CIEMAT

Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas

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Towards an European Energy Research Alliance

Enrique Soria Lascorz

Director

División de Energías Renovables

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CIEMAT Spanish Research Center in Energy, Environment and Technology

Mission: To contribute to the sustainable development of the country and the quality of life of its citizens, through the generation and application of scientific and technological knowledge.

Areas of activity:

- **Energy (Combustion and Gasification , Nuclear Fission, Hydrogen and Fuel Cells., Renewable Energies : Solar , Wind, Biomass and Biofuels, Energy efficiency)**
- **National Lab for Fusion and Basic Research**
- **Environment**
- **Technology**
- **Knowledge Transfer**

Personnel : 1.500 staff

Budget : 170 M€ / year

SEDES DEL CIEMAT

CENER-CIEMAT

SORIA

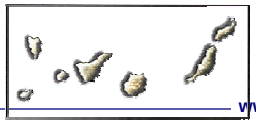
CIEMAT- El Bierzo

Puerto Información Científica Barcelona

CIEMAT- Extremadura

MADRID

ALMERÍA

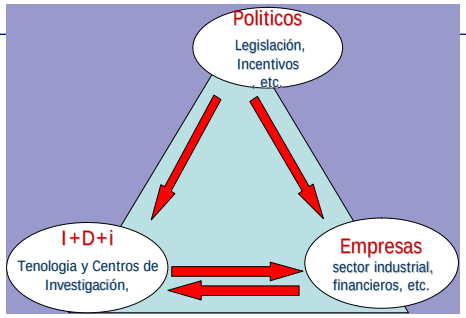


Renewable Energy Sources (RES)

New objectives EUROPE 2020:

20 % of primary energy with RES

20% reduction of CO2 emissions



SPAIN Renewable Energy Plan 2005-2010

12 % of Primary Energy with Renewable

(7.6 % 2008)

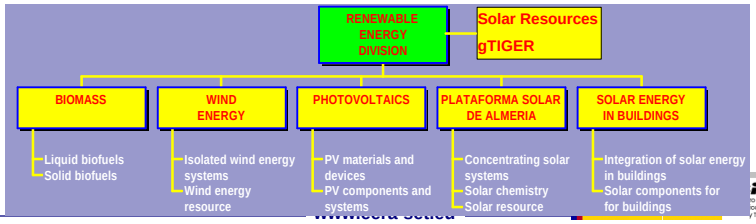
30 % of electricity with Renewable

(22% 2008)

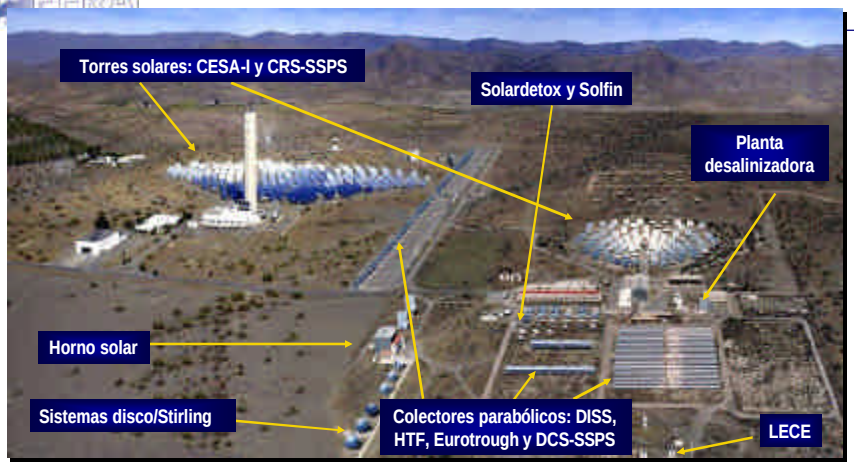
5,75 % biofuels in the transport (< 2 % 2008)

