

# Sector Group Intelligent Energy



This technology catalogue has been created by the Enterprise Europe Network to promote opportunities in the field of Renewable Energy around Europe.

The mission of the Network is to support business, innovation and transnational technological co-operation in Europe with a range of specialised business support services. Enterprise Europe services are primarily targeted at small and medium-sized enterprises (SMEs), but are also available to large companies, research institutes, universities, technology centres and innovation agencies.

The Sector Group Intelligent Energy (SGIE) was established to help businesses with cross border cooperation, information on EU legislation, funding opportunities, access FP7 research programmes and feedback SME concerns on EU policies.

The SGIE comprises some 60 members, for whom renewable energy plays a major role for regional business, research or their regional strategy. SGIE can help clients to promote their own business needs, technologies and services, as well as assist them in finding partners.

The Intelligent Energy sector covers a wide range of topics like:

- Energy production / grids / storage
- Solar energy
- Bio energy (inc. biofuels)
- Fuel cells and hydrogen technologies
- Wind energy
- Renewable energy for buildings
- Small hydropower, wave energy
- Geothermal energy

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## Renewable Sources of Energy

## Wind energy

Ref#:	Title:	Technology type:
08 IL ILMI 0JUW	Gearboxes and/or Transmissions for Wind Turbines	REQUEST
06 FR NMAN 0E2L	Realisation of a prototype for a new wind turbine with a very high-performance vertical axis	OFFER
05 IT LAAP 0DYG	Photovoltaic panels and Aeolic generators	REQUEST
06 ES BCAV 0EHC	Micro-wind-photovoltaic hybrid generator for isolated areas	OFFER
06 RO ROSM 0EQ2	Permanent Magnet Generator Kits for low-power wind turbine	OFFER
07 IT MESP 0HCN	A smart self-powered anemometer for remote and unsupervised wind speed measurements	OFFER
07 ES MADG 0HIW	Power inverter for photovoltaic plant and expertise in power control for wind generators	OFFER
07 RO RIAP 0J18	Original wind turbine with vertical axis	OFFER
07 RO RIAP 0J2S	Original wind turbine with horizontal axis	OFFER
07 IT ONCA 0JCN	Wind generator for street lamps	REQUEST
08 ES MADG 0JGM	Research in power systems: power quality and electricity market	OFFER
05 DE HRIM 0DQL	Know-how and optimum solutions for renewable energy projects	OFFER
08 ES CACI 0JU3	Measurement of ocean surface winds using Synthetic Aperture Radar (SAR) imagery	OFFER
08 FR 35K8 0JBE	0.5kW and 1kW generators and associated invertors	REQUEST
08 GR IHMI 0JYM	Innovative horizontal-axis wind turbine	OFFER
08 MT 59AE 0ICQ	A novel deep offshore wind turbine concept	OFFER
08 BG 0528 0IH3	Market technology for production of renewable power sources – solar panels and wind energy converters, confirming with applicable EU standards.	REQUEST
08 IT 55X5 0INL	AC e DC Electric Generator for mobile devices based on renouvable sources of energy	REQUEST
08 DE 1592 0IT5	Search for producers of vertical wind turbines	REQUEST
08 NL 60AF 0IWY	Drinking water from air by innovative wind driven condensation/heat pump technology	OFFER
08 GR 49R2 0IZS	Floating, autonomous and ecological desalination plant powered by wind energy	OFFER
08 LU 70DB 0J1N	A unique microporous PVC-silica membrane as gas humudifier for batteries, ventilators and energy storage devices	OFFER
08 BE 0427 0IWQ	Vertical axis wind generator with improved energy yield	OFFER
08 IT 53Z7 0J4R	Micro-porous alloys for aeronautical applications	OFFER
08 LV LVTC 0JGL	Wind power generation unit - 250 kW	REQUEST

# ENERGY

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## Renewable Sources of Energy

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### Wind energy

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**Ref#:** 05 DE HRIM 0DQL **Technology type:** OFFER

**Title:** Know-how and optimum solutions for renewable energy projects

**Abstract:** A German company is offering its global know-how in planning, projecting, financing and operation of renewable energy projects. Its activities are site assessment (selection/analysis of suitable locations, wind and solar energy measurements/expertise), complete planning of projects and also technical and economic management during the operation period of the renewable energy plant. The company is looking for a joint venture or commercial agreement with technical assistance.

**Description:** Long-term experience and manifold activities allowed a German company to achieve special knowledge and project know-how concerning the renewable energy branch in the field of following activities:

In the field of wind energy:

- Selection of suitable locations and feasibility studies
- Wind measurements at 10 and 30 m at about 15 locations
- Wind expertise - energy yield calculation
- Wind potential studies for the supply of wind farms with a three-dimensional mesoscale programme
- Calculation of wake effects in wind parks
- Noise emission expertise
- Technical and economical comparison of different types of wind energy converters
- Working out of financing and managing models
- Negotiation with manufacturers of wind energy converters, electricity utilities, banks, property owners and local authorities.
- Projecting and supervision of installation and commissioning of wind energy converters
- Elaboration of financial plans and sensitivity analysis for wind farms
- Consulting activities
- Consulting activities for local administrations, planning groups and authorities
- Operation of wind energy converters

In the field of solar energy (photovoltaic systems):

- Selection of suitable locations and feasibility studies
  - Energy yield calculation
  - Technical and economical comparison of different types of solar energy systems
  - Working out of financing and managing models
  - Negotiations with manufacturers of solar energy systems, electricity utilities, banks, property owners and local authorities.
  - Projecting and supervision of installation and commissioning of solar energy systems
  - Elaboration of financial plans and sensitivity analysis for solar energy systems
  - Consulting activities for local administrations, planning groups and authorities
  - Operation of solar energy systems
- Innovative Aspects:
- Integration of all related experts in one single procedure
  - Straightforward strategy for realisation of renewable energy plants
  - Low-cost project development
  - Low-cost electricity production
  - Quick market penetration in new markets possible

**Country:** Germany

**Ref#:** 06 FR NMAN 0E2L **Technology type:** OFFER

**Title:** Realisation of a prototype for a new wind turbine with a very high-performance vertical axis

**Abstract:** A French inventor has developed a new wind turbine with a vertical axis with higher performance than current technologies. Studies and modelling have been performed in cooperation with a French engineering school and a French university. The project is supported by public organisms. A patent has been granted and it is extended to an international level. The French inventor is looking for an industrial partner for the realisation of a prototype and its marketing.

