



Status-quo Assessment Report

PP4 AG Mobil-O (Belgium)

Date 08/09/2023

Rev. 1

Table of Contents

Index

1.	GENERAL DESCRIPTION OF YOUR REGION AND ITS DEMOGRAPHY	3
1.1	NEIGHBOURHOODS	3
1.2	LAND AREA BY TYPE	4
1.3	POPULATION DENSITY	4
2.	REGIONAL FACTORS CONCERNING THE THEME	5
2.1	MOBILITY	5
2.1.1	<i>Public network of transport system available in the region</i>	5
2.1.2	<i>Description and data on current private vehicles (non & electric ones) in the city/area</i>	6
2.1.3	<i>Description and data on other modes of e-mobility in the region (e.g. e-bicycles, e-taxis etc.)</i>	6
2.1.4	<i>Description and data on charging infrastructures</i>	6
2.2	ENERGY	7
2.2.1	<i>Availability of renewable energy in the region</i>	7
2.2.2	<i>Share of renewable energy source in energy production</i>	9
2.2.3	<i>Regional energy market structure (e.g. energy production, electricity grids, transport of energy, energy delivery to customers, ownership and operation)</i>	10
2.2.4	<i>Description of current state of Energy Communities</i>	10
2.3	INFRASTRUCTURES AS POTENTIAL HUBS	10
2.3.1	<i>Buildings and other premises (public)</i>	10
2.3.2	<i>Buildings and other premises (private)</i>	11
2.3.3	<i>Open areas</i>	11
3.	STAKEHOLDERS	11
4.	LEGISLATIVE AND FINANCIAL ENVIRONMENT IN SUPPORT TO RENEWABLE ENERGY INITIATIVES	13
4.1	LEGISLATION, REGULATIONS	13
4.2	FINANCIAL INCENTIVES	13
5.	S.W.O.T. ANALYSIS	14
6.	READINESS MODEL INDICATOR RESULTS	15

1. General description of your Region and its Demography

The city of Ostend is situated in the Flemish part of Belgium and is one of the ten coastal municipalities in Flanders. Ostend is, therefore, characterised as the ‘inflatable city’, due to the seasonal tourism. This has a major influence on the mobility, the use of infrastructure, public utilities (such as Energy supply and water supply), etc.



Figure 1: localisation of Ostend in Belgium (source: Vector-Map, 2023)

1.1 Neighbourhoods

The city of Ostend exists of eight neighbourhoods.

Neighbourhoods of Ostend

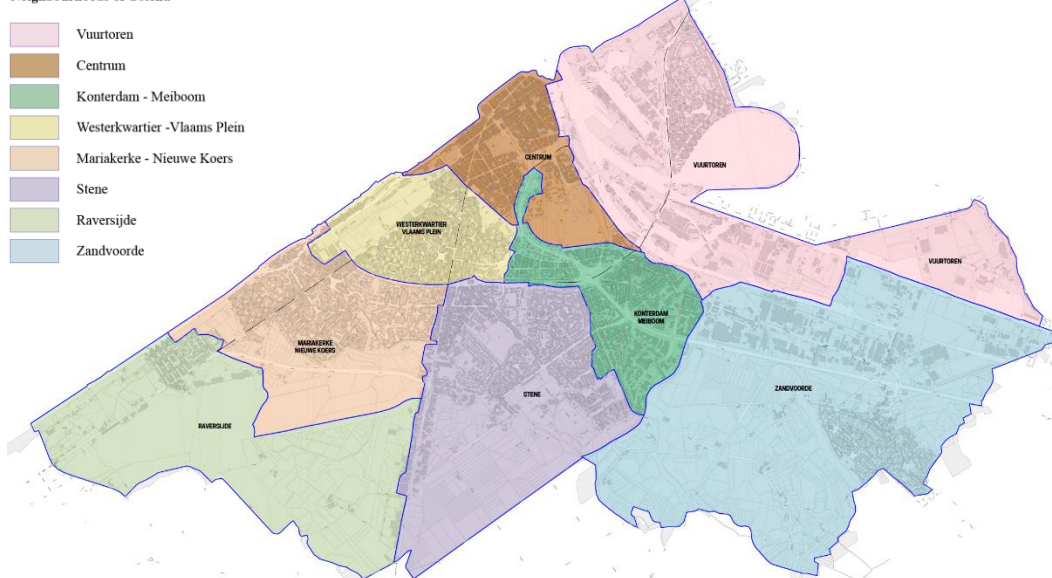


Figure 2: the eight neighbourhoods of Ostend (Source: AG Oostende, 2023)

1.2 Land area by type

The city of Ostend has different land areas by type. The province of West-Vlaanderen provides data¹ about the land occupancy for each municipality, which is 60,6 % for Ostend in 2019². The available data gives an impression of the distribution of this land occupancy across different categories. The most prominent are listed below:

- Houses & private gardens and transport infrastructure have the largest share with 13,4 % and 13,2 % of the occupied land.
- As well, 8,5 % of the occupied land is used for industrial purposes.
- Not all the occupied spaces are paved spaces, for example:
 - 11,7 % is grassland
 - 8,7 % is cropland
 - 8,6% is water
 - 6,6 % is swamp
- A last conclusion is that the International Airport Ostend – Bruges occupies as well a large amount of space in the city (with 6,1 % of the total occupied land).

The land occupancy also differs on the scale of the neighbourhood. While the neighbourhoods Konterdam – Meiboom, Mariakerke Nieuwe Koers, Stene and Westerkwartier – Vlaams Plein are mostly occupied by houses & gardens and transport infrastructure, the centre of the city has more recreative purposes. Zandvoorde, Vuurtoren and Raversijde do as well have small residential centres, but they are characterised by other categories:

- 34,5 % of the occupied land in Raversijde contains the international airport of Ostend - Bruges.
- The statistics for the Vuurtoren-neighbourhood is influenced by the large amount of water-infrastructure (26,3 %).
- Zandvoorde still has large amounts of green spaces, with 29,2 % of the occupied land by grassland and 11,0 % by cropland.

