DESLOCAÇÃO

10th Inter – Parliamentary Meeting on Renewable Energy

Madrid, 16 e 17 de Abril de 2010

RELATÓRIO

Deputada Odete João (GP-PS)

Deputado José Eduardo Martins (GP – PSD)

Enquadramento

O encontro, apesar de muito marcado por pelas circunstâncias limitadoras do tráfego aéreo na Europa, com consequências no número dos participantes, foi uma oportunidade para retomar a discussão sobre:

i) A última Directiva Europeia sobre fontes de energia renováveis e as suas obrigações para os Estados membros;

ii) O ponto de situação do desenvolvimento e implementação das energias renováveis nos diferentes espaços regionais europeus;

iii) Financiamento do desenvolvimento da energia renovável.

1. Programa

Ver anexo.

2. Opinião dos relatores

O encontro foi útil porque permitiu uma avaliação cabal do Estado da arte do desenvolvimento das tecnologias renováveis e uma avaliação do esforço a fazer para atingir as metas das directivas.

Foi também particularmente importante a discussão sobre a oportunidade política da manutenção das tarifas bonificadas e o efeito sobre os *deficits* tarifários, com possível mitigação futura a partir das transacções de certificados de origem num sistema de *cap and trade* equivalente ao das emissões de carbono.

3. Considerações Finais

O EUFORES é um fórum que permite a reunião de parlamentares nacionais e europeus no aprofundamento e discussão de matérias essenciais da política energética, pelo que entendemos ser de manter a participação portuguesa em tempo de mudanças tão aceleradas neste domínio.

Os Deputados

Odete João **José Eduardo Martins**

4. Anexos

1. Programa
2. Apresentações efectuadas

European Forum
for Renewable Energy Sources

Supported by the
Spanish EU Council Presidency

10th Inter-Parliamentary Meeting on Renewable Energy
The top 100 parliamentary decision-makers of EUROPE!

Final onsite version

**In cooperation with the Spanish EU Council Presidency,
the Spanish Parliament and the Spanish Senate**

Friday 16th April 2010
Venue: Hotel Westin Palace, 100m from Spanish Parliament
Address: Plaza de las Cortes 7, 28014 Madrid, Spain
Simultaneous interpretation: English/ Spanish

16th April 2010	
8:30	**Registration Hotel Westin Palace, Room Medinaceli** **Conference Chair: Jan Geiss**, Secretary General, EUFORES
9:15 9:30 60p	**Welcome by Antonio Cuevas Delgado**, President Committee of Industry, Tourism and Trade, Parliament of Spain ***"The Renewable Energy Sources (RES) Directive"*** **Chair: Mechtild Rothe**, Former MEP, Honorary President EUFORES • **"National implementation of the RES Directive and the vision of the Spanish Parliament", Antonio Cuevas Delgado**, President Committee of Industry, Tourism and Trade, Parliament of Spain • **"The Template for the national Renewable Energy Action Plans", Hans van Steen**, Head of Unit, DG TREN European Commission **Exchange of views with MEPs and MPs**
11:30	***Coffee Break***
12:00	***Regional discussion workshops – separate rooms*** **1. "RES in the Southern and Mediterranean Area"** (with translation English-Spanish) – Main conference room Medinaceli **- Chair: Antonio Cuevas Delgado**, MP Spain - Renewables from a regional perspective, **Jose Antonio Alonso García**, President Committee of Industry, Tourism and Trade, Senate of Spain - Climate Change and solutions in the Mediterranean Area, **José Segura Clavell**, President, Committee on Climate Change, Spanish Parliament - Expert's input: **Francisco J. Macía Tomás**, Deputy Director for Energy Planning and Monitoring, Ministry of Industry, Tourism and Trade, Spain **2. "RES in the North-Western EU"** Room Cortes I (English only) **Chair: Ingrid Nestle**, MP Germany Expert's input: **Katarzyna Michalowska-Knap**, Senior Expert, EC BREC Institute for Renewable Energy, Expert OffshoreGrid project **3. "RES in the Baltic and Scandinavian Area"** Room Cortes II (English only) **Chair: Krisjanis Karins**, MEP Latvia **Co-Chair: Anne-Grete Holmsgaard**, MP Denmark Expert input: **Anders Kofoed-Wiuff**, Energy Analyst, Ea Energy Analyses DK

EUFORES - European Forum for Renewable Energy Sources a.i.s.b.l.
Renewable Energy House | Rue d'Arlon 63-65| B-1040 Brussels | Belgium
Tel: +32-2-546 1948 | Fax: +32-2-546 1934 | Email: eufores@eufores.org

	4. "RES in Central and South-Eastern Europe" Room Cortes III (English only)
13:15	***Lunch break – Room Julio Camba***
14:15 45p	***"Financing renewables in the middle of the economic crisis"*** **Chair: Krisjanis Karins**, MEP Latvia • "Implementing the RES-Directive – the business view", **Carlos Gascó Travesedo**, Iberdrola Renewables, Spain • "Renewable energy policies to develop investment", **Juan Alario**, Head Renewable Energy Division, European Investment Bank • "Financing Renewables – The view of the European Commission", **Hans van Steen**, Head of Unit, DG Energy, European Commission **Exchange of views with MEPs and MPs**
16:00	***Coffee Break***
16:30 30p	***"Our Vision – 100% renewables in 2050"*** **Chair: Gonzalo Molina Igartua**, Former European Commission • **Movie trailer** "Energy autonomy – the 4th Revolution" (8 minutes) • "Beyond 2020 – We can deliver", **Rainer Hinrichs-Rahlwes**, EREC, BEE, EREF **Exchange of views with MEPs and MPs**
17:30	**Closing of the Conference**
20:00- 23:00	**Gala Reception "10th Anniversary of the IPM"** **Casino of Madrid, Calle Alcalá 15, 28014 Madrid (English only) (Please bring your badge! For men: jacket and tie are obligatory!)** • Welcome **Mechtild Rothe**, Honorary President EUFORES, Former MEP • "The History of EUFORES and Renewables in Europe" **Mechtild Rothe**, Honorary President EUFORES, Former MEP and Vice-President European Parliament **Carlos Robles Piquer**, Founder and Former President of EUFORES, Ambassador of Spain, Former MEP • **José María González Vélez**, President & **Mischa Bechberger**, International Affairs Manager, APPA – Spanish Renewable Energy Association

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Saturday 17th April 2010	
9:45	**Bus trip from Madrid Centre to CECRE - Control centre of renewable energies (Bus leaves from Hotel Westin Palace - Please bring your badge)**
10:30	**Site visit - CECRE, Red Eléctrica de España** • "Presentation of CECRE and Red Eléctrica", **Alberto Carbajo Josa**, Chief of Operations, Red Eléctrica de España (English only) • **Exchange of views with MEPs and MPs**
11:15	**Visit to CECRE in two groups** • **Visit to the CECRE by the 1st group.** During the visit by the first group to the CECRE, a video will be shown for the second group in the auditorium on the activity of Red Eléctrica.
11:45	• **Visit to the CECRE by the 2nd group.** During the visit by the second group to the CECRE, a video will be shown for the first group in the auditorium on the activity of Red Eléctrica.
12:15	**Lunch at CECRE**
13:00	• **A bus service to Madrid Airport for early departures will leave at 13:00 and arrive at the airport 13:30** • **Bus trip to the City Centre**
14:00-15:30	**Guided walking tour through historic City Centre of Madrid (English only)**

In cooperation with

Key-Supporting Partner

Supporting Partner

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Gala Dinner Reception

Sponsor Site Visit

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RENEWABLE ENERGY POLICIES TO DEVELOP INVESTMENTS

Juan Alario, Associate Director

European Investment Bank (BEI)

10th Inter-Parliamentary Meeting on Renewable Energy

Madrid, 16 April 2010

1.1 The European Investment Bank

- European Union's long-term financing institution set up in 1958 by the Treaty of Rome.
- Shareholders: 27 EU Member States
- Lending in 2009:
  - European Union: EUR 70 bn
  - Outside the EU: EUR 9 bn
  - Total lending: EUR 79 bn
- Broad range of financial instruments: from senior loans to equity, including specific instruments for RDI projects
- TA facilities, notably outside the EU, including the new ELENA facility to support urban energy programmes

1.2 EIB Renewable energy (RE) lending

- Substantial lending in low-carbon technologies:
  - Lending of EUR 4.2 bn to RE and EUR 1.5 bn to EE in 2009
  - Support to the less developed technologies (e.g. off-shore wind) and markets (e.g. RE/EE in cities)
  - Expertise and experience in the whole range of low-carbon technologies
- Expanding support during the crisis (practically doubling lending to RE and EE in 2009, relative to 2008)
- Strong cooperation with the Commission to develop new initiatives for low carbon technologies

2.1 RE issues in the EU

- RE in different development stages:
  - Mature (e.g. on-shore wind): close to competitiveness with alternatives
  - Emerging (PV, CSP, off-shore wind): cost expected to decrease rapidly
  - New technologies in the early development stage (such as wave energy)
- Impact of the crisis:
  - substantial decrease in RE investments in 2009, but now increasing again
  - Cost of equity and financing (spreads) has increased

2.2 RE issues in the EU

- Prices of wind turbines and PV equipment decreasing recently, but price trends dependent on many factors (raw material prices, regulations, etc.)
- Uneven development of RE technologies: substantial development for on-shore wind and PV, but still limited for biomass, for instance
- Uneven development of RE markets, but positive developments in the less developed markets in recent times

3.1 Issues to develop investments in the sector(1)

- Regulatory framework:
  - Clear and stable regulatory framework
  - Link to energy prices, particularly electricity prices, increased risk to investors, but RE protected against price fluctuations
- However, regulatory frameworks need to be adapted to market and technological changes:
  - Problems mainly with emerging technologies: as market expands total subsidies increase very rapidly
  - Regulatory change should not create regulatory uncertainty
  - Convergence between feed-in tariffs and green certificate systems?

3.2 Issues to develop investments in the sector(2)

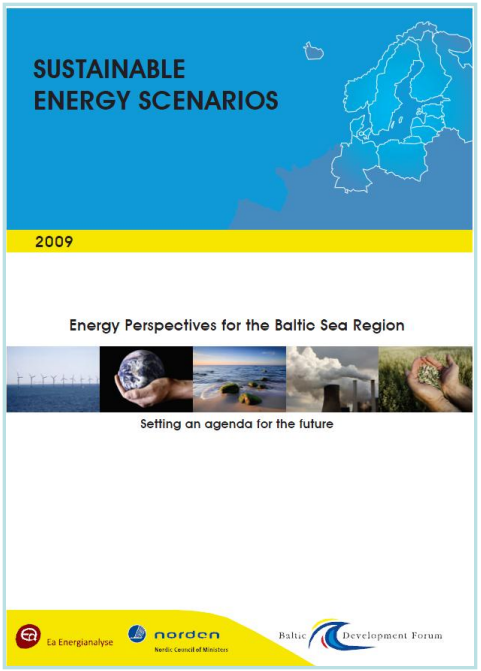
- Predictable and transparent permitting process
- Access and capacity of the electricity networks
- Address market failures, such as introduction of RE in the building environment (e.g. solar for thermal applications), heat networks using RE or geothermal (reservoir risk)

4. Conclusions

- Recently, substantial changes in the EU RE markets, linked mainly to the crisis: RE prices decreasing, changes in regulation
- Success in some leading markets is spreading out to other less developed markets of the EU, but need to accelerate movement
- Need to support the less developed RE to achieve RE objectives, particulary RE for thermal applications and RE in the urban environment
- EIB is launching new initiatives in support of EU objectives in the RE field.

Thank you for your attention

Study on ‘Enhanced regional energy cooperation in the Baltic Sea Region’



10th Inter-Parliamentary Meeting on Renewable Energy

16 April 2010

Anders Kofoed-Wiuff,

Ea Energy Analyses

Objectives

1. To promote a common energy agenda for the Baltic Sea Region through the involvement of key stakeholders
2. To provide a substantial basis for discussion of different energy scenarios for the region based on an analysis of energy data

Process

PHASE I
- Review of current energy situation
- Scenarios for 2030 – Big-tech and Small -tech

PHASE II
- Detailed scenarios of the electricity markets in the region 2010-2030

PHASE III
- Follow up analyses
- Case studies

May 2008 **Feb 2009** **Oct 2009**

Developing scenarios

Energy demand

Fuel prices

Efficiency measures

Scenario Analyses

Infrastructure

Technology data

Renewable resources

Stakeholder dialogue

Baltic Sea Parliamentary Conference

EU

Foreign Ministers

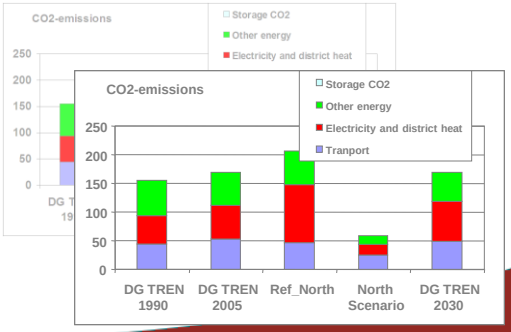
UBC

Basrec

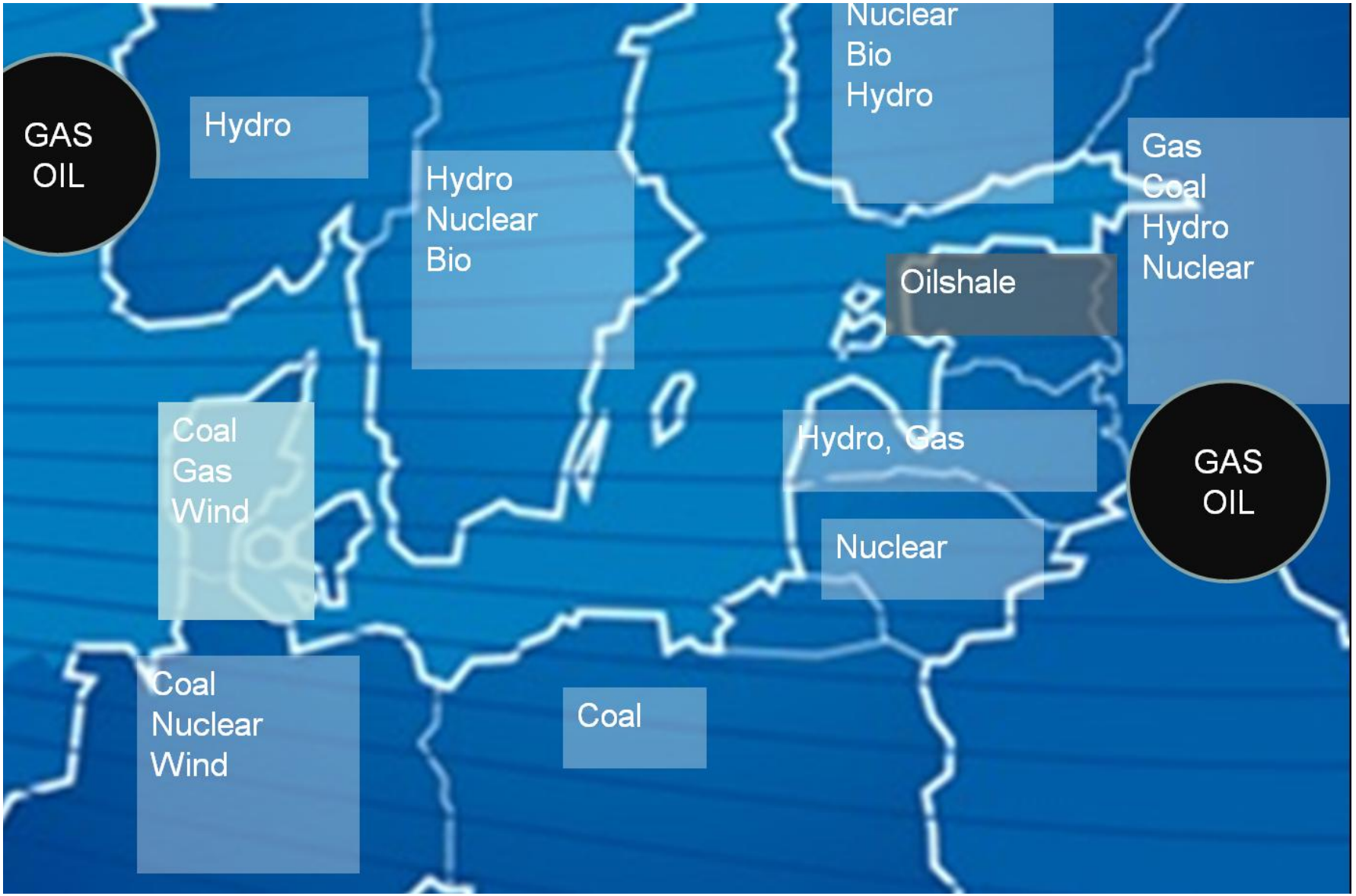
Joint Platform Energy and Climate

Energy industry

Results



Phase I


GAS
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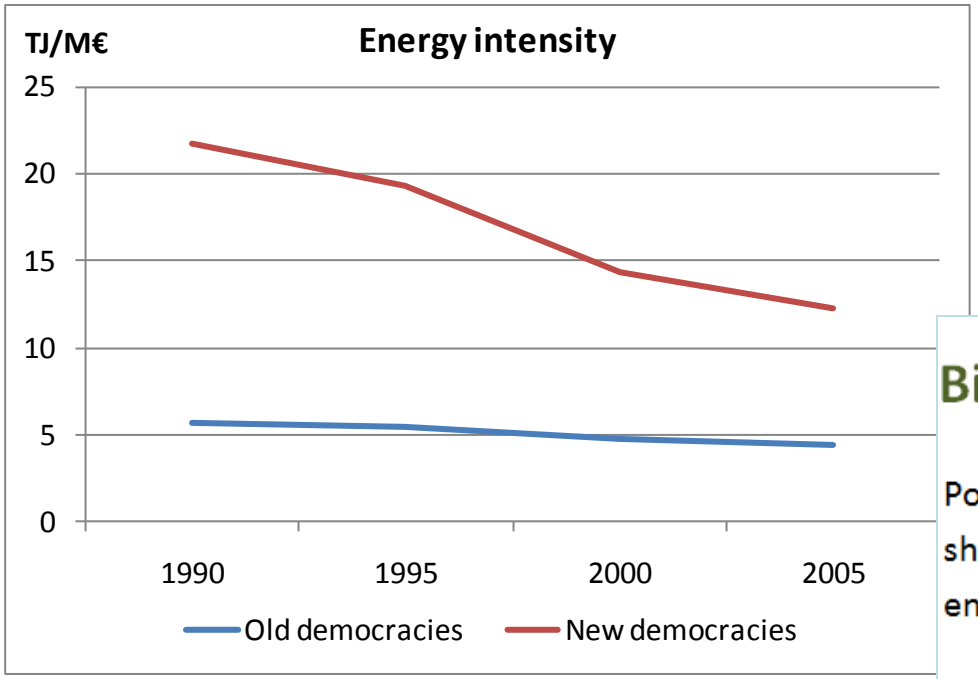
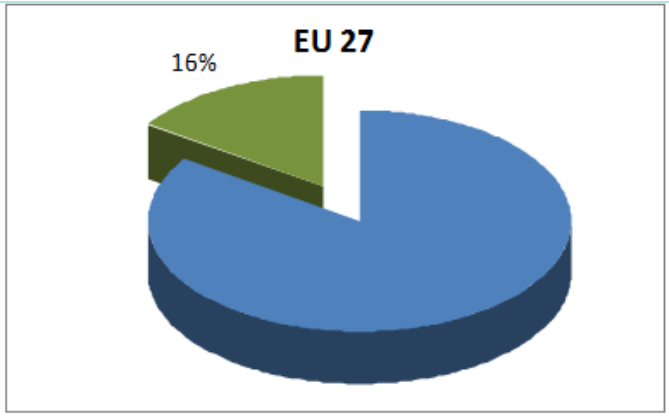
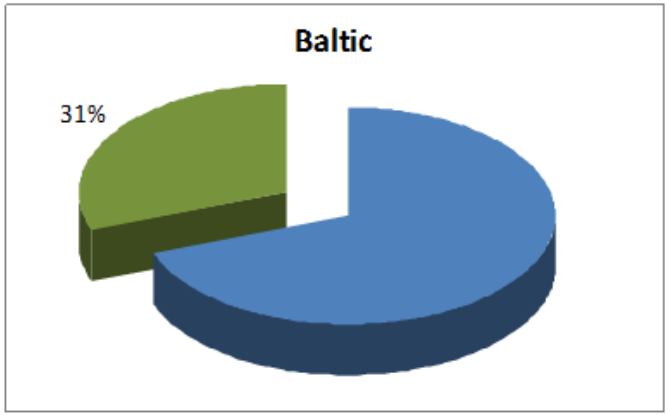


