

Request for Proposal

**for a biomass power plant in the
range 200-400 MWe in the
Antwerp port area, on a site with
direct waterfront access, plus
road and rail connections,
adjacent to the local
petrochemical cluster and other
power consumers**



**Port of
Antwerp**

1 INTRODUCTION: THE PORT OF ANTWERP

1.1 Current Situation

1.1.1 Port Area

As the result of a series of expansions, the Antwerp port area has grown to become one of the largest zones for maritime, logistics and industrial activities in the world. With a surface area of 13 057 ha, over 150 km of quay facilities, 1055 km of railways, 400 km of roads and 540 ha of covered warehousing and handling space, the Antwerp port area is one of the largest logistics and industrial hubs in Europe.

PRODUCTION FACILITIES IN THE PORT

- 1 BASF site (BASF, Air Liquide, Dow, Solvay)
- 2 Belgian Refining Corporation (Petroplus)
- 3 Solvay
- 4 Ineos Polyolefins
- 5 Monsanto site (Monsanto, Solutia, Flexys, Ferro, National Starch)
- 6 Evonik Degussa site (Evonik Degussa, Oxeno, Vertellus Specialities Belgium)
- 7 Bayer
- 8 Lanxess
- 9 Total Refinery Antwerp
- 10 Fina Antwerp Olefins (Total, ExxonMobil)
- 11 Esso Refinery (ExxonMobil)
- 12 Total Petrochemicals
- 13 Petroplus
- 14 Hercules
- 15 Ineos Phenol
- 16 Dow Haltermann Custom Processing
- 17 Lanxess site (Lanxess, Lubrizol)
- 18 Hexion Specialty Chemicals
- 19 Borealis
- 20 Ineos Oxide site (Ineos Oxide, Nippon Shokubai, Eval Europe, Praxair, Borealis, Seppic, Specialty Polymers Antwerp, Dow, General Electric)
- 21 Exxon Mobil Chemicals
- 22 Lanxess Rubber
- 23 3M
- 24 Q8 Petroleum
- 25 AT&B



The port of Antwerp also continues to confirm its position every day as the second largest port in Europe and the second largest maritime petrochemicals cluster in the world. It is also the most diversified in the

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world, with over 300 different basic chemicals being produced. The port area comprises 3,674 ha (9,075 acres) of industrial land, spanning the right and the left banks of the river Scheldt. It is home to five oil refineries, including two of the top ten European production units, four steam crackers (one of them the largest in Europe) and the largest stainless steel tank capacity in the world. More than 30 international chemical producers are present, and of the top ten global chemical producers, seven have one or more sites in Antwerp. The heart of the petrochemical cluster is situated on the right bank, on the peninsula in between the Scheldt and the Kanaaldok. Thanks to these facilities and the central location of the port in the Western European pipeline network, all companies are assured of a steady supply of feedstock. For the chemical industry, Antwerp is the place to be, as it is the dominant player for a wide range of key chemicals in Europe.

1.1.2 Advantages of the port of Antwerp

The port of Antwerp is the Gateway to Europe, through which almost 190 tonnes of cargo flow every year. These outstanding results were achieved with the efforts of more than 64 000 mostly specialised people directly employed within the Antwerp port area. Annually, the Port generates a direct added value equivalent to 9 billion Euro.

Productivity

As mentioned above, the success of the port of Antwerp is largely thanks to the more than 65 000 people employed in the port area. These employees are renowned the world over for their high productivity.

The port's legendary productivity in the area of conventional breakbulk also extends to the handling of Containers. Container handling productivity for loading and unloading containers is the highest in Antwerp as compared to competitive ports. Dock workers in the port of Antwerp follow specialised training in order to deal with the complexity and diversity of contemporary goods flows.

Collaboration with the private sector

The Antwerp Port Authority has a tradition of consultation and communication with the private organisations in the port of Antwerp. First of all are they represented in the Board of Directors of the Antwerp Port Authority, and there is a forum for regular discussions provided by the Consultative Board. At the end of 2009, Port Authority CEO Eddy Bruyninckx and Alfaport Chairman Roger Roels set up an action plan supported by the public and private sector with the 'Total Plan for a more competitive Port' as a result. More than 200 port specialists from 89 companies and organisations have made an active

contribution to the Total Plan. They defined 20 'building blocks' with the aim of boosting Antwerp's position in the select number of European mainports.

The current request for proposal originated from the same spirit, as the principles of the proposed sustainable biomass concept are based on mutual (public-private) interests and concerns.

Sea access

The deepening of the Scheldt is in progress and will be completed before the end of the year. The deepening will strongly improve the shipping conditions, as the former tide independent draught of 11,90 meter will increase to 13,10 meter. Vessels with a draught of 15 m and more, depending on the ship, will be able to enter the port.

