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**Application form “AEBR-Cross Border Award” 2009**  
**Deadline: 31.08.2009**

**Please, fill in the grey gaps and return this form by e-mail!**

**“Cross Border Cooperation after 2013  
- regional answers on current European challenges -“**

**1. General information**

**1.1 Applicant border / cross-border region:**

Euregio Scheldemond

(crossborder cooperation of the provinces of East- and West-Flanders (B) and Zeeland (NL))

**1.2 Title of the cross-border cooperation measure\* [project(s), programme(s) / strategy(ies)]:**

project: **Bio Base Europe: Innovation and training for a sustainable biobased economy**

(fully crossborder project; common project management, common financing)

**1.3 Period:**

2008-2011

**1.4 Project initiator: International Association Bio Base Europe (BE)**

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**1.5 Partners:**

Vzw Bio Base Europe Pilot Plant (BE)

Vzw Ghent Bio-Energy Valley (BE)

Stichting Biopark Terneuzen (NL)

Stichting Bio Base Europe Training Center (NL)

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**1.6. Financing of the cross-border cooperation measure (e.g. INTERREG):**

programme: Interreg IV-A Flanders-the Netherlands (€ 6.000.000)

co-financing: flemish and dutch governments, provinces of Zeeland and East-Flanders

total costs: € 21.835.000

**1.7 Links to other projects, measures and/or programmes (only if applicable):**

Bio Base Europe has roots in numerous strategic visions and policies of several local, regional, Flemish, Dutch, European and global parties, all calling for investments in the innovation chain of biobased produc-

tion. In annex e) a list (original languages of organizations and reports) including some explanation of the links (in english) between projects, measures and/or programmes and Bio Base Europe.

Also, there are links to other projects within Euregio Scheldemond, in the Canal Zone. These links are explained in the answer to question 3.6.

## 2. Contents

### 2.1 Objectives of the cross-border cooperation measure:

The biobased economy is strongly developing today as a consequence of the strong price increase for fossil resources such as petroleum, the drive towards sustainable production processes and the need to reduce the emission of greenhouse gases such as CO<sub>2</sub>. This causes a strong penetration of biobased products and processes in a multitude of industrial sectors, particularly in the chemical industry, the energy sector, the agro-industry and, to a lesser extent, the food, textile and pharma industry. As a consequence, the transition from a fossil-based economy to a biobased economy has clearly begun.

The development of the biobased economy is seriously handicapped by a number of problems. First of all there is a gap in the innovation chain of the biobased economy, caused by the lack of pilot and demonstration facilities. These facilities are required to scale up a process from a laboratory setting to an industrial production plant. The lack of pilot facilities seriously limits industrial and academic players in the realisation of their plans. As a second problem, there is a general shortage of well-trained process operators with experience in biobased processes. This general problem is reinforced by the lack of specific training facilities for biobased activities.

Bio Base Europe is a joint initiative by Europe, Belgium and the Netherlands that intends to alleviate these problems.

**Bio Base Europe is building research and training facilities for biobased products and processes (the production of biofuels, bioplastics, etc.), in order to speed up the development of a sustainable biobased economy in Europe.** In short Bio Base Europe has the objective to:

- enable **innovation and upscaling in biobased production**
- create **growth, jobs, education and international prestige** for the crossborder region
- help **battle climate change and energy shortages**
- help **battle the rise in food prices** (2<sup>nd</sup> generation biofuels)
- create **a crossborder cluster / network** for biobased companies and knowledge centers

Bio Base Europe is the result of a partnership between Ghent Bio-Energy Valley and Biopark Terneuzen and their respective stakeholders. Bio Base Europe is an important building block for the development of the biobased economy in Europe and is expected to boost the current drive towards sustainable production processes and to reduce the emission of greenhouse gases such as CO<sub>2</sub>. Biopark Terneuzen and Ghent Bio-Energy Valley have each individually already built a strong reputation as biobased enablers in the Dutch-Flemish border region. The new partnership, a cross border innovation cluster, is now set to transform the region into the main bio-economy cluster in Europe (see also annex b).

The Bio Base Europe initiative is the first of its kind in Europe. Bio Base Europe will develop a unique platform for the advancement of sustainable biobased processes that contribute to the development of bio-energy and bioproducts from renewable biomass resources and cut reliance on finite and polluting fossil resources. This transition is considered one of the primary routes towards industrial sustainability.

