Walloon expertise in the Wind Energy sector

Survey done by the TWEED cluster,

More info on www.clustertweed.be

Directory of the players of the wind turbine industry

Final version (15/02/2011)
The TWEED cluster

The cluster

TWEED aims to play a major role in the business development of "sustainable energy" sectors in Belgium. It tends to gather most of the Walloon companies in the sustainable energy sector (SME, Industries, Manufacturers, R&D, Audit, etc.).

TWEED consists of more than 95 members (www.clustertweed.be).

Its first mission is to support investments in production and exploitation of sustainable energy by gathering opportunities around concrete projects. The objective is to create the conditions for the achievement of qualitative industrial projects with sufficient payback levels to drain adequate financial means. For this purpose, the approach is reactive and proactive in order to stir up new projects.

The "Sustainable energy" covers: Renewable energy sources, energy efficiency, green products.

Moreover, TWEED promotes the networking between industrial or commercial companies and others actors of the sustainable energy sector and support other clusters in their activities related to sustainable energy.

The wind energy market in the Walloon region

Today, Wallonia counts 182 wind turbines in use, spread between about thirty parks. The total installed wind power equals 404 MW.

On the basis of the present wind turbines in use and those under construction we can confirm that wind turbines in the Walloon area should amount to a total installed capacity of 544 MW by 2012.

The projects now in a fairly advanced stage (projects submitted for Impact Studies, in the process of applying for permits and undergoing referral) represent a potential supplement of 960 MW.

If we take into account the rate of success over the last few months then approximately half of them should reach completion.

The total installed capacity in the Walloon area should therefore amount to nearly 1,000 MW between now and 2013/4 (source – Renouvelle- APERe).
For 2020, a 2000 MW objective for Wallonia is currently being discussed on a political level.

This milestone appears as a realist and achievable compromise (source : APERe).

In all, 1700 MW will thus need to be installed in Wallonia in 10 years.

**TWEED in the wind sector**

TWEED is currently compiling, in collaboration with other partners, a list of Walloon skills in the wind energy sector.

TWEED wants to help the companies in Wallonia to get into, or take positioning in the value chain and subcontracting of the wind energy sector.

The study can be summarized in several points:

1. To identify the prospects and the needs of subcontracting in the value chain of the wind sector (wind generator producers), to identify the challenges in innovation.
2. To carry out a cartography (skill mapping) of the Walloon actors (SME’s, R&D centers, training,...) active or potentially active in the sector of the wind energy, companies with competences which could enter the current or future value chain
3. To Promote the Walloon competences
4. To call for tenders (Walloon joint offers)
In this document, you will find a second draft of the Walloon competences mapping. The know-how of more than 65 Walloon companies is listed and their respective place in the value chain of the Wind sector is developed.

You will also find useful information about the key contact to do business with for each company.

For more information about the sector and the companies, please don’t hesitate the contact the TWEED team.

Enjoy the read,

The TWEED team

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The cluster « Sustainable Energy » in Wallonia
- Created in 2008
- More than 90 members ( SME’s, Universities, R&D centers, NPO’s, etc.)
- More than 16.000 people
- More than 5 billions € turnover *
- Mission: Clustering, Networking, Promotion, Project Leading
- 10 M€ Research Projects
- 6 main Workgroups
- 20 Events
- Main Partner for International
Content - by value chain position in the Wind Sector

Project Value Chain

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**Components Manufacturing (see next chapter)**

**Assembly**

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**Network/grid connection**

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<td>DUFOUR TRANSPORTS MANUTENTIONS SA</td>
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</tbody>
</table>
Walloon Companies Profiles
3B Fibreglass
Route de Maestricht 67/69
4651 Battice
www.3b-fibreglass.com

Contact

Full name: Peters Luc
Position: Technical Product Manager
Email address: luc.peters@3b-fibreglass.com
Telephone number: +32 476 24 57 12

Core business

Fiberglass manufacturing.
Core materials for blade shells and shear webs: TYCOR® W.

Knowledge and Skills in the Wind Energy sector

Value Chain:
- Blades
- Fiberglass reinforced components: Nacelle, Hood, Drive shaft, electrical laminates, ...

Certification: ISO 14001, ISO 9001, ISO 18001

References: Present in the wind sector since more than 10 years.
Supplier of Vestas, Enercon, Gamesa, REpower, GE, Suzlon, Siemens, Nordex, Acciona, Goldwind, LM and others blades constructors.
3E
Vaartstraat/Rue du Canal 61
1000 Bruxelles
www.3E.eu

Contact
Full name: Grandadam Claire
Position: Communications Manager
Email address: claire.grandadam@3E.eu
Telephone number: +32 2 217 58 68

Core business
3E is an independent engineering office in all domains of renewable energy, energy efficiency and energy strategy. 3E is a leading knowledge company that helps you create, develop, realize and manage projects, strategies, concepts and products. 3E's primary strengths are its highly qualified, multi-discipline team composed of engineers, scientists, as well as financial and legal experts, its deep market involvement as an independent expert and its wide international network of public and private research groups. It provides dedicated services in the following domains: Photovoltaic and thermal solar energy, Wind power (onshore, offshore), Bio-energy, Hydro power, Energy efficiency in buildings and industry, Corporate and public energy strategy. Based in Brussels, Toulouse, Beijing and Istanbul, 3E has an international vision and takes part in projects worldwide.

Knowledge and Skills in the Wind Energy sector
Project Value Chain
- Wind assessment, (also with Lidar)
- Environmental Impact analysis, site analysis.
- Project leading, Second opinion Project
- Performance analyses, technical check-up
- Power Output short-term estimation

Employement in the wind energy sector: 16

References:
- Wind assessment, wind cartography in Rwanda for the Belgian Development Agency.
- Power Output analysis, project leading with financial setting-up and grid simulation for several project near the Black Sea (40MW in Romania, 150-200 MW in Ukraine and Moldavia).
- Technical Second opinion on wind projects for « Caisse de dépôts et des consignations française »
- Project leading, file preparation for permit, environmental and impact analysis in industrial zone in Antwerp.
Advanced Coating SA
Rue de l'Avouerie 7,
4000 Liège
www.advanced-coating.com

**Contact**

**Full name**: Janssen Jean-Pierre  
**Position**: Directeur  
**Email address**: info@advanced-coating.com  
**Telephone number**: +32 42 54 50 11

**Core business**

Advanced Coating designs, develops and applies arc, cold, plasma and supersonic spraying of metals, alloys, ceramics and carbides.

**Knowledge and Skills in the Wind Energy sector**

**Value chain**: Surface treatment  
- Main shaft  
- Secondary shaft

Anti-wear surface treatment

**Certification**: EN 9100 and ISO 14001
Advanced Technologies Europe
Rue de la Terrienne 22
1301 Bierges
http://www.co2-cleaning.com

Contact

Full name: Ullens Pascal  
Position: Managing Director  
Email address: pascal.ullens@advancedtechnologies.be  
Telephone number: +32 476 77 85 00

Core business

Generators, electrical boxes, complex machineries cleaning with high pressure CO2.

Knowledge and Skills in the Wind Energy sector

Value Chain:
Maintenance of synchronous and asynchronous generators.

Standards: VCA, Nuclear.  
Reference: worked Electrabel.

Reference:
worked Electrabel.
Aerofleet
Chaussée de Wégimont, 25 A,
B-4630 Soumagne (Liège, Belgique)
www.aerofleet.be

Contact
Full name: Van Vlodorp Raphaël
Position: Responsable
Email address: info@aerofleet.be
Telephone number: +32 4 377 50 50

Core business
Composite materials and thermolaquering.

The composite materials offer great technical and environmental qualities by using the prepeg (fiberglass, of carbon and kevlar), the autoclave, and the vacuum infusion.

Knowledge and Skills in the Wind Energy sector
Value Chain:
- Blades
- Nacelle
- Others fiberglass reinforced components

Certification: ISO 9001

References: worked for FN Herstal, Belgocontrol, Techspace, Owens Corning, A380 Airbus, Pratt& Whitney, Alstom.....

In 1999, realization of a dome (cupola) of protection for the Very Large Telescope (VLT) developed by the ESO (European Southern Observatory) on the site of Cerro Paranal in Chili.
Alstom
Leuvensesteenweg 474
B-2812 Muizen
www.alstom.com/power

Contact

Full name: Gommeren Ward
Position: Country Sales Director
Email address: ward.gommeren@power.alstom.com
Telephone number: +32 478 423 124

Core business

Alstom delivers higher yields in wind energy thanks to our market-leading technologies. Building on more than a quarter of a century of designing and implementing proven and reliable solutions, we offer everything from turbines to turnkey wind farms, enhanced by years of operations and management experience, complemented with a state-of-the-art control and monitoring system.

Core business : Wind turbine supplier; Energy services; System energy management.

Knowledge and Skills in the Wind Energy sector

Expertise across the entire value chain:

Wind farm development : land localization, wind measurement, complete permitting
Wind turbine design : turbine design, component and material sourcing, manufacturing and assembly, transport, erection & commissioning
Wind farm construction : civil work, electrical cabling, grid connection
Operation & maintenance : preventive & corrective maintenance with local service team, parts delivery, upgrade packs

References :
With the unique ALSTOM PURE TORQUE™ drive train concept that protects the gearbox, Alstom brings a highly reliable and proven product range to the market.
Today Alstom is an established international wind turbine manufacturer operating wind farms in Spain, France, Italy, Portugal, the UK and Japan. Alstom’s 1,850 turbines currently generate more than 2,200 MW.

Building on the highly recognized technology of Ecotècnia, Alstom will accelerate growth in this expanding new market, aiming to develop wind power to its full potential on a global scale

ANSYS
Avenue Pasteur 4,
1300 Wavre, Belgium
www.ansys-belgium.com

Contact

Full name: Waucquez Christophe
Position: Country Manager
Email address: christophe.waucquez@ansys.com
Telephone number: +32 10 45 28 61

Core business
ANSYS develops, markets and supports engineering simulation software used to predict how product designs will behave and how manufacturing processes will operate in real-world environments. The company continually advances simulation solutions by, first, developing or acquiring the very best technology; then integrating it into a unified and customizable simulation platform that allows engineers to efficiently perform complex simulations involving the interaction of multiple physics; and, finally, providing system services to manage simulation processes and data — all so engineers and product developers can spend more time designing and improving products and less time using software and searching for data.