1.3 Population density

The city of Ostend has a population density³ of 1.751 inhabitants/km² in 2022. When looking at the population density by neighbourhood (see *Figure 3* on the left), it is visible that the city centre and Westerkwartier – Vlaams Plein are the most dense populated parts of the city. But as mentioned above, some neighbourhoods are characterised by other land use types: international airport (Raversijde), water (Vuurtoren), Green open spaces (Zandvoorde), etc. To be able to see where the most dense areas are situated, data from a lower scale can be analysed (statistical sectors). *Figure 3* on the right, visualises per 'statistical sector' of Ostend the population density. The city center and Westerkwartier – Vlaams plein remain the most densely populated. It's visible that a part of Vuurtoren has a high population density as well (above 10.000 inhabitants/km²) and a part with a density between 5.000-7.500 inhabitants/km², while the rest of the Vuurtoren has a low population density. This can be explained by the presence of water-, industrial- and natural infrastructure. Zandvoorde has a suburban residential area, with a low population density (2.500-7.500 inhabitants/km²), but is as well known for its industry and green open spaces. Similar for Raversijde, the low population density can be explained due to the airport and nature, with only a small residential area with a population density of 2.500-5.000 inhabitants/km².

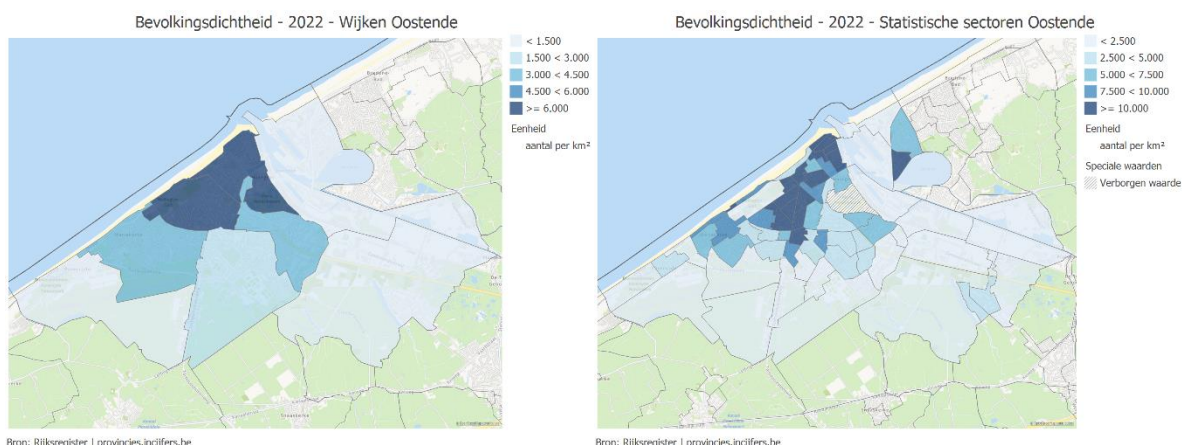


Figure 3: population density. Left: scale of the neighbourhood, right: scale of the statistical sectors (Source: Rijksregister, 2022)

¹ More information available via provincies.incijfers.be

² 2019 is the most recent year with data available

³ More information available via provincies.incijfers.be

2. Regional Factors concerning the theme

2.1 Mobility

2.1.1 Public network of transport system available in the region

The city of Ostend has a terminus train station, which is situated in the city center and profiles itself not only by its heritage value, but also because of its transit oriented development (TOD). Several parts of the train station itself are renewed, where the connection with other public transport systems like the bus and tram are optimized. At the same time the station provides a parking where people can reach the rails without being exposed to the weather. The parking doesn't only provide parking spaces for train users, but functions as city parking as well and also contains a charging station points (with two plugs). The station also provides a bicycle parking where people can store their bike / cargo bike / scooter as well as making use of shared bikes (blue bikes). Due to the proximity and the compactness of the city; amenities, the sea, etc. are all at a walkable distance.

There have been, and still are, investments in the area around the train station, like renewing the public space, improve connections for active mobility, development of residential projects, etc.



Figure 4: train station of Ostend (23/08/2023)

The train station is a stop for the tram, also known as the 'coasttram' since its line connects all the coastal municipalities with each other. Most bus lines have a stop at the station as well. The bus lines in the city connects the different parts of the city with each other, and provide a connection with the neighboring municipalities.

The public transport busses in Ostend are currently non-electrical. De Lijn, the operator of the public transport for busses and trams in Flanders, has the goal to drive emission free by 2035, by replacing the current bus fleet with electrical ones in different phases⁴. Currently some lines in Antwerp, Gent and Leuven are completely electric.



Figure 5: public transport stops and lines (Source: Geopunt, 2023)

⁴ Source: De Lijn (2023). Richting Emissievrij met onze e-bussen. <https://www.delijn.be/nl/content/e-bussen/>

In 2018 the Flemish government divided Flanders into 15 transport regions⁵, where the municipalities of each region should cooperate on a mobility plan. The transport region Ostend consist of the municipalities Bredene, De Haan, Gistel, Ichtegem, Koksijde, Middelkerke, Nieuwpoort, Ostend and Oudenburg. To increase the efficiency of the public transport network, the transport region worked out a change in the number of bus lines, by working with a core network (with the most used lines) and an additional network (to the core network). This network is currently being rolled out, but isn't yet operational everywhere in Flanders.

2.1.2 Description and data on current private vehicles (non & electric ones) in the city/area

On the first of august 2022 there were 28.548 passenger cars in Ostend⁶. Data on the number of electrical and hybrid passenger cars are available on different scale levels. As visible beneath, 1,2% of the passenger vehicles in Belgium are electric and 6,3% are hybrid. The number of electrical and hybrid cars have increased in 2022 with 75,4% and 44,9% in comparison to 2021. This indicates that the transition towards electrification has been initiated.

Type	2021	2022	%
Petrol	2.951.770	3.021.102	+ 2,3 %
Diesel	2.623.556	2.424.932	- 7,6 %
Gas	15.999	17.740	+ 10,9 %
Electric	40.851	71.651	+ 75,4 %
Hybrid	258.916	375.107	+ 44,9 %
Not specified	36.820	36.947	+ 0,3 %
TOTAL	5.927.912	5.947.479	+ 0,3 %

Figure 6: passenger cars in Belgium (2021-2022) (Source: Statbel)

There is also data available on the scale level of Ostend itself, as showed beneath.