RENEWABLE ENERGY DIVISION OF CIEMAT

- ✓ A Division of the Energy Department of CIEMAT
- ✓ Public Research Body→ Technological Development
- ✓ Facilities in Madrid, Almería (PSA) and Soria (CEDER)
- ✓ Pioneer team from 1098 with a international projection
- ✓ Staff more then 200 people



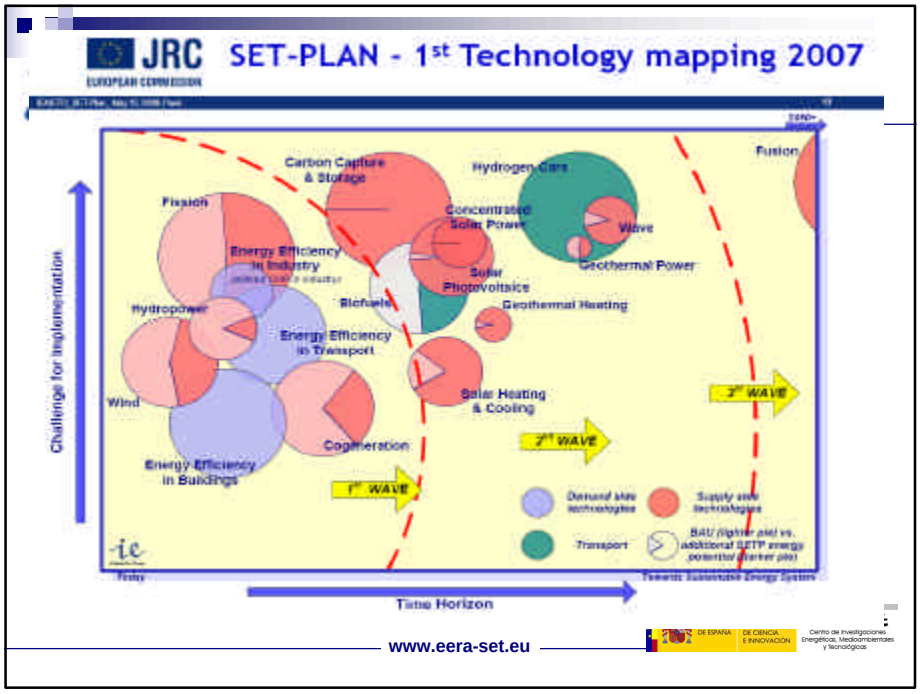
PLATAFORMA SOLAR DE ALMERÍA



ENEA - CIEMAT - Hacia un diseño óptimo y contrucción de una planta de energía modular, de 50 Mwe, que incluya almacenamiento de energía y producción de hidrógeno.

ENERGY AND ENVIRONMNT

- Energy R&D is not only convenient but strictly necessary in all potential energy sources
- Immediate Options:
  - Following with the uses of the actual energy sources, increase the efficiency of the processes, to promote the renewable energy sources (wind , biomass and biofuels, solar energy, hydro) to promote the saving of energy.
- Mid Term
  - Massive use of the Concentrated Solar Power, Offshore wind energy. Clean coal combustion
- Long Term
  - Renewable Energy Sources, Sustainable Nuclear energy , Hydrogen
- Very Long Term
  - Nuclear Fusion , Economy of Hydrogen
- Always
  - To adapt the network to a better combination of available resources



European Strategic Energy Technology Plan (SET-Plan)

Why we need a SET-Plan (1)

