

Ports Energy and Carbon Savings

Output 9

Investment in IT-systems and technologies for development of a LEM platform that enables flexible renewable energy distribution in the port of IJmond



With the financial support of



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Revision history

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1. Introduction

In the context of the EU Interreg 2 seas program, Omgevingsdienst IJmond is currently participating in the Port Energy and Carbon Savings project (PECS). The task of Omgevingsdienst IJmond within this project is to set up a so called LEM platform, which aims to offer smart grid services, monitor energy use and improve the incentive to invest in renewable energy sources. The aim is to create such a platform in the port area of the IJmond which contains approximately 350-400 SMEs.

This is a report about output 9. The description of the output is as follows: *'Based on the investments and deliverables in A.3.4 this output has been realized by PP3 with technical support from PP4 and PP9.'*

A.3.4 is described as follows: *'A pilot will be conducted in order to validate the, local energy market principles described in the 'Feasibility Study' done in WP2. The main purpose of this market is to stimulate the consumption of locally generated energy by local end users, herewith stimulating self-consumption and minimizing the network investments needed to facilitate the integration of renewables on business parks. PP3 is fully responsible for this activity.'*

2. How are the requirements from the feasibility study met?

The report from D.2.1.7 described the requirements of the LEM platform in different areas. Requirements in the area of partner roles, functionality and on-necessary functionalities are described. This paragraph will explain how these requirements are met. The requirements from the feasibility study are in italics.

2.1. Partner roles needed for the project

The following roles are needed for a successful project:

- *Energy Cooperation*
- *Platform technology provider*
- *Data analytics supplier*
- *Energy Supplier*
- *Balance Responsible Party (Programma Verantwoordelijke Partij in het Nederlands)*
- *End users, at least 2 in total, at least one with Solar PV installation.*
- *Validator of the pilot*

These roles can be fulfilled by one or multiple partners.

Almost all partner roles are currently fulfilled. The energy cooperation is established by the Greenbiz foundation and has the legal form of a partnership (Dutch: Maatschap). The energy cooperation has the name 'Greenbiz energy'.

The platform technology provider is EXE, this is a subsidiary of the Dutch network operator named Liander. The platform they provide is called 'Entrnce' (<https://exe.energy/nl/onze-merken/entrnce>). The platform provides the functionality to

trade electricity on wholesale markets like the APX or ENDEX. In addition the platform also makes it possible to locally trade (buy and sell) electricity. The functionality of trading on the wholesale market is necessary, because the supply of variable renewable electricity (solar PV in our case) is not adequate all the time, for example at night. EXE is also the program responsible party.

The data analytics supplier is EDSN (energy data services Nederland; <https://www.edsn.nl/>). EDSN describes their activities as follows: 'Energie Data Services Netherlands (EDSN) works together with the regional network operators, TenneT and GTS on central market facilitation for the energy sector. Together with these parties, EDSN is developing a reliable and innovative IT infrastructure for the energy market of the future, thereby giving the energy transition and thus the sustainability of the Netherlands more space'. In practice this means EDSN provides electricity meter data from all users on the platform, which is then used to figure out the amounts of electricity available or needed per business.

Currently there is no specific of single energy supplier. The energy suppliers will be local production installation of solar electricity, which are located on the rooftop of businesses in the port area. In addition the wholesale market will provide electricity when production from solar PV installations is not adequate.

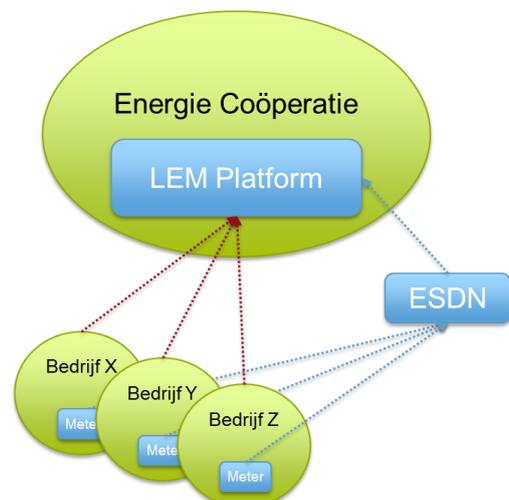
Currently there is one end user connected to the platform, and two more in the short term queue waiting to be switched on January 1st 2020. This means the requirement 'End users, at least 2 in total, at least one with Solar PV installation' is not yet met. However it will be met on the short term. In the course of 2020 more businesses will be connected. As mentioned in D.3.4.2 23 businesses are working on installing solar PV on their rooftop and 22 more are awaiting approval of their grant application. On the local consumer end, several businesses have to wait until their current energy contract expires before they can be switched on to the LEM platform.

