D4.2 IMPACTS OF PVP4GRID CONCEPTS ON GRID SYSTEM

Country report Belgium

PVP4Grid

D4.2

Public Deliverable

Authors:

Gregory Neubourg (Becquerel Institute) Belgium

Brussels, November 2019

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 764786

Table of contents

0 SUMMARY 3

1 INTRODUCTION 4

1.1 Structure of the electricity system in Belgium 4

1.2 The new EU Regulatory Framework for Self-Consumption and its Grid related Provisions 5

2 KEY IMPLICATIONS OF PVP4GRID CONCEPT TO GRID SYSTEM 9

2.1 Simulations 9

2.1.1 Hypothesis 9

2.1.2 Simulations of group 2 (building with multiple apartments) 11

2.1.3 Simulations of group 3 (Energy Community) 13

2.1.4 Conclusion of the Simulations 16

2.2 Tests 17

2.2.1 Results 17

2.2.2 Conclusion of the tests 19

3 KEY BENEFITS AND CHALLENGES FROM THE PERSPECTIVE OF THE GRID SYSTEM 20

3.1 Administrative & Legal aspects 20

3.2 Technical aspects 20

3.3 Financial aspects 21

0 SUMMARY

The recent Clean energy for all Europeans package (CE4AE Package) introduced a comprehensive update to the EU energy policy. Along with other important changes, the new rules facilitate individuals and collectives to become energy prosumers i.e. to produce, store or sell their own energy from renewable sources. The PVP4Grid project explores photovoltaic (PV) energy prosumer concepts, particularly in terms of energy communities, by carrying out qualitative analysis and quantitative simulations and testing of PV prosumer concepts in eight different EU countries, with the overall objective to gain better understanding of those factors that can potentially enable or hinder the process of consumers becoming PV prosumers in economically viable and system-friendly manner.

This report looks at the PV prosumers concepts and their implications for electricity grid system and its actors in Belgium. The so-called “grid actors” include the most relevant stakeholders such as regulatory bodies, Distribution System Operators (DSOs), Transmission System Operators (TSOs), electricity commercialisation companies, energy service companies (ESCOs), energy communities, consumers associations, aggregators, etc. The emergence of prosumers and energy communities proposes new challenges in terms of technical requirements for the network system and its management, changes in business models, and regulatory challenges to set the optimal framework conditions. The report presents the key results of the simulation and testing of several prosumer concepts conceived in the project in Belgium as well as stakeholder views and perceptions discussed at the PVP4Grid workshop organised in Brussels in October 2019.

The report is structured as follows:

- The first chapter describes the grid system and its actors providing a snapshot of the current landscape in Belgium. Then a summary of the new EU regulatory framework is provided.
- The second chapter presents the key results and conclusions of the quantitative simulation and testing of PVP4Grid concepts in Belgium
- The third chapter collects the key findings of the workshop, summarising the stakeholder views on PVP4Grid concepts, as well as the related benefits and challenges.

1 INTRODUCTION

1.1 Structure of the electricity system in Belgium

The Belgian electricity landscape is based on a liberalized market with separation between

- **Producers**: They can be private and/or organised in cooperatives,
- **Electricity suppliers**: They have to source a portion of their electricity supplies from renewable energies (RPS system).
- **Traders**: Electricity suppliers who are not producers buy their energy from a producer or on the power markets.
- **Balance responsible**: There must be a constant balance between the electricity production and the consumption of electricity. This is the responsibility of the Access Responsible Party. Imbalances can even result in power outages.
- **Transmission Grid Operator (TSO)**: ELIA transmits energy from the transmission grid and from abroad to the distribution network
- **Distribution grid operators (DSO)**: There are 24 DSO in Belgium (11 in Flanders, 12 in Wallonia and 1 in Brussels manage). They develop and maintain the electricity distribution network for a specific territory and transmit, at the supplier's request, the energy to the end users. They provide new connections to the network and are responsible for reading your electricity.

  The first driver of regional differences is caused by so-called regional public service obligations that are a consequence of the grid connection levels. The regions can impose public service obligations on grid operators below or equal to 70 kV located on their territory (which includes both profiles). The second regional impact within Belgium is caused by the certificate schemes that stem from the regional competence in terms of renewable energy obligations on their territory. Flanders, Wallonia and the Brussels Capital Region each impose their own green certificate scheme on all electricity consumers within their region (both profiles under review).
- **Regulators**: They monitor and regulate the liberalised energy market. In Belgium there is one federal regulator, the Commission for Electricity and Gas Regulation (CREG), and three regional regulators:
  - VREG in Flanders.
  - CWaPe in Wallonia
  - Brugel in Brussels

1.2 The new EU Regulatory Framework for Self-Consumption and its Grid related Provisions

A recently adopted new set of EU rules – the so-called "Clean Energy for All Europeans" Package - is aiming to further develop one of the EU's major long term policy initiatives, namely the EU Energy Union.

Major objectives of this Union include, among others, to place renewable energy and energy efficiency into the centre of a new internal energy market and put citizens at the core of the Energy Union. It includes European-wide targets, inter alias, to increase the share of renewables in the EU energy mix to 32% by 2030.

The new framework shall enable citizens to actively participate on a level playing field across the market and to benefit from Europe's energy transition. It aims at empowering and protecting consumers through better information on energy consumption and costs and helps issuing a tighter safety net to addresses energy poverty and vulnerable consumers. In addition, energy labels and eco-design measures are directed to increase cost savings and energy-efficient behaviour. Also, consumers are given more choices in their homes, making it easier to play a more active role and engage as self-consumers – or "prosumers" - in electricity markets, by investing in renewable energy, most obviously solar panels, and then consume, store or sell the energy they produce, and benefit from functioning and organized electricity markets.