#### **Bio Base Europe consists of two major parts: a Pilot Plant and a Training Center.**

The **Bio Base Europe Pilot Plant**, representing an investment of about 13 million euros and based in Ghent (Belgium), will focus mainly on second generation technologies to convert agricultural waste products and non-food crops into biofuels, bioplastics and other bioproducts. Whereas the potential of these technologies has already been demonstrated in laboratory trials, the difficulty lies in taking these processes to the production scale. Currently, many new processes are slowed down or even abandoned because of these difficulties. The Pilot Plant is set to eliminate this obstacle, by providing pilot facilities that permit the scale-up of new bioprocesses to an industrial level. The Pilot Plant is a flexible and diversified pilot plant up to ton scale, capable of performing the entire value chain in a single plant: from the green resources up to the final product (a one-stop-shop). The Pilot Plant is a completely independent facility that is operating according to the open innovation model. As such, the facilities are open to all players of the bio-based economy that can hire these facilities for service.

The second core part of the Bio Base Europe initiative will include a state-of-the-art **Training Center** to address the issue of an industry-wide shortage of skilled process operators and technical maintenance specialists, especially for the biobased economy. Representing a further 8 million euros investment, the Training Center will be located near Terneuzen in The Netherlands. It will feature training facilities for biobased

activities, and is operating according to an open education model. It will provide standard, as well as company-specific, training and education focused on biobased processes.

In addition to these activities, the project also provides in general communication activities about the biobased economy (see annex a for further information).

**The above-mentioned challenges (the need for transition away from a fossil-based economy, the need to battle climate change and the rise in food prices, the need to fill the existing gap in the innovation chain of biobased production, and the need to create growth and jobs in sustainable green sectors) are all European, if not global challenges. Bio Base Europe is an important (crossborder) part of the answer to these challenges. A regional answer, with support of the national and European level.**

## 2.2 Organisational structure and activities to implement the objectives (e.g. joint secretariat, contract):

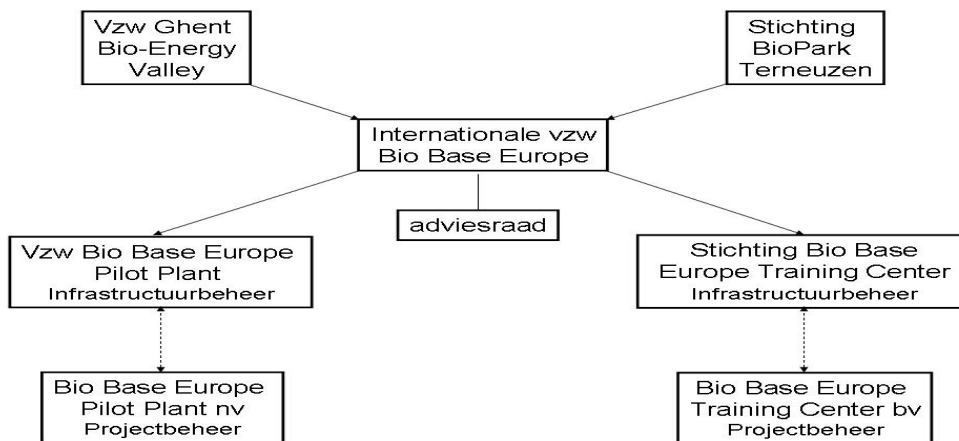
Bio Base Europe is an initiative of two founding fathers:

- Vzw Ghent Bio-Energy Valley, a public private partnership between a number of Belgian private and public partners that aim to stimulate the development of the biobased economy in the Ghent region
- Stichting BioPark Terneuzen, a public private partnership between a number of Dutch private and public partners that aim to stimulate the development of the biobased economy in the Terneuzen region

Both founding fathers already existed and have specifically created five extra structures for the management of the project:

- an international association (Internationale vzw Bio Base Europe) for the common strategic policy and management of the Interreg-project, as well as common communication, education and promotion activities;
- a belgian association (Vzw Bio Base Europe Pilot Plant) for the building and maintaining of the Bio Base Europe Pilot Plant in Belgium,
- a dutch association (Stichting Bio Base Europe Training Center) for the building and maintaining of the Bio Base Europe Training Center in the Netherlands,
- two companies (Bio Base Europe Pilot Plant nv and Bio Base Europe Training Center bv) for the exploitation of both facilities.

For the management of the project, all partners signed a contract, defining the partners' responsibilities and the allocation of funds.



