

# RELIANCE ON RENEWABLES: CLASH BETWEEN EXPECTATION AND REALITY ?

**Jorge Vasconcelos**

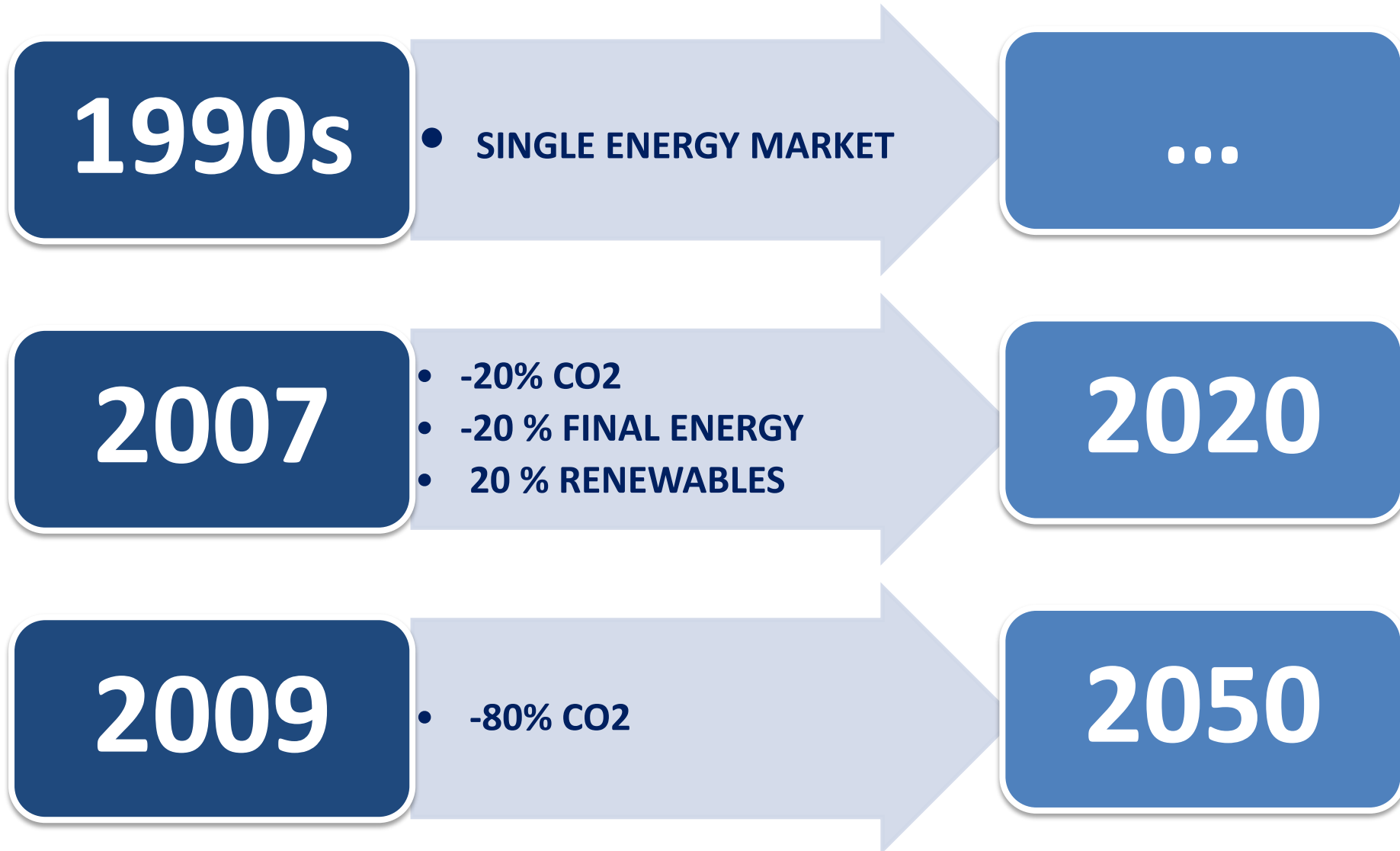
**NEWES, New Energy Solutions**

**HARVARD ELECTRICITY POLICY GROUP**

**SEVENTY-THIRD PLENARY SESSION**

**Arizona, December 13, 2013**

