



POCITYF

D7.11
WP7, T7.6

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- * PU = Public
- PP = Restricted to other programme participants (including the Commission Services)
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- CO = Confidential, only for members of the consortium (including the Commission Services)



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Executive Summary

The following deliverable falls under WP 7 - Alkmaar Lighthouse City demonstration activities task 7.6 - Demonstrating ETT #4: Citizen-Driven Innovation in Co-creating Smart City Solutions. This deliverable is the first version of D7.11. - Transition Track#4 Activities in Alkmaar, providing a status update of the implementation of Integrated Solutions (IS) and Innovative Elements (IE) up to M39 of the POCITYF project. The three Integrated Solutions for Citizen-Driven Innovation in Co-creating Smart City Solutions (ETT)#4 concern:

- IS 4.1 - Social Innovation Mechanisms towards Citizen Engagement
- IS 4.2 - Open Innovation for Policy Makers and Managers
- IS 4.3 - Interoperable, Modular and Interconnected City Ecosystem.

The document provides a detailed analysis of the current implementation of all ETT#4 related activities to be carried out at POCITYF Lighthouse City of Alkmaar. Innovative Elements associated with Integrated Solutions 4.1 (Social Innovation Mechanisms towards Citizen Engagement), 4.2 (Open Innovation for Policy Makers and Managers) and 4.3 (Interoperable, Modular and Interconnected City Ecosystem).

The focus of this deliverable is the implementation of the Integrated Solutions, therefore the document is structured to first provide an overview of the POCITYF Lighthouse City of Alkmaar and then a short overview of the activities, followed by an overview per Innovative Element (see table 14 for overview).

Due to delays for some IEs, the deliverable will provide an overview of all developments leading up to this deliverable and the final developments and updates will be included in the second version, which is due at the end of the project.



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Abbreviations and acronyms

Abbreviation	Definition
API	Application Programming Interface
CIP	City Information Platform
DBVC	Design Based Value Mapping for Communities
DGP	Data Governance Plan
ETT	Energy Transition Track
EVBD	Entrepreneurial Value Based Design
FC	Fellow City
GA	Grant Agreement
IE	Innovative Element
IS	Integrated Solution
KPI	Key Performance Indicator
LH	LightHouse
LiDar	Light/Laser Detection and Ranging
PEB	Positive Energy Building
PED	Positive Energy District
V2G	Vehicle to Grid
WP	Work Package



1. Introduction

This deliverable represents the first version of D7.11 - Transition Track #4 Activities for Alkmaar, which is to provide an overview of the developments of the Innovative Elements that are being implemented in Alkmaar Lighthouse City (LH) within the scope of the POCITYF project.

The deliverable will provide a short description of how the input for the deliverable has been collected and the aim of Energy Transition Track #4 (ETT#4). Much of the background and information of ETT#4 was covered in the proposal and in other previously submitted deliverables. Therefore, the information within this deliverable aims to provide a condensed version, referencing relevant documents where applicable.

For ETT#4 the focus primarily lies on improving citizens' quality of life and increasing city efficiency by involving citizens in the early development, design and evaluation phases of the solutions and related services being included under the umbrella of other ETTs following a "Rapid Prototyping" approach. This is a process of creating a quick mock up and testing of solutions through an interaction layer with the citizens' followed by a simultaneous and almost real-time feedback by them; thus ensuring a constant improvement of the solutions and/or the services provided to them. Such an approach will be implemented in activities that:

- a) incentivise citizens for co-creating, co-delivering and co-capturing value by the smart city solutions demonstrated;
- b) create an open innovation ecosystem between different experimentation set-ups;
- c) create a P2P Energy Trading platform.

Innovative solutions (IS) to be demonstrated and replicated include P2P energy transactions, gamification and infotainment apps.

These innovative solutions on how to increase citizens engagement in the LH City of Alkmaar will be demonstrated in this report. ETT#4 includes three Innovative Solutions under which the Innovative Elements (IE) are grouped:

- IS 4.1 - Social Innovation Mechanisms towards Citizen Engagement
- IS 4.2 - Open Innovation for Policy Makers and Managers
- IS 4.3 - Interoperable, Modular and Interconnected City Ecosystem.

Under each of the ISs the related Innovative Elements (IEs) are grouped to provide an overview of the current state and the progress achieved until the time of the deliverable. For each IE it was asked to complete a set of questions that cover the goal and description of the IE, involved partners, faced barriers and lessons learned as well as the next steps and connections to other IEs or ETTs. This also gives an indication of what progress is to be made by the end of the project.

The conclusion focusses on a holistic view of the achieved progress, next steps and the expectations for the second version of this deliverable.

1.1 Scope and objectives of the deliverable

The POCITYF project aims to embrace the Energy Transition Strategy by deploying four Energy Transition Tracks (ETT#1, ETT#2, ETT#3 and ETT#4). In interplay the ETTs provide a comprehensive, but tailored approach to ensure that common and varied challenges and conditions of the LH Cities and Fellow Cities (FC) are addressed. Within these ETTs 10 Integrated Solutions (IS) were identified to support the demonstration, replication, and acceleration of mature and innovative technologies. Three of the Integrated Solutions belong to ETT#4.

This report is to be submitted to describe the current status of all the demonstration activities, and provides information regarding the achieved progress envisioned within the implementation plan. For Innovative



Elements (IEs) that, at the moment of writing, are still in the process of being finalized in their implementation, an overview of current achieved status is provided. The second version will provide the reiteration of the deliverable with updates up to M60.

1.2 Relation to other tasks and deliverables

This deliverable and the IEs included in this deliverable have several overlapping elements with other Work Packages (WP) within POCITYF. This includes WP1 - POCITYF Smart City Framework Towards Integrated Deployment, WP2 - Setting Up, Planning and Execution of Performance Monitoring Activities, WP3 - Evaluation Activities, Socio-economic Impact Assessment and Recommendation, WP4 - Citizens Engagement and Open Innovation Activities, WP6 - Évora LH City demonstration activities, WP8 - Replication Plans and 2050 Vision for Fellow Cities.

Due to the nature that this deliverable discusses, POCITYF LH City of Alkmaar relations to the other WPs are also relevant.

1.3 Structure of the deliverable

This deliverable is composed of seven sections according to the following structure:

1. Chapter 1 - Introduction;
2. Chapter 2 - Methodological Approach;
3. Chapter 3 - Alkmaar Demonstration Area Description ETT#4;
4. Chapter 4 - Demonstrating ETT#4: Citizen-Driven Innovation in Co-creating Smart City Solutions;
5. Chapter 4.1 - IS 4.1: Social Innovation Mechanisms towards Citizen Engagement;
6. Chapter 4.2 - IS 4.2: Open Innovation for Policy Makers and Managers;
7. Chapter 4.3 - IS 4.3: Interoperable, Modular and Interconnected City Ecosystem;
8. Chapter 5 - Conclusions;

2. Methodological approach

This is not a technical deliverable, therefore the methodological approach focuses on the collection of the input from partners involved. To have a structured approach and to collect the necessary information from involved partners, the ETT-leaders (ETT#1, ETT#2, ETT#3 and ETT#4) of Alkmaar LH have decided on a shared approach. This benefits the involved partners to have a consistent and standardized approach from all ETT-leaders. In collaboration, questionnaires were developed to determine what information is necessary and relevant for the deliverable. In addition, a template questionnaire was completed to provide guidance for the partners, when completing information.

For each partner and for each IE one questionnaire was created and stored on the project's files repository, including a folder to upload the completed questionnaires. An overview was created that helps partners clearly to see which IE-questionnaire is to be completed by whom and where to upload the completed questionnaires. All information was shared and presented to partners during a physical Alkmaar meeting in September 2022 and followed up by an email with summarized instructions and links to the template questionnaires and the folders on where to upload completed information.

Partners had 1,5 months to complete the questionnaires to allow sufficient time within regular workload to complete the information, gather necessary materials and return the completed questionnaires.



3. Alkmaar Demonstration Area Description - ETT#4

Energy Transition Track (ETT#4) focuses on improving citizens' quality of life and increasing city efficiency by involving citizens in the early development, design and evaluation phases of the solutions. Key aspects of this approach are to incentivise citizens for co-creating, co-delivering and co-capturing value by the smart city solutions demonstrated, create an open innovation ecosystem between different experimentation set-ups and empower consumers to become 'prosumers' by enabling them to monetise their excess of electricity.

ETT#4 Citizen-Driven Innovation in Co-creating Smart City Solutions will help to increase citizens engagement and support for the different innovative solutions and it focusses on 3 solutions:

1. Social Innovation Mechanisms towards Citizen Engagement;
2. Open Innovation for Policy Makers and Managers;
3. Interoperable, Modular and Interconnected City Ecosystem.

The innovative solutions are grouped together under 10 Innovative Elements:

Ad 1. Social Innovation Mechanisms towards Citizen Engagement

- 4.1.a Workbook for housing corporations
- 4.1.b DBVC-method
- 4.1.c Entrepreneurial value based design
- 4.1.d Test-sharing of digital appliances aimed at facilitating communities' transition engagement
- 4.1.e InnoFest concept by students
- 4.1.f Lessons learned from the Fryslân Cultural Capital of Europe
- 4.1.g Mixed POCITYF community-engagement and community-innovation approach for stimulating the local market for the reuse of construction materials and market-oriented building flexibility services

Ad 2. Open Innovation for Policy Makers and Managers

- 4.2.1 TIPPING approach for activating the city policy makers and managers aimed at circular economy, sustainable city transport and sustainable tourism
- 4.2.2 Application of the Eco-Acupuncture tool in order to formulate challenging long-term visions and trajectories

Ad 3. Interoperable, Modular and Interconnected City Ecosystem

- 4.3.1 City Information Platform.