Bioenergy

Potential as share of gross energy demand



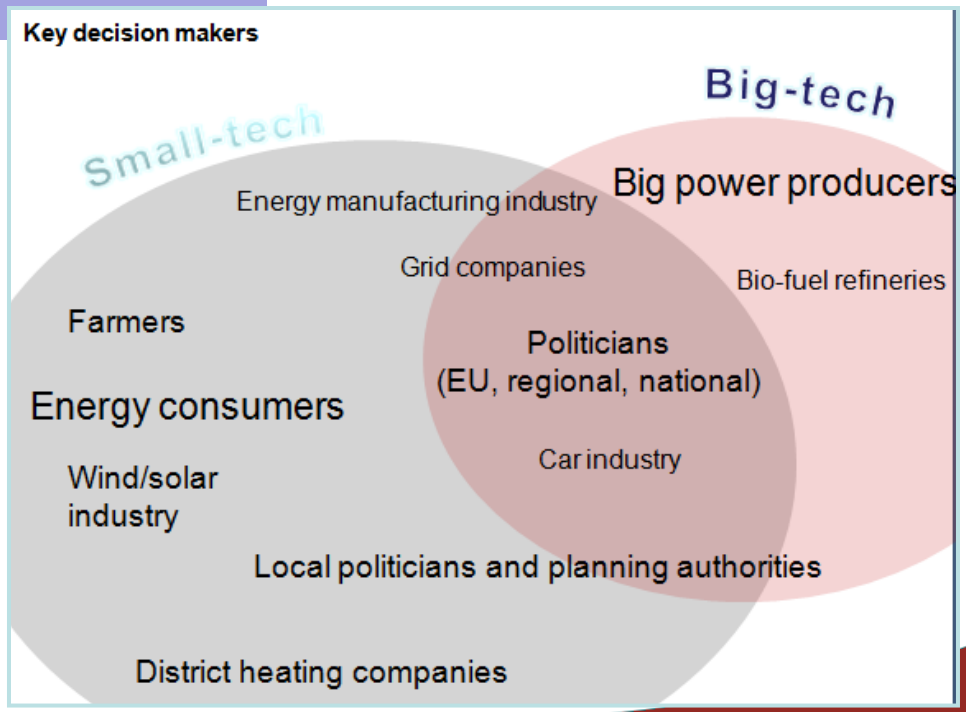


Calculation based on stats from DG TREN and EEA

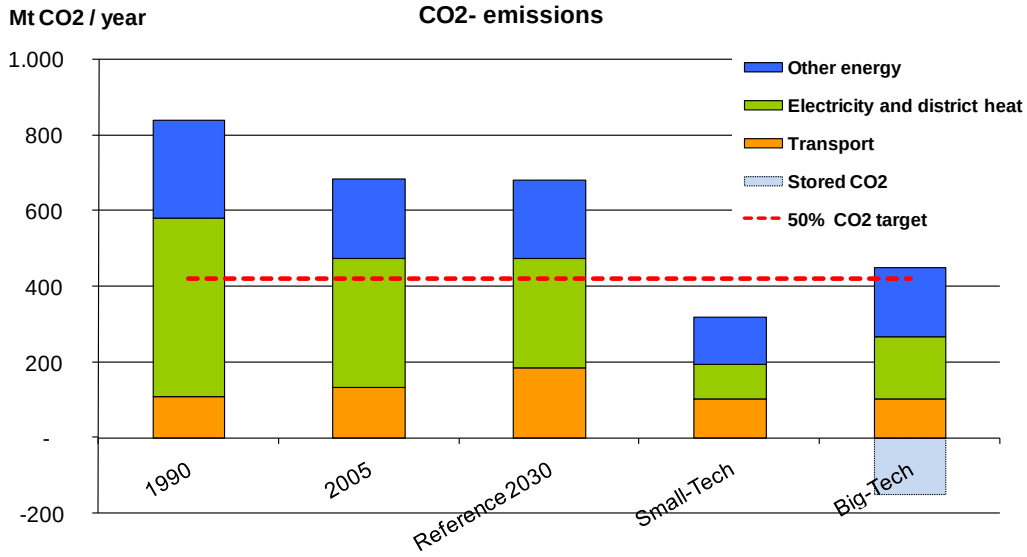
Small-tech	Big-tech
• Energy savings • District heating - CHP • Biomass • Wind, wave, solar	• Carbon Capture & Storage • Nuclear power • Biomass
• Improved fuel economy • Electric vehicles • Modal-change	• Improved fuel economy • Electric vehicles • Biofuels

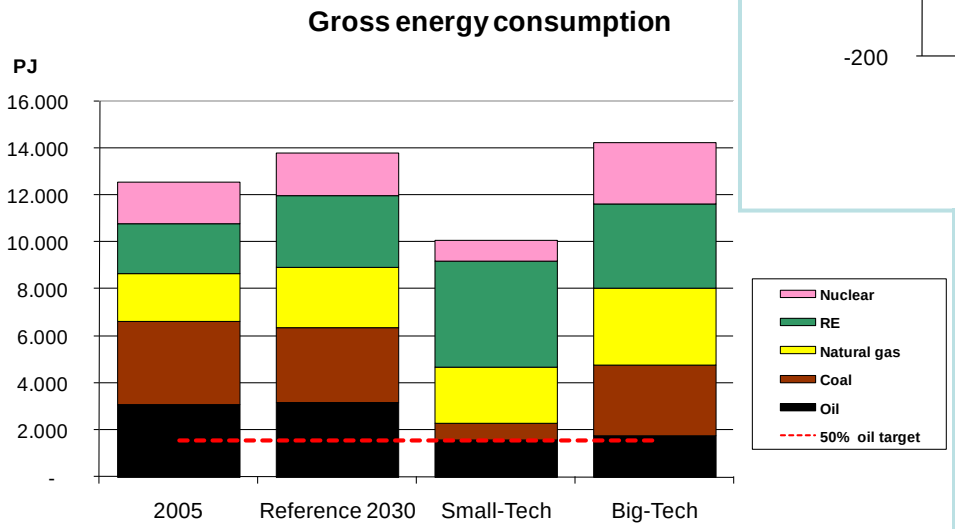
Two scenarios for 2030

Two targets
CO_2 -50 % (1990)
Oil -50 % (2005)



Energy consumption and CO2-emissions





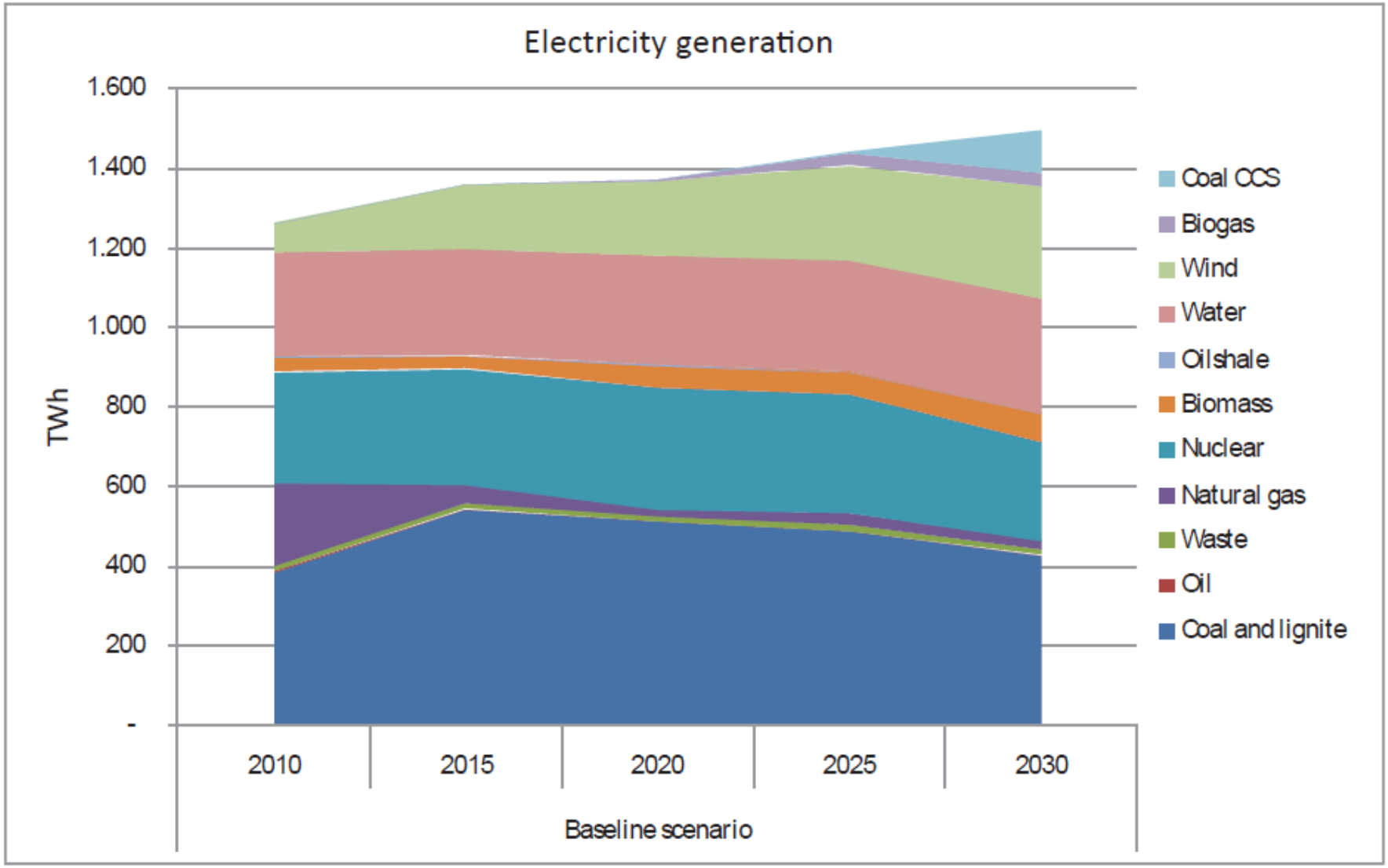
Phase II

Detailed analyses of the electricity markets 2010-2030

- Targets
  - 2020: EU targets for CO2 and RE
  - 2030: 50 % CO2 reduction compared to 1990
- Model decides new investments in generation capacity except nuclear and hydro power
- Fuel prices according to International Energy Agency (WEO 2008) - 120 $/bbl in 2030
- Baseline scenario and three variations
  - regional targets for renewable energy
  - Lower electricity demand
  - More CO2-reduction in 2020

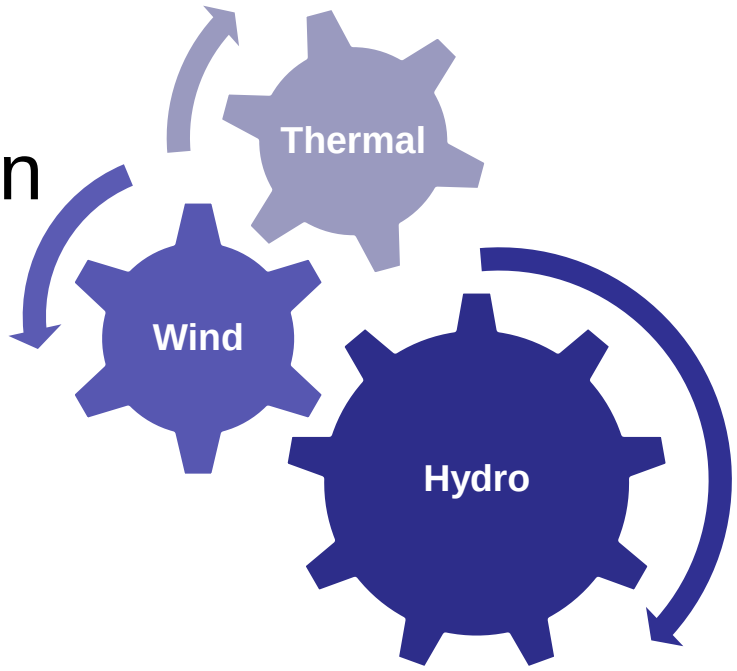
Including data for NW Russia

Generation outlook



Key findings

- The targets can be met at reasonable costs
- Potential for more efficient generation and consumption
- Benefits of regional cooperation
  - Interconnectors
  - Electricity markets
  - RE policies and projects
- *Stronger targets are possible*





National Renewable Energy Action Plans: Towards the EU Renewables 2020 Targets

EUFORES 10th Inter-Parliamentary meeting - Madrid, 16 April 2010

EUROPEAN COMMISSION

Hans van Steen, Head of Unit, DG Energy, C1

The EU´s current energy challenges

- Green House Gas emissions; long term unabated climate change to cost up to 20% of GDP…

- € 234bn in 2009 flowed out of the EU, spent on energy imports

- €↑↓oil price volatility strains our economies

- ≈✖ supply insecurity causes social and economic hardship

- 20 mill. tonnes of particulate matter polluting the air

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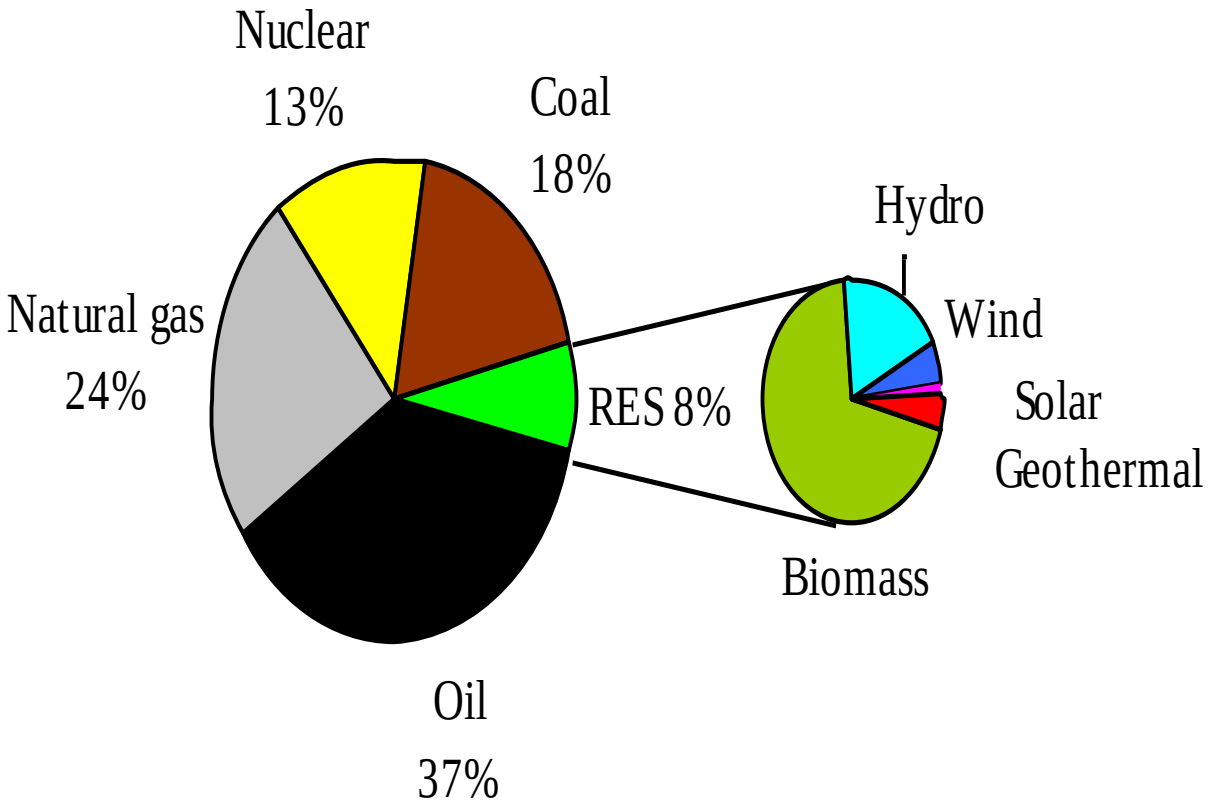
EU energy mix, 2007:



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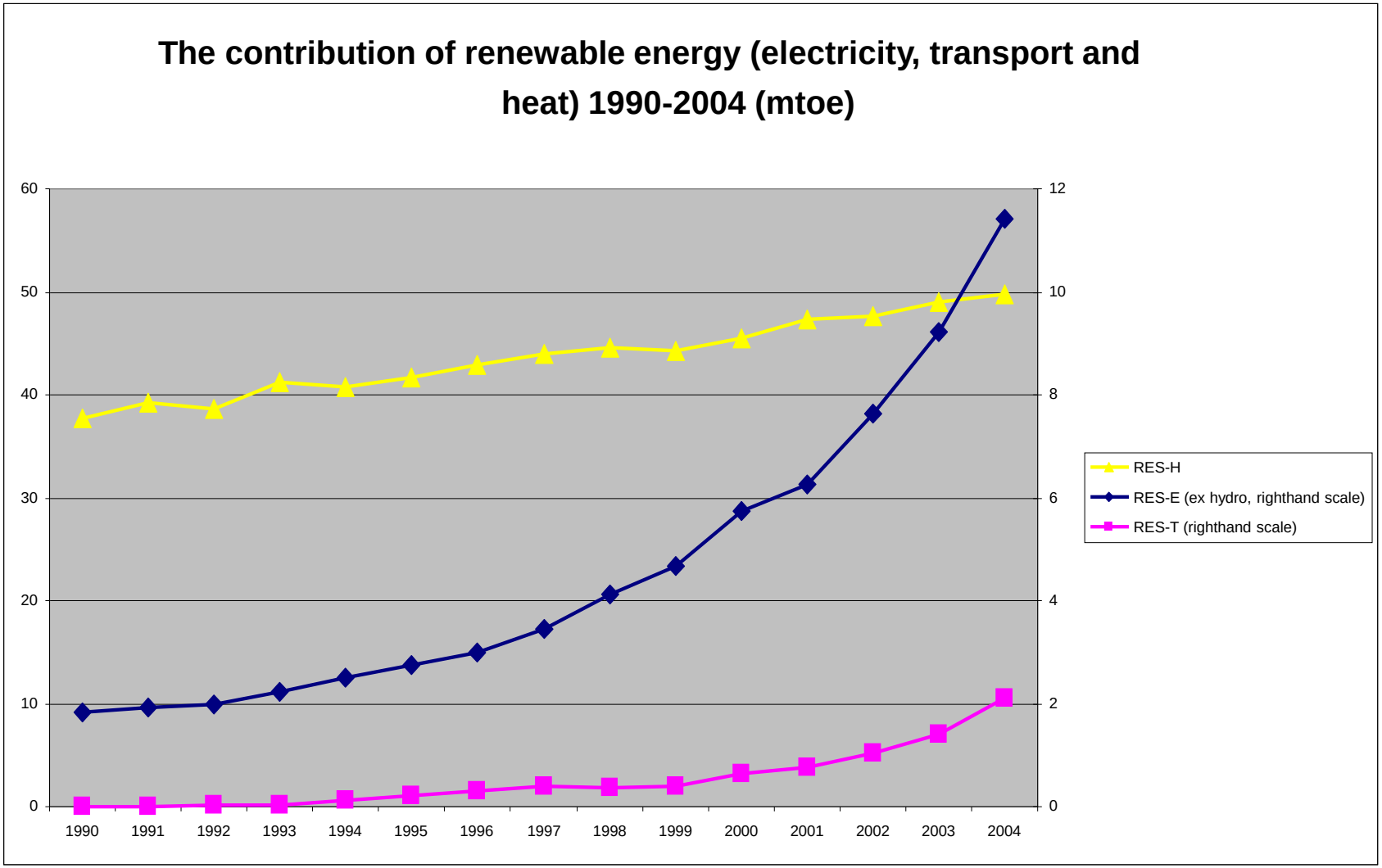
”Renewable Energy Roadmap”, 2007



