Greenparc Bleiswijk - Current Energy Architecture

Greenparc is an industrial estate comprises of predominantly special logistic companies. There are 19 companies within the vicinities of Greenparc. Greenparc is situated in the Bleiswijk area which is connected to the Bleiswijk 380kV substation of Tennet. The Bleiswijk area also connected to the G4 and G6 gas connection from STEDIN, which means that there is a maximum 16 m3 / hour gas stream. Furthermore, there are connection to the

1. Greenparc Profile, Company profile and their main business activities, number of bays at the distribution centers. It determines how many electricity demand will be in the future
2. Company renewable energy initiatives
3. Current market and energy architecture in the companies

Chapter 2 The surrounding energy architecture in the Greenparc.

* Current tariff scheme on electricity and gas
* Current load and demand profile
* Current connection and surrounding activities
* Surrounding activities

Chapter 3 Literature review on the flexible energy market in the Netherlands

There are flexible market research previously conducted in the Netherlands. ECN part of TNO commissioned a report regarding the flexible energy market. We also included the Flexnet result of the report in which the horizon 2020 projects are being conducted to iinvestigate the impact of flexible network.

Furthermore there are 26 EV Charging stations all over Bleiwijk. The New Motion in Christian Huygenstraat and Jan van den Heydenstraat

## Greenparc Bleiswijk

De optimale inrichting van het electriciteitsnetwerk hangt af van de lokale context. In dit hoofdstuk beschrijven we daarom

* 1. De huidige situatie in Greenparc Bleiswijk (netwerktopologie, type afnemers, verbruiksprofielen en leveringsprofielen). Hierbij nemen we zowel elektriciteit, gas en lokale mobiliteit mee.
  2. Mogelijkheden in het voorkomen van congestie (referentie)
  3. Voorziene veranderingen als gevolg van de energietransitie (elektrificatie, uitfaseren aardgas, lokale opwek en opslag)

1. Huidige situatië in Greenparc

Greenparc ligt in het noorden van Gemeente Lansingeringland in de Zuid-Holland povince. The Greenparc energy network consists of gas and electricity connections. Greenparc lies in the STEDIN service area for Electricity and Gas. Furthermore, there are different gas connections in Greenparc bedrijfterrrein. There are 6 Other bedrijvterrien within 20 Km radius from Greenparc. With the total area reaching to 563 M2, Greenparc host 19 companies. 10 of the 19 companies in the Greenparc are sepecialised logistics companies in groenten and bloemen delivery. As a result the energie consumption in Greenparc revolve around the physical activities in the heating plan and the cooling operation in several companies. In conjunction with the heatpump and the connected heating facilities, it might be able to realise a symbiotic relation with the other companies. The 2665 post code smart meter just recently installed in the 2nd quarter of 2019. Power to Heat and Power to Mobility is going to be important in Greenparc for the variable energy supply and demand since the normal demand is going to remain low in the Greenparc especially due to increasing efficiencies of the equipments in the Greenparc companies. EV charge in Bleiswijk, €0,375 / kWh op alle Engie laadpunten in Rotterdam regio. The area especially in the south part of the Klappoderweg is subject to the gas pipe replacement by STEDIN in the near future. This give a unique opportunity to design necessary infrastructure for improving renewable energy adoption through Power-to-Heat function. Such ways it create better opportunity as well for Stedin (create a better business opportunity).

Several Demand that needs to be taken into account:

* 1. Electricity demand from the changes happen due to the transition on the mobility side from fuel to power. That means there should be a di stepwise increase changes happen. Special attention on the HVAC because there are some special logistical purpose on the park.
  2. Electricity demand from the heat pump in which the heat will be generated no more from gas connection but from the transformation of power generated by the renewable energy sources namely the solar panel installed on top of the warehouse
  3. Electriciteitopslaag is going to be the peak shaper in the demand response of the system.
  4. Water consumption is also important since there are some that handle flower logistics. Flower logistics require constant access to the water.

Is it possible in the current profile of the Greenparc. The current system relies heavily on the grid connection installed in several places of Greenparc. There are substations dividing the

Additional information needed to simulate the system in Greenparc:

1. Data demand (electricity and gas) for the companies
2. Investment profile of Royal Lemkes for their ATEPS battery system to find out how much is the cost per kWh electricity stored
3. Infrastructure development also an important thing because the cabling is not meant for carrying big load of Reactive Power

Het marktproces in het layered energy system volgt de USEF stappen: PLAN - OPERATE - SETTLE. Dit proces is op hoofdlijnen uitgewerkt. Op basis hiervan is de toepasbaarheid van blockchain getoetst. Greenparc is connected to A12 – A13 – A20 – A4.

* 1. Mogelijkheden in het voorkomen van congestie (referentie)

There are several case studies that we can draw the experiences from:

1. Enera Germany – In Collaboration with Elaad and Eneco (Using USEF) Residential Area
2. Nijmegen North – Liander (Using USEF) Residential and Commercial area
3. Hoog Dalem – STEDIN (Using USEF and LES by Jules Energy) Residential Area
4. Brooklyn – New York City

From here we can use the lesson to draw up some scenarios in which who the current system in Bleiswijk might be congested. At the moment, the system in Bleiswjik is far from being congested. Because, the renewable energy produced is concentrated in the Royal Lemkes facility and being stored in their battery system.

Furthermore three limits of electricity congestion that needs to be analyzed:

1. Thermal limit in the transmission line
2. Voltage limit in the transmission line
3. Stability limit within the transmission network