Knowledge and Skills in the Wind Energy sector

Value chain:
Most wind turbine power production comes from large machines, in the 2 MW to 3 MW range for land-based units. The turbines are huge, with blade lengths approximately 50 meters. As a result of the sheer size, engineering simulation is both important and challenging. Full-scale physical testing is difficult, time consuming and expensive. At the same time, the cost of getting it wrong is prohibitive. ANSYS tools uniquely offer an optimal combination of high fidelity and breadth, empowering product designers to improve virtually every aspect of wind turbine design. Wind turbine design involves the interaction of a range of physical phenomena and market demands:

- The aerodynamics comprise changing wind direction and speed, making it necessary for designers to understand the flow at the turbine installation and blade boundary scales as well as effects from the unsteady rotor–tower interaction.
- Rotors must be light, strong and flexible, which indicates the use of advanced engineered materials.
- Shaft and gearbox loads are high, yet operators demand dependability and low, predictable maintenance costs.
- The industry calls for high electric generator efficiency, even for low wind speeds. The electrical control system must safely manage operation of the turbine’s overall operating conditions.
- All mechanical components must be strong to meet reliability and durability targets. At the same time, components must be light weight — as they are usually mounted 100 meters above ground.
- Nearby communities and governments demand low noise and minimal environmental impact.

In the same time, the application of smaller units is growing at fast pace. These machines provide personal and distributed power generation, sometimes in remote areas. The engineering challenges — and benefits of using the broad technology offering from ANSYS — are the same as for large industrial installations.

Actual employment in the sector: Benelux : 3
References: 2B Energy, Mecal. Many companies in Europe, eg: Suzlon, RePower, Enercon, Nordex, Conergy, Areva (Multibrid), Siemens Wind, Mitsubishi Power, Germanischer Lloyd...
Arcadis

www.arcadisbelgium.be

Contact

**Full Name:** Emmanuel Parent  
**Email Address:** E.Parent@arcadisbelgium.be

Core business

ARCADIS is an international group that advises, designs, plans and supplies engineering and management services in the environmental and construction infrastructure sectors.

Knowledge and Skills in the Wind Energy sector

**Value chain:**

- **Impact study:** Environmental impact by Wind Parks.  
- **Stability study:** Foundation and structural dimensioning.

**References:**

1. Eldapasco nv  
   EIE Offshore Wind Park – North Sea

2. C-Power nv  
   EIE Offshore Wind Park – North Sea

3. Afdeling Natuurlijke Rijkdommen & Energie  
   Vulnerability map for the implantation of a Wind Park in the Oriental Flanders Region.

4. Nike Laakdal  
   Feasibility and EIE study of the implantation of a Wind Park.

5. Belwind nv  
   EIE Offshore Wind Park – North Sea
ArcelorMittal Ringmill s.a.
Zoning Industriel CMI
Avenue Greiner, 1
B-4100 Seraing Belgium
www.arcelormittalringmill.be

**Contact**

**Full name:** Frédéric Binamé  
**Position:** Commercial Director  
**Email address:** frederic.biname@arcelormittalringmill.be  
**Telephone number:** +32 4 330 35 35

**Core business**

Subsidiary of the ArcelorMittal Group, ArcelorMittal Ringmill (AMR) is specialized in the manufacturing and heat processing of steel rolled rings.

**Knowledge and Skills in the Wind Energy sector**

**Value chain: Components**

AMR is specialized in ring rolling. These forged parts are used in 4 different applications for the Wind Energy market:

- Slewing rings
- Large bearings
- Gear boxes
- Coupling systems between shaft and gearbox

70% of AMR turnover is due to the wind energy.

**Actual employment in this sector:** 135

**References:**

AMR counts among its clients the 4 most important wind turbines gearboxes manufacturers.

20 years experience in Wind Energy market: first ring delivered to this market at the beginning of the nineties.

World class bearings manufacturers rely on AMR since several decades.
Armacell Benelux s.a.
Rue des Trois Entités 9
B-4890 Thimister-Clermont Belgium
www.armacell.com

<table>
<thead>
<tr>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full name:</strong> Natacha Bréau, Cohen Frans</td>
</tr>
<tr>
<td><strong>Position:</strong> Marketing Communication Manager, Business Development Manager Technical Foams Europe</td>
</tr>
<tr>
<td><strong>Email address:</strong> <a href="mailto:natacha.breau@armacell.com">natacha.breau@armacell.com</a>, <a href="mailto:frans.cohen@armacell.com">frans.cohen@armacell.com</a></td>
</tr>
<tr>
<td><strong>Telephone number:</strong> +32 87 32 50 75, +32 87 32 50 70</td>
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</table>

<table>
<thead>
<tr>
<th>Core business</th>
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<tbody>
<tr>
<td>In recent years, PET foams have been able to secure an established place among the core materials for sandwich constructions, due to their recyclability, good technical properties, and excellent value for money. ArmaFORM PET foams have high mechanical strength in combination with residual flexibility and excellent fatigue resistance. They also display slight variances in density and, unlike natural core materials, their availability is ensured. In addition, PET foams have the advantage of high temperature resistance and withstand short-term curing temperatures of up to +180 °C. This heat resistance leads to considerable savings in composite production methods (e.g., the prepreg procedure). As a pioneer in the field of PET foam technology, Armacell was the first manufacturer to succeed in greatly improving the flexibility of the material, thus qualifying PET foams for industrial applications. Armacell is already a reliable partner for wind energy and has a worldwide network of production facilities and is excellently positioned not only in Europe, but also in the USA and Asia.</td>
</tr>
</tbody>
</table>

More details ? www.armacell-foam-cores.com
Ateliers de la Meuse
Rue Ernest Solvay 107
4000 SCLESSIN
www.alm.be

Contact

Full name: Limbort Fred
Position: General Manager
Email address: fred.limbort@alm.be
Telephone number: +32 475 71 99 33

Core business

Manufacturing of heavy and large steel parts/components (up to 200 tons).

Knowledge and Skills in the Wind Energy sector

Components Value Chain:
- Hub
- Main shaft
- Low-speed shaft
- Bearing ring and yaw system
- Nacelle

Huge means of production and room available: TV up to 9.5m diameters, High capacity milling and turning machines, Boring machines (250t), heavy lifting capacity (300-400 tons). Variety of welding and other mechanical production equipment.

Certification: ISO 9001/2000

Subcontracting needs: small mechanical components, casting
Ateliers Jadot
Rue Château de Fairoul 6
5650 FRAIRE
www.ateliersjadot.be

Contact

Full name: Jean-Claude Jadot  
Position: Managing Director  
Email address: secretariat.jadot@skynet.be  
Telephone number: +32 71 65 00 73

Core business

Mechanical engineering, Precision mechanics, Components/technologies integration and assembly, designing.
Other renewable energy technologies integration.

Knowledge and Skills in the Wind Energy sector

Project Value Chain: cost analysis and maintenance

Components Value Chain:

- Hub  
- Main/secondary shaft  
- Servo-motor  
- Gearbox  
- Screw  
- Control system

References:

Already been working in the wind sector: small wind turbines

Subcontracting needs:

Part/Component machining when the size is out of our machine’s dimensional limits, thermal treatment, coating, automation and IT integration.
Ateliers Pol Sauvage SA
Parc Industriel de Stembert,
4800 Verviers
www.ateliersauvage.be

Contact

Full name: Sauvage Marc
Position: Administrateur délégué
Email address: ateliers.sauvage@skynet.be
Telephone number: +32 87 31 22 77

Core business

Maintenance, large size components and parts machining, gears manufacturing, reducers and transmission maintenance.

Knowledge and Skills in the Wind Energy sector

Components Value Chain:
- Hub
- Main/secondary shaft
- Bearing rings, yaw system

Project Value Chain: Maintenance
- Reducers maintenance and fix
**ATM-Pro**  
Rue Saint-André, 7  
1400 Nivelles  
www.atmpro.be

### Contact

**Full name:** Dr. Alexis DUTRIEUX  
**Position:** Managing Director  
**Email address:** alexis.dutrieux@atmpro.be  
**Telephone number:** + 32 67 84 33 04

### Core business

Environmental software, impact studies, emergency plans, risk management.

### Knowledge and Skills in the Wind Energy sector

**Value chain:** Wind study and micro-siting

Thanks to the Maestro Wind software, ATM-Pro will use meteorological models that enable the study of atmospheric movement. These models, developed by ATM-PRO, are adaptable to the local scale from several hundred metres to several kilometres or tens of kilometres and are therefore particularly well adapted to the study of potential Wind turbines.

Maestro Wind is a meso-meteorological model adapted to wind field determination on a local scale (extending from several kilometres to several tens of kilometres with a horizontal grid resolution from ~ 100 m to ~ 10 km). This model resolves the air movement equations on a grid following the relief.
AVD
Rue du Bosquet 35, Zone Industrielle sud II
1402 NIVELLES
www.avd.be

Contact
Full name: Tytgat Daniel
Position: Manager
Email address: d.tytgat@avd.be
Telephone number: +32 67 49 37 43

Core business
Composite materials for insulation and plain bearings; Industrial drive components; Measuring and weighing equipment; Mechanical power transmission

Knowledge and Skills in the Wind Energy sector
Project Value Chain:
- Assembly

Components Value Chain:
- Main Shaft
- Mechanical Brake system
- Coupling system
- Hydraulic and pneumatic brake system for rotors
- Hydraulic brake for yaw system
- Transmission/brake assembly analysis

Certification: ISO

References: Supplied brakes and couplings for Turbowinds and AREVA Fair Wind. More than 5 years experience in the wind sector.
Beltech SPRL
Rue de l’industrie 2
4530 Villers-le-Bouillet

Contact

Full name: Sougné Philippe
Position: Gérant
Email address: contact@beltech.be
Telephone number: +32 476 73 15 89

Core business

- Industrial lubrication
- Centralized oiling

Knowledge and Skills in the Wind Energy sector

Value chain:

- Maintenance
**BEWIND SA**
Négundo Innovation Center  
13 rue du Progrès  
7503 FROYENNES  
www.bewind.be

**Contact**

**Full name**: Devalez Patrice  
**Position**: Chief Executive Officer  
**Email address**: bewindeoliennes@yahoo.fr  
**Telephone number**: +32 475 73 35 02

**Core business**

Design, manufacturing and installation of wind turbine (30 à 100 kW).