The necessity to further decarbonise the world's economies to counter climate change and the ambition to make Europe become the first climate-neutral continent should be further endorsed by what the incoming President of the next European Commission, Ursula von der Leyen, chose to call the "European Green Deal" – a set of new policy initiatives announced for the new legislation period 2019 to 2024 "to reduce emissions further and faster, and by at least 50% for 2030".

In parallel, each EU Member State must transpose the new EU rules into national law and reflect them in their national energy and climate plans.

Such an ambitious trajectory will need citizens and cooperatives to play an increased role in the take-up of renewables through self-consumption. To give support to the upcoming policy-making in this respect, the PVP4Grid project results and recommendations can be used to address and reduce barriers beyond existing regulatory frameworks across the EU.

The new EU Regulatory Framework for Self-Consumption

Although self-consumption is not a new concept, and individual self-consumers are relatively widespread across Europe, the EU now obliges its Member States to adopt enabling legislative frameworks in this respect until the end of 2019 – and demonstrates its vision that consumers shall participate in energy markets as equals among all market players. By introducing new provisions and its corresponding definitions, the EU for the first time formally recognises self-consumers, as “renewable self-consumers” and “active customers”, entitled to generate, store and consume electricity from *renewable* sources but also to carry out activities beyond the self-consumption, such as the participation in flexibility or energy efficiency schemes. Hence electricity, produced either individually or collectively, can be fed into the grids and in return make self-consumers receive remuneration that reflects market value. Nevertheless, this is not supposed to represent one’s primary commercial or professional activity. Electricity behind the meter is not being charged, although exemptions are foreseen for installation larger than 30 kW, for electricity that benefits from support schemes, or if there’s system risks resulting from increasing amounts of the electricity fed into the grid (from 2026 onwards). Such active participation in energy markets is further enhanced by facilitating power-purchase agreements, peer-to-peer trading and demand response schemes.

Furthermore, the new provisions aim at tackling barriers related to over-burdensome bureaucracy by preventing consumers from being subject to disproportionate technical and administrative requirements and procedures. For instance, self-consumers owning energy storage facilities have the right to a grid connection within reasonable time.

The Grid related Provisions

From a macro-economic perspective, the most pressing challenge results from integrating renewables into the electricity networks, and in particular at distribution level where more than 90% of RES are connected. The overall system costs need to be allocated among all network users while striking a balance for pursuing the two overarching – and potentially conflicting - principles of sustainability and affordability. Sustainable, because incentivising active customers and renewable self-consumers (as well as consumer engagement in other forms, such as citizens’ and renewable energy communities) increases the RES share in the EU’s energy mix and contributes to achieving the EU’s decarbonisation targets. And affordable, because most of Europe’s network costs are still socialised among all system users and paid in form of network tariffs to ensure the network operators' revenue stream. When now an increasing number of consumers gain a higher energy autonomy and in consequence contribute less to the network and the overall system costs - while in most cases remaining connected to the distribution networks for times without sun or wind. The "passive" consumers or those without means or access to renewable self-consumption will need to afford a higher share of the system cost and might face increasing energy bills. This is the case in Wallonia but not in Flanders and Brussels. In Flanders, a prosumer tariff has been put in place to avoid this lack of revenues for the network operators and the compensation principle will be phased out starting in 2021. In Brussels, they already suppressed the compensation principle on the grid tariffs. Prosumers have to pay the grid tariff on all their energy they purchase from the grid.

The new EU rules acknowledge and address the need to outbalance this conflict of interests:

- Network charges need to be cost-reflective and contribute to the overall cost sharing of the system, and account separately for electricity consumed from the grid and electricity fed into the grid, phasing out net metering schemes beyond 2023, to make sure that self-consumers pay the full cost of service to use the grid and do not shift their share of the costs onto customers without renewable self-consumption.
- Principles for network charges and tariffs - such as for connecting consumers to the networks – according to which citizens shall not be discouraged from becoming self-consumers. Also, distribution tariffs may be differentiated, based on the system users' consumption or generation profiles.
- Active customers are financially responsible for the imbalances they cause in the electricity system but can delegate their balancing responsibility to market actors offering such services (so-called "aggregators"). Regarding demand response, consumers have to pay a compensation to other market participants or their balancing responsible party that are directly affected by their demand response activity.

Many of the new provisions in this respect are kept at rather general level, as the cost allocation and financing of accessing and using energy networks differ to large extent across the EU. Much depends on how Member States will proceed and transpose the new EU rules into national legislation, while more legal clarifications are expected to be defined in a Network Code on demand response, including aggregation and energy storage - which is likely to further develop also the framework for active customers and renewable self-consumers. Network Codes are legally binding European Commission implementing regulations to govern all cross-border electricity market transactions and system operations.

From the perspective of the electricity network, the increasing decentralisation of Europe's energy system has a major impact on how to operate networks in an affordable, sustainable and secure way. Large shares of RES, including electricity produced by self-consumers, are connected at medium and low voltage level and integrated by the distribution system operator (DSO) into the networks. Therefore, the EU has assigned new roles and responsibilities to DSOs who in their function as regulated monopolistic entities (there is no parallel electricity grids, for good reasons) shall become "neutral market facilitators" and will need to carry out more active system management, but without interfering in existing and functioning markets. While not explicitly referring to active customers and renewable self-consumers, this is reflected in the new EU regulatory framework for DSOs and designed to incentivise the further development of "smart, flexible and digitalised" networks - a prerequisite for connecting and integrating self-consumption. This entails, in particular for intermittent electricity, the use of flexibility for shifting loads and matching generation and demand (electricity networks must be in balance at all times), access to storage facilities, rules for congestion management (in times with lots of sun or wind), data exchange and management models, the further roll-out of smart meters and a better cooperation between Transmission System Operators (TSOs, operating high voltage and long distance networks) and DSOs, as well as the interaction with market parties.

