

European Wind Energy Technology Platform

EWI – The European Wind Initiative

Delivering today the energy of tomorrow

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EWI - Context

European Industrial Initiatives - EII

q SET Plan - COM(2007) 723 final:

*"The **European Industrial Initiatives** will be implemented in different ways, depending on the nature and needs of the sector and the technologies. ... **The European Technology Platforms will assist in the preparation phase.**"*

q EII are one component of the Strategic Energy Technology Plan:

§ Proposed by the European Commission in October 2007

§ Endorsed by the Council and Parliament in March 2008

q Six EII were proposed: Wind, Solar, Bio-energy, CCS, electricity grid, nuclear fission.

EII – What is it?

- q An instrument bringing resources and actors
- q Measurable objectives
- q Bringing EU-level, Member States and Industry
- q Questions and Answers on the European Strategic Energy Technology Plan (SET-Plan) - MEMO/07/494:

*“Creating European Industrial Initiatives, which will strengthen energy research and innovation by **bringing together appropriate resources and actors in a particular industrial sector. They will have measurable objectives in terms of cost reduction or improved performance, and will bring together the efforts of the EU-level, Member States and industry.**”*

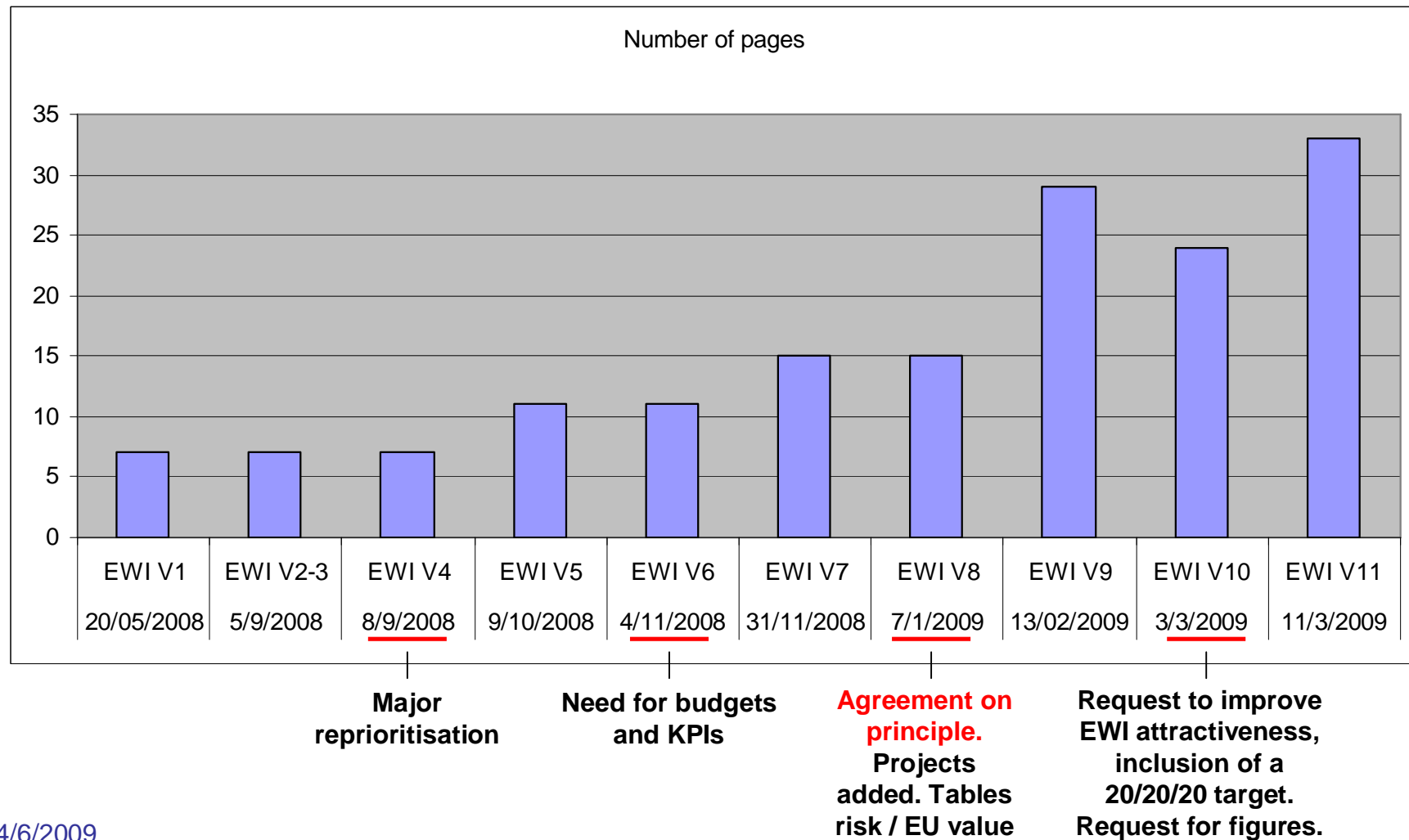
EII - Implementation

- q Depends on needs of the sector and technology:
 - § public-private partnerships (in our case)
 - § joint programming by coalitions of those interested Member States
 - § A Joint Technology Initiative is a specific case of EII
- q Questions and Answers on the European Strategic Energy Technology Plan (SET-Plan) - MEMO/07/494:

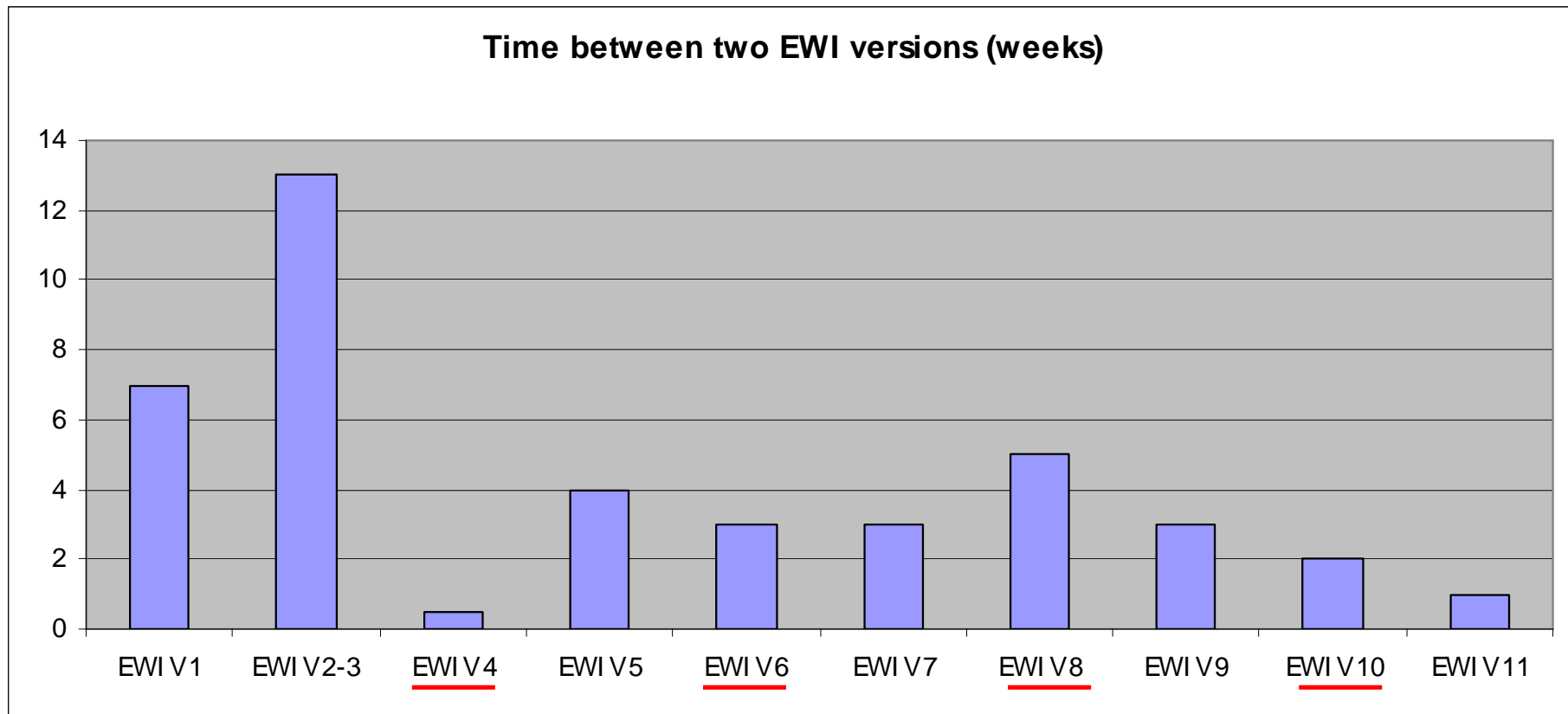
*"The European Industrial Initiatives **will be implemented in different ways**, depending on the nature and needs of the sector and the technologies. For **technologies with a sufficient industrial base across Europe they may take the form of public-private partnerships**, while for other technologies which are prioritized by a few countries, they may take the form of joint programming by coalitions of those interested Member States. ... **The Joint Technology Initiatives are one form that could be used to implement a European Industrial Initiative.**"*