**Knowledge and Skills in the Wind Energy sector**

<table>
<thead>
<tr>
<th>Project Value Chain maximum 300 kW</th>
<th>Components Value Chain maximum 300 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 – Wind-turbine:</strong></td>
<td>Blade</td>
</tr>
<tr>
<td>* motor, generator</td>
<td>Hub</td>
</tr>
<tr>
<td>* blades (number and form)</td>
<td>Main Shaft</td>
</tr>
<tr>
<td>* rotation speed of the nose</td>
<td>Bearing Ring/ Yaw system</td>
</tr>
<tr>
<td>* gearbox and generator training</td>
<td>Glass fiber composite</td>
</tr>
<tr>
<td>* steering of the installation (start, stops, net connexion, etc..)</td>
<td>Mast/tower/base</td>
</tr>
<tr>
<td>* tower (type, material, height, frequency, etc..)</td>
<td>Nacelle</td>
</tr>
<tr>
<td><strong>2 – Production cycle:</strong></td>
<td>Gearbox</td>
</tr>
<tr>
<td>* semi-automated assembly</td>
<td>Mechanical brake system</td>
</tr>
<tr>
<td>* reducing production time</td>
<td>Synchronous generator</td>
</tr>
<tr>
<td>* reducing components number</td>
<td>Asynchronous generator</td>
</tr>
<tr>
<td><strong>3 – Using of wind-turbines:</strong></td>
<td>Cooling system</td>
</tr>
<tr>
<td>* increase availabilities</td>
<td>Controller</td>
</tr>
<tr>
<td>* increase using period</td>
<td>Servo-motor for yaw</td>
</tr>
<tr>
<td><strong>Subcontracting:</strong> foundation, lift/crane, blades</td>
<td>Bearing ring</td>
</tr>
</tbody>
</table>

**Certification**: IEC 61400 (current).
Bureau d’étude Greisch
Liège Science Park - Allée des Noisetiers, 25
B4031 LIEGE
www.greisch.com

Contact

Full name: Alain LOTHAIRE
Position: Bridges and Structural Works Advisor
Email address: alothaire@greisch.com
Telephone number: +32 43 64 11 49

Core business

Structural, architectural and special techniques studies.

Knowledge and Skills in the Wind Energy sector

Value chain:

1. **Construction components**: Structural design of folding wind turbines (25 kW) for onshore wind turbines and Micro-turbines.
2. **Site organisation**: Foundations study for high power units (1.5 to 3.0 MW) and Micro-wind turbines (2 to 20 kW).

Actual employment in the sector: 1 to 2

References: Greisch is active in this sector since 2004.
**CAPAUL SA**

Industriestrasse 39  
4700 Eupen  
www.capaul.be

**Contact**

**Full name**: Fickers Alexander  
**Position**: Production Manager  
**Email address**: alexander.fickers@capaul.be  
**Telephone number**: +32 495 52 98 66 or +32 87 59 55 60

**Core business**

Specialized in high-precision machining and in the assembly of very complex sub-assembly, Capaul SA manufactures high-precision mechanical components. The company is active in aeronautics, medicine, the textile industry, the car industry, the railways, the petrochemical industry, the manufacture of compressors and of armatures and in many other fields.

Their high technology production plants turn, mill, grind, erode and control your pieces according to specifications (CAD systems, plant with total CNC, air-conditioned measurement compartment | simultaneously 5-axis machining, φ up to 1250mm, capacity of measurement 3D, 3000x2000x1000 mm on a Leitz machine).

Capaul also offers the complete integration of mechanical subassemblies (study, welding, machining, assembly and control). The required quality is verified and certified by a highly qualified team. Our production is monitored in accordance with the ISO 9001/2000 + EN 9100/2003 norm.

**Knowledge and Skills in the Wind Energy sector**

- Hub  
- Main Shaft/ Rotor Shaft  
- Secondary shaft  
- Bearing rings  
- Gearbox  
- Mechanical Brake System  
- Synchronous and asynchronous generators  
- Direction/ Servo-motor | Yaw system

**Sub-contracting needs**: Thermal treatment

**Certifications**: ISO 9001-2008 and EN 9100.
CE+T
Rue du Charbonnage 12
4020 Wandre
www.cet.be

Contact
Full name: Bleus Paul
Position: Directeur R&D
Email address: p.bleus@cet.be
Telephone number: +32 43 45 67 40

Core business
Design, manufacturing and sales of modular power converters and inverters (from 100kVA to 640kVA).

CE+T product offer includes:
> AC/AC converter
> DC/AC modular inverter for telecom infrastructure
> DC/AC modular inverter for high industry standards
> Modular UPS for ICT, Datacenter, and industrial application
> Solar DC/AC Inverter for alternate energy (Grid and Off Grid)
> DC power system for telecom and industry (Domestic market)

Installations, service, site audits, maintenance

CE+T has developed the most efficient Inverter available

Knowledge and Skills in the Wind Energy sector
Components Value Chain:
- Power Electronics
- Transformer
- Converter/inverter
- Control system

Project OPTISHARE in collaboration with ULg (solar-wind turbine mix)
Cegelec
Cegelec Industry
Rue Santos Dumont, 3
6041 Gosselies
www.cegelec.be

Contact

Full name: Etienne BERTRAND
Position: Business Development Manager
Email address: etienne.bertrand@cegelec.com
Telephone number: +32 71 60 65 60

Core business

Cegelec offers installation, services and maintenance of industrial processes with regards to electricity, automation, instrumentation, energy and high voltage systems, networks, analyser systems, telecommunication, steel structures, steel plates, piping, metal constructions and machinery.

Knowledge and Skills in the Wind Energy sector

Value chain:
- Electricity and instrumentation
- Mechanical and piping
- Industrial multitechnical maintenance
- Shutdowns and revisions
- CAD/CAE / Engineering / Commissioning
- Industrial automation
- ICT installations
- Analysers and metering systems
Cenaero A.S.B.L.
Rue des Frères Wright 29
6041 Gosselies
www.cenaero.be

Contact

**Full name:** Roger Cocle  
**Position:** Sales & Business Development Manager  
**Email address:** roger.cocle@cenaero.be  
**Telephone number:** +32 71 91 93 30

Core business

Cenaero is an applied research center providing to any company, involved in a technology innovation process, high fidelity numerical simulation methods and tools to invent and design more competitive products.

Knowledge and Skills in the Wind Energy sector

**Value chain:** Engineering
- Manufacturing of components  
  - Innovative welding processes for towers, Assembly optimization of manufactured parts, ...
- Structural design analysis and optimization  
  - Design and optimization of tower, main-frame, hub, blades: shape and materials, ...
- Cost performance tradeoffs  
  - Performance requirements with low cost objectives starting in the early design phase
- Process design, modeling and simulation for composite parts  
  - Thermal and chemical shrinkage of T, Z, I, L, Omega shaped profiles, double curved stiffened structures, from both open and closed mold processing routes, ...
- Structural integrity and damage tolerance analysis  
  - Analysis of the overall load carrying capacity in the presence of defects, Analysis of the stability of manufacturing defects or detected cracks, ...
- Large scale structural analysis on HPC infrastructure  
  - Up to 50MDOFS FE simulations with material and geometrical non-linearities, macro-elements, bushings, contacts, composite shells or volumic shells
- CFD-based analysis  
  - Multi-physics flow problems around complex geometries (100+ MDOFs) with Argo (ALE finite volume/element second-order solver), ...

**Actual employment in the sector:** 2 engineers/Ph.D.

**References:** Cenaero has over 3 years experience in this sector.
Centre de compétence Forem Formation Environnement
Rue Pierre et Marie Curie, Parc Initialis,
B-7000 MONS
www.leforem.be

Contact
Full name: Guibert DEBROUX
Position: Manager
Email address: guibert.debroux@forem.be
Telephone number: +32 65 88 10 21

Core business
Professional training, competences center

Knowledge and Skills in the Wind Energy sector

Value chain: Training
Le FOREM has experience as much in the electrical as the electro-mechanical and engineering fields (mechanics, hydraulics, pneumatics, programmable controllers, etc...) and the training of personnel. The training equipment is kept completely up to date.

Actual employment in this sector: 6
Direct employment:
- 2 people in the Skills Centre
- 1 person at Le FOREM, Charleroi (HQ)
- 3 people with training partners

References:
Since 2004, Le FOREM has organised courses of between 3 to 6 years duration on renewable energy sources, such as, for example, wind energy, aimed at future project managers.

In December 2009, Le FOREM will launch its first course in wind turbine maintenance in partnership with HELHA (Haute Ecole de Louvain en Hainaut) and the Lycée Bazin at Charleville-Mézières (France). This training will include BZEE certification.
CG Power Systems
Rue Vital Françoise 220,  
6000 Charleroi 
www.cgglobal.be

Contact
Full name: Declercq Jan  
Position: Chief Business Development Officer  
Email address: Jan.Declercq@cgglobal.com  
Telephone number: +32 15 283 240

Core business
CG Power Systems Belgium N.V. is one of the leading manufacturers of three-phase transformers in the world. The group has manufacturing plants and subsidiary companies on 3 continents: 6 manufacturing plants in the world: one each in Belgium, Ireland, Hungary, Canada, the United States of America and Indonesia.

More than 600 000 transformers installed in 135 countries worldwide and a production of more than 30 000 transformers each year.

3500 people are employed actually at CG Power Systems.

Knowledge and Skills in the Wind Energy sector
Value Chain:
- Transformer
CITIUS Engineering
Head office: Montfort, 36; 4130 Esneux
Operations: Rue d’Abhooz 31, 4040 Herstal
www.citius-engineering.com

Contact

Full names: Grégory Reichling, Fabien Defays
Positions: Directors
Email address: info@citius-engineering.com
Telephone number: +32 478 76 00 62

Core business

Citius is an engineering office specializing in mechanical and electrical engineering and mechatronics. Its main activities concern:

- Conception, modification and upgrade of special machines, systems and test benches
- Modification and adaptation of industrial infrastructures (process, fluids, energy, piping, etc.)
- Industrial and technical project coordination and management

Citius undertakes turn-key projects for its customers in Belgium and abroad.