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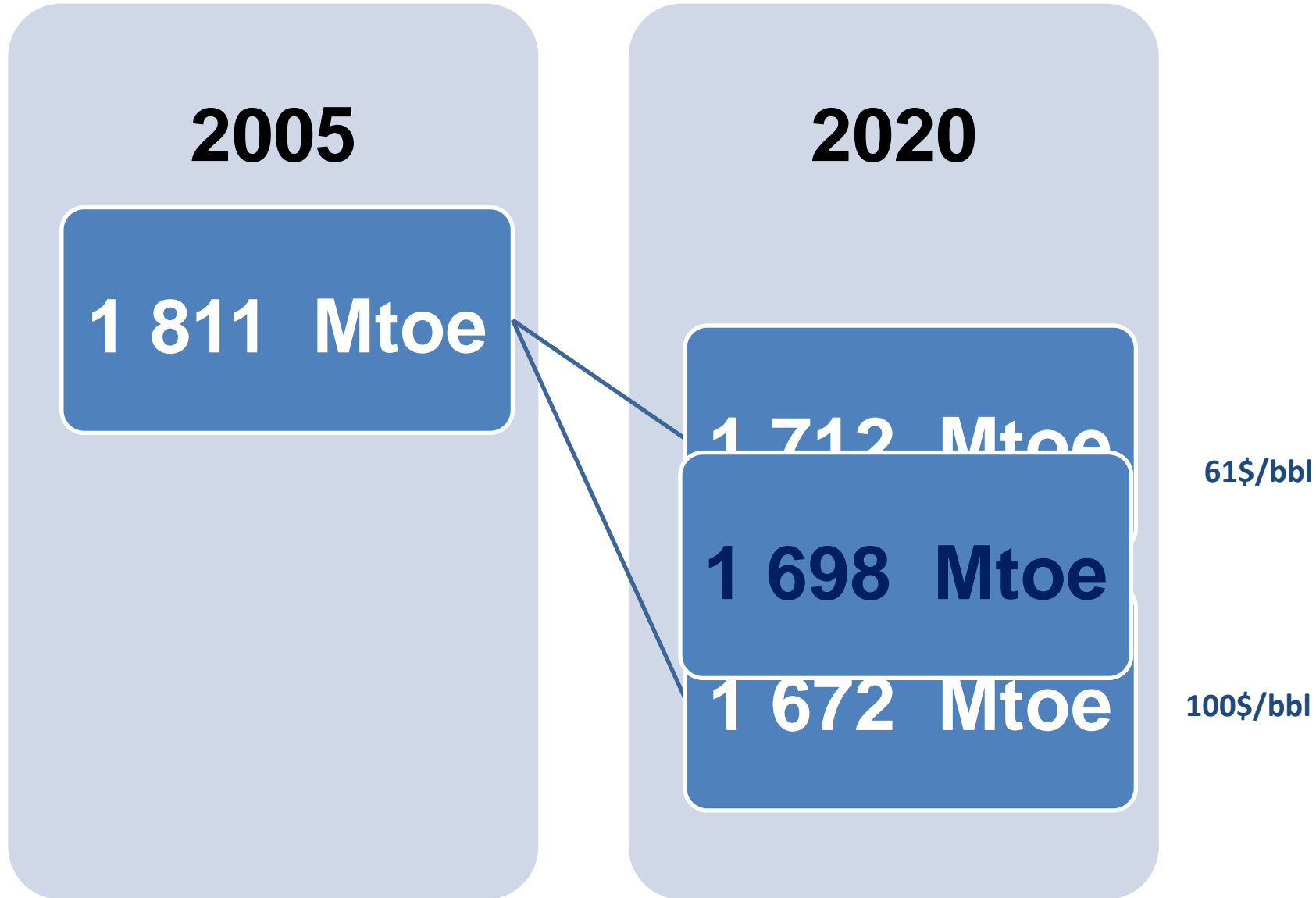
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**SINCE THE 1st  
OF JULY 2007  
ALL  
ELECTRICITY  
AND GAS  
CONSUMERS  
ARE FREE TO  
CHOOSE  
SUPPLIER  
FROM ANY  
MEMBER STATE**



