



Greenhouse Gas Emission Limitation and Promotion of Renewable Energy Sources in the Power Sector

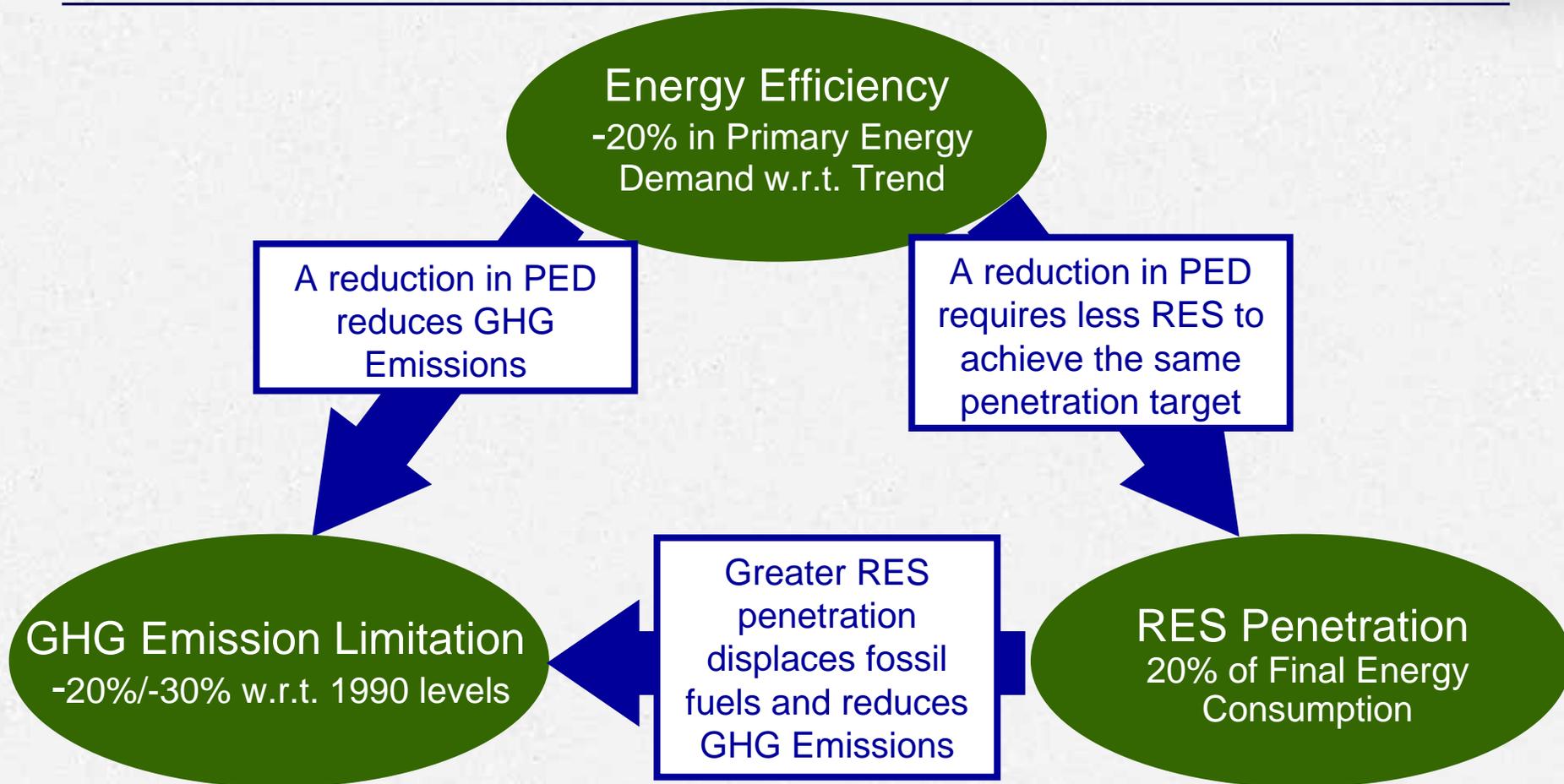
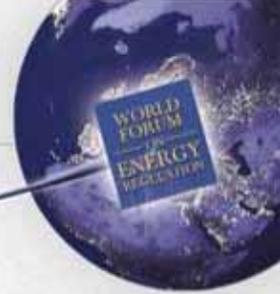
Alberto Pototschnig
Deputy Chairman