1.2 The Ports Sustainable Energy Policy

1.2.1 The Cascaded Focus

The Ports number and nature of activities, together with its geographical size, makes it a source of challenges and ambitions regarding its further growth towards sustainability.

As Europe's largest petrochemical, industrial and refrigeration warehouse cluster, the ports electricity use amounts to a total of 8000 GWh or a tenth of the total Belgian electricity use. Most of these activities already use state of the art techniques in the search for higher efficiency. The larger part of the electricity and heat demand is generated through a matrix of cogeneration units. But the search for higher efficiency and sustainability remains a priority.

The Port Authority works towards energetic sustainability through a cascaded focus. The primary focus is on rational use of energy. Up to now, the leverage was created through the ports electricity distribution network program. Soon, a specific incentive program will be started up. The first phase, the energy audits, is already ongoing. A prefinancing tool for energy saving investments is being shaped as we speak.

This brings us to the secondary focus, namely the use of the ports own potential for renewable energy production. It is under this program that the current project for biomass energy production can be categorised.

Finally there's the Port Authority's own exemplary nature through retrofitting.

1.2.2 The Sustainable Production Potential

In wind production, the Antwerp Port was one of the Belgian pioneers. On the left bank, the first 600 kW turbine was built in 1997. On the right bank, the first permits for the 2MW-series were obtained in 2001, the turbines were erected in 2003. As the planning for the left bank turbine cluster is coming to an end, we hope to install another 150 MW in the upcoming years in the expectation that a modus vivendi can be found with the air space manager.

Regarding photovoltaic solar energy, a total amount of 43MW has been installed for a total surface of 30 hectares.

Given the ambition of the Port Authority concerning the ports renewable production and taken into account the remaining opportunities for new sea vessel focused activities, the leap towards biomass should evidently be made. Not only can biomass strongly contribute to the yearly port renewable production amount, combined with an energy clustering in the petrochemical cluster (cogen, district heating), the efficiency level can make the Antwerp based concept an example in its range. On top of that, the synergetic possibilities with the ports regrowable raw material for chemistry program (see also the CEFIC - Suschem-program) can furthermore increase the sustain.

Together with the focus on smart grids technology to keep the upcoming renewable production feasible as far as grid stability and grid investment is concerned, the combination as described can support the ports sustainable efforts.

1.2.3 Sustainable Biomass – the Political Environment

1.2.3.1 European Policy

The European Commission published a White Paper in 1997 setting out a Community strategy for achieving a 12% share of renewables in the EU's energy mix. The decision was motivated by concerns about security of supply and environmental protection.

The 12% target was adopted in a 2001 directive on the promotion of electricity from renewable energy sources, which also included a 22.1% target for electricity for the EU-15. The legislation was an important part of the EU's measures to deliver on commitments made under the Kyoto Protocol.

In January 2007, the Commission published a Renewable Energy Roadmap outlining a long-term strategy. It called for a mandatory target of a 20% share

of renewable energies in the EU's energy mix by 2020. The target was endorsed by EU leaders in March 2007 when European leaders signed to a binding EU-wide target to source 20% of their energy needs from renewables, including biomass, hydro, wind and solar power, by 2020. To meet this objective EU leaders agreed a new directive on promoting renewable energies, which set individual targets for each member state.

On the 23rd of April 2009, the EU adopted the Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources.

The new Directive on renewable energy sets ambitious targets for all Member States, such that the EU will reach a 20% share of energy from renewable sources by 2020 and a 10% share of renewable energy specifically in the transport sector. It also improves the legal framework for promoting renewable electricity, requires national action plans that establish pathways for the development of renewable energy sources including bioenergy, creates cooperation mechanisms to help achieve the targets cost effectively. The new Directive should be implemented by Member States by December 2010.

March 2010, The European Commission published its on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling. The Report makes four main recommendations regarding sustainability of solid biomass:

1. a general prohibition on the use of biomass from land converted from forest, other high carbon stock areas and highly biodiverse areas;
2. a common greenhouse gas calculation methodology which could be used to ensure that minimum greenhouse gas savings from biomass are at least 35% (rising to 50% in 2017 and 60% in 2018 for new installations) compared to the EU's fossil energy mix;
3. a. the differentiation of national support schemes in favour of installations that achieve high energy conversion efficiencies; and b. monitoring of the origin of biomass;
4. non-application of criteria to waste

Although not yet implemented in European or national legislation, the Port Authority will use the criteria as mentioned above as a guideline in the definition of the project criteria and the evaluation of the project proposals.

