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Fuels from biomass - opportunities & risks

Business as usual has NO future

- Because CO2 emissions are not going down while
- Energy dependency goes up
- This is the message from
 - IEA scenarios
 - DG TREN scenarios
 - Green vision scenario

Only high efficiency and renewables policies deliver

- Substantial CO2 reductions
- Reduce oil dependency
- Reduce gas dependency
- Reduce nuclear dependency



Gross energy consumption by fuel and energy and carbon intensities:
 Combined energy efficiency and high renewables case versus Baseline

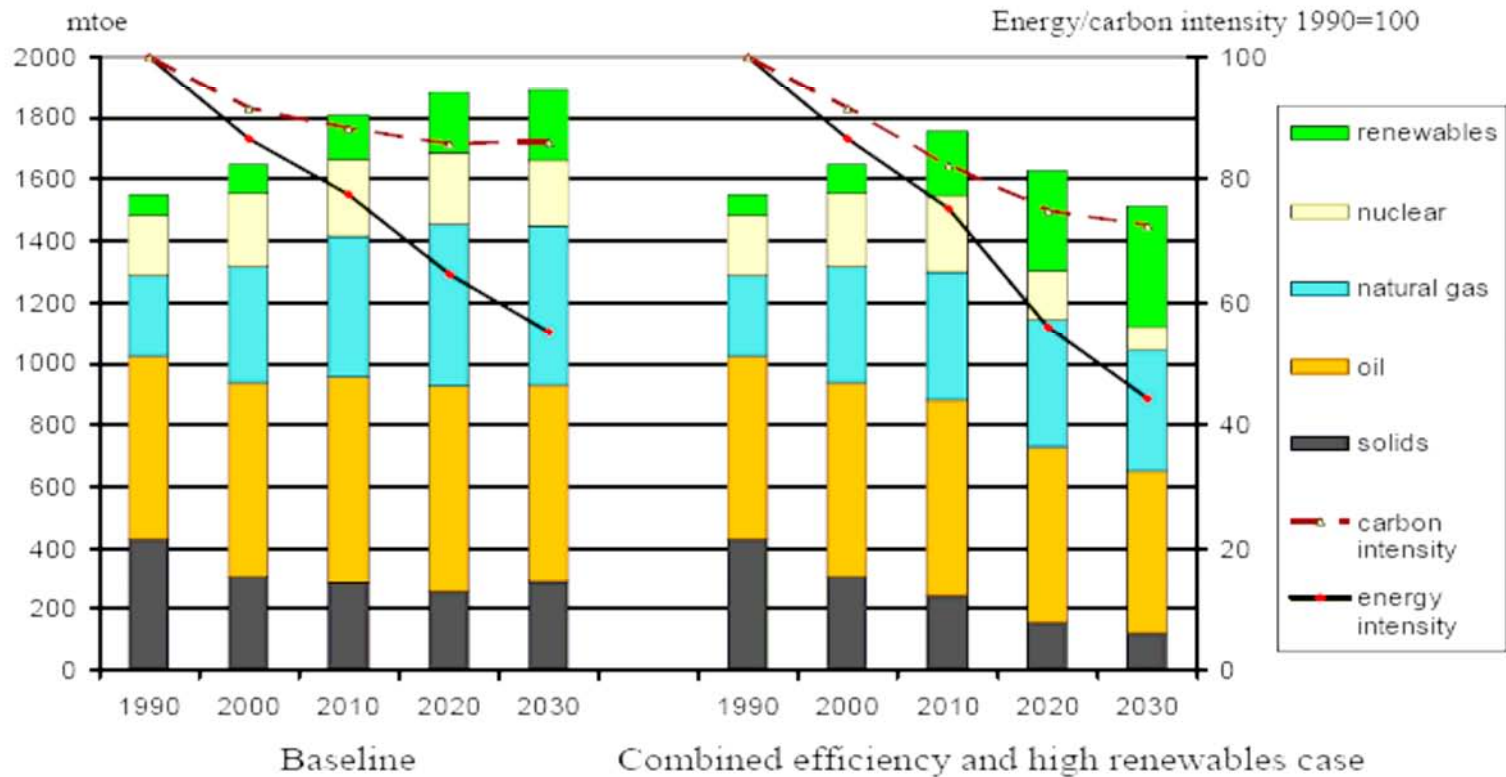


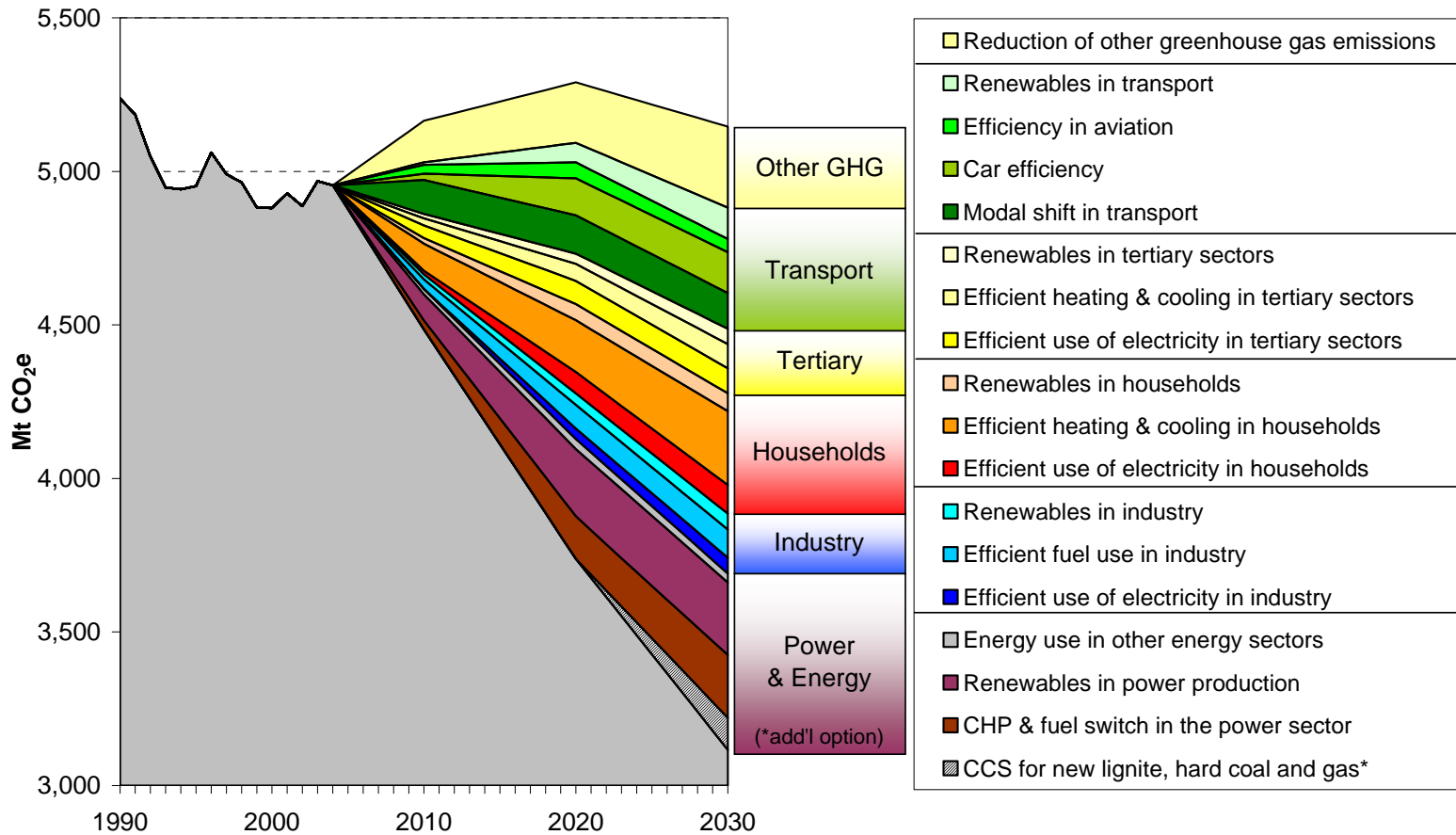


Table 1.4-1: Primary Energy Demand in EU-25 in the “Combined high renewables and efficiency” case