Table 1: data on number of electric vehicles for Ostend (source: FOD Mobiliteit en Vervoer)

Titular NIS number	Titular Postal code	Titular City	Vehicle use group	Vehicle fuel	Number of plates
35013	8400	Ostend	Moped / speed pedelec	Electric	544
35013	8400	Ostend	Motorbike	Electric	23
35013	8400	Ostend	Passenger car / van	Electric	445
35013	8400	Ostend	Passenger car / van	Plug-in Hybrid	840
35013	8400	Ostend	Special use	Electric	29

2.1.3 Description and data on other modes of e-mobility in the region (e.g. e-bicycles, e-taxis etc.)

An other mode of e-mobility is the use of e-steps. Currently (July 2023) there are 724 electrical steps (from Bird) spread over the city. Data about the number of e-taxis and e-bicycles (privately owned) isn't available on city level.

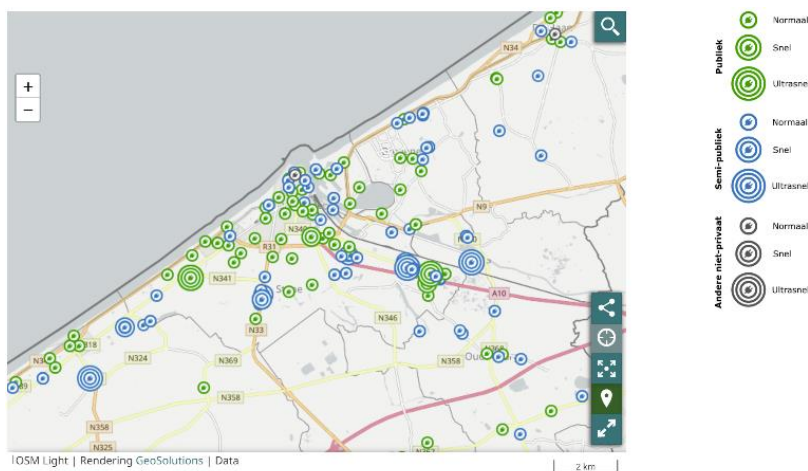
2.1.4 Description and data on charging infrastructures

The Flemish government provides a map with the location of the (semi-)public and other not-private charging infrastructure, as well as the speed of charging for Flanders⁷. The map below shows a zoom on the part of the map situated at Ostend and parts of the neighbouring municipalities.

⁵ More information via : <https://www.vlaanderen.be/basisbereikbaarheid/vervoerregios>

⁶ Source : Statbel, via : <https://statbel.fgov.be/nl/themas/mobiliteit/verkeer/voertuigenpark#panel-12>

⁷ More information via : <https://mow.vlaanderen.be/laadpalen>



OSM | Rendering GeoSolutions | Data © OpenStreetMap contributors, ODbL
 Figure 7: Map with (semi-)public charging stations (source: Departement Mobiliteit en Openbare werken, 2023)

Chargemap⁸ also provides information about charging points in Ostend. According to them, there are 89 charging points (with 370 sockets in total) in Ostend. Their map does not only give information about the location of the charging point, but as well the availability, the operator of the infrastructure and if the charging point is powered by green electricity. With a quick scan, it becomes clear that only three charging points provide green energy.

Note: Chargemap only provides an overview of public and semi-public charging points.

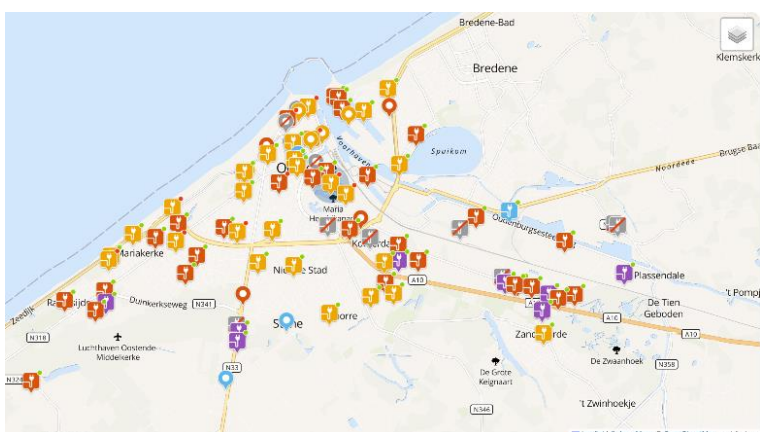


Figure 8: Charging stations in Ostend (Source: ChargeMap, 2023)

2.2 Energy

2.2.1 Availability of renewable energy in the region

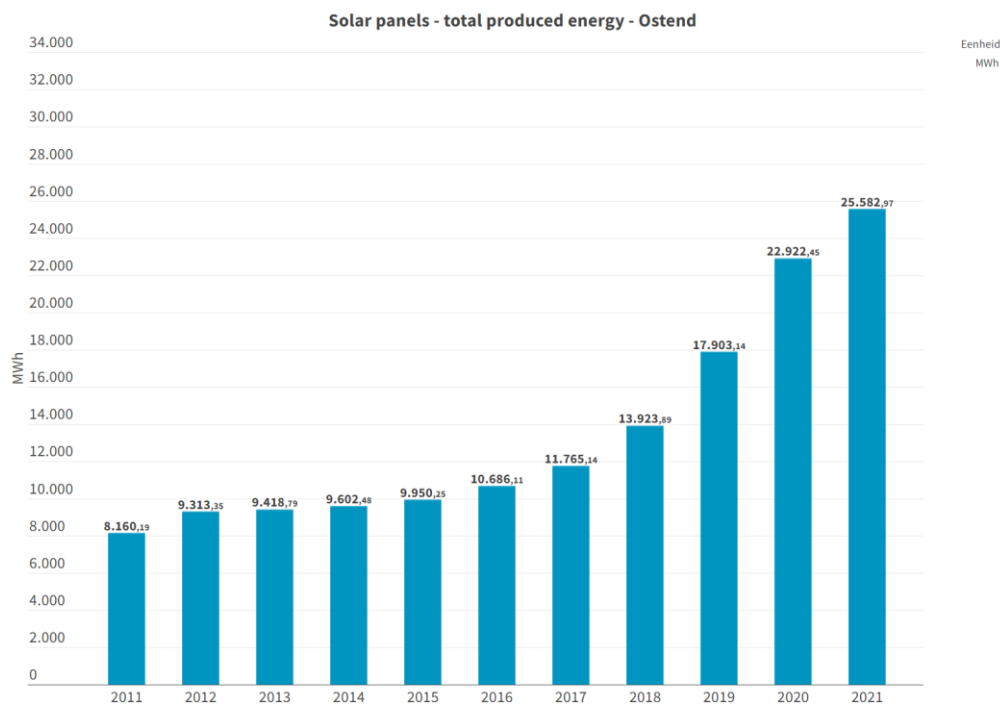
For the city of Ostend and its surrounding, a distinction must be made between different modes of renewable energy production. These will be explained in the section below. The share of renewable energy sources for the city of Ostend will be explained in the next section.

