



## **WP I1 | ACTIVITY I1.2 | DELIVERABLE I1.2.1**

### **VALUE PROPOSITIONS FOR THE STAKEHOLDERS OF THE CVPP LOENEN**

PARTNER RESPONSIBLE: FOUNDATION SUSTAINABLE PROJECTS LOENEN

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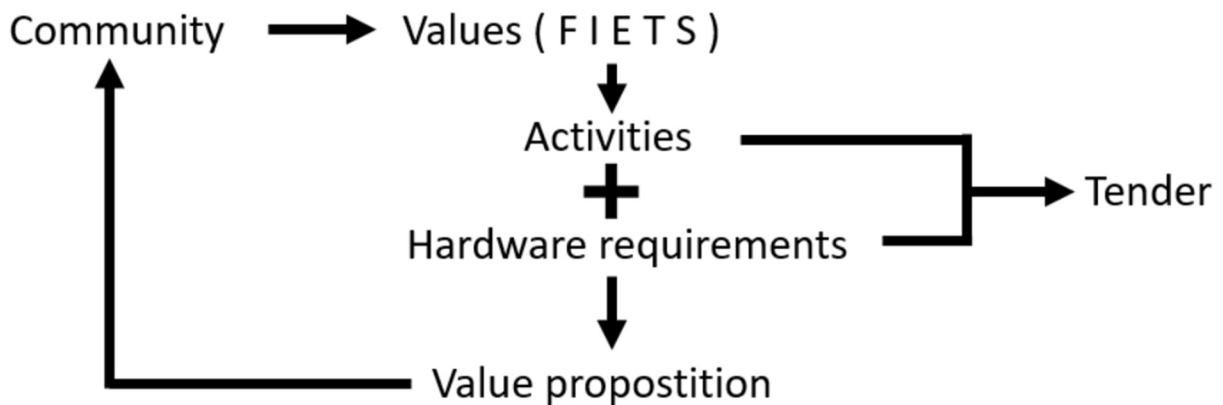
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# 1 IMPLEMENTATION SUMMARY

Based on deliverable “cVPP Value propositions and their communication plan (T1.2.1)”, suitable value propositions for Dutch local communities and other stakeholders to engage in a cVPP will be selected and implemented locally. After thorough preparation, the chosen communication strategy will be rolled out (Deliverable I1.2.2).

The process below has been executed to come to the right requirements for the tender. The community could give their opinion through the interviews, workshops and a survey (p4.1, p4.2). With this input of the community the importance of the different values (FIETS) were determined (p4.3), after which the corresponding activities have been established (p5.1). Finally, the concluded value proposition is brought back to the community for approval (p5.2) and move forward with the Tender of the cVPP system in Loenen.



## 2 IDENTIFIED COMMUNITIES

### 2.1 COMMUNITIES IN LOENEN

Loenen is a village with nearly 3.200 inhabitants divided over 1.330 households. Of these houses, 68% is privately owned, and 23% of the houses are owned by a Cooperative. The remaining 9% are houses for rent, probably with private owners. There are a couple of sport clubs (football, tennis) and other sport or leisure associations. The Dorpsraad (Village council) is a well-known and active body in Loenen. For the purpose of this project, Loenen Energie Neutraal (Loenen Energy Neutral, LEN) is a foundation that is founded 5 years before the start of the cVPP project and has ever since been active in the promotion and financial facilitation (revolving fund) of solar panels and other RES, as well as insulation measures.

There are 305 enterprises registered in Loenen. Therefore, it is possible to define several typical communities. For the purpose of the cVPP project, the whole village of Loenen is considered as the community: the target of 100 participating households for the VPP means a success rate of 7,5%, which seems rather ambitious for these kind of projects.

## 2.2 SELECTION OF STAKEHOLDERS

The selection of stakeholders was very pragmatic at the start of the project. The idea was to identify a number of people from who it was known that they already had solar-PV installed, thus assuming that they might be frontrunners and interested in the cVPP concept. The database of Loenen Energy Neutral (LEN) was the starting point for this selection. The households/people that are in this database, are not typical stakeholders for the community of Loenen, as they have the shared characteristic that they have solar-PV installed. For the cVPP project however, this starting point was ideal.

Being aware of this aspect, also other stakeholders were approached and invited. All the households of the housing cooperative were invited for a workshop, as well as the chairman of an Association of owners (VvE) of a complex of apartments. Other stakeholders that were approached were among others the chairman of the "Dorpsraad", energy coaches of the municipality of Apeldoorn, and some owners of local SME's.

## 3 ACTIVITIES THAT ARE DISCUSSED WITH THE COMMUNITY

The starting point to choose the right value propositions is the list of potential activities as listed in T1.2.1. Not all of the possible activities were discussed with the community because of several reasons:

- They were out of scope for this project, such as the joint purchase and maintenance of assets;
- Because of technological availability and possibilities of RES in Loenen to conduct activities, for example to contain, restore or replace frequency or to provide emergency power supply.
- In order to keep the content simple for the community to easily understand and relate to the topic.

In the table below it is indicated which activities are discussed with the community.