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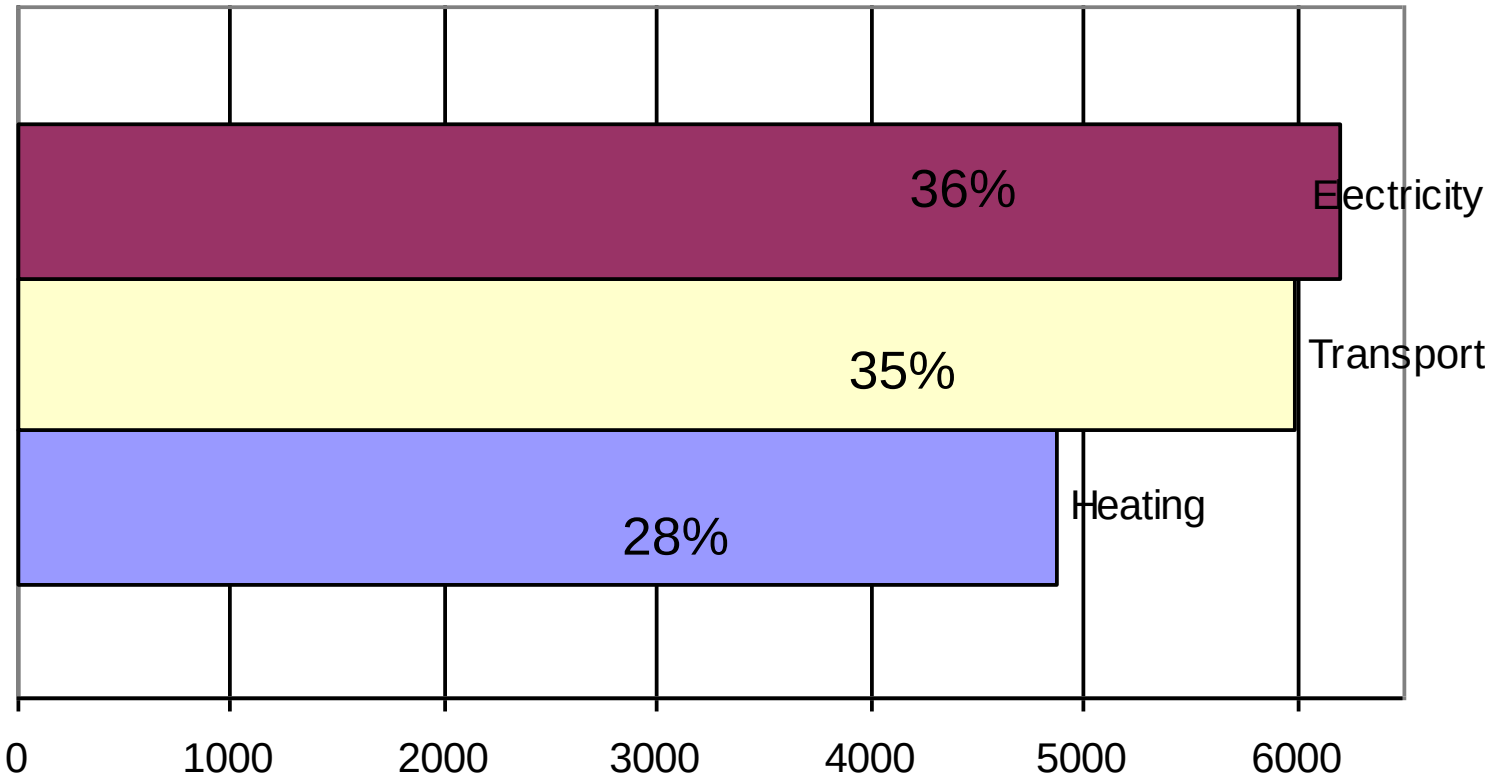
Renewable Energy Growth

Renewable energy growth 2004-2007 by sector (Total 17000 ktoe)



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Progress towards the 2010 targets - patchy

	Electricity		Transport (biofuels)			Electricity		Transport (biofuels)	
	2004-2006 growth	progress towards targets	2005-2007 growth	progress towards targets		2004-2006 growth	progress towards targets	2005-2007 growth	progress towards targets
AT	😐	☹	☺	☺	LV	☹	☹	☹	☹
BE	☺	😐	☺	☹	LT	😐	☹	☺	☺
BU	😐	☹	☺	☺	LU	😐	😐	☺	😐
CY	☹	☹	☹	☹	MT	☹	☹	😐	☺
CZ	😐	☹	😐	☹	NL	☺	☺	☺	😐
DK	☹	☺	😐	☹	PO	😐	☹	😐	☹
EE	😐	☹	😐	☹	PT	☺	☹	☺	😐
FI	☹	☹	😐	☹	RO	☹	☹	😐	☹
FR	😐	☹	☺	😐	SK	☺	☹	☺	😐
DE	☺	☺	☺	☺	SI	☹	☹	😐	☹
GR	☺	☹	☺	☹	ES	😐	☹	😐	☹
HU	☺	☺	😐	☹	SW	😐	😐	☺	😐
IE	☺	😐	😐	☹	UK	😐	☹	😐	☹
IT	☺	😐	☹	☹	*EU*	☺	😐	☺	😐

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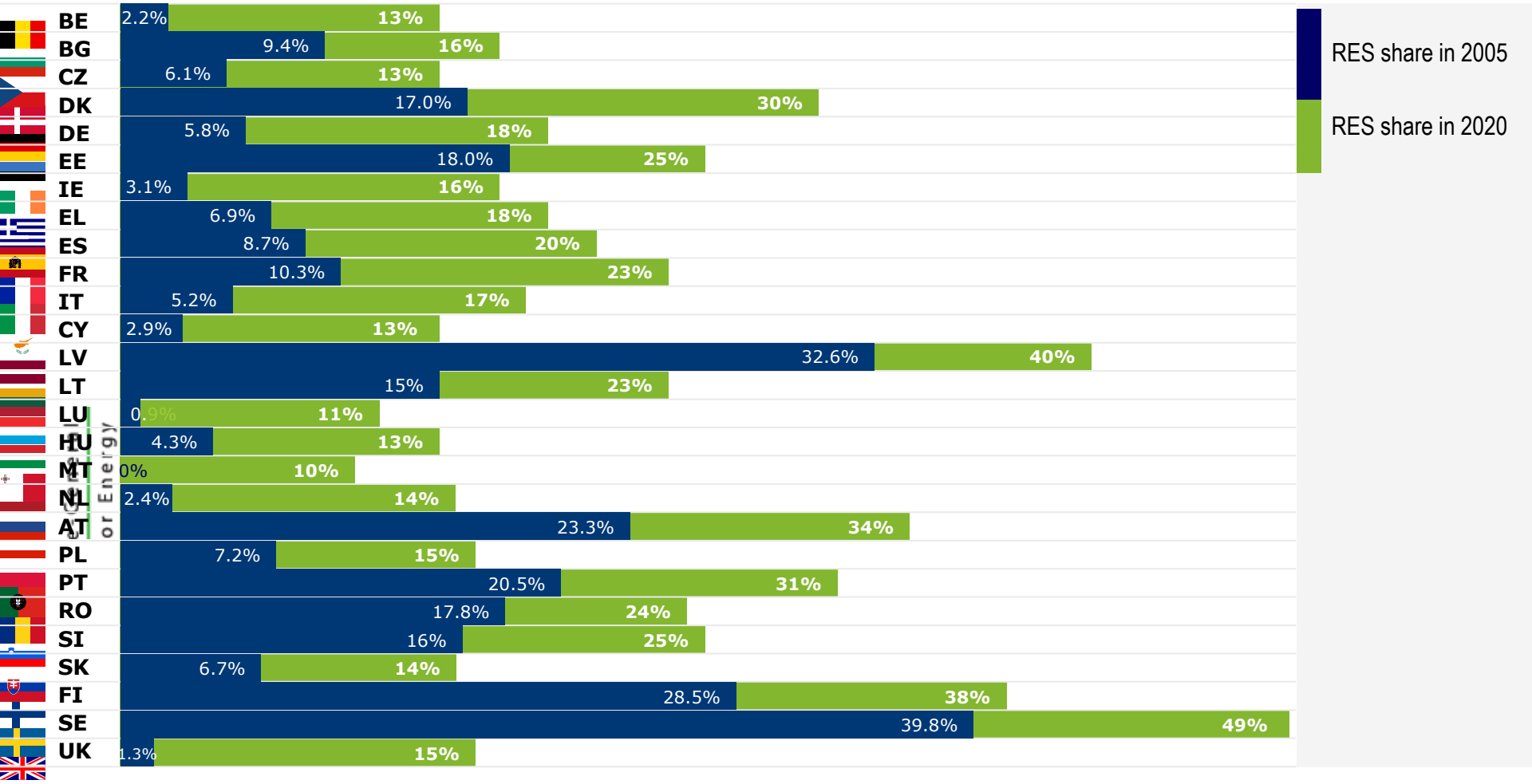
Member States' targets for 2020



The renewables Directive

- Mandatory national targets (overall + renewables in transport)
- Flexibility between Member States
- National Renewable Energy Action Plans, NREAPs
- Reduction of administrative and regulatory barriers, grid issues, etc
- Sustainability regime for biofuels

The role of the new Directive / NREAPs

- Setting the legal framework for renewable energy and the pathways towards the 2020 targets
- Critical for:
  - the necessary stability / predictability for investors
  - the Commission's ability to effectively enforce the Directive and keep Member States on track
  - transparency of RES developments in the EU

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Flexibility Instruments / Forecast Documents

- All Forecast Documents received by Febr. 2010
- Detailing each Member State's intended use of co-operation mechanism, i.e.
  - estimated statististical transfers
  - potential for joint projects
- Conclusions: (1) EU can meet its target through domestic production of RES, (2) limited use of flexibility mechanisms envisaged.

Summary table of intended use of co-operation mechanisms

ktoe	2011-2012	2013-2014	2015-2016	2017-2018	2020	2020 target
AT	0	0	0	0	0	34%
BE	675	857	812	521	-279	deficit (12.3% Vs 13%)
BG	1-144	186-346	231-481	53-375	-140 to +289	surplus (18.7% Vs 16%)
CY	0	0	0	0	0	13%
CZ	0	0	0	0	0	13%
DK	613-809	769-784	473-657	333-366	-337	deficit (28% Vs 30%)
FI	0	0	0	0	0	38%
FR	0	0	0	0	0	23%
EE	47-69	78-96	79-88	52-67	3	surplus (25.1% Vs 25%)
DE	5930-7058	5866-6997	4657-5917	3842-5088	1387	surplus (18.7% Vs 18%)
GR			70.9 (0.3%)	239.4 (1%)	488 (2%)	surplus (20% Vs 18%)
HU	0	0	0	0	0	13%
IE	251-259	255-272	403-430	138-148	0	16%
IT		-86	-860	-1170	-1170	deficit (16% Vs 17%)
LV	0	0	0	0	0	40%

ktoe	2011-2012	2013-2014	2015-2016	2017-2018	2020	2020 target
LT	96.3 (1.8%)	93.9 (1.7%)	79.7 (1.4%)	52.9 (0.9%)	18.3	23.3% Vs 23%
LU					-43 to -300	deficit (5-10% Vs 11%)
MT	2.8	6.2	7.1	14.1	-43,5	deficit (9.2% Vs 10%)
NL	0	0	0	0	0	14%
PO	519-866	705-1032	647-1162	613-1129	333	surplus (15.5% Vs 15%)
PL	0	0	0	0	≥0	surplus (result still 31%)
RO	0	0	0	0	0	24%
SI	0	0	0	0	0	25%
SK	56	112	134	167	143	surplus (15.2% Vs 14%)
ES	4200		4791		2700	surplus (22.7% Vs 20%)
SE	1074	1273	1286	1105	486	surplus (50.2% Vs49%)
UK	-119	-210	-254	40		15%
surplus	13465-15309	10201-11869	13671-15916	7130-9272	5558-5847	
deficit	-119	-296	-1114	-1170	-1873 to -2173	
net	13346-15190	9905-11573	12557-14802	6270-8102	3546-3718	20.3%

BLUE - Member State expecting to need a transfer in its

GREEN - Member State expecting to have a surplus available to transfer to another Member State

WHITE - Member State not expecting to produce a surplus or require a transfer to meet its

Conclusions

- Renewable energy form an indispensable part of any strategy for decarbonising the energy sector
- The Renewable Energy Directive provides a good framework for achieving and enforcing the 20% target for 2020
- Next critical step will the delivery of the National Renewable Energy Action Plans. These must be delivered on time, be complete and credible in terms of target compliance

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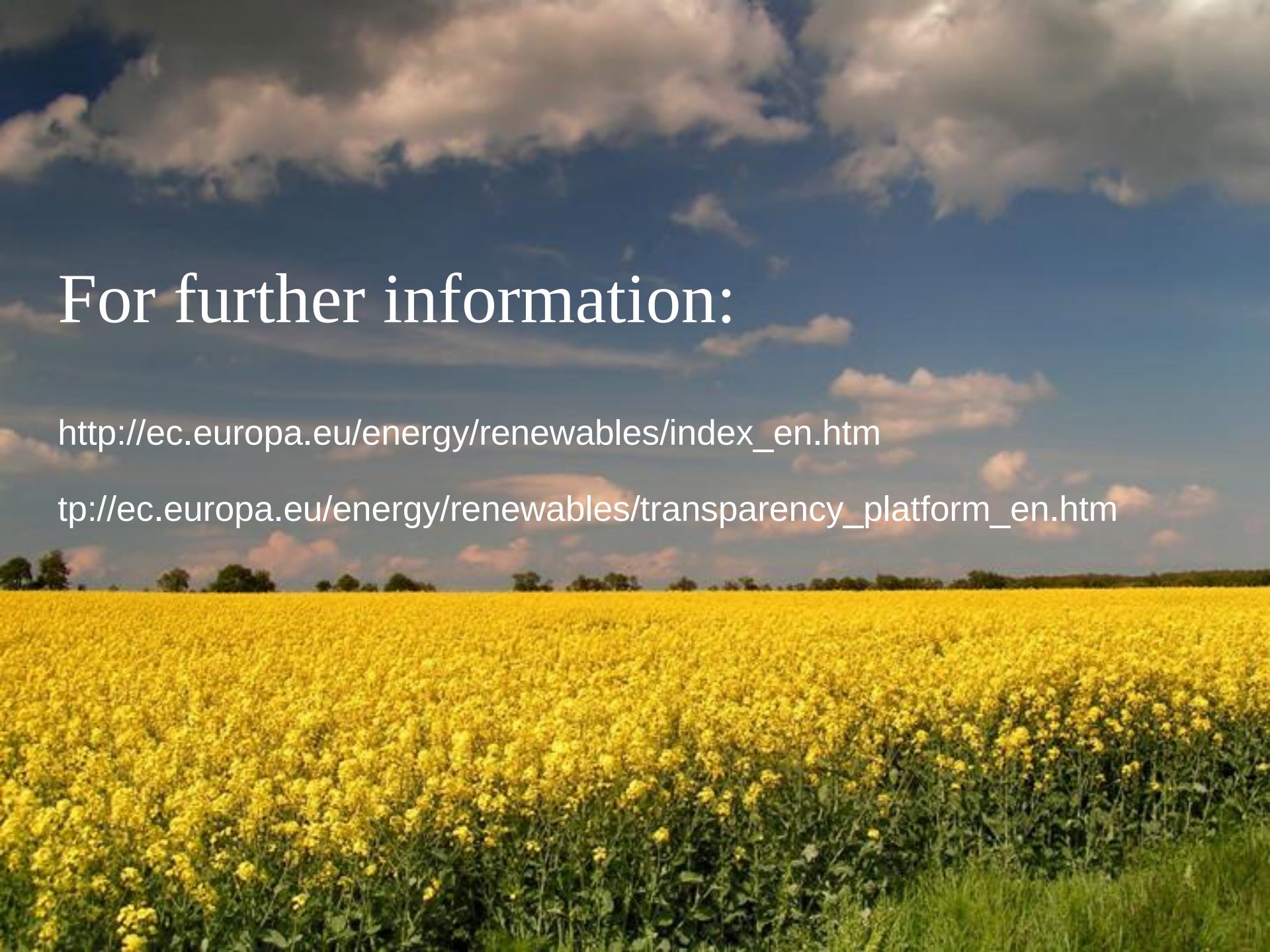
2021 Progress report – success!

	Overall RES		Transport 10%			Overall RES		Transport 10%	
	2018-2020 growth	progress towards targets	2018-2020 growth	progress towards targets		2018-2020 growth	progress towards targets	2018-2020 growth	progress towards targets
AT	☺	☺	☺	☺	LV	☺	☺	☺	☺
BE	☺	☺	☺	☺	LT	☺	☺	☺	☺
BU	☺	☺	☺	☺	LU	☺	☺	☺	☺
CY	☺	☺	☺	☺	MT	☺	☺	☺	☺
CZ	☺	☺	☺	☺	NL	☺	☺	☺	☺
DK	☺	☺	☺	☺	PO	☺	☺	☺	☺
EE	☺	☺	☺	☺	PT	☺	☺	☺	☺
FI	☺	☺	☺	☺	RO	☺	☺	☺	☺
FR	☺	☺	☺	☺	SK	☺	☺	☺	☺
DE	☺	☺	☺	☺	SI	☺	☺	☺	☺
GR	☺	☺	☺	☺	ES	☺	☺	☺	☺
HU	☺	☺	☺	☺	SW	☺	☺	☺	☺
IE	☺	☺	☺	☺	UK	☺	☺	☺	☺
IT	☺	☺	☺	☺	EU	☺	☺	☺	☺

Directorate-General for Energy

EUROPEAN COMMISSION



For further information:

http://ec.europa.eu/energy/renewables/index_en.htm

tp://ec.europa.eu/energy/renewables/transparency_platform_en.htm

EUROPEAN RENEWABLE ENERGY COUNCIL

EREC

RE-thinking 2050

On behalf of EREC:

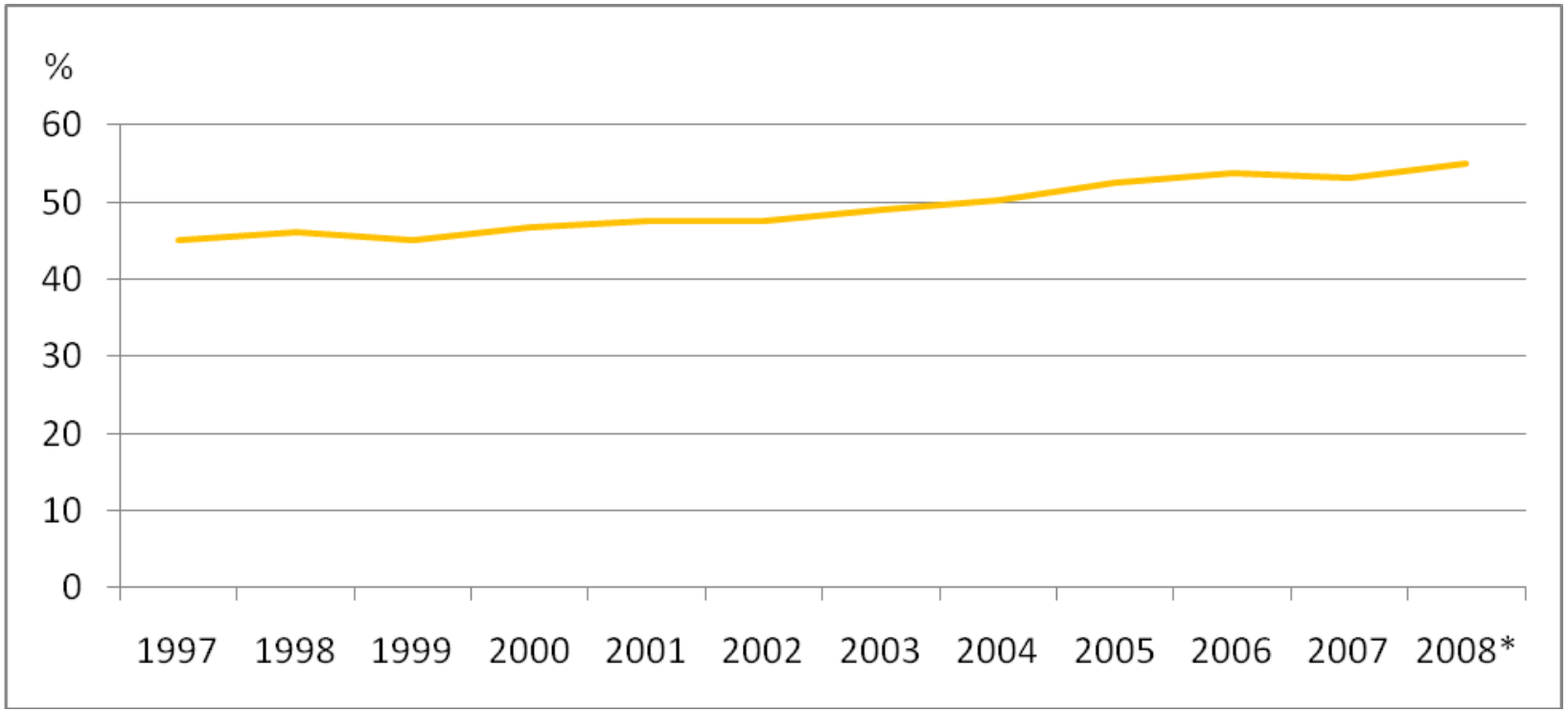
Rainer Hinrichs-Rahlwes

Vice-President of EREF

Board Member of BEE (German RE Federation)

IPM Madrid, 16th April 2010

Security of energy supply



Source: EREC based on Eurostat

* 2008 based on Eurostat´s 2009 *monitoring report of the EU sustainable development strategy*

Security of energy supply

100 percent

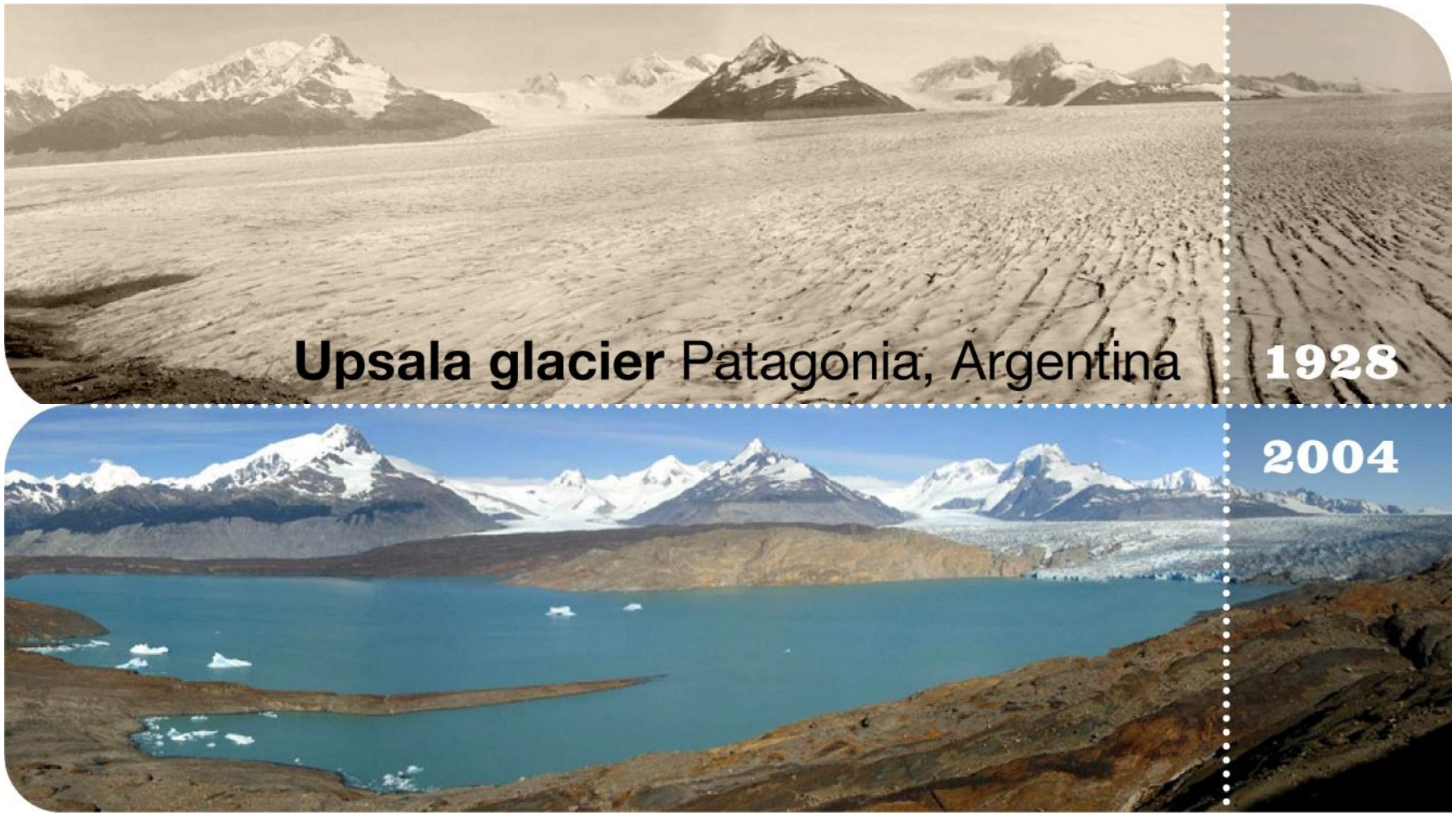
Estonia, Latvia, Lithuania, Bulgaria, Finland, Ireland and Sweden

>69 percent

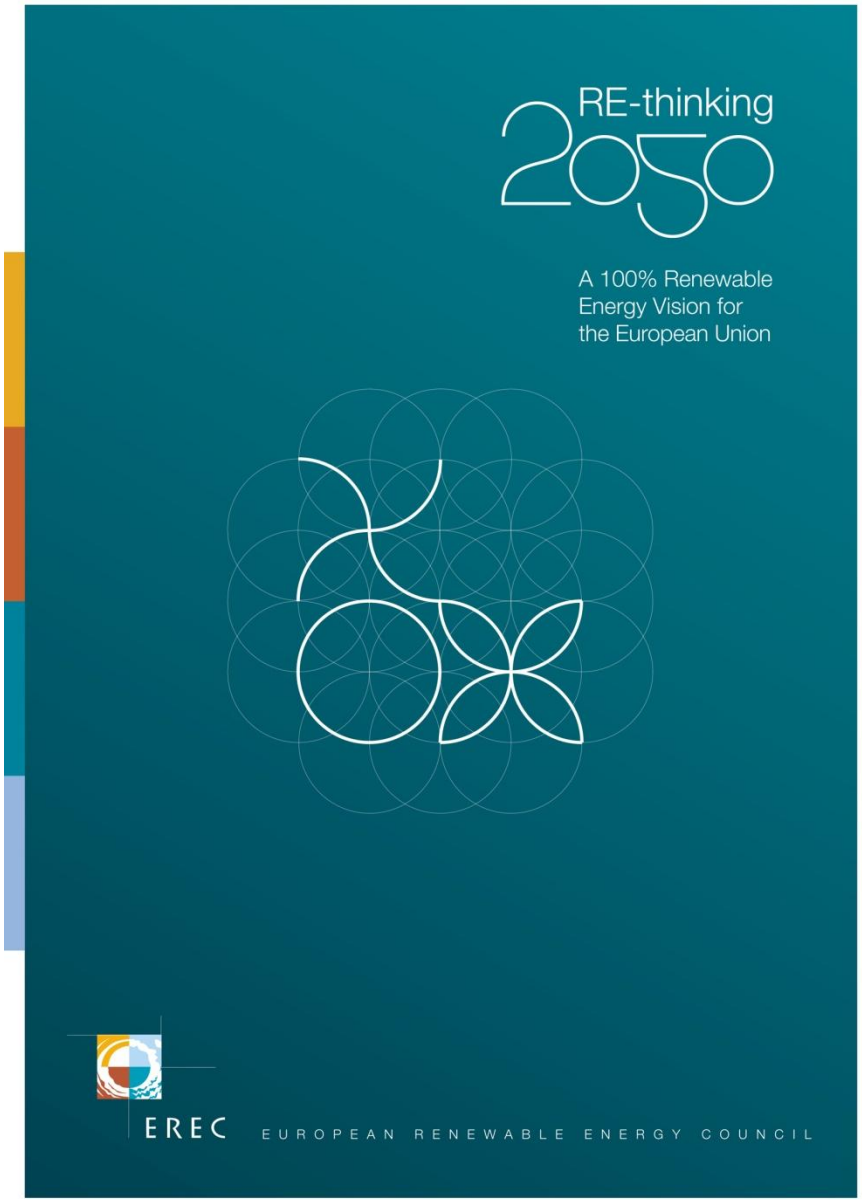
Greece, Hungary, Austria, the Slovak Republic, Poland, Romania and the Czech Republic

Source: European Commission „Second Strategic Energy Review“, 2008

Climate Change

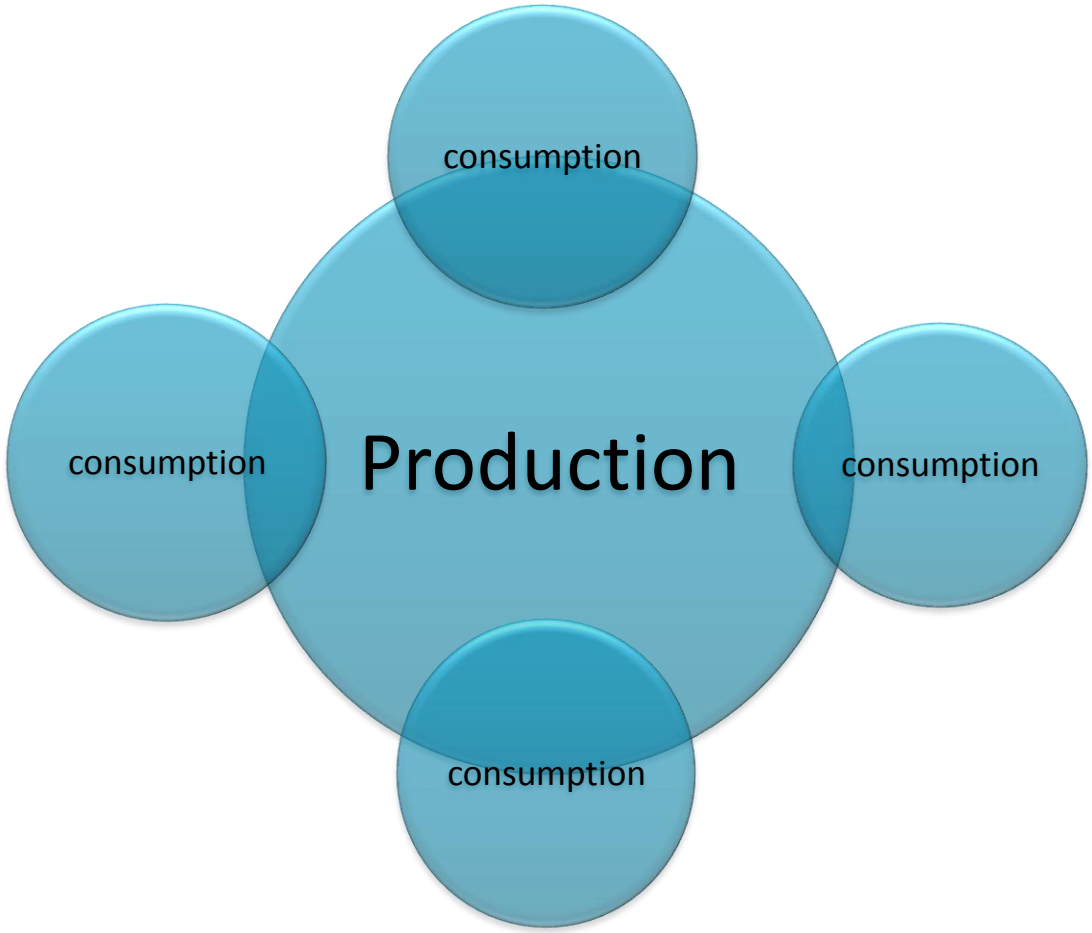


- Climate Change
- Competitiveness
- Security of energy supply

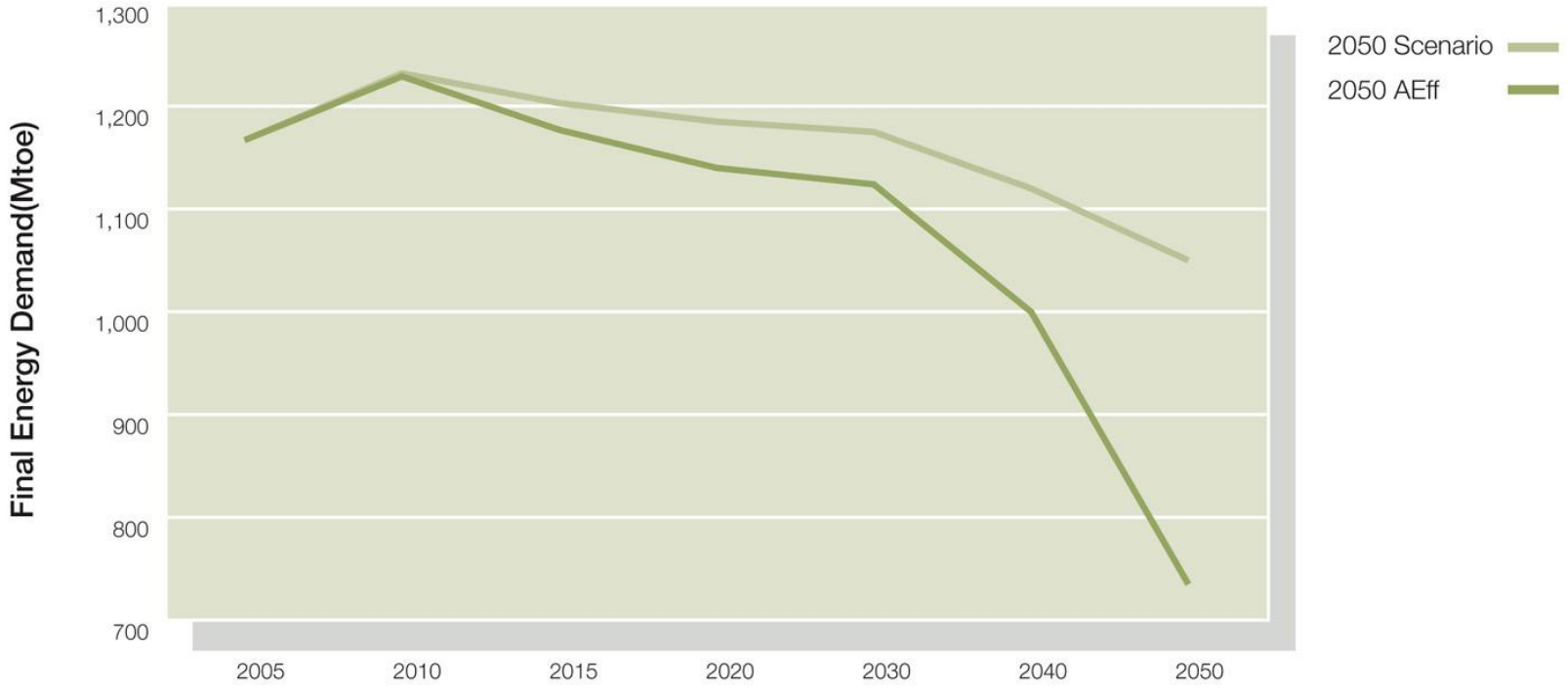

RE-thinking
2050
A 100% Renewable
Energy Vision for
the European Union
EREC
EUROPEAN RENEWABLE ENERGY COUNCIL

EREC Member Associations

AEBIOM	European Biomass Association
EGEC	European Geothermal Energy Council
EPIA	European Photovoltaic Industry Association
EREF	European Renewable Energies Federation
ESHA	European Small Hydropower Association
ESTELA	European Solar Thermal Electricity Association
ESTIF	European Solar Thermal Industry Federation
EUBIA	European Biomass Industry Association
EU-OEA	European Ocean Energy Association
EUREC	European Association of Renewable Energy Research Centres
EWEA	European Wind Energy Association


consumption
consumption
Production
consumption
consumption

Consumption Assumptions (2005-2050)



	2005	2010	2015	2020	2030	2040	2050
NEP MP	1,167	1,232	1,203	1,185	1,175	1,120	1,050
NEP HP	1,167	1,229	1,177	1,140	1,124	1,000	735

Source: EREC

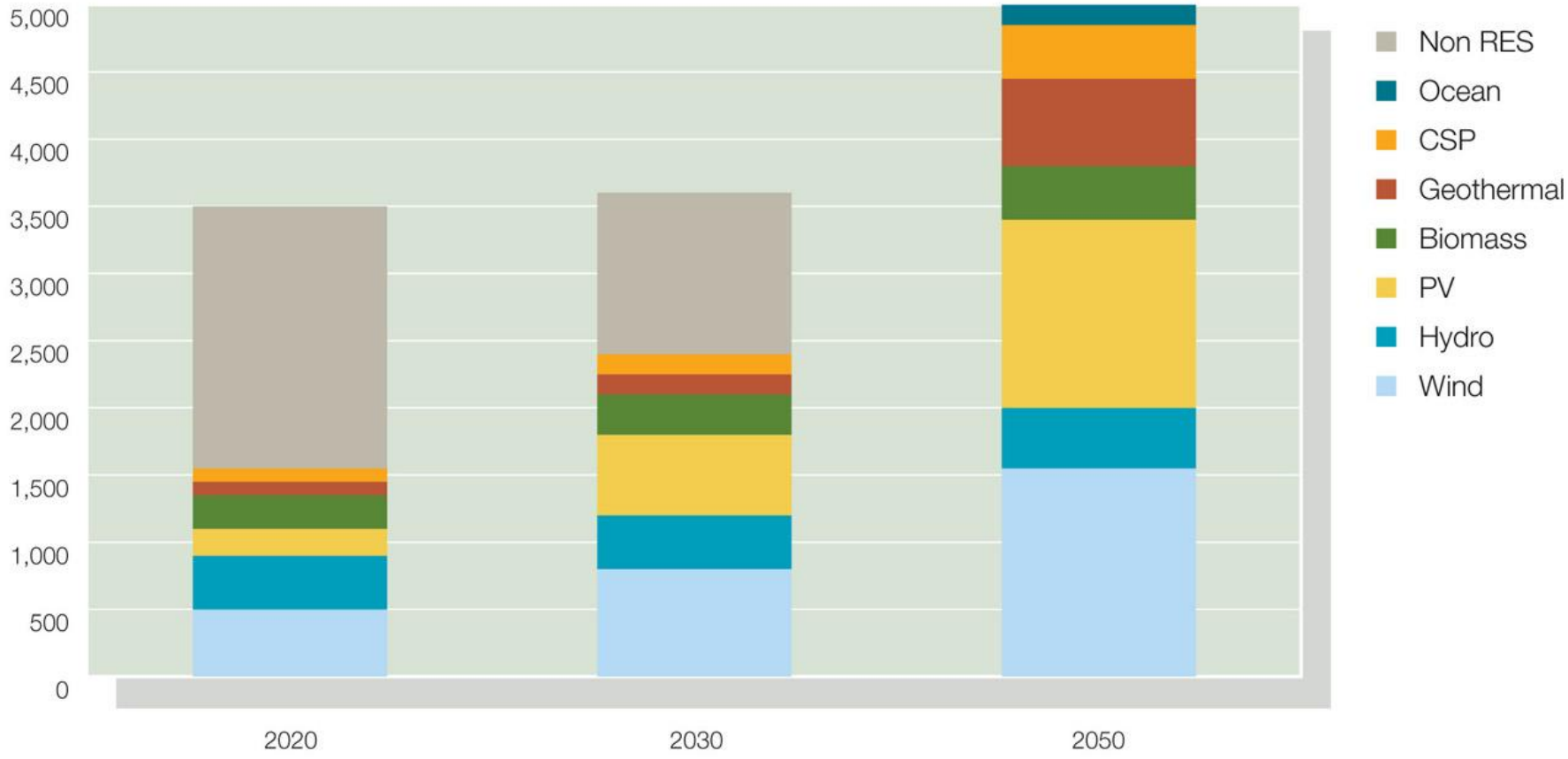
Renewable Electricity Installed Capacity (GW)