Solar energy

At the moment, 5.294 solar energy installations are installed within the border of the city of Ostend, which comes down to 74 solar panels per 1.000 inhabitants⁹. Most of these solar panels are privately owned. As the chart below shows, the total production of renewable energy by solar panels is increasing each year. Considering today's incentives (e.g. group purchase via Ostend's autonomous municipal company, a premium from the grid operator, average price decrease of solar panels etc.), it's expected that the amount of solar panels in the region will only increase.

⁸ More information via: <https://nl.chargemap.com/cities/oostende-BE>

⁹ Source: <https://apps.energiesparen.be/energiekaart/gemeenten/oostende/zonnepanelen>



Bron: Vlaams Energie- en Klimaatsagentschap en Fluvius - PV | provincies.lincijfers.be

Figure 9: total produced energy by solar panels (source: Vlaams Energie- en Klimaatsagentschap en Fluvius)

Wind energy

For wind energy, a distinction must be made between on- and offshore wind turbines. The nearest onshore wind turbines can be found near Gistel, a neighboring city of Ostend. These wind turbines (six at the moment) are privately owned by different companies and/or landowners. The offshore wind turbines¹⁰ are more numerous (ca. 399 with a total capacity of 2.262 MW), privately owned by different companies and spread over several wind farms (the closest one is approximately 23 km away from the coast). Taking into account the current capacity, approximately 8 TWh can be produced, which covers 10 % of the total electricity need of Belgium. By 2030, it is expected that the capacity of wind energy production in the North Sea will further grow till 6 / 8 GW (with the arrival of a new wind farm in the Princess Elisabeth-zone), which will cover 30 % of the total Belgian electricity need.

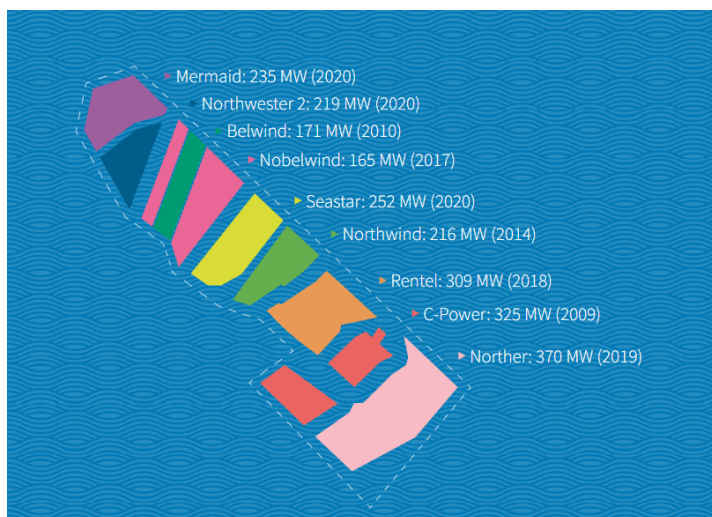


Figure 10: list of wind farms and their capacity (source: Belgian offshore platform)

Bio energy

There is one company in the region that produces bio energy, namely Biostoom¹¹. They annually produce green electricity for 45.000 families from 183.000 tons of residual waste, originating from pre-treated industrial and/or household waste.

¹⁰ More info available via <https://www.belgianoffshoreplatform.be/en/>

¹¹ More info available via <https://bionerga.be/energieopwekking/site-oostende/>

Combined heat and power (CHP)

CHP or cogeneration is the use of a heat engine or power station to generate electricity and useful heat at the same time. This method is more efficient, because otherwise wasted heat from electricity generation is put to productive use. In case of the city of Ostend, Biostoom produces residual heat via their bio energy production.

2.2.2 Share of renewable energy source in energy production

The total production of renewable energy in 2020 (most recent available statistic) on the territory of Ostend is estimated at 41.662 MWh. This corresponds to 11,4 % of the total electricity consumption in the territory in the same year¹². This number does not take the offshore windfarms into account because they are not within the actual border of the city. They do however provide renewable energy for the city of Ostend, which will be explained in this section.

Solar energy

Within the actual border of the city of Ostend, the production of solar energy is good for 55 % of the total green energy production in 2020. Most solar panels are privately owned and thus privately used. The solar energy that is produced by the households / companies that is not immediately used, will be reinjected on the grid against a feed-in fee.

Wind energy

Although there are no onshore wind turbines within the border of Ostend, there is some wind energy passing through the grid by the offshore wind turbines. Today, there is only one wind farm that is connected to the grid via the Port of Ostend (i.e. C-Power). This wind farm consists of 54 wind turbines, has a total capacity of 325 MW and generates 1.000 GWh of renewable energy. The other wind farms are connected to the grid via the Port of Antwerp-Bruges.