### LIST OF POTENTIAL ACTIVITIES

ACTIVITIES	PROPOSER	BENEFICIARY	Discussed with community
1. SERVICES TO INCREASE AWARENESS			
Technical support/information on electricity assets or insulation	FACILITATOR	PROSUMER	x

Legal support on electricity assets or insulation	FACILITATOR	PROSUMER	x*
Finance support on electricity assets or insulation	FACILITATOR	PROSUMER	x*
Independent design of electricity assets or insulation	FACILITATOR	PROSUMER	x
Provide benchmarking & automatic/manual reduction of energy use	FACILITATOR	PROSUMER	x
Provide intermediary between community and other market actors (ESCO, AGGREGATOR, Etc.)	FACILITATOR	PROSUMER	x
Organize co-Finance collective renewable energy projects of community	FACILITATOR	PROSUMER	x
Organize collective investments of community in collective renewable energy projects	FACILITATOR	PROSUMER	x
Flexibilize energy supplier through a third party purchaser	FACILITATOR	PROSUMER	x
2. JOINT PURCHASE AND MAINTENANCE OF (SHARED) ASSETS			
Organize group purchase (economical aspect) of electricity assets or isolation	FACILITATOR	PROSUMER	
Follow-up of electricity assets & production warranty	FACILITATOR	PROSUMER	
3. SUPPLY OF SHARED ENERGY			
Investment of community in collective renewable energy projects	PROSUMER	PROSUMER	x
4. PEER-TO-PEER			

Provide trade peer to peer within local energy communities	LOCAL ENERGY MARKET FACILITATOR	PROSUMER	x
5. OPTIMIZE INDIVIDUAL PROSUMERS ENERGY PROFILES (IMPLICIT)			
Provide self-balancing: maximise auto-consumption (behind meter)	ESCO	PROSUMER	x
ToU optimization: Flexibilise cost structure of grid cost	DSO	PROSUMER	
ToU optimization: Flexibilise cost structure of electricity cost	SUPPLIER	PROSUMER	x
ToU optimization: Provide electricity cost management (through intelligent EMS system)	ESCO	PROSUMER	x
ToU optimization: Provide ecological impact management (through intelligent EMS system)	ESCO	PROSUMER	x
Provide kWmax control	ESCO	PROSUMER	x
Allow purchase of excess electricity of prosumer	SUPPLIER	PROSUMER	x
Provide emergency power supply	ESCO	PROSUMER	
6. PROVIDE EXPLICIT DEMAND-SIDE FLEXIBILITY SERVICES (EXPLICIT)			
Provide flexibility through electricity assets (PV, Batteries, electric car, boilers, heat pumps)	PROSUMER	AGGREGATOR	x
Provide frequency containment reserves from prosumer flexibility (former R1)	AGGREGATOR	TSO/BRP	
Provide automatic frequency restauration reserves from prosumer flexibility (former R2)	AGGREGATOR	TSO/BRP	

Provide manual frequency restauration reserves from prosumer flexibility (former R3)	AGGREGATOR	TSO/BRP	
Provide frequency replacement reserves from prosumer flexibility (former slow R3)	AGGREGATOR	TSO/BRP	
Provide voltage support from prosumer flexibility	AGGREGATOR	DSO	x
Provide grid capacity management high voltage from prosumer flexibility	AGGREGATOR	TSO	x
Provide grid capacity management low voltage from prosumer flexibility	AGGREGATOR	DSO	x
Provide congestion management high voltage from prosumer flexibility	AGGREGATOR	TSO	x
Provide congestion management low voltage from prosumer flexibility	AGGREGATOR	DSO	x
7. OPTIMIZE THE COMMUNITY ENERGY PROFILE (IMPLICIT)			
Provide Self-balancing: Maximise community auto-consumption (neighbourhood or other level)	ESCO	PROSUMER	x
ToU optimization: Provide ecological impact management (through intelligent EMS system)	ESCO	PROSUMER	x
Provide kWmax control	ESCO	PROSUMER	x
Provide emergency power supply	ESCO	PROSUMER	

\* This activity was already started by the foundation Loenen Energie Neutraal (LEN) before the start of the cVPP project in Loenen and was still carried out by LEN during the realization of the cVPP.



## 4 SELECTION PROCESS

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With the aim of finding 100 participants for the cVPP and to select the Value Propositions of the community (of Loenen), a process was started consisting of interviews, a workshop, survey and a follow-up session. This was supported by a communication strategy (see also Deliverable I1.2.2). The whole process took approximately 6 months from the first interviews to the feedback session following the specification of the Value Propositions.

### 4.1 INTERVIEW SESSIONS

To start the process, 10 inhabitants known from LEN were approached by telephone for an interview. The aim of this interview was to test the story of the cVPP and the general knowledge of the energy transitions and related challenges for PV grid integration on the longer term. There was a 100% participation rate. The conclusion of the interview sessions was that there is a general acknowledgement of the challenges in the energy transition and that there is a willingness to explore the possibilities for solutions like a cVPP. Next to that, the impression was that of the FIETS values, the focus on financial return seemed to be in balance with the other values with a non-financial focus. Apart from this, the interviewees were also asked if they would support the foundation of an energy cooperative. This was also positively received.

### 4.2 WORKSHOP

#### 4.2.1 Why a workshop

The workshops in Loenen were held because of several reasons. First of all, the project team wanted to get in touch with the community of Loenen, to inform them about the project, the current developments and opportunities of sustainable energy and its impact on the electricity system. Secondly, the project team wanted to get a grasp of the different opinions, worries and thoughts prevalent around these topics and stimulate informed opinions. Thirdly, the project team wanted to enthusiasm people to continue talk about the topic with other community members and spread the word on this cVPP project. The best way to do this was having an interactive workshop setting with around 24 community members. The reason for this amount of participants is that it would be big enough to maximize the amount of people with different ideas, yet having the maximum amount to be split up in three smaller groups and maintaining a setting where each of the community members would feel comfortable and free to ventilate its own ideas.