	Mtoe				% change from baseline		
	2000	2010	2020	2030	2010	2020	2030
Solid Fuels	306.5	246.0	156.9	124.5	-14.2	-39.5	-57.5
Liquid Fuels	634.7	637.7	574.9	529.8	-4.6	-14.2	-17.3
Natural Gas	376.3	417.8	413.7	394.3	-9.6	-21.9	-23.9
Nuclear	237.7	248.8	161.5	73.5	0.0	-29.4	-65.1
Renewable En. Sources	96.5	209.2	324.9	393.7	45.5	66.2	70.5
Total	1653.8	1761.6	1633.4	1517.5	-2.8	-13.4	-19.9
EU-15	1456.9	1543.0	1411.1	1293.1	-2.8	-13.1	-19.6
NMS	196.9	218.6	222.4	224.4	-3.1	-15.0	-21.7
Mt CO₂ emitted	3674.1	3524.1	2968.8	2669.5	-9.2	-24.4	-32.5
EU-15	3127.0	2990.7	2543.3	2300.1	-9.1	-23.0	-30.5
NMS	547.1	533.4	425.5	369.4	-9.8	-32.2	-42.6

Source: PRIMES.

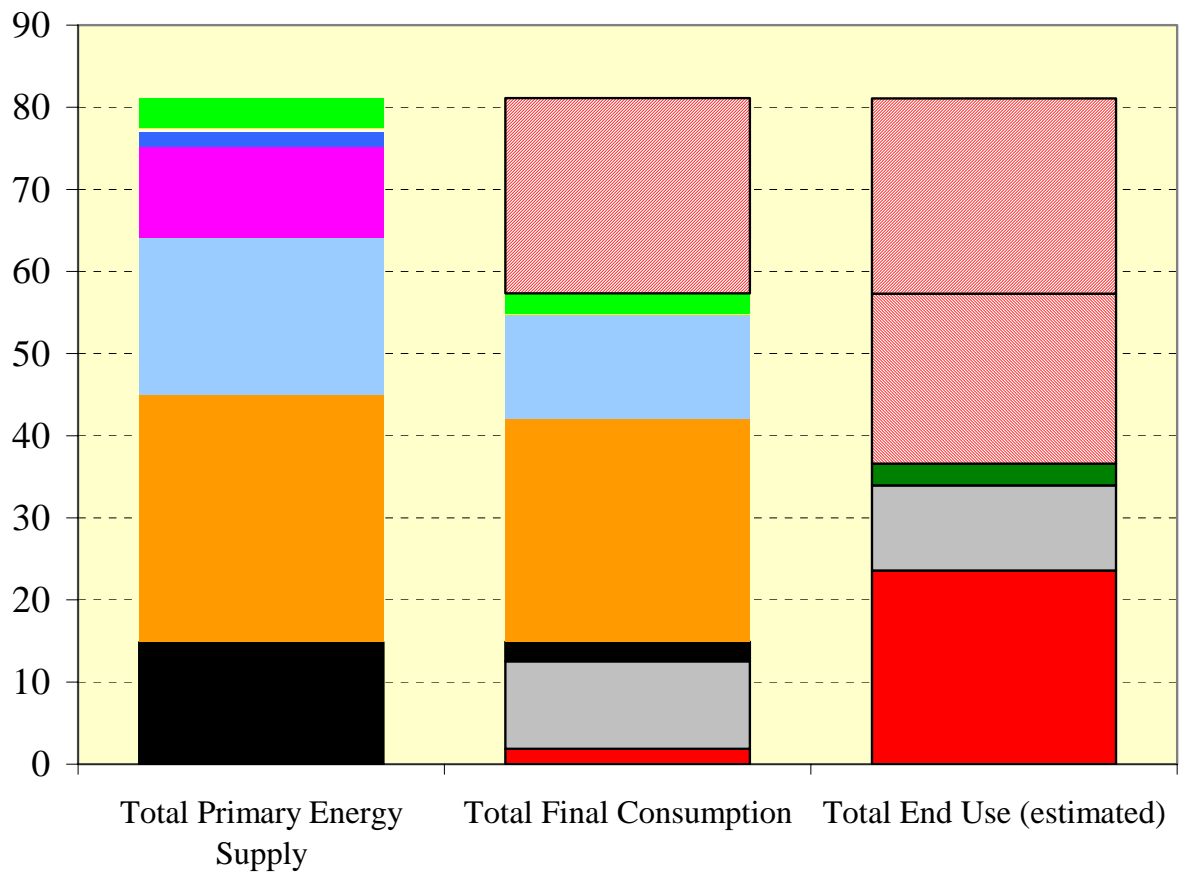
Green vision: concrete steps to cut 30% CO₂ in 2020



