steps. Activities to support can consist of drafting and facilitating workshops with the relevant partners and stakeholders in the Innovation Ateliers, invite external experts to session with the Innovation Atelier communities for sharing knowhow and/or advice. Reflection and reviewing of output of these steps can be considered as a supporting activity as well.

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APPENDIXES

Appendix A: Financial plan

Innovation Atelier

Income	2021	2022	2023	2024	2025	2026	Upfront
R&D&I projects							
Public cofunded R&D&I projects							
Contract R&D&I activities							
Initial series production							
Other, namely ….							
Subtotal R&D&I projects	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*
Memberships							
Memberships (1st tier)							
Memberships (2nd tier)							
Other, namely ….							
Subtotal Membership and sponsering	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*
Consultancy and services							
Workshops							
Training and education							
Scouting and market intelligence							
Incubator services							
Other consultancy, namely …							
Subtotal consultancy and services	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*
Other							
IP(R) – revenues							
Participations (e.g. in spin-offs, etc.)							

Conference fees							
Renting out infrastructure							
Other, namely ….							
Subtotal Other	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*
Total	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*

Costs	*2021*	*2022*	*2023*	*2024*	*2025*	*2026*	*Upfront*
Preparation business plan							
Consortium building							
Market analysis							
Set-up of the Work Programme							
Drafting of business plan							
Other, namely …							
Subtotal preparation business plan	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*
Infrastructure							
Housing							
Machines and equipment							
IT infrastructure							
Other, namely …							
Subtotal Infrastructure	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*
Projects							
Resources (materials, inputs, etc.)							
Researchers							
Training of staff							
Other, namely …							
Subtotal Project	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*
All other operational costs							
Management							
Governance							

	2021	2022	2023	2024	2025	2026	Upfront
Business development, PR, etc.							
Operational staff							
Administration, HR, etc.							
PR and marketing							
Utilities (energy, water, etc.)							
Software &lincenses							
Maintenance							
repayment with interest on loans							
Other, namely …							
Subtotal other operational costs	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*
Total	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*
Total Income - Total Costs	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**

Investments	2021	2022	2023	2024	2025	2026	Upfront
Partners							
Other financial contribution (i.e. other than "Income")							
Sponsorships							
In-kind personnel							
In-kind equipment							
In-kind housing							
Equity financing							
Dept financing							
Other, namely …							
Subtotal Partners	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*	*€ 0*
Other private investments							
Financial sponsoring							
Sponsorships							
In-kind equipment							
In-kind personnel							

Equity financing							
Dept financing							
Other, namely …							
Subtotal Private	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Public (i.e. publicaly funded)							
Equity financing							
Dept financing							
Sponsoring							
General cofounding							
Other, namely …							
Subtotal Public	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Total	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0

Grand total: Total Income plus total Investments minus Total Costs	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0

Appendix B: Investment Model Canvas

Investment plan canvas innovation hubs

Costs − **Income from services** = **Gap funding**

Costs

What are the cost of running the innovation hub

a. Depreciation of technological infrastructure

b. Housing, IT and other infrastructure

c. Research and other project staff

d. Operational staff (incl. business development)

e. Management and governance

f. Communication and PR

g. Other costs

Income from services

What are **customers** for what?
What are they willing to pay?
How can **public** support for these specific services?

Technology services

A. Strategic RDI
B. Contract research
C. Technical support on scale-up
D. Provision of technology infrastructure
E. Testing and validation

Business support services

F. Incubator/accelerator support
G. Access to finance
H. Skills and education
I. Project development

Ecosystem services

J. Community building
K. Strategy development
L. Ecosystem learning
M. Lobbying

Other

N. IPR/Licensing
O. Participations
P. Memberships
Q.

Gap funding

Who are willing to support with basic funding? How much and when?

1. Regional government

2. National government

3. European Union

4. Partners

5. Private investors

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Appendix C: Organizational models

Network Organization

A network organization refers to a governance structure, in which more than one organization combine to produce a good or provide a service. These organizations can either get into a partnership for a particular venture, or one organization can hire others to handle one or more of its functions (outsourcing), for example, marketing, production, sales etc. This network form involves a select, persistent, and structured set of autonomous firms (as well as non-profit agencies) engaged in creating products or services. They base on implicit and open-ended contracts to adapt to changes as well as coordinating and safeguarding such changes.