All associations have partners from both countries, creating a vastly intertwined network that crosses borders between public and private sectors, local and regional actors, and Flemish and Dutch parties.

The International Association also has an advisory board (adviesraad) consisting of all large actors in both countries as well as European organisations (See annex c).

On the 12th of December 2008, Europe, Flanders and The Netherlands have joined forces within the framework of an Interreg IV project and allocated €21.8 million to Bio Base Europe to become the first open innovation and education center for the biobased economy in Europe. In total € 6 million is funded within the Dutch-Flemish Interreg IV programma from ERDF. Bio Base Europe is the largest Interreg project ever granted to the Dutch-Flemish border region.

## 2.3 How far has the cooperation measure been implemented?

Works on both the Pilot Plant and the Training Center have already started. The Bio Base Europe Pilot Plant, located in Ghent in a former port fire-station at the Rodenhuis docks, will become operational in the

second half of 2010 and will be fully operational in the first quarter of 2011. The site will be visited during the AEBR-excursion on Saturday 7-11. The Bio Base Europe Training Center will be operational in the first quarter of 2011. This entirely new building will be built in the Koegorspolder, south of Terneuzen in The Netherlands. Activities in the field of networking, clustering and promotion towards companies in the border region, Northwest Europe and far beyond have already started.

**3. Contribution of the measure (added value) to the development of the border/cross-border region:**

*(Please tick where applicable and explain shortly)*

**3.1  Economy (e.g. globalisation, necessary structural change, development of new markets, technological development)**

The transition from the current fossil-based economy towards a biobased economy is considered one of the primary routes towards industrial sustainability. When the world needs to reduce its dependency on oil, one of the alternatives is to build a biobased economy. Not only for energy (for which there are also other alternatives such as hydrogen, wind, tidal and solar energy), but also for bioproducts such as bioplastics, biode-tergents, fibres, pharmaceuticals, biocolorants, etc.

Especially in the US and Brazil, a large biobased economy already exists. The problem with the current modes of production is that food is needed to produce bioproducts. The sudden rises in corn prices in for example Mexico in 2008 were partly attributed to the increasing demand for corn from biofuel enterprises. Bio Base Europe, however, is focussing on the bioproducts of the second and third generation, based on agricultural and silvicultural residues (for example wood waste or corn cobs). Subsequently, there is no need to use food resource, alleviating the worldwide increase in food prices. The polyvalent pilot installation near Ghent will allow companies and knowledge centres to test such biobased processes on a pilot semi-industrial scale. Although the proof-of-concept of these technologies has already been obtained at the laboratory scale, the scale-up of these processes in a pilot plant is required to reach the industrial scale.

In the Training Center, process operators and maintenance technicians will be trained in order to work in biobased companies and related businesses in the processing industry. The economic benefit of this facility for the Zeeuws-Vlaanderen region, a demographically declining region, is the creation of more educational possibilities for its youth. The Training Center focuses on all sectors of the processing industry, including biobased industries.

Expectations are that 39 fulltime permanent jobs will be created directly on both sites. However, the employment growth will be much larger, considering that the project investments will substantially help the growth of companies in the Gent-Terneuzen zone (e.g. Cargill, Rosendaal Energy, Nedalco, Heros, Yara, Biomassa Unie, Bioro, Oleon Biodiesel, Alco Bio-Fuel, Genencor, Organic Waste Systems, Electrabel and Stora-Enso). Also the surroundings regions of Ostend (Greenbridge), Antwerp, North-Brabant, Flemish Brabant (see annex d), will profit from both facilities. Moreover, both facilities will operate according to the open innovation and education model and will be open for companies from the whole of Europe. It is expected that Bio Base Europe will stimulate growth in the Ghent-Terneuzen region, stimulate the creation of new companies in the region, and expand existing port activities (transport of biomass). In order to manage these increasing transports, a new sea-lock will be built in Terneuzen.

**3.2  Demographic change (e.g. birth rate, ageing, migration, effects on the labour market)**

The project helps to battle the negative effects of demographic change on the labour market in the Dutch partner region: here the already-mentioned benefits of the Terneuzen facility in the Zeeuws-Vlaanderen region apply. Zeeuws-Vlaanderen, as a demographically declining and peripheral industrial region, craves for more educational possibilities for its youth, to stop them from leaving the region.

**3.3  Climate change (e.g. draught, storms, flooding, global warming)**

Bio Base Europe is an important building block for the development of the biobased economy. This 'new green economy' will reduce the emission of greenhouse gases such as CO<sub>2</sub>. The emission of greenhouse gases by biofuels is indeed substantially reduced in comparison with the emissions of cars driving on gas or petroleum.

