Scenarios for the Ten Year Network Development Plan 2012

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ENTSO-E EU 2020 scenario versus TSO vision scenario B

Key features	
Scenario EU 2020	**Scenario B**
Top down	Bottom up
Based on Long term vision of the future (3X20 targets)	Based on anticipated generation projects + short term vision (max. 7 years)
EU targets: National Renewable Energy Action Plans (RES capacity/energy and consumption) plus TSO assessment of conventional generation	Potential overestimation of generation capacity
Merit order: gas before coal	Merit order: coal before gas
No location information regarding new generation units	Location of new generation units are known

Assessing results - Calculated indicators

EU target	Calculated Indicator
Cutting energy consumption by 20% of projected 2020 levels - by improving energy efficiency	Impact of efficiency measures on electricity consumption [%]
Increasing use of renewables (wind, solar, biomass, etc) to 20% of total energy consumption	RES share in electricity consumption[%]
Cutting greenhouse gases by at least 20% of 1990 levels	Change in CO2 emissions from electricity generation [%] - sensitivity range

Impact of efficiency measures on electricity demand [%]

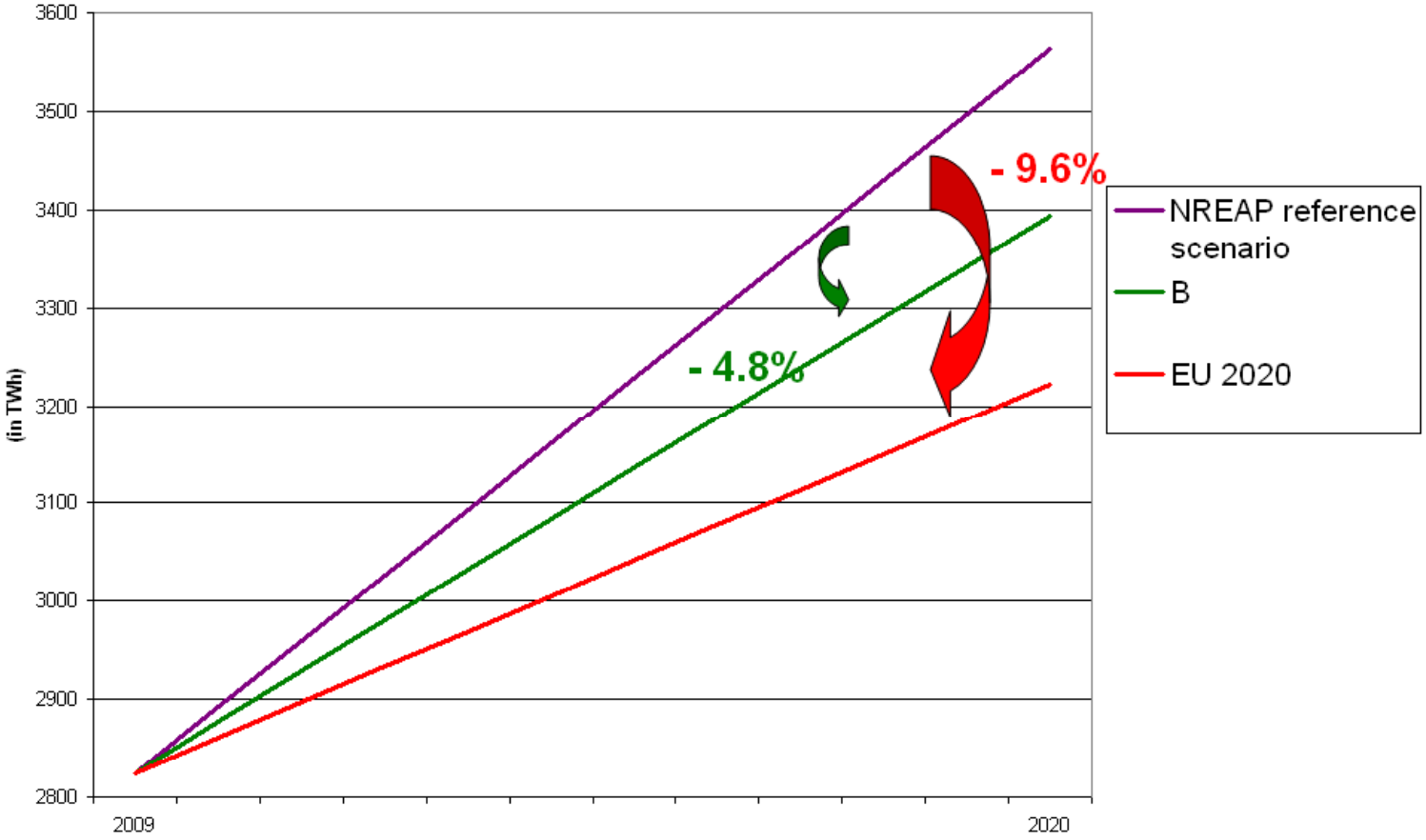
Improve efficiency by 20% of projected 2020 levels

