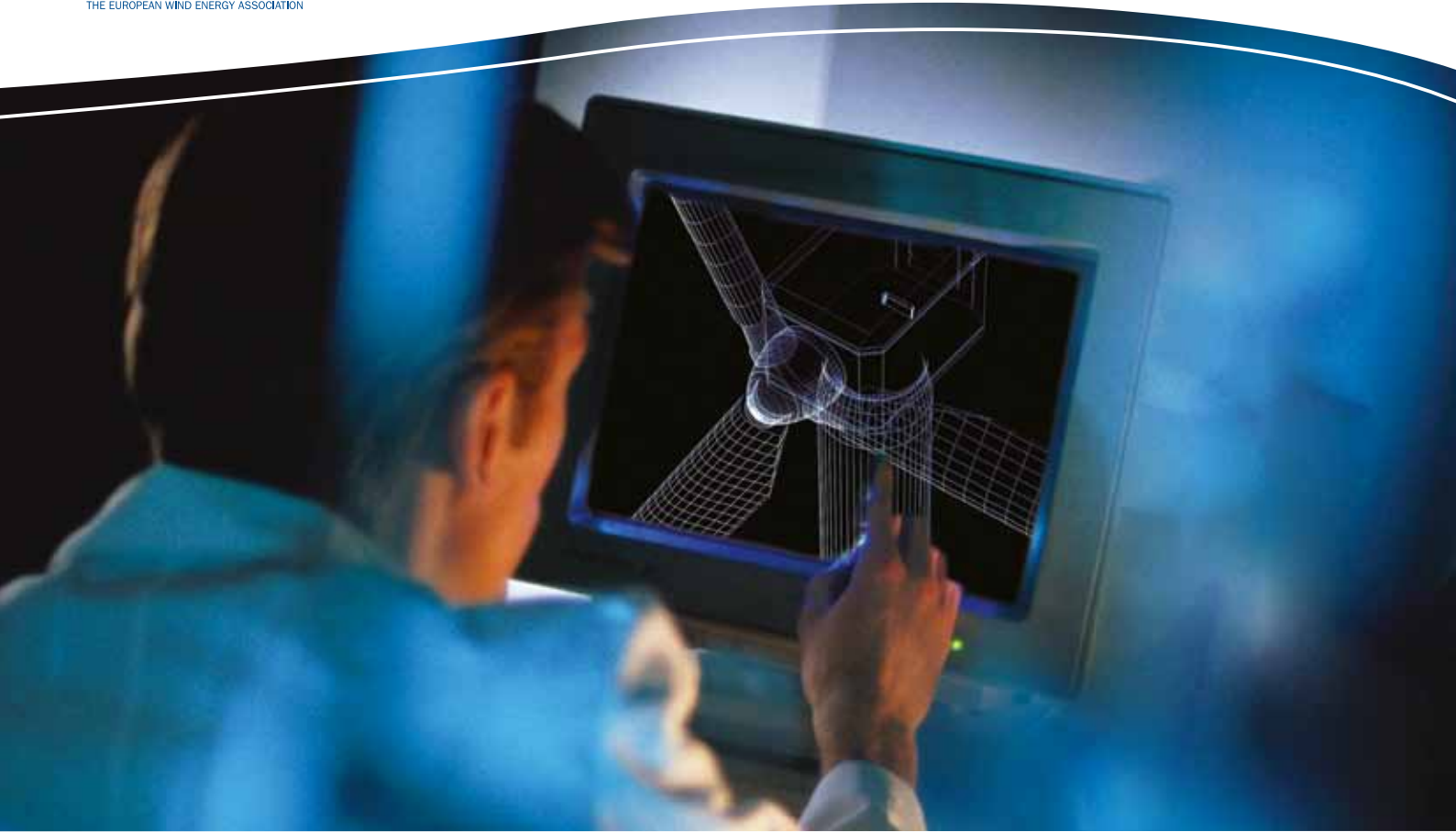




EWEA

THE EUROPEAN WIND ENERGY ASSOCIATION



The European Wind Initiative

Wind power research and development for the next ten years

A European Wind Energy Association briefing - June 2010

Introduction

In order to fight climate change, improve energy security, enhance Europe's competitiveness, and maintain our technological leadership, the European wind industry - together with the European Commission and Member States - has developed a ten year research and development programme.