**Description:** The technology is a wind turbine with a 31 meters tall vertical axis, an equatorial diameter of 40 meters, a 12 meters tower, three blades, and a nominal power of 200 kW to 10m/s. The patented system consists of rotor geometry and an inferior level. The system is based on a novel technology. By its vertical axis and the new profile of its blades, this wind turbine is omnidirectional, noiseless and requires less maintenance. Innovative Aspects: - New geometry of the rotor doubling the scoured surface  
- Specific level ensuring the automatic regulation  
- Blades profile reducing the wisps and increasing the lift  
- High profitability of the turbine  
- Low cost for the kW/h  
- Noiseless  
- Easily to industrialise  
- Easier maintenance

**Country:** France

<b>Ref#:</b>	<b>05 IT LAAP 0DYG</b>	<b>Technology type:</b>	<b>REQUEST</b>
<b>Title:</b>	Photovoltaic panels and Aeolic generators		
<b>Abstract:</b>	A firm located in Rome specialised in research, design and implementation of electrical energy generation systems by a renewable source, is looking for innovative photovoltaic panels and wind generators. A commercial agreement is sought.		
<b>Description:</b>	A firm located in Rome specialised in research, planning and implementation of electrical energy generation systems fuelled by a renewable source, is looking for innovative photovoltaic panels and Aeolic generators in order to improve their systems' performances in terms of duration of the working life, weight, size, management, maintenance and cost. Any other innovative aspect not listed before will be taken into consideration. Technical Specifications / Specific technical requirements: Photovoltaic panels and wind generators must supply an accumulation system for the differentiated production of electrical energy with powers varying from a few tens to 3.500 Watt (and even more).		
<b>Country:</b>	Italy		

**Ref#:****06 ES BCAV 0EHC****Technology type: OFFER****Title:**

Micro-wind-photovoltaic hybrid generator for isolated areas

**Abstract:**

A Spanish technological centre has designed a 2, 5 kW micro-wind generator in conjunction with photovoltaic plates. The hybrid system takes maximum advantage of renewable resources to supply electricity autonomously. Thus, it is an ideal solution for communities distant from the grid. It has easy installation and maintenance, remote control via GPRS and minimum aesthetic impact. Partners for manufacturing or commercial agreement with technical assistance are sought.

**Description:**

The wind system is a triple-bladed generator with a horizontal axis rotor. Each blade is 2.1m long with an aerodynamic profile chosen for working with low Reynolds values - they have a variable angle of torsion running from the base to the tip. In this way, the angle of attack of the wind with respect to the vane is kept constant all along its length. They have a wide base to easily start up and a narrow tip to reduce noises to high-spin speeds. The rotor is directly coupled to a multi-polar electric generator consisting of permanent magnets (PMG) with no intermediate multiplier. The current generated is alternating and with variable voltage and frequency. This current goes to a number of batteries after passing through a voltage regulator that converts the alternating current to direct and eliminates the surplus voltage. Finally, a current inverter adapts the voltage for customary usage.

The wind generator starts to rotate at wind speeds of 3.5m/s and reaches maximum power at 9.5m/s. If the wind exceeds a velocity of 16m/s the passive power control system (side furling) of the wind generator comes automatically into operation: this control system is achieved through an articulated assembly between passive power regulation system and the body of the wind generator, which is situated eccentrically to the axis of the wind generator's truss tower. Thanks to this braking mechanism for the rotor, both the electric surge infrastructure and the mechanical components are protected against excessive centrifugal forces.

The photovoltaic system has 4 plates made of mono-crystalline silicon with 0,5 kW of total power.

The wind-photovoltaic system is monitored and managed by remote control. The communication interface of the remote control has been developed specifically for low-power wind generator by the Spanish technological centre. This interface is more economical than network analysers existing on the market. The remote communication is via GPRS (Global Packet Radio System). One advantage of GPRS is that customers may be charged only for the amount of data that is transported instead of the duration of connection.

This hybrid system is designed to work autonomously, i.e. outside the electric grid system. So, this kind of application is of great use in communities distant from cities or towns such as rural areas or zones under development. These systems can be used as a substitute for the grid in areas where the latter system is prohibitively expensive and, moreover, they promote awareness regarding natural resources. Innovative Aspects: - If they are compared to high-powered wind generators, the main difference is in the simplicity: easy installation and maintenance, minimum aesthetic impact and totally integratable into the environment.

- Lower stress fatigue, less noise and lower variation of aerodynamic torque in the axis than in traditional wind generator.

- Only regulated by wind speed.

- Wind-photovoltaic hybrid system is the optimal solution for isolated generation since photovoltaic system complements energy production in calm periods when micro-wind generator does not work. - Simplicity:

- no multiplier,

- minimum number of mobile parts

- Passive power and orientation control system,

- minimum maintenance.
- Remote control via GPRS.
- Electrogenic groups can be connected to the inverter in order to charge batteries if the renewable resource is not enough.

**Country:** Spain



**Ref#:** 06 RO ROSM 0EQ2 **Technology type:** OFFER

**Title:** Permanent Magnet Generator Kits for low-power wind turbine

**Abstract:** A Romanian R&D company with expertise in designing, development and production of electrical machines, has designed a permanent magnet alternator kit specifically for micro wind energy applications. The kit consists of a rotor with permanent magnets and a stator with impregnated windings. The company is looking for partners to integrate the generators within wind energy turbines.

**Description:** A Romanian R&D company with expertise in designing, development and production of electrical machines, has designed a permanent magnet alternator kit specifically for micro wind energy applications.