Efficiency [%] = (cons. sc. EU 2020/B – cons. Reference sc. NREAP/BAU) / cons. reference scenario NREAP/BAU

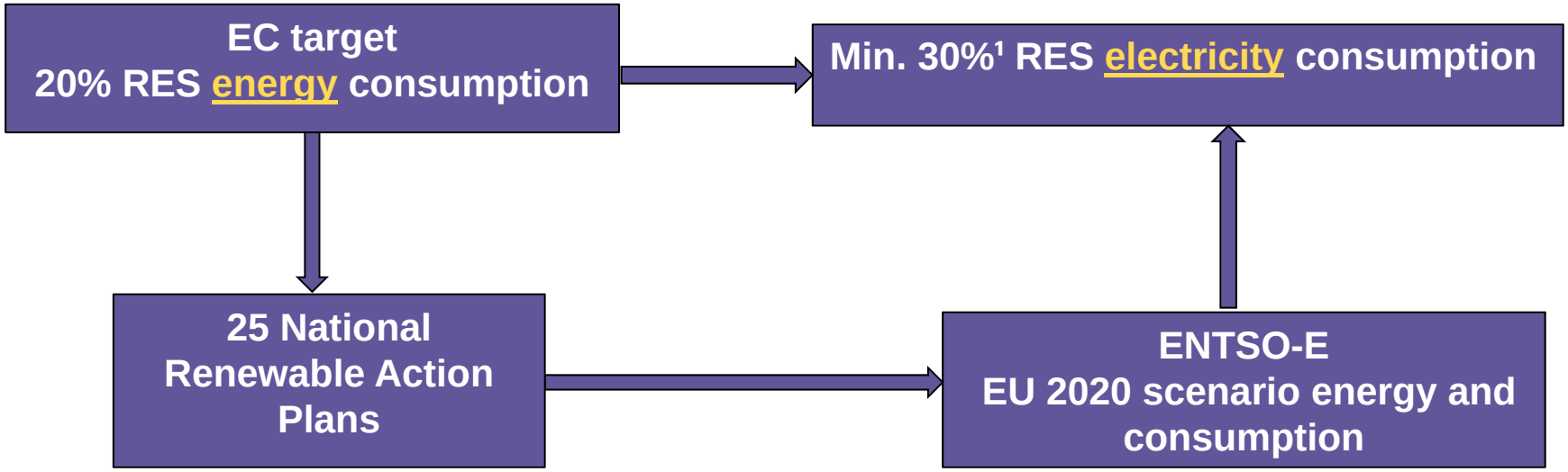
- **Rationalization of energy in traditional electricity use (Lighting/ Appliances)**

- **Number of lighting/appliances per household;**
- **Number of households;**
- **Growth in new uses of electricity (electric cars, heat pumps)**