EWI - process

EWI process – 11 versions



Delays shortening



Major
reprioritisation

Need for budgets
and KPIs

**Agreement on
principle.**
Projects
added. Tables
risk / EU value

Request to improve
EWI attractiveness,
inclusion of a
20/20/20 target.
Request for figures.

EWI - Structure

- q **EWI: The wind industry 20 / 20 / 20 target**
 - § A policy-oriented box summarizing the EWI objectives
 - § EWI components, context and objectives, impact
- q **EWI: Implementation Plan**
 - § 6 fiches: objectives, actions, expected impact, budget, KPI and milestones
- q **EWI: Budget:** based on available knowledge (annex II)
- q **Annex I:** Summary, European added-value, Risk estimation, and Stakeholders
 - § Table and graphs illustrating the EWI components
- q **Annex II:** Budget elements
 - § Examples illustrating the budget components
- q **Annex III:** Summary of key performance indicators
- q **Annex IV:** Implementation and structure – first proposal

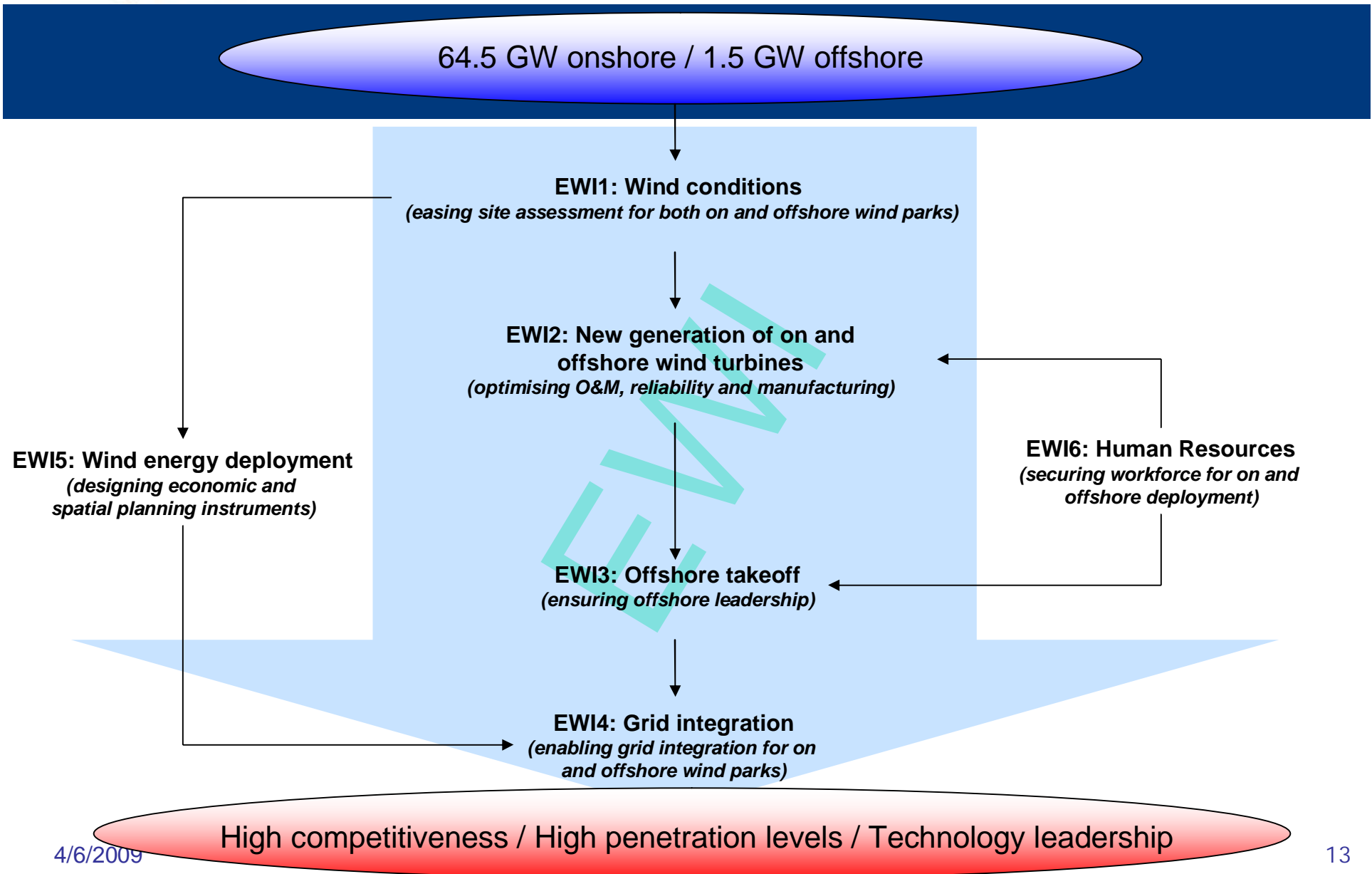
EWI – focus and objectives

European Wind Initiative – SET-Plan objectives

- q *European Wind Initiative*: focus on **large turbines and large systems** validation and demonstration (relevant to **on and off-shore** applications).