With a budget of €6 billion, approximately half of which will be provided by the industry, the so-called European Wind Initiative's objectives are:

- To maintain Europe's technology leadership in both onshore and offshore wind power;
- To make onshore wind the most competitive energy source by 2020, with offshore following by 2030;
- To enable wind energy to supply 20% of Europe's electricity in 2020, 33% in 2030, and 50% in 2050.

To achieve these objectives, the European Wind Initiative prioritises the following technology areas: new turbines and components, offshore technology, grid integration, resource assessment and spatial planning.

Key activities in wind energy research are:

- Improving the design and layout of wind farms;
- Increasing reliability, accessibility and efficiency of wind turbines;
- Optimising the maintenance, assembly and installation of offshore turbines and their substructures;
- Demonstrating large wind turbine prototypes and large, interconnected offshore wind farms;
- New methods of grid management to allow high levels of wind power in the electricity system;
- Development of spatial planning standards at EU level.



Photo: Eon

Strategic Energy Technology Plan

The Strategic Energy Technology Plan (SET-Plan)¹, published by the European Commission in November 2007, aims to increase, coordinate, and focus EU support on key low-carbon energy technologies, such as wind power.

The implementation of the SET-Plan started with the establishment of the **European Industrial Initiatives (EII)s**² which bring together industry, the research community, the Member States and the Commission in risk-sharing, public-private partnerships aimed at the rapid development of key energy technologies at European level. In parallel, the **European Energy Research Alliance (EERA)** has been working since 2008 to align individual R&D activities to the needs of the SET-Plan priorities, and to establish a joint programming framework at the EU level. The envisaged budget for the SET-Plan has been estimated at up to €71.5 billion, of which just €6 billion would be for the wind sector.

1 http://ec.europa.eu/energy/technology/set_plan/set_plan_en.htm
2 http://ec.europa.eu/energy/technology/set_plan/doc/2009_comm_investing_development_low_carbon_technologies_roadmap.pdf

The SET-Plan has two major timelines:

For 2020, the SET-Plan provides a framework to accelerate the development and deployment of cost-effective low carbon technologies, such as wind power. This framework is needed to help meet the 2020 targets to reduce greenhouse gas emissions by 20%, and ensure that 20% of Europe's energy comes from renewable energy sources.

For 2050, the SET-Plan is targeted at limiting climate change to a global temperature rise of no more than 2°C, in particular by matching the vision to reduce EU greenhouse gas emissions by 80-95%. The SET-Plan objective in this regard is to further lower the cost of renewable energy and put the EU's renewable energy industry at the forefront of the rapidly growing low carbon technology sector.

The SET-Plan objectives for 2020 and 2050 are aligned with the ambitious objectives of the wind energy sector, as described by the Strategic Research Agenda³ published by the European Wind Energy Technology Platform (TPWind). The vision of the wind energy sector is the following:

- **Phase 1: Short term (2020)**-The market matures in western Europe and develops in central and eastern Europe. Competition from low labour cost countries intensifies. Large-scale deployment of offshore wind energy begins. The installed capacity reaches 230 GW, of which 40 GW is offshore. In 2020, wind energy represents 20% of EU electricity consumption.
- **Phase 2: Medium term (2020-2030)**-Wind energy continues to develop both onshore and offshore. The main developments are further cost reductions and high penetration levels. Deep offshore technology develops on an industrial scale. Exports from Europe grow substantially. The capacity installed reaches 400 GW in 2030, and annual installations reach 20 GW, of which half is offshore and 7.5 GW is from repowering. In 2030, wind energy represents 33% of EU electricity consumption.
- **Phase 3: Long term (2030-2050)**-The main European market is offshore wind, repowering, and exports from Europe are substantial. In 2050, wind energy provides 50% of the electricity consumed in the EU.

3 <http://www.windplatform.eu/92.0.html>



Photo: Vestas

The European Wind Energy Technology Platform

The European Wind Energy Technology Platform⁴ (TPWind) is a network and R&D forum composed of approximately 150 wind energy researchers and experts representing the major EU players of the sector. TPWind was financed by the European Commission and coordinated by the European Wind Energy Association (EWEA), which hosts its Secretariat. EWEA manages the Platform in cooperation with Garrad Hassan, now part of the Germanischer Lloyd group, and Risoe/DTU (Technical University of Denmark).

