

GUIDE PROSUMERISM



EFFECT4buildings

Investments in energy efficiency are not currently happening at the rate needed, hindered by barriers such as high upfront costs, lack of access to finance, high perceived risk, lack of trust in new technologies, competing investment priorities, lack of knowledge, awareness and personal resources, and split incentives. Many of these barriers can be overcome, at least significant part, with well-designed financial tools and instruments.

The Interreg Baltic Sea Region Program 2014-2020 project EFFECT4buildings is providing building owners and managers with a set of financial tools and instruments to support the implementation of more energy efficiency measures, developed, and improved in real cases.

The main target group is building managers in charge of public or privately owned building portfolio.

The nine tools are:

- Convincing Decision makers
- Financial calculations
- Bundling
- Funding
- Energy Performance Contracting
- Multi Service Contracting
- Green Lease Contracting
- Prosumerism

EFFECT4buildings was implemented from 2017 to 2020 with the support from the Interreg Baltic Sea Region Programme 2014-2020. There were seven partner countries – Denmark, Estonia, Finland, Latvia, Norway, Poland, Sweden.

The project was also a part of the implementation of the EU Strategy for the Baltic Sea Region (EUSBSR), being a flagship project under policy area Energy and the horizontal action Sustainable development. Flagship projects demonstrate the progress of the EUSBSR and serve as pilot examples for desired change.

The full toolbox can be found on project webpage: www.effect4buildings.se

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PROSUMERISM

Prosumerism targets a group of energy consumers that not only consume energy but also produce energy and can give back the surplus to the grid or other energy consumers. There are many reasons for becoming a prosumer, both economic (reduction of electricity bills and gaining profit) and environmental.

This guide helps building managers to with deeper insights in steps for learn how to become a prosumer, by (i) introducing legislation frameworks regarding prosumerism in the EU and each participating country; (ii) tackling PV market trends and costs; and (iii) discussing future development and barriers, using case studies and lessons learned from them. Finally, it provides the reader with a step-by-step instruction on how to implement prosumerism, using solutions the EFFECT4buildings tool provides, with an example from Latvia.

Let's understand the problem

Access to energy and its production has proven to be a key aspect of modern life. Until recently, most of energy in the world was produced by means of combustion, the only exception being hydroelectric power. However, recent technological developments have made it possible to obtain energy in cleaner forms, from sources such as sun and wind energy, which are free and inexhaustible and whose costs arise only from the installation of the equipment needed for producing it.

Energy prosumer is an energy consumer that produces energy. Prosumer buildings are becoming increasingly common (e.g., nearly zero-energy buildings and plus-energy buildings). Buildings that can become a net-producer of energy create new technological, juridical and socioeconomic challenges for public authorities as producers, distributors and consumers in smart grid systems.

Energy pricing in a two-way distributed energy trading usually ends up with prosumers selling energy when it is cheap and buying it when it is expensive. With energy-brokering-related pricing and a tool supporting selection of the optimal solution, electrical equipment can be optimized from an energy perspective and lower high peak-loads. Investments in systems for energy exchange and optimal consumption can lower the costs

for energy and help finance other savings. Negotiations on the energy price tariffs between the building owner and the energy grid owner via related protocols are needed to help financing investments in energy production. Better management of energy loads results in reduced primary energy consumption and costs. This creates new business opportunities for building owners and facility managers.

The calculations of a prosumer value are explicitly impacted by regulatory policy in each country. Thus, to take the right financial decision, the project's target group needs detailed knowledge in order to take the right financial decision: on

- how to become a prosumer of energy; e.g. price regimes, legal issues, contracting;
- when to invest in production capacity, and when to lease or co-own it;
- how to include socioeconomic benefits; and
- how to negotiate contracts to benefit from energy investments.

The joint focus of buildings as active partners in the energy system goes hand-in-hand with technological advancements in the area. For example, the cost of building integrated photovoltaics (BIPV) has been greatly reduced; recent advances in heat atlases have improved the planning basis in relation to low-temperature district heating systems.

Solution

Prosumerism guidelines for building managers show how to tailor energy production/consumption solution; how to manage energy loads to develop smart prosumer-friendly energy management; and how to take into account relevant laws, tax situation, and regulations at a local/regional level, to help inexperienced prosumers navigate through administrative hurdles to complete installation, start energy production, and share energy with the municipality. Prosumerism aims to stimulate access to the benefits of producing renewable energy, to make real estate management more efficient, and even to reduce energy poverty.

The first step in tackling this problem is to understand EU and country-specific laws and regulations regarding prosumerism. This is what the first section of the guideline helps to achieve, in additional summarising information on support schemes, support

tools, and guidelines for each project country. The main strategy of the existing EU energy policy is to place consumers at the core and encourage them to take the ownership of energy transition. They are expected to actively participate in the market, at the same time fundamentally transforming the energy system of Europe. Regarding each member state, currently none of them has specific legislation that would fully regulate the prosumer issue. Instead, most countries have adjusted existing regulations and legislation, regulating either the electricity sector or the use of renewable energy sources, or both, to include and define prosumers, and to regulate various related aspects.