In a network organization, there is often a core company formed. This core defines the main strengths and characteristics of an organization. These characteristics give the core a competitive advantage e.g. technical capabilities or enhanced knowledge that allow businesses to get ahead of others. This core distributes its functions to different companies which can be located in different (geographical) locations and can outsource or delegate initiates partnerships in a network for e.g. product development, communication services, logistics, distribution, manufacturing etc. The distributed and/or outsourced ones become peripheral organizations connected to the core. They are responsible for their own share and losses that are not distributed to the whole network.

Regarding decision making, the network structure has a flatter structure (contrast to the hierarchical ones). It is because here many layers of management are cut from between and their functions are passed on to other organizations. This flat nature of network structure makes its control span wider and that leads to a possibility of a bottom to up communication. In this model, managers play a vital role because they coordinate and control both internal and external relationships.

Regarding its fit to a sector, network governance is not universally accepted as a positive development for the public sector. The doubt is its ability to adequately perform as a democratic governance structure while others view it as phenomenon that promotes efficient and effective delivery of public goods and services.

A network structure has its pros and cons such as following:

Benefits of Network Structure

- Clearer focus and purpose coming from the core and also definition of an each partner who joins for a specific functionality or a service,
- Lower costs due to less complexity in transactions and communications coming from flat structure,
- Flexibility to outsource whenever a service is needed or also to add more organizations or partners based on changed needs overtime, since the network organization does not own all the products or services,
- Increased efficiency and reduced agency problems due to distributed problem solving (e.g. transaction and management overload),
- Increased effectiveness due to allowing creative and emerging problem solving and reducing micromanagement.

Drawbacks of Network Structure

- Controlling difficulty over time due to;
  - shortened linkages between partners (not everyone or representative of each stakeholder involved in communication),
  - its widespread when the network grows, it gets more and more difficult to control.
- Reliability as a whole entity
  - due to delegation of work of partners that are already outsourced, the whole network can suffer from an unreliable partner.
- Communication inefficiencies when partners are geographically dispersed.
- Lack of secrecy as the information spread is difficult to control here.
- Loss of control due to outsourced operations done by others
- Sacrificing of profit depending on the agreements among partners,
- Multiple stakeholders that attempt to influence without authority, competing goals and accountability particularly with the control issue.

Fit to PED Innovation Ateliers

The core organization is relevant for the key organizations that initiate the PED Ateliers and ability to add new organizations, services or people either with formal bonding or outsourcing is what PED Ateliers need. The role of public sector (from authority vs. democratic decision making), avoiding competing goals, and accountability with a loose overall control would be the attention points for fitting this to the PED Ateliers. Assigning task groups or organizations that can handle the drawbacks of this organizational model would be essential such as communication managers.

Virtual Organization

Virtual organization is a governance structure that forms temporarily a consortium of partners from different companies established to fulfil a value adding task to a specific customer or a product or market. Virtual organization is often associated with such terms as virtual office, virtual teams, and virtual leadership and the term virtual in this sense has its roots in the computer industry. These organizations cooperate with each other independently in terms of legal bonds. It is considered that when an organization assembles resources from a variety of firms, a virtual organization seems to have more capabilities than it actually possesses (Thomas, n.d.). They are formed to provide set of services to outside world and act as one entity. The lifespan of a virtual organization is restricted after the task is accomplished the organization becomes dissolved.

The leading principle of this unconventional organization is that cooperation does not physically but an entirely digital process relying on independents web associates. Virtual organizations are centred on technology and position physical presence in the background. Virtual organizations possess limited physical resources as value is added through (mobile) knowledge rather than (immovable) equipment. Virtual organizations necessitate associations, federations, relations, agreements and alliance relationships as they essentially are partnership webs of disseminated organizational entities or self-governing corporations.

Potential benefits include increased access to market opportunities, sharing risks, reducing costs, achieving business goals not achievable by a single organization etc. Besides, a virtual organization can be formed and adjusted rapidly by a business opportunity and

specifically tailored to the requirements of that opportunity. Thus it brings agility which is a survival element in turbulent market scenarios.

Benefits of Virtual Organization Structure

- Rapid formation as it does not require physical assets or resources prior to its establishment.
- Flexibility to include organizations
- Agility against market turbulences
- Low cost establishment
- Focus on mobile resources (knowledge, innovation) rather than immobile ones

Drawbacks of Virtual Organization Structure

- Difficult to guarantee requirements due to its dynamism and agility
- Difficult to guarantee the commitment due to its dynamic nature
- Requiring common and clearer shared as well as individual goals and objectives
- Requiring mutual trust as this has the least formal bond between organizations
- Requiring ICT infrastructure that enables to operate actors remotely and its costs and maintenance is an issue.