SOURCE: [http://ec.europa.eu/clima/documentation/roadmap/docs/com\\_2011\\_112\\_en.pdf](http://ec.europa.eu/clima/documentation/roadmap/docs/com_2011_112_en.pdf)

## EU PRIMARY ENERGY CONSUMPTION



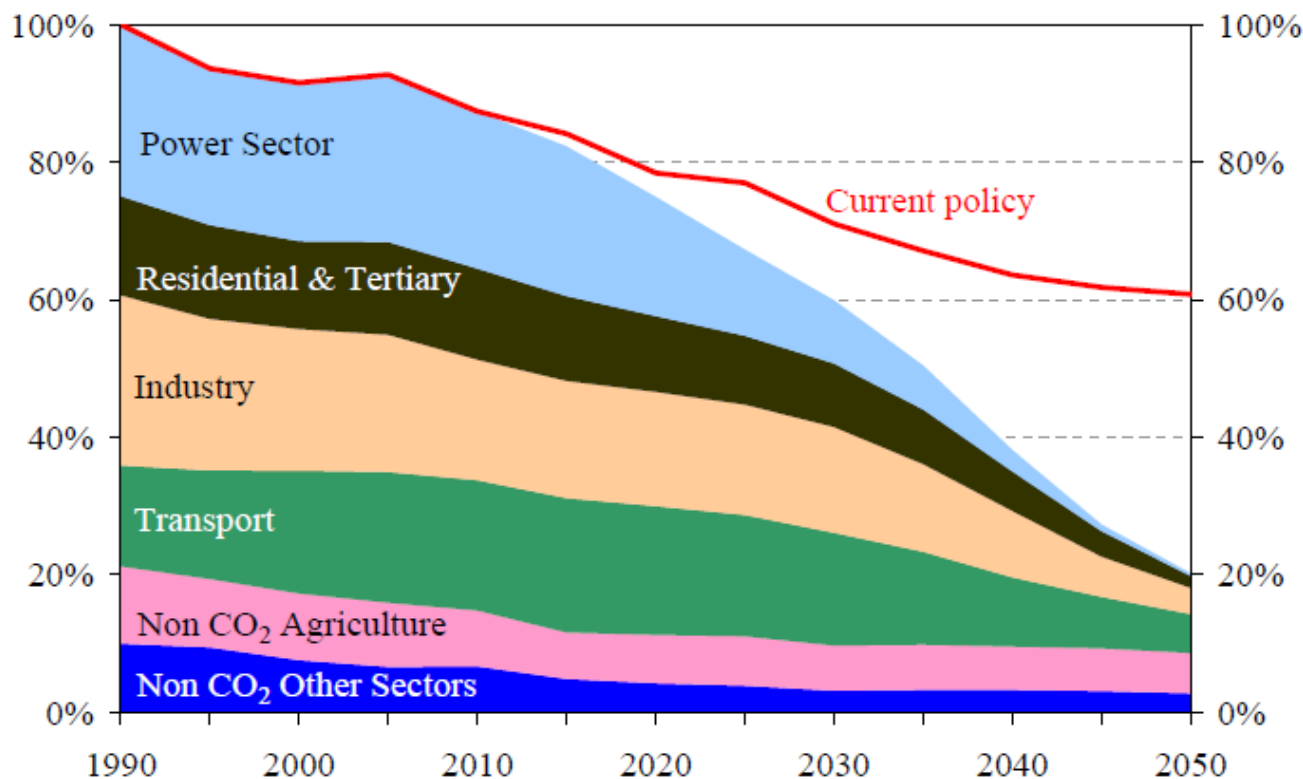
Commission staff working document accompanying the Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions Second Strategic Energy Review An EU energy security and solidarity action plan and future energy position Demand – resources - investments” COM(2008) 744  
http://ec.europa.eu/energy/strategies/2008/doc/2008\_11\_ser2/strategic\_energy\_review\_wd\_future\_position2.pdf