Impact of efficiency measures on electricity demand [%] at EU level



RES share in electricity consumption



Source[1]: http://ec.europa.eu/energy/renewables/electricity/electricity_en.htm

RES share in electricity consumption at ENTSO-E/ EU level

	EU2020 scenario	scenario B 2020
ENTSO-E LEVEL		
Consumption data [GWh]	3543214	3718266
TOTAL renewable energy generation [GWh]	1350790	1217686
RES share in electricity consumption	38%	33%
EU 27 LEVEL (without Malta)		
Consumption data [GWh]	3221277	3394007
TOTAL renewable energy generation [GWh]	1159321	1026147
RES share in electricity consumption	36%	30%

CO2 emissions indicator

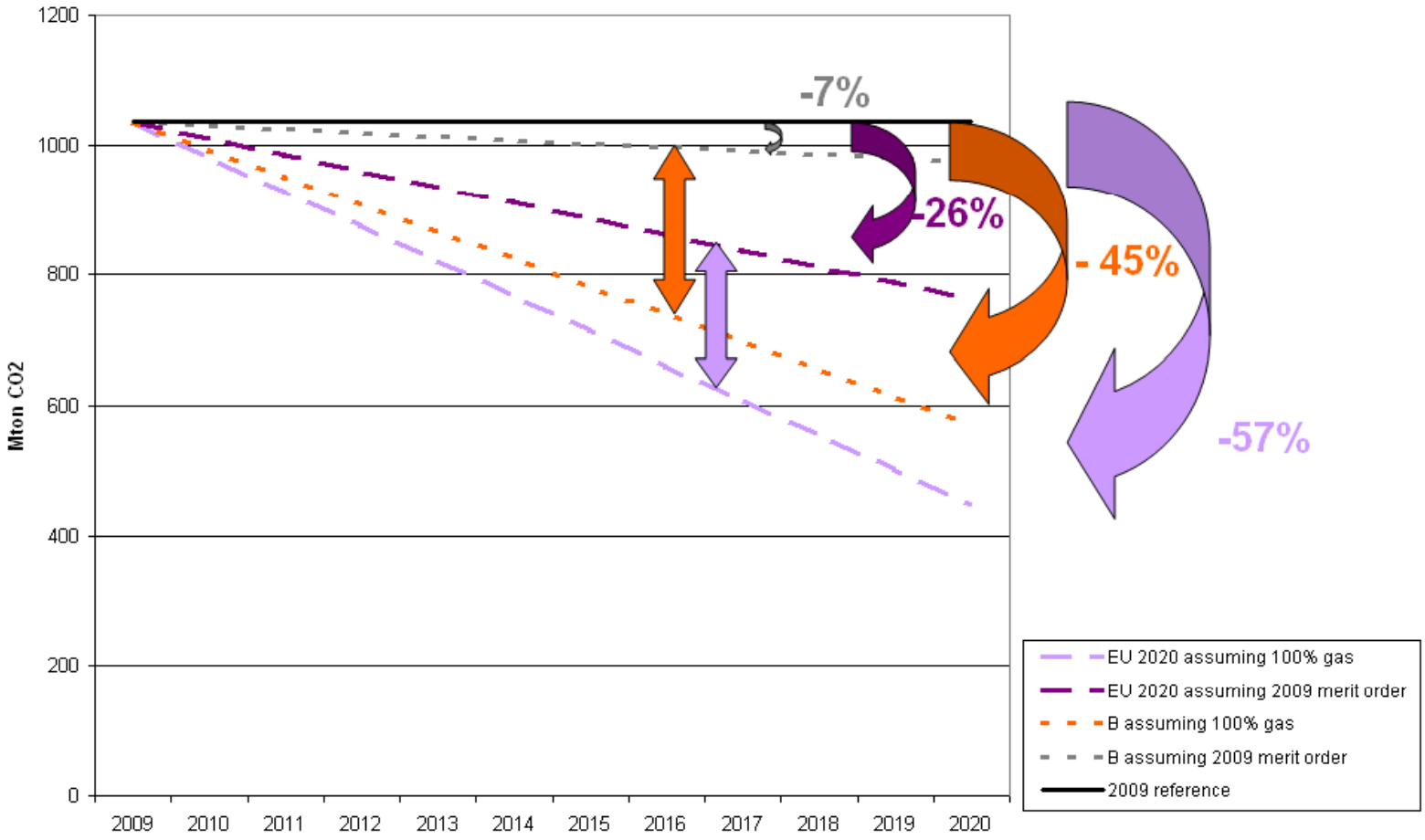
Reduce greenhouse gases by at least 20% of 1990 levels