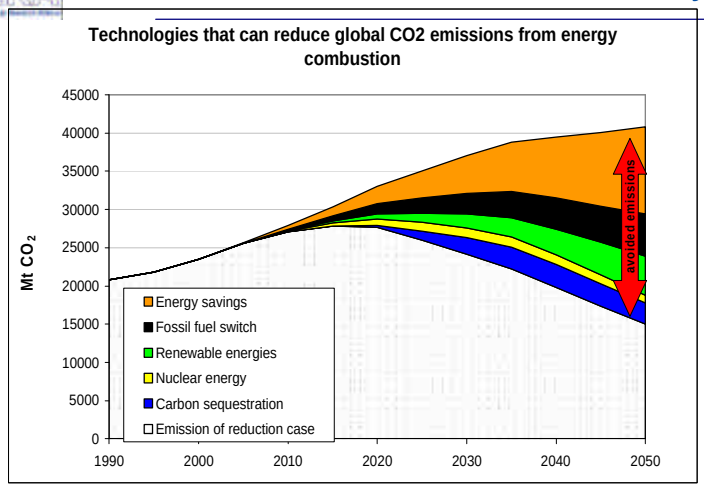
- **Technology is vital to achieve our policy objectives**
- **Today we are falling short**
  - **not on a pathway to meet our policy objectives**
  - **lack of innovation drivers for the industry**
  - **insufficient energy research budgets in the EU**
- **Intrinsic weakness in energy innovation**
  - **long lead times, incumbent technologies, system inertia**
  - **no natural market appetite for new energy technologies**
  - **social acceptance issues and up-front integration costs**

Why we need a SET-Plan (2)

- **Europe should lead the world**
  - **growing international competition**
  - **MSs working alone will struggle**
  - **mastery of technology vital to competitiveness**
- **Time is of the essence**
  - **decisions taken now will have lasting consequences**
  - **cost of inaction will be much higher in the long run**

We need to use the ambition and the targets of the Energy Policy for Europe to create a new European policy for energy technology

Possible, in theory ...



Source: JRC-IPTS

Key EU technology challenges for the next 10 years

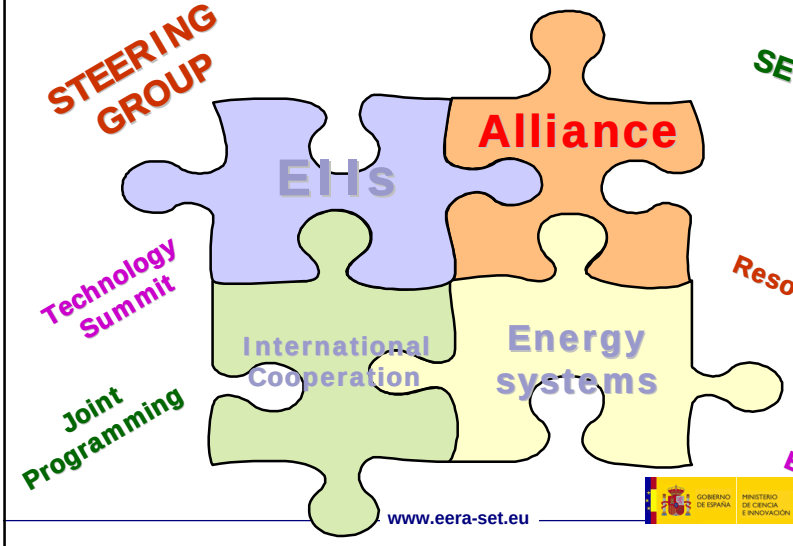
2020

- 2nd generation biofuels
- Commercialisation CCS
- Larger wind turbines
- Large scale PV and CSP
- Enable a single, smart grid
- Market energy efficiency devices
- Long-term waste management

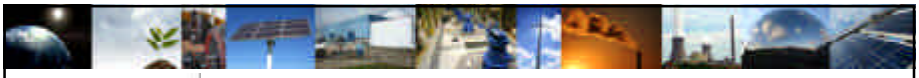
2050

- Next generation of renewables
- Breakthroughs in energy storage
- Hydrogen fuel cell vehicles
- Gen-IV
- Complete ITER
- Alternative vision TEN-E and systems
- Breakthroughs in materials, nano-science, ICT, bio-science, ...