- q SET-Plan - Reaching 2020 objectives
 - § **Double** the power generation capacity of the largest wind turbines, with **off-shore wind as the lead application**.
 - § Enable a single, smart European electricity grid able to accommodate the **massive integration of renewable** and decentralised energy sources.
- q SET-Plan - Reaching 2050 objectives
 - § Bring the next generation of renewable energy technologies to **market competitiveness**.

EWI – objectives

- q To make wind energy the most competitive energy source on the market during the decade 2020-2030, and as a first step decreasing the wind energy costs by at least 20% by 2020
- q To enable the required large-scale deployment and grid integration of wind energy offshore and onshore with the aim of reaching wind penetration levels beyond 20% of European electricity consumption in the early 2020's
- q Ensuring the European technology leadership on- and offshore, and developing large offshore wind turbines, including exploring concepts up to 20 MW.



Total installed
capacity (GW)

300

230

66

2008

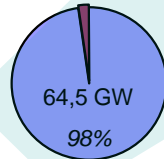
2020

2030

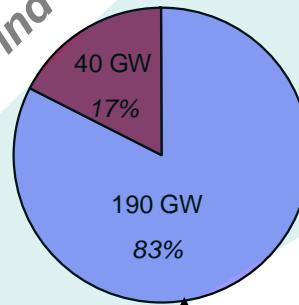
2050: Exports from EU
are strong; repowering
is key market