$$CO2_{calculated}\ [\%] = \frac{(CO2\ sc.\ EU\ 2020/B - CO2\ 2009)}{CO2\ 2009}$$

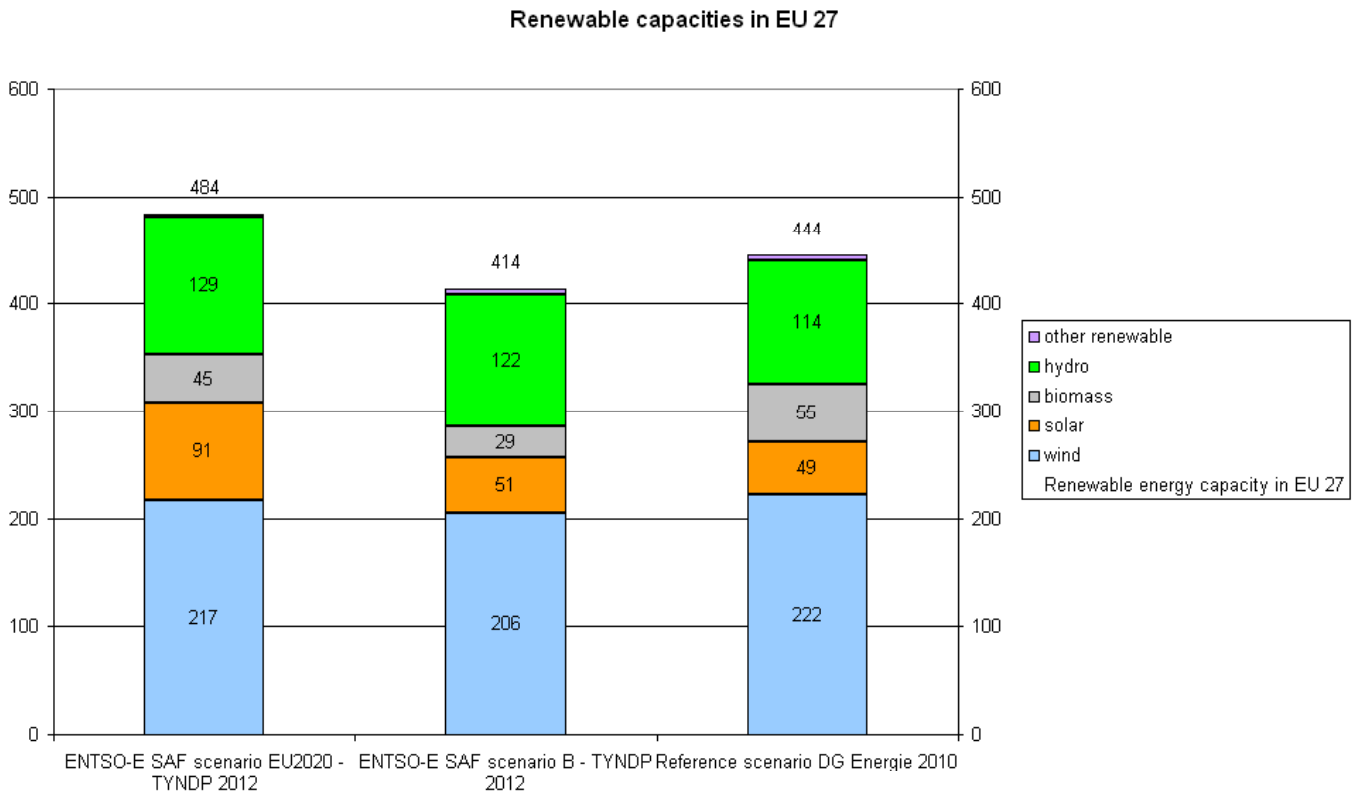
- An improvement in the thermal efficiency of electricity and heat production
- New lower carbon generation mix