EU25 + ACC4 + EFTA3 during 2003

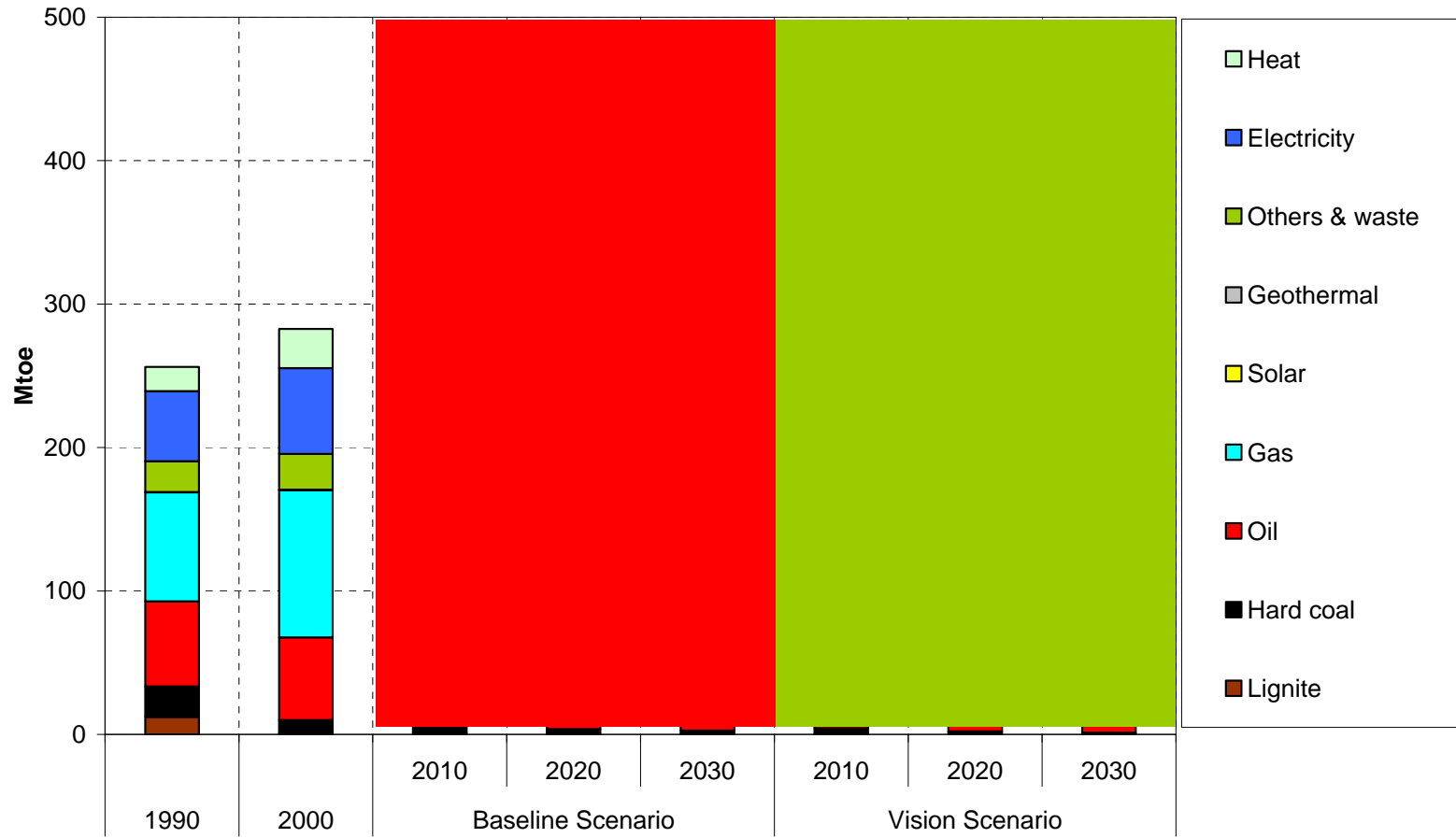
Total Primary Energy Supply = 81,1 EJ

EJ



- Losses in the energy transformation sector
- Losses in end use
- Combustible Renewables and Waste
- Solar/Wind/Other
- Geothermal
- Hydro
- Nuclear
- Natural Gas
- Petroleum Products
- Coal and Coal Products
- Transportation
- Electricity
- Heat

bau versus vision:Households



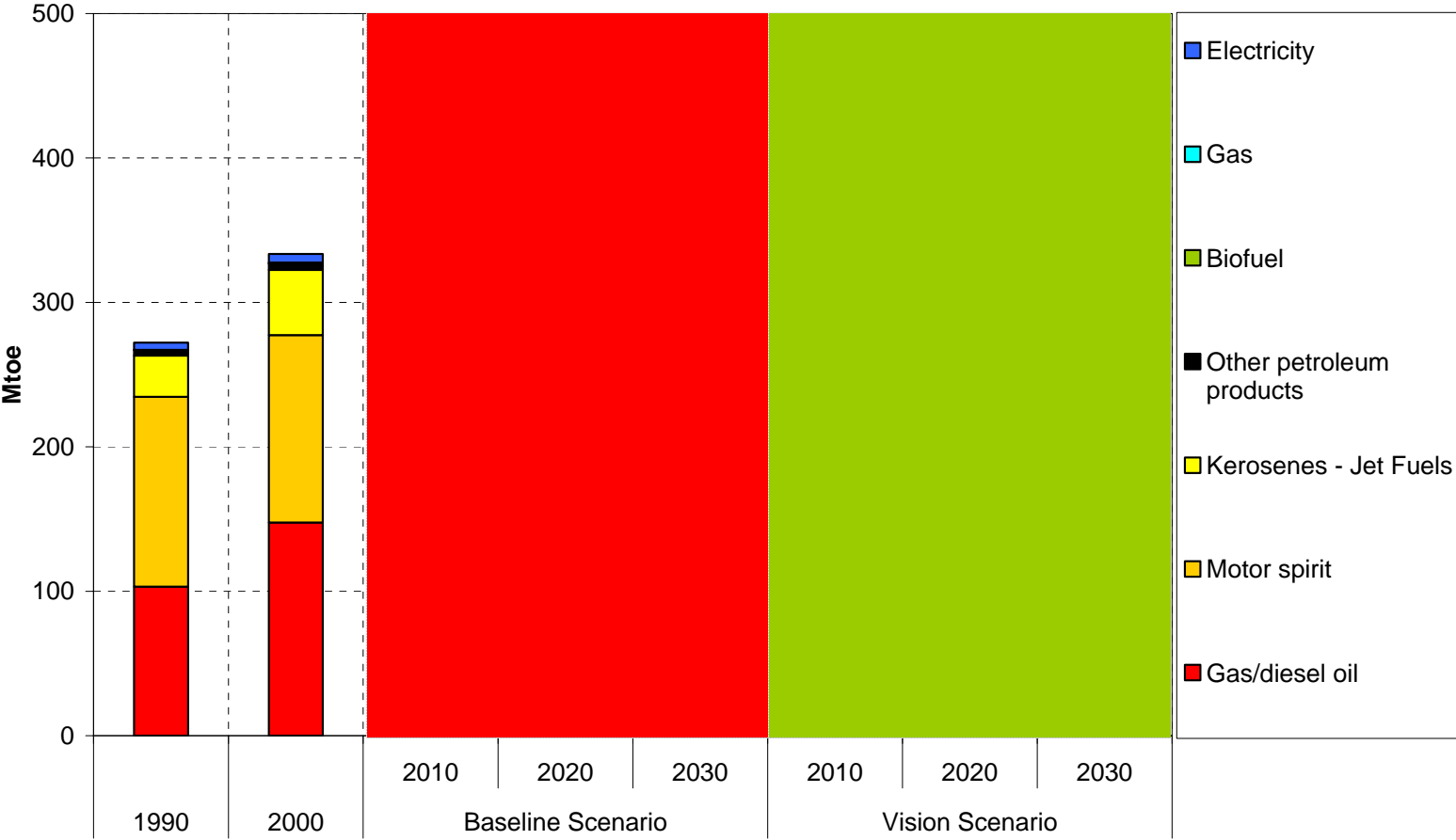
Household measures

- Higher efficiency standards for new
- 2,5 times more existing buildings refitted
- Heat supply from CHP and district heating
- More efficient appliances
- Renewables
 - 22,5% from final energy in 2030
 - Most from biomass CHP, rest from solar and geothermal
 - NEW directive for heating/cooling needed
 - Invest in heating/cooling networks (revise CHP directive)