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*“ reducing greenhouse gas emissions by 80-95% by 2050 compared to 1990 as agreed in October 2009 will require a revolution in energy systems, which must start now ”*

European Council, February 2011

Figure 1: EU GHG emissions towards an 80% domestic reduction (100% =1990)



SOURCE: [http://ec.europa.eu/clima/documentation/roadmap/docs/com\\_2011\\_112\\_en.pdf](http://ec.europa.eu/clima/documentation/roadmap/docs/com_2011_112_en.pdf)



## MISSING BLADE RIDDLE

# UFO HITS WIND TURBINE

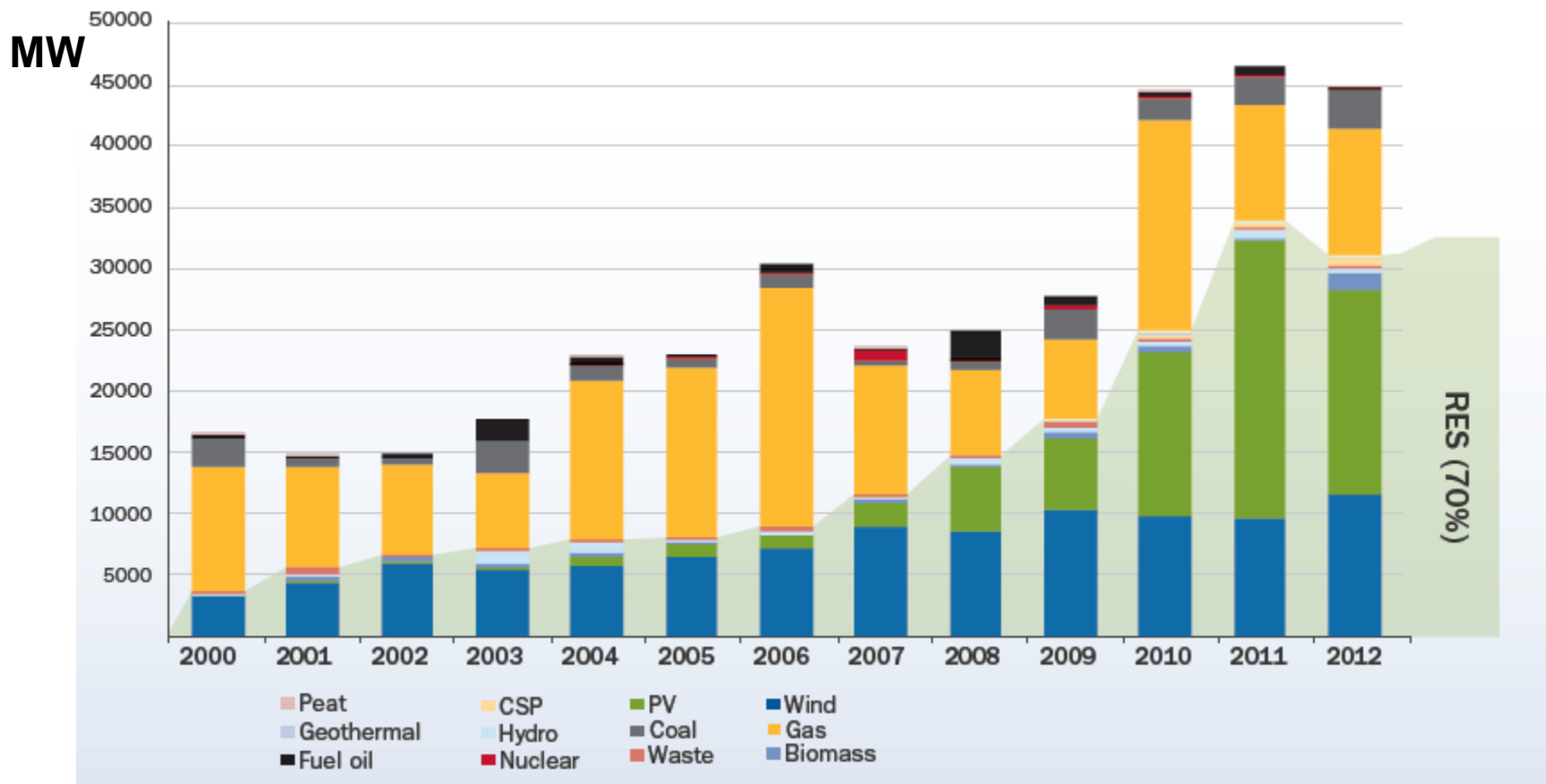
4am prang at 300ft

RENEWABLES ARE NOT  
A MYTH ANYMORE



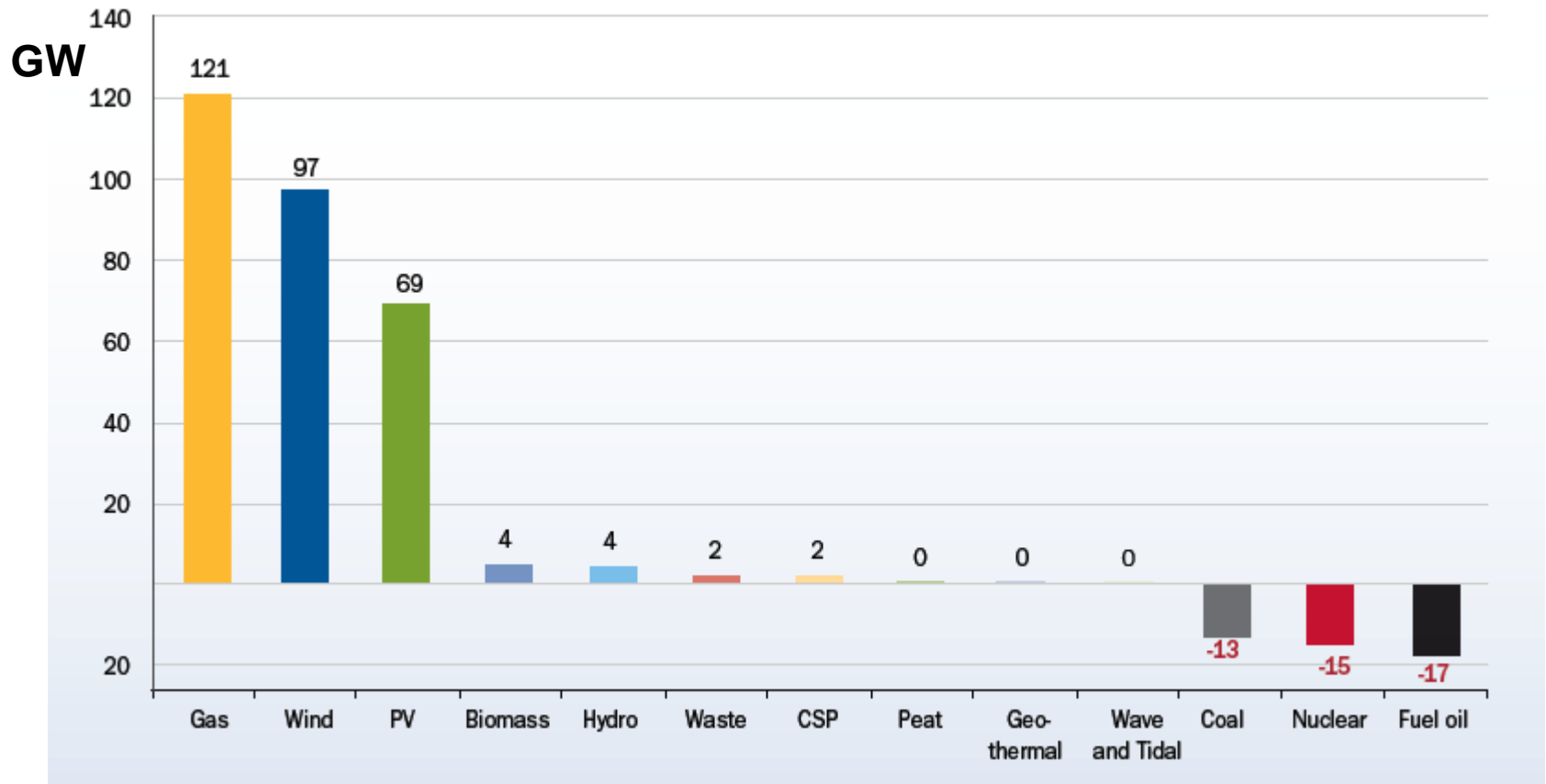
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## ELECTRICITY GENERATION CAPACITY ADDITIONS IN THE EU 2000 – 2012



