

Seminar Organised by INFORSE & EUFORES & EREF



Brussels, November 9-10, 2004
Presentation by Oliver Schaefer, EREC

A Vision for Renewable Energy Development and a new Target for Europe for 2020

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European Renewable Energy Council

Seminar on New and Upcoming EU Policies for Sustainable Energy and Climate Protection
Organised by INFORSE – EUFORES – EREF
November 9-10, 2004, ICA, Brussels

European Renewable Energy Council

Umbrella organisation regrouping:

As Members

- ✓ **EPIA** European Photovoltaic Industry Association
- ✓ **ESHA** European Small Hydropower Association
- ✓ **ESTIF** European Solar Thermal Industry Federation
- ✓ **EUBIA** European Biomass Industry Association
- ✓ **EWEA** European Wind Energy Association
- ✓ **EUREC Agency** European Renewable Energy Research Centers Agency

As Associate Members

- ✓ **EGEC** European Geothermal Energy Council
- ✓ **AEBIOM** European Biomass Association

EREC's objectives

- **To act as a forum** for exchange of information and discussion on issues related to RES.
- **To provide information and consultancy** on renewable energies for the political decision makers on local, regional, national and international level.
- **To launch policy initiatives** to create a positive framework for renewable energy sources
- **To promote European RES equipment, products and services** on world markets

20 % by 2020 in Europe

20 % by 2020

- ◆ A contribution of RES to total inland consumption of 20 % by 2020 is possible
- ◆ The contribution of RES to electricity production will be more than 33 % in 2020
- ◆ The contribution of RES to heat production will be 25 % in 2020.

Contribution of RES to Total Inland Consumption – 20% by 2020

Eurostat Convention (Mtoe)

TYPE OF ENERGY	2000		TARGETS 2010		TARGETS 2020	
	Eurostat Convention	% of total	Eurostat Convention	% of total	Eurostat Convention	% of total
Total Gross Inland Consumption	1,455		1,576 (reads to 2030)		1,576	
1. Wind	1.92	0.13	14.4	0.91	38	2.4
2. Hydro	27.6	1.9	30.6	1.94	33	2.1
3. Photovoltaics	0.01		0.3	0.02	3.6	0.2
4. Biomass	54.5	3.73	125.5	7.96	205	13.0
5. Geothermal	3.32	0.22	6.2	0.4	12.4	0.8
6. STC	0.38	0.02	3	0.2	24	1.5
Total Renewable Energies	87.8	6.0	180	11.43	316	20.0

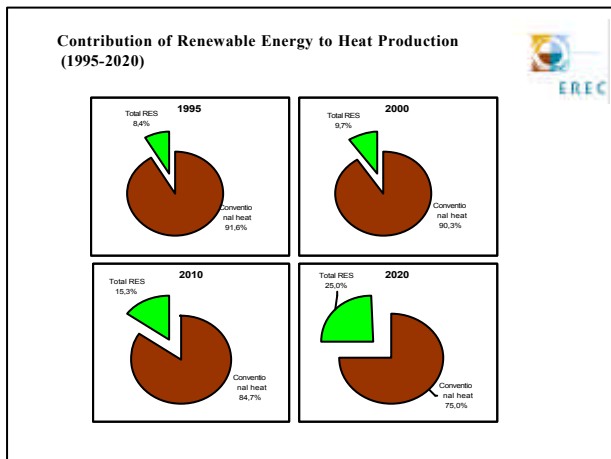
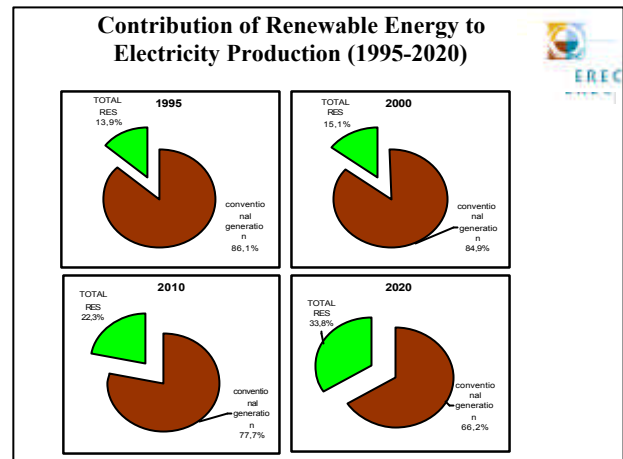
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Contribution of Renewables to Electricity Production (1995-2020)

	1995 Eurostat TWh	2000 Eurostat TWh	2010 Projections TWh	2020 Projections TWh
Wind	4	22.4	168	444
PV	0.03	0.1	3.6	42
Biomass	22.5	39.2	141	282
Hydro	290.2	321.5	355.4	384
Geothermal	3.5	4.8	7	14
TOTAL RES	320.2	388	675	1166
Total Electricity Generation (Trends to 2030)	2308.3	2574	3027	3450
Share of RES	13.9%	15.1%	22.3%	33.8%