Its origins lay in the Barcelona European Council of 2002, when the European Union set the goal of increasing the European research effort to 3% of the EU's GDP by 2010. One of the instruments developed to reach this objective was the Technology Platforms, which were designed to bring together public and private organisations in order to define a common R&D agenda in several strategic sectors, including wind energy. These agendas were aimed at mobilising a critical mass of public and private investments, hence contributing to strengthening Europe's economic and technological leadership.

TPWind followed a three-phase development process:

Stage 1: Stakeholders were brought together with the aim of achieving a common vision for the way forward. The Strategic Vision Document was published in 2006;

Stage 2: The Platform's members develop the research agenda, which defines the R&D and technological development priorities of the sector for the medium to long term. The Strategic Research Agenda/Market Deployment Strategy (SRA/MDS) was published in 2008;

Stage 3: The research agenda is implemented with the support of the European Commission, the European Investment Bank, the EU Member States and private investors.

TPWind was crucial for the SET-Plan process: it developed the European Wind Initiative and the Wind Energy Roadmap (WER) Implementation Plan for 2010-2012 and will support the European Commission and Member States in order to ensure the effective implementation of the WER.

European Wind Initiative

A European Focus and A Global Ambition

The European Wind Initiative is the high-tech roadmap to reduce the cost of wind energy. Its implementation will pave the way for the large-scale deployment of wind energy worldwide, and secure long-term European technological and market leadership.

The EWI will take the European wind industry to the next stage. It will develop the wind energy technology of the future, the necessary testing facilities, and streamlined manufacturing processes.

The European Commission has highlighted that “more than 250,000 skilled jobs could be created” in the wind industry as a result. The strategic objectives of the EWI are:

- To maintain Europe’s technology leadership in both onshore and offshore wind power;
- To make onshore wind the most competitive energy source by 2020, with offshore following by 2030;
- To enable wind energy to supply 20% of Europe’s electricity in 2020, 33% in 2030, and 50% in 2050.

To reach these objectives, the EWI focuses on four main technology areas:

- New turbines and components;
- Offshore technology;
- Grid Integration;
- Resource assessment and spatial planning.

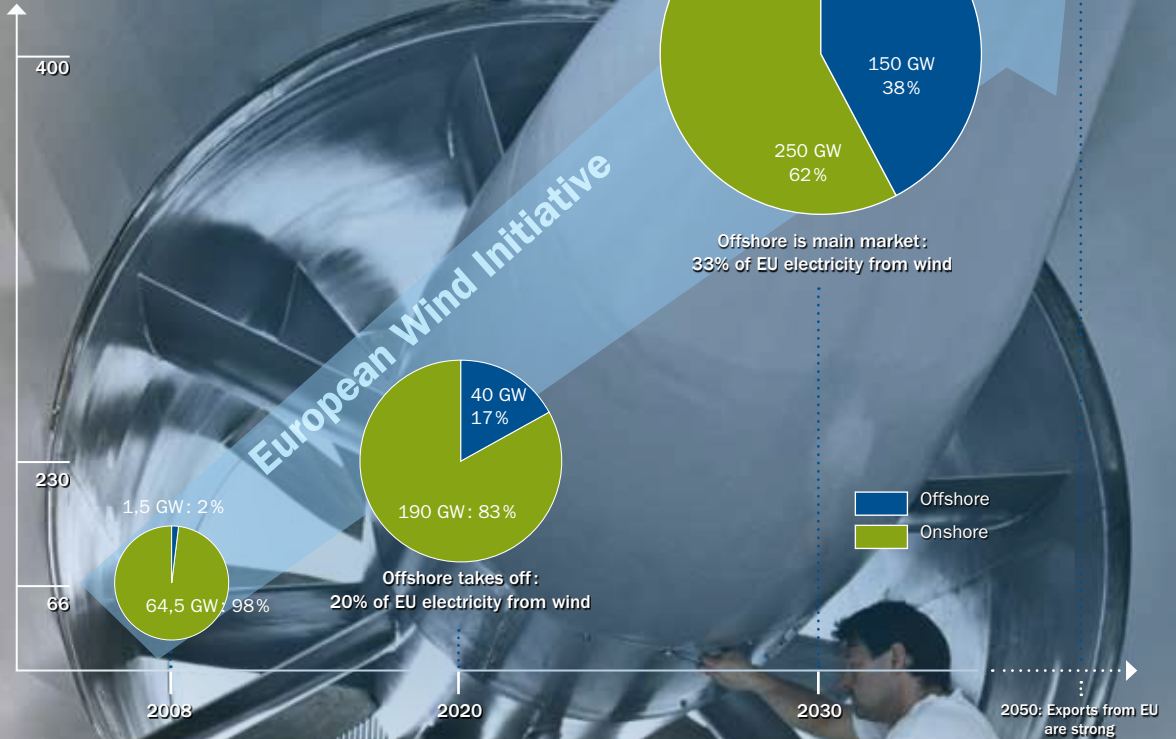
The EWI therefore developed the following research activities:

- To ease the site assessment, and gather data for improved designs on- and off-shore;
- To develop the technology used in wind turbines, and their manufacturing - both for onshore and offshore - to reduce the cost of wind energy. A prototype of a large offshore wind turbine in the 10-20 MW range will be developed and demonstrated;
- To support the take-off of the offshore wind industry in the short to medium term and ensure long-term offshore technology leadership. This action is focused on turbine-support structures (including in deep waters), assembly, installation, operation and maintenance, decommissioning and environmental research;
- To enable the large-scale grid integration of onshore and offshore wind energy;
- To design the economic spatial planning instruments to deploy onshore and offshore wind energy technologies.

The timely implementation of the EWI would lead to a high wind energy penetration level, the ambition being to reach a 20% penetration level in 2020, 33% in 2030 and 50% in 2050.

Sustained European technology leadership

Total installed capacity (GW)



Wind Energy Roadmap - Priorities for 2010-2012

The EWI was developed by TPWind in cooperation with the European Commission and EU Member States and was therefore the result of a shared and concerted process. It was finalised in the summer of 2009 and submitted to the European Commission, which published it as the **Wind Energy Roadmap (WER)**.

As requested by the SET-Plan High Level Steering Group, TPWind has developed the WER Implementation Plan for the first three years (2010-2012), which will be revised and updated every year. For the 2010-2012 period, the WER launches 18 priority activities in the four strategically important technology areas:

New turbines and components

- Large scale turbines and innovative design for reliable turbines rated 10-20 MW;
- Improved reliability of large wind turbines and wind farms;
- Turbine optimisation and demonstration for complex terrain and cold climates;
- Definition of methods and standards for testing large wind turbine components;
- Improvement of size and capabilities of system-lab testing facilities for 10-20 MW turbines,
- Field testing facilities for 10-20 MW aimed at increasing reliability;
- Large scale manufacturing and logistics, both size and numbers for in and out-of-factory and site erection.

Offshore technology

- Deep offshore, and site identification for demonstration of large-scale substructures;
- Industry-wide initiative on mass-manufacturing of substructures;
- Standards.

Grid integration

- Combined solutions for wind farm grid connection and interconnection of at least two countries;
- Controllable HVDC multi-terminal offshore and onshore solutions;
- Wind power plants requirements and solutions to wind farms supporting the system dynamics;
- Balancing technologies for large scale wind power penetration;
- Market integration.