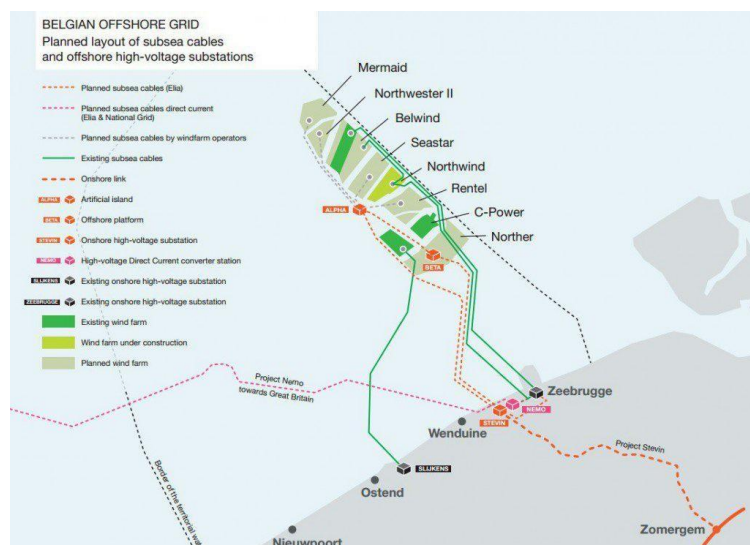


Figure 11: Belgian Offshore Grid (source: Elia)

Bio energy

Within the actual border of the city of Ostend, the production of bio energy is good for 45 % of the total local green energy production in 2020. Even the residual heat obtained from the generation of bio energy is put to use through a heat network that is (being) rolled out throughout the city.

- Installed heat network
- Heat network in progress
- Heat network under investigation

¹² Source: https://provincies.incijfers.be/databank/report/?id=rapport_klimaat&input_geo=gemeente_35013

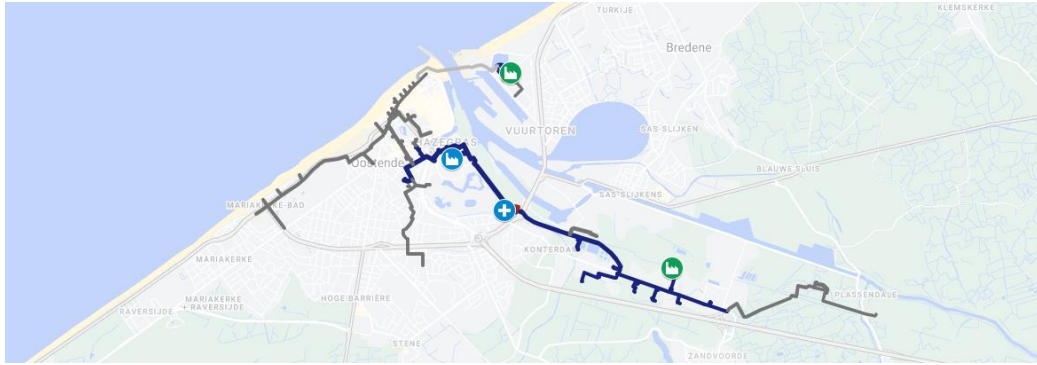


Figure 12: heat network (Source: Beauvent)

2.2.3 Regional energy market structure (e.g. energy production, electricity grids, transport of energy, energy delivery to customers, ownership and operation)

Energy production¹³

- Nuclear energy production by two nuclear power plants (Doel and Tihange), operated by ENGIE Electrabel: good for ca. 47 % of the Belgian electricity production.
- Wind energy production (several on- and offshore wind farms, operated by a broad range of private and public legal entities): good for 12,5 % of the Belgian electricity production.
- Solar energy production (operated by a broad range of private and public legal entities): good for 7,5 % of the Belgian electricity production.
- Bio energy (operated by a broad range of private and public legal entities): good for 2,5 % of the Belgian electricity production.
- Fossil energy and others (operated by a broad range of private and public legal entities): good for 30,5 % of the Belgian electricity production.

Electricity grids¹⁴

- Transmission grid operated by Elia
 - Voltage of 380 kV and 220 kV: these lines form the connection with the larger European grid. The Belgian nuclear power plants and the pumping station of Coe inject directly in this grid.
 - Voltage of 150 kV: the remaining big power stations inject directly in this grid.
 - Voltage of 30 kV, 36 kV and 70 kV: these are regional transmission grids. The smaller energy production units inject directly in this grid.
- Distribution grid operated by Fluvius
 - At a voltage of less than 30 kV: can be subdivided in the medium voltage grid (1 kV – 30 kV) and the low voltage grid (< 1 kV).

Delivery, ownership and operation by customers

- Within the city of Ostend, the energy is delivered by Fluvius.
- The indoor energy installations are managed by the customer in cooperation with their electrician.
 - These installations have a voltage of 230 V – 400 V for residential users and 15 kV for industrial users.

2.2.4 Description of current state of Energy Communities

There are currently no active energy communities within the border of the city of Ostend¹⁵.

2.3 Infrastructures as potential hubs

2.3.1 Buildings and other premises (public)

The city could check which of its premises are suitable to be (further) developed as a potential hub. The city of Ostend currently has the ambition to renovate eight of its premises in an energy efficient manner. It concerns the following buildings: city hall, the sports complexes ‘Mister V.’ and ‘De Spuikom’, ‘the urban workplaces’, the building of the Ostend green service, the library ‘Kris Lambert’ and ‘the Venetian Gallery’. The renovation works include the installation of energy-efficient boiler rooms, energy-efficient lighting systems, solar panels and the improvement of the arrangement of the buildings.

¹³ More information available via <https://www.nuclearforum.be/actualiteit/nieuws/belgische-elektriciteitsmix-2022-jaarcijfers#:~:text=Veel%20export,en%2015%2C6%20TWh%20ge%C3%AFmporteed.>

¹⁴ Information received via ‘het Energiehuis’, the autonomous municipal company of the city of Ostend.

¹⁵ According to VREG (Flemish Regulator of the Energy and Gas market), Citizen Energy Communities and Renewable Energy Communities must register with the VREG. This is required by law from 1 January 2022 and must be done within 30 days of the establishment of the energy community.