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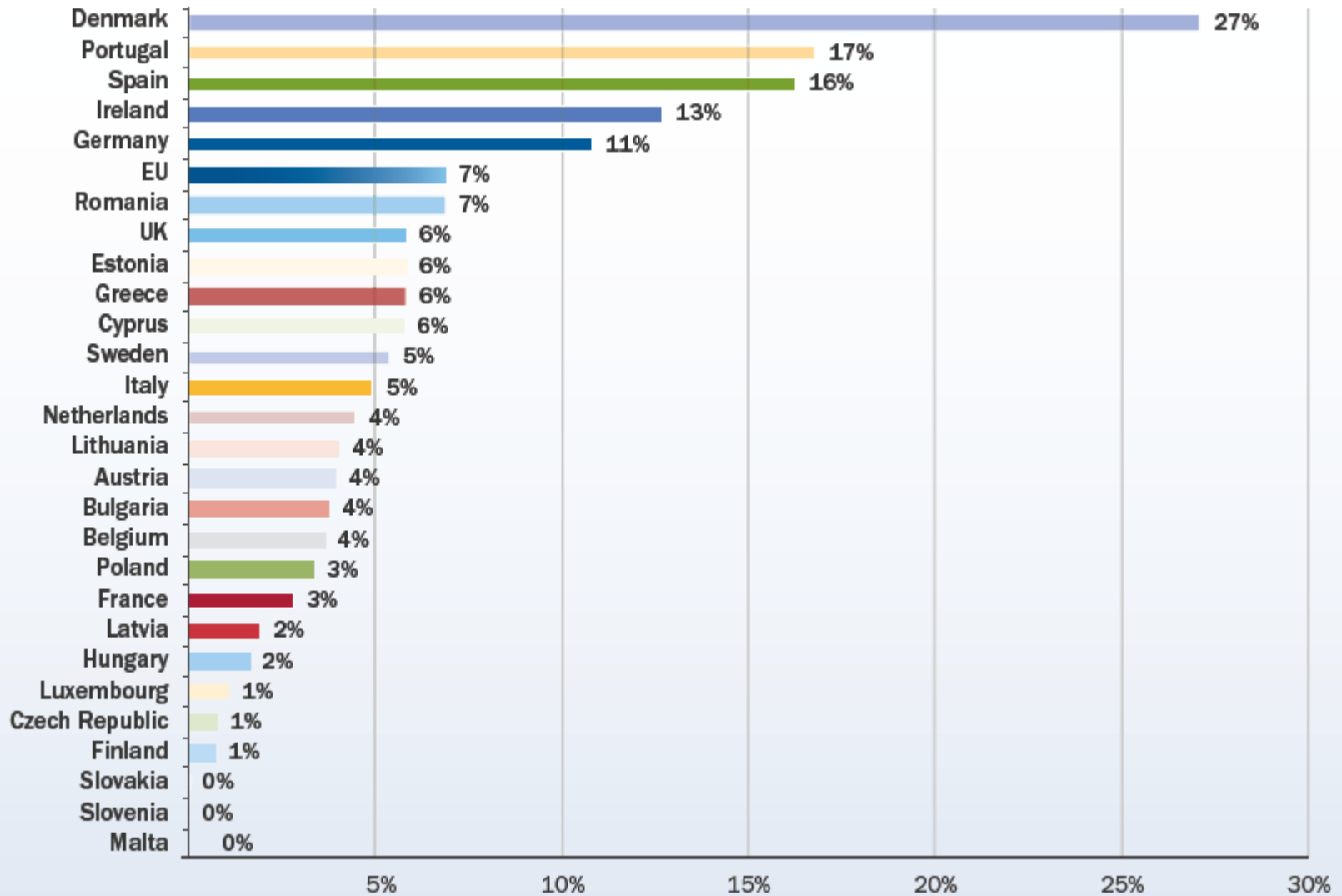
## NET CHANGES IN GENERATION CAPACITY IN THE EU 2000 – 2012