Since Bio Base Europe will help launching biobased production of the second and third generation, it also helps to stop further cutting of rainforests. Nowadays, large parts of the Amazon rainforest are deforested for the cultivation of soy for biofuels, which Brazilians and other peoples use to drive their cars. If it becomes possible to drive on corncobs, wood waste or even common household green waste, it's expected that this will reduce the pressure on the forests.

**3.4**        **Transport and accessibility / mobility (e.g. Trans-European Networks, cross-border traffic links, motor highways on the seas)**

Considering the enormous future risks stemming from oil shortages for the world economy, transport and mobility, Bio Base Europe and similar initiatives can be seen as important moves to maintain the way of life that we've become accustomed to, while reducing our environmental footprint.

**3.5**        **Energy supply and removal, energy efficiency (e.g. water, electricity, gas)**

Just like above, the problem of future oil shortage will eventually be solved by initiatives like Bio Base Europe, and the response to those initiatives by the private sector and consumers.

**3.6**        **Geography (e.g. dangers of territorial concentration / depletion of rural areas, centres of excellence in cross-border rural areas, polycentric development)**

Bio Base Europe is the latest in a series of projects in Euregio Scheldemond to gradually integrate the ports of Ghent and Terneuzen (creating the world's first crossborder harbour). It is becoming a cross-border 'valley', or 'centre of excellence' on several harbour-related fields, including biobased activities (together, Ghent and Terneuzen form the largest bio-port in Northwest Europe).

Nowadays, a more or less undivided zone is situated between Ghent and Terneuzen (across the border) in which harbour-related activities flourish: the Canal zone Ghent-Terneuzen. The project Bio Base Europe contributes to the crossborder geographical development since it is - up to now - the largest project to integrate the Canal Zone to one crossborder port zone.

The first project to integrate the Canal Zone (in Interreg II) focussed on an area-specific approach for the entire cross-border harbour region. The area-specific approach 'ROME' (a dutch acronym for Spatial Planning, Environment and Economy) was invented in the Netherlands and was implemented in Belgium for the first time through this Interreg project. Later on, Belgium had further developed the policy method which was an educative benefit for the Netherlands.

The research project 'Integration Harbour Ghent-Terneuzen' offered a number of actual possibilities for cooperation between both harbour managements. Comprehensive integration was for example possible concerning safety. Within the project 'Linking Safety Plans' this integration was realized.

With 'Strategic Vision Industrial zones' and 'Employers Action plan Canal zone' the employers came into action. Starting from the vision developed in the first project, in the second project an actual action plan was developed for specific initiatives (for example concerning environmental clustering, innovation, information) between companies in the canal zone. Small-sized business-to-business projects also contributed to the integration between entrepreneurs.

Education projects like Riton (e-learning), 'KAT' and 'Innotech' (technical educations focussed on innovation) and 'Samen Oogsten voor de Glastuinbouw' within the Canal Zone, as well as initiatives by Eures Scheldemond, helped create a workforce which is ever more 'binationally' educated. Crossborder labour is growing.

Around 2007, the integration was raised to a higher level, based on suggestions from the former research project. This resulted in 'Boundless Canal zone', a project which is momentarily being developed and in which both harbour managements will start to operate jointly at a number of core activities. The authorities involved will adjust their environmental planning starting from a joint spatial vision (created in consultation with companies, inhabitants, etc.). This will take place in a period in which the maritime entrance of the canal zone will be improved (initiative outside Interreg) and in which the North-South connection will be reinforced (infrastructural works on the Tractaat road, Sluiskil tunnel connection to the Westerscheldt tunnel, etc.).