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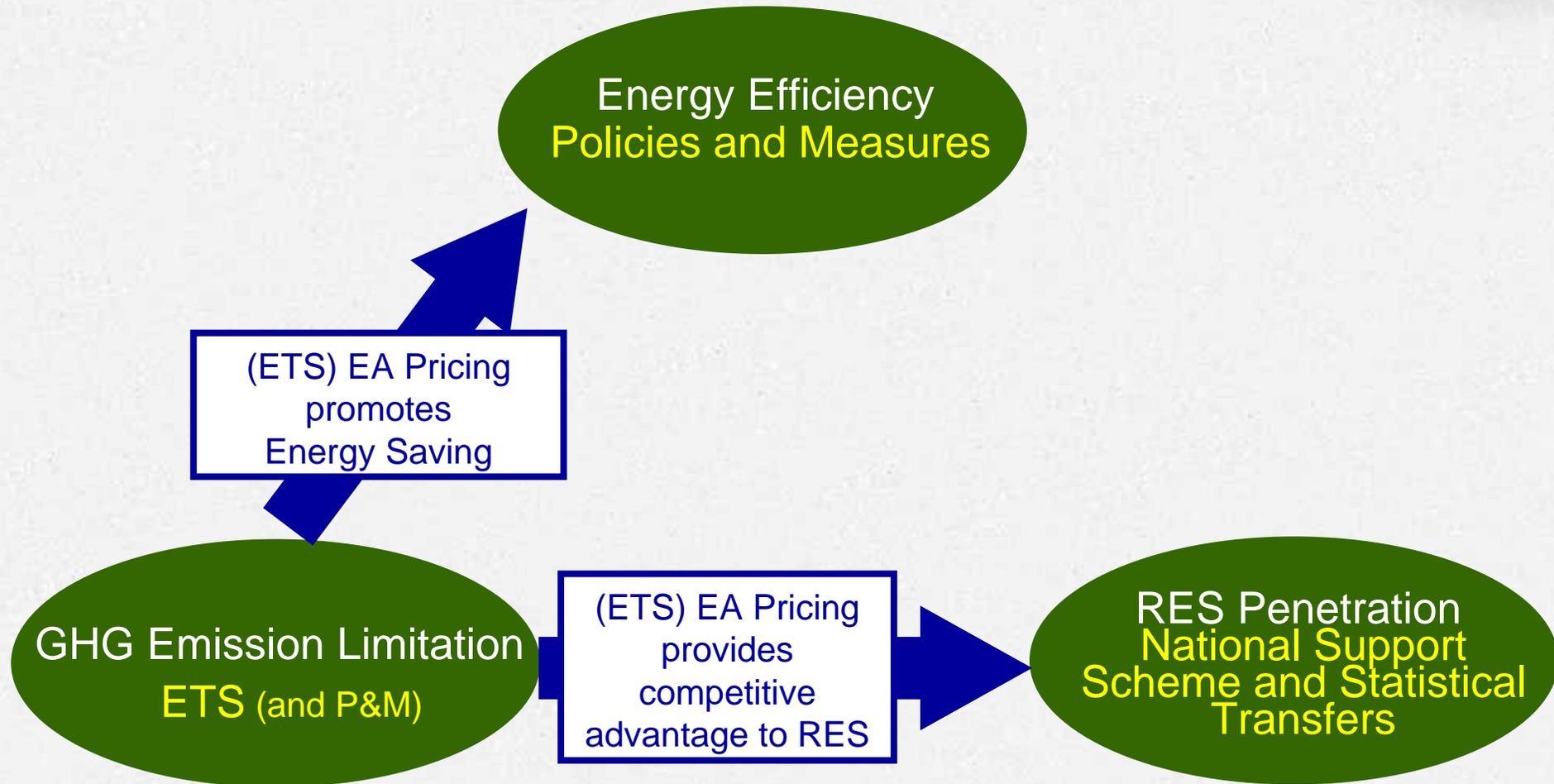
World Forum on Energy Regulation IV
Athens, Greece