European Wind Initiative

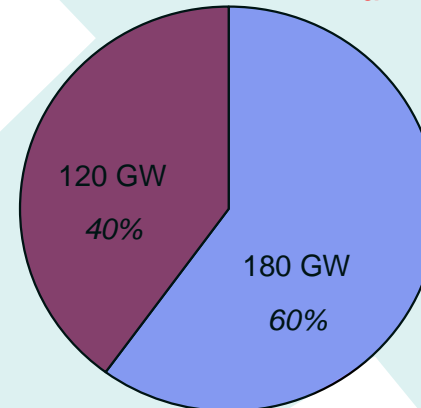
1,5 GW
2%



Offshore takes off
>18% of EU electricity



Offshore is main market
25% of EU electricity



Technology leadership
Max. competitiveness

Offshore

Onshore

Year

EWI components

6 components with offshore as a core

- q **EWI1** will ease the site assessment, and gather data for improved designs on and offshore
- q **EWI2** put in place the turbine technology and manufacturing capacity for both onshore and offshore
- q **EWI 3** supports offshore take-off in the short to medium term and ensures long-term offshore leadership. This action is focused on support structures, assembly, installation, O&M, decommissioning and environment
- q **EWI4** enables large-scale grid integration of on and offshore wind energy
- q **EWI5** designs the economic and spatial planning instruments to deploy on and offshore technologies
- q **EWI6** implements the training structures to secure the necessary workforce for on and offshore deployment

EWI 1: Wind conditions for optimised wind turbine design, micro-siting and wind resource assessment

q Objectives:

- § **Improving** reliability & cost efficiency
- § **Harnessing** complex sites, including offshore
- § **Mapping** the wind resource – offshore / eastern countries (spatial planning)

q Actions:

- § A **measurement campaign** feeding a database enabling to run CFD codes for design, resource assessment & siting
- § A **detailed wind atlas**

EWI1 – KPIs & Milestones

q Key performance indicators

§ Statistical forecast distributions on wind speeds and energy production can be proposed with an **uncertainty of less than 3%** on any selected EU site by 2020

q Milestones

§ Implementation of at least 10 **measurement campaigns** lasting at least 3 years each (to cover seasonal variations) by 2012;

§ Publication of a comprehensive publicly available online **wind atlas** in 2015 (covering EU-27 and EEA onshore and offshore), including high heights and extreme winds.

EWI 2: Very large wind turbine technology in the 10-20 MW range: Reducing the cost of wind energy by optimizing reliability, O&M, efficiency, manufacturing processes and, breakthrough technologies

q Objectives

- § **Improving reliability and cost efficiency:** Next generation of onshore and offshore technologies. Include very large scale turbines in the 10-20 MW range
- § **Optimising manufacturing processes:** Manufacturing technologies, advanced manufacturing processes for turbines, components and offshore structures, more wind turbine production capacity

q Product-related actions

- § One large long-term R&D program focused on the WT of the future, including very large-scale turbines (10-20 MW range)
- § Includes full-scale demonstration activities on specific aspects

q Process-related actions

- § Optimise manufacturing processes (e.g. automation)
- § Optimise logistics, implementation and improve recycling. Includes testing facilities
- § Launch a major cross-industrial cooperation and demonstration programme – automotive, offshore, civil aerospace

EWI2 – KPIs & Milestones

q Key performance indicators

§ Reducing the wind energy kWh cost (onshore and offshore) by 20% by 2020

- New logistics strategies
- Development of recycling strategies
- Reducing manufacturing time and costs

q Milestones

§ Large Medium / long-term R&D programme - 2012

§ 1 prototype of very large-scale turbine (10-20 MW range) - 2017

§ 5 industry-led demonstration activities - new generation of onshore and offshore wind turbines and components by 2015 + 5 (2015-2020)

§ 5 EU testing facilities for onshore and offshore wind turbines by 2015, and 5 on period 2015-2020

§ New cross-industrial cooperation and demonstration Programme with automotive, offshore, and civil aerospace by 2012

EWI 3: Supporting offshore take-off in short to medium term

q Objectives

- § Cost-effective substructures
- § Assembly, installation & decommissioning
- § Improve knowledge of the physical environment

q Actions

- § Access systems and vessels
- § Automation of substructures manufacturing
- § Sponsorship of demonstration programmes
- § Onshore facilities – dedicated harbours
- § Installation and maintenance in relation with oil&gas sector – includes building ad hoc installation vessels