4. Demonstrating ETT#4: Citizen-Driven Innovation in Co-creating Smart City Solutions

The basis of POCITYF strategy is built around 4 multidisciplinary and complementary Energy Transition Tracks (ETTs). These ETTs aim to enhance the integration of commercialized and innovative energy systems, leading the way towards transforming existing city blocks into becoming self-sustainable and more environmentally friendly for their citizens. The term Transition Track is an overarching terminology used to group interdisciplinary and complementary Integrated Solutions (see table 1) taking the terms and focusses they address under an umbrella term. In general, the objective is to further the energy performance levels of urban districts in historical city centers and develop a large amount of Positive Energy Districts (PEDs) by 2050. Within ETT#4, contributions are made through citizen-driven innovation in order to promote co-creation that leads to smart city solutions contributing to a green, lean and sustainable city.

Table 1: ETT#4 Integrated Solutions and Innovative Elements

 ETT#4: Citizen-Driven Innovation in Co-creating Smart City Solutions		
Integrated Solutions	 IS 4.1	Social Innovation Mechanisms towards Citizen Engagement Workbook for housing corporations // DBVC-method // Entrepreneurial value based design // Test-sharing of digital appliances aimed at facilitating communities' transition engagement // InnoFest concept by students // Lessons learned from the Friesland Cultural Capital of Europe 2018 // Mixed POCITYF community-engagement and community-innovation approach for stimulating the local market for the reuse of construction materials market-oriented building flexibility services
	 IS 4.2	Open Innovation for Policy Makers and Managers TIPPING approach // Application of the Eco-Acupuncture tool
	 IS 4.3	Interoperable, Modular and Interconnected City Ecosystem City Information Platform

4.1 IS 4.1: Social Innovation Mechanisms towards Citizen Engagement

The energy transition to positive buildings, districts and communities will be pursued through a close relationship with citizens, encompassing a bottom-up approach, in which co-creation, co-development and co-implementation processes play a central role. Innovative social engagement strategies will be designed to boost and motivate the citizens to participate and create solutions along with the industry and policy



makers. A focus on disadvantaged communities will be given, in order to provide inclusive technology capable of improving local life conditions, while promoting sustainable tourism.

Within ETT#4, IS 4.1. Social Innovation Mechanisms towards Citizen Engagement encapsules seven Innovative Elements for the city of Alkmaar. In the following chapters, an overview of each IE will be provided. An overview of the IEs and partners involved is provided in the following table (see table 2):

Table 2: Overview of Innovative Elements in IS 4.1

Innovative Element	Partners involved
IE 4.1.a ¹ - Workbook for Housing Cooperations	TNO
IE 4.1.b - DBVC-method	TNO
IE 4.1.c - Entrepreneurial Value Based Design	Inholland / NEC
IE 4.1.d - Test-sharing of digital appliances	Gemeente Alkmaar
IE 4.1.e - Innofest-concept	Inholland
IE 4.1.f - Fryslân Cultural Capital of Europe 2018	NEC
IE 4.1.g - Community-engagement and community-innovation approach	Gemeente Alkmaar / Inholland / Woonwaard / Van Alckmaer / InVesta

4.1.1 Demonstrating IE 4.1.a - Workbook for Housing Corporations and IE 4.1.b - DBVC-method

These two IEs are described together because the DBVC-method is incorporated in the workbook for Housing Corporations. IE 4.1.a ‘Samen lokaal in beweging’(see table 3) describes which trajectory needs to be taken locally in order to include more tenants and motivate them to generate actions towards energy transitions projects.

Table 3: IE 4.1.a - Workbook for Housing Corporations and IE 4.1.b - DBVC method

IE 4.1.a. - Workbook for housing corporations (‘Samen Lokaal in Beweging’)
IE 4.1.b. - DBVC-method: Design Based Value Mapping for Communities
Goal and Description of IE
The goal of the workbook “Make sustainable together with tenants - Workbook for participation and communication for housing corporations ²³ ” is to help housing corporations and the commercial and public organizations with which they collaborate in formulating a participation and communication strategy to realize a high engagement of tenants in energy transition projects.
The workbook provides concrete steps for housing corporations to engage tenants in making the assets owned by housing corporations sustainable. It includes theory, examples from practice and methods and tools to be used in practice. Following the steps in the workbook results in a well thought through

¹ The numbering of these IEs match the numbering as mentioned in the Grant Agreement

² [Becoming sustainable together with residents- participation and communication manual for housing corporations - POCITYF - POCITYF](#)

³ [Werkboek participatie en communicatie voor woningcorporaties - Energy.nl](#)



communication and participation strategy. By using this strategy energy transition projects on a local level can become more efficient and effective with higher degrees of tenant engagement.

This solution is addressing the human needs and values of tenants and formulates a participation and communication strategy that respects these needs and values. By doing so the solution engages tenants by addressing what is important to them, what drives them and makes sure that it fits the goals of other stakeholders as well. Human needs and values are identified through a value based analysis. The workbook and its methodology have been developed based on earlier experiences from projects from TNO and the housing corporations Woonwaard and Van Alckmaer and 5plus1. It has been written during application of the different methods and tools for tenant engagement in the projects Highrise and Bloemwijk, both part of the POCITYF project.

The resulting participation and communication strategy must address and match firstly the needs of tenants and secondly the other stakeholders such as the housing corporation.

The resulting participation and communication strategy should improve the engagement of tenants throughout the project and shorten the timelines of the project by better addressing the needs and values of tenants.

Role of partners involved

- TNO, Woonwaard, Van Alckmaer

Progress achieved until M38 (provide a progress and timeline on preparation and implementation)

Finished. The workbook has been translated in English in February 2022.

Faced barriers and lessons learned (M0 to M38)

At first the methodology was difficult to put in practice and evaluate due to Covid-19, so the evaluation had to be moved towards the end of the project. However, the methodology has been evaluated with housing corporations on its applicability.

Next steps (what will be done/what still has to be done - add dates if known)

The workbook will be evaluated in the follow-up activities for Bloemwijk. Through dissemination and application in other projects or cities (e.g. follower cities) the workbook will be fine-tuned based on the evaluation results there.

Connected IEs with ETTs

The DBVC-method is included and part of this workbook.

4.1.2 Demonstrating IE 4.1.c - Entrepreneurial Value Based Design

Table 4: IE 4.1.c - Entrepreneurial Value Based Design

IE 4.1.c - Entrepreneurial Value Based Design
Goal and Description of IE
In Entrepreneurial value-based design (EVBD), value creation is central and the designer/developer focuses on the values that the product has and keeps for the end-user and the citizen. Looking at product/service development, this implies that a product or service should not only be marketable (commercially driven objective) but that it should be a responsible product or service that primarily contributes to the objective of value creation for the end user. During the design there is a focus on three aspects:



- Economics (business case)
- Social impact (affects the interaction between people)
- A positive or neutral impact on the environment.

In the context of POCITYF and specifically in LH Alkmaar, the question is how products and services can be designed and developed that supports (cultural-historical) cities in their transition to becoming greener, more sustainable, smarter and more liveable.

Role of partners involved

The partner involved is Inholland with the support from NEC. Inholland focuses on the practical implementation of the EVBD philosophy in the minor Innovation & Entrepreneurship within the university of applied sciences. In this minor, students work on setting up a so-called Student Company in which they start their own company (including taking care of a.o. business plan, share issue, communication and marketing, sales) in which the entire process from concept development of product or service to realization placing it on the market) is completed. The emphasis is on creating value in accordance with the EVBD philosophy (economically feasible, socially relevant and sustainable). The concept has proven to be so successful that various Student Companies are continued after the minor and are permanent.

Progress achieved until M38 (partners to provide input on timeline of IE, research, delivery, installation, testing, etc.)

Various successful products have been created in the Student Companies. Examples of this are:

- Schuurmaat (SandingMate, see figure 1): an innovative sanding attachment to more easily sand curves in wood and complex profiles (as you often encounter in old, cultural-historical buildings), such as banisters, table legs and decorative frames. Not only does this make it easier to restore and maintain wood (which helps to prevent wood from being replaced too quickly), but it also prevents injuries to people who take care of the maintenance work.



Figure 1: Picture of SandingMate



Figure 2: Picture of Deskey

- Deskey (see figure 2): this product responds to the growth of working from home and provides a foldable worktop with integrated laptop support for home workers to store their used work equipment in no time. With space to store office supplies, people working from home will not forget or lose them. The Deskey is produced entirely from recycled PET bottles (43 bottles are processed in each Deskey).

Faced Barriers and Lessons Learned (M0 - M38)

One of the main lessons learned is that support and coaching is needed for companies that have the potential to continue their activities after the minor. Inholland is currently exploring the possibilities of continuing to offer this support in a certain way f.i. by involving Engineering students working on constructional assignments.

Next steps (what will be done/what still has to be done - add dates if known)

Although the concept of EVBD has already been and is being applied, possibilities are currently being examined to apply the EVBD concept to the POCITYF aspect of 'cultural history and energy transition'



(where Alkmaar can serve as a testing ground) in the minor for 2023 (start in January). However, students in this minor are free to choose a product/service/market they want so it cannot be made mandatory.

Connected IEs within ETTs

In principle, the EVBD concept can be linked to any other ETT because of the design of Innovative Elements for (energy-positive) buildings, energy networks and storage systems and mobility. For the time being there is no direct connection with the other ETTs and there is also no dependency in other ETTs.

4.1.3 Demonstrating IE 4.1.d - Test-sharing of digital appliances

This IE consists of two separate activities concerning test-sharing of digital appliances, i.e. app development and game development. Therefore the two activities are mentioned in one table.