The kit is a powerful brushless permanent magnet generator consisting of a rotor with strong permanent magnets and a three-phase stator with impregnated windings.

With an output of 400, 600, 1000 and 1500 W, the generators are over 80% efficient at full load and have a 3-year warranty.

The company has extensive expertise in designing, development and production of electrical machines.

The company is looking for partners to integrate the generators within wind energy turbines. Innovative Aspects: Innovative aspects consist of many possible wind energy generation applications, including:

- Remote homes and cabins.
- Water pumping.
- Battery charging.
- Remote monitoring systems.
- Remote radio and telecom.
- Offshore platforms.
- Sea-side homes and cabins.
- Sail boats.
- Signalling/beacons.
- Eco-resorts - Efficient.

Advantages:

- Reliable.
- Maintenance-free.
- Durable.
- No brushes, no slip rings to fail or replace.

**Country:** Romania

**Title:** A smart self-powered anemometer for remote and unsupervised wind speed measurements

**Abstract:** A small Italian company has developed a simple, effective anemometer that is powered by wind energy. The device, using a GSM line, is then able to transmit data from inaccessible locations in an unsupervised manner. The company is interested in commercialising the device, providing the necessary technical assistance.

**Description:** An Italian SME with a good technological know-how, operating since 1983 on the design, production and commercialisation of devices for electrical conversion, has developed an airspeed indicator that can be used for unsupervised operation.

The key feature of the anemometer is that it is powered by the electricity generated by the wind itself, without using any battery.

The anemometer records the wind speed at a given frequency (e.g., every 5 minutes) and collected data are transmitted over a GSM line. The product may be placed in distant, unsupervised locations, and it can be remotely controlled.

It can be used for acquiring data for the preliminary evaluation of wind farm sites.

The company is interested in establishing a commercialisation agreement with technical assistance. Innovative Aspects: - Powered by wind energy.

- GSM data transmission.
- Unsupervised operation.

**Country:** Italy

**Title:** Power inverter for photovoltaic plant and expertise in power control for wind generators

**Abstract:** The Power System Control Group of a Madrid based university has developed a technology that allows the control of power inverters for photovoltaic plants grid connection. The research group has a great deal of experience in R&D projects dealing with the modelling and control of electrical machines, mainly for wind energy and photovoltaic applications, and renewable energy grid integration. They are seeking companies in these energy sectors, for a technical cooperation.

**Description:** The Power Control Group in a Madrid based Engineering School has expertise in developing new solutions to solve industrial problems related to the control of electrical components and systems in the renewable energy sector.

They are specialists in designing and developing control systems for grid connection of photovoltaic systems. Recently, they have developed an innovative solution of industrial interest for the control of power inverters for photovoltaic plants grid connection. The control system allows for the active and reactive power control of the plant. Maximum power point tracking is achieved by an innovative fuzzy logic control algorithm, and while the output production is maximized, the control system allows for power factor control of the plant, which in the Spanish regulation allows achieving a retribution complement up to 8%. Power factor regulation can be reconfigured into voltage control for the connection to weak grids which has advantages for both the distributor and the photovoltaic plant.

In addition, they are specialists in providing solutions for the control of wind farms with specifications of power-frequency regulation and voltage-reactive power, with the aim of improving the integration of wind energy into the grid. The services they offer in this field, include:

\*Designing and developing control systems for variable speed wind energy generators. They have wide and proven experience in developing solutions that allow the connection of electrical energy generated at variable frequency by variable speed wind energy generators to the grid of fixed frequency.

\*Designing and developing control systems for electrical drives. They have expertise in field oriented vector control, direct torque control, parameter identification, sensorless control, etc.

\*Developing solutions for integration of distributed generation into the grid.

They have the following equipment in their premises:

- Synchronous machine with excitation winding.
- Permanent magnets synchronous machine.
- Asynchronous machine with rotor winding.
- Asynchronous machine with squirrel cage rotor.
- Real time control cards.
- Electronic power converters.

The research group collaborates with companies in the field of generation, transport and distribution of electrical energy, providing integral services of R&D, consulting, assessment, and training. They are members of the Institute of Electrical and Electronics Engineers (IEEE) and participate actively in the activities of the Power Electronics Society. Innovative Aspects: - Their power control systems allow optimizing the production from the wind farms and photovoltaic plants.

- The systems are designed in order to optimize the connection of the electrical energy generated by the aerogenerators to the grid.

**Country:** Spain

**Title:** Original wind turbine with vertical axis

**Abstract:** A small Romanian research company developed an original wind turbine with vertical axis. It's a simple and robust solution that can operate also at very low wind speed (>2.5m/s). Type of partner sought: research company for further development or license agreement, end users for commercial agreement with technical assistance.

**Description:** In certain hilly zones, mountain and seaside, when it comes to choosing to save energy, it's possible to use very efficiently a wind engine, with little dimensions, simple, robust and reliable. With comparison to classical turbines having many blades but horizontal axes, this type of turbine is realised in an original and new conception; it includes two patents and presents the following elements of novelty:

- The rotor of turbine is a mono-block construction realised from spun glass; due to its geometrical profile of helical type, it begins to operate at very low wind speed (at 2.5m/s); at too high wind speed (more than 20m/s) it has an express self-braking facility.
- It presents a very good reliability due to its mono-block construction from spun glass.

This turbine is able to produce the movement of an electric generator having constant magnets; the electric power generated can be stored in batteries. Innovative Aspects: With comparison to classical turbines, this one has the following innovative aspects and advantages:

- Simple and robust construction, very good reliability.
- Low production cost.
- High power reported per active surface.
- Well operating also at very low wind speed (>2.5m/s)
- Good efficiency due to its vertical axis and to the geometrical profile of its blades.
- It has high torque in the beginning.
- Exit of wind without especial mechanical systems.

**Country:** Romania

**Title:** Original wind turbine with horizontal axis

**Abstract:** A small Romanian research company developed a wind turbine with horizontal axis for 5,000-W energy production. The main advantage of this device: operation from very low wind speed (>2.5m/s). Type of partner sought: construction company for license agreement, end user for commercial agreement with technical assistance.