2.3.2 Buildings and other premises (private)

The options listed below are mainly suggestive and have not been presented to the private entities themselves:

- (Private) school parking lots could be provided with loading infrastructure for electric vehicles (powered by solar panels on the roofs of the school building), which can be used by staff during the day and by others after school hours.
- There are currently two charging stations on the airport grounds (one of which is fast charge that runs on green electricity).
- The station of Ostend currently functions as a transport hub for different modes (transport oriented development). Adjacent to this station is a car park that is currently not equipped with charging infrastructure for electric cars, although there are solar panels on the roof of the car park.
- Tax incentives already ensure that more companies are investing in electric driving and the provision of the associated charging infrastructure. At the level of the business park, hubs are already being set up to provide fast electric charging via green electricity. The infrastructure is also being provided at the level of some companies, but often not yet powered via green electricity. Several of these charging stations are already being made publicly accessible.

2.3.3 Open areas

The city of Ostend doesn't have the ambition to invest in a potential hub in open area and wants to concentrate this infrastructure in the urban tissue.

3. Stakeholders

Underneath is a non-limited list of possible stakeholders during the project phases 1 & 2¹⁶. Due to new insights during the project, (new) stakeholders can be added to the list or removed from it:

On local scale:

- **The city of Ostend**
The city of Ostend makes political decisions about investment in public spaces, policy, legislation, monetary investments, etc. As well the administration of the city can share the necessary knowledge and realise projects about the current situation of Mobility and Energy.
- **AG Oostende – stadsontwikkeling**
This autonomous city company of Ostend increases the urban tissues, liveability, attractiveness, climate adaptivity, etc. of the city through urban renewal and development in Ostend.
AG Oostende supports the city of Ostend, both in terms of knowledge and project management.
- **Energiehuis Oostende¹⁷**
The 'Energiehuis Oostende', as well an autonomous city company, advises everyone in the city with questions about energy and provides guidance by renovations to reduce the energy cost. Through the 'Energiehuis Oostende', inhabitants and entrepreneurs can get a loan for renovating their building to improve energy performance, can ask for an energy- and waterscan of their building and participate in a group purchase for solar panels, green gas or electricity.
Energiehuis Oostende can participate in the project by providing the city with knowledge and data about green energy in the city, provide knowledge on how to reduce the energy cost and participate as a partner by implementing a pilot project with focus on mobility and green energy.
- **Economisch huis Oostende¹⁸**
Economisch Huis Oostende has four pillars:
 - Attract entrepreneurs to the city, with the goal to increase and sustain the employment (in tourism, trade and catering industry, services, industry, transport and logistics).
 - Support all the entrepreneurs in the city.
 - Promote the city as an entrepreneurial city
 - Support companies in their search for employees and deploy on a policy to activate individuals to support them to take the step towards work through training, coaching and guidance.
- **Police of Ostend**
The local police force of Ostend can play a part in the project with traffic education.
- **School**
One or multiple schools can participate as stakeholders as well, by implementing an energy hub (with for example solar panels) and through making it accessible for inhabitants after school hours.

On provincial scale:

- **Provincie West Vlaanderen**
The province of West Flanders already takes multiple actions to move towards more green energy and mobility, such as:
 - Group purchase of green energy, solar panels, etc. for particulars and entrepreneurs.

¹⁶ The proposed stakeholders still have to be approved by the political board of the city.

¹⁷

¹⁸

- The ‘Testkaravaan’ is an initiative of the province of West Flanders, and comes to the municipalities and interested companies in the province. Inhabitants and employees of these municipalities and companies can then lend an e-bike, spedelec of e-cargo bike for two weeks. With this initiative the province wants to create a modal shift towards active travel modes.
- Treffik is an initiative of the province of West Flanders that guide companies to sustain their mobility as much as possible. It starts with analysing the commuting of employees towards work and advises the company with actions that can be implemented about electrical (shared) mobility, subsidies, etc.

The province West Flanders can contribute to the first phases of the project by providing knowledge and help propose possible actions towards a more green mobility system.

- **West-Vlaamse Intercommunale (WVI)**

The WVI is an intermunicipal organisation, that works together with 54 municipalities, situated in the province West Flanders. Main activities of the WVI are: development of residential projects and business- and industrial parks, studies about urban planning, mobility, GIS, climate change, renewable energy, regional networking, etc.

The WVI can share her knowledge on green energy and mobility, and can provide and look for intermunicipal projects towards a more sustainable mobility.

- **Fluvius**

Fluvius is an intermunicipal organisation that builds and manages all public utility infrastructure (electricity, gas, water and heat) in Flanders. Fluvius has to the goal to help build towards a more climate adaptive Flanders.

As a stakeholder, Fluvius provides the necessary utility infrastructures to implement energy communities.

On regional scale:

- **Department Mobiliteit en Openbare werken**

The ‘Department Mobiliteit en openbare werken’ from the Flemish Government can also be a possible partner in the project, since they want to stimulate the use of sustainable transport. On way to reach this, is with the new mobility vision of the Flemish government since 2019. With the decree of basis accessibility (in dutch: decreet basisbereikbaarheid), Flanders wants to set the transition towards more efficient, sustainable and more flexible public transport, complementary with the cycling and walking network. Therefore, the ‘Departement Mobiliteit en Openbare werken’ is implementing ‘hoppin’-points since July 2023: nodes where different transport modes comes together.

The ‘Departement Mobiliteit en Openbare Werken’ can therefore be an important stakeholder, to share their knowledge and possible help to implement some hoppin-points in Ostend, that can be combined with an energy hub.

- **Department Omgeving**

‘Department Omgeving’ (Department environment) from the Flemish Government is responsible for urban and spatial planning, climate and environment. ‘Departement Omgeving’ can play a role by providing the necessary policy to allow the implementation of Energy hubs.

- **Vlaams Energie- en Klimaatagentschap (VEKA)**

The VEKA has different tasks: guiding inhabitants towards sustainable heating, lowering the energy cost, obligations for renovating, etc. One of their pillars is to stimulate energy sharing and energy communities.

The ‘Vlaams Energie- en Klimaatagentschap’ can be a stakeholder by helping to introduce energy communities into the city.

- **Vlaamse Instelling voor Technologisch Onderzoek (VITO)**

VITO is a Flemish autonomous research organisation for cleantech and sustainable development, with the goal to accelerate the transition towards sustainable energy.

VITO can provide, test and investigate the necessary technology towards a more green mobility and energy system.