- Increase in electricity production

CO2 emissions indicator at EU level



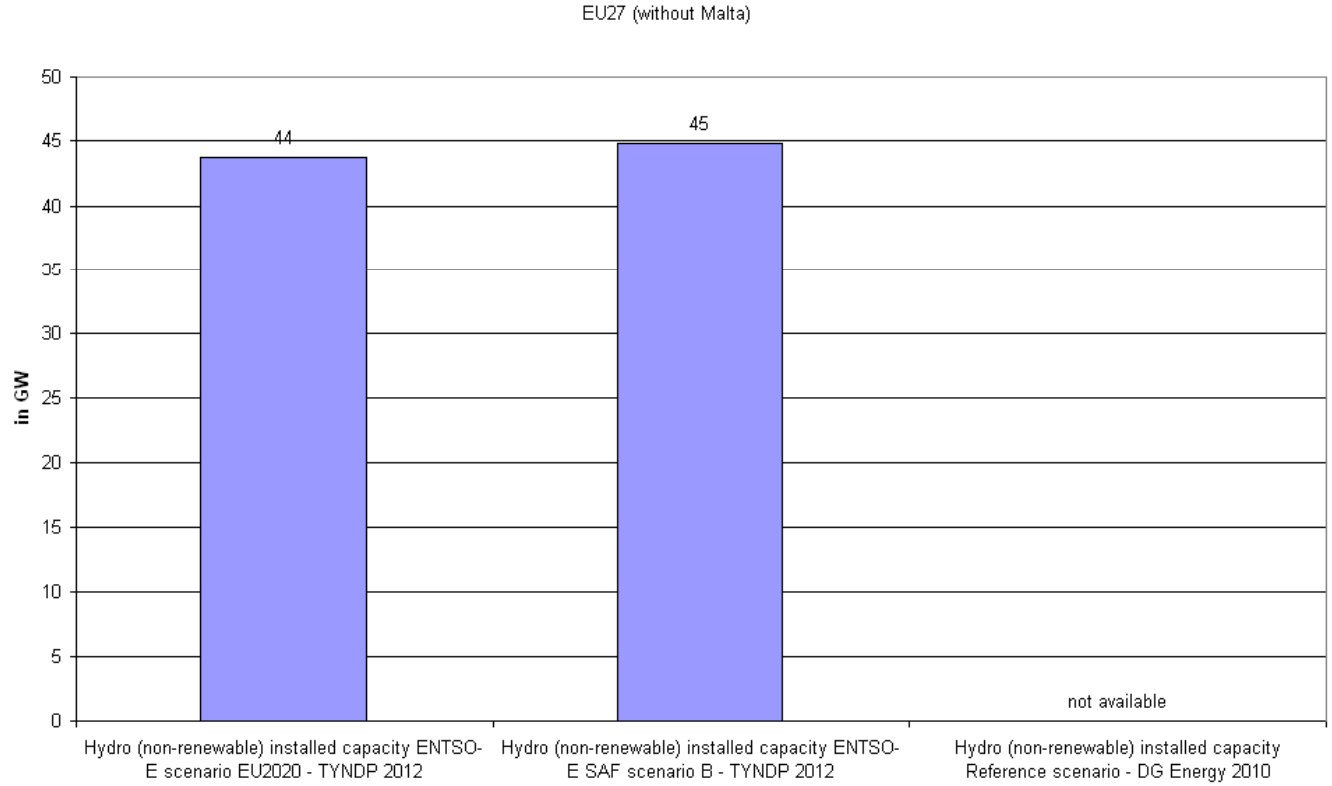
Comparison :scenario EU2020/B/ reference scenario DG Energy