**Description:** A small Romanian research company developed a wind turbine with horizontal axis. The power provided by this turbine can vary from 3,000 to 7,000 W. A characteristic and interesting element of this device is that it operates already at low wind speed (> 2.5 m/s). As it can be seen from the figure (power diagram), the nominal power (5,000 W) is obtained at a wind speed of 10 m/s. When the wind speed is too high (> 20 m/s) the turbine has a protection system by tilting over in vertical plane. Number of used blades: three, from spun glass; diameter of rotor: five meters. Bearing pile from zincate steel; height of bearing pile: from 9 to 12 m. The turbine has an automaton system for orientation according to wind direction. Coupled to a dynamo, it provides 240 V. Innovative Aspects: The main innovative aspects and advantages of using this turbine are as following:

- Well operating also at very low wind speed (> 2.5m/s).
- Protection system against excessive wind speed (>20m/s).
- An easy and resistant used material for blades.
- Good efficiency.
- Simple and robust construction, very good reliability.

**Country:** Romania

**Title:** Wind generator for street lamps

**Abstract:** An Italian company operating in alternative energy engineering is looking for a new wind generator to be integrated in street lamps or energy stations. The innovation of the required system lies in the combined use of wind/solar energy, and should be very reliable and long-life-guaranteed. Suitable partners could be industries or universities interested in wind generator production. The company is only interested in a license agreement.

**Description:** The wind generator will be applied to a street lamp or energy station, and then it should be suitable to the following features. Wind generator should be interfaced and integrated in already commercialised devices, so license agreement is fundamental for the company policy. The lamp for street central illumination, powered by wind/solar energy, is a completely autonomous, ecological and economic system supplying light to places otherwise almost impossible and very expensive to reach. It is also an economic alternative substitute of damaged and out-of-date electrical systems. The system should accumulate the energy produced (36 Watt) by the photovoltaic panels and the wind generator. The generator should continue to produce energy (when wind is present) also during the hours of darkness. The street lamp needs to be guaranteed for working 3/4 nights (for 10 - 14 hours for night) even in case of almost total lack of sunlight and total lack of wind. The energy station is an accumulating energy system, supplied by silica monocrystalline photovoltaic panels and by a rotating wind generator. The system needs to have a very simple and rapid installation and maintenance. When fully charged, the station can provide energy at 2.4 kW. At 24 Volt CC, with good sunlight, the station can provide constant power equivalent to 330 Watt. Technical Specifications / Specific technical requirements: The wind generator would be a vertically driven wind rotor with special product characteristics, due to its construction. Indicative requirements would be:

- Cut in wind speed at 3-4 m/s (in every position).
- Independent from the wind direction.
- Maintenance-free.
- Truly noiseless even at high wind velocities.
- No cut-off wind speed.
- Aerodynamically auto regulated rpm's.
- Nominal output at wind speeds of 14 m/s and higher.
- Very reliable, long product life.
- Power max. 60 Watt.

**Country:** Italy

<b>Ref#:</b>	<b>08 ES MADG 0JGM</b>	<b>Technology type:</b>	<b>OFFER</b>
<b>Title:</b>	Research in power systems: power quality and electricity market		
<b>Abstract:</b>	A Spanish research group has experience in the electricity market, grid integration of wind energy and power quality. The group may offer consulting activities with a high component of research. They are looking for the collaboration of companies involved in consulting related to electricity markets, integration of wind power in the electricity network, and power quality.		
<b>Description:</b>	<p>This Spanish research group is formed by a number of electrical engineers with a large activity in consulting related to electricity markets, integration of wind power in the electricity network, and power quality. The group has an in-depth knowledge of the Spanish electricity industry, since it has cooperated with important companies and organisations in this sector. Different works in consulting, R&amp;D national and international research projects and on-site courses have provided the group with experience in its fields of specialisation. The group members are familiar with different standard power system analysis tools such as PSS/E (Power System Simulator for Engineering tool), PSCAD/EMTDC (Power Systems Computer Aided Design/Electromagnetic Transients including DC), ATP (Alternative Transient Program), MATLAB/Power System Blockset, GAMS (General Mathematics Model Construction Software), and has developed programs following the end users requirements, such as SIPREÓLICO, the short-term wind power prediction tool now in use by Red Eléctrica de España, the Spanish TSO (Technical Services Operations). The results of this research has been acknowledged in the academic and industrial sectors, and several members of the research group participate in national and international working groups. Innovative Aspects: Experience in new energy sources, such as high integration of wind energy. Use or design of new optimisation and analysis tools. Experience in grid integration of wind energy.</p>		
<b>Country:</b>	Spain		



**Ref#:** 08 LV LVTC 0JGL **Technology type:** REQUEST

**Title:** Wind power generation unit - 250 kW

**Abstract:** A Latvian electric power generation company is looking for a 250-kW wind power generation unit. The company is looking for a partner able to deliver, adapt and install it according to the requested specifications and conditions. The company is looking for a commercial agreement with technical assistance.

**Description:** A Latvian company is looking for a field-tested power generation unit already on the market. The technology developer is expected to offer: wind power generator, installation mast, full power distribution box with connection outlet to power grid, as well as the installation service according to the requester's specification and requirements. Technical Specifications / Specific technical requirements: - Wind power generation unit: 250 kW, preferably gearless.  
- Blade nr: according to the developer's technical specifications.  
- Axes: horizontal.  
- Height of installation mast: 50-70 m.  
- Distribution box with possibility to connect: 220 V/0,4 kV/10 kV, 50 Hz.

**Country:** Latvia

**Ref#:**

**08 ES CACI 0JU3**

**Technology type: OFFER**

**Title:**

Measurement of ocean surface winds using Synthetic Aperture Radar (SAR) imagery

**Abstract:**

A Catalan company has developed a technology that provides environmental marine information for assessing the wind energy stakeholders. It is based on the measurement of ocean surface winds (intensity and direction) using SAR imagery. Some advantages of SAR imagery are the improvement on coverage, data source sustainability and reliability it offers. The company is seeking a joint technology development project and the possibility to participate in the commercialisation and distribution.