	2007	2020	2030	2050
Wind	56	180	288.5	462
Hydro[1]	102	120	148	194
PV	4.9	150	397	962
Biomass	20.5	50	58	100
Geothermal	1.4	4	21.7	77
CSP	0.011	15	43.4	96
Ocean	-	2.5	8.6	65
Total RES-E capacity (GW)	185	521.5	965.2	1,956

Source: EREC

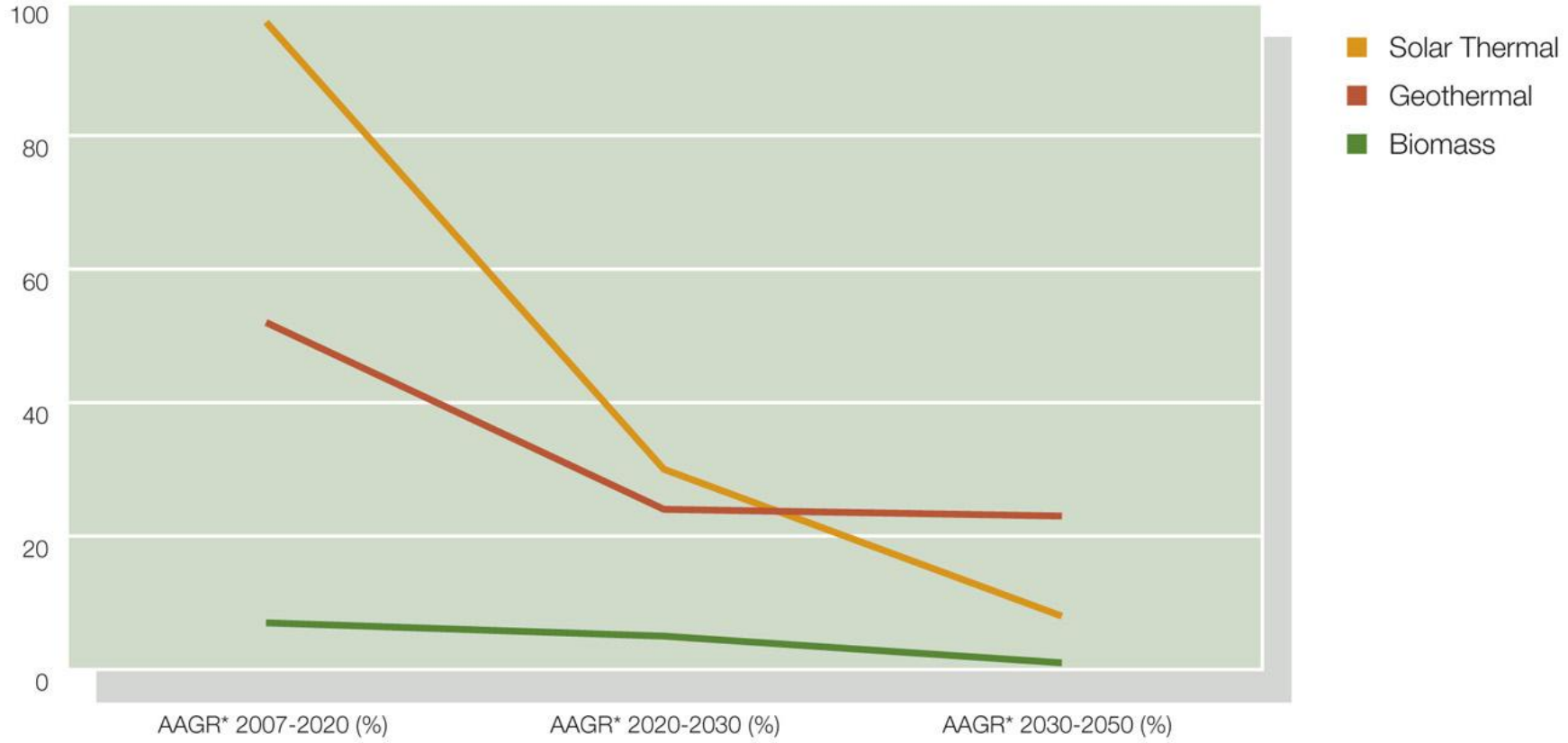
1 The capacity of pumped storage plants is not included

Contribution of Renewable Electricity Technologies to Electricity Consumption (TWh)



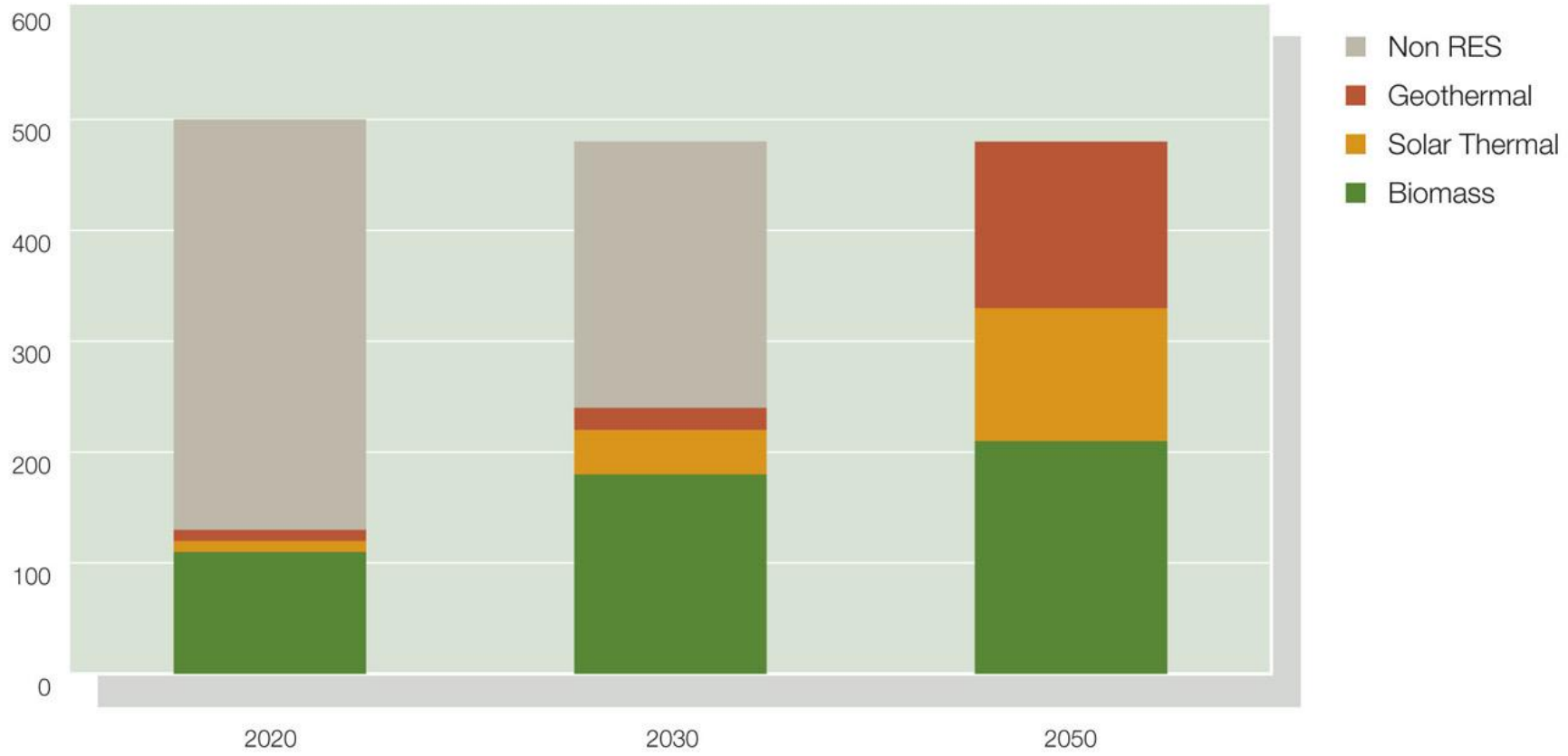
Source: EREC

Average Annual Growth Rates of Renewable Heating and Cooling Technologies



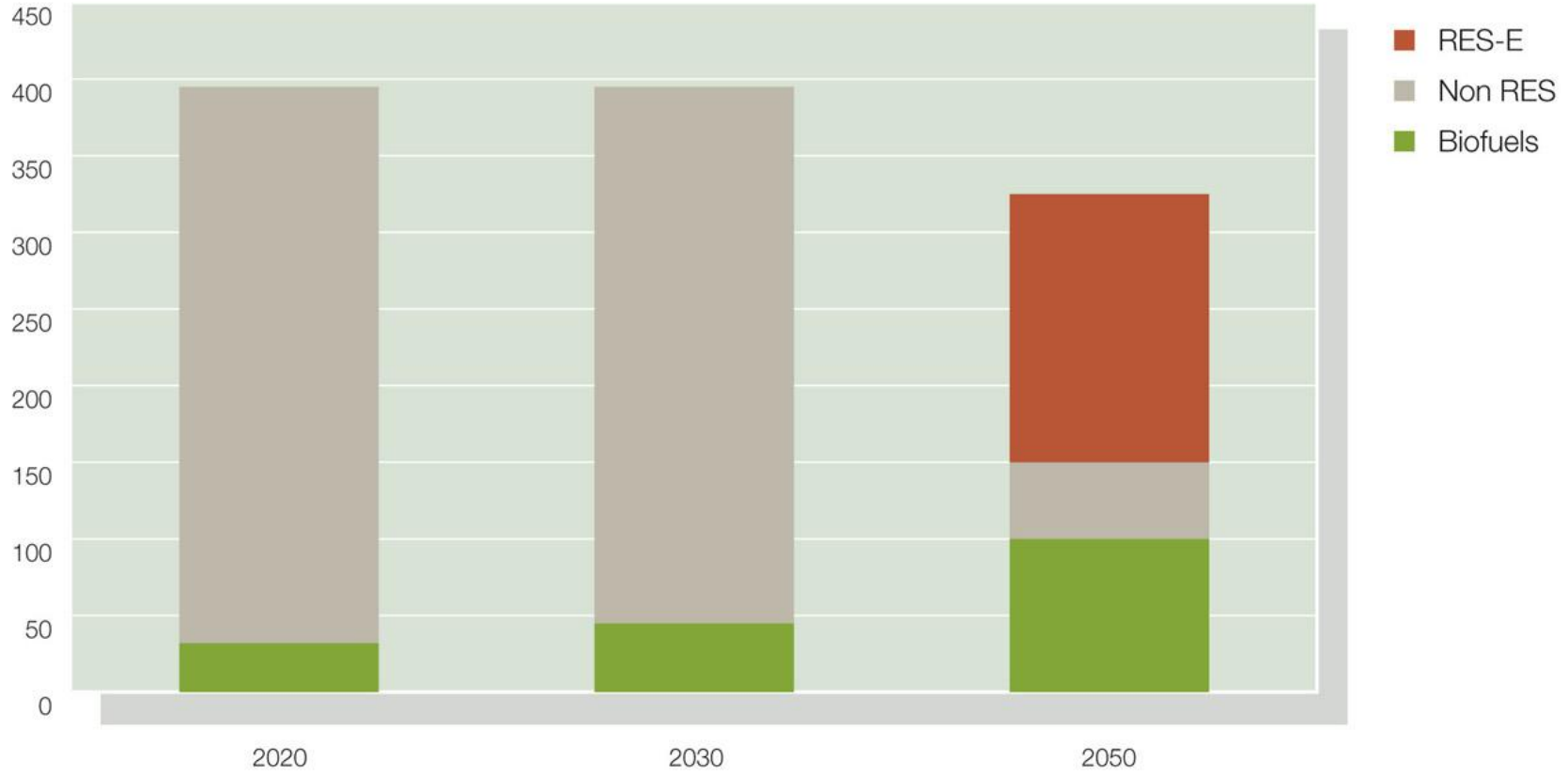
* Average Annual Growth Rates (AAGR) under "ceteris paribus" conditions

Contribution of Renewable Heating and Cooling Technologies to Heat Consumption (Mtoe)



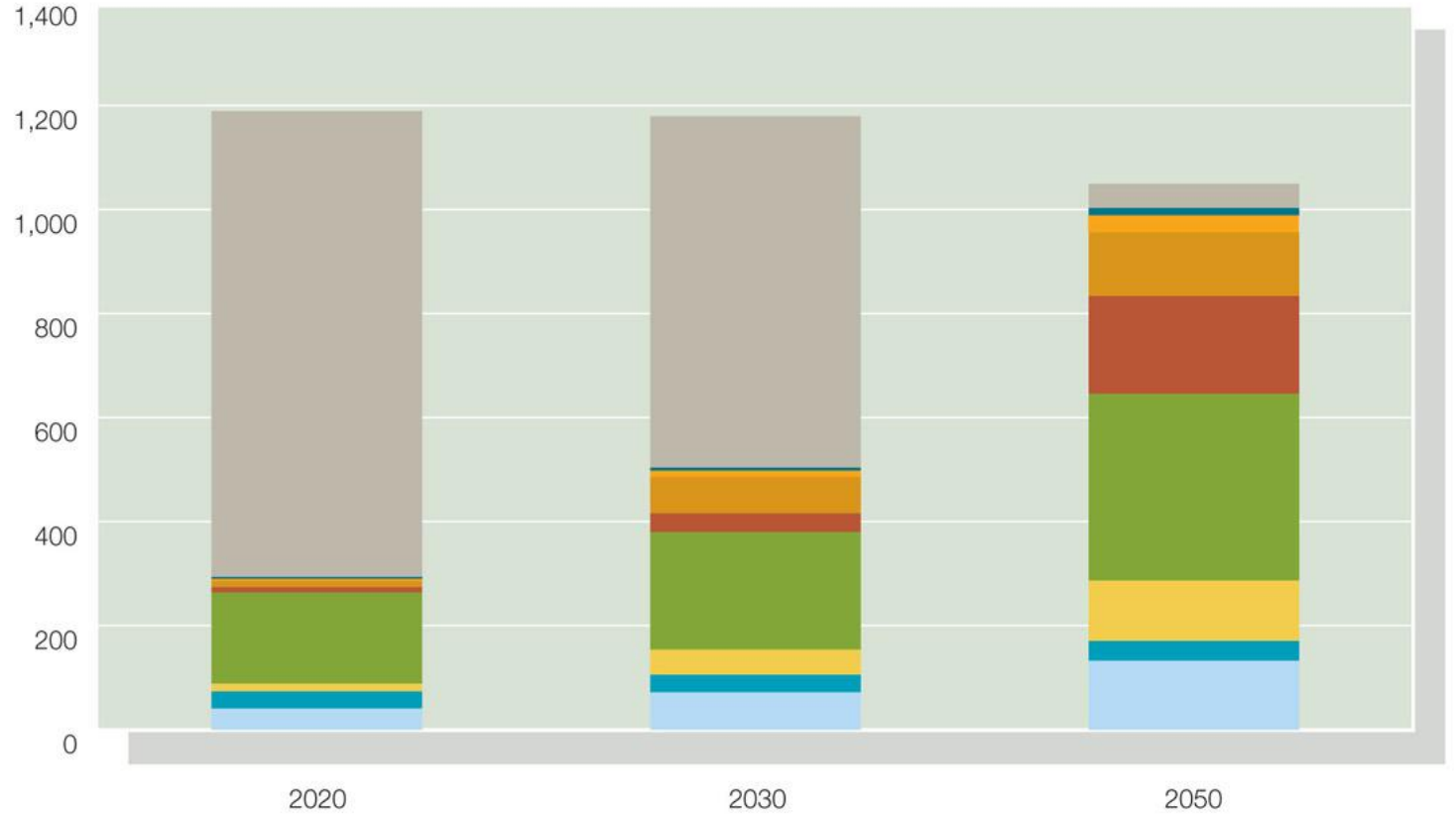
Source: EREC

Contribution of Biofuels to Transport Fuel Demand (Mtoe)



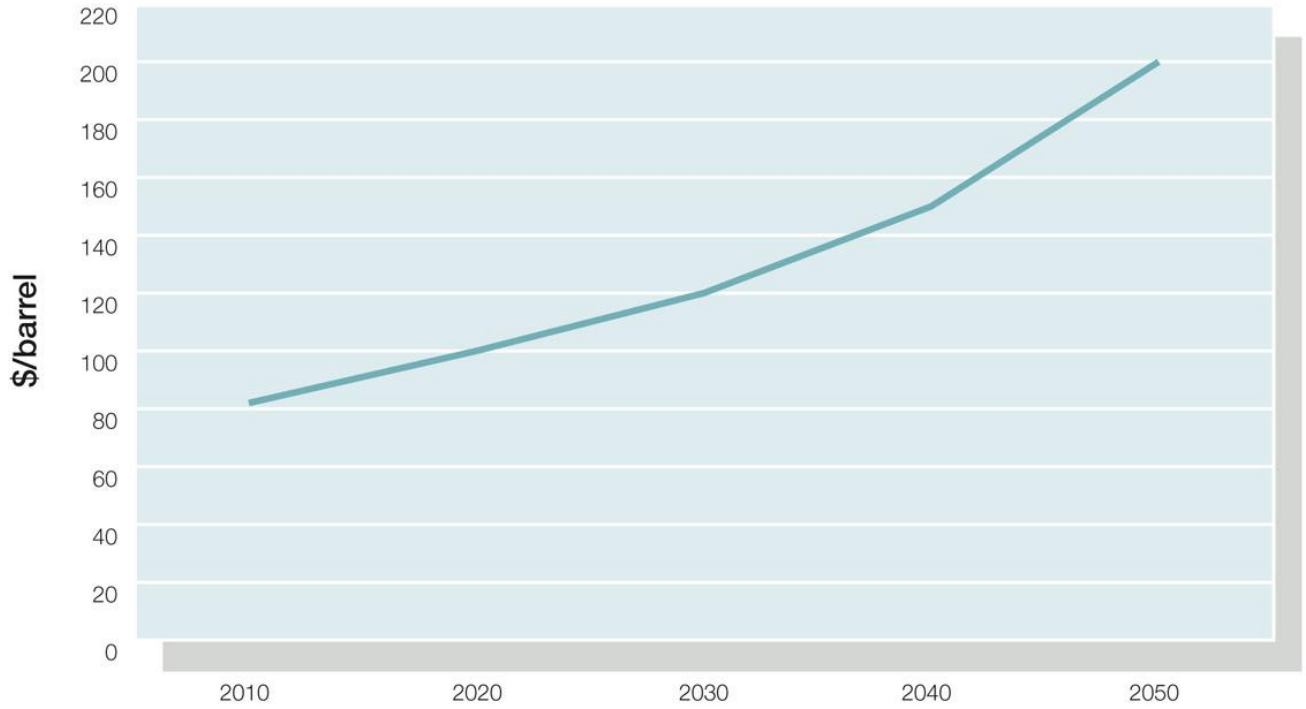
Source: EREC

Contribution of Renewable Energy Technologies to Final Energy Consumption (Mtoe)