All in all, with the new EU framework on self-consumption, the principles on network charges and tariffs, as well as for the new rules for the operation of electricity distribution networks, the EU is trying to establish a fair balance between customer and the electricity system needs – which the Member States will now need to reflect when implementing the "Clean Energy for All Europeans" Package into national legislation.

2 KEY IMPLICATIONS OF PVP4GRID CONCEPT TO GRID SYSTEM

What are the economic impacts of collective self-consumption and energy community models on the electricity grid and the entire network?

To answer this apparently simple question, the "PV-Prosumers4Grid" project conducted a detailed study, spread to eight European countries including Belgium, using both computer simulations (2.1) and real-world data (0).

The main results of this study, which can be downloaded from the website www.pvp4grid.eu, are given in the following paragraphs. The reader is therefore invited to refer to this study for more details on the calculation assumptions and their results.

2.1 Simulations

2.1.1 Hypothesis

PVP4Grid consortium has evaluated the theoretical advantages of sharing energy produced by photovoltaic systems for two configurations: A single building with different apartments and a commercial area (group 2) and European village: multiple houses including group 2 and commercial buildings (Group 3).

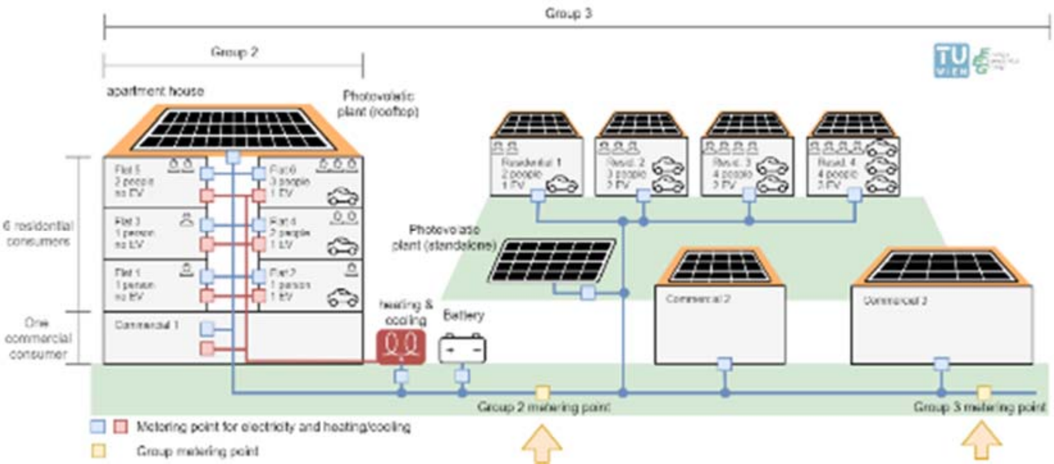

Figure 1 : Schematic of group 2 and 3 with group metering points

3 scenarios have been considered: a scenario without RES (*Grid consumption*), a scenario with RES (*No community) and a scenario with RES and community.*

The community approach considers all loads aggregated at the group metering points. If considering only group 2 then the group 2 metering point is relevant. For the evaluation of group 3, only the group 3 metering point is considered. For clarification, the community metering points are not necessarily physical metering points but could be the aggregation of all individual upstream metering points.

Community scenario	Metering point	Investment options	Energy sharing
Grid consumption	Individual metering (per household)	None	No
No community	Individual metering (per household)	PV and BESS	No
Community	Group metering	PV and BESS	Yes

Table 1: Overview of the community scenarios

Besides the community scenarios we define two **demand scenarios** to reflect the effect of sector coupling in future. The scenario with low consumption is called *baseline scenario*. With considering a “normal” electricity consumption we define that all heat for floor heating and hot water is generated fossil and is not considered in the electricity consumption. Since cooling is widely used in southern Europe, we consider for all countries an individual cooling load within the electricity consumption. The *future scenario* consists of all loads in the baseline scenario, but additional heat is distributed by heat pumps and electric vehicles (EV’s) are considered. Therefore, the electricity consumption of the *future scenario* is much higher due to sector coupling.

Demand scenario	Floor heat & hot water	Individual Transportation
Baseline	Fossil (not considered in the model)	Fossil (not considered in the model)
Future	Electric Heat-Pumps	Electric Vehicles

Table 2 : Overview of the demand scenarios

Energy tariffs:

While no costs apply for exchanging energy within Group 2 because there is no use of the public grid outside the building, the model assumes a reduced electricity price also for Group 3 because only the local BT grid is used.

Energy source	BE
Electricity exchanged inside Group 2 [€/kWh]	-
Electricity exchanged inside Group 3 [€/kWh]	0.098
Electricity purchased from the outside [€/kWh]	0.250
Excess Electricity [€/kWh]	0.045

Table 3 : Electricity prices (€/kWh)

2.1.2 Simulations of group 2 (building with multiple apartments)

The most interesting results, for both Group 2 and Group 3, are the economic results. In particular, it is interesting to see how the total costs, which result from the sum of the investment costs, the cost of purchasing electricity from the grid (grid procurement), the annual fixed costs, and revenues from the sales of exceeding electricity change in the different scenarios.