Knowledge and Skills in the Wind Energy sector

Value chain: Pre-feasibility and feasibility study

Feasibility studies, concepts design, system analysis, project management and coordination, analysis and selection of state-of-the-art solutions, business plan, etc...
CMI Group

Avenue Greiner, 1
BE 4100 Seraing
www.cmigroup.com

Contact

Full name: Didier Leboutte
Position: Group Development Direction
Email address: didier.leboutte@cmigroupe.com
Telephone number: +32 (0) 4 3 30 24 13

Core business

The CMI group constructs, modernises and ensures the maintenance of equipment in the energy, defence and industrial sectors.

Knowledge and Skills in the Wind Energy sector

Value chain: Maintenance

Company operational in the maintenance of onshore and offshore Wind Turbines by supplying the following services to their clients:

- construction support
- maintenance
- renovation of components
- hydraulic tightening
- definition and revision of a maintenance plan

References:
CMI is active in the offshore wind park project (C-Power): The CMI technicians ensure the maintenance of these 5MW turbines.
Collignon Eng.
Z.I. de Grâce-Hollogne, Rue de l’Expansion 45,
4460 GRACE-HOLLOGNE
www.collignon.net

Contact

Full name: Delporte Hervé
Position: Energy Manager
Email address: hdelporte@collignon.eiffage.be
Telephone number: + 32 498 15 13 82

Core business

Low, Medium and High Voltage electricity work, telecommunication, automation, instrumentation, etc.

Knowledge and Skills in the Wind Energy sector

Project Value Chain:

- Grid connection: Active on the whole value chain of the power infrastructure.

Collignon Eng., member of the group « Eiffage », positions itself as the privileged partner for the whole wind turbine electrical integration.

Certification: OHSAS 18001, ISO 9001 et ISO 14001

Reference: already worked on wind park projects.
De Simone
Rue Fontenelle 18
6240 Farciennes
www.desimone.be

Contact
Full name: Sente Frédéric
Position: Managing Director
Email address: frederic.sente@desimone.be
Telephone number: +32 478 56 52 31

Core business
Industrial machinery and equipment manufacturer, sun trackers, and hybrid system (Solar/Wind) called « duovolt »

Knowledge and Skills in the Wind Energy sector
Components Value Chain:
- Support System/ Framework/ Mast/ Tower for small wind turbines
- Yaw system

De Simone manufactures full systems

Certification: VCA

Reference: More than one year in the small power wind turbine sector
Dexia Banque
Boulevard Pachéco 44
1000 Bruxelles
www.dexia.be

Contact

Full name: Catherine Dumonceaux, Thierry Blanpain
Position: Investment Manager, Project Finance Energy
Email address: catherine.dumonceaux@dexia.com, thierry.blanpain@dexia.com
Telephone number: +32 2 222 21 37, +32 2 222 22 17

Core business
Retail Bank, Private Equity, Structured Finance, Corporate Finance, Corporate Banking

Knowledge and Skills in the Wind Energy sector

Value Chain:
Funding in Equity and Debt
DMPI
Rue du Marché 6, 4950 Waimes
www.dmpi.be

Contact
Full name: Philippe Warland
Position: Managing Directeur
Email address: philippe.warland@dmpi.be
Telephone number: +32 80 67 98 63

Core business
Large size machining (batch or unit), mecano-welding and components assembly.

Knowledge and Skills in the Wind Energy sector
Value Chain:
- Wind turbine hub
- Main/Rotor shafts
- Bearing rings
D.T.A. sa
Z.I. des Hauts Sarts - Zone 2
Rue Bon Espoir, 13
4041 HERSTAL (Milmort)
www.dta.be

Contact

Full name: Carlo Sollami
Position: Administrateur
Email address: direction@dta.be
Telephone number: +32 495 24 40 78

Core business

Industrial electrical works

Knowledge and Skills in the Wind Energy sector

Value Chain:
- Network connection
- Maintenance
- Transformer

Actual employment in this sector: 17

References: Installation of “Elena Energy Windturbine”
DTI
Rue de la gare, 35
5100 NANINNE
www.dti-be.com

Contact
Full name: Montoisy Christophe
Position: Managing Director
Email address: cmontoisy@dti-be.com
Telephone number: +32 496 52 15 98

Core business
Develops solutions combining electronic and data-processing: solutions for performance measurement, wear and vibration measurements + any data transmission according to the needs.
Develops control monitoring interfaces, alert system for remote installations.

Knowledge and Skills in the Wind Energy sector
Value Chain:

  Structural analysis
  - Performance, wear and vibration analysis.

  Control system
  - Data processing and transmission, specialized in data acquisition
  - Solutions for control monitoring, alert system, automation, etc.

DTI provides an integrated service from consultancy to prototyping, production and after-sales service.

Certification/References: DTI develops solutions complying with norms from the medical and industrial sector, EMC, CE, etc.
DUFOUR Transports Manutentions sa
Zoning Industriel de Tournai-Ouest,
Rue Terre à Briques 18
7522 MARQUAIN
www.dufour.be

Contact

**Full name**: Frédéric Dufour  
**Position**: Managing Director  
**Email address**: info@dufour.be  
**Telephone number**: +32 475 93 98 30

Core business

Heavy loads cranes; Exceptional Transport and Wide Load Transport Services; Wind turbine assembly and maintenance; Boom lift up to 90 m; civil engineering work - road plan and foundation work; Concrete delivery; Fuel delivery; Container renting

Knowledge and Skills in the Wind Energy sector

**Value Chain**: site organisation/developments, transport and assembly

- Site development/ landscaping
- Road works
- Transport
- Assembly
- Maintenance

Heavy load lift/cranes, transport, earth-moving, foundation work

**Certifications**: ISO 9001, ISO 14000, & Mase.

**References**:

This company has been working for more than 7 years in the wind sector for OEMs; Enercon, Gamesa, GE, REpower, Vestas, Turbowinds, Nordex, Siemens et WinWind.
ECV
Rue du Travail 5,
4460 Grâce-Hollogne
www.ecv-sa.be

Contact

Full name: Steegmans Antoine
Position: Directeur général
Email address: asteegmans@ecv.eiffage.be
Telephone number: +32 494 53 41 09

Core business

- LV/MV/HV Electrical boards/cabins. Turnkey projects for industries (LV-HV).
- Consultancy/engineering in electricity- automation - instrumentation
  - Automation
  - Maintenance of electrical installations, 24H/24H
  - Technical assistance
  - Feasibility study and integration of CHP solutions
  - Supply of complete electrical cabins for Wind Park + optical fibers

Knowledge and Skills in the Wind Energy sector

Project Value Chain:

- Grid connection
- Maintenance
- HV cabins

Certifications: ISO 9001; VCA - LSC** -ISO14001 2010)

References: more than 18 months experience in the wind sector, works with Windvision, SPE, etc.
Electrawinds Mouscron
Rue des Garennes 17
7700 Mouscron
www.electrawinds.be

Contact

Full name: Bekaert Herman, Mosbeux David
Position: Project manager, manager
Email address: herman.bekaert@electrawinds.be, david.mosbeux@electrawinds.be
Telephone number: +32 0478 84 36 14, +32 489 77 52 99

Core business

Electrawinds is a Belgian energy company which produces green energy via wind turbines, biomass power plants, and solar farms. The various forms of technology are developed, built, and exploited by Electrawinds itself. Electrawinds has operational projects in Belgium, France, Italy, South Africa and Romania. The company is furthermore in the process of expanding its operations in Eastern Europe (Bulgaria, Poland, and Serbia) and is also active in Namibia. The Electrawinds headquarters are located in Ostend, Belgium, and this recently established energy company employs about 200 staff.

Knowledge and Skills in the Wind Energy sector

Value Chain:
- Formation
- Wind study
- Environmental impact study
- Cost study
- Project management
- Landscaping (Space settlement)
- Access road settlement
- Transport
- Assembling
- Network connection
- Exploitation
- Maintenance

References:

In the wind sector since 1998. Worked for Enercon, Gamesa, Vestas, REpower, GE, Siemens and Nordex.
Emphase environnement – SPRL
7, place Dekeyser
7940 Cambron-Casteau
www.emphase.be

Contact

**Full name:** Frédéric Musin  
**Position:** Director  
**Email address:** frederic.musin@emphase.be  
**Telephone number:** +32 495 25 44 67

Core business

Feasibility study for the implantation of wind parks, environmental impact study, single permit and road permit requests, wind turbine worksite security co-ordination, wind turbine technology and maintenance training.

Knowledge and Skills in the Wind Energy sector

Value chain:

1. **Training:** Training of maintenance technicians for large wind turbines.
2. **Pre-feasibility and feasibility studies:**
   - *Onshore wind turbines:* Environmental impacts (objective impacts; acoustical, shade given... and subjective; landscaping) and Wind turbine technology. Various computerised tools have been created and validated during the course of the company’s activities (shade provided, visibility, photo shoots, etc...).
3. **Components:**

**Actual employment in the sector:** 2

References:

Since 2000, it has been behind the creation of impact evaluation methods used in the Walloon region.

Emphase has 9 years of experience: Around 400 MW followed up in projects and 60 MW implemented.
ENEAS s.a.
Rue des Anglais, 5
4430 ANS
www.eneas.be

Contact

Full name: Georges Bora
Position: Project Manager
Email address: g.bora@eneas.be
Telephone number: +32 473 74 59 70

Core business

Optimisation of energy procedures in the industry, production applications in renewable energy (biomass, wind turbines), cogeneration etc...

Knowledge and Skills in the Wind Energy sector

Value chain:

1. Pre-feasibility and feasibility study:
   Project management
   Pre-feasibility study
   Feasibility study
   Single permit

2. Road maintenance organisation:
   Civil engineering

3. Network Connection:
   Electrical connection
   Constructors
   Launch

Actual employment in the sector: 24

References:
ENEAS has 4 years of experience in onshore installations.
Monde Wind Park – France (17 wind turbines 2.2 MW Re Power);
Amiens Wind Park – France (21 wind turbines 760 kW Enercon);
Brittany Wind Park – France (42 wind turbines 2.2 MW Re Power)
Eolola (Wind win)

www.eolola.be

Contact

Full name: Bob HENROT
Position: Responsible
Email address: bob.henrot@gmail.com
Telephone number: +32 473 66 21 56

Core business

Weatherman since 1993. He realized some wind studies for aerodrome runways.