Source: EREC

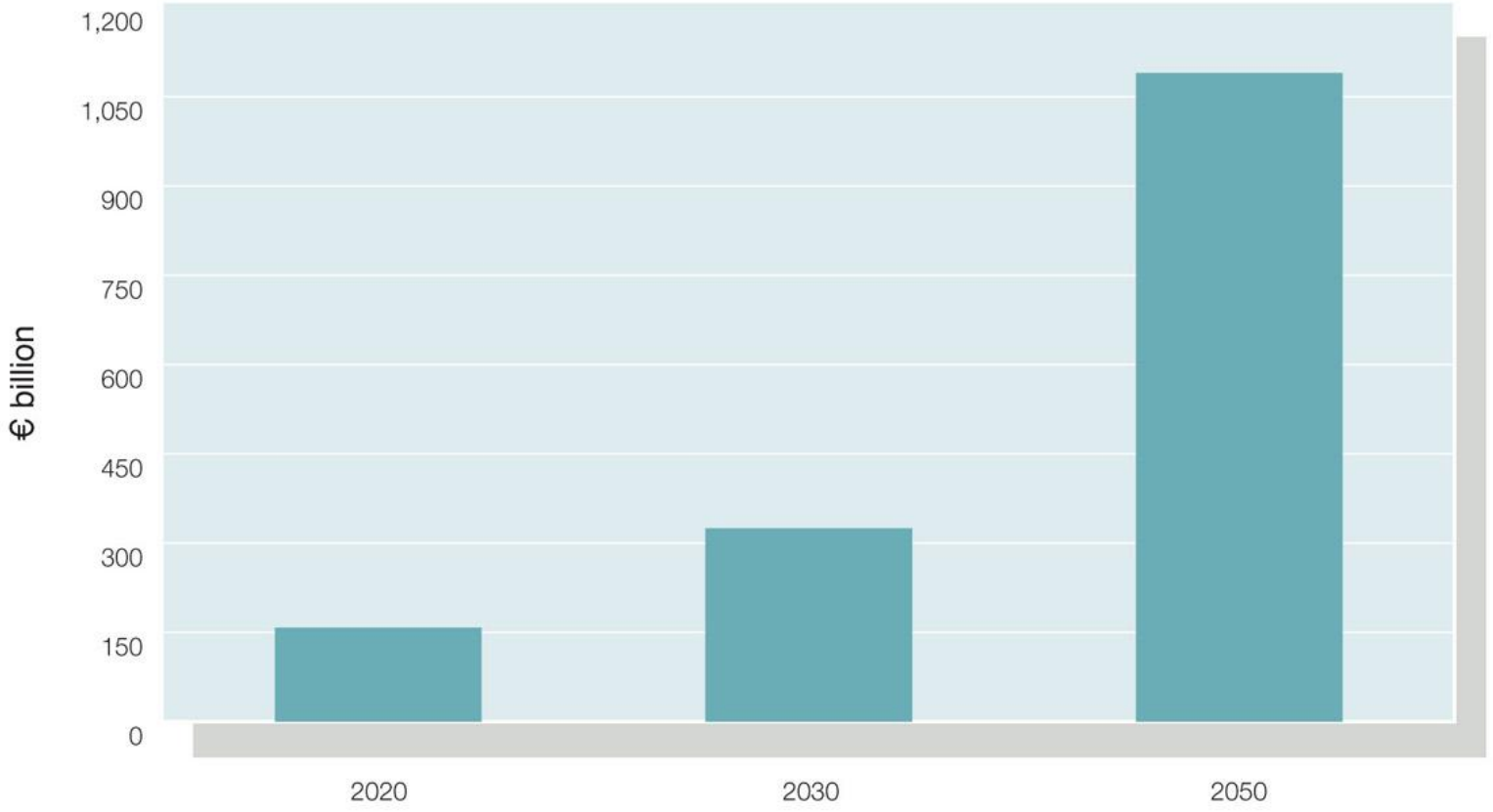
Oil Price Assumption (2010-2050)



	2010	2020	2030	2040	2050
Oil price assumption	82	100	120	150	200

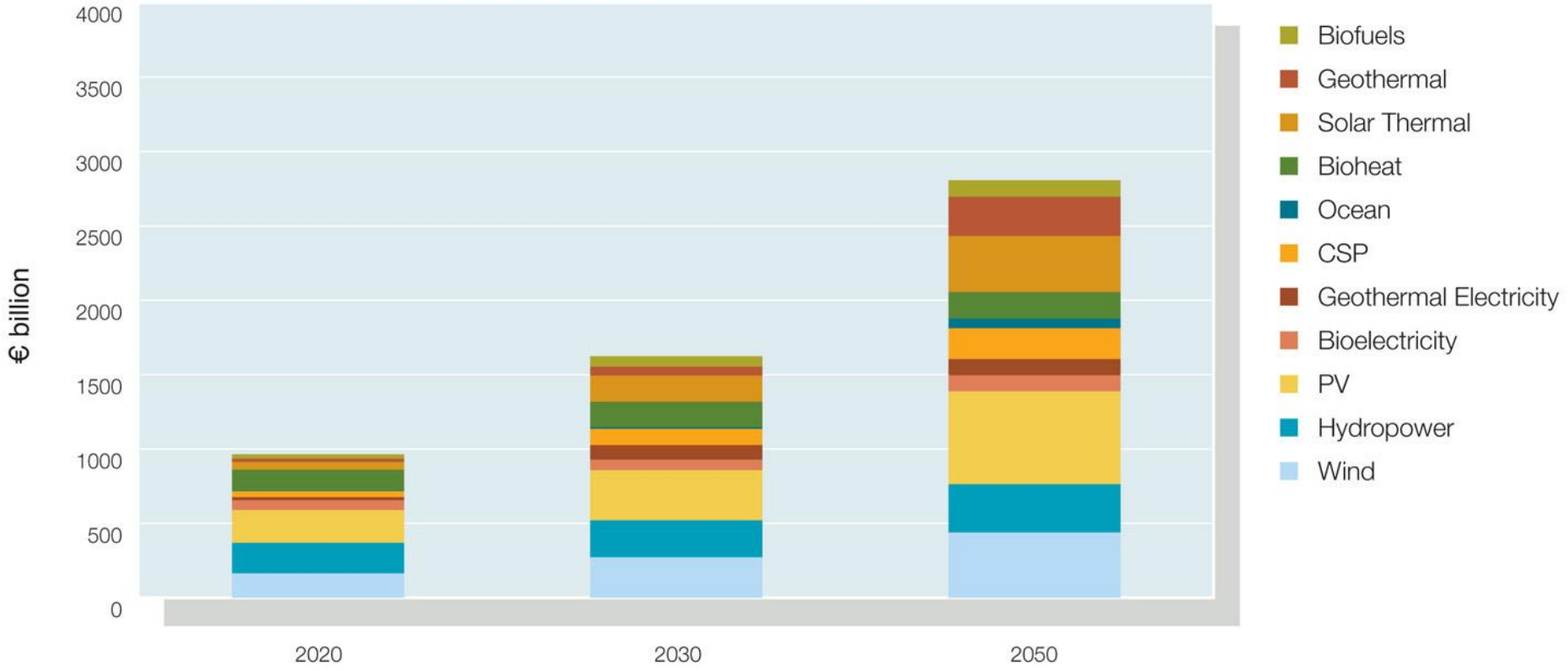
Source: EREC
* 2010: European Commission, Market Observatory;
2020: NEP High Price scenario;
remaining based on EREC assumptions

Avoided Fuel Costs from RES Deployment (2020-2030-2050)



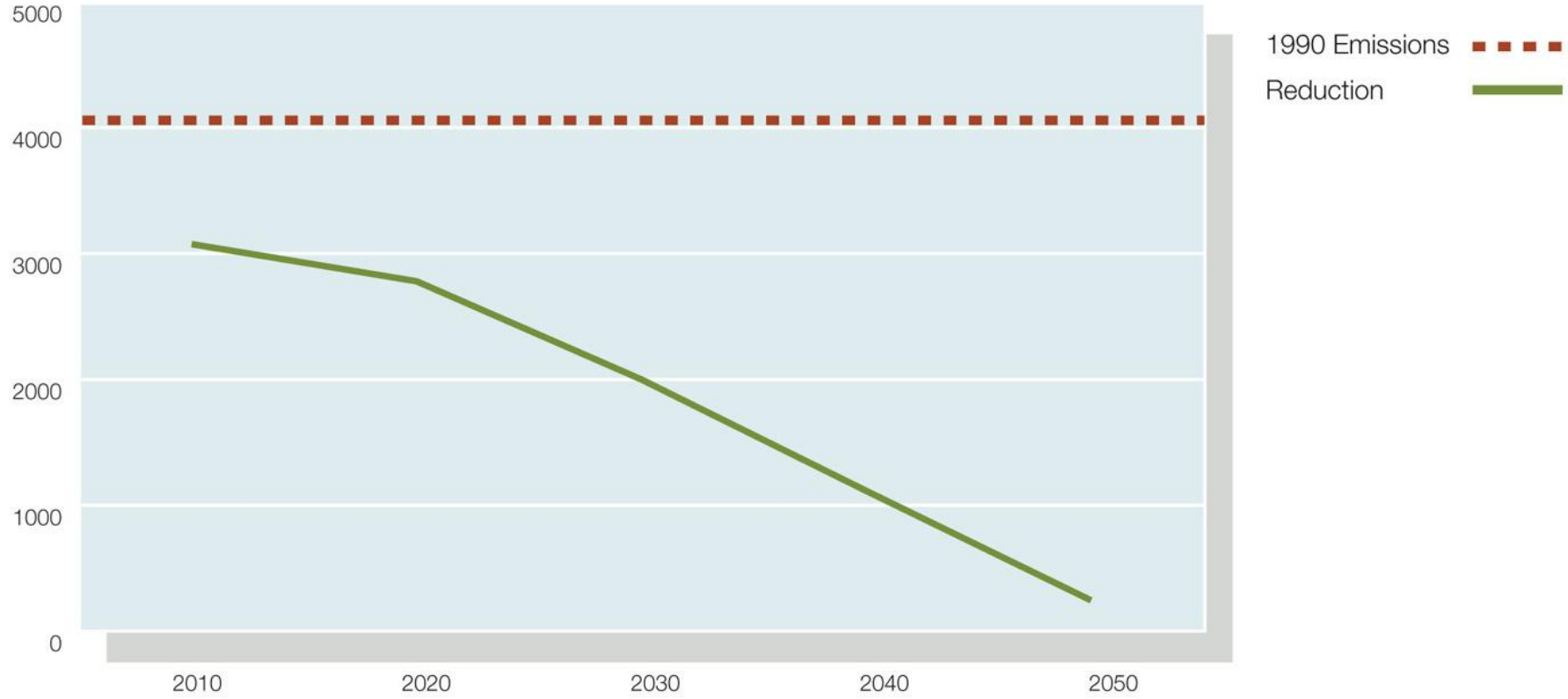
Source: EREC

Total Cumulative Investments (2020-2030-2050)



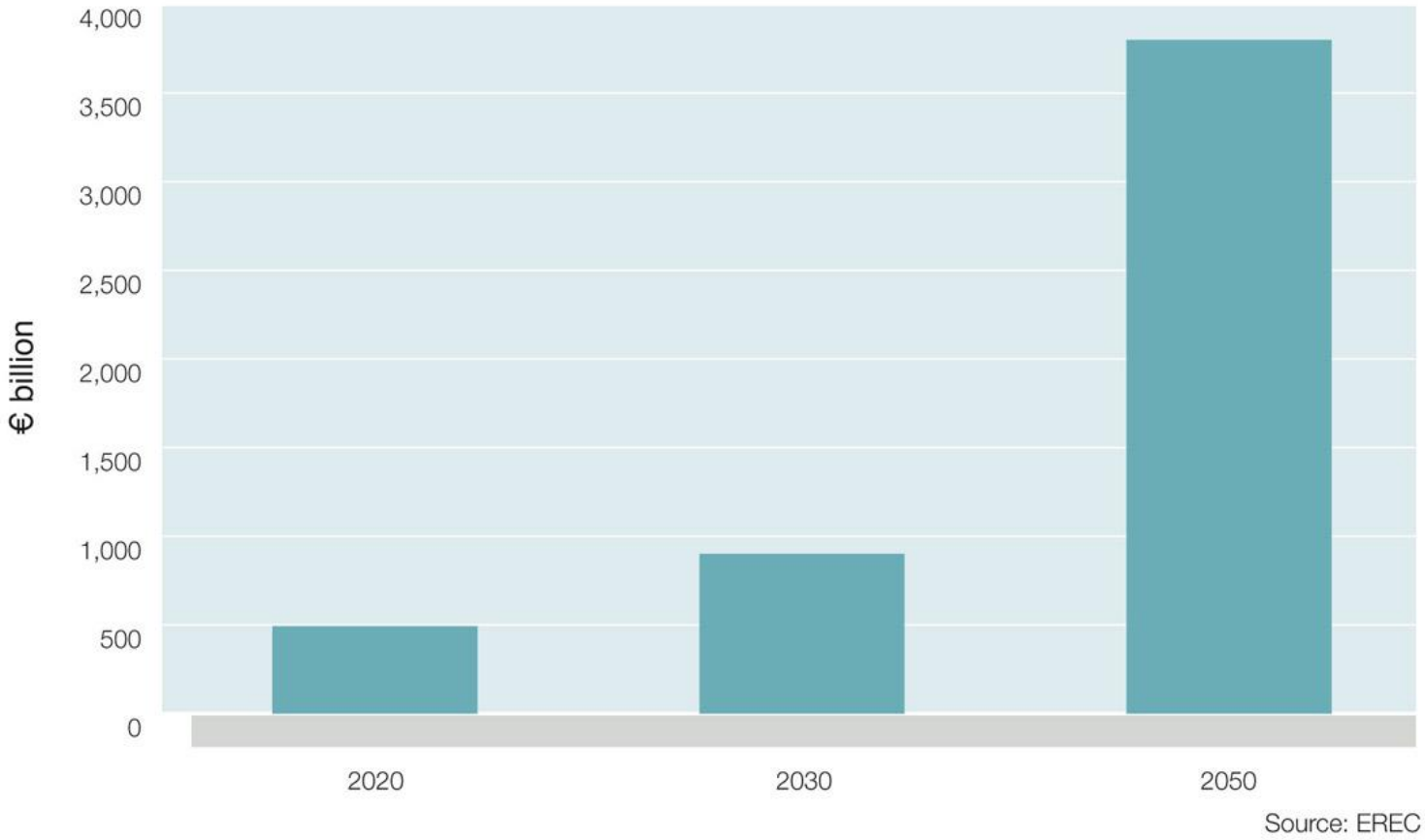
Source: EREC

CO_2 Avoidance (2020-2050)



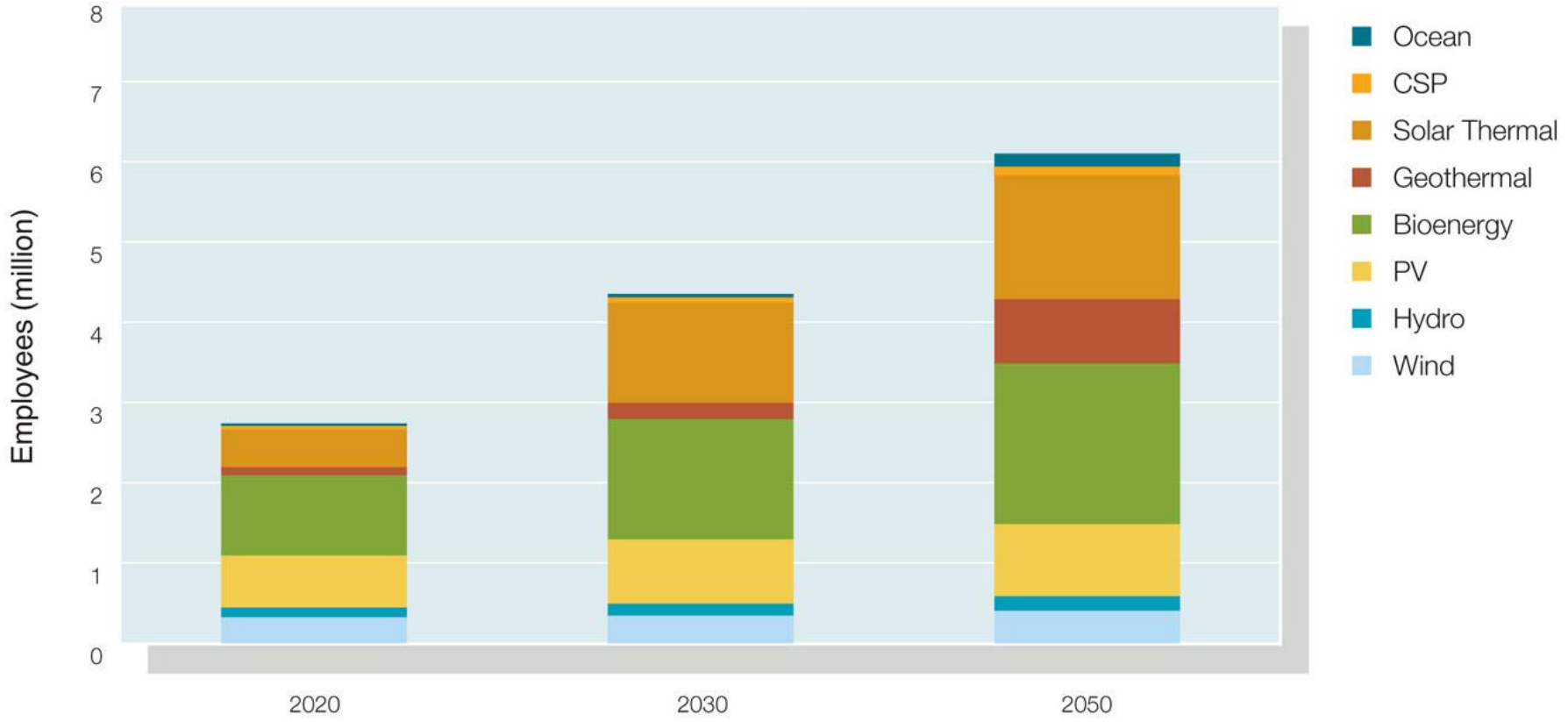
Source: EREC

Carbon Costs Avoided (2020-2030-2050)



Source: EREC

Gross Employment in the Renewable Energy Sector (2020-2030-2050)



Source: EREC

Policy Recommendations

- Inventing Tomorrow Today -

Enabling Policy Measures

- Supporting the transition towards a 100% renewable energy economy with all EU policy areas
- Less is more – an ambitious framework for Europe's energy demand
- Effective and full implementation of the new RES Directive
- Binding renewable energy targets for 2030
- Full liberalisation of the energy market
- Phasing out all subsidies for fossil and nuclear energy and introducing an EU-wide carbon and energy tax

EUROPEAN RENEWABLE
ENERGY COUNCIL

EREC

Be part of a sustainable energy future!