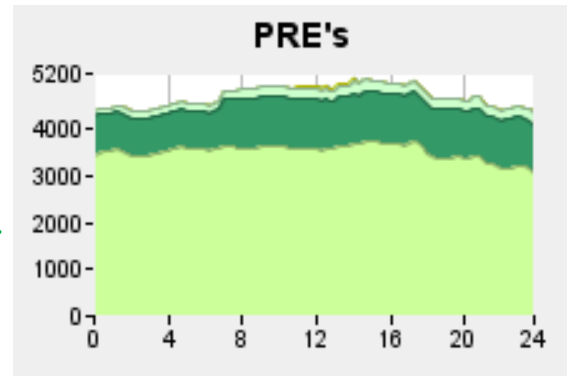
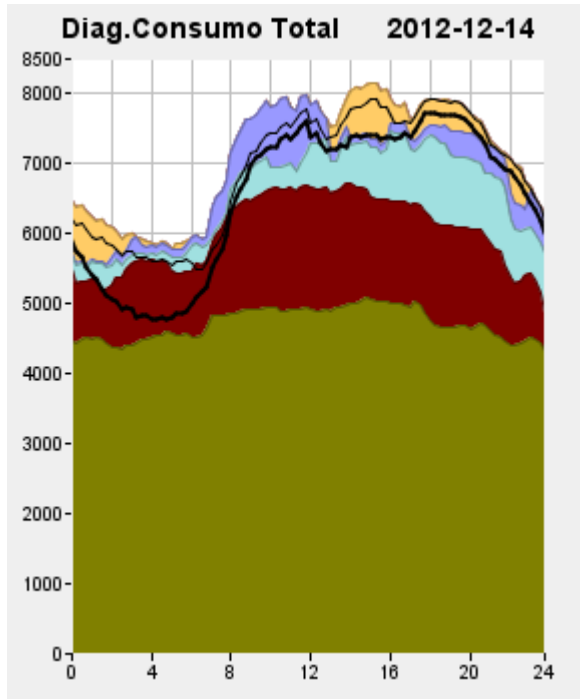
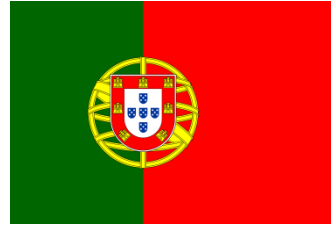