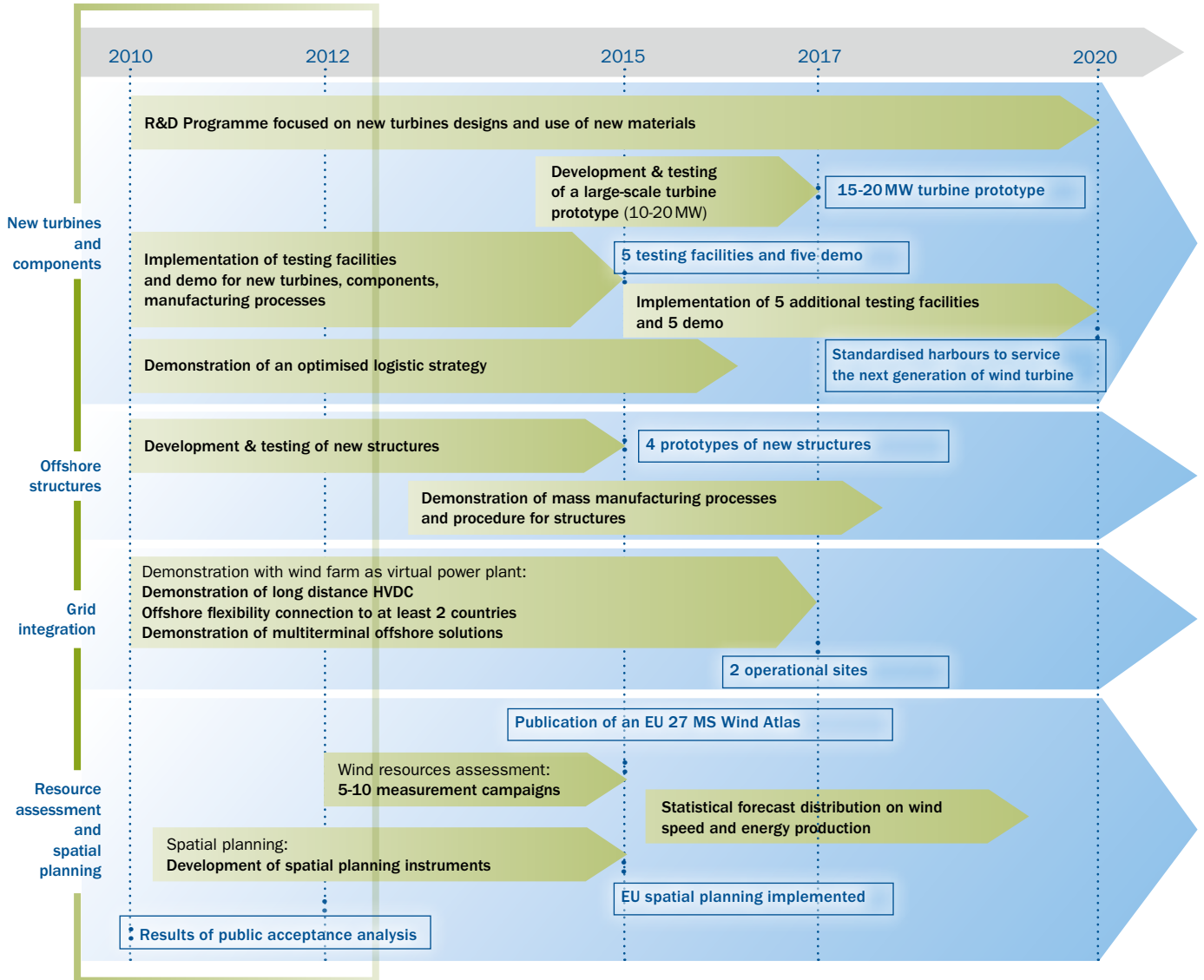
Resource assessment and spatial planning

- Data sets for new models for wind energy;
- Coordination process for on- and offshore spatial planning;
- European wind study on the socio-economic value of wind energy in the EU.



Photo: LM Glasfiber

WER implementation plan for 2010-2020



Source: European Commission, "A Technology Roadmap" - SEC(2009) 1295

Financial Resources for Successful Implementation

The implementation of the WER will require a yearly investment of public and private resources of approximately €600 million (totalling €6 billion by 2020).

It is expected that between 15% and 24% of the total budget for the EWI will be spent financing the first implementation period from 2010-2012, depending on whether or not the European Economic Recovery Plan (EERP) is included in the calculation.

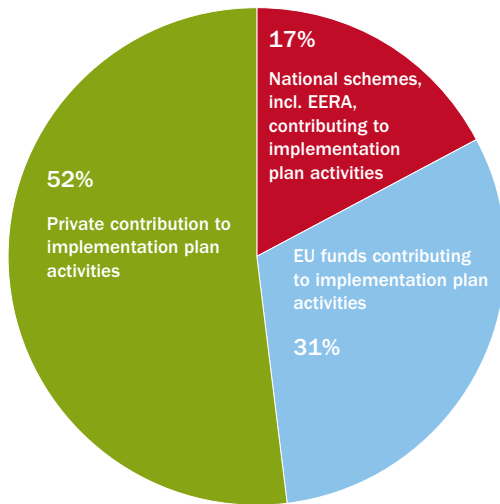
Since the EERP budgets are already allocated, it is necessary to secure the **additional funding** required by the wind energy roadmap for 2010-2012. According to the estimates of TPWind, the wind industry should contribute 52% of the 2010-2012 budget, the EU 31%, and Member States 17%.