1.2.3.2 Federal and Regional Policy

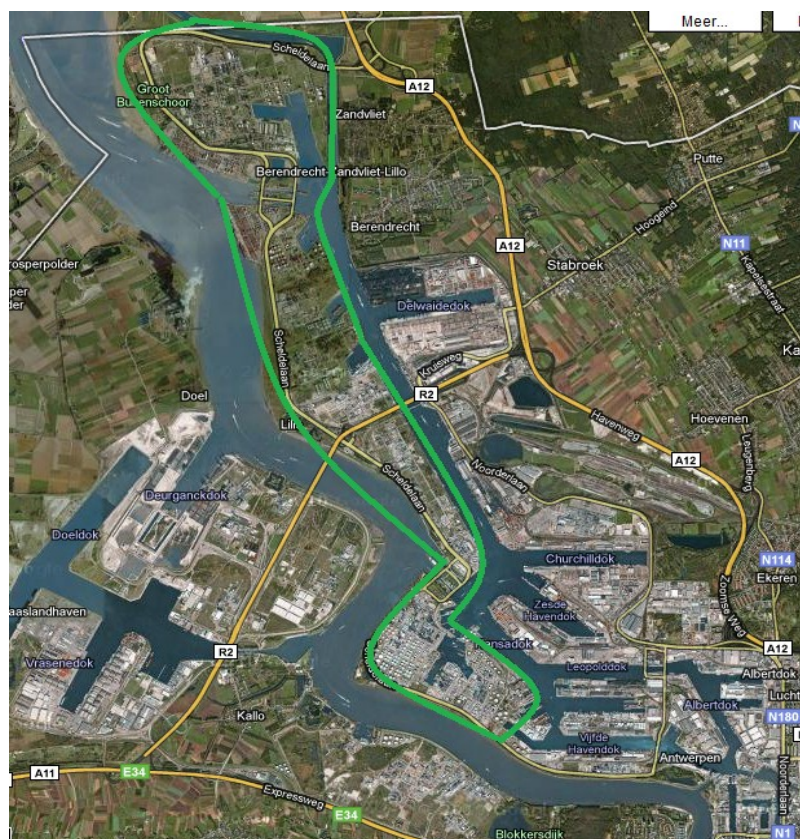
With the approval of the directive 2009//28/EC, the member states were required to set targets for their share in the 2020 action plan. For Belgium, a 13% share of renewables in the total electricity production was put upfront.

In Belgium, the renewable policy is in the hands of the regions. For Flanders, it is the Flemish energy agency VEA who has written a renewables action plan 2020 for Flanders. In this action plan, the main role has been foreseen for biomass. In correspondence with the policy of the public Flemish waste society OVAM, sustainability criteria for biomass will be formalised in the upcoming months. Evidently, the criteria will correspond to those of the European Commission report with the focus being on carbon balance, sustainable management of wood products through labelling, interaction with existing continental recycling flows and energy efficiency.

2 PROJECT DESCRIPTION -THE POWER PLANT CONCEPT – AIM OF CONSULTATION

With this request for proposal, the Antwerp Port Authority wishes to request producers to submit a project proposal. This request for proposal envisages a biomass-fired power plant in the 200-400 MWe power range. Such power plant could be installed on a land that is given into concession in the Antwerp Port Area.

The raw biomass material for this power plant is to be transported mainly by sea vessel. Both in the interest of the efficient handling of the vessels as for the cooling capacity of the power plant, several water bound concessions have the necessary space available (possible project area's). The concessions concerned are all located behind the locks.



Further more the concession grounds where a biomass power plant could be installed (possible project areas):

- Are close to the 380kV transmission network;
- Are immediately accessible by primary road, railroad;
- Are neighbored by several companies with a high level electricity, steam and/or heat demand;

The possible project areas are all situated within the petrochemical cluster. For the Port Authority, the strengthening of the (chemical) cluster is a basic condition for the evaluation of the project proposal. This clustering can take form through the direct delivery of energy (current, heat or steam) or through a synergy with local biomass flows. For the latter, in addition to the sea going raw material, the openness for a combination with local (portal) biomass flows can be an advantage in the evaluation of the concept proposed. Specifically the residual biomass flows from the chemical cluster are of interest.

3 APPLICATIONS

3.1 Form

The aim of the consultation is to determine if there is adequate response and interest from the sector for the proposed concept under chapter 2. This response will determine whether or not the Antwerp Port Authority will create the necessary political openness for a biomass-fired power plant in the Antwerp Port Area. The submitted project proposals will also be the basis for the selection of the most suitable concession location and for the selection of candidates for the final tendering procedure.

3.1.1 Deadline for Submissions

All submission should be delivered to the Port Authority, Entrepotkaai 1 2000 Antwerp, by the 26th of November 2010, 1 A.M..