Table 5: IE 4.1.d - Test-sharing of digital appliances

IE 4.1.d - Test-sharing of digital appliances (app development)
Goal and Description of IE
The apps raise the awareness and sense of urgency of tenants of housing corporations and citizens on energy transition. Also it unlocks the way to trustworthy information on energy solutions. It facilitates the tenants to communicate with each other and supports the problem solving by themselves. The applications improve the engagement with tenants of housing corporations and citizens, strengthen the social cohesion and raise awareness on sustainable energy solutions. The need for attractive and livable living environment of citizens. Also the need of the municipality and housing corporations to strengthen the social cohesion among tenants and citizens. In the mobile app, different functionalities are incorporated. Tenants/citizens can make their personal profile, a chats function is included to facilitate communication and offer a market place for supply and demands for help. Other functionalities are: an Idea & Question box, Livability, nuisance and sustainability reports and notifications can be made, poll function, information on sustainable solutions and energy reduction and the programs of housing corporations. The apps were developed during the minor 'app development' for Informatic students and the minor Entrepreneurship & Innovation for students for the bachelor programs for Business engineering, Creative business, Business Studies and Informatics from the Inholland University of Applied Sciences and the Antwerp University of Applied Sciences.
Role of partners involved
The following POCITYF partners are involved with app development: - Municipality of Alkmaar: Municipality is involved in the co-development and demonstration of the apps. - Housing corporations: Client and problem owner. - Inholland: Students from Inholland developed the apps under supervision of teachers and in co-creation with students from Antwerp University of Applied Sciences (Artesis Plantijn). Inholland was the partner involved in organizing the student Hackathon in April 2022, where the
Progress achieved until M38 (provide a progress and timeline on preparation and implementation)
An App prototype for tenants for housing corporation Woonwaard has been made. The solution has been tested among stakeholders, but unfortunately the apps did not meet the requirements.
Faced barriers and lessons learned (M0 to M38)



The major barrier was to combine the needs of GA, housing corporations and tenants. Students did not have a complete picture of these needs.
Next steps (what will be done/what still has to be done - add dates if known)
Due to the fact that the apps did not meet the requirements of GA and the housing corporations, no further action was taken to improve the apps. However, several functions will be integrated in the CIP.
Connected IEs with ETTs
N.A.
IE 4.1.d - Test-sharing of digital appliances (game development)
Goal and Description of IE
The Grant Agreement contains the following description of this Innovative Element: (d) The test-sharing of a number of digital appliances aimed at facilitating communities' transition engagement, which have been proposed by and for Évora, the other Lighthouse city within POCITYF. Strictly speaking, this means that the digital appliances being discussed (this concerns apps) must be delivered to Alkmaar by the involved project partners in Évora, after which they can be tested in Alkmaar. These apps are not yet ready however. Nevertheless, Alkmaar partners have been working on the development of digital appliances (games) that aims to promote energy awareness and involvement in the energy transition. The activities carried out in Alkmaar in this context are described under 'Progress achieved until M38'. The games aim to offer citizens an experience in sustainable energy. It raises awareness for solutions for sustainable energy production and measures for energy reduction. Smart use of energy consumption is part of the games. Also, the Alkmaar energy solutions are visualized. Municipality is focussing on Smart use of energy solutions and make sustainable solutions fun. The games meet the following principles: • Citizens/users become aware of solutions around renewable energy generation and energy saving measures times. • Strategy of reward and a dose of entertainment, so that users are challenged to play the game multiple times. • The target group we have in mind are: children and/or 15-30 years old people (in Alkmaar). • Influence behavior around sustainability. • Players should be able to see which innovative solutions there are within POCITYF, and the city of Alkmaar must be visually recognizable in the game. The players must remember that Alkmaar is an attractive and sustainable city. What should at least visibly come back in terms of location and innovative elements: • Solar panels (Van der Velde flat, Bloemwijk, De Meent, Investa) • Possibly batteries (Bloemwijk, De Meent, InVesta) • Smart lamp posts and energy-generating noise barrier • The Meent • Energy Innovation Park/InVesta • Connecting the digital world to the real world The games are developed by students of the Minor Game Development (Computer Science). The launch of the games is being prepared by students marketing and creative business, they are developing a marketing plan. They will be part of an "Experience" and our broader communication plan on sustainability and innovation. The games trigger the conversation about sustainability and the coins that can be collected for a reward keep the story going during the other communications we do on this theme.



The games chosen focus on sustainability and have a "Learn" component in them.

- The game ElecCity provides a detailed explanation of each sustainability component the player collects and through co-op allows another player to join in the game to make the city more sustainable.
- The game Greenville is a narrative mobile game for children explaining how global warming works and ways to get the temperature down.
- And ReLife focuses on the role of an activist who must achieve as many sustainable goals as possible within a certain time limit to make Alkmaar more sustainable. This can include handing out flyers, cleaning up garbage, installing solar panels, repairing broken equipment, installing windmills and more.

For each game, a player can score points by becoming more sustainable. The best scores can be used during marketing campaigns to win prizes if the city manages to become the most sustainable.

Role of partners involved

InHolland and Gemeente Alkmaar. Students of InHolland have been developing the games, supervision of the students (besides the teachers) was done by team Data of Gemeente Alkmaar.

Progress achieved until M38 (provide a progress and timeline on preparation and implementation)

Planning of developing the games: 1st of February 2022, 39 students of the minor game engineering will develop energy games in a scrum setting with weekly sprints during a period of 18 weeks. Testing among the target audience is part of the requirements.

Planning of the development of the games in spring/ summer 2022:

1. Presentation by client (POCITYF)
2. Pitch
3. Proof of Concept
4. Vertical Slice
5. Alpha release
6. Beta - feature freeze
7. Release Candidate
8. Gold master

Out of the 8 games 3 were good and attractive enough and chosen to be developed and introduced to the citizens, to be launched. From September 2022 students of Creative Business have worked for 10 weeks on business models and value creation for the games, followed by 10 weeks for the marketing plan. In October the presentation of their concept took place (the Alkmaar Energy Zone). The idea is to develop a multilevel program for scholars in which the games will be part of this experience.

Faced barriers and lessons learned (M0 to M38)

1. What barrier(s) has/have been faced and what are the lessons that could be retrieved from circumventing/resolving the barrier(s).
2. Also describe potential changes in the to be demonstrated solutions as well as the reasoning for the change of applicable.
3. Making arrangements with American host, Photon License, was not easy. How can a municipality organize collaboration in game development?
4. Quality of the games not equally good so only a few can be launched, students are not competent enough.
5. Games alone are not enough to attract a lot of traffic and continuously, you must build an action around them.
6. Exchange between the various student groups was minimal which reduced the quality of the final product. Large development teams produce better results.
7. Support and further development of the games after the course is not possible because of the loss of students.

Next steps (what will be done/what still has to be done - add dates if known)

In February 2023 game(s) can be released.

The marketing plan has to be executed. The games will be part of a bigger program. Since the marketing plan is not ready yet, these are some of the actions we probably have to take.

1. Contact with schools in Alkmaar have to be made.
2. Location has to be decided upon: part of the pop up Alkmaar Energy Experience.



3. Monitoring is done through data analysis of the play experience within Unity. Within each game, data indicators have been added to measure experience and activity.
4. The challenge, however, is to continue developing the games to improve the quality of the experience and keep it fresh.

Regarding test sharing of digital appliances developed by and for Évora: contact has to be made with Évora to check what kind of digital appliances are to be developed and how and when these apps can be tested in Alkmaar.

Connected IEs with ETTs

TIPPING (theme sustainability education): in the first TIPPING session one of the outcomes was that investment in a sustainability program in schools is needed to raise awareness about sustainability among the youth. This gamification approach can become part of the offer towards schools.

4.1.4 Demonstrating IE 4.1.e - Innofest-concept

Festivals offer students and startups the possibility to test their sustainable products and services. In several days hundreds of feedback moments and user experiences are created. This input will speed up the innovation process.

Table 6: IE 4.1.e - Innofest-concept

IE 4.1.e - InnoFest concept
Goal and Description of IE
The aim of the Innofest concept is to facilitate a process in which sustainable products or services are presented and tested in the prototype phase on festivals in order to create broader acceptance of the products or services by the target group and/or potential clients (consumers or businesses). The process consists of the following phases: 1. During the minor Innovation and Entrepreneurship students develop and test sustainable products and services⁴. 2. The prototype testing takes place within festivals or B2B environments. 3. As part of the minor students start their own business. 4. Their products/businesses are presented at: www.studentpatent.nl. 5. The student businesses are in a contest and the winner is presented during Mix & Match events in the North Holland North region organized in collaboration with the entrepreneurs associations (Ondernemend Regio Alkmaar & West-Friese Bedrijven Groep). 6. Students who want to go on with their own startup after graduation, can participate in a business programme that facilitates the startup process. This alumni startup programme is under construction. 7. These alumni startups are presented at www.FabriekC.nl. 8. Sustainable businesses/startups on a higher readiness level can enter the incubator programme of IDEA (incubator for sustainable economy Alkmaar region).
Role of partners involved
Inholland, NEC, Gemeente Alkmaar

⁴ [Minor I&O Basis info & testing.pptx](#)



Progress achieved until M38 (provide a progress and timeline on preparation and implementation)
Current status of the IE (what has been achieved?) - Step 1 till 5 are realized. - Step 6, 7 and 8 have been started and will be preliminary finalized by the end of 2022.
Faced barriers and lessons learned (M0 to M38)
Entrepreneurs of Alkmaar and the North Holland North region are looking for more entrepreneurship skills among students. Student and alumni startups did not succeed and were not ready for the IDEA incubator programme.
Next steps (what will be done/what still has to be done - add dates if known)
Feedback from Inholland lecturers, students, entrepreneurs, IDEA and TerraTechnica partners will improve all steps in this solution so co-creation is reached. Step 9 has still to take place (end of 2022).
Connected IEs with ETTs
Not applicable.