**Description:**

The technology developed is based on the measurement of ocean surface winds (wind intensity and direction) using SAR (Synthetic Aperture Radar) imagery. The final output of this innovative technology will be adapted to the client needs, most probably in the form of an IT tool or a GIS platform, providing environmental marine information for assessing the wind energy stakeholders in the process of placement and construction of offshore wind farms.

Accurate, easily accessible, and financially affordable wind information is needed at different levels of detail before deciding the siting of a wind farm and during the life cycle of a wind farm, so it is within oil spill events, navigation, civil protection actions, and turbine design amongst others. In the case of wind parks, the need for such data is even more important for offshore facilities, where installation costs are higher than onshore. An error of a few percent in wind resource evaluation will affect enormously the profitability of an offshore wind farm. Therefore, providing reliable wind data adapted to the wind industry's needs, improving wind resource assessment accuracy and spatial description are crucial to reducing financial risks associated with the installation of offshore wind farms and to improving the management of energy production.

In the decision process and the development of offshore activities the confidence in and acceptance of wind data and information is crucial. The advantage to use SAR imagery is the improvement on coverage, data source sustainability and reliability.

The company has already analyzed all the SAR imagery available and suitable to be considered as input for the service. For each sensor the different SAR products have been detailed. Then, a prototype software version is on going with the following objectives:

- To retrieve wind direction from SAR imagery.
- To apply inversion model for CMOD4 and CMOD5 (Compact Meteorological and Oceanographic Drifter).

The software is going to be validated with additional EO data e.g. scatterometer data suitable for comparison of result.

There are two kinds of final products:

- A zero level product, "raw" wind field vector.
- A wind analysis product based on:

- \* Wind climatology, which is necessary for the selection of those sites where the mean wind field values computed a long the different time scales are the most favourable for offshore wind farm turbines.

- \* Statistical Analysis of the selected sites:

- Histogram.
- Weibull distributions.
- Power density distributions.

- Wind roses. Innovative Aspects: The main innovative aspect is the ability to retrieve wind fields from SAR images, taking advantage of the high resolution and wide coverage offered by wide swath images represents and important improvement for applications where knowledge of the wind field

is crucial.

Benefits of this technology include:

- Economical benefits:

Accurate, easily accessible, and financially affordable wind information is needed at different levels of detail before deciding the siting of a wind farm and its life cycle. Furthermore, oil spill events, navigation, civil protection actions, and turbine design amongst others will also require wind data assessment. In the case of wind parks, the need for such data is even more important for offshore facilities, where installation costs are higher than onshore. An error of a few percent in wind resource evaluation will affect enormously the profitability of an offshore wind farm. Their technology offers reliable and wide coverage wind information

- Performance:

The final output will be a GIS user-friendly tool. No specific expertise will be needed by the final user.

- Wide range of products and applications:

From "raw" wind field vector to wind analysis products (wind climatology, statistical analysis), as well as energy production management or boundary conditions generator for mesoscale and modelling.

**Country:**

Spain

<b>Ref#:</b>	<b>08 IL ILMI OJUW</b>	<b>Technology type:</b>	<b>REQUEST</b>
<b>Title:</b>	Gearboxes and/or Transmissions for Wind Turbines		
<b>Abstract:</b>	An Israeli manufacturer of gear-based products is looking for a technology to produce gearboxes and transmissions for wind turbines. Ideally, the developed product should fit wind turbines with a power capacity of 1-3 MW. The technology/product requested should be fully developed.		
<b>Description:</b>	<p>An Israeli company is a built-to-print manufacturer and has been on the market of the automotive and aerospace industry for 40 years. They want to broaden the range of their products or services. By now, the company has capabilities to manufacture gears and assembled &amp; tested gearboxes. Their facilities include gear manufacturing, grinding, heat treatments, coating, special processes and test benches. The company is interested in manufacturing and marketing new gearboxes and/or transmissions for wind turbines. Technical Specifications / Specific technical requirements: The developed product should fit wind turbines with a power capacity of 1-3 MW.</p>		
<b>Country:</b>	Israel		

**Title:** Innovative horizontal-axis wind turbine

**Abstract:** A Greek company based in central Greece and active in aircraft parts manufacture developed a wind turbine with horizontal axis for 0.7-MW energy production for a diameter of 10 m. The main advantages of this device are the operation from a wide range of wind speeds, the lower weight/volume ratio and the low environmental impact. The company seeks construction companies for a license agreement or an end user for a commercial agreement with technical assistance.

**Description:** The device uses an innovative high-efficiency rotor, providing high power-to-volume ratio with comparison to existing classical designs. It is worth mentioning that with a diameter of 10 m, a power of 0,7 MW can be achieved. It operates in a wider range of wind speeds, requiring lower cut-n wind speed. Pitch regulation is not required. Also, it has an order of magnitude less overall weight with comparison to same-power classical turbines. The device is easy to be installed, with minimal environmental impact due to reduced volume. The innovative rotor (patented) consists of two rows of blades, a stationary and a rotating one. The airflow passed through each nozzle made up of two successive blades of the stationary row is enhanced, before impacting to corresponding blade of the rotating row, transmitting momentum to the power shaft. Innovative Aspects: The device has a high-efficiency rotor providing high power-to-volume ratio with comparison to traditional designs (with a diameter of 10 meters, a power of 0.7 MW can be achieved). Also, it has a much lower volume/weight ratio and it needs lower start-up wind speed. Finally no pitch regulating is required, and the device has low environmental impact.