The results are shown in the following two graphs: Figure 2 shows the absolute variation of the total costs in the different scenarios, while Figure 3 shows the variation of the total costs, but relatively, taking as a reference the scenario "network" electrical.

Total costs = Investments + grid procurement (cost for electricity purchased from the grid) + Annual fixed (fixed cost of the electricity bill) + revenues (from the excess electricity selling)

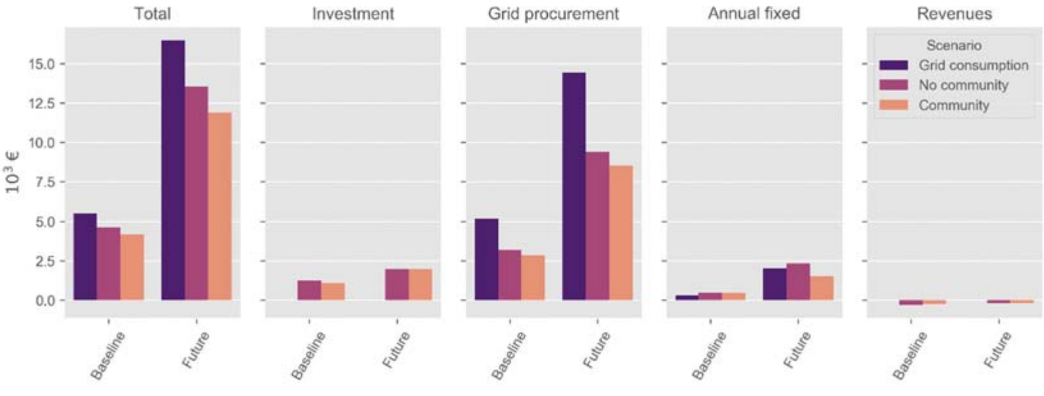

Figure 2 : Composition of total costs in Belgium for group 2

Figure 2 shows clearly show for Belgium, but also for the other countries included in the study, a reduction of the total costs if you go from the scenario with only the electricity grid to the two "photovoltaic" scenarios and, in particular, to the "Community" scenario, where it is possible to share the energy produced on the roof of the building where the end consumers reside. It's even more clear in the future scenario.

Figure 3 shows the same results in the other countries but in relative savings of the two "photovoltaic" scenarios compared to the grid procurement scenario.

In general, in baseline or future scenario, the interest of a community is around 10% higher than a no community approach. As the full load hours of solar PV are higher in the southern target countries (i.e., Italy, Spain, and Portugal), savings are higher compared to the other target countries. For France and Austria, price of electricity is cheaper so, the global interest of investing in PV is lower.

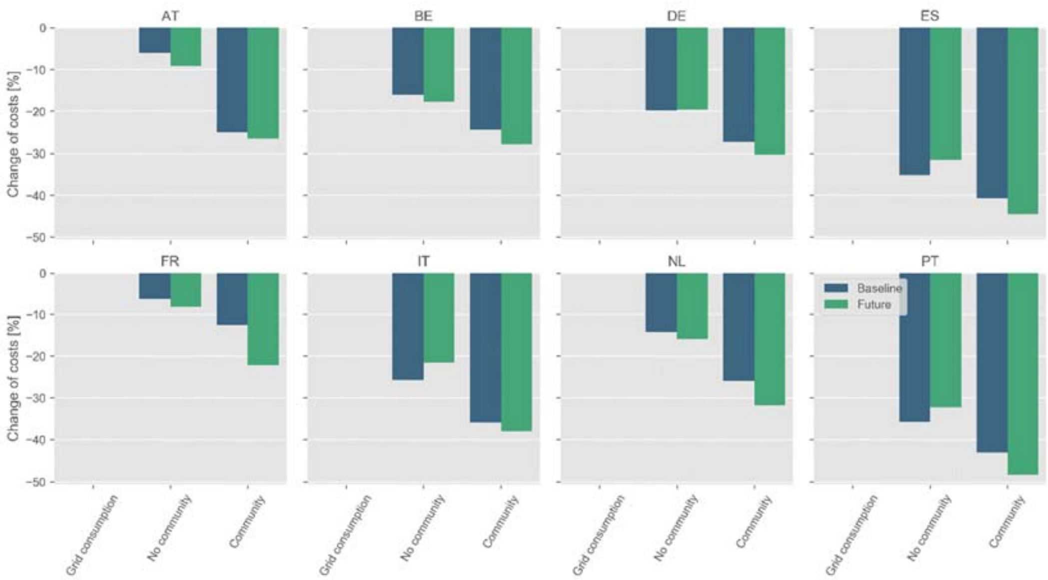

Figure 3 : Comparison with other countries (group 2)

The results show also two other important elements for group 2:

- The investment decisions into solar PV show that most of the target countries invest up to the maximum available generation in the energy community approach, restricted by available rooftop area.

- Most notable is the fact that the implementation of energy communities decreases the need for storages that is already very low in that configuration. This results from the fact that energy is being sold to other consumers rather than storing it.