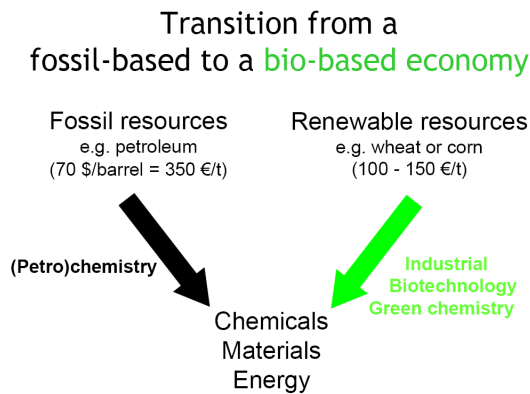
In the wake of administrative rapprochement and the contacts between companies, the idea for Bio Base Europe came from the academic world (Ghent University, professor Wim Soetaert). In Terneuzen as well as in Ghent, the clusters Biopark Terneuzen and Ghent Bio-Energy Valley were formed to promote the development of a biobased economy, coincidentally situated next to each other on both sides of the border. Upon the initiative of Ghent University, both clusters, ports, local and regional authorities, Bio Base Europe was launched as an Interreg project, uniting both everybody across the border towards a common goal. Bio Base Europe puts the Ghent-Terneuzen biobased cluster prominently on the map, as a European center of excellence with worldwide charisma and appeal.

The Scheldemond council, the highest crossborder platform in the euroregion, is already discussing further initiatives to further stimulate crossborder harbour integration and the development of the biobased economy. For example it will develop a crossborder Action Plan on Climate Change, in which supportive actions for the biobased economy and general communication efforts on the subject will be developed.



annex a) Short description of the project contents (in English, French and German)

The biobased economy is strongly developing today as a consequence of the strong price increase for fossil resources such as petroleum, the drive towards sustainable production processes and the need to reduce the emission of greenhouse gases such as CO<sub>2</sub>. The combination of these factors causes a strong penetration of biobased products and processes in a multitude of industrial sectors, particularly in the chemical industry, the energy sector, the agro-industry and, to a lesser extent, the food, textile and pharma industry. As a consequence, the transition from a fossil-based economy to a biobased economy has clearly begun.



In the current fossil-based economy, human needs are met by fossil resources (in the graph to the left), mostly petroleum. In the biobased economy, renewable resources are used, in large complexes called biorefineries. Today, petroleum has become considerably more expensive than wheat or corn, as can be seen in the graph.

A key technology for this development is industrial biotechnology, as opposed to traditional petrochemistry. Industrial biotechnology is also referred to as "white" biotechnology, white symbolizing clean and sustainable technology, differentiating it from "red" biotechnology (medical) and "green" biotechnology (directed towards genetically modification of plants).

This "third wave" of the biotechnology is developing fast and creates completely new possibilities for the production of chemicals, materials and energy. The development of the biobased economy is however seriously handicapped by a number of problems. First of all, there is a serious gap in the innovation chain, caused by the lack of pilot and demonstration facilities. These facilities are required to scale up a process from a laboratory setting to an industrial production plant. The lack of pilot facilities for biobased processes seriously limits most industrial and academic players to realize their plans and to valorise their knowledge. As a second problem, there is a general shortage of well-trained process operators with experience in biobased processes. Apart from a generally decreasing interest for technical professions by youth, the problem is reinforced through the lack of specific training facilities for biobased activities.

Bio Base Europe is a joint initiative by Europe, Belgium and the Netherlands to alleviate these problems. They have united their forces in order to speed up the development of a sustainable biobased economy in Europe.

**Bio Base Europe is building research and training facilities for biobased activities** (the production of biofuels, bioplastics, etc.), in order to speed up the development of a sustainable biobased economy in Europe. In short Bio Base Europe has the objective to:

- enable **innovation and scale-up in biobased products and processes**
- create **growth, jobs, education and international prestige** for the crossborder region
- help **battle climate change and energy shortages**
- help **to fight the rise in food prices** (2<sup>nd</sup> generation biofuels)
- create **a crossborder cluster** for biobased activities

Bio Base Europe is the result of a partnership between Ghent Bio-Energy Valley and Biopark Terneuzen and their respective stakeholders such as Zeeland Seaports, the cities of Ghent and Terneuzen, Ghent University and the provinces of Zeeland and East-Flanders. Bio Base Europe is an important building block for the development of the biobased economy in Europe and is expected to boost the current drive towards sustainable production processes and to reduce the emission of greenhouse gases such as CO<sub>2</sub>. Biopark Terneuzen in The Netherlands and Ghent Bio-Energy Valley in Belgium have each individually already built a strong reputation as biobased enablers in the Dutch-Flemish border regions. The new Bio Base Europe partnership, a cross border innovation cluster, is now set to transform the region into the main bio-economy cluster in Europe.

The Bio Base Europe initiative is the first of its kind in Europe. Bio Base Europe will develop a unique platform for the advancement of sustainable biobased processes that aid the development of bio-energy and bioproducts from renewable biomass resources and cut reliance on non-sustainable fossil resources. This transition from the current fossil-based economy towards a biobased economy is seen as one of the primary routes towards industrial sustainability. Biobased production is already transforming a broad range of industries, notably in the chemical, energy and agro-industrial sectors around the world.