Support 100% renewable energy

www.rethinking2050.eu

RES in the North-Western EU

Katarzyna Michalowska-Knap,
Institute for Renewable Energy

16/04/2010

Intelligent Energy Europe

Regional distribution of RES potential DLR 2006

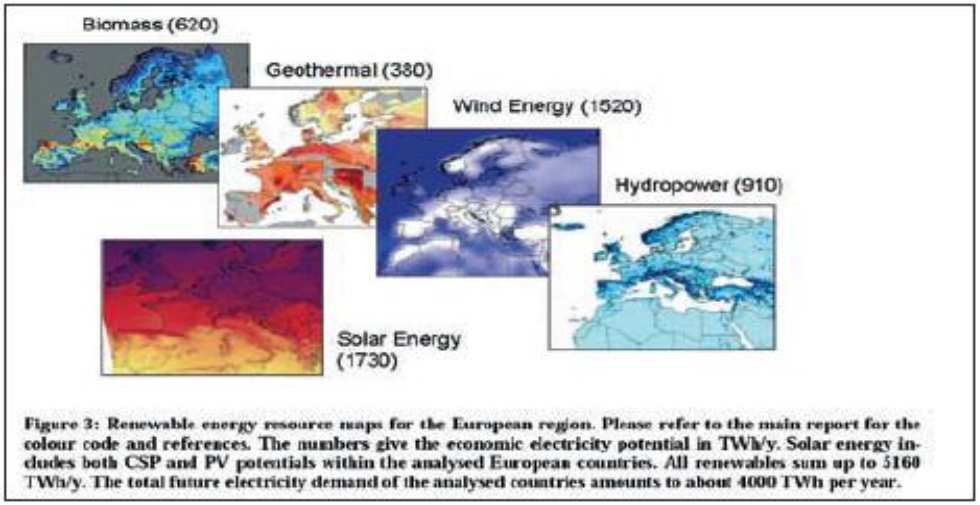


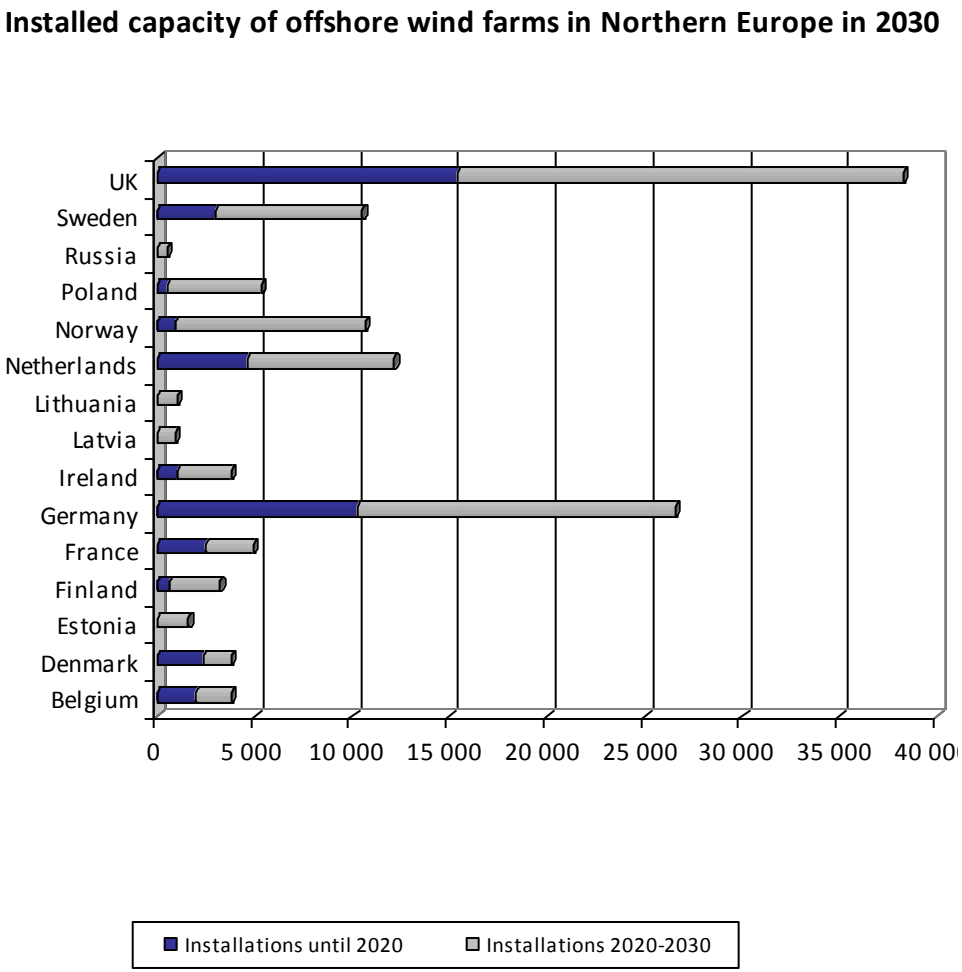
Figure 3: Renewable energy resource maps for the European region. Please refer to the main report for the colour code and references. The numbers give the economic electricity potential in TWh/y. Solar energy includes both CSP and PV potentials within the analysed European countries. All renewables sum up to 5160 TWh/y. The total future electricity demand of the analysed countries amounts to about 4000 TWh per year.

	Hydro	Geo	Biomass	Solar	Wind	Photo-voltaic	Wave and tidal	Total
Belgium	0.5	no entry	7.3	no entry	13.0	2.1	0.2	23.2
Bulgaria	12.0	0.8	7.7	no entry	8.9	2.0	no entry	31.4
Czech Republic	3.0	no entry	20	no entry	5.8	1.1	no entry	29.9
Denmark	0.0	no entry	6.6	no entry	55.0	1.3	2.2	65.1
Germany	26.0	28.2	87	no entry	262.0	23.4	7.0	433.6
Estonia	0.4	no entry	10.5	no entry	3.0	no entry	no entry	13.9
Ireland	1.3	no entry	6.2	no entry	55.0	1.1	4.0	67.9
Greece	12.0	9.4	7.2	4	49.0	3.9	4.0	89.5
Spain	41.0	28.2	40.4	1278	93.0	19.5	13.0	1531.1
France	72.0	14.1	79.1	no entry	129.0	23.4	12.0	329.7
Italy	65.0	19.6	46.1	7	79.0	17.6	3.0	237.2
Cyprus	1.0	no entry	0.6	20	6.0	0.1	0.2	27.9
Latvia	4.0	no entry	4.6	no entry	1.3	no entry	no entry	8.6
Lithuania	1.5	0.8	12.5	no entry	0.9	no entry	no entry	15.7
Luxembourg	1.0	no entry	0.4	no entry	0.0	0.8	no entry	2.2
Hungary	4.0	51.9	11.3	no entry	1.3	2.0	no entry	70.5
Malta	no entry	no entry	0.1	2	0.2	0.1	0.1	2.3
Netherlands	0.1	1.3	9.6	no entry	40.0	4.3	1.0	56.3
Austria	56.0	4.1	30.6	no entry	3.0	2.9	--¬	96.6
Poland	7.0	1.7	52.1	no entry	65.0	3.1	1.0	129.9
Portugal	20.0	14.1	15.2	142	18.0	3.9	7.0	220.1
Romania	18.0	1	40.9	no entry	7.9	2.0	no entry	69.8
Slovenia	8.0	0.4	6.3	no entry	0.3	1.0	no entry	16.0
Slovakia	6.0	3.1	10.7	no entry	0.7	2.0	no entry	22.5
Finland	20.0	no entry	53.7	no entry	27.0	1.7	2.0	104.4
Sweden	90.0	1.3	80.4	no entry	63.5	3.7	2.0	240.9
United Kingdom	8.0	0.3	30.7	no entry	344.0	7.8	60.0	450.8
EU Countries	477.8	180.3	677.8	1453.0	1331.8	130.8	118.7	4370.2

In North-Western EU major resources are:

- Wind (especially offshore)
- Biomass (sustainability limitations, landuse conflicts)
- Hydro (potential used already)
- Wave and tidal (in long term perspective)

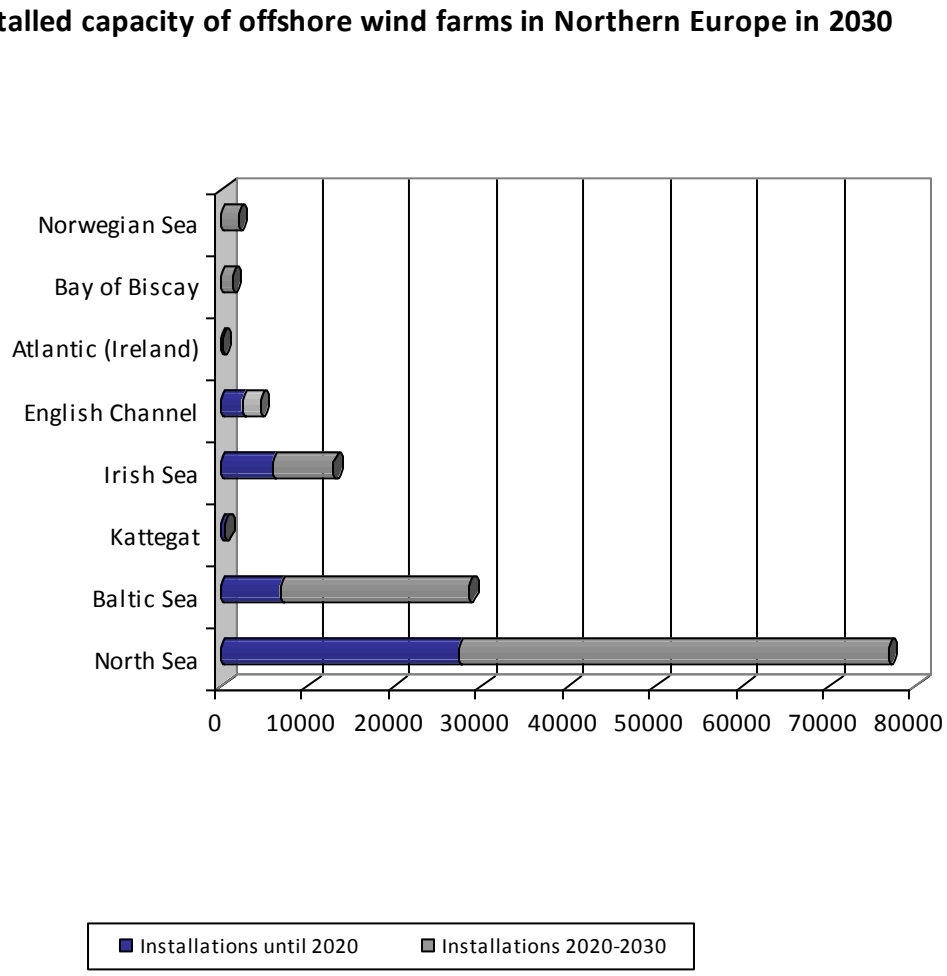
The scenario of offshore wind installed capacity in 2030



Main assumptions:

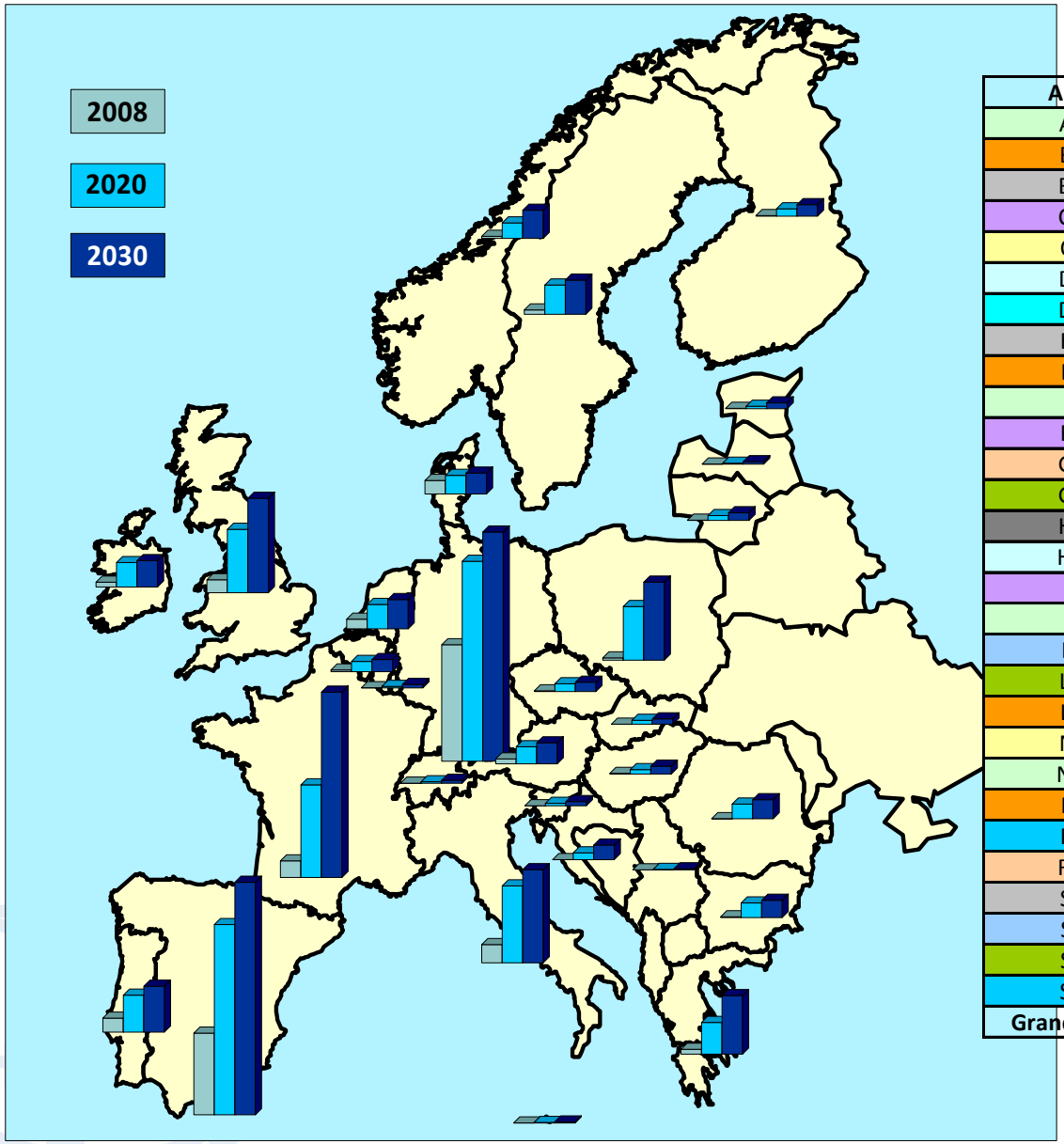
- the proactive governmental policy will be continued and joined by further countries;
- wind farms licensed already (areas approved) and with advanced permitting procedure will be implemented before 2020
- the wind farms operating in 2030 will be located in already identified zones
- innovative concepts (far deep offshore, floating) will not significantly contribute before 2030

The scenario of offshore wind installed capacity in 2030



Majority of projects will be constructed on North Sea

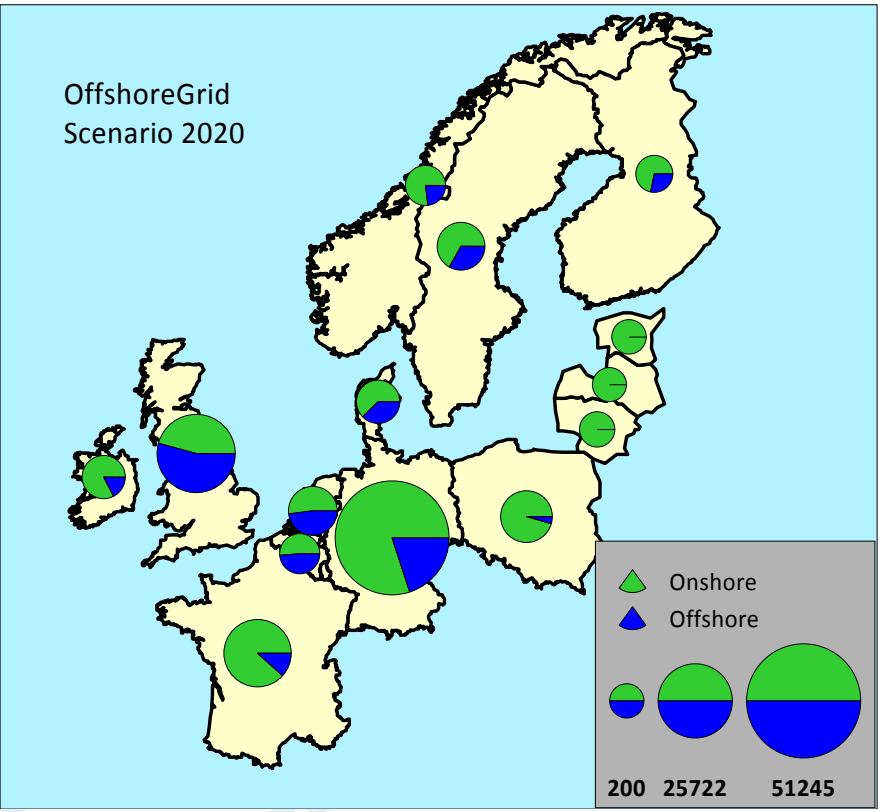
Onshore installed capacity scenario

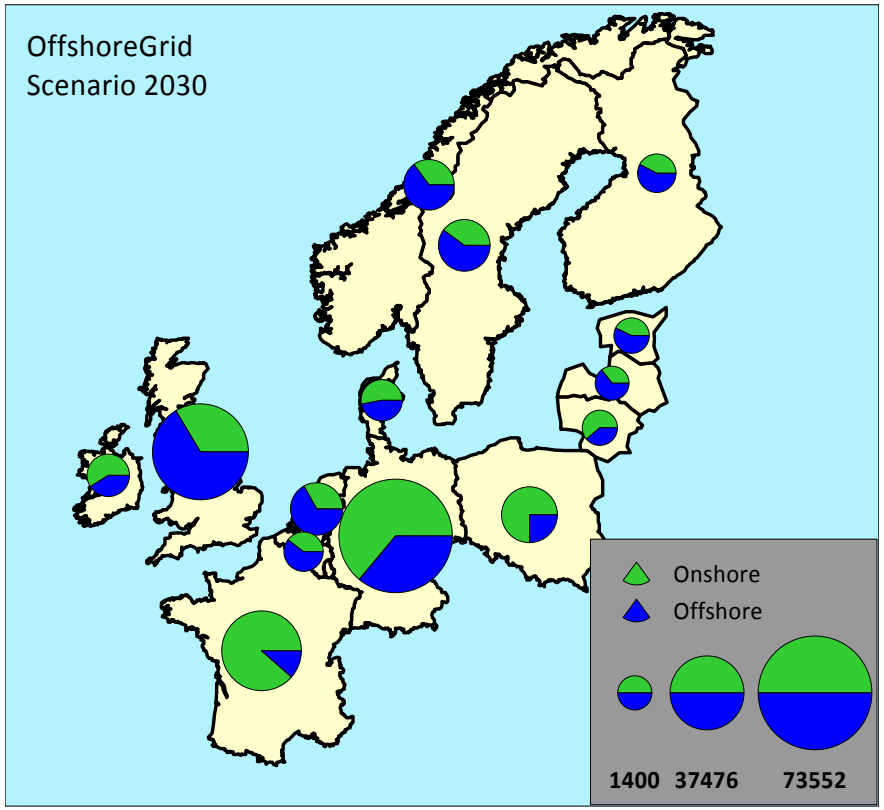


Area	Onshore 2020 [MW]	Onshore 2030 [MW]
AT	3500	4300
BE	2100	2500
BG	3000	3550
CH	300	600
CZ	1600	1920
DE	41000	47000
DK	3820	4280
EE	500	1200
ES	39000	47666
FI	1500	2360
FR	18990	37999
GB	13000	19360
GR	6500	12000
HR	1400	3000
HU	900	1600
IE	5000	5400
IT	15770	19090
LT	1000	1570
LU	300	700
LV	200	500
NL	5000	6000
NO	3180	5780
PL	11000	16000
PT	7572	9412
RO	3000	3900
SC	80	200
SE	5990	7000
SK	800	1100
SV	500	860
Grand Total	**196502**	**266847**