Electricity measures

- More efficient appliances, office equipment, industrial equipment
- Less electricity for heating and cooling
- High amount of CHP
- Renewables grow:
 - 44% in 2020, 59% in 2030
 - Most from wind (offshore important) and biomass (CHP important), some later from solar and geothermal
 - Strengthen existing directive with new targets
 - Invest in infrastructure and create fair economic framework

bau versus vision: Transport



Transport measures

- Private cars efficiency (80 gr/km in 2020)
- Modal split changes (+10% in goods and +10% in persons)
- Aviation into ETS and kerosene tax
- Fuels from biomass
 - 5,75% in 2010, 18% in 2020, 25% in 2030
 - 75% from second generation because higher efficiencies
 - Strengthen existing directive with new targets
 - Certification needed to allow for global trade
 - Auto oil directive standards on volatility stay

After hydrogen hype, the biofuels hype?

- Biofuels are only a small part of solutions
- Priorities for the next years are
 - Higher efficiencies in energy and transport sector
 - Biomass to cogen heat&cool and power
 - Fuels from biomass:
 - Obligatory certification
 - Create space for 100% fuels and not only blending
 - Create local/regional high added value chains



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Thank you for listening!

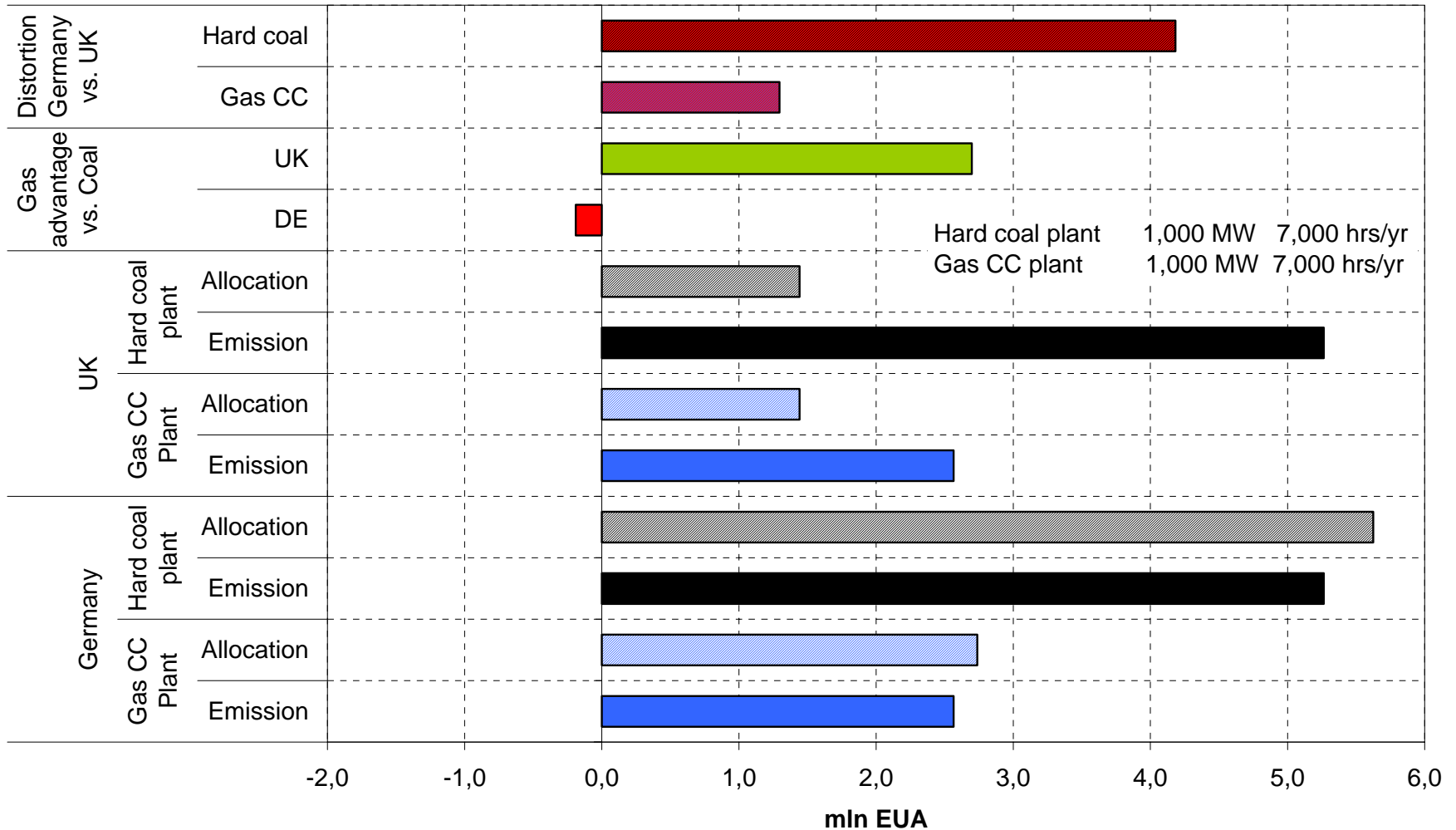
More info

<http://www.greens-efa.org/>

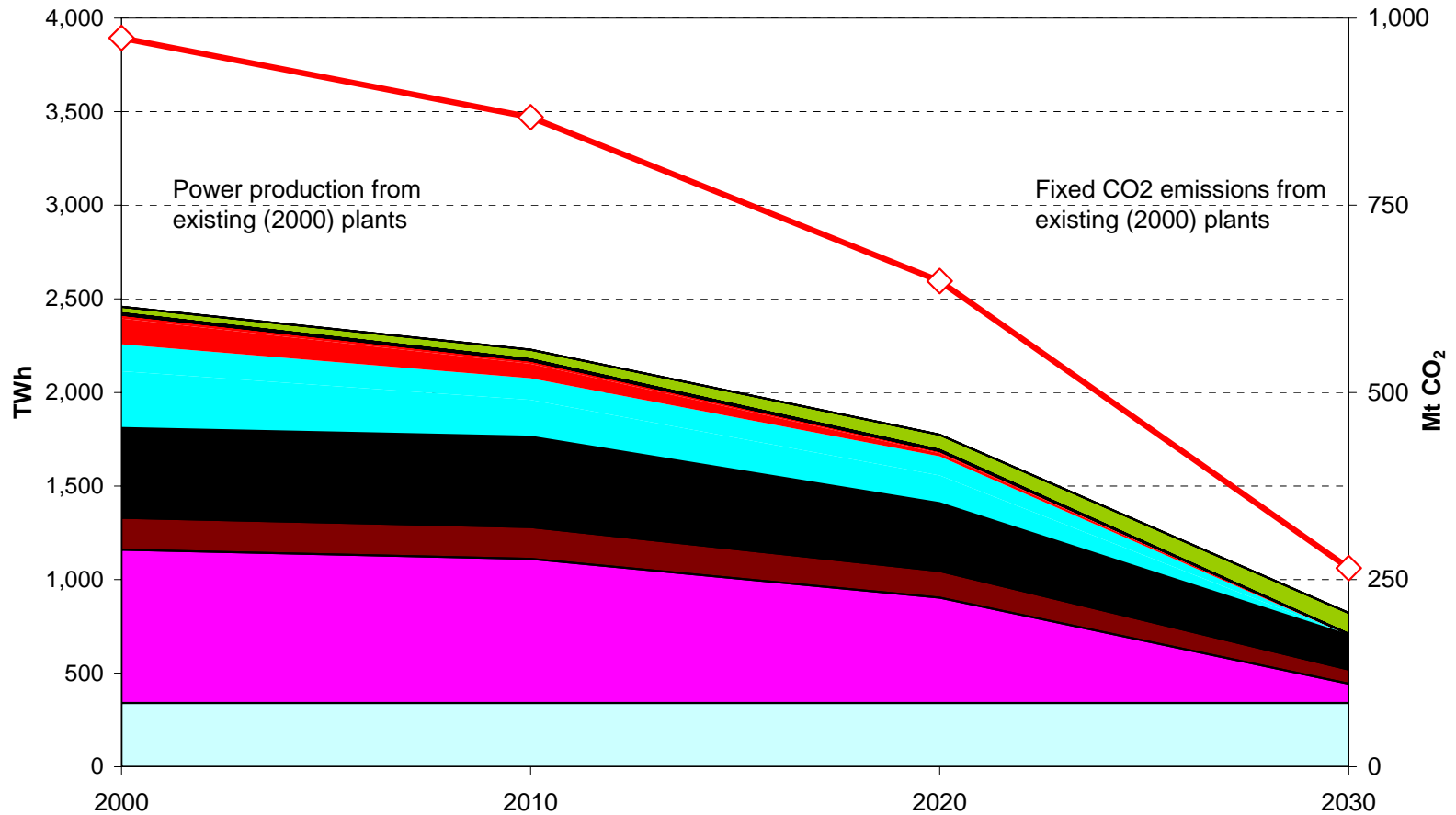
[www. stopclimatechange.com](http://www.stopclimatechange.com)