EWI3 – KPIs & Milestones

q Key performance indicators

- § Reducing installation costs of offshore wind turbines by 20% by 2020 (also in cooperation with the oil & gas service sector)
- § Reducing maintenance costs of offshore wind turbines by 20% by 2020 (also in cooperation with the oil & gas service sector)

q Milestones

- § 2 new types of access vessels - 2015
- § 4 prototypes of new substructure - very large-scale offshore turbines / different water depth - 2015
- § 5 wind farm monitoring programmes - 2015 + 5 - 2015-2020
- § Comprehensive guide on environmental and structural performance – 2015
- § Publication on standards and guidelines on safe and deficient operation and maintenance of offshore wind farms by 2015
- § Standardised harbours in Europe to service the next generation of offshore wind turbines - 2020

EWI 4: Enabling large-scale grid integration of wind energy offshore and onshore, reducing the cost of wind energy integration

q Objectives:

- § Grid management & system operation: improving existing systems
- § Grid reinforcement & extension
- § Networks of the future

q Actions:

- § Cross cooperation with European Grid Initiative
- § Cooperation with TSOs & DSOs for developing advanced management procedures, market regulations, including prediction
- § Long-term planning & grid extension
- § Exploit HVAC & HVDC for managing systems as virtual power plants in a smart super grid

EWI4 – KPIs & Milestones

q Key performance indicators

- § Reaching a wind energy contribution to the overall EU electricity demand above 20% early in the 2020 decade

q Milestones

- § 2 sites showing feasibility of balancing wind power variability with large-scale storage - 2020
 - making use of the necessary HVAC and HVDC, with wind farms managed and operated as “virtual power plants” having a “virtual load factor” of 80%, in a “smart super grid” with support of flexible energy markets
- § Development and testing of at least 3 different large-scale storage technologies for balancing wind power – 2020
- § Detailed implementation plan for an EU Super Grid – 2012
 - Include Baltic interconnection plan; North Sea offshore grid; Mediterranean Energy ring, North-South interconnections with Central & Eastern Europe.

EWI 5: facilitating Europe-wide wind energy development

q Objective

- § Enabling **large-scale deployment through spatial & grid planning** for lowering project risks and improving access to capital, enabling quick decision making, securing the portfolios, and therefore enabling capacity & installation investments

q Actions:

- § Stable & attractive **support-schemes**
- § **Spatial planning** on/offshore
- § Quick implementation of the 2008 20% directive

EWI5 – KPIs & Milestones

- q Key performance indicators

- § European **spatial planning** implemented in 2015

- q Milestones

- § European-wide spatial planning **instruments** available in 2012

EWI 6: Addressing the issue of human resources

- q Objective:

- § **Training**: providing the necessary amount of skilled workers to the industry - 10,000 jobs/year are needed

- q Creating the **European Wind Energy Training Centre** in partnership with European universities all around the EU

EWI6 – KPIs & Milestones

q Key performance indicators

§ Up to **1,000 trainees / year** in 2020, at PhD and Master level with the aim of reaching 10,000 trainees in 2030