The Benefits

Total RES investment (2001 - 2020)

	2001-2010 Billion Euro	2011-2020 Billion Euro	2001-2020 Billion Euro
Wind	55	101	156
PV	10	66	76
Biomass	44	45	89
Hydro	11	9	20
Geothermal	4	7	11
Solar thermal	16	75	91
TOTAL RES	140	303	443

Cumulative Avoided External Costs in the EU15 (2001 - 2020)

	2001-2010 Billion Euro	2001-2020 Billion Euro
Wind	9.4 - 24.0	40.2 - 102.8
PV	0.2 - 0.5	2.7 - 6.8
Biomass	16.7 - 42.7	62.6 - 160.1
Hydro	2.2 - 5.6	7.5 - 19.1
Geothermal	0.6 - 1.4	2.5 - 6.3
Solar thermal	1.3 - 3.4	11.2 - 28.8
TOTAL RES	30.4 - 77.6	126.7 - 323.9

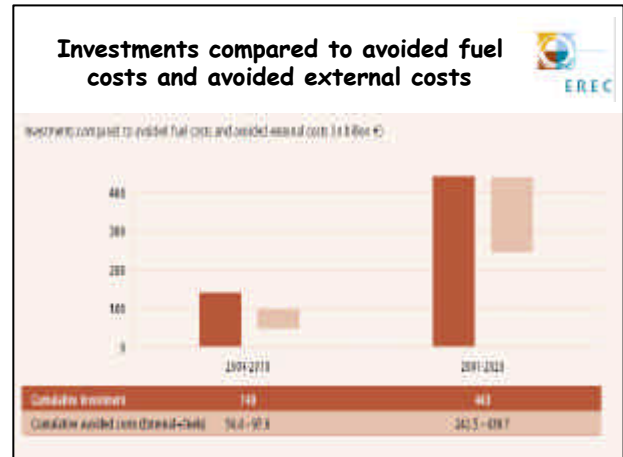
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Cumulative Avoided Fuel Costs in the EU-15 (2001 - 2020)

	2001-2010 Billion Euro	2001-2020 Billion Euro
Wind	12.9	63
PV	0.2	4.3
Biomass	-	-
Hydro	3.1	11.5
Geothermal	1.5	7.3
Solar thermal	2.3	29.7
TOTAL RES	20.0	115.8

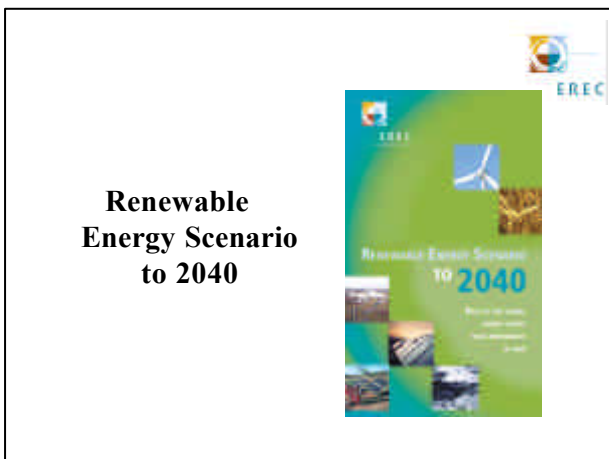


Annual CO₂ Emission Reductions due to RES Penetration (2001 - 2020)

	2010 Mt/year	2020 Mt/year
Wind	99	236
PV	2.2	24
Biomass	176	326
Hydro	23	35
Geothermal	5.8	15
Solar thermal	14	92
TOTAL RES	320	728
% of total EU15 CO ₂ emissions in 2000	9.6%	21.9%

RES - Full Time Employment Growth (2001 - 2020)

	2010 Jobs (FTE)	2020 Jobs (FTE)
Wind	184,000	318,000
PV	30,000	245,000
Biomass	338,000	528,000
Biofuels	424,000	614,000
Small Hydro	15,000	28,000
Geothermal	6,000	10,000
Solar thermal	70,000	280,000
TOTAL RES	1,067,000	2,023,000



Why a Scenario ?

- ◆ images of alternative futures
- ◆ neither predictions nor forecasts
- ◆ image of how the future could unfold
- ◆ useful tools for investigating alternative future developments and their implications

Scenarios can create a vision for the future

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The Advanced International Policies Scenario