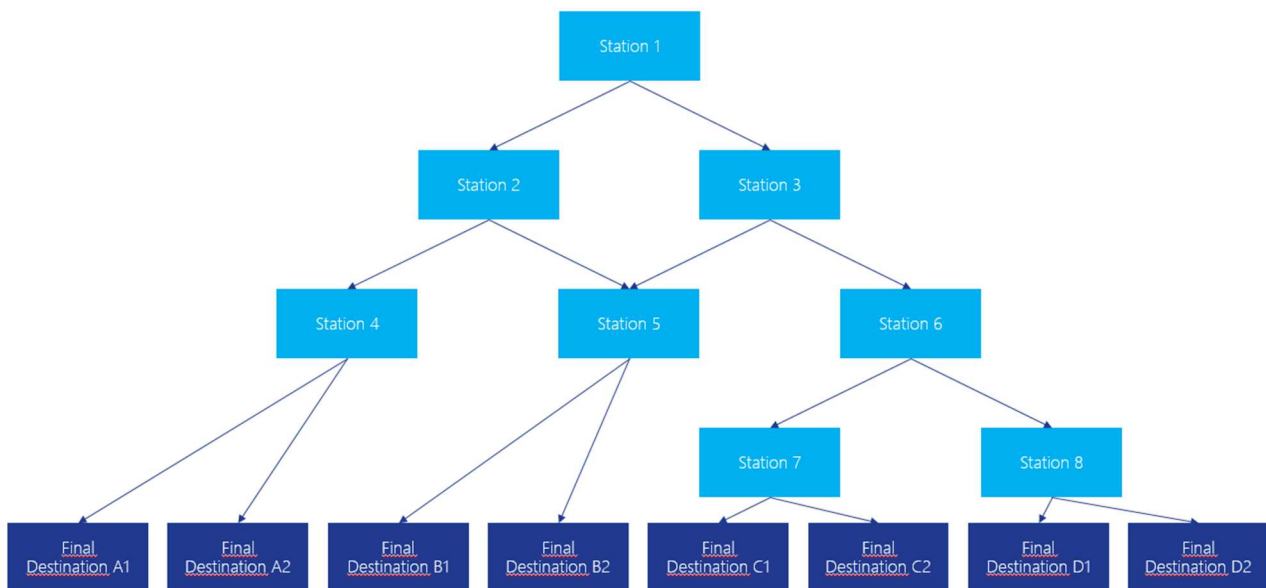
#### 4.2.3 Methodology of the workshop

The community selection workshops were developed together with the Wageningen University & Research (WUR)<sup>1</sup>. The WUR had developed a method to select value propositions together with the community for the City-zen project prior to this Interreg NWE cVPP project. The workshop of WUR works with the five FIETS values, of which the values "Institutional" and "Technical" are grouped in one value called "New Roles". We will describe this method briefly in the coming paragraphs.

The workshop leads participants in small groups through different sub-stations to one of the eight final destinations. Every final destination depicts a different mix of value propositions, and therefore a different type of VPP. A number of statements is presented to the group of participants at every station. Depending on the participants' consensus with regard to the statements at a station, they are led to a different station. In this way, a specific route takes shape to their final destination. The statements deliberately steer the participants in a certain (contrasting) direction in order to stimulate discussion. As it is vital that each participant feels included and represented in the consensus of their group, there is a set of instructions to play by in close guidance of organization members to ensure a clean and fair decision-making process. The instructions are:

- 1) Choose somebody to turn around the letter at the sub-stations and read out the description on the back of the letter.
- 2) Subsequently, read out the statements on the letter and determine the answers/consensus on the statements within the group. The answer takes you to the left, or right to a next sub-station.
- 3) Every group is allowed to insert a joker in the process, so part of the group could split off in case there are fundamental differences within the group about the chosen answers, and therefore the chosen path. The ones that split off have to be a significant minority.
- 4) It could happen that you arrive at a specific sub-station and realize that the consequences of your earlier choices or consensus are not acceptable. In this case you are allowed to take one step back and choose another direction.

In this way, the workshop is set up as depicted in the following figure:



The final destination includes a rough hypothetical payback period. The stations and final destinations are described in the table below.

Station	Description and number of subsequent station
Station 1	Statements towards more financial VPs (2) or towards more Social/Environmental VPs (3)
Station 2	Statements towards more financial VPs (4) or towards more social VPs (5)
Station 3	Statements towards more social VPs (5) or towards more environmental VPs (6)
Station 4	Choose between Final Destination A1 or A2
Station 5	Choose between Final Destination B1 or B2
Station 6	Statements towards VPs with a new role (e.g. knowledge) (7) or towards more environmental VPs (8)
Station 7	Choose between Final Destination C1 or C2
Station 8	Choose between Final Destination D1 or D2

Destination	Description	(Roughly) Estimated Payback period	Financial	Climate	Social
Final Destination A1	Purely financial driven cVPP	+/- 7 years	*****	*	
Final Destination A2	No cVPP as participants are not willing to share data in a collective system	Not applicable			
Final Destination B1	Mostly financial and, to a lesser extent, social driven cVPP	+/- 9 years	****	**	***

Final Destination B2	Equally financial as social driven cVPP	+/- 7 years	****	*	****
Final Destination C1	Mostly financial and, to a lesser extent, environmental driven cVPP	+/- 11 years	***	***	
Final Destination C2	Mostly environmental and, to a lesser extent, financial driven cVPP	+/- 13 years	**	****	
Final Destination D1	Mostly environmental and, to a lesser extent, social driven cVPP	+/- 15 years	*	*****	***
Final Destination D2	Equally environmental as social driven cVPP	+/- 14 years	*	*****	*****

It is important to note that the participants are in front of all the final destinations after having made their choice at the last station. In this way everybody is able to read and discuss the implications and consequences of their decisions in the workshop. For example, final destination B1 does not necessarily exclude any environmental VPs, as well as it is the case for financial VPs for final destination D1. After having looked at the final destinations, there were group sessions (in different group formations) for a discussion of the outcomes and the consequences of the choices. Whereas the first session has steered the participants through contrasting statements, the results and discussion are intended to reflect and stimulate nuances. It is the goal of this workshop to end the night with participants having the necessary insights for a well-balanced opinion.