4.1.5 Demonstrating IE 4.1.f - Fryslân Cultural Capital of Europe 2018

Focus lies on lessons learned from the energy transition activities during the 'Fryslân Cultural Capital of Europe 2018'-program (see table 7).

Table 7: IE 4.1.f - Fryslân Cultural Capital of Europe 2018

IE 4.1.f - Fryslân Cultural Capital of Europe 2018
Goal and Description of IE
The innovative element - Lessons learned from Fryslân Cultural capital of Europe 2018 - has as goal to communicate the success stories and the obstacles overcome during the bottom-up (lead citizens and community groups) led innovations in the field of energy, transport, and circularity, that took place in Fryslân leading up to and during the Cultural Capital year 2018. Subsequently, to inform, inspire, and activate citizens in Alkmaar and motivate them to actively engage in the local innovation ecosystem. The innovative element translates into a storybook, which is a collation of the most outspoken success stories of bottom-up innovations in the transition process related to the Cultural Capital of Europe hosted by Fryslân. The stories highlight not only the innovation that took place, but most of all will give an insight in the process towards the successful implementation of the innovation. It will highlight the social success factors in the innovation process and the path local citizens and community groups had to take and the hurdles they had to overcome to successfully implement their innovation. It will communicate the lessons of the Why, How, and What. Often lessons are drawn from history and historic insights. This innovative element is meant to shorten the learning curve to accelerate among others the local energy transition in Alkmaar. The innovation is therefore not in the method but in the message. An aggregation of success stories to motivate others to replicate the success or be inspired to book their own success. Citizen engagement and social innovation is assigned in increasing proportion as an important success factor in the energy transition. Transparency and visibility of successful bottom-up initiatives is therefore of importance. The storybook aims at clearly communicating and disseminating the achievements made in Fryslân. Developing the storybook will exist of three phases:



1. In the deep-dive phase, a dive is taken into the topic Fryslân Cultural Capital of Europe 2018 and its achievements. It consists of an extensive analysis of the different activities and projects that can be related to or took place during Fryslân Cultural Capital of Europe 2018 to identify all the different bottom-up led initiatives and the related success stories. 2. Subsequently in the information gathering phase, a selection of success stories is made. A more in-depth analysis and if necessary, interviews are held, to further unravel the stories involved. 3. In the third and final phase the stories are written and edited into a compelling booklet. The booklet will be disseminated within Alkmaar and will be shared with Évora and the fellow cities.
Role of partners involved
The following POCITYF partners are involved: • New Energy Coalition: Performs the analysis and develops the storybook.
Progress achieved until M38 (provide a progress and timeline on preparation and implementation)
The following steps have been performed or are under construction: • Background information on the lessons that can be learned from the cultural capital of the province of Fryslân has been collected and analyzed. • Currently the deep-dive phase is under development. The extensive analysis is aimed to be concluded by the end of December 2022.
Faced barriers and lessons learned (M0 to M38)
The main barrier was the ability to retrieve the right information due to Covid. The information-gathering process was complicated by the inability to arrange face-to-face meetings with interviews and fieldwork. The issue has partly been overcome by arranging online interviews.
Next steps (what will be done/what still has to be done - add dates if known)
After the performance of the deep-dive the following actions will be performed: • Data gathering and processing: January 2023 • Reporting - writing booklet: February 2023
Connected IEs with ETTs
N/A

4.1.6 Demonstrating IE 4.1.g - Mixed community-engagement and community-innovation approach

Table 8: IE 4.1.g - Community-engagement and community-innovation approach

IE 4.1.g - Mixed community-engagement and-innovation approach (GA)
Goal and Description of IE
This IE is specifically about stimulating 1) a local market for the reuse of building materials (activate local real estate agencies) and 2) for involving citizens in advanced Vehicle to grid (V2G) systems for energy transport. 1. Stimulating the local market for the reuse of construction materials (create active local broker agencies). GA (the municipality) has been one of the initiators and is a member of a network called “Cirkelstad”, CirculairCity Alkmaar. This network is active since 2021 and it seeks cooperation in the region, to realize



circular projects together, develop knowledge, share and secure with the aim of scaling up and accelerating the circular economy⁵.

Several times a year Cirkelstad-members meet to work on individual cases and common interests in the field of circularity. Together with affiliated parties, projects are tackled on topics such as circular development, demolition, construction and maintenance.

As a partner of Cirkelstad Alkmaar, GA (the municipality) is an active part of a group of regional frontrunners. Partners can come from different areas, such as housing corporations, waste processors, architects, entrepreneurs, governments, knowledge institutions, property managers, etc. Educational institutions and representatives of "talents from the neighborhood" are also represented as partners.

A Community of Practice is organized four times a year. Every meeting has a specific circularity related topic on the agenda like "Reuse of (building) Materials".

Two companies in Alkmaar have a hub of circular construction materials, GP Groot and CA de Groot. The municipality is in consultation with Cirkelstad and these companies how to support and stimulate the local market.

Besides this collaboration within Cirkelstad, GA has set up a Circular Economy approach:

a) GA focuses on campaigns to realize more conscious choices regarding consumer goods by supporting citizens in making choices in their purchasing behaviour. Or by providing insights in alternatives such as sharing, leasing or second-hand products easier and more visible. GA sees an important role for education in order to train the city in circularity.

b) GA supports the further increase of the possibilities for residents to offer their waste separately. In this regard a lot of attention is paid to communication and campaigns to raise awareness both in the field of waste separation and waste prevention. The aim of these activities is to show people how waste products can be used to make new products with a new destination and of high quality.

These 2 approaches are being organized together with companies, knowledge institutes, second-hand shops, the Repair Café and local shopkeepers. A budget is provided for students for locally driven initiatives to promote residual waste/sustainability/food⁶.

2. Engagement of citizens in advanced V2G systems for energy-transport.

No concrete activities have yet been carried out on this subject and therefore no progress has been made. It is expected that concrete steps can be taken in this area in 2023, in particular because the V2G concept will then become available as part of the electric shared car within the subproject in Bloemwijk. This offers good opportunities to inform and engage users in Bloemwijk and other interested parties about the role that V2G can play in the energy transition and more specifically the partial compensation of imbalance between supply and demand of sustainably generated electricity and the relief of the local electricity grid. Possibilities to promote the V2G concept will therefore also be examined, particularly among households and companies that have electric cars that are suitable for this and which also involve sustainable energy production (in most cases by means of solar panels).

Role of partners involved

- InHolland, Investa, GA, Woonwaard
- Circular apartments (Woonwaard)
- Circular cladding (Inholland/InVesta)
- Developing local engagement regarding recycling and circular products (Inholland, Hugo Booms/GA/GPGroot/Kesselaar)

⁵ [Sept2020_De Nieuwe Energie.pdf](#)

⁶ [Concept_memo De Nieuwe Energie.docx](#)



Inholland: Several student assignments on the use of and business models on circular materials in the construction sector and InVesta. Like the study report 'Sustainable re-use of scrap wood'⁷.
Progress achieved until M38 (provide a progress and timeline on preparation and implementation)
Current status of the IE (what has been achieved?) - A small local market for reuse of construction materials is realized by GP Groot and CA de Groot. - The Circular economy approach has been designed, but for the execution we needed the approval of the city council.
Faced barriers and lessons learned (M0 to M38)
Lack of urgency Many companies are not yet doing circular business is that they do not yet feel the urgency. Primary raw materials are readily available now, however more expensive than before. The increase in price of raw materials is most of all caused by the war in Ukrain and not so much as an effect of raw material scarcity. The increase in price and scarcity are seen as temporary effects and are not seen as visible and tangible. Insufficient incentives A circular economy is not an obligation in laws and regulations. In addition, linear production is often still cheaper, making it more difficult for circular products to compete with linear products. In addition, circular materials and products often have to prove themselves in practice first and are not yet certified. Companies also indicate that there is still too limited market demand for circular products. Negative perceptions about second-hand and recycled materials hinder the use of circular products. This makes it more difficult to close the business case for a circular product. Investors also often rate circular projects as risky, making it more difficult to obtain financing. Scaling up innovations and initiatives is therefore a challenge. Regulation barrier Current laws and regulations are designed for the linear economy. This hinders the circular economy. For example, certain regulations sometimes inhibit the reuse of waste streams as new raw materials. Furthermore, for example, standards for building materials in the building code make it difficult for companies to use circular building materials. In addition, organizing collaboration in chains requires a lot of time and money. Companies already face many challenges, for example due to the nitrogen crisis, making this a lower priority. Insufficient knowledge There is a lack of knowledge and insights about the opportunities presented by circular business. Circular economy is a relatively unknown concept and for many companies it is not clear what applying circular principles can bring, how they can do it and where knowledge can be obtained. In addition to companies, this also applies to fellow governments that can drive and support the transition. Municipalities have insufficient insight into the task, their role and action perspective to contribute to the transition. Our approach and activities are therefore mostly focused on the above barriers. What is especially important, and has proven to be successful, is that we always take up or target the activities together with our partners. We try to create a network in which we as a municipality act primarily as an equal partner. In this we are also transparent in our role: as a municipality we are not a market leader, innovator or expert. What we try is to bring these market leaders, innovators and/or experts into contact with each other and with other entrepreneurs/residents as much as possible. You do not create a circular economy alone, but together with all your partners.
Next steps (what will be done/what still has to be done - add dates if known)

⁷ [project_report_group4_scrap_wood.pdf](#)



The final next steps for (most) innovative elements should be the monitoring of the performance.