The SET-Plan



www.eera-set.eu



Towards an European Energy Research Alliance

The need to develop and accelerate deployment of new energy technologies

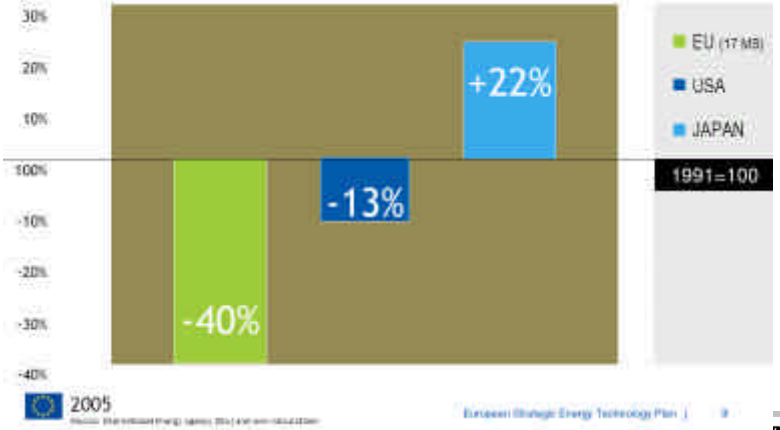
www.eera-set.eu

Context

- **Challenges are increasing**
  - **Climate change**
  - **Security of supply**
  - **Economic competitiveness (sustainable growth)**
- **Change is needed**
  - **Goals and ambitions can not be met using today's technologies**
- **A next generation of energy technologies needs to be developed**
  - **From fundamental research to commercialisation phase**
  - **SET-Plan, industry groupings and technology platforms**

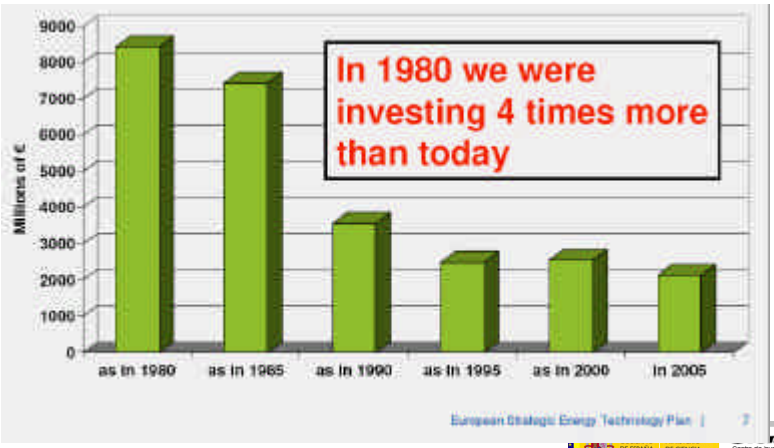
The urgency

Evolution of public R&D: EU, USA and Japan 1991 - 2005



The urgency

Development of energy RTD investments in the EU



Towards an EERA

- **History: EERA announced in SET-plan**
- **Initiative by 10 leading institutes to found an EERA**
  - **Total annual turnover on energy research approx 1,300 M€ and over 10,000 scientists**
  - **Supported by EUA and EUROHORCS and facilitated by EC**
- **Aim: accelerate development of new energy technologies**
  - **Strengthen, expand and optimise research capabilities**
  - **Harmonisation of national and EC programmes, decrease fragmentation**
  - **Draw on results from fundamental research**
  - **Mature technologies to hand over to industry driven research (industry groupings)**

EERA Context

Link to other platforms, bodies and initiatives

- Primary focus of EERA is on development of next generations of energy technologies
  - Drawing on results from fundamental research
  - Maturing technologies so it can be embedded in industry driven research
- Avoid duplication, connect to existing initiatives
  - JTI's, Industry Initiatives
  - KIC's
- Linking to SET-plan
  - SET Steering Group, EC