**Country:** Greece

**Ref#:** 08 MT 59AE 0ICQ **Technology type:** OFFER

**Title:** A novel deep offshore wind turbine concept

**Abstract:** A Maltese inventor is offering a novel deep offshore wind turbine installation concept where, the wind turbine assembly together with its ballast, is suspended to an annular float by means of radially spaced tethers. With this arrangement the whole installation would have two separate centres of gravity and buoyancy for both the annular float and turbine tower assembly. Financial resources, license agreement, joint venture and technical cooperation are the preferred forms of collaboration.

**Description:** This novel concept provides a more stable deep offshore wind turbine installation.  
Catenary or taut legged mooring systems can be used to moor the installation.  
This concept provides a more versatile mechanical configuration, especially in the Mediterranean sea, where the port facilities are relatively shallower than other world sea locations.  
As this is a novel concept, an extensive research needs to be conducted to find the optimum configuration of the installation before a prototype is built. Innovative Aspects: As this concept is radically different from the present day deep offshore wind turbine installation technology, it offers various ways how such a concept can be developed for an optimum mechanical configuration. In particular, the wind turbine assembly together with its ballast is suspended to an annular float by means of radially spaced tethers. With this arrangement the whole installation would have two separate centres of gravity and buoyancy for both the supporting annular float and also for the wind turbine tower assembly respectively.  
This technology offers a cheaper and more stable deep offshore wind turbine installation that can be materialized to the benefit of countries where its population density is high (like Malta) and thus has to resort and to install deep offshore wind turbines.

**Country:** Malta

**Ref#:** 08 BG 0528 0IH3 **Technology type:** REQUEST

**Title:** Market technology for production of renewable power sources – solar panels and wind energy converters, confirming with applicable EU standards.

**Abstract:** A Bulgarian private company specialized in production and repairs of electrical turbines and generators is looking for cost effective technology for production of renewable power sources – solar panels and wind energy converters. The company is looking for license or commercial agreement with technical assistance. The company is willing to engage in joint-venture agreement for assembling and maintenance in order to further develop a technological solution related to the technology requested.

**Description:** Cost effective market technology for production of renewable power sources – solar panels or wind energy converters, confirming with applicable EU standards. The photovoltaics produced under such technology must be building-integrated, standalone devices and photovoltaics in transport could be considered also. Co-operation in terms of assembling and maintenance with commercial partner who has access to EU markets. Technical Specifications / Specific technical requirements: Devices produced under such technology must comply with corresponding EU standards. Photovoltaics must be building-integrated, standalone solutions.

**Country:** Bulgaria

**Ref#:** 08 IT 55X5 0INL **Technology type:** REQUEST

**Title:** AC e DC Electric Generator for mobile devices based on renewable sources of energy

**Abstract:** An Italian SME, active in the Conservation of Cultural Heritage field, is looking for two kinds of electric generator fuelled by renewable sources of energy: one is a power supply for mobile devices and the other one is an AC generator for portable (but non mobile) devices. All these devices have to be used for the restauration and the monitoring of the historical and cultural heritage. Partner sought can be a SME or an industry that designs, produces and sells electric generator.

**Description:** Actually the firm uses battery powered devices for diagnostic and monitoring, and electric generators fuelled by diesel for the electric devices used during the process of restoration of historical and artistic objects. (where the electric network is not available). Both these kind of energy sources are pollutant, and not complying with the mission and the corporate image of this little company. Thus the firm is looking for two kinds of power suppliers:

- a power supply that can replace batteries (Direct Current, 1.5V or similar), with similar size (not greater than 6-8 battery). Thus the more suitable generators will be based on solar cells or fuel cell for mobile equipments.
- An electric generator (Alternate Current), without constraints on its size and shape (because it will be used just for the restoration process). Thus the more suitable generators will be based on solar cells, or on fuel cells for non mobile equipments, or on wind energy. Technical Specifications / Specific technical requirements: The power supply (Direct Corrent, 1.5V) has to have size not greater than 10x8x25 cm (as little as possible). The maximum current intensity required is 20 mA for max 10 s, each 10 minutes and 10  $\mu$ A for remaining time. The working range of temperature has to be at least [-20o +70 o], and the percentage of humidity in the air has to be as high as possible. The electric generator of Alternate Current (220/110V) has no constraints on the size, and has to work in a range of temperature at least of [-20o +70 o].

**Country:** Italy



**Ref#:** 08 DE 1592 0IT5 **Technology type:** REQUEST

**Title:** Search for producers of vertical wind turbines

**Abstract:** A small German company working in the renewable energy business is searching for companies that produce vertical wind turbines. More specifically, they are looking for a licence agreement. The company has been operating since 2000 at national level as well as at international level. The activity of the company focuses on the use of wind, solar and biomass. The technology requested should be fully developed.

**Description:** A small German company working in the renewable energy business is searching for companies that produce vertical wind turbines.

The company has been operating since 2000 at national level as well as at international level.

The German company provides location and selection of raw materials, acquisition process and plant engineering, equipment advice, development of financial concepts, feasibility studies, profitability calculations, research and development of innovative energy uses and energy consultancy.

It features nationwide very good contacts to the agricultural sector.

By now the company wants to offer vertical wind turbines in the future. In order to do so, they search a company that produces vertical wind turbines with an output of at least 1 - 5kW. Technical Specifications / Specific technical requirements: Vertical wind turbines with an output of at least 1 - 5kW.

**Country:** Germany

**Ref#:** 08 NL 60AF 0IYWY **Technology type:** OFFER

**Title:** Drinking water from air by innovative wind driven condensation/heat pump technology

**Abstract:** A young Dutch company has developed a new concept in which safe drinking water can be provided. A relatively small windmill can be used for drinking water, sanitation water or irrigation. With this system it is possible to desalinate large quantities of water with little energy. The company is looking for a technical cooperation with a strong partner in region with expertise in water technology. The technology will be adapted for specific needs of the companies demand.