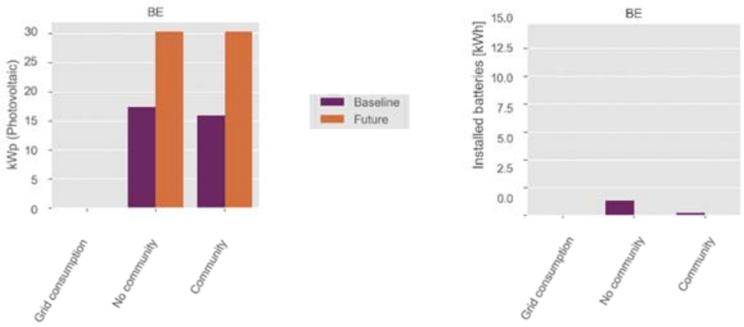

Figure 4 : Investments into PV and batteries for Belgium (group 2)

In terms of peak load and peak feed-in, the Figure 5 includes the three scenarios and demand scenarios and shows us that the community concept decreases slightly the maximum positive residual load and the negative peaks. As stated previously, reduced peaks occur on the common metering point and not for the energy flows between members.

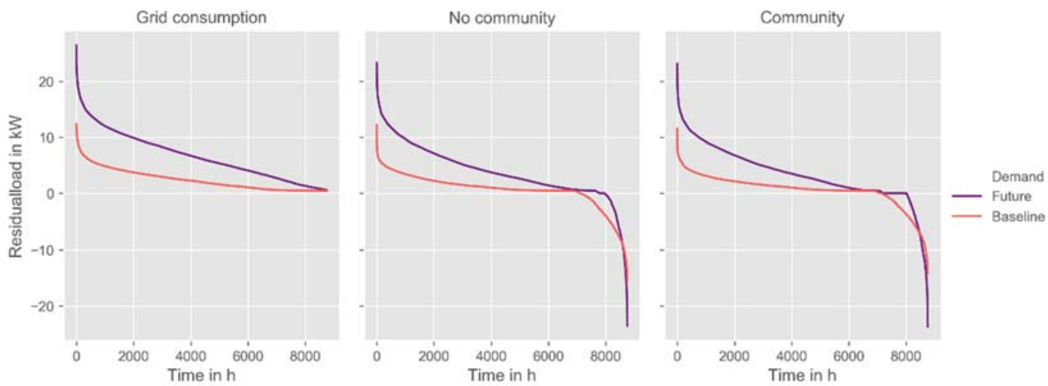

Figure 5 : Sorted residual load for Belgium (Group 2)

2.1.3 Simulations of group 3 (Energy Community)

The results for the European Village are also interesting. They show the same trends for the investments than in group 2 with two main differences :

- A higher number of consumers, i.e., higher total energy demand but flexibility as well.
- More local resources available, meaning that investments are now not only limited to the roof area.

Both arguments support the economies of scale, which exist for solar PV as well.

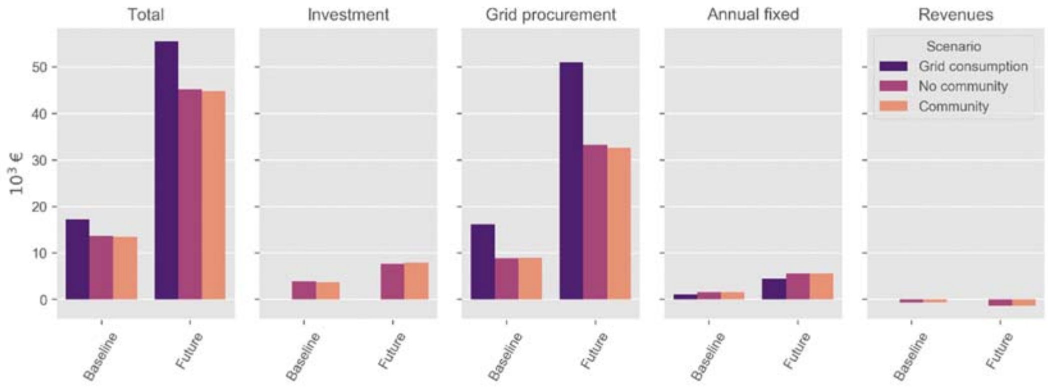

Figure 6 : Composition of total costs in Belgium for group 3

In the group 3 approach, the simulations do not show a significant cost reduction (Figure 6) between the “No community” and the “community” approach both in baseline and future scenario. And this trend is similar into all the countries analysed (Figure 7)

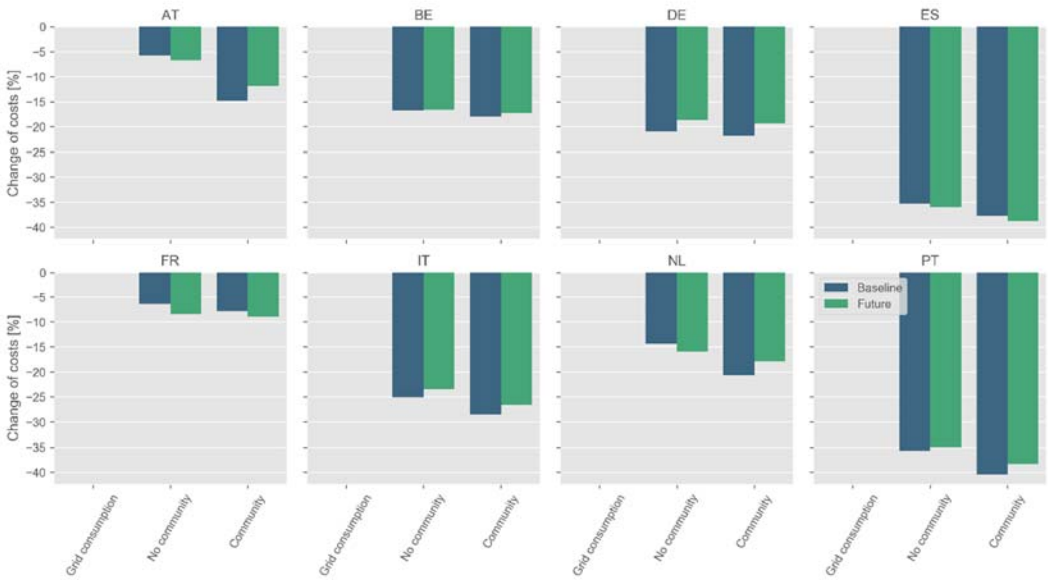

Figure 7 : Comparison with other countries (group 3)