Fit to PED Innovation Ateliers

The formation of any collaborative informal organizations that consist of multiple independent organizations need to base on a commonality among its members. This commonality can include sharing of common or compatible goals, possessing some level of mutual trust, having established some common or interoperable computer infrastructures, and having agreed on some common policies, codes for practice and value systems, e.g. common policies for business practices in industry-based collaborative networks (Caraminha-Matos, Afsarmanesh & Ollus, 2005).

In order to exploit either network or more informal one as the virtual organizational structure, having a base conditions (as codes, manifests, missions, anything that is explicit and becomes a code of conduct) is crucial. That is a prerequisite for agility (Caraminha-Matos, Afsarmanesh & Ollus, 2005). Here the importance of the mission and vision statements become important as they can also serve such code of conduct. A key question becomes guaranteeing basic requirements in dynamism for PED Ateliers.

Membership Associations

This organizational model is to form a governance structure in order to achieve a given objective with other like-minded individuals to create a (legal) entity in the form of an association.

Forming an association has several requirements: They have to have at least 2 members, they need to organize meetings of members in which members gain full power and authority. The association has to form a committee and is a chair, secretary and treasurer. Each members has a right to vote in this form. There are different types of associations and they vary from having a full legal power to a limited legal capacity. moreover, the primary objectives of an association are to be detailed in the legal documentation necessary for an association to be established and registered by its country's government. This documentation is sometimes called the articles of incorporation or charter. Objectives described in the documentation should be accounted for in an association's organizational

structure. Deriving from these objectives, membership organizations have several task groups and management layers: There is a direction of the board or an executive committee (a subset of the board), committees, task forces, representatives to other organizations, sections, a paid chief staff person (if applicable), other units of the association. The number, functions, and responsibilities of the officers and groups will vary according to the size and nature of the organization. And its management layers do make associations typically hierarchical. There are generally two kinds of associations: Full-capacity and Limited Capacity. Both kinds have house rules in addition to their statutes for day-to-day affairs that are not subject to the civil-law.

In an association with a full legal capacity, members are not personally liable for its obligations. But the members need to apply to a civil-law notary to draft so-called deed. This deed states the establishment purpose (profit sharing for members is not a valid purpose or objective), member requirements, procedures for calling general meeting of members, rules for appointing and removing committee members and allocation of surplus after dissolution. In this case it might be mandatory to list the association with 'full legal capacity' at the Chamber of Commerce. This kind has the same rights and duties as a member of the public. For example, they can take out loans and own and inherit registered property. Subsidy providers often require that associations have 'full legal capacity'.

An association with Limited Legal Capacity does not need to apply to a civil-law notary yet the members become personally liable for its obligations. This liability can be limited or extra personal measures can be taken against it. It is probable that an association with 'limited legal capacity' cannot own a registered property e.g. real estate.

Benefits of Membership Association Structure

- Flexibility to offer different forms for establishment for different capacity needed for Innovation Ateliers
- Full legal capacity to apply subsidies and making purchases
- Recognizable organizational and decision making practice (from property ownership associations)
- Hierarchical nature of decision making may bring speed to actions (See drawbacks of this issue below)

Drawbacks of Membership Association Structure

- Hierarchical nature of the governance may be challenging for cases, when democratic decision making is a social norm.
- The objectives of a membership organizations may evolve or grow over time, in this case a clear understanding of the organizational structure may vanish. Task descriptions may accumulate or be uncomprehend and communication may complicate.

Fit to PED Innovation Ateliers

In PED Ateliers, A full-capacity membership association seems suitable as the vision and mission statements create a main objectives around the stakeholders. The challenge would be making suitable task groups and establishing an efficient communication rules between them. IFLA's suggestions would be benefited: Committees, task forces, and other similar units should have a charge or statement that describes the group's purpose, a defined term of existence, an approved number of members, and a defined reporting relationship to

another unit within the organization, usually the board of directors or other governing body. Sections and other professional interest groups should report directly to the governing body and may need their own bylaws. These bylaws should not conflict with the parent association's bylaws.