#### 4.2.4 Results of the workshop

The workshops turned out to be well visited, lively and enjoyable. The participants were active in discussions stimulated by the game which was executed in relatively small groups (approx. 8 people per group). The game as described in the previous chapter, led to rather widespread outcomes, which in itself is good and have way for a balanced opinion. People felt free to choose what they wanted without being suppressed by "peer pressure".

The workshops also were a very good aid in getting the participants informed about aspects of the energy transition in general and a cVPP in more detail. This is helpful in the whole project and provides a good basis for the next steps, like the Survey following the workshop (chapter 4.5).

As the workshops were ended with a small drink, it was also a social event helping to get to know other people and discuss questions and opinions on the subject, but also small talk, all contributing to the social structure.



## 4.3 SURVEY

In the days after the workshop, the Loenen project team asked the attendees to fill out an online personal survey where they could state which FIETS-values they find important in a cVPP.

**Translyse** **Qirion** **Interreg** **North-West Europe** **cVPP**  
European Regional Development Fund

### Enquête Workshop cVPP Loenen

Beste workshopdeelnemer,

Hartelijk dank voor uw deelname aan de workshop van de virtuele energiecentrale in Loenen. Via deze enquête willen we u vragen om aan te geven of u geïnteresseerd bent om aan te sluiten bij de toekomstige virtuele energiecentrale en wat u hierbij belangrijk vindt. Geen van onderstaande antwoorden zal beschouwd worden als definitief antwoord, u gaat hiermee dus geen enkele verplichting aan. Al uw antwoorden in deze enquête zijn persoonlijk en vertrouwelijk en dienen uitsluitend bovengenoemd doel. De algemene uitkomsten van deze enquête zullen anoniem worden teruggekoppeld. Mocht u tevens ervoor willen kiezen om deze enquête geheel anoniem in te vullen, heeft u hiervoor de gelegenheid door uw naam niet op te geven.

Het invullen van de enquête zal minder dan 10 minuten van uw tijd in beslag nemen.

Bij voorbaat hartelijk dank voor uw deelname aan deze enquête.

Namens Translyse en Qirion,

André Zeijseink, René van Egmond, Stefan Nellen, Astrid van Sprang & Jasper Kroondijk

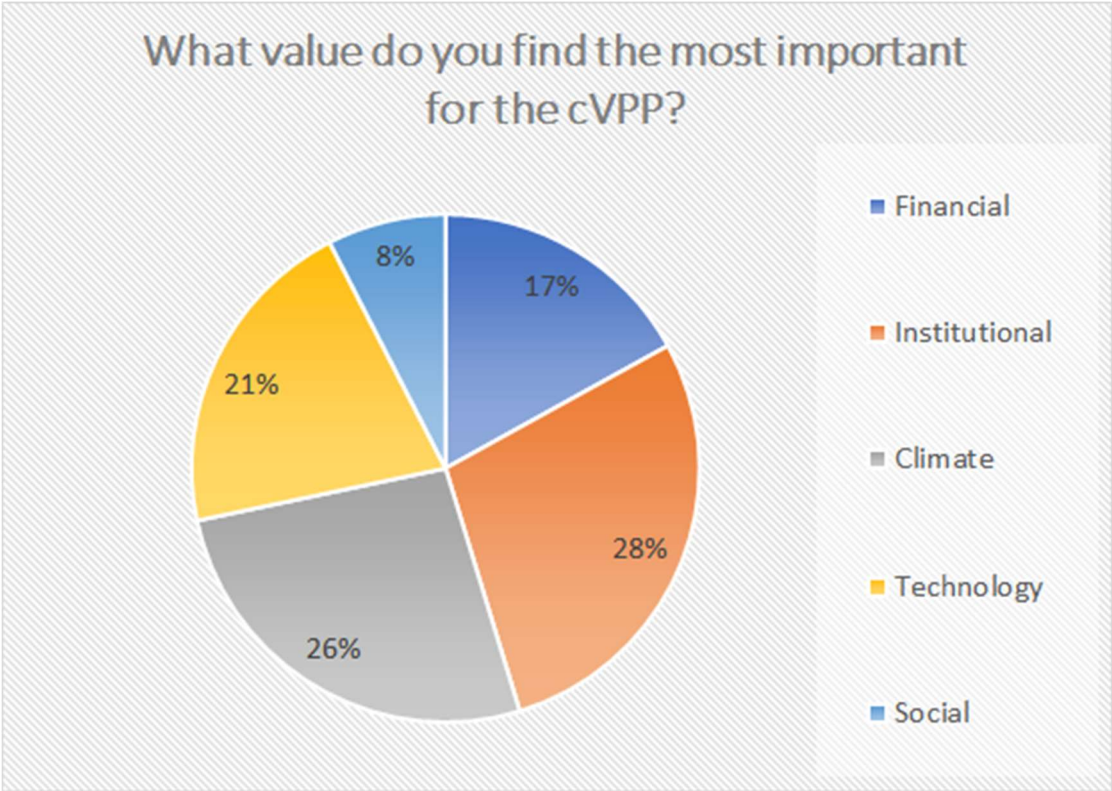
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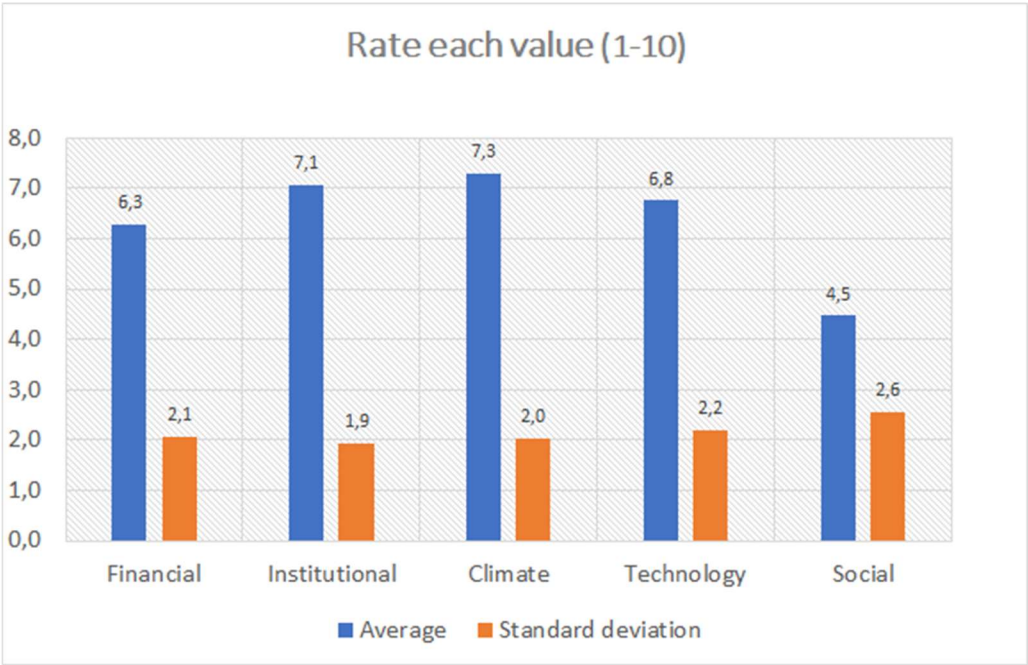
The survey consisted of twenty questions where the attendees were not only asked to scale the importance of the different FIETS values but also to indicate their willingness to participate (including with which devices). Please see attachment 1 for an overview of the questions that were asked in this survey. 66 attendees completed the whole survey.