October 18 - 21, 2009

Energy Efficiency, GHG Emissions and Renewable Energy Sources



The Mix of Policy Instruments



The Power Sector

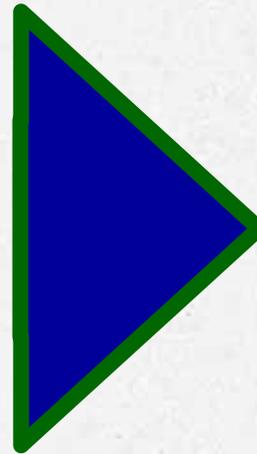


In 2005 accounted for 46% of CO2 emissions from the Trading Sector

Is characterised by a relatively small number of operators and installations

There are significant potentials for RES penetration

Has low exposure to international competition (low risk of carbon leakage)



It is looked at as a main contributor to EU Environmental Policy

Modelling Assumptions



- Static analysis in 2020
- Member State-specific Electricity Demand Trend: 0.3–4.0% per year
- Avoidable Costs of Existing Generators
- Total Costs of New Generation Capacity
- Least-Cost Dispatching to meet Electricity Demand (No Capacity Concerns)
- Given Import/Export Patterns
- RES-E Potentials from OPTRES Report
- Import Dependency from Eurostat

RES-E Statistical Transfers



- Statistical Transfers (ST) allow optimal (re)allocation of effort to achieve the RES penetration target ...
- ... especially since the individual Member States' targets have been mainly based on “ability to pay”, with little reference to potentials and costs
- However, ST decouple financial and physical efforts
- Benefits from RES are global, regional and local
- Therefore ST may imply that Member States paying for RES do not receive all the benefits

Power Sector Targets



	All Sectors Targets		Power Sector Targets
GHG Emission Reduction	- 20% w.r.t. 1990	➔	- 21% w.r.t. 2005
	- 30% w.r.t. 1990	➔	- 38% w.r.t. 2005
RES Penetration	20%	➔	30%
EE	-20%	➔	-20%
			-10%

Policy Scenarios and Results



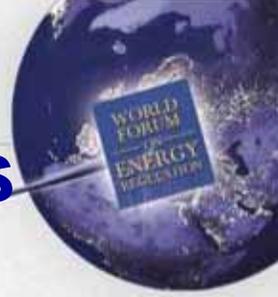
Scenarios	1	2	3	4	5	6	7	8	9	10	11	12	13	14	13	14	15	16	17	18	19	20	
Policy Instruments																							
ETS	X		✓					X			20 €/tCO2								✓				
RES Support	X		X					✓			✓								✓				
Statistical Transfers	X		X		X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	✓
Energy Efficiency	X	10%	X	10%	X		10%		20%		X		10%				X					10%	
Description	No ETS No RES support		ETS to achieve GHG emission limitation target. No RES support		No ETS RES support to achieve penetration target						ETS: power sector as price taker. RES support to achieve penetration target				ETS to achieve GHG emission limitation target. RES support to achieve penetration target								
Var. GHG em. w.r.t 2005	36%	17%	-21%	-21%	0%	1%	-9%	-11%	-20%	-21%	-16%	-19%	-26%	-29%	-21%	-21%	-38%	-38%	-21%	-21%	-38%	-38%	
RES-E Penetration	12%	13%	18%	17%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	
CO2 Price (€/tCO2)			61	46							20	20	20	20	33	25	58	56	4	4	45	43	
RES-E Value (€/MWh)						94		85		74		80		72		77		56		80		58	

Policy Scenarios and Results



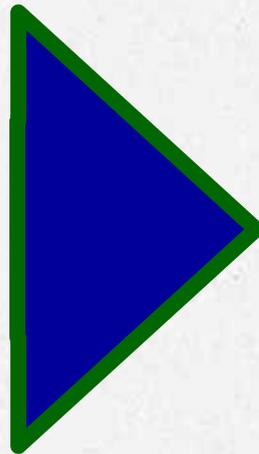
Scenarios	1	2	3	4	5	6	7	8	9	10	11	12	13	14	13	14	15	16	17	18	19	20	
Policy Instruments											20 €/tCO ₂												
ETS	X		✓					X											✓				
RES Support	X		X					✓					✓						✓				
Statistical Transfers	X		X		X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	X	✓	✓
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Achieving the EE and the RES Targets



Energy
Efficiency
Target ✓
(20%)