EERA context

Context: main players

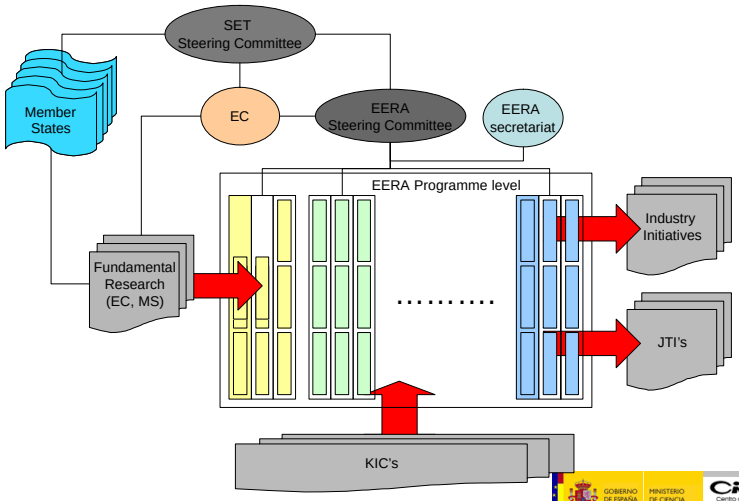
- Founding members and participants on the programme level
  - Interests to be addressed through the Executive Committee
- Funding actors:
  - Ministries, Energy Agencies, European Commission, Industry
  - Interests to be addressed through Advisory Committee
  - Member States give orientation through the SET Plan Steering Group
- Observers:
  - EUROHORCS, EUA, European Commission
  - Attend Executive Committee meeting
- End-users:
  - European technology platforms
  - EII and EIT/KIC
  - Public research stakeholders
  - Executive Committee has to ensure link between Coordinator of a Joint Programme and these end-users (information exchange, harmonisation)

Governance structure

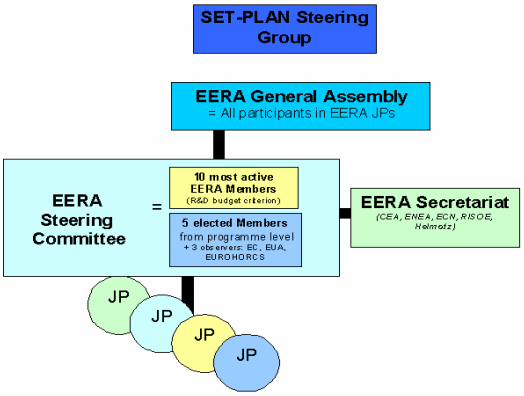
Definition: a Joint Programme (JP)

- **Harmonised activities based <u>on own resources</u>**
  - **Flexibility to align with joint priorities is required**
  - **Not: EC co-funded projects (objectives are already laid down in existing contracts)**
  - **In line with SET-plan priorities**
  - **Areas: wind, pv, CCS, CSP, materials for nuclear, bio fuels, etc.**
- **Described through a Description of Work (DoW)**
  - **Objectives, time line, expected results**
  - **Who puts in how many resources for a specific activity**
- **Within a Joint Programme, sub-programmes may be defined**
- **If the programme is up and running, alignment/merging with EC research programmes**

Link to other bodies



Governance Estructure (EERA)



Governance structure

- Participation in EERA <u>open to all research</u> organisations
  - Not just a membership; need to bring in significant R&D capacity
  - Governance structure: programme level and steering board
  - New Member States in particular invited to join

Participants on programme level

- Participants have the option to have their logo and contact details displayed at EERA website
  - Partner section (not: founding member)
- Criteria for membership of EERA:
  - <u>Minimum effort > 5 person years / year per Joint Programme</u> per individual institute or cluster of institutions
    - Threshold to be evaluated early 2010
  - Signing of 'letter of support' to ratify EERA objectives

Towards an EERA

- **Key areas yet identified (and to be explored)**
  - **Carbon Capture and Sequestration**
  - **Wind**
  - **Solar PV and Concentrated Solar Power**
  - **Second generation bio fuels (and beyond)**
  - **Biomass**
  - **Materials for nuclear**
  - **Fuel cells**
  - **Smart grids**
  - **Geothermal power**
  - **Marine applications**
  - **More to follow….**

Hacia la Alianza EERA

Founding partners:

With the support of:

Towards an EERA

To conclude:

- **The EERA aims to accelerate development of advanced technologies**
  - **Joint programming**
- **But: just increasing research efficiency is not enough**
  - **Increase of R&D budgets also needed**
- **More information: www.eera-set.eu**