Intelligent Energy Europe

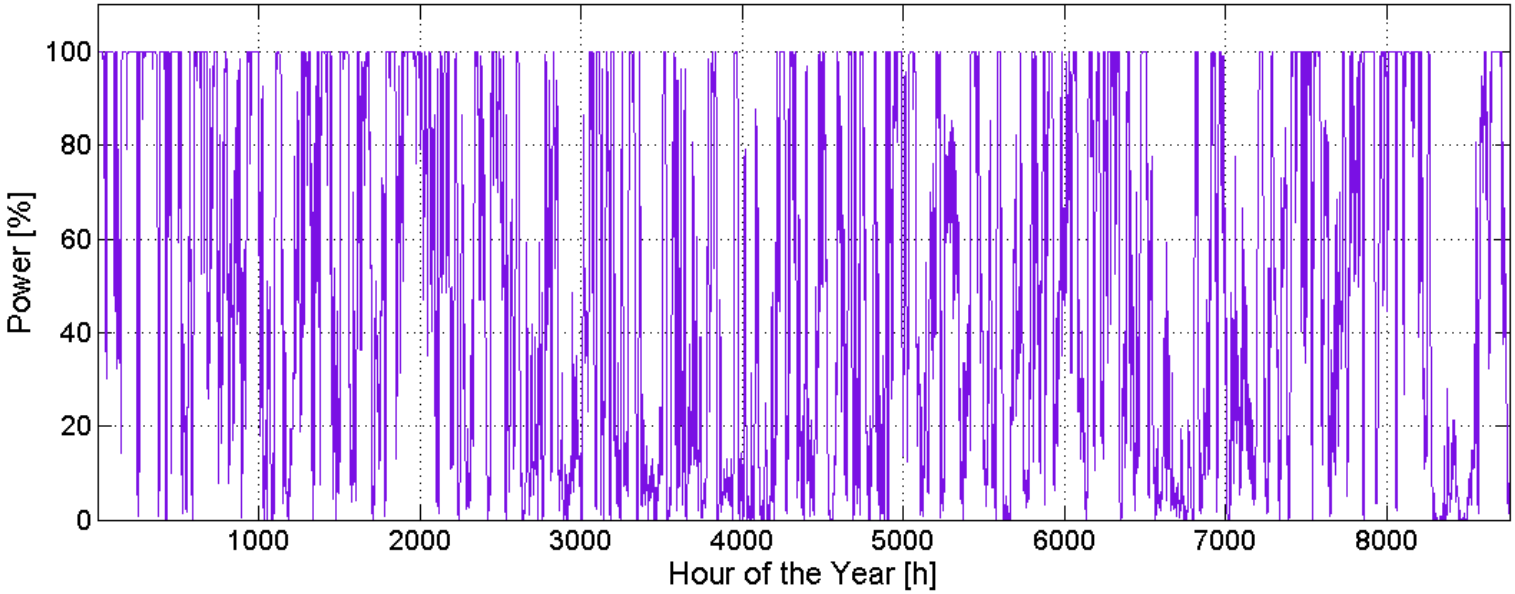
Installed capacity scenario Northern Europe





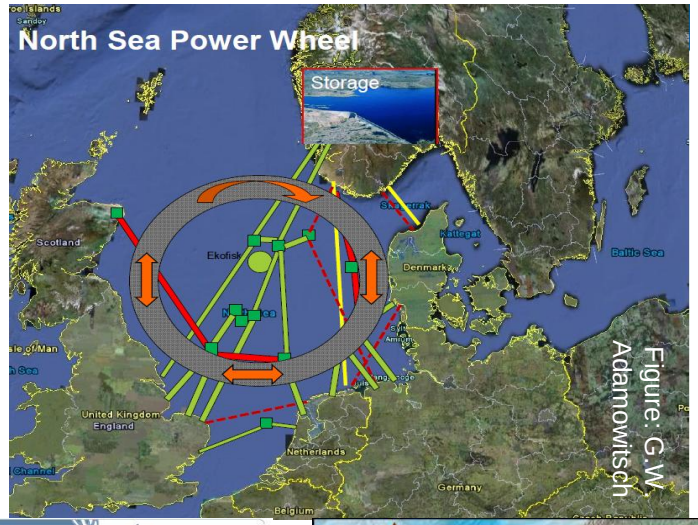
North-Western EU – majority of elecricity generation might be offshore even before 2020

Sample power output at offshore location

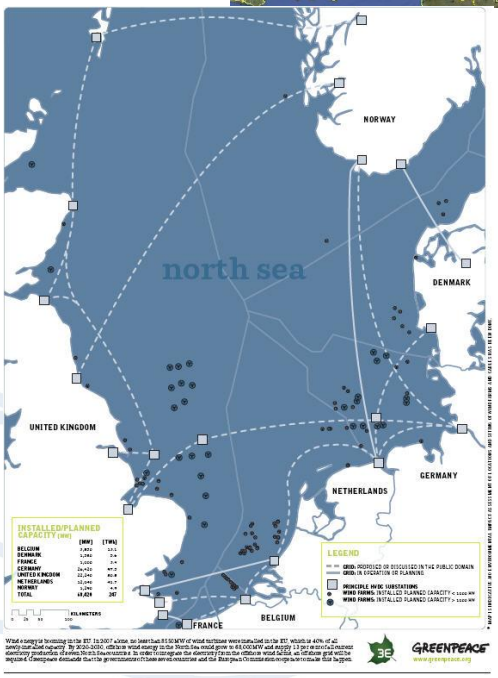


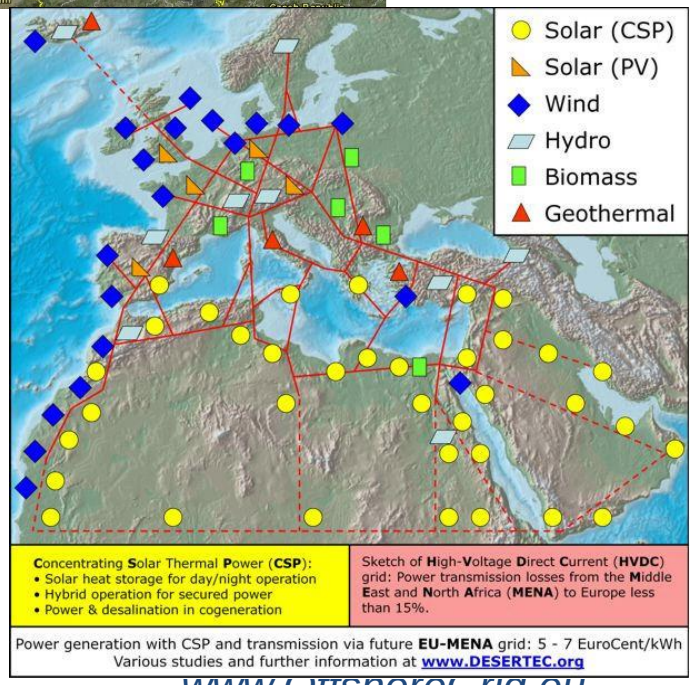
- Peak management (incl. electricity in transport)
- **Storage**
- Balancing with other types of RES (hydro, solar)
- International cooperation (development of „Supergrid" concepts)

Several grid development concepts



Necessary coordination of activities and different initiatives (on national and EU level)





RES in the Southern And Mediterranean Area

Secretaría de Estado de Energía
Ministerio de Industria, Turismo y Comercio

Madrid, 16 abril 2010

1	Objetivos UE 2050
2	Evolución de las EERR en España
3	Integración sistemas energéticos UE- Mediterráneo sur
4	Necesidad de cambios sustanciales en la red
5	Conclusiones

1	**Objetivos UE 2050**
2	Evolución de las EERR en España
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4	Necesidad de cambios sustanciales en la red
5	Conclusiones

Necesidad de un cambio en el mix energético

- **Objetivo:** Evitar que la temperatura media del planeta aumente más de 2ºC en 2050
  - La UE deberá **reducir más de un 80% la emisión de GEI** (~ 80% emisiones GEI proceden del uso de la energía)

Cambio radical en el mix energético

Necesidad de un cambio en el mix energético

Cambio radical en el mix energético

- **Descarbonización** casi total de la **producción de electricidad**
  - Energías renovables (participación 60%-80%)
  - Centrales nucleares
  - Combustibles fósiles → Captura y almacenamiento de CO_2 (CAC)
    - Aplicable a fuentes estacionarias y con un volumen importante de emisiones (centrales térmicas, refinerías, industrias, cementeras y siderurgia)
- **Revolución** en el **mix energético final**
  - Cambio en el sector transporte: sustitución de combustibles fósiles → EERR (biocombustibles/ electricidad)
  - Cambios en otros sectores:
    - Calefacción/refrigeración edificios → bomba de calor,…
    - Industria: CAC, cambio de combustible → electricidad

Necesidad de un cambio en el mix energético

Cambio radical en el mix energético

- **Descarbonización** casi total de la **producción de electricidad**
  - Energías renovables (participación 60%-80%)
  - Centrales nucleares
  - Centrales de carbón con CAC
  - Cambio en el sector transporte: sustitución de combustibles fósiles → ERR (biocombustibles/ electricidad)
  - Cambios en otros sectores:
    - Calefacción/refrigeración edificios → bomba de calor,…
    - Industria: CAC, cambio de combustible → electricidad

- Protagonismo creciente de la electricidad
- Energías renovables componente fundamental del mix de generación eléctrica

1	Objetivos UE 2050
2	**Evolución de las EERR en España**
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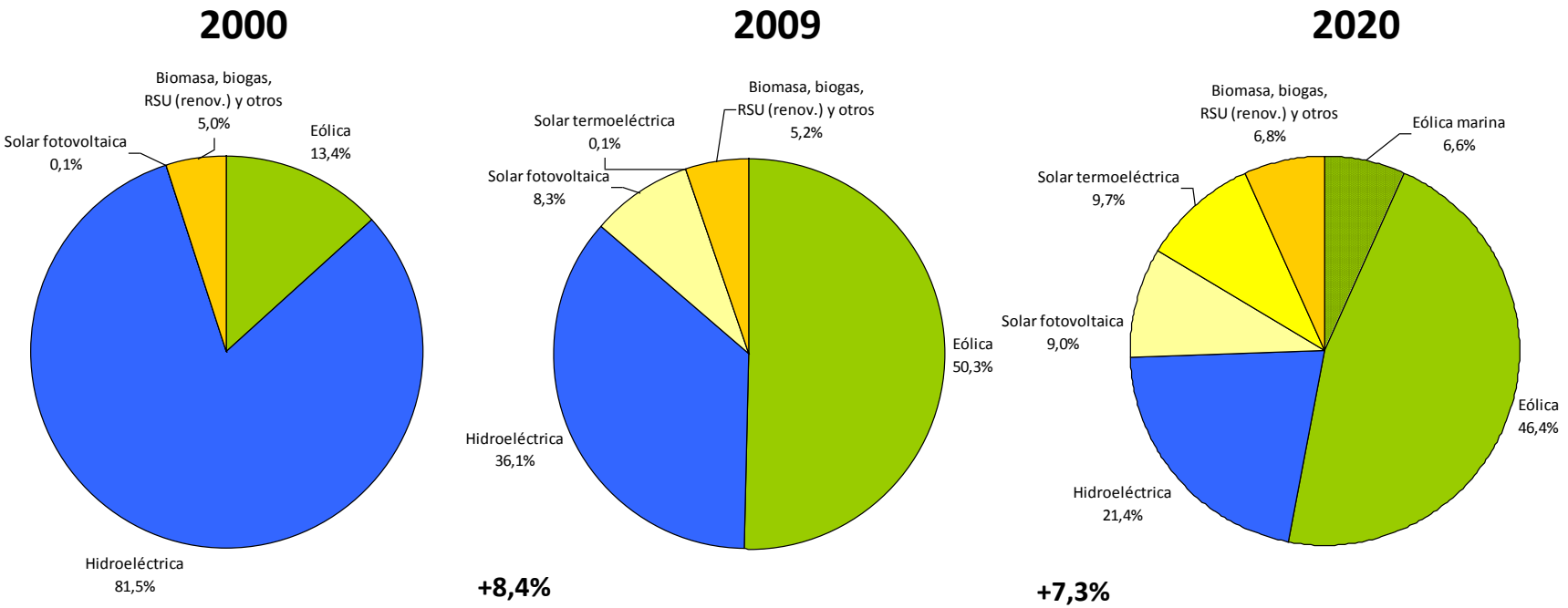
Evolución de las energías renovables en España



	2000		2009		2020
	35 TWh	+8,4%	73 TWh	+7,3%	158 TWh
P. Bruta	225 TWh	+3,1%	296 TWh	+2,3%	380 TWh
ER/P.Bruta	16%		25%		42%

***NOTA**: Incrementos como media anual del periodo*

1	Objetivos UE 2050
2	Evolución de las EERR en España
3	**Integración sistemas energéticos UE- Mediterráneo sur**
4	Necesidad de cambios sustanciales en la red
5	Conclusiones

Integración sistemas energéticos UE- Mediterráneo sur

Plan Solar Mediterráneo (PSM)

- En julio de 2008 se procedió al relanzamiento del **"Proceso de Barcelona: Constitución de la Unión Por el Mediterráneo (UpM)"**, siendo el PSM uno de sus 6 proyectos

- **Objetivos prioritarios**
  - Desarrollo de **20 GW de capacidad eléctrica renovable** en la ribera sur del Mediterráneo en 2020
  - Desarrollo infraestructuras de interconexión necesarias → **Anillo Mediterráneo** (subanillos?)
    - Status prioritario en 2ª Revisión Estratégica Energética comunitaria (nov 2008)
    - Actualmente la única conexión eléctrica entre Europa y el norte de África es el doble cable submarino entre España y Marruecos

Integración sistemas energéticos UE- Mediterráneo sur

Plan Solar Mediterráneo (PSM)

Hoja de ruta prevista

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fase preparatoria (identificación de retos)													
Fase inicial (proyectos "piloto": *learning by doing*)													
Implementación masiva													

Retos identificados:

- Tecnológicos
- Evaluación de recursos renovables
- **Infraestructuras de transporte de energía**
- **Financiación**
- **Marco regulatorio**
- Desarrollo local
- Gobernanza

Integración sistemas energéticos UE- Mediterráneo sur

Plan Solar Mediterráneo (PSM)

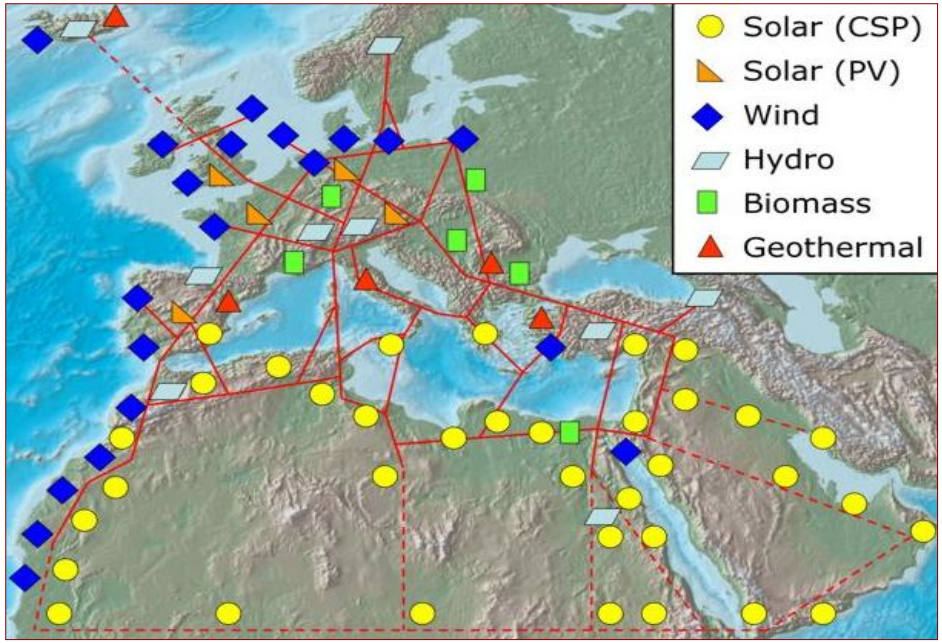
- **España participa activamente** en esta iniciativa desde su lanzamiento, dentro del "núcleo duro" de países que la lideran (junto con Francia y Egipto como co-presidentes de la UpM, Alemania, Italia y Marruecos)
- **Hitos relevantes**
  - Conferencia sobre el PSM (Valencia; 11-12 mayo)
  - Reunión Ministerial de Energía (El Cairo; 2-3 junio)
  - Cumbre UpM-Euromed (Barcelona; 5-7 junio)

Integración sistemas energéticos UE- Mediterráneo sur

Desertec

- Iniciativa privada para instalar en el Sáhara plantas termoeléctricas capaces de suministrar electricidad a la región MENA (Middle East and North Africa) y Europa

PROPUESTA POSIBLE RED DE SUMINSITRO



Miembros fundadores

- Industria: ABB, Siemens, M+W Zander
- Energía Solar: Abengoa Solar; Solar Millennium/MSM, Schott Solar
- Empresas eléctricas: EON, RWE, REE
- Instituciones financieras: Deutsche Bank, HSH Nordbank
- Otros: DESERTEc Foundation, Cevital; Muenchener Rueca

Integración sistemas energéticos UE- Mediterráneo sur

Desertec

- Conceptos principales:
  - El proyecto supondrá la construcción hasta 2050 de al menos 100 GW de plantas de generación eléctrica con energías renovables, principalmente eólicas y solares
  - El 15% del consumo de electricidad europeo y las dos terceras partes del consumo de la región MENA será cubierta mediante la realización de este proyecto
  - El desarrollo y comercio de la energía proveniente de fuentes renovables impulsará el desarrollo económico en las regiones desérticas
  - Necesidad de desarrollo de líneas de transporte de tecnología HVDC (High-Voltage Direct Current) que permitan transferir energía con pérdidas inferiores al 3% por cada 1.000 km

1	Objetivos UE 2050
2	Evolución de las EERR en España
3	Integración sistemas energéticos UE- Mediterráneo sur
4	**Necesidad de cambios sustanciales en la red**
5	Conclusiones

Necesidad de cambios sustanciales en la red

- El mix energético en 2050 se caracterizará por:
  - Incremento importante de la participación de la **energía eléctrica** en el consumo de energía final
  - Las **energías renovables** constituyen el **núcleo duro** del nuevo mix de generación.
- Una parte importante de las energías renovables son "no almacenables"

Cambios sustanciales en la forma de gestión de los sistemas eléctricos

Necesidad de cambios sustanciales en la red

- El equilibrio entre una demanda **poco gestionable** y una **oferta fluctuante**, en sistemas de **pequeña dimensión** (como los nacionales) presenta problemas:
  - En caso de **excedente de generación**: necesidad de almacenamiento (bombeo,...) o **interconexiones**
  - En caso de **déficit de generación**: necesidad de sistemas de apoyo o **interconexiones**.

Si consideramos un sistema de gran dimensión como es el de toda la Unión Europea, los problemas se diluyen

Necesidad de cambios sustanciales en la red

- Existe un efecto de **compensación** entre los distintos países y si se dispone de una **red adecuada** se pueden trasladar los excedentes nacionales a una zona de déficit.
- El problema de la **necesidad de almacenamiento se minimiza**.

- **El modelo energético del futuro no puede basarse en sistemas nacionales autosuficientes.**
- **Se debe ir a un modelo de gran dimensión que se extienda al conjunto de la Unión Europea y Norte de África**

Necesidad de cambios sustanciales en la red

- Sobre la red de transporte actual deberá existir **una red de alta capacidad a otra escala** y con la finalidad de transportar **grandes cantidades de energía a gran distancia con mínimas pérdidas**.

Desarrollo de una "super-grid"

Red en corriente continua de muy alta tensión con capacidades de más de 6000 MW por línea

- Además es necesario actuar sobre la demanda, haciendo que participe activamente en el equilibrio oferta-demanda.

Desarrollo de redes inteligentes (smart-grids)

Cambios considerables en las redes de transporte y distribución actuales

1	Objetivos UE 2050
2	Evolución de las EERR en España
3	Integración sistemas energéticos UE- Mediterráneo sur
4	Necesidad de cambios sustanciales en la red
5	**Conclusiones**

Conclusiones

1. **Necesidad de cambio del mix energético**
   - Alta penetración de las energías renovables en el mix eléctrico
   - Mix energético con emisiones específicas de GEI mucho menores
   - Continuará creciendo el peso de la electricidad en los usos finales, sobre todo a largo plazo (cambio en sector transporte)
2. **Modelo energético más sostenible**
   - Mejora del grado de autoabastecimiento
   - Se reduce el peso de los recursos agotables
   - Se reducen las emisiones de GEI procedentes del sector energético
3. **Necesidad de desarrollo de una supergrid para la implementación masiva de energías renovables**

Conclusiones

4. **Los objetivos en el horizonte 2020 son sólo una primera etapa hacia objetivos más ambiciosos en el horizonte 2050**

   - Cambio radical del sistema eléctrico
   - Integración de la UE con regiones próximas para aprovechar complementariedades y sinergias
   - Necesidad de empezar ya el desarrollo de la supergrid
     - Línea evacuación eólica off-shore del Mar del Norte
     - Línea Magreb-España-Francia para evacuación PSM, Desertec y planes eólicos Península Ibérica

RES in the Southern And Mediterranean Area

Secretaría de Estado de Energía
Ministerio de Industria, Turismo y Comercio

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