- **Mobipunt vzw**

Mobipunt vzw is an organisation that guide cities, municipalities and organisations with the conceptualisation, planning and implementation of Hoppin-points in Flanders. Since 2019 Mobipunt vzw is guiding different pilot projects of Hopping points in Flanders and they are partner in the European project (Interreg NEW) eHUBS where they exchange knowledge with the different partners.

Mobipunt vzw can participate as a stakeholder by advising the city for the planning of Hopin-points in Ostend that fits into the mobility vision of the city and creates added value for the inhabitants, visitors and entrepreneurs.

- **Beauvent**

Beauvent is a cooperative company, that invests in wind energy, solar panels and energy efficient technologies (such as a heat network) through citizen capital. Beauvent uses the cooperative principle in order to create a societal support for renewable energy, where as much people as possible participate. One of the projects of Beauvent is the realisation of the heat network in Ostend. Beauvent can participate as a stakeholder by helping roll-out energy communities in the city with the necessary knowledge, infrastructure, etc.

4. Legislative and financial environment in support to renewable energy initiatives

4.1 Legislation, regulations

In terms of policy, a distinction must be made between different governmental levels:

- **Federal**
 - The federal government is competent for matters which, because of their technical and economic indivisibility, require equal treatment at national level (e.g. tax policy, production policy, energy supply security etc.)
 - The North Sea in which Belgium can exercise jurisdiction in accordance with international maritime law fall within the domain of competence of the federal government. Installations for the production of energy from renewable sources in the North Sea therefore fall under the competence of the federal government.
 - The federal government is responsible for the makeup of a national energy and climate plan that aims to set out the guidelines for the transition towards a sustainable, reliable and affordable energy system for the period 2021 – 2023¹⁹.

- **Flemish**
 - The Flemish government is responsible for the distribution of electricity and gas (and their distribution networks), the recovery of energy by the industry and other users, new energy sources (except those who are related to nuclear energy) and the promotion of rational energy use.
 - The 'Energiedecreet' (in English: Energy Decree) regulates the juridical rules about gas and electricity. This includes regulation about Local Energy Communities and energy sharing.
 - The Flemish government is responsible for the founding of VEKA (Flemish Energy and Climate Agency), an independent agency that implements a sustainable energy and climate policy, the outlines of which are summarized in the Flemish Energy and Climate Plan (VEKP) 2021 – 2030²⁰.
 - The Flemish government will also take care of the preparation of a solar, wind, heat and flexibility plan which implement the policy on green and renewable energy as described in the VEKP by 2025.

- **Local**
 - The Covenant of Mayors is an European Initiative that voluntarily brings together different local governments around Europe to make a commitment to achieve the EU climate and energy targets. It is not an optional charter. The EU monitors whether the municipality fulfils its commitments. In other words, the cooperation does not only consist of promises, but also deeds. The CO₂ atlas is an example of this. This tool contains all the data and calculations necessary to draw up a CO₂ inventory for the territory, in accordance with the minimum reporting requirements of the Covenant of Mayors.
 - In Ostend, according to the urban planning regulations, it is mandatory for new roofs of at least 20 m² with gradient of less than 15° to implement a green roof, to install an accessible roof terrace or to place solar panels / collectors.

4.2 Financial incentives

In terms of financial incentives, a distinction must be made between different governmental levels:

- **Federal**
 - The federal government provides various tax incentives to promote renewable energy.
 - For example, the law of 25/11/2021 on fiscal and social greening of mobility makes it possible to obtain tax relief for installing charging stations that are smart, use exclusively green electricity and are controllable via a digital management system which can control the charging time and the charging power of the charging station and whereby this connection is freely available to the users²¹.
 - Another example is the changing taxation of company cars. The tax deductibility for company cars that run on fossil fuels will be phased out to 0 % between 2026 and 2029. The same goes for hybrid vehicles. Full electric company cars will be 100 % deductible before 2027. This will decrease until a steady deduction percentage of 67,5 % from 2031²².

- **Flemish**
 - The Flemish government provides support for green energy projects via certificates:

¹⁹ More info available via <https://www.nationaalenergieklimaatplan.be/nl/wat-is-het-nekp#het-definitief-plan>

²⁰ More info available via <https://www.vlaanderen.be/veka/energie-en-klimaatbeleid/vlaams-energie-en-klimaatplan-vekp-2021-2030>

²¹ More info available via https://etaamb.openjustice.be/nl/wet-van-25-november-2021_n2021033910.html

²² More info available via <https://www.titeca.be/nl/nieuwsitem/autofiscaliteit-wat-brengt-de-toekomst/>

- Green electricity certificates: a compensation is obtained when it is demonstrated that a certain amount of green electricity has been produced²³.
 - Combined heat and power (CHP) certificates: a compensation is obtained when it is demonstrated that a certain amount of primary energy was saved in a high quality CHP-installation compared to a reference power station and a reference boiler²⁴.
 - Grid operators (as such Fluvius for the city of Ostend) are obliged by the Flemish government to paying out premiums for a certain regulatory energy saving measures in buildings.
 - The Flemish government is organizing various calls to promote green energy. For example the call ‘green energy’ is a competition for medium-sized PV installations and small / medium-sized wind turbines in which applicants submits a bid for their installation (i.e. the ratio of the requested support and the expected energy yield). Bids are then ranked based on cost efficiency. The best ranked bids are paid out in function of the budget²⁵.
- **Local**
 - The city of Ostend provides various support measures through its autonomous municipal company ‘Energiehuis’²⁶:
 - Group purchases for solar panels.
 - A loan for home renovations that focus both on housing quality and on improving energy performance (translated from Flemish regulations).
 - Free home renovation guidance with the aim to become more energy efficient.