Knowledge and Skills in the Wind Energy sector

Value chain:
- Wind study:
  - Analysis
  - Expertise and pre-expertise
  - Pre-diagnostic
  - Configurations optimisation
  - Production forecasting
  - Etc...
## Contact

**Full name**: Verhulst Didier  
**Position**: Gérant  
**Email address**: info@etsverhulst.be  
**Telephone number**: +32 43 77 92 92

## Core business

HV/MV cabins and transformers.

## Knowledge and Skills in the Wind Energy sector

**Value chain**:  
- Network connection  
- Transformer  
- Cables

**Certification**: ISO 9001 and VCA

**References**: In the wind sector since 12 years. Worked for Enercon, Luminus, Energie 2030 and SPE.
**Eutomation & Scansys**

Rue de l’industrie 28b  
4700 Eupen  
www.scansys.be  
www.eutionation.be

**Contact**

**Full name:** S. Skopienski, Philipp Breuer  
**Position:** Technical & sales engineer  
**Email address:** sts@scansys.be, p.breuer@eutomation.be  
**Telephone number:** +32 87 68 05 61, +32 473 96 76 66

**Core business**

Eutomation: Automation, assembly procedures, robotic, …  
Scansys: Dynamic testing benches, data acquisition,…

**Knowledge and Skills in the Wind Energy sector**

**Value chain:**

- Assembly  
- Monitoring and control  
- Mechanical and electronic studies  
- Machining  
- Cables  
- Programming  
- Montage  
- Refinement, adjustment and calibration  
- Installation on site and worldwide formation
GDF Suez Energie Services: Fabricom – Axima Contracting - Cofely Services – Tractebel Engineering

Rue des anglais 7, 4430 Ans
Chaussée de Gilly 263, 6220 Fleurus
www.gdfsuez.com

Contact

Full name: Luc Tambuyser
Position: Belgian Operations, Area Sales Manager
Email address: Luc.Tambuyser@fabricom-gdfsuez.com
Telephone number: +32 71 24 28 63

Core business

Supplier of energy and services in the energy sector: Engineering, accomplishment, maintenance, management and optimisation.

Knowledge and Skills in the Wind Energy sector

Value chain: Onshore and Offshore Wind Park Installation
- Installation
- Assembly
- BT and MT electrical networks.
- Fibre optic network ‘data’.
- MT Equipment for wind turbines.
- Electrical equipment testing and configuration, cable dielectric testing.
- Network connection (GRD or ELIA)
- Cabins and MT / BT electrical protection.
- Project underway with Pauwels for the voltage transformer regulators.
- Environmental Impact Assessment and Permitting
- Pre-feasability and feasibility studies, incl. site screening
- EPCM (Engineering, Procurement, Construction Management) and Owner’s Engineer
- Wind assessment
- Ground & site analysis

Potentially: Civil engineering, drainage, foundations and roads.

References:
Projects underway and installations undertaken for ± 800MW, N°1 in Belgium for Wind Park installation.
Faymonville
Schwarzenbach 12
B – 4760 BÜLLINGEN
www.faymonville.com

Contact

Full name: Alexander Bandel
Position: Sales Germany North-East-South(east) & Windenergy
Email address: Alexander.bandel@faymonville.com
Telephone number: +49 162 253 70 81

Core business

As biggest Belgian and European-wide leading manufacturer of semi-trailers for the heavy haulage, with payloads from 20 to above 1,000 to, Faymonville defends its concepts since more than 40 years across Europe, and even worldwide. The aim is to provide the optimal solution for every transportation need outside the norms, whether for the transport of construction machines, wind turbine elements, boats, elevators, glass, wood or concrete elements.

Knowledge and Skills in the Wind Energy sector

Value chain:
- modular trailers, 2 – 6 axle lines, different loading platforms, interchangeability with other existing brands
- self-propelled modular trailers
- lowbed trailers with 2 to 8 axles, with extendible vessel bridge
- stepframe trailers with 3 to 10 axles and extendible loading platform
- flatdeck trailers extendible up to 52 m
- flatdeck trailers for crane ballast
- and many other tailor-made solutions

Certifications: ISO 9001

References:
- Long relationship with main producers of wind turbines
- Cooperation and sales to many European heavy haulage companies, which are major players in the transportation of all elements of wind turbines
G.D.K. S.A.

Parc
rue Phocas Lejeune 22
5032 ISNES
www.gdk.be

Contact

Full name: Gérard Dekoninck
Position: Administrateur délégué
Email address: gerard@gdk.be
Telephone number: +32 495 20 73 64

Core business


Knowledge and Skills in the Wind Energy sector

Value chain:
- Study and setting up of lightning conductors
- Ground network
- Runway lighting: lighting of electric pylons to guide planes
- High frequency impedance measures for the wind market

Certification: ISO 9001:2000

References: 3 years experience in the wind sector. Worked for SPE.
Greenelec Europe SA
Metzert Rue du Beynert 64
6717 Attert
www.greenelec.be

Contact
Full name: Jacques Mambour
Position: Administrateur délégué
Email address: greenelec@skynet.be
Telephone number: +32 63 21 72 56

Core business
- Wind turbines installation
- Cooperative management of wind turbines parks
- Integration of combined systems:
  o Wind turbine – solar – biomasse
  o Storage by pump-turbine installation

Knowledge and Skills in the Wind Energy sector
Value chain:
- Project manager
- Synergy in the realization of business plan, for teaching aspects concerning participation of local population, in the organization of community financing and in profit optimization for the local population.

Partnership with « Energie Verte Couvin EVE asbl »
Grimonprez Transmission Gears
Rue Theodor Klüber 7
7711 Dottignies
www.grimonprez.com

Contact

**Full name** : Dedecker Xavier  
**Position** : Managing Director  
**Email address** : x.dedecker@grimonprez.com  
**Telephone number** : +32 56 33 30 32

Core business

Manufacturing of gears and transmission components

Knowledge and Skills in the Wind Energy sector

**Components Value Chain**

- Main Shaft/ Rotor Shaft  
- Secondary shaft  
- Gearbox  

Small Wind Turbines

**Certification** : ISO 9001.
HELHA (Haute Ecole Louvain en Hainaut)

Catégorie Technique
18a, rue de l'Hôpital
7000 Mons
www.helha.be

Contact

Full name: Paul Lebailly / Frédéric Musin
Position: Director / Professor
Email address: paul.lebailly@helha.be / frederic.musin@helha.be
Telephone number: +32 65 31 73 67 / +32 495 25 44 67 (mobile)

Core business

Research and Education:
- High Power wind turbine design and maintenance training.
- Micro-turbine testing (between 400 W and 30 kW).

Knowledge and Skills in the Wind Energy sector

Value chain:

1. **Training**
   - *Onshore wind parks*: Industrial training in electrics and electro-mechanics. It participates with Le FOREM and Le GRETA Champagne-Ardennes in the training of high power wind turbine maintenance technicians. It’s actually the second training session.

2. **Components**
   - *Micro-wind turbines*: Low power commercial wind turbine testing with test-bench (<30 kW). Various suppliers currently offer a diversity of machines with a variable performance range. La Haute École evaluates the performance of these machines over the long and short term. Various projects equally aim at low power wind turbine controller design (<30 kW).
   - *Blade*: Test of pitch system motors with test-bench Enercon.

3. **Maintenance**

Actual employment in this sector: 17

References:
HELHa has 4 years of experience in this sector
Haute Ecole Robert Schuman
Catégorie technique
Chemin de Weyler, 2
B6700 ARLON
www.hers.be

Contact
Full name: Gérald Troessaert / Michael Nahant
Position: Director / Professor
Email address: gerald.troessaert@hers.be / michael.nahant@hers.be
Telephone number: +32 63 23 00 00

Core business
Research and Education

Knowledge and Skills in the Wind Energy sector

The « Chèques Technologiques » is a pump-turbine project aiming wind turbine energy storage with MAMBOUR J. of Greenelec as industrial partner.

The major part of the project is about storage (analysis of pumps, turbines, pipes, regulation ...). The actual targeted place is the old slates manufacture in Martelange.

The wind turbine part is about potential production capacity study, site and grid-connection analysis and cost study.
Hydro Aluminium Seneffe
Zoning industriel, Zone C
7180 Seneffe
www.hydro.com

Contact

Full name : Arne Bojesen
Position : Sales Manager Industrial Products
Email address : arne.bojesen@hydro.com
Telephone number : +45 51 22 77 65

Core business
Aluminium transformation and manufacturer (cables, tubes, spread profiles).

Knowledge and Skills in the Wind Energy sector
Value chain :
- Shaped parts
- Cables
- Cooler (oil)(supplier of raw material)
Hydrogaz
Rue de l’informatique, 3
4460 Grace-Hollogne
www.hydrogaz.be

Contact

Full name: Bertrand Jardinet
Position: Commercial
Email address: bertrand.jardinet@aomelotte.be
Telephone number: +32 477 42 62 35

Core business

Network Infrastructure: HV and LV circuits, drinking water, HP or Low Pressure gas, fire control, district heating, telecom, public lighting, civil engineering work.

Knowledge and Skills in the Wind Energy sector

Value Chain: Network/Grid Connection

- Installation of MV cables
- Excavation and trenching works
- Installation of LV/MV/HV substation/cabins
Icare

Contact

Full name: Elmar Steffens  
Position: Manager German Speaking Europe  
Email address: Elmar.steffens@icareweb.com  
Telephone number: +32/474.98.24.24

Core business

I-Care is specialized in the online measurement of windmills. We offer a protection system based on vibration measurements. Our engineers are also able to analyze the saved spectrums to avoid unplanned maintenance stops of the equipment. Transient phases like speed or load changes can also be analyzed in detail.

Knowledge and Skills in the Wind Energy sector

Value chain:

- Protection system
- Online measurement allows to know the condition of the mechanical parts like gearboxes, pumps, etc.
- Avoid unplanned shutdowns using predictive maintenance technologies

Actual employment in this sector: 5

References:

I-Care has 6 years experience in the predictive maintenance.
Infravision
Rue Haut-Vinâve de Momalle 77
4350 Momalle
www.infravision.be

Contact
Full name: André Godin
Position: Managing Director
Email address: a.godin@infravision.be
Telephone number: + 32 4223 80 90

Core business
Predictive maintenance of electrical and mechanical components by thermographic diagnosis.