1. A more intensive approach on stimulating the local market reuse of construction materials is under discussion at this moment. The idea is to create a 'Materials Hub' on one of the terrains of the 'Alkmaars Kanaal', but this has to be developed further with Inholland and the municipality.
2. The twofold awareness approach is ready for execution.

Connected IEs with ETTs

Not applicable

IE 4.1.d - - Mixed community-engagement and-innovation approach (GA/Robonsbos mill)

Goal and Description of IE

The municipality of Alkmaar takes the lead in making valuable cultural historical buildings becoming more sustainable. The national monument 'Robonsbosmolen (see figure 3)' in the Westrand district has been restaured in 1976 (see picture 4), but several materials show defects. These defects have a negative effect on the building physics, like the thermal comfort, the hygrothermal comfort and the air quality of the mill.



Figure 3: Robonsbos mill



Figure 4: Restauration of Robonsbos mill in 1979

The renovation work should fall within the frame work of POCITYF and at the same time the cultural historical value of the building needs to be guarded. The owners and the municipality do not have an



integrated sustainability plan for the mill. Students of Inholland will make this plan and hopefully it will create a basis for future renovation projects for this kind of buildings within the municipality. Research for adequate sustainability measures will be done in order to make the mill more sustainable, level up the living climate to a modern standard and ultimately contribute to making the Westrand energy positive.
Role of partners involved
The following POCITYF partners are involved with the renovation of the Robonsbos mill: - Municipality of Alkmaar: Municipality is involved in financing and renovation of the Robonsbos mill. - Owners - Inholland: Students from Inholland are developing a sustainability plan for the mill, under supervision of teachers and in co-creation with the owners and the municipality.
Progress achieved until M38 (provide a progress and timeline on preparation and implementation)
Students have drawn up a project plan in accordance with requirements and legislation ⁸ . They also made an extensive planning for their activities ⁹ .
Faced barriers and lessons learned (M0 to M38)
The major barrier was to combine the needs of the owners and the rules and regulations that are concerned with making a national monument sustainable. Students had to search for this particular information and could not be helped by teachers.
Next steps (what will be done/what still has to be done - add dates if known)
The project will be finished at the end of January 2023. Students will present their sustainability plan for the Robonsbos mill to the municipality, the owners and teachers.
Connected IEs with ETTs
N.A.

4.2 IS 4.2: Open Innovation for Policy Makers and Managers

Policy makers and local government managers fulfil a crucial role in the energy and circular transition of cities and their residential, commercial and industrial zones. They have the unique position, in the beginning of a change process like in the implementation of Sustainable Development Goals, to bring the transition actors together. Within the Quadruple Helix the industry government knowledge institutes public relations and actors interact in a region or city and contribute to the required change process. Within ETT#4, IS 2.2: Open Innovation for Policy Makers and Managers is comprised of two Innovative Elements for the city of Alkmaar. The following chapters provide an overview of each IE. To keep the overview of the IEs comprehensive and inline with the methodology, IEs that will be/are implemented by the same partner at multiple locations this will be handled in one table. IEs that will be/are implemented by multiple partners and at multiple locations will be described separately. An overview of the IEs and partners involved is provided in the following table (see table 9):

Table 9: Overview of Innovative Elements in IS 4.2

Innovative Element	Partners involved
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⁸ [20221031_Document_Projectplan_Team-17_V1.0.pdf](#)

⁹ [20221031_Document_Bijlage 3-Faseringschema_Team-17_V1.0.pdf](#)



IE 4.2.1 - TIPPING approach for activating the city policy makers and managers	NEC
IE 4.2.2 - Application of the Eco-Acupuncture tool	NEC

4.2.1 Demonstrating IE 4.2.1 - TIPPING approach for activating the city policy makers and managers

The TIPPING approach is a method to intensify the role of policy makers and local government officials in the energy and circular transition of cities and their housing, commercial and industrial zones (see table 10). The "TIPPING" wheel consists of eight main strategies (see figure 5) that can be used to create a mix of innovative policies within the municipality.

Table 10: IE 4.2.1 - TIPPING approach for activating the city policy makers and managers

IE 4.2.1 - TIPPING
Goal and Description of IE
The TIPPING approach, as tool for policy makers and managers, aims to improve and strengthen innovation policy and governance by integrating citizen engagement in the policy development process. It should lead to a new social-cultural practice, giving citizens and stakeholders an integral role in policy development. Thus, the purpose of TIPPING in Alkmaar is to bring together a large number of stakeholders, both physical and digital, who are active or interested in the development of a more sustainable historic city center. To jointly look into the current municipality's innovation policy and reflect on how local policies and initiatives can support a joint effort to achieve a path towards a sustainable and green historic city center of Alkmaar. In doing so, it aims to accelerate local innovation through shaping innovation policy in a participative and bottom-up manner. Social innovation requires new ways to cooperate and methods that support it. The TIPPING method offers an approach to actively involve citizens and stakeholders in an unusual manner. Assuming that the municipality has an important role in the initial phase of a change process, the TIPPING method gives the municipality additional tools to actively involve citizens and transition stakeholders in shaping innovation policy. Thus, the application of the TIPPING method can play an important role for the municipality to bring together the so-called quadruple helix; government, industry, knowledge institutions and citizens, to jointly reflect on shaping policies to encourage green innovation. The underlying idea behind the TIPPING method is that the knowledge and expertise for making the cultural and historical inner city more sustainable is largely present in the city itself. In order to determine the course for the energy transition in the city, it is therefore necessary to consult the direct and closely involved stakeholders. To match innovation policies with the needs and ambitions of the city as a basis for action. Originally TIPPING is designed as a creative tool used as innovation model to go from an existing to a new innovation ecosystem, using the TIPPING-wheel and the so called "dancefloor", illustrated in figure 5. In Alkmaar and within POCITYF this is translated to a practical and pragmatic three step approach for the use in cities: Step 1: Formulating the positive dream - shaping an artistic shared dream of what a sustainable and energy neutral historic city of Alkmaar could look like, via the input gathered by digital participation campaign Step 2: TIPPING workshop - translating the shared dream into practical project ideas using the TIPPING-wheel Step 3: Co-creation session - co-create a shared roadmap towards a green historic city of Alkmaar, translating ideas into projects.



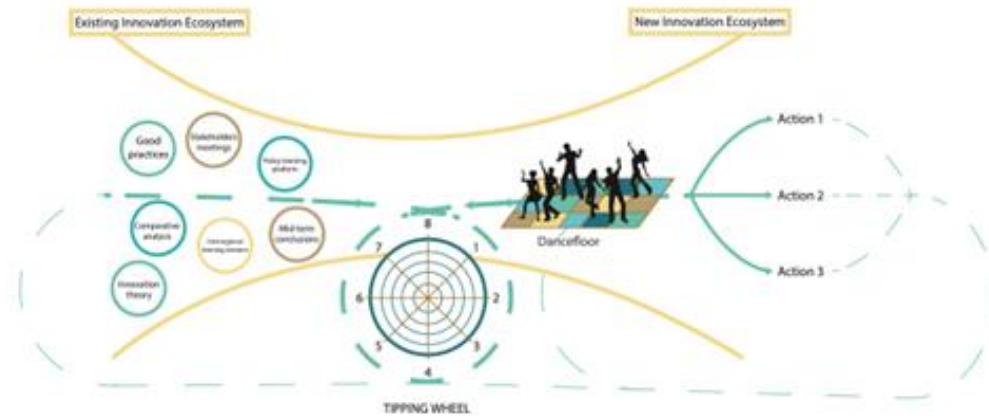


Figure 5: TIPPING innovation ecosystem via application of the proposed TIPPING-wheel



Figure 6: Participants in action during the TIPPING-workshop, further discussing possible projects inspired by the positive dream

The TIPPING-approach addresses the need for inclusion and ownership of citizens and stakeholders in policy innovation. Using the strength and knowledge hidden within the social capital of the city. Moving from a top down to a more bottom-up and inclusive form of governance (see figure 6).

Role of partners involved

The following POCITYF partners are involved with TIPPING:

- Municipality of Alkmaar: Municipality is involved in the co-development and demonstration of TIPPING in Alkmaar.
- Inholland: The aim was to make students from Inholland participate in the TIPPING-approach. Inholland was the partner involved in organizing the student Hackathon, developing the preliminary positive dream.

Progress achieved until M38 (provide a progress and timeline on preparation and implementation)

The first application of the TIPPING-method has successfully been performed in Alkmaar. Each step of the proposed three step approach has successfully been completed. The application of the method is meant as demo to develop a pragmatic interpretation of the original method to make it fit the urban city governance structure:

- For the first step a positive dream has been formulated in collaboration with a local Artist based on the input delivered by citizens through an online participation campaign. Illustrating the possible future of how the historic city center of Alkmaar could look like in 2040. The participation campaign was kickstarted by the “City of the Future” concept for Alkmaar developed by students from Inholland during a student hackathon/ battle, see **Error! Reference source not found.**7. The students received the second place and a reward of €500,-



for the proposed concept, see **Error! Reference source not found.**8. The Artist impression combined all input and developed a positive dream which resembles a metro right to an energy neutral historic Alkmaar in 2040, see **Error! Reference source not found.**9.

- During the interactive TIPPING-workshop, the second step, the participants came up with an extensive list of over 150 project ideas. Ranging from smart energy solutions to the need for better education. Subsequently, citizens could cast their votes online on their favourite top 5 projects.
- The final step of the method, to develop a roadmap toward a green historic Alkmaar, has not delivered the sought result. It has not resulted in the development of a sound roadmap of the top 5 projects, but has let to further discussion for citizen engagement. Two projects, sustainable transport and sustainability educations, are currently being discussed for further development.