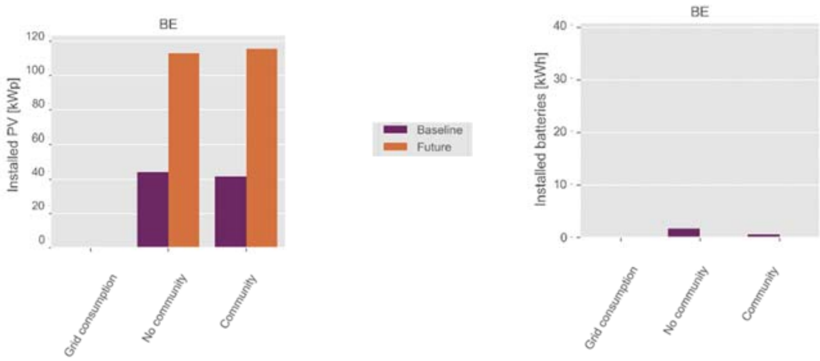

Figure 8: Investments into PV and batteries Belgium (Group 3)

In terms of installed capacity, the PV investments are more than doubled in the future scenario. No real business case for batteries in all the scenario's tested.

In terms of peak load and peak feed-in, the Figure 10Figure 5 shows the same trends as in the Group 2. The energy community approach reduces the peek feed-in. In future scenario, without community approach, the peak-fin in is very important and could become problematic for the net.

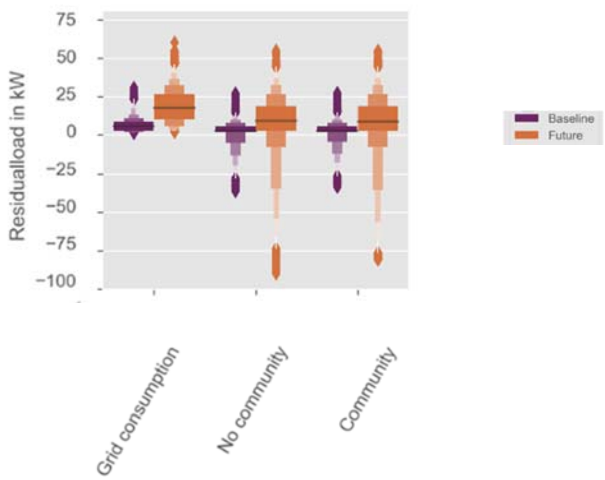

Figure 9 :Boxenplot of the residual load for Belgium (Group 3)

Finally, a sensitivity of the grid tariff has been conducted by the TU Wien for the 8 target countries. Therefore, they variate the price of peak-power consumption from 0 to 60 €/kW

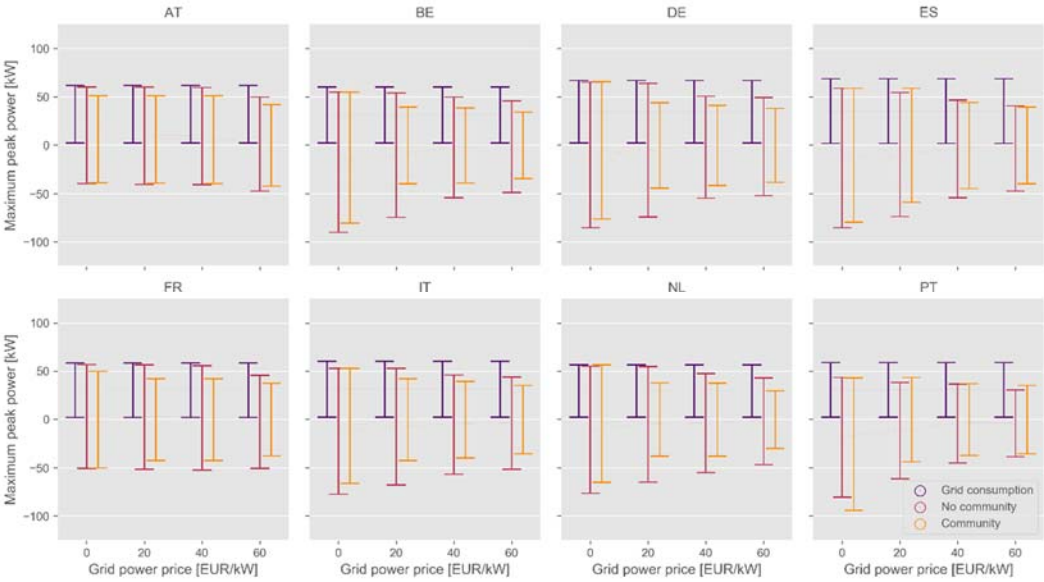

Figure 10: Peak consumption and feed-in as result of the sensitivity analysis

Figure 10 shows peak load and generation (of the residual load) of all target countries. While the y-axis, includes the variation of the power price (from 0 to 60 €/kW), are the plotted value the results of the residual load for each scenario. The results show that power pricing reduces the peaks in both directions already with a small tariff of 20 €/kW especially in a community approach. Still, there are countries with a better ability in reducing peaks than others. Mostly this depends on the generation factor (i.e., full load hours) of solar PV and the correlation of load and generation.