Currently, governments use several methods to support, incentivise and remunerate the generation of electricity from renewable resources. There are currently several methods governments use to support,

STEP 1

Understanding country specific laws, regulations and support schemes regarding prosumerism

STEP 2

Understanding available tools and guidelines that assist prosumers

STEP 3

Understanding the trends and current situation of the PV market

STEP 4

Understanding the main barriers from experiences from existing projects

STEP 5

Understanding the implementation of a solar project

STEP 6

Understanding the application of the EFFECT4buildings instrument

FIGURE 1. PROSUMERISM GUIDELINES' CONTENTS.



incentivize and remunerate the generation of electricity from various renewable resources. This includes quota system, tenders, tax regulations, subsidies, loans and grants. Many tools and guidelines also exist to assist prosumers, including CAAD, visualization and simulation tools.

The next step is understanding the trends and current situation of the PV market. Therefore, the next section gives insight into global PV market trends and costs, including installed capacity trends, model cost trends, PV technology, and its efficiency trends. The installed PV capacity has witnessed rapid growth in the last decade. Europe has the second highest level of installed capacity, with its annual new capacity

additions decreasing since 2011. Despite all that, in countries participating in this project less than 1% of produced energy comes from solar power. Even though installation costs of PV systems differ between and within regions, PV module prices have been rapidly declining in the last 10 years.

To motivate PV system implementation, it is necessary to understand its main barriers. Since experiences from related projects and implementations can help, the guidelines include them. The next step is to understand the implementation process itself. The guidelines describe four steps on how to implement prosumerism:

STEP 1 Planning of the installation

- Access the potential of PV in the desired site
- Determine the consumption profile and the power of the PV installation to cover the energy demand
- Access rooftop or wall orientation and estimate sunlight availability
- Determine appropriate system size and components
- Calculate necessary investments and payback, assess the overall profitability of the installation
- Prepare and certify of the project of the installation

STEP 2 Understanding the main barriers from experiences from existing projects

STEP 3 Understanding the implementation of a solar project

STEP 4 Understanding the application of the EFFECT4buildings instrument

FIGURE 2. FOUR STEPS OF IMPLEMENTING PROSUMERISM

An essential part of every project is planning. For PV projects, it first of all translates to determining the overall feasibility of becoming a prosumer, which is done by assessing the consumer's energy needs and the optimal size and power of the planned PV site. First, PV potential in the desired site must be assessed using various available tools, and industry professionals can be consulted if necessary.

Then, the consumer needs to take into account the site's energy consumption, to determine the consumption profile and the power of the PV installation that would cover the energy demand; he or she can consider installing a storage unit to save energy for later usage. Then, after assessing the rooftop or wall orientation (for wall integrated systems), sunlight availability must be estimated.

This is followed by using available simulation or calculation tools, in order to determine the appropriate system size and components to achieve the necessary production of electricity. In the final step, one calculates necessary investments and payback time, and assesses the overall profitability of the installation. When the project proves to be optimal, it must be prepared and certified by a qualified technician or institution.

The EFFECT4buildings toolbox contains several financial instruments for building managers to implement energy-efficient measures. The guideline also includes a manual for the procurement of PV Systems, including general recommendations, a manual, and technical descriptions.

The Prosumerism calculation tool helps building owners:

1. To determine the optimal size of the PV system
2. To find out how much electricity can be produced from a selected area
3. To make financial calculations to identify savings, income, necessary investments, repayment time and the overall profitability of the system
4. To find out how much a storage system would improve PV systems efficiency

Results from testing and recommendations

The tool was tested in Gulbene municipality in Latvia, which plans to install a solar power plant on a local government administration building. Using this tool, Gulbene calculated the amount of electricity that the planned PV system can produce, and determined that the project would be profitable. Data gathered later using this tool will be used when making procurement.

Benefits derived from own energy production partly depend on legislation and available support mechanisms regarding prosumerism in the given country. One should thus analyse these issues, to learn the current PV market and understand how PV systems are implemented.

Combination with other tools

Prosumerism focuses more on energy production and use, it can be integrated with EPC and MSC or used individually. Municipalities may want to become prosumers and this can be incorporated with other goals. Supportive tools like funding, bundling, convincing decision makers and technical solutions are all necessary to make Prosumerism more effective.



Conclusions

Thanks to producing energy and returning the surplus to the grid or other energy consumers, prosumerism helps reduce electricity bills and become more environmentally friendly. Before deciding whether to become a prosumer, one needs to analyse the current situation in terms of legislation, laws, and support mechanisms in one's country.

Existing tools, including the EFFECT4buildings tool for prosumers, can help calculate the project's profitability. Deciding to become a prosumer, one should follow existing guidelines and instructions to implement the chosen PV system.



TOOLS

1. Guideline for Solar energy (strategic) planning
2. Guideline for Step-by-step to become a prosumerist
3. Guideline for Procurement of solar energy
- 4a. Guideline for Prosumerism calculation tool
- 4b. Prosumerism calculation tool
- 4c. Prosumerism calculation tool. Example Gulbene.
5. Prosumerism training material

FIND ALL TOOLS HERE

www.effect4buildings.se/toolbox/prosumerism



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