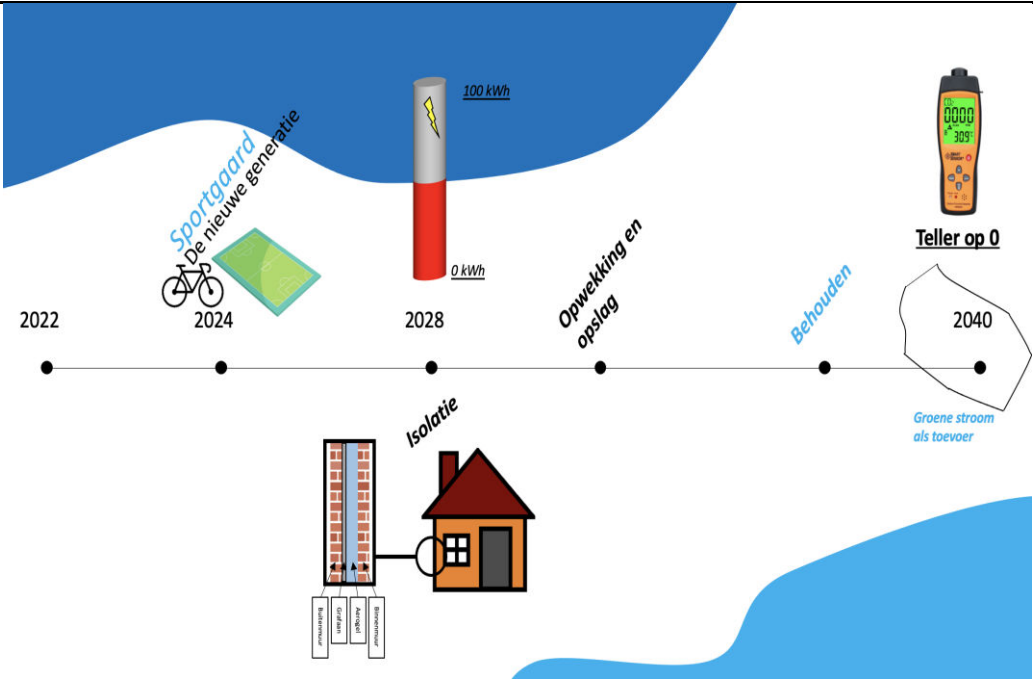


Figure 7: City of the future concept developed by students from InHolland during a student Hackathon



Figure 8: Students at work during the Hackathon (Right) and the students cheering after receiving the second place for best renewable concept (Left)



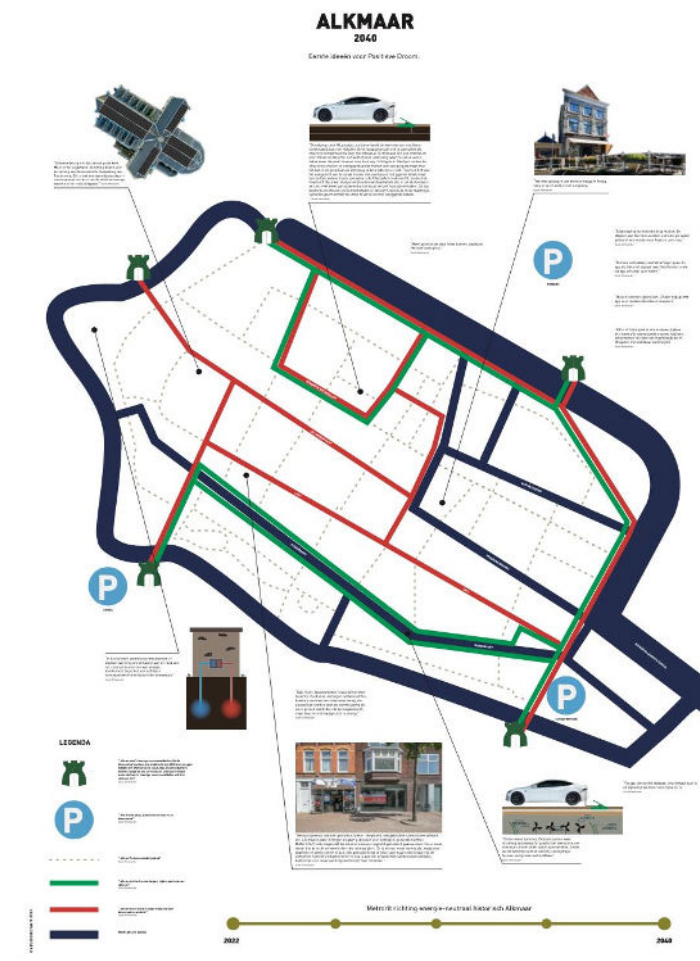


Figure 9: The Positive Dream artist impression resembling a metro right to an energy neutral historic Alkmaar in 2040

Faced barriers and lessons learned (M0 to M38)

Besides the delays caused due to corona, the following preliminary boundaries have been determined:

- Sufficient support within the municipality
- Sufficient number of participants to legitimize outcome
- Clear problem owner, who's problem are we trying to solve and how will we take the outcome further. To legitimize the method a predetermined plan should be in place on what will be done with the outcome of the approach, what is the process to implement the proposed roadmap.

Based on preliminary insights the main difference will be defining a concrete problem owner. In the demo simulation New Energy Coalition was the problem owner as executor of TIPPING. However, in practice the municipality was the real problem owner. This discrepancy caused a lot of haze and unclarity in the approach and expectations of the participants. The defined problem, how to move to a green and sustainable historic centre, was too broad. In the future a narrower problem definition is required to be able to get to an actual project roadmap within the course of one TIPPING cycle.

Next steps (what will be done/what still has to be done - add dates if known)

Finalise the TIPPING-method:

Write reflection report: Q1 2023

Write renewed TIPPING-guide: tool for improving innovation policy and governance structure in urban city environment (original method will be updated based on lessons learned of demo).



The updated TIPPING-approach will be repeated one more time in Lighthouse city Alkmaar 2023/2024.

Connected IEs with ETTs

Tipping (theme sustainability education): in the Tipping session one of the outcomes was that we need to invest in a sustainability program in schools. So that awareness about sustainability is raised among the youth. This can be linked to the gamification approach. Also, a link is made to the hackathon organised by Inholland.

4.2.2 Demonstrating IE 4.2.2 - Application of the Eco-Acupuncture tool

In this approach, visions are formulated with regard to desirable, low carbon and resilient futures. Next to this, strategic conversations between stakeholders are being held in order to develop future scenarios and transition trajectories. Specific Eco-Acupuncture-projects are being realised to present a ‘taste of the future’ (see table 11).

Table 11: IE 4.2.2 - Application of the Eco-Acupuncture tool

IE 4.2.2 - Eco-Acupuncture
Goal and Description of IE
Eco-acupuncture is a program to develop challenging long-term visions and trajectories for the city of Alkmaar on the topics of energy transition, circular economy, and sustainable city transport, by “exhibiting the future in the present”. Eco-acupuncture provides a method and structure to develop long term visions for small interventions in an existing urban precinct that can shift the community’s ideas of what is permissible, desirable and possible, and provide transformation points for a new trajectory to accelerate the development to a resilient low-carbon future. Specifically, through the Eco-acupuncture program, between 4-8 long-term visions will be developed for the city of Alkmaar in the demo areas of Westrand, Canal Zone, Historical Center, and Boekelermeer, for small niche interventions in areas such as energy transition, circular economy, and sustainable city transport. Visions that intervene in the city’s existing ecosystem and breathe new energy, inspiration and life into it. The long-term visions should be seen as interventions for the city and serve as a proposal for action. It is not a redevelopment program but a creative visual representation of possible change paths for small physical changes in the cityscape and educational opportunities while respecting current plans for urban development. The proposed interventions can have different perspectives, for example, propose new uses for existing infrastructure. The interventions can be temporary in nature and propose a temporary intervention in the cityscape or it can be a new facility for a vacant or unused site, and it can be a re-filling of an existing building. Ultimately, all interventions/long-term visions are intended as tangible, visible expressions and design of the future city. In order to create and generate the small physical and transformative interventions based on the long-term visions for Alkmaar, an interactive and collaborative approach is used between the university, an innovation team, and the community of Alkmaar. The community here is to be understood as a combination of the local council, its citizens and local organisations. By doing so, the approach and the visions created are supported by the university by means of research on future challenges the city might face. Through inclusion of students of the design academy there is a focus on education and knowledge generation. There is a “continuous” feedback loop with the community of Alkmaar for citizens to be engaged in the creation of the future visions. The innovation team functions as the heart of the operation where the knowledge and



work are collated, aggregated, processed and shaped. Focussed on the iterative process and interaction between the different stakeholders, collaborative trajectories of change are formed. All together to get to the demonstration of niche developments a five-step iterative process is followed:

Step 1: Analysis of site-specific challenges - Reviewing the specific environmental and social challenges that Alkmaar is expected to face within the next 25 year, as well as to identify possible public empty niche environments suited for the development of local physical interventions.

Step 2: Future (25y) visions workshops - Cooperative development of 25 year visions on the above mentioned topics led by the innovation team and participation by the community.

Step 3: Future visions design elaboration - Set up a design atelier for a multiple week design “marathon” to further design and enhance the developed vision. This period is characterised by among others a series of presentations, presentations of progress, engagement workshops, and opening hours for visitors from the municipality.

Step 4: Student research mapping and design concepts - A multidisciplinary group of students and designers continue to further develop and deepen the visions and trajectories.

Step 5: Exhibition on-site - To conclude the program an exhibition is held to share the “trajectories of change” with the city.

By doing so, the program responds to the lack of strategic visions on how to adapt and mitigate the impacts derived from climate change, as structural transformation from the fundamental systems supporting our (urban) livelihood is demanded. However, structural change within very static systems and communities is hard to set in motion. How to effectively initiate rapid change within cultural structures is a growing question and concern from governments, academia, and society. Eco-acupuncture aims to address this issue by offering a solution.