Invest signal for New Power Plants under NAP2: DE-UK

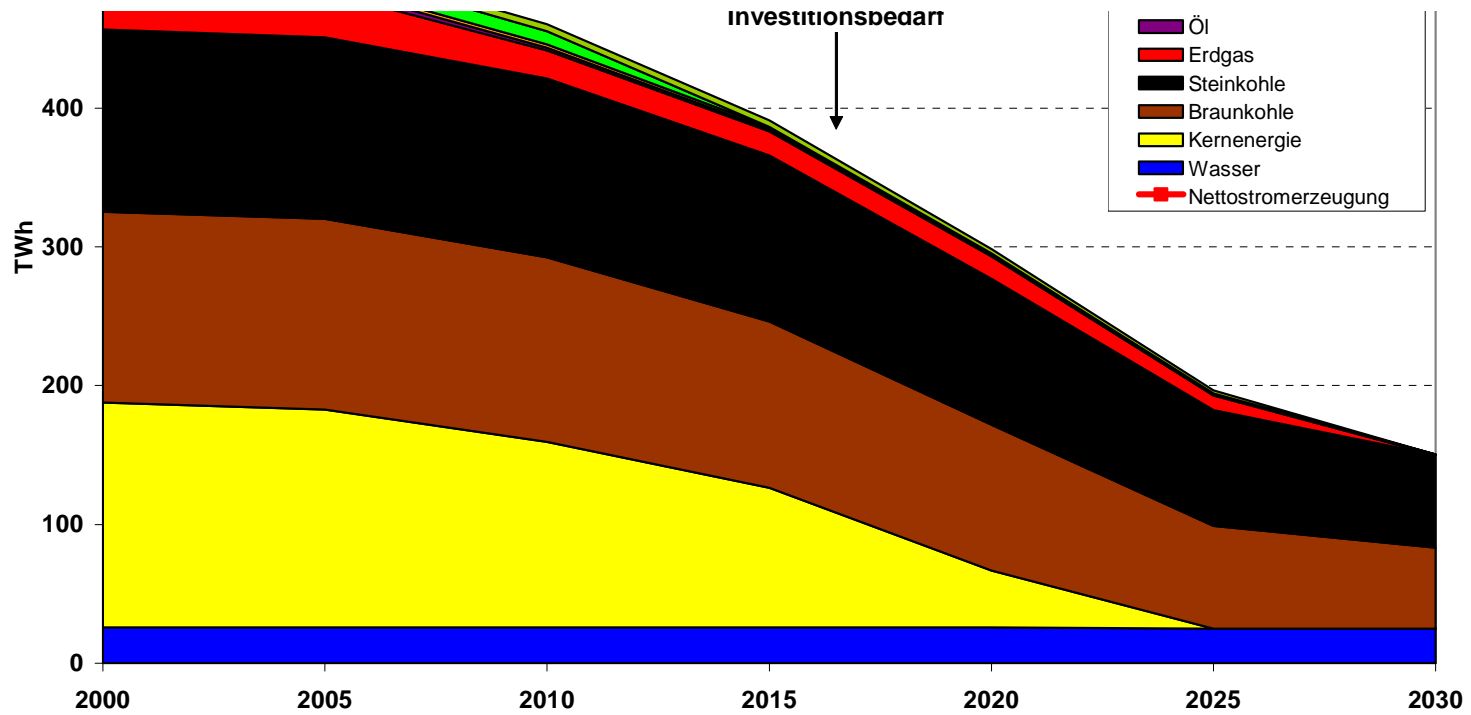
Case study 1,000 MW 7,000 hrs/yr



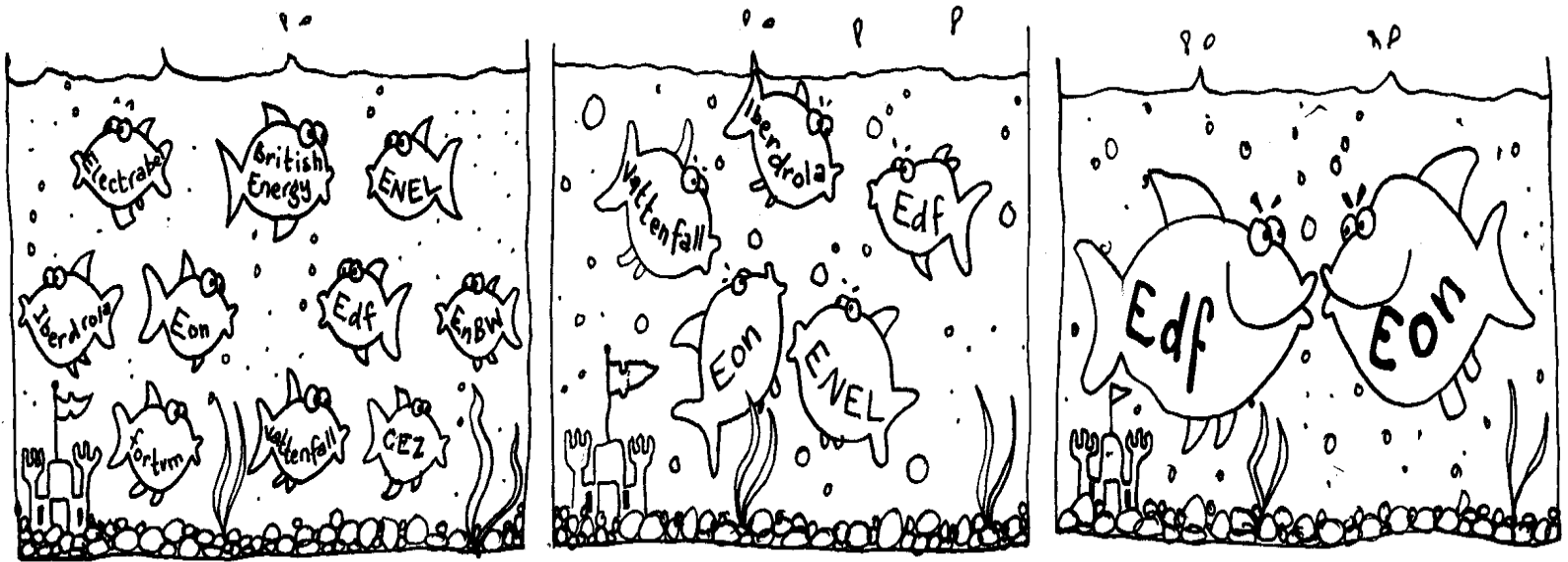
The new investment cycle: the race against coal



The case of Germany



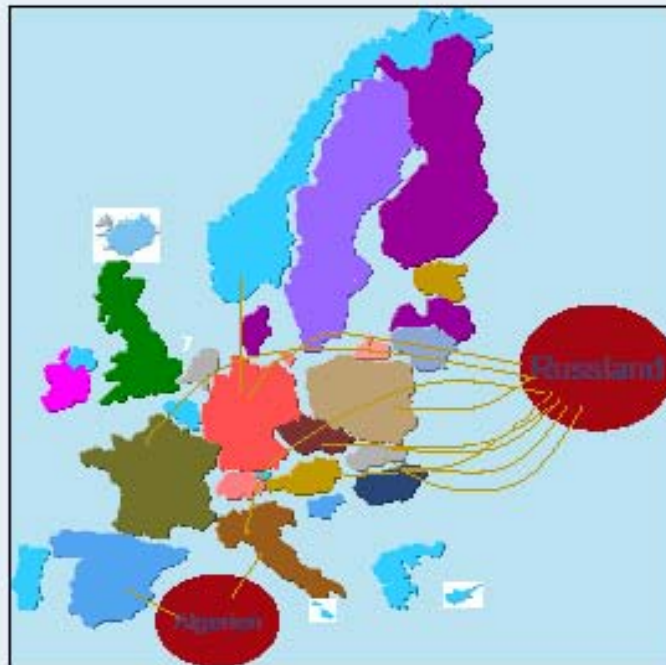
Competition?



Big fish, small pond

Create a fair market for electricity

- Stop existing market distortions in favour of coal and nuclear
- Allow for support schemes at least until unfair market conditions are stopped
- Impose full ownership unbundling to allow for new investment in grid (also off-shore)