q Milestones

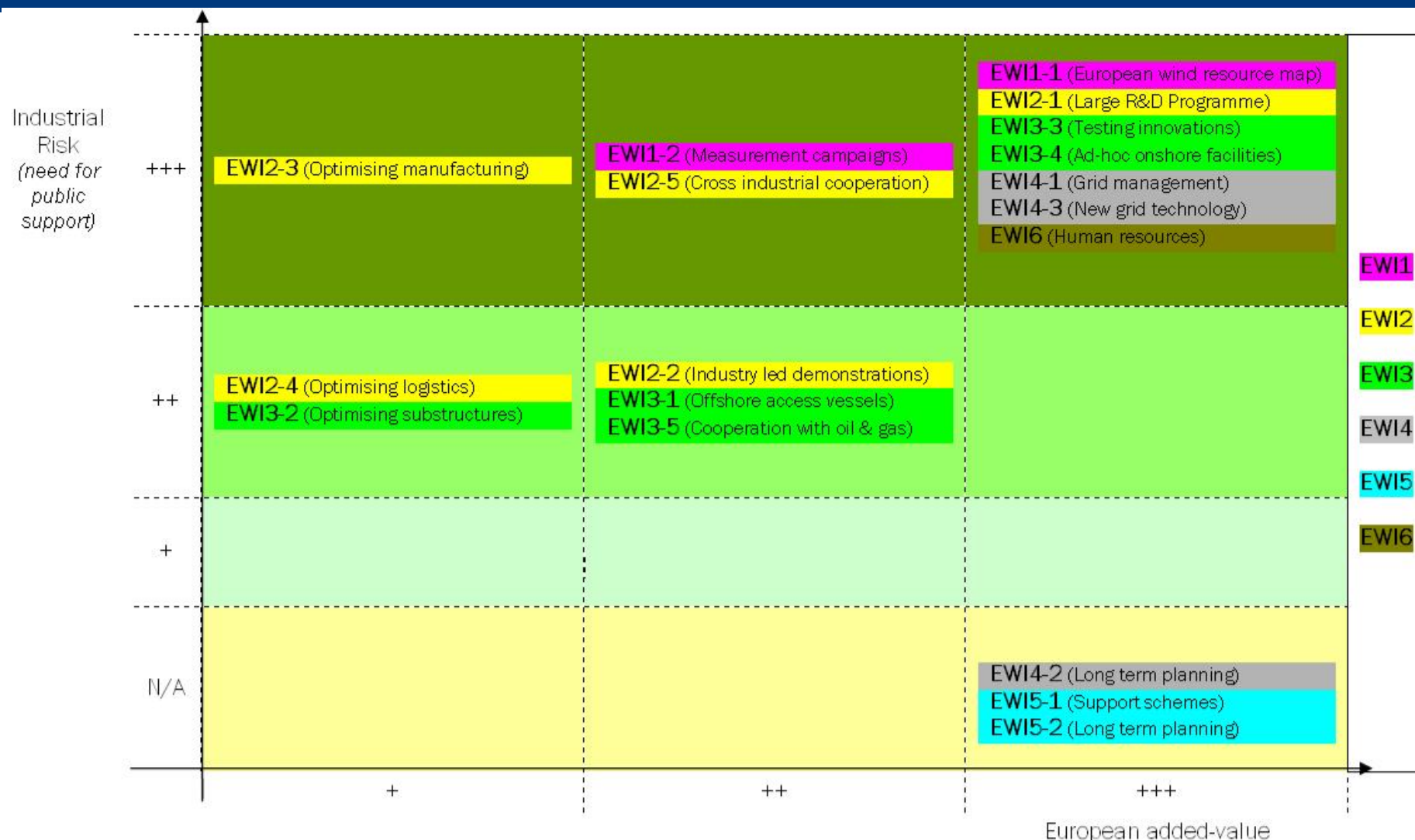
§ Launch of the new **European Wind Energy Training Centre** in cooperation with the *European Research Alliance* and the *European Academy of Wind Energy* by 2012