**Bio Base Europe consists of three parts: a Pilot Plant, a Training Center and communication activities.**

The **Bio Base Europe Pilot Plant** will focus mainly on second generation technologies to convert agricultural waste products and non-food crops such as wheat straw, corn cobs, wood chips, Jatropha and algae oils into biofuels, bioplastics and other bioproducts. Whereas the potential of these technologies has already been demonstrated in laboratory trials, the difficulty lies in taking these processes to the production scale. Currently, many new processes are held up or even abandoned because of these difficulties. The Bio Base Europe Pilot Plant is set to

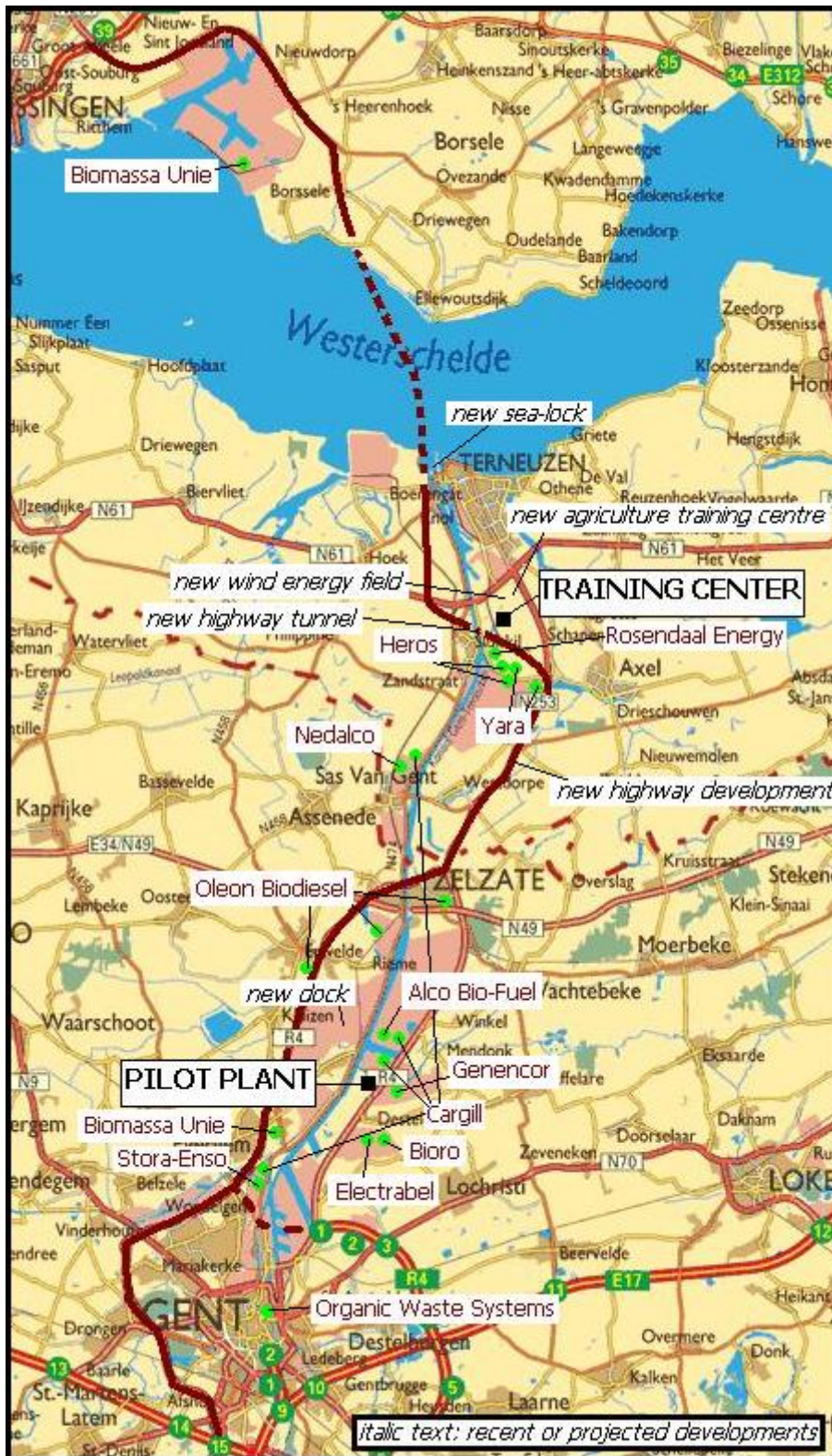
eliminate this obstacle, by providing pilot facilities that permit scaling up new bioprocesses to an industrial level. The Bio Base Europe Pilot Plant is a flexible and diversified pilot plant, that contains fermenters and reactors for green chemistry, as well as a variety of up- and down-stream processing equipment capable of producing bioproducts up to ton scale. The pilot plant is a one-stop-shop, capable of performing the entire value chain in a single plant, from the green resources up to the final product. The Bio Base Europe Pilot Plant is a completely independent facility, operating according to the open innovation model. As such, the facilities are open to all players of the bio-based economy that can hire these facilities for service. It will be available for commercial companies and research institutions throughout the world that are engaged in biobased activities. The new €13 million facility, which will be located near Ghent, Belgium, will become operational in the second half of 2010.