The most interesting outcomes of the survey will be discussed here. The figure below shows the results for question 3: Which value of the listed (FIETS) values below is the most important for you for the community-based virtual power plant in the village? As could be seen, an almost equal moment of participants valued the institutional and climate values as most important (28% and 26% respectively), quickly followed by a 21% that valued technology as most important and 17% of the participants that valued financial returns as most important. As became clear during the community workshops, very few participants valued the social value as most important. Attendees did not want to mix social activities such as maintaining the community building with energy demand and generation, partially because there are already several social initiatives taking place in Loenen.





When asking the participants to value each value on a scale from 1 till 10 (question 4 in the survey), a similar like picture arose. The figure below gives the results when the attendees were asked to score the different FIETS values individually. It can be seen that the values institutional and climate switched (insignificantly) in importance but the ranking of the other values is congruent with the answers on question 3.



The table below gives the amount of PV systems and controllable appliances under the 66 participants of the survey. Electric vehicles and heat pump are still rare but a rapid increase in numbers is expected. The participant of the survey also have been asked if they are willing to be a key-user of the system. These key-user will test the (build quality) of the components of the cVPP system before the rollout of the system at 100 participants will be started, and are asked to be a ambassador during implementation in the village to tell about their experiences and how the systems works at their home. Although the project team aimed for only 10 key-user, 28 participants signed up to be key-user and another 20 participants have shown interest to become a key-user.

Household appliance	Participants
PV system	31
Electric vehicle	6
Heat Pump	5
Electric boiler	18
Smart Meter	30
Key-user	28

## 4.4 COMMUNICATION DURING THE SELECTION PROCESS

During the selection process the communication was based on the general Communication strategy (Deliverable I2.2.2) and consisted of the following components:

- Direct approach by telephone
- Direct approach by e-mail
- Website DPL
- Facebook/LinkedIn
- Local newspaper publications
- Leaflet (see attachment 2)
- Invitation letter for tenants of Housing Cooperative

It appeared to be quite effective to get the first participants out of direct approach. However, after this source was exhausted, more communication was necessary to reach the envisaged number of participants.



Therefore, the communication was scaled up in order to reach the community in a broader way. This was done by a modest campaign using a leaflet, news on the website and a dedicated Facebook page at the same time. Next to that, we shifted the workshop to a Monday evening after having organised the previous workshops on Tuesdays and Thursdays. This all was very effective, with 29 participants for the last workshop and having held a total of 5 workshops.

## 5 PROCESS FOR FURTHER BUY-IN

### 5.1 PROPOSED SET OF VALUE PROPOSITIONS

On the basis of the survey and input of the community during the workshops the following activities are chosen to execute in Loenen. The stars indicate the suitability of the activity per value. The financial benefit of maximizing auto consumption will increase when 'salderen' will be abolished. 'Salderen' is Dutch legislation where kWhs supplied to the electricity grid are settled with the purchased kWhs, meant only for consumers that own solar panels and have a maximum grid connection of 3x80A. In this way, Dutch prosumers do not pay taxes to the energy they put on the grid and is made sure that the price they get for their energy is equal to the price they pay for their energy. As this legislation has been very successful, the Dutch government has been wanting to stop it or alter it. However, for several years the abolishment of "salderen" has been postponed due to pressure from several pressure groups, resulting in a foreseeable continuation of this legislation till 2023.

	Financial	Institutional	Environmental	Technology	Social
Maximize auto-consumption (individual and community)	**** (without 'salderen')	***	****	*****	
Provide grid support (possible compensation from grid operator)	***	*	***	*****	***
Make use of flexible cost structure of electricity cost	****		**	*****	
Allow purchase of excess electricity of prosumer (to energy supplier and at a later stage peer to peer)	****	****	***	*****	

trading within local energy communities)					
Prepare for future flex market	*****		*	*****	

Eventually these activities give the following value propositions in Loenen:

- Primary focus on aligning local demand and local supply as much as possible, maximizing both the values of climate neutrality and energy independency.
- Overproduction will be used to generate extra revenue for the cVPP members, materializing the financial value. Examples are flexibility for the DSO or saving the surplus of supply in a community battery to maintain day/night equilibrium
- An additional benefit is an increase in energy savings as a result of more awareness and aligning supply & demand, enhancing both financial return as climate neutrality.