**Description:** The company has developed an innovative technology and working on new and revolutionary concepts for the production of fresh water. The technology is especially focused on those area's where there is limited infrastructure and available surface water is polluted or brackish solutions for safe water supply and desalination are needed. The concept is based on a modified "standart-type" windmill in which no electricity is produced but heat by using a heat pump. This heat is used in a "flash evaporation" process. Water that evaporated under low pressure by means of a heat pump condenses again and returns heat to the evaporator. This system makes it possible to desalinate large quantities of water with little energy. Expected yield is approx. 200m3 and more dependent on the size and power capacity of the chosen. In this way different water sources such as sea water or polluted surface water can be purified. A relatively small windmill already has a significant capacity and can be used for drinking water, sanitation water or irrigation. Innovative Aspects: No fuel/electricity consumption therefore minimal environmental impact, robust and proven components, no need for infrastructure, local water production. Local production possible in a world-wide license structure.

**Country:** Netherlands

**Title:**

Floating, autonomous and ecological desalination plant powered by wind energy

**Abstract:**

A company, spin-off of a Greek University, is operating a floating, autonomous desalination unit, powered solely by wind energy. The unit was developed in response to the need for water supply in remote areas and is the first floating wind turbine in the world, which is not only providing electricity, but incorporates a desalination plant to provide potable water. The company is seeking partners for scaling up of the unit and further development of its capabilities.

**Description:**

The use of renewable energy sources has been well recognized as a key factor in assuring our economic viability and quality of life. Concerning wind energy, the development of offshore wind parks is gaining ground. This is the case, especially in Northern Europe, where the water is shallow for a long distance from the coast and the bases of the wind turbines are being cemented to the bottom of the sea.

In the Mediterranean region (but also in Japan and the United States) where the sea is deeper, floating wind turbines are considered as the solution, and to this end a lot of effort has been put already by the research community.

Many islands of the Aegean sea (e.g. Milos, Kimolos, Iraklia, Schoinoussa, Simi, Halki, Patmos, Megisti and many others) face significant water shortage, and, in most of the cases, the required water supplies are transported to the island from other regions. But in most cases the supply cannot meet the need and the related cost is very high.

At the same time, the cost of producing electrical energy in these islands is also high due to the fact that they are not connected to the national electrical grid, thus making the operation of a desalination plant (a highly energy-demanding installation) prohibiting.

The company has developed and is operating a unit which is coupling a desalination unit with a wind turbine and is placed on a floating structure. The result is the first floating wind turbine in the world, which is not only providing electricity (through a connection cable reaching the nearest land), but incorporates a desalination plant to provide potable from sea water.

The wind turbine produces energy, which, through appropriate electrical and electronic systems, is being used to feed an advanced desalination unit for the production of potable water from sea water. The platform on which the whole unit is mounted, is designed in such a way that the wind turbine and the system as a whole can operate even under extreme weather conditions.

The operation principle of the desalination unit was improved in comparison to conventional units in order to achieve the highest possible energy savings for the production of the required water, thus increasing the efficiency of the unit.

Research on the optimization of the desalination unit succeeded in:

- ?) Minimizing the scaling and fouling effects on the membranes.
- ?) Increasing the energy efficiency of the cycle.
- C) Achieving operation without chemical treatment.

The unit is autonomous, which means that it is not required to be connected to the national electrical grid. As it is mounted on a floating base, even large structures can be constructed and erected in a shipyard

and towed to the installation point. Furthermore, it is possible for the whole unit to be transported to a different location, if required. The structure complies with the marine safety regulations and the requirements of the classification societies.

Finally the unit has an advanced control system, which enables its fully automated operation and provides the possibility for tele-operation and remote-monitoring, if needed. Innovative Aspects: Among the system's competitive advantages are included:

- \* Easy transportation to the place of operation.
- \* Potential of fulfilling seasonal needs of islands.
- \* Minimization of expenses of installation.
- \* Minimization of disturbances to residents.
- \* Possibility of transportation to a different location, if required.
- \* No impact on underground waters compared to the desalination of brackish water, which leads to the intrusion of seawater to underground water.
- \* Potential of system scale-up without installation problems.

Furthermore, an important innovation of the system is that it is adapted to operate with a varying power input, which enables it to use all the available wind power.

**Country:** Greece

**Title:** A unique microporous PVC-silica membrane as gas humidifier for batteries, ventilators and energy storage devices

**Abstract:** A Luxembourg based company has developed a unique microporous PVC-Silica membrane that can be used as separator in various types of batteries and energy storage devices. The unique absorption/desorption capacity offers great potential for use as gas humidifying membrane in various devices. The main advantages of the support are the controllable silica content and pore size distribution. The company can customise the support to the specific needs of the partner's field of application.

**Description:** The support is a microporous PVC-silica sheet with a porosity in the 70-80% range. The pore size, as determined by mercury intrusion porosimetry, is in the 0,02 to 2,0 micron range. Due to the unique cold extrusion process, the silica aggregates are not embedded in the polymer, but remain fully accessible. Therefore the support is extremely hydrophilic. This material is highly absorptive and non compressible under normal conditions. It has excellent resistance against oxidation and chemical attack and can be used up to 80°C. For alkaline medium, the silica can be replaced by an alternative filler.

The pores are highly tortuous. By changing the filler type or filler content, the pore size distribution can be changed and controlled. Innovative Aspects: The pore volume and pore size distribution can be customised. The developed material is already extensively used as separator in industrial lead-acid batteries but promises to serve the industry in a wide variety of applications, in particular in flow batteries (especially ZnBr technology).

- The support is characterised by :
- High porosity
  - Controlled pore size distribution
  - PVC-Silica matrix
  - Good acid, alcohol and hydrocarbon resistance
  - Excellent absorption capacity

**Country:** Luxembourg

**Ref#:** 08 BE 0427 0IWQ **Technology type:** OFFER

**Title:** Vertical axis wind generator with improved energy yield

**Abstract:** A Belgian SME has designed a vertical axis wind generator employing a novel strategy to optimise the energy yield. The technology is intended for domestic and other small-scale applications. Calculations have been verified by an independent scientific authority, and a conceptual prototype is available. The company is looking for collaboration to develop a fully functional prototype, and subsequent production and sales.