Knowledge and Skills in the Wind Energy sector
Value chain:
Maintenance of:
- Synchronous and asynchronous generator
- Transformer
- Control and monitoring system
- Cables
- HT/BT equipments

Certifications:
- ISO 17020 (BELAC)
- VCA Certification

References:
More than 20 years experience in maintenance. Worked for SPE.
JD’C Innovation, Ateliers Jean Del’Cour
Rue de l’Expansion 29
4460 Grâce-Hollogne
www.jean-delcour.be

Contact

Full name: Cécile GEORGE
Position: Company Manager
Email address: cecilegeorge@jean-delcour.be
Telephone number: +32 4 239 80 80

Core business

JD’C Innovation: Composite materials / Multi-materials assembling / Processes industrialization
Ateliers Jean Del’Cour: Packaging, harnessing (cables – electrical beams) and mechanics

Knowledge and Skills in the Wind Energy sector

JD’C Innovation:
- Development, production and marketing of parts made with composite materials (glass and carbon fibers prepreg with epoxy resin) with available autoclave, oven and clean room.
- Multi-materials assembling with hot or cold gluing or by ultrasonic welding.
- Integration of electronics components (for example, tag RFID) or sub-assemblies in finished products.

Certifications: EN9100, Sonaca, Techspace Aero

Ateliers Jean Del’Cour:
- Shrinking, blistering, flow packing
- Electronics, cables and harnessing
- Cutting, machining, fitting, welding

Certifications: ISO9001

References:
Aeronautics and Defense
Jomy
Rue Bourgogne 20,
4452 Wihogne
www.jomy.be

Contact

Full name: Philippe Decroës  
Position: Directeur de Projet  
Email address: phd@jomy.be  
Telephone number: +32 4 278 55 12

Core business

Manufactures aluminum constructions and structures for access at heights, industrial access (Retractable ladder, Exterior staircases in aluminum, Permanent ladders, with or without cage, Mobile access systems, Accessory safety solutions)

Knowledge and Skills in the Wind Energy sector

Components Value Chain:

- Access ladders for wind turbine.

Jomy SA designs and manufactures ladders with fall protection which can be integrated in any wind turbine towers (primary, secondary or escape access).

Certification: Machine Norm ISO 14122 and a lot of others, see website

Contact

Full name: Keustermans Jean-Pierre
Position: Research Program Manager
Email address: jean-pierre.keustermans@laborelec.com
Telephone number: +32 2 382 04 50

Core business

Laborelec is the technical competence centre in energy processes and energy use that is essential to the current and future business of our partners and customers in the international market. Laborelec is the R&D department for electrical energy within the GDF SUEZ Group.

Knowledge and Skills in the Wind Energy sector

<table>
<thead>
<tr>
<th>Project Value Chain</th>
<th>Components Value Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Grid connection</td>
<td>- Main shaft</td>
</tr>
<tr>
<td>- Exploitation</td>
<td>- Gearbox</td>
</tr>
<tr>
<td>- Maintenance</td>
<td>- Synchronous and asynchronous generators</td>
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<td></td>
<td>- Transformer</td>
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<td></td>
<td>- Cables</td>
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<td></td>
<td>- Anticorrosion</td>
</tr>
<tr>
<td></td>
<td>- Control system</td>
</tr>
</tbody>
</table>

Laborelec belongs to an industrial Group which is more a WT technology user than a developer. As support of that Group, Laborelec has built up strong & recognized expertise in the following domains: Condition Monitoring (oil, vibrations, generator, bearings, ...) ; Structural Vibrations ; Non Destructive Techniques ; Ice-detection ; Anti-icing systems ; Lightning protection & detection systems ; Wind forecasting ; Accurate performance assessment ; Performance monitoring ; Power Quality ; WT/Grid interaction... Facilities include high standard Laboratories such as Materials Technology Laboratories Chemical Laboratories and Electrical Technology Laboratories.

Certification: VCA; ISO9001 on several activities; ISO17025 on several activities; EN473, Level 2&3 on several NDT.
Lambert Frères
Rue de la chapelle 181,
6687 Bertogne
www.lambert-freres.be

Contact

Full name: Paquay Eddy
Position: Technico commercial
Email address: beton@lambert-freres.be
Telephone number: +32 49628 40 05 or +32 61 24 06 12

Core business

Civil Engineering work– Excavation, foundation work – Road work – Concrete work

Knowledge and Skills in the Wind Energy sector

Project Value Chain:
- Site development: foundation works
- Road works
- Assembly

Certification:
Agréation: n° 14.804
Classe 1: Category V
Classe 3: Categories B; G; Sub-categories B1 - C5
Classe 4: Category E; Sub-categories C2; E1
Classe 5: Category C6
Classe 6: Category C – Sub-category C1

BENOR for the concrete work (Concrete plant in Bastogne)

References: More than 8 years experience in the wind sector, worked for Dewind and Fuhrlander and on several projects: Ste Ode I & II wind park for the road access and the wind turbine foundation. In 2010, worked on Bourcy wind park and on the Ciney wind park.
Lepage Frères s.a.
Rue de l’Aurore, 2A
6010 Jumet
www.lepage-jumet.be

Contact

Full name: Benoit Fondu
Position: Commercial Director
Email address: b.fondu@lepage-jumet.be
Telephone number: + 32 71 28 57 34

Core business

Industrial services provider.

Knowledge and Skills in the Wind Energy sector

Value chain: Assembly
- Assembly
- Mechanics
- Piping
- Soldering
Les compagnons d’Eole asbl
ZI, Plantis des Aisements, 1
6590 Momignies
www.compagnons-eole.be

<table>
<thead>
<tr>
<th><strong>Contact</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full name:</strong> Rulmont Jacques</td>
</tr>
<tr>
<td><strong>Position:</strong> Managing Director</td>
</tr>
<tr>
<td><strong>Email adresse:</strong> <a href="mailto:cv@compagnons-eole.be">cv@compagnons-eole.be</a></td>
</tr>
<tr>
<td><strong>Telephone number:</strong> +32 479 12 33 62</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Core business</strong></th>
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</thead>
<tbody>
<tr>
<td>Green Certificate trade commissioner for producers ≤ 10 kVa.</td>
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<tr>
<td>Information on small wind turbine.</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Knowledge and Skills in the Wind Energy sector</strong></th>
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<tbody>
<tr>
<td><strong>Value Chain :</strong></td>
</tr>
<tr>
<td>Project Leader</td>
</tr>
</tbody>
</table>
Maintenance Partner Wallonie
Rue des Gerboises, 1
5100 Naninne
www.maintenancepartners.com

Contact

**Full name:** Frédéric Choteau  
**Position:** Project Manager  
**Email address:** frederic.choteau@maintenancepartners.com  
**Telephone number:** 0496 57 21 48

Core business

Mechanical and electrical maintenance and repair of all types of rotary machines such as gas turbines, generators, compressors...  
Predictive maintenance, vibration analysis, thermographs...  
Manufacture of generator bobbins.

Knowledge and Skills in the Wind Energy sector

**Value chain:** Maintenance  
→ **Onshore:** Repair & Exchange, Condition Monitoring Systems, 24/7 Service, Preventive Maintenance, Spare Parts & Logistics service  
→ **Offshore:** Not yet present but wishes to integrate itself in this market.

**Actual employment in this sector:** 6

**References:**  
Maintenance Partners has one year of experience in this sector.
Manex
Rue Wagner 127,
4100 Boncelles
www.manex.biz

Contact

Full name: Keunen Vincent
Position: CEO
Email address: vincent.keunen@manex.biz
Telephone number: +32 475 473436

Core business

Specialized in the development of computer software for all sectors, based on advanced technologies: Technical computing, secured data transmission, portal, mobile IT solutions, custom development, etc.

Knowledge and Skills in the Wind Energy sector

Value Chain: Control and Monitoring

IT – IT solution development
Walloon aggregation for IT consultancy.
Micromega Dynamics SA
Rue du Trou du Sart 10,
5380 Fernelmont
www.micromega-dynamics.com

Contact
Full name: Nicolas Loix
Position: Administrator
Email address: nloix@Micromega-Dynamics.com
Telephone number: +31 82 24 81 00

Core business
Engineering & anti-vibration devices.

Knowledge and Skills in the Wind Energy sector
Value chain: Component construction
Micromega Dynamics undertakes studies and measuring campaigns for a large wind turbine manufacturer (2.5MW). It also supplies vibration reduction devices to reduce noise and improve expected life span.

Actual employment in this sector: 2

References:
Micromega Dynamics has worked for 6 years in this sector.
Mockel S.C.A.
Rue du Développement, 9
BE - 4837 BAELEN
Z.I. Eupen-Baelen
www.mockel-precision.be

**Core business**

Mockel is a dynamic company in which each colleague is specialized in manufacturing high-precision mechanical components. We have the necessary production machines, the technical know-how and the experience to produce high precision parts. No matter if small or large parts, simple or complex components, series of 5 or 10000 parts, we translate your ideas into a perfect technique. All our parts are turned and milled with the highest degree of accuracy on up to date machines with numerical controls. We control your pieces on a plant with total CNC 3D / air-conditioned measurement compartment.

Our customers belong to the following sectors: aeronautics, aerospace, defence, the construction of machines and hydraulics, renewable energy...

Realization is supported by ERP HI-PASS and CAO/FAO MASTERCAM X³ systems, we can integrate CATIA and IGES files.

Mockel currently occupies 30 collaborators and is certified in accordance with the standard ISO 9001/2008 and the European aeronautical standard EN 9100/2003.

**Knowledge and Skills in the Wind Energy sector**

**Value chain:**
- Hydraulics components => 20 Years experiences
- Main Shaft
- Rotor Shaft
- Mechanical System

**Actual in this sector:** 18 % from the turnover.
**Multitel asbl**
Avenue Pierre et Marie Curie, 2
7000 Mons
www.multitel.be

---

**Contact**

**Full name:** Domenico Giannone  
**Position:** Head of applied photonics department  
**Email address:** giannone@multitel.be

---

**Core business**

Research and Development

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**Knowledge and Skills in the Wind Energy sector**

**Value chain:** Pre-feasibility and feasibility study

Development of a laser with integrated fibres:

Their proposed approach aims to supply the elements that enable prospection in an active manner, this means searching for potential operators who have already localised possible implantation zones for wind parks and measured the wind potential as well as the potential energy output. For this it is necessary to study existing functional wind parks.