5. S.W.O.T. Analysis

Table 2: legislative

<p>Strengths Federal and regional legislation (e.g. climate plans, energy decree etc.) sets out the guidelines about sustainable energy for local authorities. This is how the city of Ostend created their own climate plan which includes a vision to become climate neutral against 2050.</p> <p>Through the urban planning regulation of the city of Ostend, buildings with a roof surface of at least 20 m² are obligatory to have a green roof or solar panels. This stimulates households, investors and entrepreneurs to invest in a more sustainable city.</p>	<p>Weaknesses Legislation is divided over different governmental organisations and scales (local, provincial, regional and federal).</p>
<p>Opportunities Throughout the change in taxation of business cars, the federal government stimulates the shift from fossil-fuel vehicles towards electric and hybrid cars. This can result into an increasing investment in electric vehicles, charging infrastructure, etc.</p> <p>An opportunity can be that the city works out a policy on how to strategically place charging infrastructure in the public space and how this can increase through time, taking into account the need for regular public parking spaces and green accessible spaces. This can be in combined with rethinking the parking policy in Ostend.</p>	<p>Threats Today, there isn’t a framework (local or regional) on how to strategically place charging infrastructure and promote energy hubs throughout the city/region. Because of this uncertainty, cities are adopting a wait-and-see attitude. Nevertheless, this threat can be turned into an opportunity.</p> <p>A change of policy (due to another political environment, new insights, changing social trends) could lead towards more uncertainty on different levels.</p>

Table 3: Behavioural/organisational

<p>Strengths The legislative and organisational weakness of the various legal jurisdictions can also be seen as a strength because of the existing cooperation between these different organisations to reach the same (climate) ambitions through sharing knowledge, materials, infrastructure etc.</p>	<p>Weaknesses The city of Ostend doesn’t have an energy community yet, even though there are incentives to start one.</p>
---	--

²³ Conditions for obtaining green certificates are shown via the following link: <https://www.vlaanderen.be/bouwen-wonen-en-energie/groene-energie/certificatensteun-voor-groene-energie-en-wkk/groenestroomcertificaten>

²⁴ Conditions for obtaining CHP certificates are shown via the following link: <https://www.vlaanderen.be/bouwen-wonen-en-energie/groene-energie/certificatensteun-voor-groene-energie-en-wkk/warmte-krachtcertificaten>

²⁵ More info available via <https://www.vlaanderen.be/call-groene-stroom>

²⁶ More info available via <https://www.oostende.be/energiehuis>

<p>Opportunities The city of Ostend wishes to create more support base through diverse pilot projects on different governmental scales (European, federal, regional, provincial and/or local) and via a clear communication to its citizens.</p> <p>In this way, an attempt is being made to further initiate a mental shift that will boost initiatives regarding sustainable energy (such as the establishment of a (renewable) energy community) and sustainable mobility (such as the modal shift).</p>	<p>Threats Sustainable mobility and energy-use requires a sustainable society where everyone contributes their part. Even though this is an opportunity to work on, we must be aware that this will require enormous efforts from the population (the so-called mental shift).</p>
--	---

Table 4: Economic

<p>Strengths There are various economic incentives on different governmental levels for the establishment of more sustainable mobility, energy hubs, energy communities etc.</p>	<p>Weaknesses A weaknesses is the affordability of green energy, which is still more expensive. This results in the fact that households tend to choose for cheaper energy based on fossil fuels (from heating a house to choosing a car).</p>
<p>Opportunities Via it's 'Economisch Huis', the city of Ostend could cooperate with entrepreneurs to investigate which excess profits could be made by the sustainability of the businesses and their environment.</p>	<p>Threats Societal trends provide an uncertainty on the market, which causes volatile prices (e.g. energy, private vehicles, food etc.), which exacerbates further social inequality (e.g. the affordability of electric cars). This trend tends to exceed the scale level of the city.</p>

Table 5: Technological

<p>Strengths Several technologies to generate renewable energy (e.g. solar, wind, heat and bioenergy) are already operational in and near Ostend.</p> <p>Flanders is in the process of replacing all the remaining analogue meters with digital ones in the region. These digital meters can be monitored, which results in data regarding usage, peak times, etc.</p>	<p>Weaknesses The implementation of renewable energy sources such as solar energy, wind energy, biomass and geothermal energy requires continuous technological development and improvement of efficiency and storage options. Not all technology is available today to do this as efficiently as possible.</p> <p>Data concerning solar panels, electric car ownership, electric bicycles, charging infrastructure, modal shift distribution, etc. are collected and monitored on provincial and regional scale level. Not all these data can be rescaled towards local scale. Therefore, we don't have these data available on the level of Ostend.</p>
<p>Opportunities The city of Ostend uses new technologies of renewable energy in its city development strategy to further sustain the city.</p>	<p>Threats In the S-Q-analysis, it became clear that only a small amount of the charging infrastructure is provided by green energy. Electrification of the car park to reach the climate goals only makes sense if the delivered electricity is completely green.</p> <p>It's not clear if the capacity of the power grid fits with the expected demand in case of further electrification of the car park.</p>

6. Readiness model indicator results

The legislation on the establishment of EC's (energy communities) is ready, the necessary information on how to set one up is available, (economic) incentives are known and technological progress is made every day. This explains why most aspects are (partly) marked green within the readiness model. Given this, the city of Ostend has the opportunity, thanks to the regulatory framework at a higher scale level, to further develop a strategy on the implementation of renewable energy sources, the set up and promotion of EC's amongst its inhabitants, the increasing sustainability of its city etc.

However, what the readiness model shows us is that despite the "incentives" to establish an EC, the city of Ostend has none within its territory to this date. Reasons for this can be of different nature: it could be financially more expensive to share energy (within an EC) instead of purchasing new (renewable) energy from the DSO (distributor system operator), the lack of financing entities willing to take on potential risks, the lack of technicians to ensure a speedy service, the technical capacity of the grid is not optimal, a somewhat low awareness among the population etc. The city of Ostend is aware of this and realizes it does not have a solution for all the difficulties. Nevertheless, the city of Ostend has the ambition to work on this theme

through her autonomous municipality company 'het Energiehuis'. The city of Ostend wishes to examine where it is opportune to set up EC's, starting with its own patrimony to give the good example. Subsequently, the city of Ostend also wants to promote the establishment of EC's to her population and companies. Maintaining clear communication and providing accurate service is one thing, but getting the population on board could be a challenge. A challenge the city of Ostend will not shy away from. We realize very well that a mental shift will be necessary to focus on making our city more sustainable. Investments in and improvements on more sustainable energy, mobility, economy etc. simply cannot be achieved without a more sustainable society.

With all this in mind, the city of Ostend wishes to share its knowledge and know-how with all the other partners within the PROMOTER project, but above all to learn from others experiences.