- Reduce market domination of incumbents and favour new entrance in RE and CHP
- Create a fully integrated gas market



→ Nachhaltige, **vertragliche Zersplitterung** des Marktes

→ Abgeschottete nationale Märkte

Conclusion:

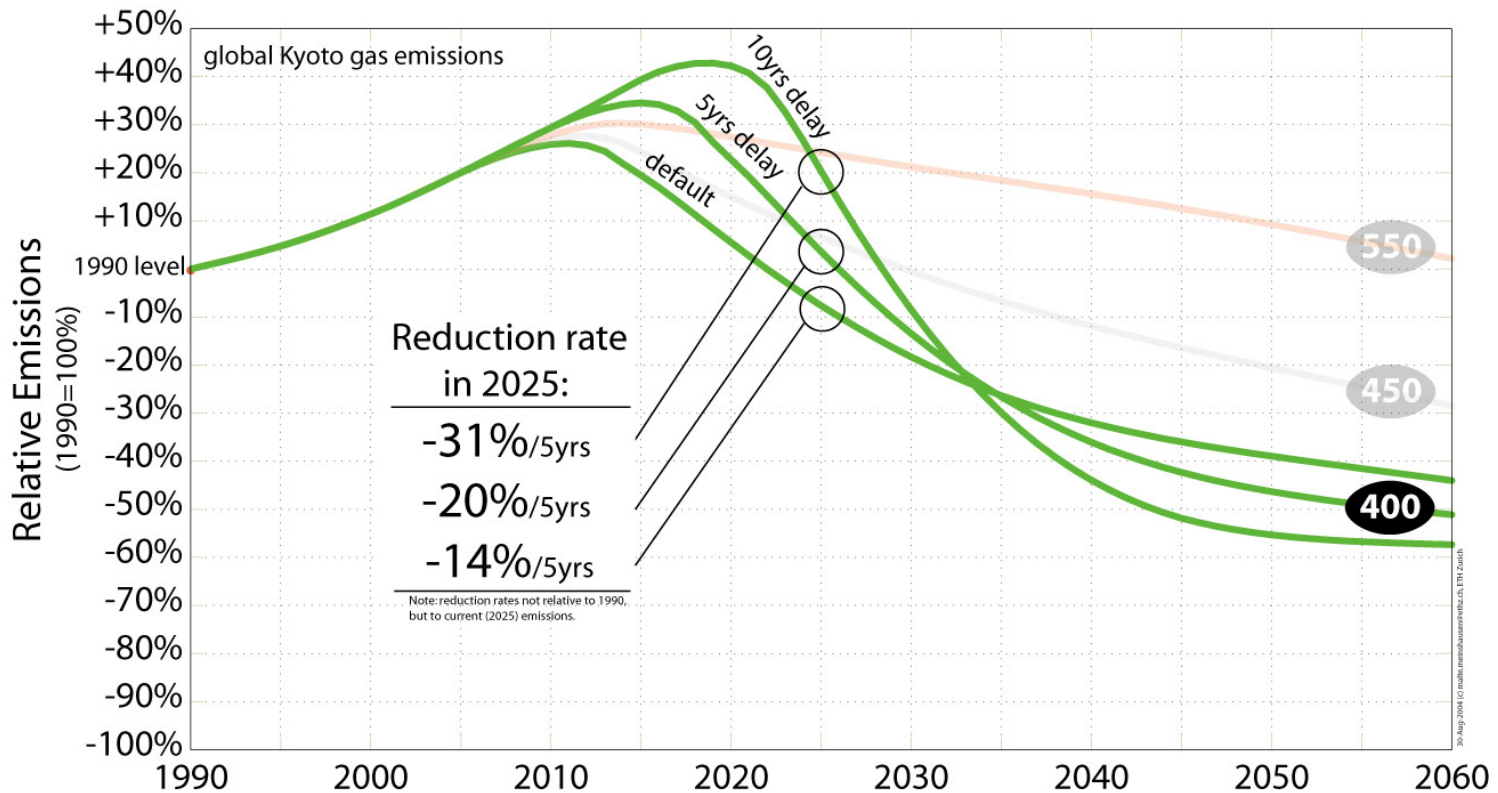
- High energy and renewables policy measures
 - solve climate change AND security of supply problems
 - ensure EU leadership in climate change AND in technology
 - Will cost additional money but well below Stern's 1% of GDP
 - Energy intensive industries need an EU wide transparent special regime