The wake effect of wind turbines, i.e. the influence of a turbulent wind flow from a wind turbine situated upwind compared against the performance of one situated downwind, are still relatively unknown.

These types of measures enable the characterisation feasibility of wind resources available onsite, given an average of one LIDAR, and improvement of the existing meteorological calculating tools. Also, these measures enable the supply of speed maps for the wind turbine slipstream and therefore an increase in knowledge relative to wake effects.
NERXIO

www.nerxio.com

Contact

Full name: JACQMARD Nicolas
Position: Partner
Email address: nicolas@nerxio.com
Telephone number: +32 473 23 63 03

Core business

Strategic and financial expertise intended for the energy sector (production, technology, services).

- Project analysis and business plans
- Fund raisings
- Public-private partnerships
- Mergers and acquisitions
- Investment vehicles
- Provision of Directors
- Energy and certificates selling contracts optimization

Knowledge and Skills in the Wind Energy sector

Skills:

- Project analysis and optimization (regulatory, subsidies, output)
- Business plans
- Setting up partnerships between local authorities, citizens and private developers
- Fund raisings
- Mergers and acquisitions
- PPA/CPA

Clients:

- Private developers
- Green energy producers
- Public authorities
- Investors
- Group of citizens
Nexans

http://www.nexans.be

Contact

Full name: Steegmans Antoine  
Position: Pascal Place  
Email address: pascal.place@nexans.com  
Telephone number: +32 475 95 06 57

Core business

- Cables manufacturer (Produced in Belgium: medium and high-voltage cables (6 to 500 kV) with synthetic insulation (XLPE), aerial cables (Aero-Z), etc.)
- WINDLINK® - Reliable, high-performance cable solutions for wind turbines worldwide

Knowledge and Skills in the Wind Energy sector

Components Value Chain

- Cables:

  WINDLINK® - Reliable, high-performance cable solutions for wind turbines worldwide:

Solutions for towers:

Low-voltage loop rubber cables
Medium-voltage loop rubber cables
Low-voltage fixed installation cables
Medium-voltage fixed installation cables
Control cables
Electronic and data transmission cables
Fiber-optic cables
Fiber-optic accessories
Low-voltage connectors
Medium-voltage connectors
Low-voltage sets and kits
Medium-voltage jumpers
Active switch systems for communication and monitoring

Solution for Nacelles:

Low-voltage 120°C flexible cables with EMC
Medium-voltage flexible cables
Medium voltage 180°C singlecore cables
Control cables
Electronic and data transmission cables
Fiber-optic cables
Fiber-optic accessories
Low-voltage connectors
Medium-voltage connectors
Low-voltage sets and kits
Medium-voltage jumpers
Active switch systems for communication and monitoring
NONET SA
Rue François Steignier, 54
5170 Bois-de-Villers
www.nonet.be

Contact

Full name : Nonet Simon
Position : Directeur Commercial
Email address : simon.nonet@nonet.be
Telephone number : +32 495 29 64 36

Core business

Public and private works in the road management and underground network sector.

Knowledge and Skills in the Wind Energy sector

Value chain :
- Landscaping (space settlement)
- Acces roads
- Network connection

Certification :
- ISO 9001
- Agregation C1 and C2 in class 6

References :
Present in the wind sector since 6 years. Worked for Enercon, Vestas, REpower, Nordex, Air Energy, Greenwind, SPE and Windvision.
Numflo
Parc Scientifc Initialis,
Rue Descartes 2
7000 Mons
www.numflo.eu

Contact

Full name: Hirsch Charles
Position: Président
Email address: charles.hirsch@numflo.eu
Telephone number: +32 65 32 15 04

Core business

NUMFLO is active in the development of high fidelity simulation technology for fluid flow, heat transfer, aeroacoustic and fluid-structure interactions and collaborates with leading CFD and CAE vendors to provide efficient customized solution to industry needs. NUMFLO is a subsidiary of NUMECA.

NUMFLO provide specific solutions to support your simulation process and in particular:

- Technology-based solution, through advanced research and development of high fidelity fluid simulation software, focusing on fluids-multiphysics applications;
- Consulting in fluid/solid mechanics and multiphysics, serving our customers through high level specific and dedicated services.

Knowledge and Skills in the Wind Energy sector

Project Value Chain:
- Wind study, aerodynamics analysis

Components Value Chain:
- Blade
- CFD - Computational Fluid Dynamics to:
  1) Determine and analyse wind turbines aerodynamics and performances.
  2) Optimize blade design.
  3) Wind flow analysis to assess a wind park potential

References: worked for Enercon, Suzlon. More than 10 years experience in the wind sector.
Paumelles Liégeoises
Parc industriel des Hauts Sarts,
4e Avenue 5,
4040 Herstal
www.paumelles-liegeoises.com

Contact

Full name: Nathalie Morelle
Position: Manager
Email address: info@paumelles-liegeoises.com
Telephone number: +32 43 43 43 23

Core business

Manufactures split-hinges for welding, hinges for welding on all type of surfaces such as steel doors, stainless steel (304 & 316L), aluminium, etc.

World-known, our steel hinges are used in several industries: automobile industry, ship industry, iron works, defense, hardware business, etc.

We customize any components on demand.

Knowledge and Skills in the Wind Energy sector

Components Value Chain

- Hinges, Split Hinges (Steel, Stainless steel, etc.)
- Ironmongery
SAMTECH s.a.
Rue des Chasseurs-Ardennais 8
4031 Angleur
www.samtech.com

Contact

Full name: Didier Granville
Position: Chief Strategy Officer
Email address: didier.granville@samtech.com
Telephone number: +32 4 361 69 69

Core business

Provider of Industrial Modelling software and associated engineering services for Computer Aided Engineering of large Wind Turbines.

Knowledge and Skills in the Wind Energy sector

Value chain: Components

SAMTECH offers an integrated professional software for Wind Turbine modeling and for the verification of each structural component in fatigue, **SAMCEF for Wind Turbines (S4WT)**. This advanced software has exhaustive functionalities and is very open:

- It allows the easy modeling of any on-shore or off-shore wind turbine concept, with direct transmission or with mechanical gearbox, with a fixed or a floating foundation, monopile, tripod, with pre-stressed cables ...;
- It contains pre-defined parametric models that can also be modified by the user;
- It allows the interactive preparation of new models from geometries imported from CAD tools;
- It is applicable to the computation of dynamic loads in any wind conditions and also accounts for the machine control system;
- It allows the modeling and the detailed computation of the whole mechanical gearbox transmission chain;
- It can evaluate the durability of each structural component in order to put in evidence which machine parts could be damaged during the most severe load cases;
- It can support the maintenance and the reengineering of existing machines.
SGS Belgium Environmental Services
Parc Scientifique de la Province de Namur, Rue Phocas Lejeune 4
5032 Gembloux
www.be.sgs.com

Contact

Full name: Nève Catherine/ Van der Auwera Benjamin
Position: Responsable de projets
Email Address: catherine.neve@sgs.com/benjamin.vandrauwera@sgs.com
Telephone number: +32 81 71 51 66/+32 (0) 497 62 53 38

Core business

The « Studies & environnemental expertises» department is specialized in the environmental management: environmental impact studies, environmental audits, administrative and juridical assistance, acoustic studies, environmental authorization, help to implement environmental management system ISO 14001/ EMAS, environmental formation, ...

Knowledge and Skills in the Wind Energy sector

Core business

Value chain:
SGS provides appropriate services to support the environmental aspects of wind project development. The SGS team consists of experts in each field of the environment (noise, wildlife, ground, underground, water, landscape, land use planning...). State-of-the-art techniques and equipments are used to perform the assessments, including noise measurements, noise modelling, birds and bats surveys, shadow modelling, visibility modelling, photo simulations, mapping...

SGS operates at different stages of wind projects:

Decision support to identify suitable locations: Using GIS tools and multicriteria analysis, opportunities and constraints are mapped and combined in order to identify locations potentially suitable for wind developments.

Environmental feasibility study: Based on field surveys and available data, a feasibility study determines the sensitivity of the natural environment. Following this, SGS provides advice to minimize potential impacts on the environment.

Environmental Impact Assessment study (EIA): The impact assessment study includes a thorough description of the various components of the initial state of the environment based on field observations, measurements and bibliography. The impacts are then assessed and, when appropriate, compared with relevant the standards. Recommendations are issued by SGS to mitigate the impact of wind farm on the environment.

Administrative assistance in permit application: Beside the EIA, SGS can help customers through the process of permit application (including appropriate announcements to the local population, public meetings, application file preparation...)

Wind farm monitoring: Once wind farms have been set up, SGS can perform any monitoring operations requested by the authorities, such as verifying the compliance with allowed noise levels or assessing the impact on birds and bats...).

References: For 10 years, SGS Belgium - Environmental Services has performed impact studies for major wind developers on the Belgian market (Electrabel, SPE-Luminus, Air Energy, Windvision, Aspiravi, Alternative Green, ...). Beside the core of the service which is the Environmental Impact Assessment (EIA), a wide range wind farm related services can be proposed to our customers. Worked with Nordex and others wind turbine promoters.
Solutia
Rue Laid Burniat, 3
B - 1348 Louvain-la-Neuve
www.solutia.com

Contact
Full name: Baudouin Oldenhove
Position: Sales & Marketing Manager
Email address: baudouin.oldenhove@solutia.com
Telephone number: +32 10 48 13 62

Core business
- Chemical specialty

Knowledge and Skills in the Wind Energy sector
Value chain:
- Various components based on chemistry (ex.: Ground sheet)
Technifutur
Rue Bois Saint Jean, 15-17
4102 Seraing Belgium
www.technifutur.be

Contact

Full name: Maurice SEMER
Position: General Manager
Email address: maurice.semer@technifutur.be
Telephone number: +32 4 382 45 01

Core business

Industrial training: Assembly, mechanics, micro-technologies, maintenance, mechatronics, information and communication technologies.