Role of partners involved

The following POCITYF partners are involved with eco-acupuncture:

- Municipality of Alkmaar: Municipality is involved in the first three steps of the approach, both as an information provider as well as participant in shaping the visions during the co-creation/ cooperative parts of the program.
- Inholland: It is aimed that Inholland, as university of applied science, together with its students from the different faculties such as design, architecture, urban planning and development, landscape and environmental management, civil engineering, will play a pivotal role in the research and design tasks of Eco-acupuncture.

Progress achieved until M38 (provide a progress and timeline on preparation and implementation)

The method is finished in concept. Eco-Acupuncture is a complex method with involvement of universities, architects and designers at a high level. Normally performed by and under supervision of VEIL, Vectorian Eco-Innovation Lab. For POCITYF in Alkmaar, an adapted methodology is developed. The alternative version of the method does not differ in the process used compared to the original methodology; it differs in the fact that the cooperating partners are locally sources to better anchor the outcome and have local support. The partners involved in the method are as a rule from or around Alkmaar. Finalisation of the plan of action is currently under way and will be finished by the end of Q4 2022.

Faced barriers and lessons learned (M0 to M38)

The main barrier faced in the preparatory face of the Eco-acupuncture program in Alkmaar is the lack of monetary resources reserved and allocated.

Next steps (what will be done/what still has to be done - add dates if known)

Preparation, arrange funding, and consortium building: Q1 2023



Step 1: Q3 2023

Step 2: Q3/4 2023

Step 3: Q1 2024

Step 4: Q1/2 2024

Step 5: Q2 2024

Connected IEs with ETTs

At the moment, no direct connections with other innovative elements and work packages can be made. However, during the finalization of the plan of approach, linkages are sought to be made where possible.

4.3 IS 4.3 - Interoperable, Modular and Interconnected City Ecosystem

This solution will not only cover the monitoring needs of the demonstration areas at building and district-level, but also pave the way for the transition to an interconnected ecosystem that will underpin the effectiveness of the three previous transition tracks. At the same time, it will enable the conception of new solutions based on the data that will be retrieved and centralized at a city-level platform.

Within ETT#4, IS 4.3. Interoperable, Modular and Interconnected City Ecosystem towards Citizen Engagement entails one Innovative Element for the city of Alkmaar. An overview of the IE and partner involved is provided in the following table (see table 12):

Table 12: Overview of Innovative Elements in IS 4.3

Innovative Element	Partners involved
IE 4.3.1 - City Information Platform	Gemeente Alkmaar

4.3.1 Demonstrating IE 4.3.1 - City Information Platform

Table 13: IE 4.3.1 - City Information Platform

IE 4.3.1 - City Information Platform
Goal and Description of IE
Alkmaar's City Information Platform (CIP) (see figure 7) is going to be a basis for encouraging dialogue and collaboration between (local) government, citizens and companies. The digital twin will present all available open data of the city of Alkmaar. By enabling data aggregation and monitoring we can improve the decision making by policy makers and local representatives, and improve the dialogue with our citizens. It 1) provides municipalities and decision makers with an overview of all relevant city data on different fields, 2) will give insight for the inhabitants of Alkmaar to collect/view data in their neighborhood, and 3) will give insight for companies that want to use the data to develop smart propositions. By presenting effective insights based on cross domain data we expect better understanding, awareness and policymaking concerning the goal of POCITYF: a greener, smarter, more sustainable city. And specific insights in the PEBs and PEDs (the ones we are realizing within this project) help us to learn and to identify possibilities in the municipality. The digital twin (our CIP) is based on open and standard-based IT platform architecture rules and application programming interfaces (APIs) and supports interoperability with external databases and data sources and



which will offer an easy replication in other cities. The CIP is supported by a Data Governance Plan (DGP) to guarantee the right, secure and sustainable use of data. The DGP is crucial for building trust and participation among all stakeholders. Connected sensors will collect and communicate real-time data about mobility, air quality, noise, waste collection, energy, health, etc., and combine them with forecasts into a customizable dashboard on the platform, allowing different parties to monitor key performance indicators (KPIs). Companies can make use of the datalake to develop new services and test innovations, thus allowing Alkmaar to become a living lab for social innovations. At the same time the CIP will offer all the tools for new solutions and applications.

Features and behavior:

- 3d Light/Laser Detection and Ranging (LiDar) map (see figure 12), 3D basic map and 2D map
- Specific maps for specific issues
- Data from the subsurface, topsoil, air, social
- Interactive elements with residents (Participation and Energy data)
- Sensors created by residents visualized on the platform