## 5.2 COMMUNITY FEEDBACK SESSION

On June the 17<sup>th</sup> 2019 the community feedback session was held. This session represents the next step in the process by verifying the activities and hardware requirements (also known as the value proposition) with the community. When the community approves the value proposition suggested by the project team it is possible to start the next step; the tender. In this paragraph the process of organizing the community feedback session is described as well as the session itself.

First of all, there was a flyer designed to inform and enthuse the participants (see attachment 2). This flyer was distributed among all participant of the workshops, survey and general mailing list. With a second wave the flyer was distributed door to door in Loenen and was shared on social media. And of course, there were some face to face invitations by the project members who live in Loenen.

There were taken multiple actions to increase the response rate to the invitation:

- The session was planned on a Monday because of the high response on this day during the workshops;
- The session time was shortened relative to the workshops;
- A buffet was offered so the starting time could be set an hour earlier.

Around 40 to 50 participants responded to the invitation and attended the session. A very respectable amount for one evening compared to the response rate of the workshops and enough different stakeholders to justify the community-based approval.

At the session the project team presented, next to the general project purpose and recent developments, the process and (value) proposition as described earlier in this document. During the presentation the attendees asked a lot of questions varying from practical implementation to general energy transition subjects. These

questions form the base of a FAQ distributed to all interested possible participants of the cVPP. When all questions were answered the project team asked the community for their general feeling and approval on the proposed value proposition. This question was shortly followed by an applause of the attendees. In the remaining time the project team clarified the next steps using a timeline and explaining some of the requirements to become Key-user (test user) to test the system as one of the first. After discussing the plans and developments of the Energy-Cooperation Loenen the session was closed with a drink where the project team members joined the conversations of the attendees to get a grasp of their stance towards the project and their approval. Next to that, several attendees came up to project team members to already sign up to become a key-users.



Picture of the community feedback session June 17<sup>th</sup> 2019

## 5.3 DESIGNING THE SYSTEM

With the approval of the community at the community feedback session, the value propositions were finalized. A tender is written based on these value propositions, in which the requested system is described. According to Interreg NWE and Dutch regulation, a limited tender was started in which five market parties were invited to provide an offer. The requested system will be designed towards controlling PV, EV, heat pumps and an occasional electric boiler and Smart Grid Ready (SGR) home appliances through insights in production of households, consumption of households and the surplus of energy production in the community. A dashboard/app will be designed to give a visualisation of these individual insights to participants. Aggregated insights on community level will be publicly available in Loenen, including the village energy bulletin board (see I1.2.4 for more information about the bulletin board).

Three different packages, depending on prosumer characteristics, will be implemented:

Light – Community members that do not have PV or controllable appliances, but would like to make use of locally produced renewable energy and would like to get insights in their energy consumption;

Basic – Light + community members that have PV, but lack an EV, a heat pump or SGR appliances;

Extra – Basic + community member with controllable appliances, to make maximum use of their flexibility.

## 6 CONCLUSION

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The described approach to come to the community-based value propositions for the cVPP turned out to work well. The main elements of the approach are:

- Test the concept and the way to bring it on a small group of perceived innovators before a larger roll-out.
- Have an interactive workshop with background information to get the participants informed about the cVPP concept and to get them enthusiastic.
- Enhance the workshop results by a survey in order to learn the values of the community
- Have a feedback event to verify the system design of the cVPP according to the values in the survey. This is necessary to formulate the requirements and design of the cVPP system in order to be able to conduct a tender for the cVPP system.

A broad set of communication means is advised in order to approach sufficient people, having the advantage in Loenen that there are already existing networks that are liaised to renewable energy initiatives.

This all has led to a sufficient large group is interested and willing to participate in the cVPP project and form a good basis to at last reach the targeted 100 participants.

## Attachments

### *Attachment 1: survey*

1. Would you be interested to join the community-based Virtual Power Plant in the village?
2. In case you choose "no" at the last question, could you please motivate your answer?
3. Which value of the listed (FIETS) values below is the most important for you for the community-based virtual power plant in the village?
4. Please indicate on a scale of 1 (low) till 10 (high) how important you value "financial return"?
5. Please indicate on a scale of 1 (low) till 10 (high) how important you value "investing in social initiatives (with)in the village"? Please be aware that these are not activities related to climate neutrality.
6. Please indicate on a scale of 1 (low) till 10 (high) how important you value "making the village as climate neutral as possible"?
7. Please indicate on a scale of 1 (low) till 10 (high) how important you value "making the village as independent as possible from energy-suppliers and influences from outside"?
8. Please indicate on a scale of 1 (low) till 10 (high) how important you value "taking a lead role in technology with our village and be an example to others"?
9. If you find it important to make the village as climate neutral as possible, would you rather want to personally invest the return of the virtual power plant to reach climate neutrality in your household firstly, or jointly invest the return to reach climate neutrality as a village together?
10. Are there other values that you find important with regard to a community-based virtual power plant?
11. Would you be open to let (an experienced) third party manage the virtual power plant in order to achieve the chosen values?
12. In case you choose "no" at the last question, could you please motivate your answer?
13. Do you own a solar panel, electric vehicle, heat pump, electric boiler, fridge, freezer, laundry machine, dryer, dish washer, electric storage, wind mill and/or air conditioner? (Here a survey-participant could tick the boxes of the appliances).
14. Which of the mentioned equipment would you like to use in the virtual power plant? (Here a survey-participant could tick the boxes of the appliances).
15. Could you please specify how old your appliances are that you described in question 13, if these appliances could be controlled remotely (for example on/off) and if these appliances have the label "smart-grid-ready"?