2.1.4 Conclusion of the Simulations

This theoretical simulation shows us different elements for Belgium:

- In any case, it's interesting for the end-user to install PV. It will reduce his electricity bill.
- The community approach (Group 3), even with a strong reduced price for the energy exchanged inside the community, has not a big financial advantage compared to the individual approach.
- The community approach (Group 3) has the potential to reduce the peak load which is positive for the grid. This peak load could be reduced with an adapted tariff.

2.2 Tests

Next to the theoretical calculation, tests were made based on real data. TUW considered 30 Belgium households, where 15 are equipped with PV. The selected consumers and prosumers have a wide variation in annual consumption and PV electricity production. The generation-consumption-ratio of the prosumers varies from 40 % to 200 % which indicates that some PV systems are undersized while others are oversized.

For each prosumer, the potential of the value of the participation in an energy community is the difference between procurement prices and feed-in prices for the excess energy. For each consumer, it is the difference between procurement prices and feed-in prices for the available excess energy.

In this analysis, the electricity costs for all households are evaluated in the **Baseline** scenario. Further, all consumers have the opportunity in investing in PV and all prosumers can extend their existing PV systems in the **PV expansion** scenario. The community approach evaluates the costs for all households without investing into PV in the **Community** scenario and as well with PV investments in the **Community with PV expansion** scenario.

It's important to add that the annual net metering (so called "compensation") scheme wasn't considered as support scheme for the prosumers. The tests are done in a self-consumption scenario. (which will be applied in Brussels in 2020 and in Flanders in 2021).

2.2.1 Results

In the base baseline scenario, the total revenues for feed-in is evaluated at 1980 € for all prosumers (remuneration is based on the time-dependent wholesale market price). If the prosumers would sell the energy within the community, they could maximum charge the procurement price of 0.246 €/kWh which leads to a potential of 12669 €. In reality, the revenue for selling energy within a community would lie between those 2 numbers since also consumers should benefit. The value of an energy community where the selection of 15 prosumers share their excess energy is maximum 10689 €.

The four cases and the composition of the costs are depictured in Figure 11.

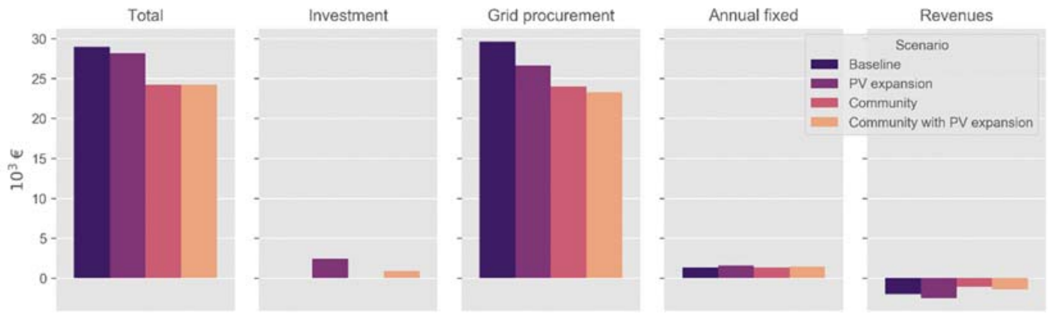

Figure 11: Composition of total costs for Belgium test site

The highest costs occur in the **Baseline** scenario. In the **PV expansion** scenario, it is profitable for 9 out of 15 consumers to invest into 3,1 kWp of PV (28 kW in total) each but an PV expansion is not profitable for the prosumers which have already a PV system. The costs can be reduced by 3 %. The highest cost-reduction with another 14 % occurs when building an energy community (**Community** scenario). PV investments for the community are possible in **Community with PV expansion**. It's interesting to notice that this scenario leads to a smaller extra installed capacity. The community invests into 12 kWp of PV but the further cost reduction is minimal.

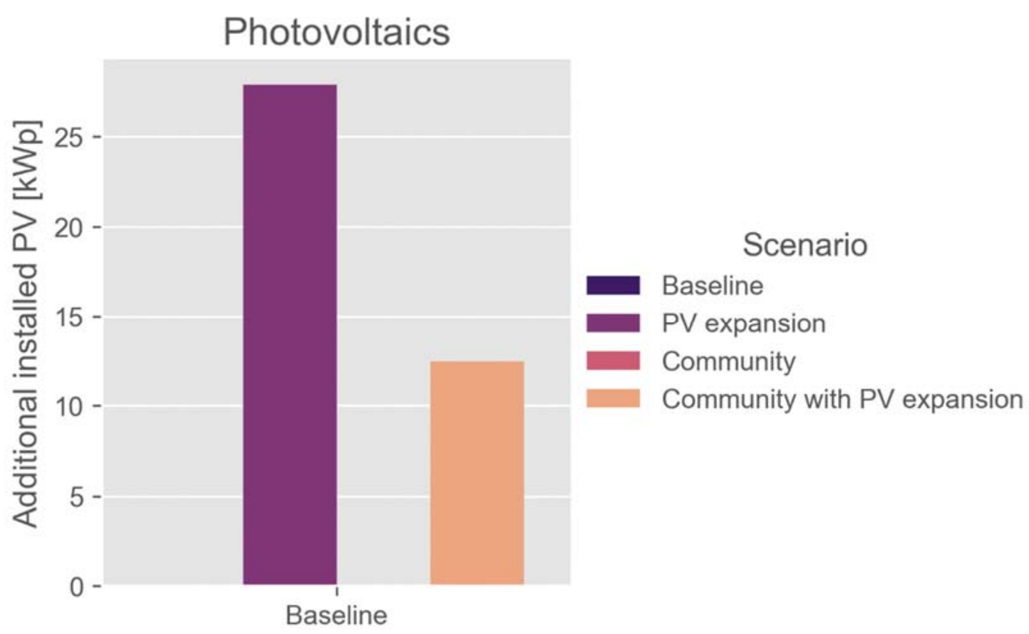

Figure 12: Installed PV for individual investments (PV expansion) and the community approach