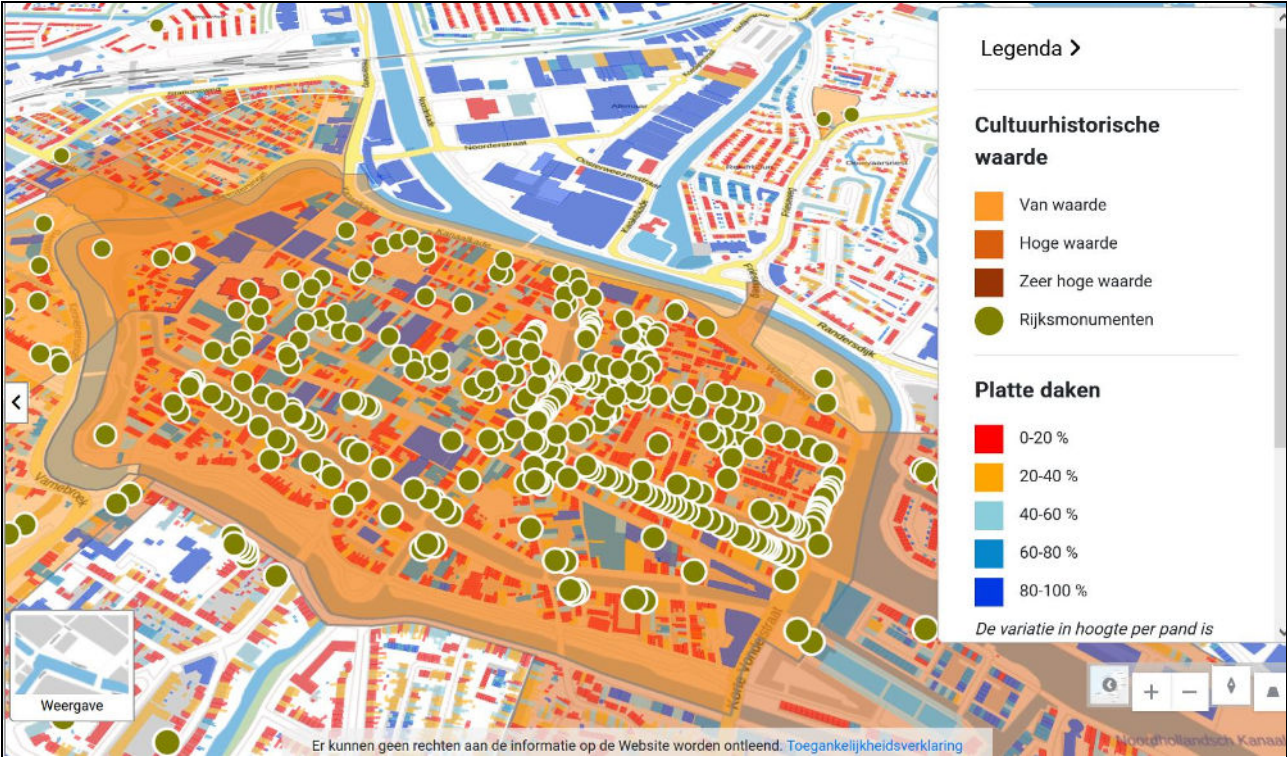


Figure 10: Overview cultural historical value

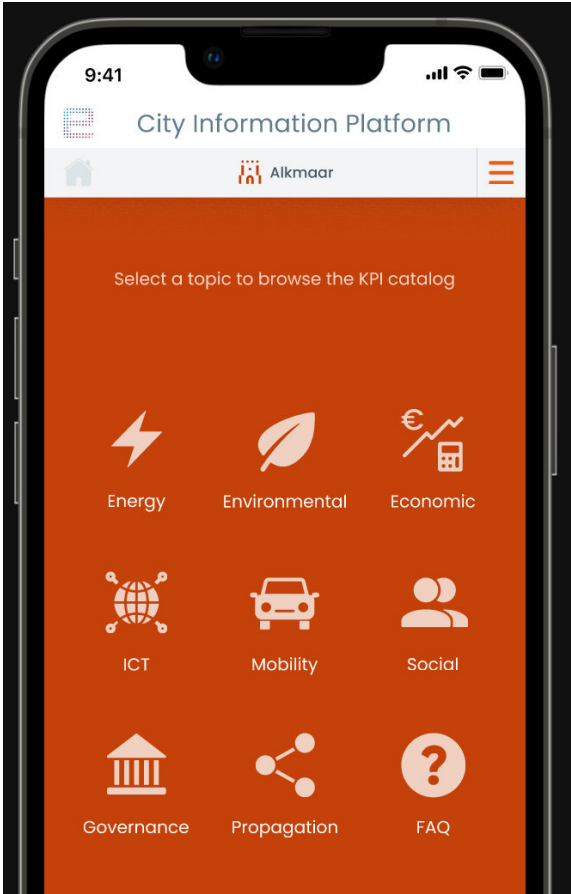


Figure 11: Image of CIP app





Figure 12: 3D LiDar Environment

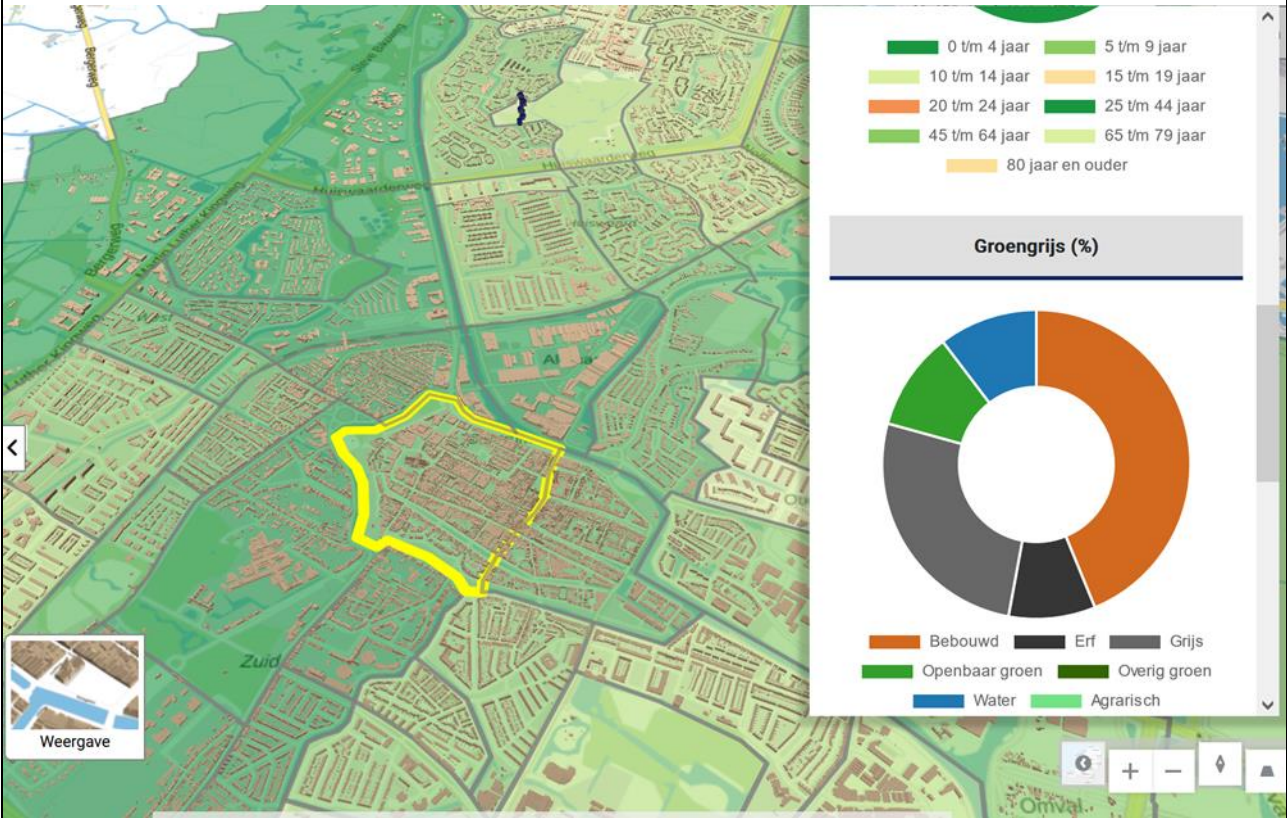


Figure 13: Green vs Grey map

Role of partners involved

The following partners are involved:



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement N° 864400.



• InHolland: datalake connection, information about the PEBs • Enersis: mockups + visual layer • Neroa: sensors
Progress achieved until M38 (provide a progress and timeline on preparation and implementation)
A framework for harmonized data gathering, analysis and visualisation is being developed. The status of the platform component within the CIP is in the testing phase. The Digital Twin of Alkmaar is being released. But not all the information of POCITYF is available yet. The mock-up of the platform is being developed. In the development phase, it is important to have the partners available to deliver data in an agreed-upon data structure. Key deliveries 1. CIP has basic energy data visualised; 2. Data storage problem between Neroa and the Inholland data lake has been solved; 3. In January 2023 the development of the Enersis platform will be finished.
Faced barriers and lessons learned (M0 to M38)
Barriers: Unfortunately, due to delays in the data storage component, the agreed date for a sprint development was not met and this had an effect on the overall planning of the POCITYF project for the municipality of Alkmaar. Other lessons learned: • KPI discussion: The KPI discussion caused a lot of delay because Inholland could not take a step forward because of lack of clarity in the architecture and description of values. • We had a discussion about open standards. In Portugal, Ubiwhere is working in a different way and that did not come together yet. • Due to personel problems at Enersis the project took longer. • We had to develop more than was obvious at the start of POCITYF. Microsoft had come up with an approach and budgeted for something simple, but it turned out not to be appropriate. So too little money and months of work budgeted. • We had to make a separate agreement with InHolland regarding the exchange of data (privacy).
Next steps (what will be done/what still has to be done - add dates if known)
In Q4 2022 - preparation sprint Enersis and needed technology In Q4 2022 - first version participation tool mobile ready In Q1 2023 - first version Enersis platform ready In Q2 2023 - second version Enersis platform ready
Connected IEs with ETTs
Connected with WP2: KPI / Monitoring



5. Conclusions

The previous chapters discussed the goals and descriptions of each innovative element. Including the role of the partners involved. In these chapters the progress of each innovative element was described including faced barriers and lessons learned. Also, it was described which next steps need to be taken. Below we conclude the status and the next steps for each of the Innovative elements (see table 14).

Table 14: Status and next steps per IE

Social Innovation Mechanisms towards Citizens Engagement			
Nr.	Innovative Element	Completed	Next steps
4.1.a	Workbook for housing corporations	Yes	The workbook will be evaluated in the follow-up activities for Bloemwijk. Through dissemination and application in other projects or cities (e.g. follower cities) the workbook will be fine-tuned based on the evaluation results there.
4.1.b	DBVC-method	Yes	See 4.1.a
4.1.c	Entrepreneurial value based design	Ongoing	Although the concept of EVBD has already been and is being applied, possibilities are currently being examined to apply the EVBD concept to the POCITYF aspect of 'cultural history and energy transition' (where Alkmaar can serve as a testing ground) in the minor for 2023 (start in January). However, students in this minor are free to choose a product/service/market they want so it cannot be made mandatory.
4.1.d	Test-sharing of digital appliances aimed at facilitating communities' transition engagement	Ongoing	Due to the fact that the apps did not meet the requirements of GA and the housing corporations, no further action was taken to improve the apps. However, several functions will be integrated in the CIP. In February 2023 game(s) can be released. The marketing plan has to be executed. The games will be part of a bigger program. Since the marketing plan is not ready yet, these are some of the actions we probably have to take. 1. Contact with schools in Alkmaar have to be made. 2. Location has to be decided upon: part of the pop up Alkmaar Energy Experience or if it will be presented/ organized in our "Stadslab".

			3. Monitoring is done through data analysis of the play experience within Unity. Within each game, data indicators have been added to measure experience and activity. 4. The challenge, however, is to continue developing the games to improve the quality of the experience and keep it fresh. Regarding test sharing of digital appliances developed by and for Évora: contact has to be made with Évora to check what kind of digital appliances are to be developed and how and when these apps can be tested in Alkmaar.
4.1.e	InnoFest concept by students	Ongoing	Feedback from Inholland lecturers, students, entrepreneurs, IDEA and TerraTechnica partners will improve all steps in this solution so co-creation is reached. Step 9 has still to take place (end of 2022).
4.1.f	Lessons learned from the Fryslân Cultural Capital of Europe	Yes	After the performance of the deep-dive the following actions will be performed: 1. Data gathering and processing: January 2023 2. Reporting - writing booklet: February 2023
4.1.g	Mixed POCITYF community-engagement and community-innovation approach	Ongoing	1. A small local market for reuse of construction materials is realized by GP Groot and CA de Groot. 2. The Circular economy approach has been designed, but for the execution we needed the approval of the city council. 3. The project (Robonsbos mill) will be finished at the end of January 2023. Students will present their sustainability plan for the Robonsbos mill to the municipality, the owners and teachers.
Open Innovation for Policy Makers and Managers			
4.2.1	TIPPING approach for activating the city policy makers and managers	Ongoing	Finalise the TIPPING-method: Write reflection report: Q1 2023 Write renewed TIPPING-guide: tool for improving innovation policy and governance structure in urban city environment (original method will be updated based on lessons learned of demo). The updated TIPPING-approach will be repeated one more time in Lighthouse city Alkmaar 2023/2024.
4.2.2	Application of the Eco-Acupuncture tool	Ongoing	The method is finished in concept. Eco-Acupuncture is a complex method with involvement of universities, architects and designers at a high level. Normally performed by and under supervision of VEIL, Vectorian Eco-Innovation Lab. For POCITYF in Alkmaar, an adapted methodology is developed. The alternative version of the method does not differ in the process

			used compared to the original methodology; it differs that the cooperating partners are locally sources to better anchor the outcome and have local support. The partners involved in the method are as a rule from or around Alkmaar. Finalisation of the plan of action is currently under way and will be finished end of Q4 2022.
Interoperable, Modular and Interconnected City Ecosystem			
4.3.1	City Information Platform	Ongoing	A framework for harmonized data gathering, analysis and visualisation is being developed. The status of the platform component within the CIP is in test. The digital Twin Alkmaar is being released. But not yet all the information of POCITYF is available. The mock-up of the platform is being developed. In the development phase, it is important to have the partners available to deliver data in an agreed upon datastructure. For some data elements in regard to solar power we moved the data solution to the municipality environment so we can increase the turnover rate of our information products. Key deliveries 1. CIP has basic energy data visualised 2. Data storage solution with Inholland has been solved 3. In January 2023 the development of the Enersis platform will be finished.