Knowledge and Skills in the Wind Energy sector

Value chain: Training

Since January 2009, Technifutur has provided maintenance training for wind turbines. The training takes place over 14 weeks: The theory is taught at the Technifutur premises and the practical side is with the collaboration of a French school that possesses the specific equipment necessary.
At the culmination of the training period the students take a test to receive BZEE certification for electrical and mechanical maintenance, working at heights and English. Technifutur proposes two training courses per year for 8 students.

Actual employment in this sector: 10

References:
Technifutur has trained unemployed persons for wind turbine maintenance since January 2009.
Typhoon Master S.A. (or TML SA)
Rue de Louvrange, 80
1325 Dion-Valmont
www.tmlwind.com

Contact

Full name: Moucheron Serge
Position: Commercial Engineer
Email address: smoucheron@tmlwind.com
Mobile number: +32 494 086 868
Telephone number (office): +32 2 733 69 91

Core business

Design, manufacturing and installation of wind turbines (25 à 300 kW).

Knowledge and Skills in the Wind Energy sector

<table>
<thead>
<tr>
<th>Project Value Chain maximum 300 kW</th>
<th>Components Value Chain maximum 300kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cost analysis</td>
<td>Blade</td>
</tr>
<tr>
<td>- Project leading</td>
<td>Hub</td>
</tr>
<tr>
<td>- Assembly</td>
<td>Main Shaft</td>
</tr>
<tr>
<td>- Transport</td>
<td>Bearing Ring/ Yaw system</td>
</tr>
<tr>
<td>- Grid connection</td>
<td>Glass fiber composite</td>
</tr>
<tr>
<td>- Exploitation</td>
<td>Mast/tower/base</td>
</tr>
<tr>
<td>- Maintenance</td>
<td>Nacelle</td>
</tr>
<tr>
<td>Subcontracting: foundation, lift/crane.</td>
<td>Gearbox</td>
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<tr>
<td></td>
<td>Mechanical brake system</td>
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<tr>
<td></td>
<td>Synchronous generator</td>
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<tr>
<td></td>
<td>Asynchronous generator</td>
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<tr>
<td></td>
<td>Cooling system</td>
</tr>
<tr>
<td></td>
<td>Controller</td>
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<tr>
<td></td>
<td>Servo-motor for yaw</td>
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<tr>
<td></td>
<td>Bearing ring</td>
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<tr>
<td></td>
<td>Transformer</td>
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<td></td>
<td>Wind Vane</td>
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<td>Anemometer</td>
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<td></td>
<td>Cables</td>
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<td></td>
<td>Anticorrosion protection</td>
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<td></td>
<td>Fire protection</td>
</tr>
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<td></td>
<td>Control system</td>
</tr>
</tbody>
</table>

Certification: IEC 61400-2
References: More than 10 years experience in the wind sector. Supported by TURBOWINDS S.A.
Université Catholique de Louvain (UCL)
1, Place de l’Université 
1348 Louvain-la-Neuve
www.uclouvain.be

Contact

Full names: Winckelmans Grégoire / Chatelain Philippe / Macq Benoît
Position: Professors
Email addresses: gregoire.winckelmans@uclouvain.be / philippe.chatelain@uclouvain.be / benoit.macq@uclouvain.be
Telephone number: +32 10 47 22 14 and +32 475 33 85 64 (mobile)

Core business
Research and Education

Knowledge and Skills in the Wind Energy sector

Value Chain:
Training, development / Prof. Winckelmans:

Design of vertical axis wind turbines (VAWT): research projects on the Savonius, critical analysis on the WARP, wind flow analysis 3D, etc.
Design of a new VAWT (design and technical/economical feasibility study): the Defour VAWT, co-financed by EBW.

Wind assessment and wake impact studies: Prof. Chatelain and Prof. Winckelmans

Development of 3D numerical fluid simulation tools, for all size components (small and large WT): dynamic lifting line model with full 3D and turbulent wake dynamics down to very large distances; 3D simulation of turbulent wind, with proper shear in ground effects, turbulence statistics, etc.

Wind measurement for site assessment: Prof. Macq

Simulation of coherent Doppler LIDAR measurements through 3D simulations of turbulent winds, Development of processing algorithms for wind profile and turbulence statistics estimation, LIDAR performance estimation.

Reference: Worked on a contract (design and technical/economical feasibility analysis) on a small VAWT for EBW. Worked and on a contract (flow simulation and wake dynamics) for large HAWT for GE. Worked on FAR-Wake, an EC project including advanced simulations of 3D wake vortices with 3D turbulent winds.
Université de Liège (ULg)
Espace Eurêka - LIEGE science park
4, Avenue Pré-Aily
4031 Liège (Angleur)
www.interface.ulg.ac.be

Contact
Full name: Cathy Lebaron
Position: ULg : Enterprises University Interface
Email address: c.lebaron@ulg.ac.be
Telephone number: +32 63 230 909

Core business
Research and Education

Knowledge and Skills in the Wind Energy sector

Value chain:
- Turbomachines and Propulsion:
  - Design methods for turbomachines – Health monitoring of energy systems
  - Test bench for pumps and (small) jet engine
  - Health monitoring of wind turbines
- Multibody & Mechatronic Systems:
  - Computer-aided tools for the mechanical design of wind turbines
  - Vibration test facilities
  - Dynamics of wind turbines
  - Mechanical analysis, control and monitoring of wind turbines
- Transmission and distribution of electrical energy:
  - Interaction of wind with power lines to increase power line transfer using smart sensors
  - Test systems on vibration table (with V2i spin-off)
- Applied and Computational Electromagnetics:
  - Electromagnetic Compatibility (EMC)
- Aeroelasticity and Experimental Aerodynamics:
  - Steady and unsteady aerodynamics, aeroelasticity, nonlinear dynamics
  - Large low speed wind tunnel
- Research unit in Systems and Modelling:
  - Integration of either large wind farms in transmission systems or distributed wind generators in distribution networks, in particular the local or the centralized control of multiple sources for secure operation of the electrical network.
  - Detailed or simplified simulation of the behavior of wind generators, seen from the network
- Climatology and Topoclimatology:
  - Belgium, France, Europe, power generation, distribution network, effect of topography , local and regional climatology
  - Thermal mapping and specific meteorological forecast methodologies
- Naval Architecture and Transport System Analysis:
  - ANAST focuses on offshore floating wind turbines. Especially on maintenance planning and structural optimization in terms of weight and production costs of steel monopile offshore wind structures. ANAST is also investigated promising floating concepts
  - Design of the support of wind turbine for onshore and offshore wind farms – Development of the EOL Software
  - Optimisation of the assembling and building of wind turbines (on site) – Development of the OPTIVIEW Software
  - Remote monitoring of the behavior and loads of wind turbines, for maintenance planning and optimisation
Université de Mons (UMONS)  
Faculté Polytechnique – Energy Research Centre  
Fluids-Machines Department / Electrical Engineering Department  
Rue du Joncquois, 53/Bd Dolez, 31  
B-7000 Mons  
http://www.umons.ac.be

Contact

FullName: Grégory Coussement/ Jacques Lobry  
Position: Professors  
Email address: Gregory.Coussement@umons.ac.be/jacques.lobry@umons.ac.be  
Telephone number: +32-65-37 45 08/+32-2-65-37-41-86

Core business

- R & D and education in fundamental fluid dynamics, applications dealing with interactions of fluids with structure, machine, human and/or its environment and CFD (Computational Fluid Dynamics) techniques.

Knowledge and Skills in the Wind Energy sector

Value chain:
- Methods of pre-project, design and optimization of aerodynamic blade profile for horizontal or vertical axis wind turbines. Analysis of wind potential for onshore and offshore, Belgium and Walloon region sites.
  - Assessment and cartography of wind potential in the Walloon Region, Belgium, onshore, inshore and offshore sites.
  - Draft methods and aerodynamics design of lift based wind turbines
  - Performance analysis by CFD simulations of horizontal and vertical axis wind turbines
  - Geometrical optimization of aerodynamic performances
  - Problem and analysis of fluid-structure interactions
  - Analysis of unsteady effects, wake and rotor/stator interactions
  - Effect of heart boundary layer
  - Technical and economic feasibility studies of single wind turbine solution or combined wind/photovoltaic/thermal production systems for renewable energy

- Wind generation stochastical modeling: Development of well-suited statistical model for wind generation in the case of reliability studies led on large electrical networks (study of the inter-correlation between wind parks, adequate clustering of wind data,...)
- Impact on transmission grids: Introduction of wind generation in a software used for investments and reliability evaluation of a given transmission grid (for example, the software Scanner: collaboration with Tractebel Engineering).

Actual employment in this sector: 3 (1 assistant and 2 professors)  
References: 15 years of experience (R&D and collaborative works with industries) in this sector of aerodynamic performances of wind turbines. More than 40 publications.
Université Libre de Bruxelles (ULB)
Aero-Thermo-Mechanics (ATM) Department
Avenue F. D. Roosevelt, 50 (CP 165/41)
1050 Brussels
http://mecapp42.ulb.ac.be/atm

Contact

Full name: Patrick Hendrick
Position: Professor
Email address: patrick.hendrick@ulb.ac.be
Telephone number: +32-2-650 2673

Core business

R & D in Computational Fluid Dynamics (CFD), oil systems/quality and training at University level.

Knowledge and Skills in the Wind Energy sector

Value chain:

1. Component construction:
   → Onshore and Offshore Wind Turbines: Their numerical simulation system (computational fluid dynamics) can be adapted to the wind turbine blades or other components. They are also skilled in the design of heat exchangers and the testing of cooling systems.

2. Transport:
   → Offshore Wind Turbines: Work on the transport and stocking of energy as well as new concepts such as floating platforms.

3. Wind study:
   → Micro-Wind Turbines: Wind study to find the best placement.

Actual employment in this sector: 2
- 2 research engineers
- To which should be added professors and students

References:
ATM has 3 years of experience in this sector.
Usimaintenance SPRL
Rue de l’industrie 2
4530 Villers-le-Bouillet
www.usimaintenance.be

Contact
Full name: Simon Pierre
Position: Directeur commercial
Email address: contact@usimaintenance.be
Telephone number: +32 4 259 49 43, +32 4 259 49 44

Core business
- Machining
- Foundery

Knowledge and Skills in the Wind Energy sector
Value chain:
- Machining