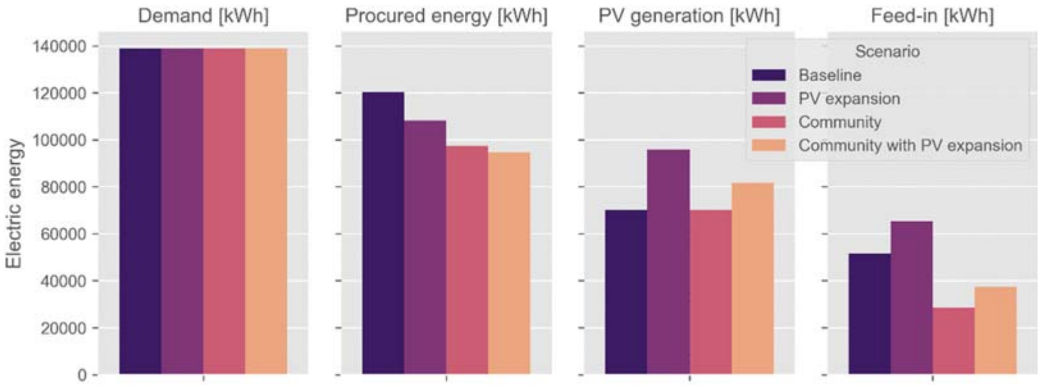

Figure 13: Energy flows for Belgium test site

Figure 13 shows the energy flows for the 30 consumers and prosumers. The annual demand of 140 MWh stays constant but the procured energy decreases when investing into PV or building an energy community with prosumers. Feed-in is obviously lower in a community approach.

2.2.2 Conclusion of the tests

In this test case, it is very profitable in terms of total investments on 25 years to connect prosumers and consumers in an energy community. When some prosumers have an oversized PV system (if we compare annual production and consumption) they can benefit from higher prices than the wholesale market price when joining an energy community. Likewise, consumers benefit from lower prices. From the 15 prosumers it was only profitable for 9 of them to invest into PV, while the other 6 have a to low energy consumption. While not everyone has the opportunity to build a PV system due to building restriction and so the supply from excess PV energy can be merged with the individual demand in an energy community. The benefit of joining an energy community depends mainly on each energy consumption, production, the participants of the community (consumers or prosumers) and additional charges and fees.

3 KEY BENEFITS AND CHALLENGES FROM THE PERSPECTIVE OF THE GRID SYSTEM

The belgian DSOs deal with PV prosumers since more than 10 years reaching today one of the highest penetration rate in the world : more than 10% of the households have PV. It’s quite unique in Europe.

The development of energy communities is a new chance for the DSOs to do a step forward into the energy transition, but it comes with challenges and benefits. These are the main elements highlighted during the national workshop organised in October 2019.

3.1 Administrative & Legal aspects

The 3 Regions of Belgium are evolving at different speed in terms of legislation around energy communities. Since end 2018, Wallonia has a legislation and is working on application decrees. The other two regions only allow pilot projects until now.

The legislative framework should be simple and evolutive.

- *Simple* because creating the energy community, bringing people together is already a difficult challenge. The extra layer of administrative aspects should be reduced to its minimum in order to facilitate their development.
- *Evolutive* because it must consider the main factors that influence the financial feasibility of such projects: the electricity tariffs. The actual discussions about the tariff structures must be considered. As the two legislations are evolving in parallel, there is a high risk of developing a support for EC that could lose all logic if the tariff structure changes.

3.2 Technical aspects

All parties present during workshop agreed that the roll-out of smart-meters is an essential precondition to allow the operator to follow the energy flows inside the EC.

It will allow the DSO to develop a tool that can split the energy between the different participants of an EC.

3.3 Financial aspects

To promote the development of ECs, as recommended by the European Commission, financial attractiveness needs to be guaranteed. Different ways to achieve it:

- Incentive per kWh self-consumed inside the EC.
- Reduction of the grid fee. This has also a physical sense since the use of the net is limited if electricity is used inside the EC.
  SIBELGA for instance is analysing 3 tariffs reductions linked to the area of the EC:
  - Tarif A: In the same building: maximal reduction of grid fee. No transport fee
    Tarif B: Under the MT-BT transformation post: smaller reduction of grid fee, No transport fee
  - Tarif C: Under the HT-MT transformation post: only =o transport fee
- Reduction of taxes: We could also imagine reducing (temporary or not) other parts of the electricity bill like the regional fee, Federal VAT, etc.

All these supports forms raise other questions like the duration of the support, the budget (for incentives) or the losses of incomes (for the reductions).

Next to these advantages, an extra charge for DSOs related to the management of these ECs (management of participants, split key, etc.) could be taken into account. Two ways to do it:

- Included an extra charge into the grid cost per kWh for the electricity self-consumed inside the EC
- An extra annual fixed fee for EC participants or for the EC community.