Gas as an important part of the foreign dimension

- New risk sharing through upstream and downstream activities
- Long term contracts between market and security of supply
- A stable and rule based international system (WTO)
- Corporate Social Responsibility

A European Energy Strategy

- **Establish consensus on those issues where there is agreement and take EU wide actions**
 - End use Energy efficiency (buildings, transport, electricity)
 - Renewables
 - True functioning markets with
 - Fair and market driven pricing (CO2 NAPs, nuclear risk)
 - Neutrality of infrastructures
 - Fighting oligopolies
 - A coherent EU gas strategy
- **Agree “not to agree” and leave these to national sovereignty**
 - Role of coal will depend on national choice
 - Role of nuclear will depend on national choice



Note: (a) The 550C_e, 5450C_e, and 5400C_e stabilization scenarios are based on the EQW multi-gas emission pathways method, which builds on the gas-to-gas correlations within the pool of 54 SRES and Post-SRES scenarios (Meinshausen et al. submitted).
 (b) Landuse CO₂ emissions are sharply decreasing in the default scenarios. If constant CO₂ emissions from the landuse sector were assumed, the emission reductions of the Kyoto-gases (fossil CO₂, Methane, N₂O, HFCs, PFCs, SF₆) have to be more pronounced. Alternatively, if emission allowances were given to avoided landuse emissions, overall emission allowances for the Kyoto-gases would have to be reduced accordingly (solid line).
 (c) Delay profiles were calculated by assuming a 5 or 10 delay in global action. In the illustrative default scenarios, OECD and REF regions are assumed to enter stringent emission reductions by 2010, and ASIA and ALM by 2015.

Source: Malte Meinshausen, Swiss Technical University



...Harry Potter will not help

Figure 1: Expected Viability of Carbon Abatement Technologies in the 7th Framework Programme