RES
Penetration
Target ✓



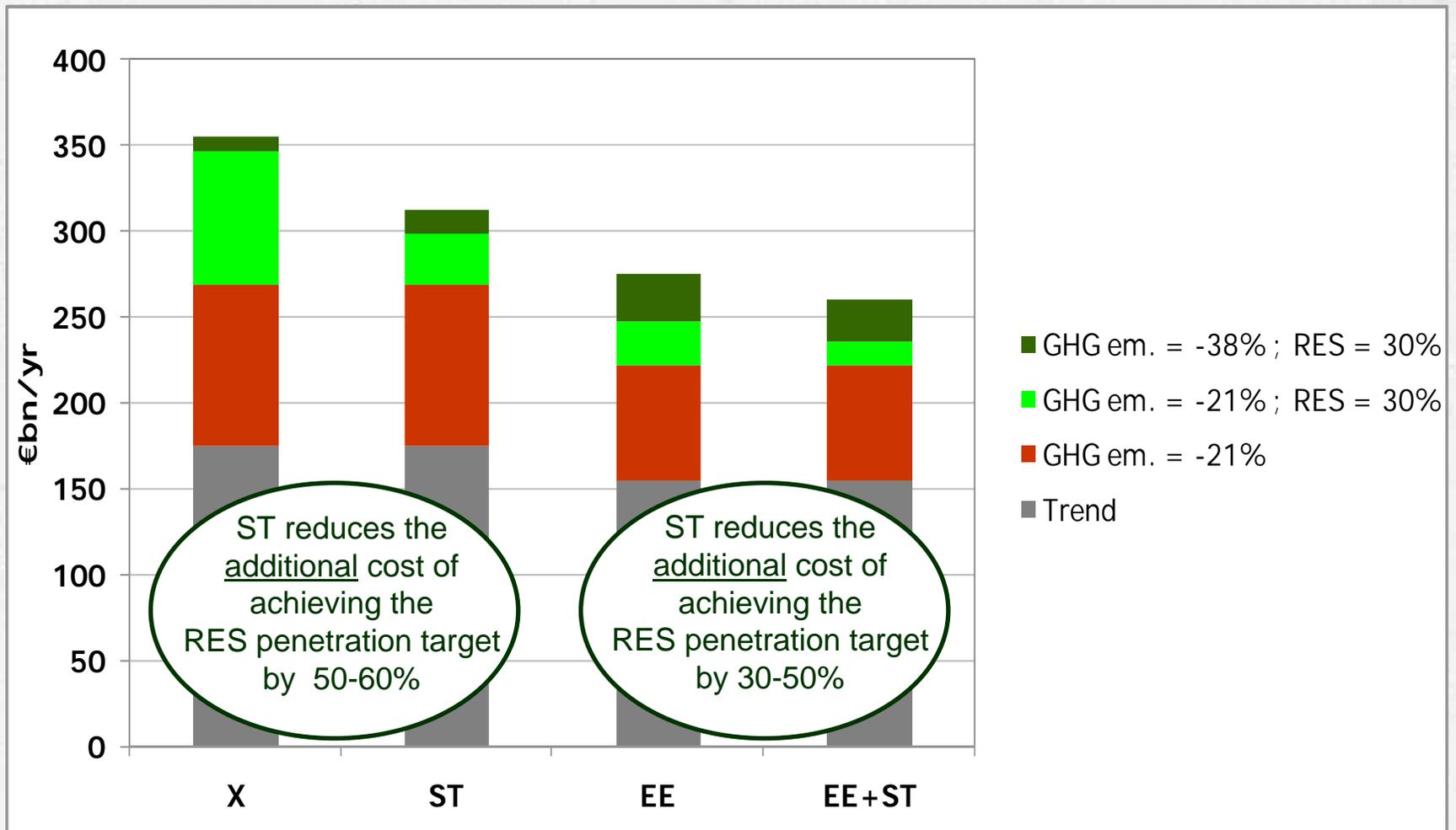
CO2
Emissions
Target ✓

-20% w.r.t. 2005
(without ST)