Omgevingsdienst IJmond is the validator of the project. Its role is to check the process and make adjustments where needed.

2.2. Functional requirements of the LEM platform

The LEM platform should at least provide the following functionality:

- Collaboratively purchase energy on wholesale markets
- A local market for Solar PV, a price incentive that stimulates the consumption of locally generated renewable energy.
- Automatically process the administration, billing of energy to end users and support exchange of energy between end users.
- An energy monitoring portal for end users and for the energy cooperation
- An energy analytics portal where automatic energy advice can be generated and where end users can provide additional information of their energetic situation in order to improve the outcome of energy scans/advice.



- *Provide price forecasts to end users in order to enable manual demand response.*
- *Be future proof, so the platform can in the future be used as the basis of a smart grid.*

As mentioned under 2.1 the LEM platform is able to collaboratively purchase energy on the wholesale market by using the Entrnce platform and (smart) meter data from EDSN. A daily forecast (of the electricity demand) is made using the EDSN meter data and submitted through the Entrnce platform. A more accurate forecast means the purchased electricity will be cheaper. This is due to the responsibility to keep the electricity network in balance (production and consumption should be equal). The Entrnce platform also automatically administrates information about electricity production and consumption, therefore also automatically providing the billing process. The platform management does not actively have to handle the billing process. The bills are easily made by multiplying the electricity use (or production) with the (local) market price. A so called 'white label bill' is generated. The platform management is thereafter able to put their own logo on the bill.

Businesses that are connected to the platform are able to access their own portal, where their electricity use, renewable (solar PV) production and bills can be found. This portal can be found by login in on [this page](#) (1). The management or administrator of the platform has a so called 'admin account', which offers an overview of the aggregate electricity consumption and production through the same portal.

The LEM platform provides to functionality of trading locally produced renewable (solar) electricity. The renewably produced solar electricity does not have a higher yield when sold locally, due to the Dutch SDE+ grant that applies to the solar PV production. This is a so called 'feed in tariff' which means the producer receives a price for the electricity that is set beforehand.

The legal structure of the ESCo is a partnership (Dutch: Maatschap). This has an important role in the LEM platform being future proof. The ESCo could for example choose to apply some sort of large battery in the port area in the future. When this battery is owned or by the ESCo, it basically means the battery is owned by all partners (=businesses) that are part of the partnership. In this way it is possible to store electricity without paying taxes when the electricity is redistributed towards the businesses on a later point in time.

2.3. Nonfunctional requirements

Furthermore partners are responsible for:

- *Taking care of energy supplier and balance responsibility (BRP)*
- *The solution should work with a minimum of 2 end users*

The LEM platform already meets the first requirement, the balance responsibility is taken care of by EXE, trough the Entrnce platform. The second requirement should be met from January 1st 2020.

3. How is local production and consumption stimulated?

An important part of the description in A.3.4 is 'The main purpose of this market is to stimulate the consumption of locally generated energy by local end users(..)'. Therefore it is useful to reflect whether this purpose is met.

The main incentive to produce and use (more) renewable electricity is favourable prices per kWh. This is caused by the shortened supply chain, due to the peer-to-peer trading process. Usually all businesses in the supply chain take their profit. With the LEM platform this is not the case, there are only users, producers and a wholesale market. The cost savings per kWh are split between the user and producer. The ESCo or platform does not charge a surcharge per kWh. The same goes for the electricity that still needs to be purchased on the wholesale market. This means it is cheaper to purchase electricity on the LEM platform than from a conventional electricity supplier. It is hard to estimate beforehand how much costs could be saved, due to the fluctuating prices on the local and wholesale market. This means the cost savings will differ widely per business, as the time of electricity use will be influential. If businesses only use electricity during off peak hours, the kWh price will be lower compared to use during peak-hours. This mechanism will incentivize the off peak use of electricity, therefore postponing or even preventing investments in the electricity network.

The only costs outside the kWh price are costs for the GreenBiz foundation membership. This will cost €100 per business per year, to cover the costs of the ESCo and platform management. This is a relatively low fee, compared to the electricity costs of an average business in the Port area.

4. References

<https://exe.energy/nl/onze-merken/entrnce>

<https://www.edsn.nl/>

(1) https://login.entrnce.exe.energy/auth/realms/deal-platform/protocol/openid-connect/auth?response_type=code&redirect_uri=https%3A%2F%2Fentrnce.exe.energy%2Fcallback%3Fclient_name%3DGenericOidcClient&state=mNy-cdLq6ohEKggfwpKoxyWCg4y0rP3f8jaDXvwwj0g&client_id=entrnce-gateway&scope=openid+profile+email