Half of the global energy supply by renewables in 2040

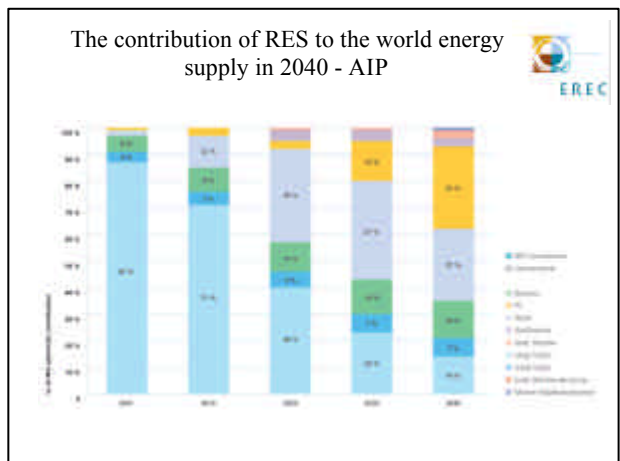
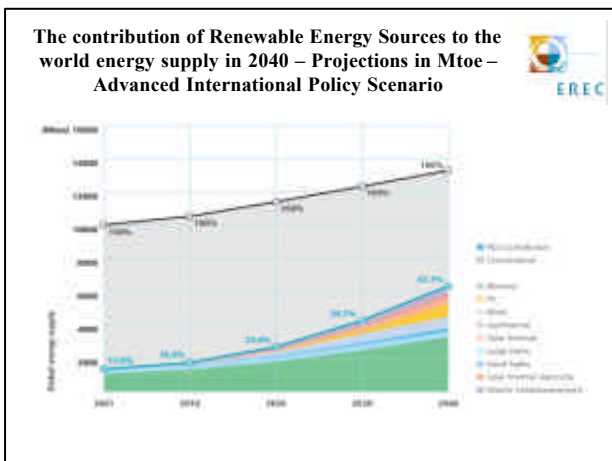
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- ◆ ambitious growth rates
 - ◆ additional support measures
 - ◆ regions already active in the promotion of renewables will increase their efforts
 - ◆ higher prices for conventional energy supply
 - ◆ growing support for electrification of the poor regions by renewables.
 - ◆ implementation of the Kyoto protocol and additional measures
 - ◆ international cooperation
 - ◆ total energy consumption are based on a scenario from the IIASA

The assumptions for all renewable energy sources technologies

	1996-2001	2001-2010	2010-2020	2020-2030	2030-2040
Biomass	2%	2.2%	3.1%	3.3%	3.8%
Large hydro	2%	2%	1%	1%	0%
Small hydro	8%	8%	10%	8%	8%
Wind	3.3%	18%	20%	7%	2%
PV	23%	28%	30%	25%	13%
Solar thermal	10%	10%	10%	14%	7%
Solar thermal electricity	2%	18%	22%	10%	15%
Geothermal	0%	0%	0%	0%	4%
Marine Hydro/Wave/Ocean	0%	0%	10%	22%	21%

The contribution of Renewable Energy Sources to the world energy supply in 2040 – Projections in Mtoe – Advanced International Policy Scenario

	2001	2010	2020	2030	2040
Renewables in Total Supply	10.1	19.4	34.4	48.1	107
Biomass	0.96	1.11	1.71	1.81	2.11
Large hydro	20.7	20	20	20	20
Small hydro	0.1	0.1	0.1	0.1	0.1
Wind	0.7	4.4	20	7.4	2.8
PV	0.2	2	2.8	2.1	1.8
Solar thermal	0.1	0.1	0.1	0.1	0.1
Solar thermal electricity	0.1	0.1	0.1	0.1	0.1
Geothermal	0.1	0.1	0.1	0.1	0.1
Marine Hydro/Wave/Ocean	0.1	0.1	0.1	0.1	0.1
Total RES	10.1	19.4	34.4	48.1	107
RES Contribution	11.4%	14.4%	20.5%	21.7%	47%



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First Conclusions



- ◆ Abundant RES potential world-wide
- ◆ Policy framework crucial for RES development.
- ◆ RES have tangible economic, ecological and social benefits.
- ◆ International collaboration a must

Market Development-Policy Link



- ◆ RE has the technological potential to replace fossil fuels as mainstream energy source.
- ◆ RE is integral part of the energy supply in many countries today.
- ◆ In the long run there is no Alternative to RES
- ◆ All other energy sources are finite

The Case for shifting to a RES supply



- ◆ Climate Protection
- ◆ Keeping risks within a normal range without nuclear energy
- ◆ Security of supply
- ◆ Social Benefits

Necessary Conditions and Solutions (1)



- ◆ Establishment of legally binding targets
- ◆ Raise Awareness
- ◆ Combine energy and development policy
- ◆ Shift towards RES in international financial institutions

Necessary Conditions and Solutions (2)



- ◆ Change of subsidies policy
- ◆ Increase R&D for renewables and grid integration
- ◆ Ratification of the kyoto protocol
- ◆ International cooperation

Integration of RES



- ◆ The strength of RES is based on the mix :
- ◆ Neither wind nor PV nor Hydro or any other RES will dominate
- ◆ A stable balance between the different RES technologies facilitates integration
- ◆ Supply will be more decentralised

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Summary



- ◆ RE has the technological potential to replace fossil fuels as mainstream energy source.
- ◆ RE is integral part of the energy supply in many countries today.
- ◆ RE has tangible economic, ecological and social benefit.
- ◆ **BUT: RE market development depends on a coherent, predictable, supportive political & legal framework.**



Further information:

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