Appendix D: EU public funding programme for supporting sustainability in Europe

EU public funding programme for supporting sustainability in Europe:

(https://ec.europa.eu/environment/ecoap/about-action-plan/union-funding-programmes_en)

European Commission has launched a variety of forms of funding being available for eco-innovation. This ranges from R&D to finance, supporting SME's to infrastructure. Listing among others:

HORIZON 2020 (EU Framework Programme for Research and Innovation (2014-2020). Allocated nearly 80 billion euro investment on resource efficiency, key enabling technologies, SMEs, water and waste. Recently extended with the Green Deal Call for 2020/ 2021: Allocated budget 1 billion, as a direct response to the climate crisis, and protecting the EU biodiversity and habitants under threat.

LIFE: EU Funding Instrument for the Environment and Climate Action (2014 – 2020), which allocated budget is nearly 3,5 billion euro, focussed on capacity building, demonstration and pilots for environmental technologies and resource efficiency.

COSME: EU programme for the Competitiveness of Enterprises and Small and Medium sized enterprises (2014 – 2020). With an allocated budget of 2.3 billion euro, to improve access to finance and markets, conditions for competitiveness and sustainability for SME's and entrepreneurs. By offering Loan Guarantee Facility (LGF), Equity Facility for Growth and direct access to finance for SMEs. For further reading: https://ec.europa.eu/info/business-economy-euro/growth-and-investment/financing-investment_en#ui-id-5

ESIF: European Structural and Investment Funds (2014-2020), with an allocated budget over 350 billion euro, targeted for regional development, research and innovation, low carbon economy and environment and resource efficiency. By establishing an EU Regional Development Fund, the EU Social Fund, Cohesion Fund, and two funds focussed on agriculture and maritime & fishery.

Outlook for the years ahead: in **HORION EUROPE**, the next EU research and innovation programme starting off in 2021. The programme envisions to drive the systemic changes required to reach climate neutrality and ensure an inclusive ecological and economic transition at the same time.

35% of the Horizon Europe spending will be targeted to climate objectives directly. The new research programme will work closely with industry and countries to support green partnerships in critical area's as transport, energy, low carbon steel, circular biobased sectors, the built environment and biodiversity.

Horizon Europe missions area's (https://ec.europa.eu/info/horizon-europe/missions-horizon-europe_en) aim to mobilize research and innovation, catalyse actions and deliver impacts; supporting the European Green Deal ambitions:

- A Climate Resilient Europe: adaptation to climate change and societal transformation.
- Restore the Ocean and Waters : healthy oceans, seas, coastal and inland waters
- 100 Climate Neutral cities by 2030 – by and for the citizens
- Caring for Soil and Caring for Life.

Furthermore, the *Innovation Principal* (https://ec.europa.eu/info/research-and-innovation/law-and-regulations/innovation-friendly-legislation_en) approach has been launched to ensure that legislation is designed in a way that creates the best possible conditions for innovation to flourish. By design, new EU policies and regulations will support innovation and the regulatory framework in Europe will be innovation friendly.

European Investment Bank (EIB) support scheme's for Innovators, through InnovFin (https://www.eib.org/en/products/mandates-partnerships/innovfin/index.htm), offering lending capacity, guarantees and equity type of funding to SME's, large companies and/or research institutes for innovator needs. A large set of tools and programmes are in place and designed for specific target groups: https://www.eib.org/en/products/mandates-partnerships/innovfin/products/index.htm. For smart cities related energy projects, it is worth mentioning the programme **ELENA** (European Local Energy Assistance) from EIB, which specifically addresses grants for supporting technical (including project, legal and energy) assistance for energy efficiency and renewable energy investments targeting buildings and innovative urban transport (https://www.eib.org/en/products/advising/elena/index.htm)

European Investment Fund (https://www.eif.org/) is offering a wide range of tools through financial intermediaries (pan European) to improve access to finance for SME's. For example, the EIF is managing the SME initiative combining the ESIF resources and the centralised EU guarantee budget support for lending to SMEs. Another example of an EIF programme is **JEREMIE**: Joint European Resources for Micro and Medium Enterprises (https://www.eif.org/what_we_do/resources/jeremie/index.htm).

Certain institutional networks in Europe further help the bridge the financial needs with accessible funds in Europe. For illustration of such initiatives, see **JASPERS** network in relation to Smart City project development:
http://www.jaspersnetwork.org/display/HOME/Homepage