Comparison :scenario EU2020/scenario B/ reference scenario DG Energy

Pure pump storage

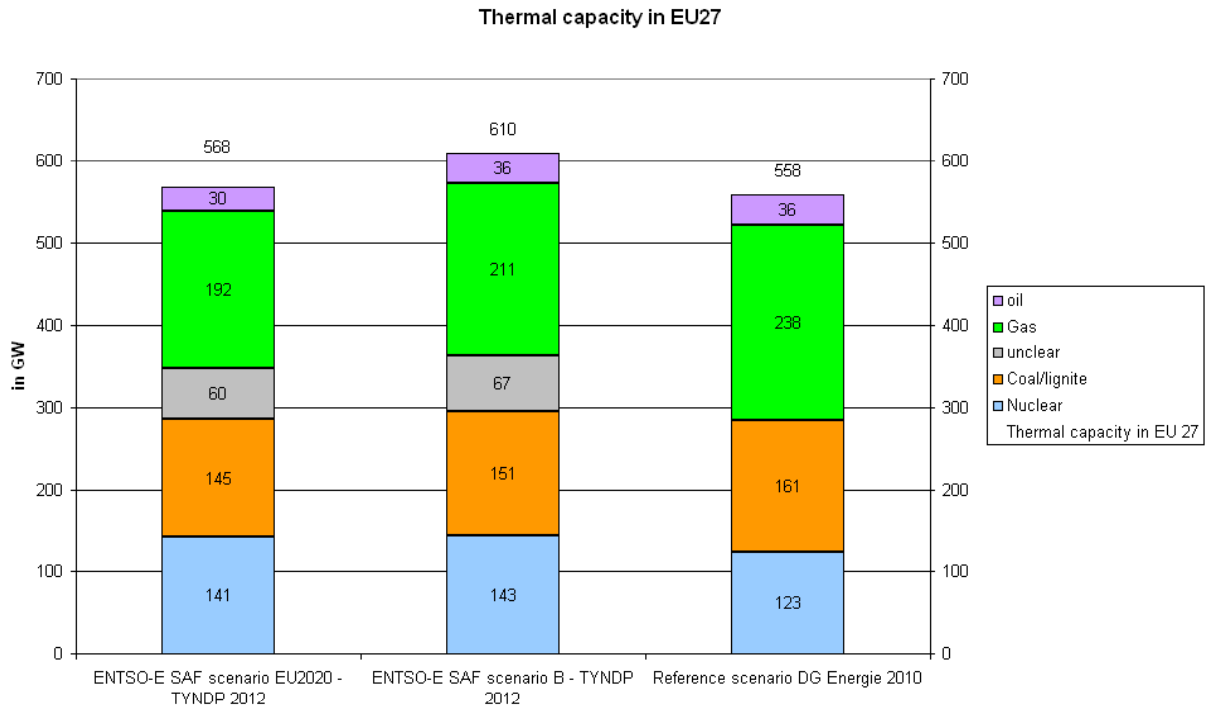
- Detailed information on pure pumped storage is crucial for the assessment of future grid development for the accommodation of wind installed capacities and other intermittent power sources.



Comparison :scenario EU2020/ B/ reference scenario DG Energy

Nuclear & Fossil fuel & non clear capacity

- The reason for the lower Nuclear & Fossil fuel & unclear capacity in publicly available top down studies may be that they are based on an energy model that does not necessary foresee enough back up capacity for the intermittent generation.



Initial conclusions on scenario EU 2020

- 10% reduction in electricity consumption due to efficiency policies
- RES electricity consumption EU level 30-36%
- CO2 reduction 27% - 57% compared to 2009 level

ENTSO-E top down scenario meets the 2020 targets

- Different generation mixes meet EU 3x20 targets but might end up with different grid requirements.