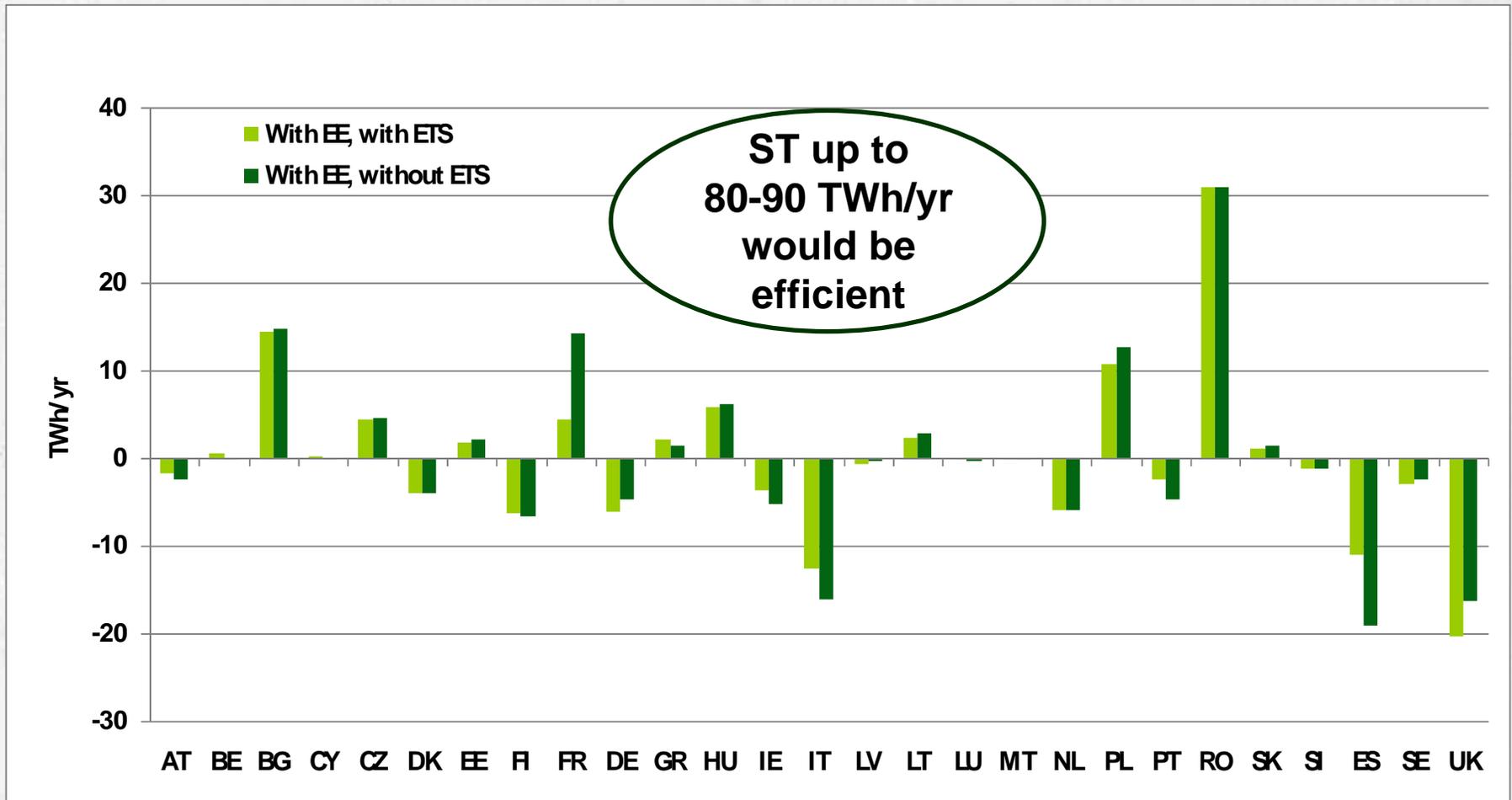
-21% w.r.t. 2005
(with ST)