16. To what extent would you like to stay in control of the management of appliances with an automatic thermostat, such as a fridge, freezer and heat pump, in case you would like to use these appliances for the virtual power plant? To what extent would you like to stay in control of the management of appliances that you manage manually, such as a laundry machine, dryer and dish washer, in case you would like to use these appliances for the virtual power plant?
17. Are you going to take the possible flexibility of an electric appliance into account when buying such appliance in the future?
18. Are you willing to share your instantaneous supply- and demand-data with the virtual power plant for the purpose of the management of the cVPP? Please be aware that this data will not be available for other members of the cVPP, but is needed to match the supply and demand of electricity. If you answer "no", it is not possible to participate in the cVPP.
19. Do you have a digital energy and gas meter?
20. Would you like to be a key-user for testing (components of) the virtual power plant during the development and implementation in the village?

Attachment 2: workshop promotion leaflet

Frontside

## Praat mee over een duurzame energievoorziening in Loenen!



**26 MAART 19.30 tot 22.00 uur**  
**BRUISBEEK** Loenerdrift 80, LOENEN

**01 APRIL 19.30 tot 22.00 uur**  
**DE HUNEKAMP** Imbosweg 30, LOENEN

### Denk en deel mee in het nieuwe Loenense EU project “de Virtuele Energiecentrale”.

We willen een afstemming krijgen in de vraag en aanbod van de lokale duurzame energie in Loenen. Hierbij hebben wij uw hulp hard nodig. De interactieve workshop wordt gegeven onderleiding van de Universiteit Wageningen.

**AANMELDEN** met datum en naam, stuur een e-mail naar [projectondersteuning@duurzaamloenen.nl](mailto:projectondersteuning@duurzaamloenen.nl) of meld u aan via onze website [duurzaamloenen.nl/agenda](http://duurzaamloenen.nl/agenda)



## Backside

Beste dorpsgenoten,

Zoals u wellicht hebt gehoord, loopt er in Loenen een nieuw EU-project om ons dorp verder te verduurzamen. Dit project richt zich niet alleen op het stimuleren van zonne-energie (PV), maar ook op het beter afstemmen van het aanbod en de vraag naar duurzame energie. In dit nieuwe EU-project is een belangrijke rol voor de inwoners van Loenen weggelegd. Er moet een systeem worden ontworpen dat het mogelijk maakt vraag en aanbod van elektriciteit beter op elkaar af te stemmen. Hierbij hebben we uw hulp nodig.

In de workshop kunt u zich uitspreken over wat u belangrijk vindt in de verdere verduurzaming van Loenen. Geld speelt natuurlijk een belangrijke rol, maar daarnaast zijn ook milieu, klimaat, onderlinge samenwerking, zelfvoorzienendheid en zelfs 'energie-ondernemerschap' mogelijke factoren om rekening mee te houden.

Meer informatie over het project vindt u op: [www.duurzaamloenen.nl](http://www.duurzaamloenen.nl).

De workshops vinden plaats op 26 maart en 1 april in Loenen, onder leiding van de Wageningen Universiteit. In spelvorm maakt u telkens keuzes over de verduurzaming van Loenen. Aan het eind komt daar het meest gewenste energiesysteem voor Loenen uit.

Iedereen is van harte welkom! Graag zien we zowel mannen als vrouwen in de workshop, om een goed gemengd beeld te kunnen krijgen. Technische kennis is voor de workshop niet vereist.

Geïnteresseerden wordt verzocht zich van tevoren aan te melden via een mailtje naar [projectondersteuning@duurzaamloenen.nl](mailto:projectondersteuning@duurzaamloenen.nl) en daarbij aan te geven op welke dag men wenst deel te nemen.

Wij hopen u op een van de komende workshops te mogen begroeten. Inloop zal zijn vanaf 19:00, maar we beginnen om 19:30!

Met vriendelijke groet,

André Zeijseink



*Attachment 3: FAQ list***cVPP project**

What is a community-based Virtual Power Plant ( cVPP ) now exactly ?

A Virtual Power Plant is, as the name suggests, a virtual power plant. The power plant consists of several interconnected small renewable energy sources (usually solar panels) and consumers (usually households) through an energy management system (EMS). The EMS makes the generation and consumption transparent and can also be influenced. Deliberately influencing consumption and generation leads to a different network load. This has advantages for the energy system and is called "flexibility". This flexibility of (the participants of) the VPP can be used for various activities. For example, offering centrally to a network manager to prevent network overloading.

The "c" of c VPP stands for "community" (the community, therefore you) that determines how the EMS is used: which values is important to the community and for which activities flexibility is used.

2Why would I want to participate ?

The energy supply is changing. There is more and more sustainable generation (sun, wind) and we will use energy differently (from natural gas). These are all positive developments, but they also bring a number of challenges. For example, the existing infrastructure must be rigorously adapted to cope with changing demand and volatile supply. These adjustments require large financial investments, but also investments in time (scarce technicians) and raw materials. A Virtual Power Plant (VPP) can ensure that these challenges are partially addressed.

In addition, a VPP also gives the possibility to gain more control over (the origin of) energy consumption (energy saving) , financial benefits can be achieved and it gives the opportunity to strengthen the community.

In addition to the above reasons, it is also just fun and educational and you participate in this innovative project about the energy system of the (near) future. It is expected that, with all local sustainable sources, it will increasingly be organized in this way. Also with delivery from consumer to consumer: we become " prosumer " (producer and consumer). You have the opportunity to participate in this innovation so that we can all learn together.

If I participate, what do I notice at home ?