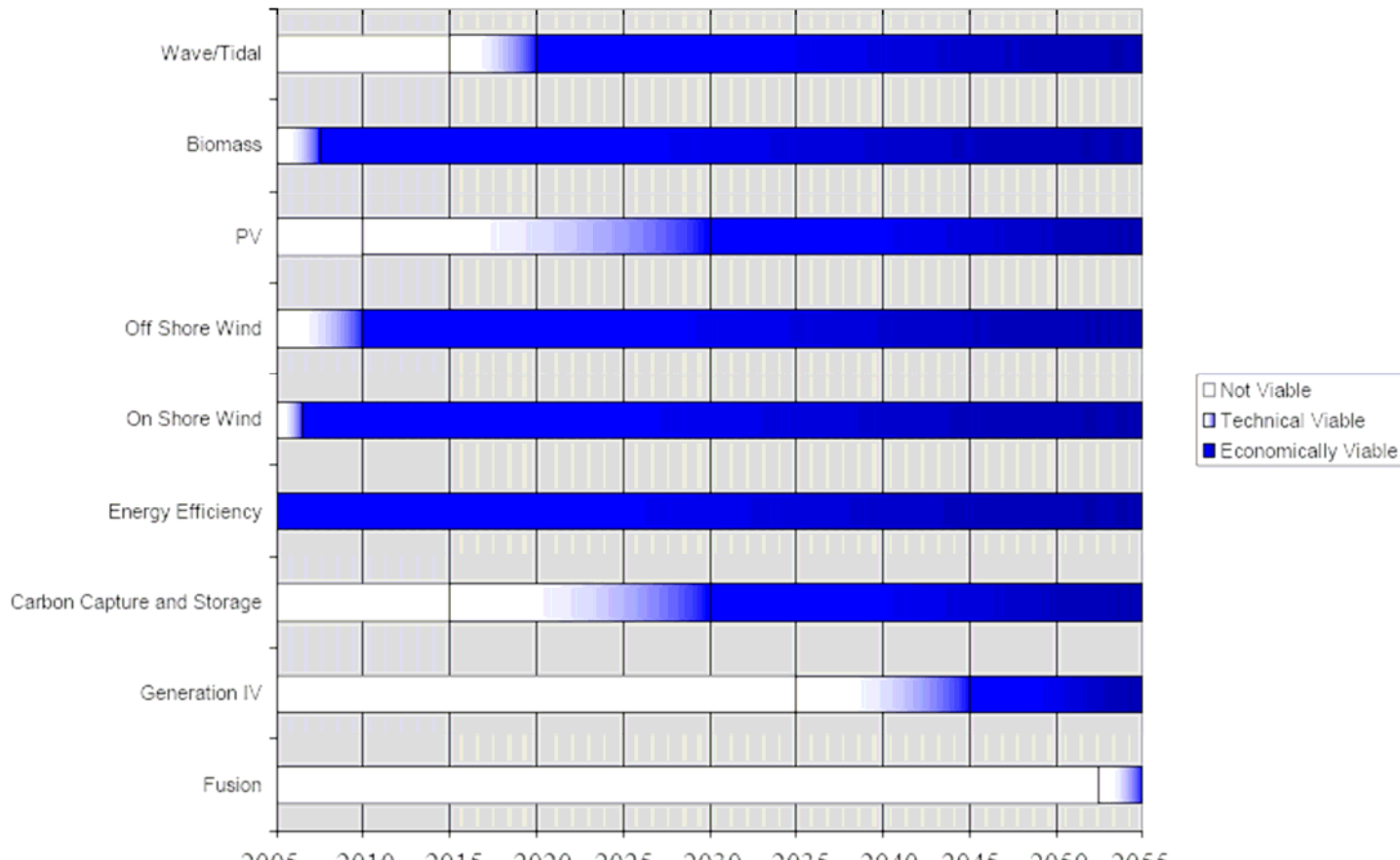
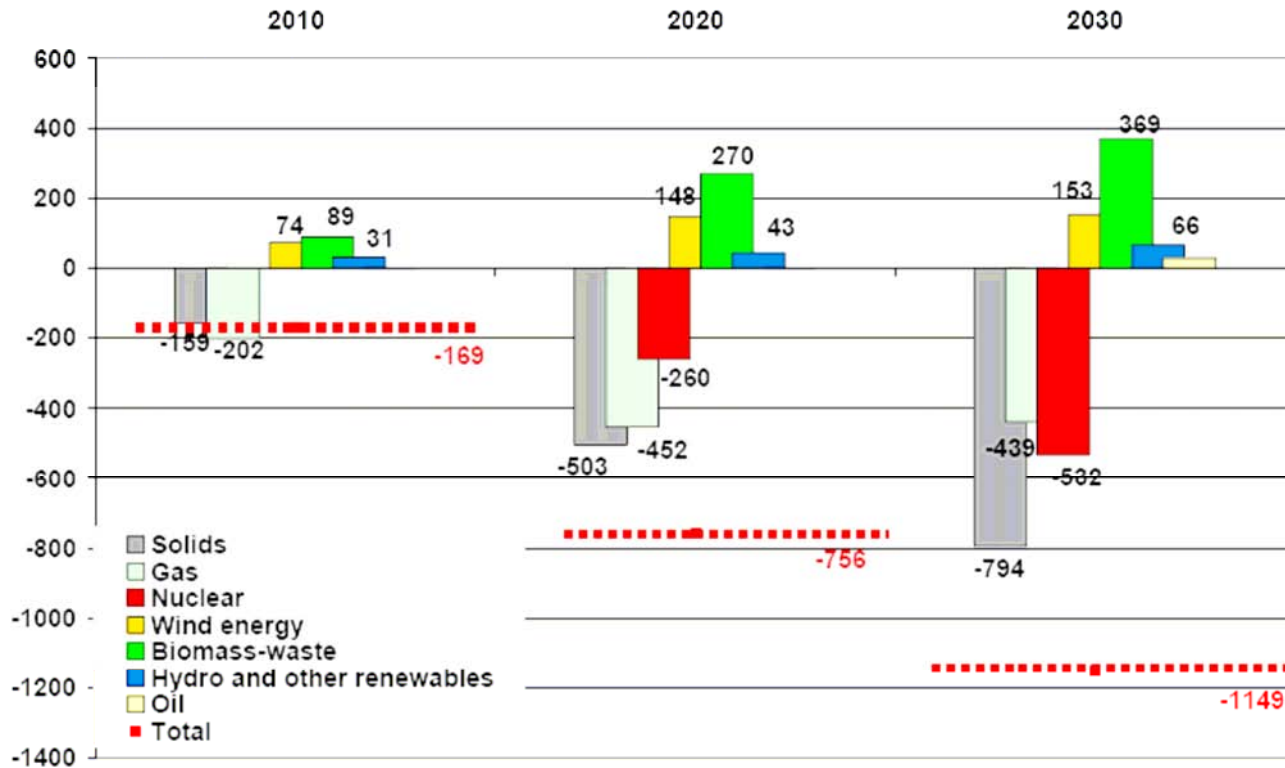




Figure 1.4-3: Changes in electricity generation by energy form in EU-25 (diff. from Baseline in TWh) in the “Combined high renewables and efficiency” case



Source: PRIMES.



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Table 1.4-4: Installed capacity by plant type in EU-25 in the “Combined high renewables and efficiency” case

	GW installed				change from baseline (in GW)		
	2000	2010	2020	2030	2010	2020	2030
<u>Nuclear energy</u>	141.1	136.4	105.8	40.4	0.0	-11.1	-60.8
<u>Renewable energy (excl. biomass-waste)</u>	110.1	215.3	312.7	403.9	31.1	71.2	97.9
Hydro (pumping excluded)	97.2	106.9	110.5	112.6	3.0	1.9	0.4
Lakes	52.2	57.4	58.8	59.2	1.4	1.0	0.7
Run of river	45.0	49.5	51.7	53.4	1.6	0.9	-0.3
Wind power	12.8	106.5	190.1	252.1	28.1	62.5	69.2
Wind on-shore	12.8	93.3	140.2	164.2	23.2	31.2	25.6
Wind off-shore	0.0	13.2	50.0	87.9	4.9	31.3	43.6
Solar	0.2	1.7	11.7	38.7	0.0	6.8	28.4
Other renewables (tidal etc.)	0.0	0.2	0.4	0.4	0.0	0.0	0.0
<u>Thermal power</u>	410.5	471.0	476.4	515.1	-19.1	-108.1	-174.5
Solids fired	188.9	152.5	91.4	90.9	-4.1	-65.4	-120.3
Oil fired	74.3	61.8	48.0	39.6	-4.3	0.1	4.7
Gas fired	131.9	219.1	233.5	233.6	-26.3	-87.7	-126.6
Natural gas	119.2	207.3	223.9	226.7	-26.3	-87.8	-125.2
Derived gasses	12.7	11.8	9.6	6.8	0.0	0.1	-1.3
Biomass-waste fired	14.5	34.1	98.3	145.0	13.4	41.2	63.4
Fuel cells	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geothermal heat	1.0	3.6	5.3	6.0	2.2	3.7	4.4
Total	661.7	822.7	895.0	959.4	12.0	-48.0	-137.3
EU-15	588.1	735.4	795.9	834.2	11.0	-32.6	-95.8
NMS	73.7	87.4	99.1	125.2	1.0	-15.4	-41.5
<i>of which CHP</i>	113.0	149.3	195.3	241.1	-1.6	-13.7	-6.9
EU-15	88.5	122.7	165.5	196.5	-2.0	-10.0	2.5
NMS	24.4	26.6	29.7	44.6	0.4	-3.7	-9.4

Source: PRIMES



Where the EU should put its research money

Energy end use efficiency in buildings, electricity, transport, industry (also sociological aspects)

- ☺ 21 renewables technologies for XXI century
(biomass, wave, solar thermal, solar PV, geothermal)
- ☺ Combined production (cooling)
- ☺ CCS



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Merci pour votre attention!

Pour plus d'informations

<http://www.greens-efa.org/>