The second core part of the Bio Base Europe initiative will include a state-of-the-art **Training Center** to address the issue of an industry-wide shortage of skilled process operators and technical maintenance specialists, especially for the biobased economy. Representing a further €8 million investment, the Bio Base Europe Training Center will be located near Terneuzen, The Netherlands. It will feature training facilities for biobased activities, and is operating according to an open education model. It will provide standard, as well as company-specific, training and education focused on biobased processes. Bio Base Europe Training Center will also encourage networking activities, technological innovation and entrepreneurship and will develop a public information and communication program. The Bio Base Europe Training Center will be operational in the first quarter of 2011.

Bio Base Europe also develops major **communication activities** to promote the Pilot Plant, the Training Center and the biobased economy as a whole. It further aims to inform the general public, companies and students about the possibilities of the biobased economy:

- global profiling of Bio Base Europe as **the** centre of excellence for the biobased economy in Europe via a newsletter, a website ([www.biobaseeurope.org](http://www.biobaseeurope.org)), brochures, launch event, participation at conferences
- Informing the general public about bio-energy and biobased products and processes; through the website, brochures, flyers, an exhibition, an educative film, an art project, a visitor center etc.
- networking activities for entrepreneurs, researchers, venture capital providers, etc.

annex b) Map of the cross border Canal Zone Ghent-Terneuzen and its biobased activities



annex c) List of member-organisations of the advisory council

European organisations:

- EuropaBio – European federation of biotechnological companies
- Suschem – European Platform for Sustainable Chemistry

Flemish-Dutch organisations:

- Platform sustainable Canal Zone Ghent – Terneuzen
- Crossborder platform bio-energy