**Description:** Vertical axis wind generators are traditionally considered to exhibit a performance that is inferior to horizontal axis generators, mainly caused by the drag of the blades that rotate into the wind. Consequently, they are said to have a low starting torque and to require an extra device to start the turbine running. Moreover, this type of generator is usually placed closer to the ground, where wind conditions are non-optimal (i.e. lower wind speed or influence from nearby buildings). An interesting solution is to provide a cyclic blade pitch variation; most strategies, however, are the result of trial-and-error and are limited by the possibilities of the chosen mechanical setup. The resulting energy yield is therefore not optimal.

The wind generator design of this proposal employs a novel cyclic blade pitch strategy that increases the energy yield considerably, by keeping the blade pitch as optimal as possible. This allows for application in areas with non-optimal wind conditions, e.g. in an urban environment, and may eliminate the need for a starting device. A coefficient of performance of 0.35 lies within reach, for turbines in the 5-30 kW range. The design principles and the resulting strategy are verified by an independent scientific authority, and a proof-of-concept prototype is available. Collaboration is sought to develop it further into a production prototype, including a suitable electric generator. Main focus is on the mechanical concept to set the optimal blade pitch in an elegant and reliable way. Innovative

Aspects: Innovations:

- Novel technology for optimised energy yield
- Consequently, application also possible under non-optimal wind conditions

Further advantages:

- Can be put on flat roofs
- Easy installation, may be offered in do-it-yourself version
- Blends nicely with urban environment, reducing the possibility of conflict with urbanistic rulings

**Country:** Belgium

**Title:** Micro-porous alloys for aeronautical applications

**Abstract:** An Italian company, active in production and marketing of innovative technologies, developed an electro-deposition method for complex (ternary, quaternary,...) metal alloys with uniform dispersion, mass ratios, mechanical properties. It yields micro-porous structures suited for airfoil boundary layer control and cooling, with resistance to high temperatures, better performances, cheaper manufacturing. Commercial agreement and technical cooperation is sought for development and industrialization.

**Description:** The technology proposed is a micro-porous structures for airfoil boundary layer control and cooling. Boundary layer control is a well known strategy for improving airfoil performances or for cooling/heating bodies in a stream. It is carried out by equipping such surfaces with holes distributed across the skin of the body, and by injecting or sucking a fluid through it. This technology, named film cooling/heating, is widely adopted in aeronautics/aerospace and gas turbine field. The current technology to fabricate metallic structural elements for airfoils provided with such perforated walls employs mechanical drilling or laser beams to machine the holes. Such old fashion technology presents several drawbacks, among them: high fabricating costs, and mechanical weakening of the body structure, because mechanical drilling or laser operations cause cutting of the metal fibers. As a consequence, the maximum number of holes for surface unit, such as the minimum diameter thereof is limited, so that the efficiency of the technology concerning boundary layer control and cooling/heating on airfoil surfaces does not reach the potential optimal performance. In order to improve boundary layer control and heat transfer on the external surfaces of structural elements, a dramatic advancement is obtained by increasing the number of holes and the density per surface unit thereof, thereby realizing the so called "transpiration effect". Starting from this background, the following is the core of the innovative solution: fabricating structural elements by means of a specific electrolytic electroforming process aimed to realize a transpiration effect thereon. Such process allows carrying out structures being intrinsically equipped with micro-holes, without any need for further processes of tooling. In practice, the invention makes available a micro-porous structure which - as far as the boundary layer control/cooling is concerned - has a configuration which has the effect of overcoming the limitation provided by discrete holes or slits, as it is currently in use.

In conclusion, the fluid-dynamics behavior of the invented structures is close to that of transpiration or sweating wall, due to the accomplishment of a very high density of micro-holes. Such structures, in form of shells or inserts, are fabricated by means of a controlled galvanic forming technology (using nickel, nickel based alloys, cobalt based alloys, titanium, etc.). This technology is considerably simpler and cheaper than traditional fabrication methods (melting, molding, machine tool processing) of known holed structures. Moreover from a technological point of view it makes effective solutions being not otherwise obtainable by means of the state-of-the-art techniques (several hundreds of holes per square inch, airfoil complex shapes, etc.).

Implementation and testing of a first prototype, specifically a part of a gas turbine combustor liner made of current alloys, has been recently obtained, so that an optimal know-how for this innovative electrolytic electroforming procedure is available. Innovative Aspects:

- Self standing components;
- Reduction of manufacturing costs;
- Reduction of the fabrication tolerances;
- Secondary deposition (protective coating, i.e. Platinum-Aluminium diffusion-coating, other alloy with different ductility, etc.);
- Simpler than traditional fabrication methods (melting, moulding, machine tool processing);

- It makes possible design solutions that cannot be obtained by means of current state-of-the-art techniques
- 1. Reduction of process and manufacturing costs;
- 2. Alternative metallurgic processes for fabrication of alloys, fabrication of purified alloys
- 3. Fields of application
  - Aerospace, aeronautics and heavy duty
  - Turbomachinery and combustion chambers
  - Automotive (bearings, coatings)
  - Ferro-Magnetic application
  - Bio-medical applications
  - Fabrication of coatings and structural parts. New technologies (photovoltaic layers, protective layers, etc)

**Country:** Italy



**Ref#:** 08 FR 35K8 0JBE **Technology type:** REQUEST

**Title:** 0.5kW and 1kW generators and associated invertors

**Abstract:** A French SME developing devices using renewable energies is looking for electrical generators of 0.5kW and 1kW and associated invertors in order to product small-sized wind turbines.

**Description:** A French SME developing devices using renewable energies is looking for electrical generators of 0.5kW and 1kW and associated invertors in order to product small-sized wind turbines with vertical axis.

Technologies involved in the production of the said wind turbines are mostly innovative :

- patent applied for the rotor speed control whatever the wind speed, without electronic enslavements
  - product particularly fit for individual use
- Technical Specifications / Specific technical requirements: Small delivery time is expected, for a yearly production of 1000 to 5000 pcs to start, and 20.000 ready-to-use pieces in 2010.

**Country:** France