3.1.2 Corporate Information Required

The Port Authority would like to receive the following information from the company, companies or consortium that will apply:

- name, address, telephone, VAT number;
- Articles of Association of the relevant association or associations;
- in the case of a consortium or collaboration, the text of the collaborative agreement (if it already exists);
- contact person, including position held and contact details;
- shareholder structure;
- annual accounts for the last three years (both for the company concerned and consolidated annual accounts if the company forms part of a group).

3.2 Content of the Project Proposal

3.2.1 General: principles of the proposed concept to be taken into account for the project proposal

During a later tender process, the following conditions/principles will be of primary importance for the allocation of a project. The Port Authority wishes to notify participants of these principles already at this stage, so as to include them in the required project proposal and to make it known that candidates for the further tendering procedure as mentioned under item 3.1 will be based on the selection of suitable projects out of the current call for proposal procedure. This evaluation of the project proposals will be based on the following principles :

3.2.2 Regarding the power plant and the experience of the participants

Relevant experience

Participants shall demonstrate relevant experience in the construction and operation of a large scale biomass power plant by providing the following details:

- main and subordinate activities;
- existing biomass power plants with details on combustion techniques;
- biomass production facilities in development;
- market position of the company in the activities it carries out, and the development of this market position. The participant should list those factors which in their opinion have influenced their market position.

Participants shall also convey their view of the future development of the activities they wish to carry out (also in reference to developments in volume) and how these will fit within the further development of the company.

Investment summary and financial plan

Participants in this consultation shall provide an overview as detailed as possible of the investments that will be necessary for carrying out the proposed project. The participants shall also demonstrate that they have the necessary financial strength to guarantee the operation of the biomass power plant.

Environmental conditions

The Flemish environmental legislation ('VLAREM') regulates the main part of the environmental aspect of the biomass concept. The Port Authority wishes to receive specific information and of the candidate regarding the following aspects:

- **Fine dust emissions during the handling from ship to shore: in what way are substantial dust particle emissions to be expected, which countermeasures are foreseen to eliminate possible annoyance;**
- **Given the concentration of energy and emission-intensive activities, the Port Authority is strongly concerned about the global emission of air pollutants in the port and the feasibility towards the surrounding areas. Therefore the Port authority sees the Flemish legislation as a basis. In addition to a comparison with the Flemish legislation, a benchmarking with representative combustion plants on a European scale is required in order to appreciate the relative performance of the proposed power plant concept.**

Clustering

As mentioned earlier, all possible project areas are situated within the petrochemical cluster. The Port Authority sees a contribution to the strengthening of the cluster as a basic condition. This clustering can take form in different ways:

- **Energetic clustering: what concepts does the candidate deem feasible with regards to the direct delivery of current, of heat or steam to neighbouring industrial sites? Does the candidate foresee commercial attractive tariffs for the partnering local concessionary (see further) or the neighbouring chemical companies?**
- **Biomass: as described before, the Port Authority encourages the chemical industry to shift from fossil to regrowable raw materials wherever commercially feasible. This policy is in line with the European SusChem project. A part of the effort towards feasibility will be the management of the residual biomass flows which cannot be used by the chemical cluster but are usable as feedstock for the power plant. The candidate is asked for his vision on this subject.**

Terminal Layout and technical organisation of the site

Participants in this consultation shall state the ideal size of the respective terminal/site with a view to maximising productivity and achieving the most efficient organisation (in terms of layout, use and occupation of land). The space needed for the actual combustion and the feedstock storage should be stated separately. The Port Authority attaches great importance to high productivity per area of land. In their project proposal, participants in the market consultation must stipulate how they will achieve this.

3.2.3 Regarding Logistics

The candidates are asked to describe the modal split of the logistic chain in detail and this for both the incoming feedstock and the outgoing residues:

- **Sea going (and barge for outgoing):**
 - **Total volume;**
 - **type and division of visiting ships;**
 - **characteristics of size-determining ship:**
 - overall length;
 - beam;
 - expected maximum operational draft on arrival/departure;
 - DWT
- **Rail: total volume, destinations;**
- **Road: total volume, destinations;**

Participants are asked to appoint a contact person who may be contacted to answer any additional questions related to these specific content conditions.

3.2.4 Regarding the Organisation of a project

As stated before, the possible project areas are all existing concessions, managed by petrochemical companies. As indicated before, the Port Authority wishes to implement a number of policy targets concerning the sustainability of the cluster in a broad sense. To ensure this, the Port Authority wishes to evaluate the possibility to take a minority share in an eventually selected project. The concessionary possibly wishes to take an equal share for the same policy reasons. The Port Authority wishes to receive the candidate's vision on the subject of local minority partners in the project.