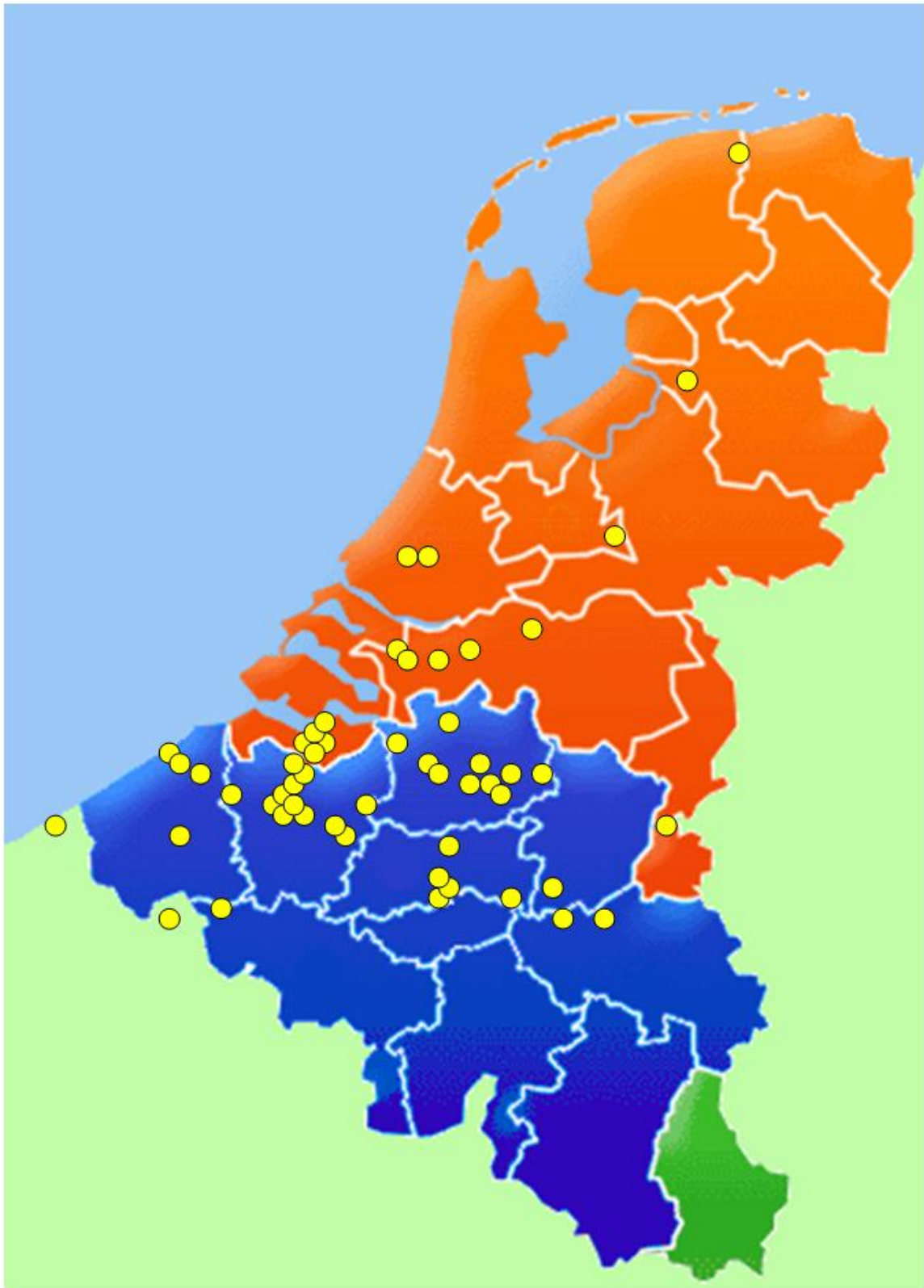
Flemish organisations:

- Essenscia Vlaanderen – federation of Flemish chemical industry
- Agoria - Flemish sectorfederation of the technological industry
- FlandersBio – Flemish Federation van biotechnological companies
- VIB - Flemish Institute for Biotechnology
- VITO – Flemish Institute for Technological Research
- ILVO – Institute for Agricultural and Fishery Research
- GENT BC (Gent Big In Creativity vzw)
- KUL - Catholic University Leuven
- VUB - Free University Brussels
- POVLT – Provincial Education Centre for Agriculture
- Power Link – energy knowledge platform Ostend – Greenbridge
- ODE – Organisation for Sustainable Energy
- Boerenbond (Farmers' union)
- BBL – Bond Beter Leefmilieu (environmental organisation)

Dutch organisations:

- VNCI – Association of the Dutch Chemical Industry
- BZW – Brabant-Zeeland employers' union
- WUR - Wageningen University and Research Centre
- TUDelft - Technical University Delft
- TNO – Technological Dutch Research Institute
- DOE – Sustainable Development
- ZLTO - Southern Agricultural Organisation
- ZMF – Zeeland Environment Organisation

annex d) Map of companies in the Benelux that expressed an interest in using the Pilot Plant



annex e) List of policy documents relevant to the investments in Bio Base Europe

Bio Base has roots in numerous strategic visions and policies of local, regional, national, European and global parties. Below is a list (original languages of organizations and reports) including some explanation in english:

	<b>Name initiative/project/measure/programme</b>
Local	<p><b>City of Ghent</b> (2007). Beleidsnota innovatie 2007 – 2012.</p> <p><b>City of Terneuzen</b> (2007). ROM(E): Grenzeloze Kanaalzone</p> <p><b>Port of Ghent GAB</b> (2007): Ondernemingsplan 2008-2012</p> <p><b>Zeeland Seaports (2005)</b>: Beleidsvisie 2005 - 2015</p>
Provincial	<p><b>Province Oost-Vlaanderen</b> (2007). Algemeen beleidsprogramma 2007 – 2012.</p> <p><b>Province Zeeland</b> (2005). Provinciaal Sociaal Economisch Beleidsplan 2005-2008</p> <p><b>Grenzeloze kanaalzone</b> (2007). Project for creating a spatial development vision for the crossborder Canal Zone Ghent-Terneuzen.</p>
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