Summary and tables

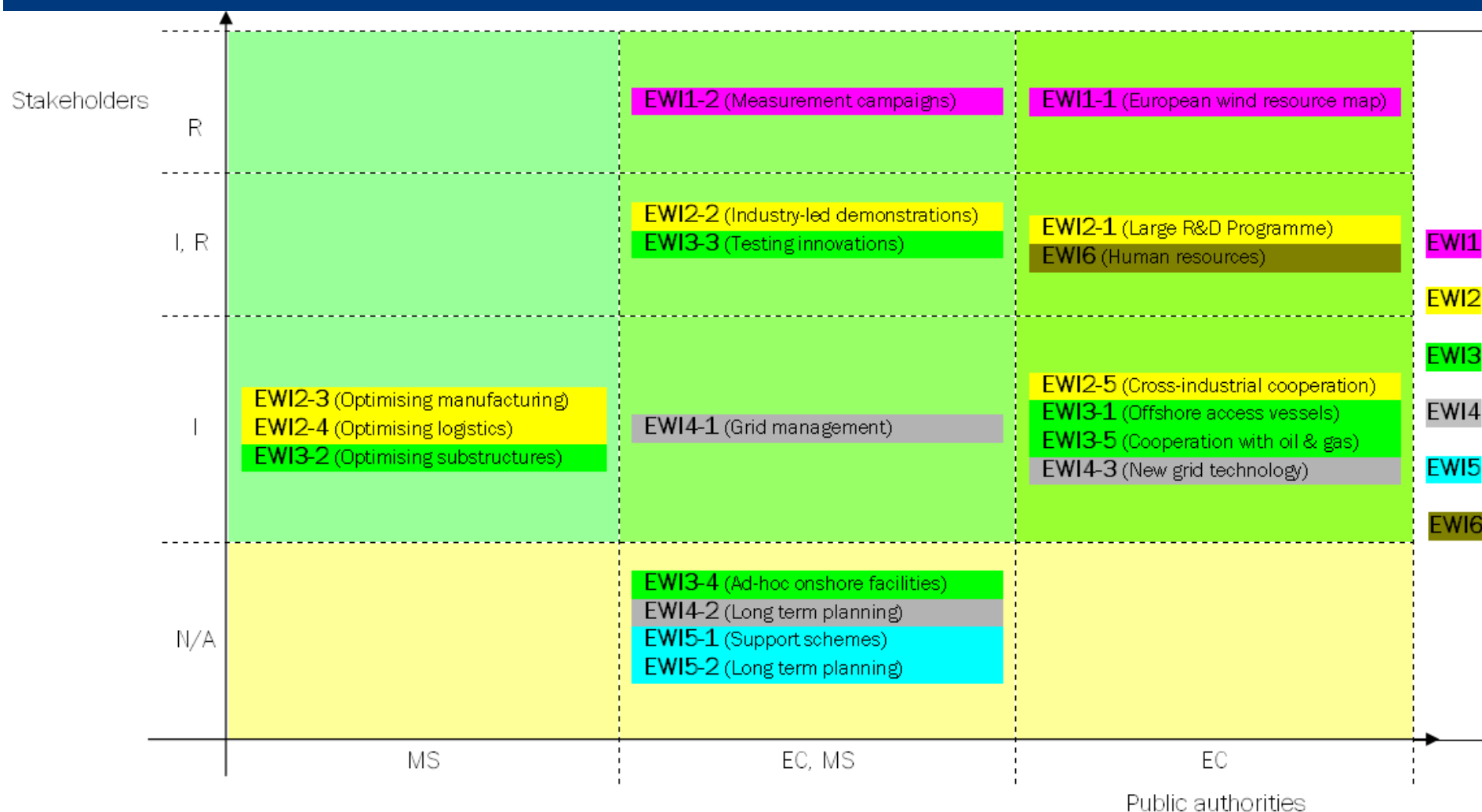
Example for EWI1 & 2

EWI component		Action	Foreseen budget (€ million)	Start date	End date	European added-value	Risk attached to private investment in the area	Public financing actors considering EU added-value, and risk MS= Member States EC = European Commission	Main project owner I=industry R = Research Institutes
EWI1	EWI1-1	European wind resource map	175	2009	2015	+++	+++	EC	R
	EWI1-2	Measurement campaigns		2009	2015	++	+++	EC, MS	R
EWI2	EWI2-1	Large long-medium term R&D programme	< 2000	2009	2020	+++	+++	EC	I, R
	EWI2-2	Industry-led full-scale European demonstration activities		2009	2020	++	++	EC, MS	I, R
	EWI2-3	Optimising manufacturing processes		2009	2020	+	++	MS	I
	EWI2-4	Optimising logistics		2009	2020	+	++	MS	I
	EWI2-5	Cross-industrial cooperation and demonstration program		2009	2020	++	+++	EC	I

Funding intensity & European integration



Leadership and funding



Budget

Based on the best available knowledge, and existing activities.

EWI component	Foreseen budget (€million)
EWI1	175
EWI2	< 2000
EWI3	> 1000
EWI4	> 2000
EWI5	25
EWI6	500
Total	< 6000