A small box (the gateway) is installed in the meter cupboard which is connected to the internet (probably via your modem) and the smart meter (the project team is talking to Liander to provide everyone with a smart meter). The gateway communicates with a central software platform where choices are made to deploy flexibility based on weather forecasts, energy prices and smart algorithms. You will not notice anything else here. You get an extensive "dashboard" at your phone, pc or tablet, with which you can accurately follow your electricity consumption, have insight into the advice / choices of the cVPP and therefore your equipment at the right times (with a lot of local generation) (washing machine, boiler etc ) can be switched on / off and operated . At a later stage, switching on and off can be automated with possibly an additional hardware module per device.

Who pays for the software and the gateway in-house and who is the owner ?

The costs for developing the software and installing the equipment for the first 100 participants are paid from the Interreg project "community-based Virtual Power Plant" which manages Sustainable Loenen. This project will in principle last until June 2020, but there are possibilities for a follow-up. The Energie Cooperative Loenen UA (ECL) was established, among other things, to manage the cVPP. The members of the cooperative then decide how to proceed with the cVPP. The software system and the equipment remain the property of the ECL.

Are there any costs involved for me ?

No, apart from the power consumption of the datalogger (not expected to be more than € 10 per year) there are no further costs. If devices are controlled and a reduction in efficiency occurs as a result, depending on the activity and value chosen, they will have to be compensated by selling the flexibility or the ecological value of the control will be chosen. In the future, this also applies to the use of (home) batteries. This is because they have standstill and charge / discharge losses.

I have registered as a "key- user". What does that all mean ?

If you have registered as a key- user, we first look at how many registrations there are and how that fits with the intended number. If you are selected, you are part of the test phase. That means that we are extra curious about your initial experiences, and we will (more or less) have to call on you to rectify faults that will occur more often in this phase. Perhaps you can fix it yourself, as a key user, via our instructions, or we will come by. It will therefore require a little more time and attention than in the normal operational phase.

What do you expect from me if I participate ?

During the installation of the gateway, you are expected to be home to let the engineer in. We will then leave you alone as much as possible, but occasionally we will approach you to share your experiences with us, for example. This can be done via a survey, a workshop or otherwise.

It may happen that the gateway has a malfunction. This sometimes happens when, for example, the modem is replaced. Initially, we will ask you to restore the connection, but if this does not work remotely, we will come by to resolve the malfunction.

Do I have to switch energy suppliers ?

No that is not necessary. It can be interesting to hire a supplier that offers flexible hourly rates. There are few of them. Perhaps the ECL will also make a proposal for this later. See also question 1.10.

What about privacy ?

The project team is aware that privacy sensitive data such as personal data and usage data are being used. The system is designed in such a way that this data stays in house as much as possible. The data that does go out will be sent encrypted. The parties that process this data (which is stated in the participants' agreement) work in accordance with the General Data Protection Regulation (AVG). In addition, you can ask at any time what data is collected about your household and how it is handled.

What are the disadvantages ?

When you participate in the CVPP, it becomes attractive to conclude an electricity contract with hourly variable electricity rates. The cVPP will help you move as much consumption as possible to the times when prices are low. If the system is not working properly or your consumption cannot be moved to these

moments, then it is possible that your costs will increase. However, it is not mandatory to conclude a new electricity contract and on the dashboard, for those who do not have variable rates, there will be insight into the benefit that you could have based on your historical consumption.

I do not have a PV or electric car. Can I still participate?

Certainly! You gain insight into your electrical consumption and see what is generated and used in the village (the cVPP participants). We think it can also help you make energy savings through more insight. And it's interesting and fun.

I want to quit, is that possible?

Of course you can, we will remove the equipment. Of course we hope that you will continue to participate under the motto "it is voluntary but not optional".

## Equipment

Will my equipment last longer due to more on / off switching ?

The equipment will be switched on and off more often, and at other times than you may have been used to. Incidentally, not much equipment will be eligible for influencing by the CVPP . We now only aim for heat pumps and charging points for an electric car.

What about the warranty on my devices if they participate in the CVPP ?

The starting position of the cVPP is to control devices with software via the ports that the manufacturer offers. As a result, the warranty conditions are not normally violated. If a different management method is chosen, this will be done in consultation with you.

Is the equipment being installed safe ?

The box (the gateway) is a normal product and complies with all applicable regulations (CE mark) . It gets its power from the smart meter, and therefore does not need a power outlet.

## Other questions

What happens / should I do if the system does not work ?

If the system does not work, contact : follows after choosing the supplier of the system . By the way, if the cVPP system does not work, you will still have power. These are separate cases (or there must be a general power outage).

What is the Energie Coöperatie Loenen UA ?

The Energie Coöperatie Loenen UA (ECL) was established within this project to manage the cVPP towards the end of this project , so that continuity remains. The members of ECL then determine how it will proceed with the CVPP . In addition, ECL. Just like other energy cooperatives, they are going to develop sustainable projects and provide services to their members, including electricity sales.

Can I also become a member of the Energie Coöperatie Loenen UA (ECL) ?

Yes you can, in fact: the first 100 participants in the CVPP will receive a free membership of the ECL for a year . This enables them to influence how the cVPP will be steered and what should happen with any income. That takes place in the General Assembly.

What is the netting arrangement ?

Hereby, your solar PV production is deducted from your electricity consumption at the same rate on an annual basis. What you possibly produce more than you consume is reimbursed at a lower rate. The netting scheme is under pressure, but has been extended until 2023 for the time being.

What does FIETS mean ?

"FIETS" is a way of weighing developments or investments in the areas of Financial, Institutional, Ecological / Economic, Technical and Social. In the cVPP project we used this framework to house the different values of the "community".

4Where should I go if my question is not listed here ?

You can ask your question via [projectondersteuning@duurzaamlo.nl](mailto:projectondersteuning@duurzaamlo.nl)