Scenarios 7 and 8

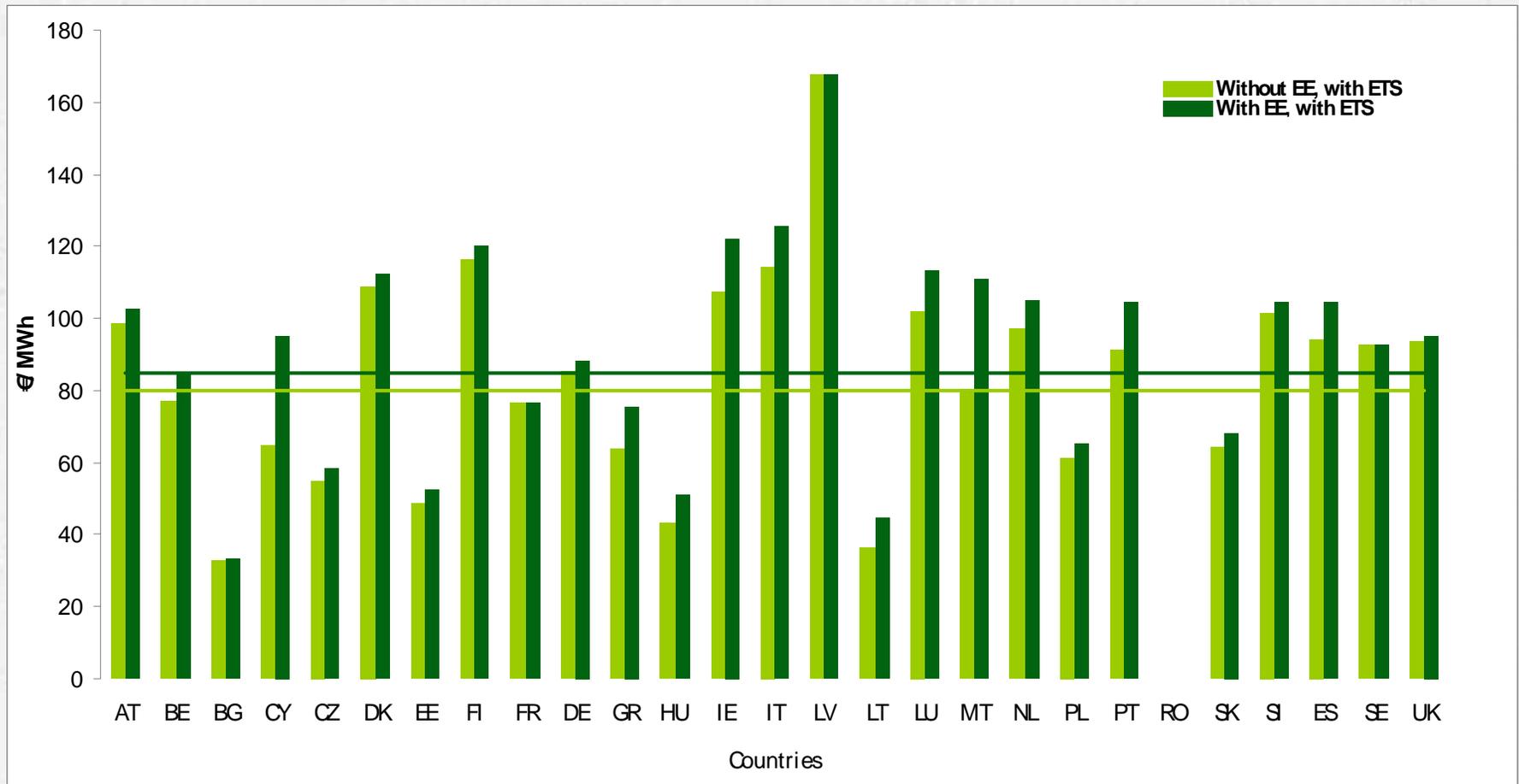
Costs of Target Compliance

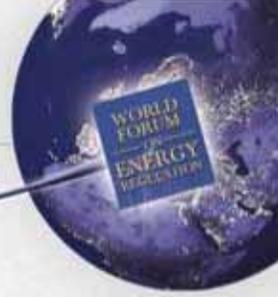


Statistical Transfers

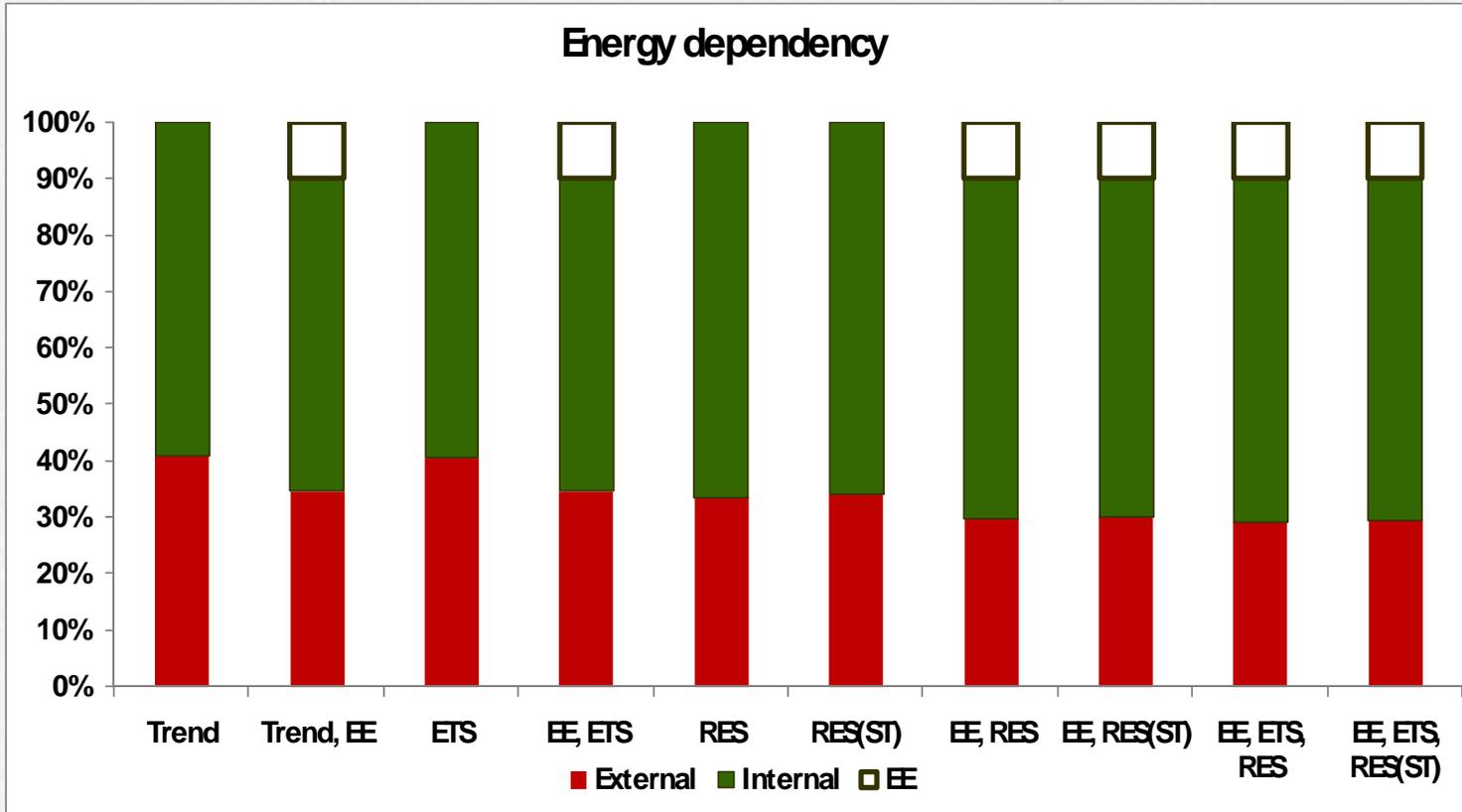


The Renewable Value of RES-E





The Implications for Supply Security



The achievement of RES Penetration and GHG Emission Limitation Targets reduces External Energy Dependency of the Power Sector by 4-7%

Conclusions (1)



- The analysis only considers the Power Sector
- ETS by itself, even with high CO₂ prices (45-60 €/tCO₂) produces a 4-6% increases in the RES-E penetration in the Power Sector, less than 1/3 of what is required to achieve the target
- The achievement of the 20% Energy Efficiency and RES Penetration Targets will deliver the GHG Emission Limitation target as well ...
... the future of the ETS depends on the performance of other trading sectors
- At a CO₂ price of 20€/tCO₂, if the RES-E penetration target is achieved, the Power Sector overachieves its GHG emission limitation target and therefore is a net supplier of Emission Allowances

Conclusions (2)



- A 10% reduction in Electricity Consumption (EE) will reduce the costs of achieving the RES-E and GHG emission limitation targets by 15-30%
- If the RES-E penetration target is achieved, the achievement of the GHG emission limitation target in the Power Sector implies a CO₂ price of:
 - 25-33 €/tCO₂ without EE
 - 4 €/tCO₂ with 10% EE
- ST up to 80-90 TWh/yr would be efficient
- RES-E Statistical Transfer can reduce the additional costs of achieving the RES penetration target by 30-60% ...
...but it will lead to the decoupling of RES costs and benefits
- The achievement of the RES-E Penetration and the GHG Emission Limitation Targets will reduce external energy dependency of the Power Sector by 4-7%

End of Presentation



**Thank You
for
Your
Attention**