The biggest issue – when and from where will the public money come from?

The wind industry anticipates that the following public funding mechanisms will be available to finance the WER between 2010 and 2012:

- The 7th Framework Programme for R&D actions (responsible: EC & MS);
- The EU Budget new special budget line for SET-Plan (responsible: EC, EP, Council);
- Annual EU Budgets for pilot projects in Renewable energies (responsible: EC, EP & Council);
- Competitiveness and Innovation Programme (CIP) (responsible: EC);
- New Entrants Reserve (responsible: EC & MS),
- National programmes, including Structural Funds (responsible: MS);
- EIB instruments (responsible EC & EIB):
 - Risk Sharing Finance Facility (RSFF)-soft loans for R&D projects,
 - Marguerite Fund-equity investments in renewable energy and grid projects,
 - European Local Energy Assistance facility (ELENA),
 - Kolzoduy International Decommissioning Support Fund-Energy Efficiency Facility (for wind energy projects in Bulgaria);
- Global Energy Efficiency and Renewable Energy Fund (GEEREF) (responsible EIB & EIF).

Technology objectives	Total budget (M€)	Budget (M€) in period 2010-2012	Budget intensity
1. New turbines and components	2,500	750	30%
2. Offshore structure-related technologies	1,200	310	25%
3. Grid integration	2,100	334	16%
4. Resource assessment and spatial planning	200	36	18%
Total incl. EEPR	6,000	1,433	24%
Total excl. EEPR	6,000	914 (EEPR 519)	15%



Period after 2012

Early in 2011 the mid-term review of both the EU multiannual budget and the FP7 activities will be published by the European Commission. At the same time debates on the 2014-2020 EU Budget will begin. This will be a crucial time for the EU decision makers to show their commitment towards the European wind industry by allocating sufficient funding resources for wind energy development and research activities through FP8 and other programmes, so that this time EU 2020 goals will become reality.

EWEA recommendations

Short term:

- Launch efficient and effective EII teams with committed parties;
- Ensure that the European Commission's proposed EU annual budget line for SET-Plan activities contains sufficient funding to ensure the European Wind Initiative is implemented;
- Substantially increase FP7 energy budget to match SET-Plan ambitions through FP7 mid-term review;
- Focus on coordination: EU Member State commitment is needed, and alignments of their R&D programmes on SET-Plan priorities;
- Ensure strong involvement and coordination of EIB and EC funding instruments;
- Strongly involve EIB, and increase coordination with NER300 calls (criteria were defined independently);
- Strengthen links between SET-Plan and CIP Intelligent Energy Europe programme;
- Work on propagation of KPIs through FP7 calls and national calls.

Medium term:

- Ensure that in the next financial perspective, 2014-2020, sufficient money is allocated to finance the European Wind Initiative;
- Adapt EU financial perspectives to the new role the EU is taking in the innovation field for energy. Develop and expand upon the Europe2020 vision of 3% R&D, together with concrete and effective European and national plans;
- At Member States level: match the Council decision to double R&D funds;
- Design adequate funding instruments for FP8, which are flexible, avoid red tape, are result oriented, and ensure IP management;
- Promote the SET-Plan process outside Europe and ensure equivalent roadmaps are developed for the main wind energy markets. Advocate the coordination of those roadmaps, with the view of promoting the European approach to innovation.



Give Europe a breath of fresh air



Europe possesses an energy source which could power it seven times over: the wind. European companies are world leaders in wind power, generating thousands of jobs. Wind energy reduces Europe's dependence, and spending, on imported fossil fuels. It lowers electricity prices and emits no CO₂.

Over the next 12 years, Europe must build new power capacity equal to half the current total. We must use this opportunity to construct a modern power system that meets the challenges of the 21st century.

Give Europe a breath of fresh air by adopting a wind turbine at www.ewea.org/freshair

Breath
of **FRESH AIR**
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