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## WIND SHARE OF TOTAL ELECTRICITY CONSUMPTION IN EU COUNTRIES 2012

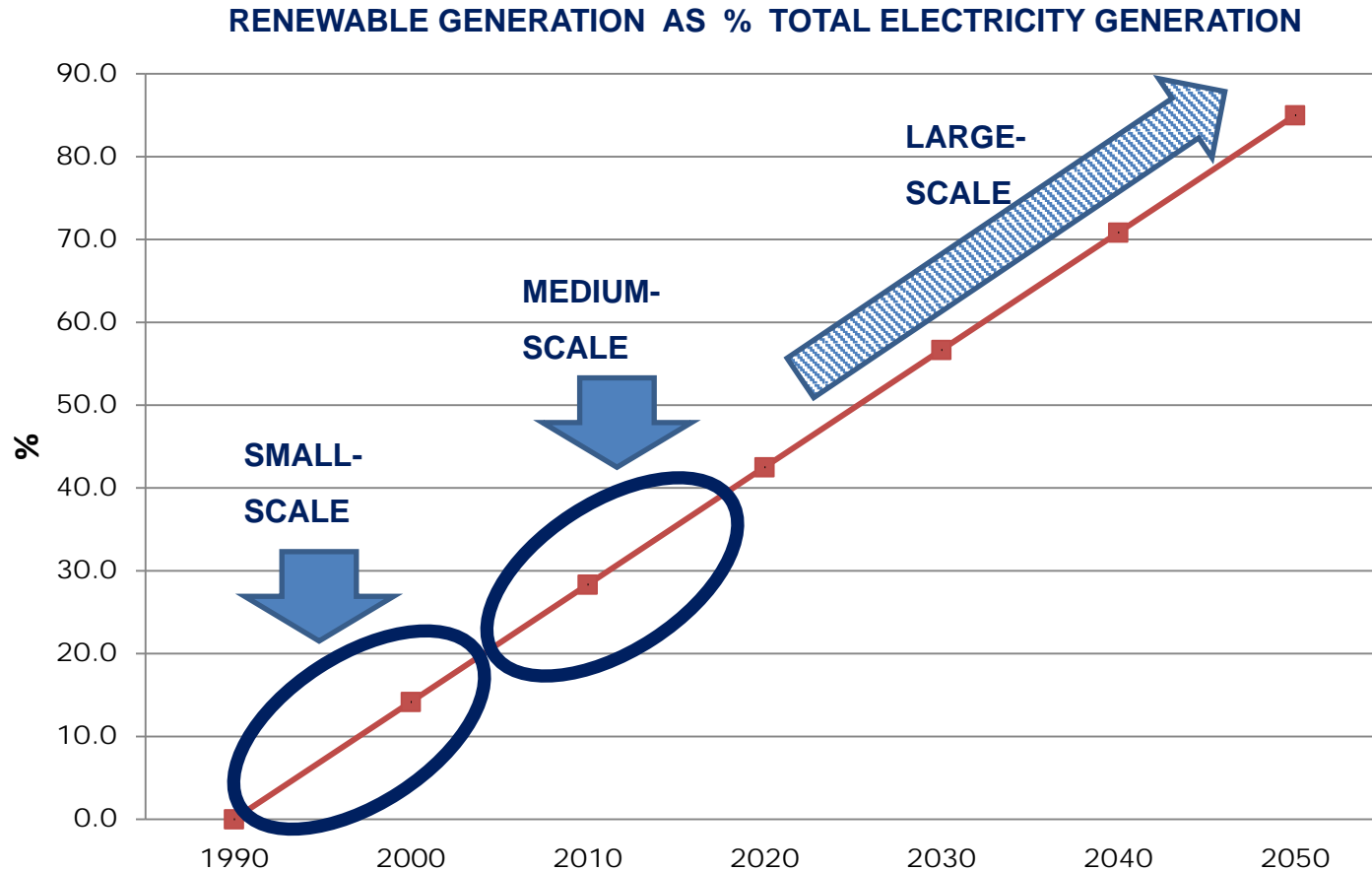


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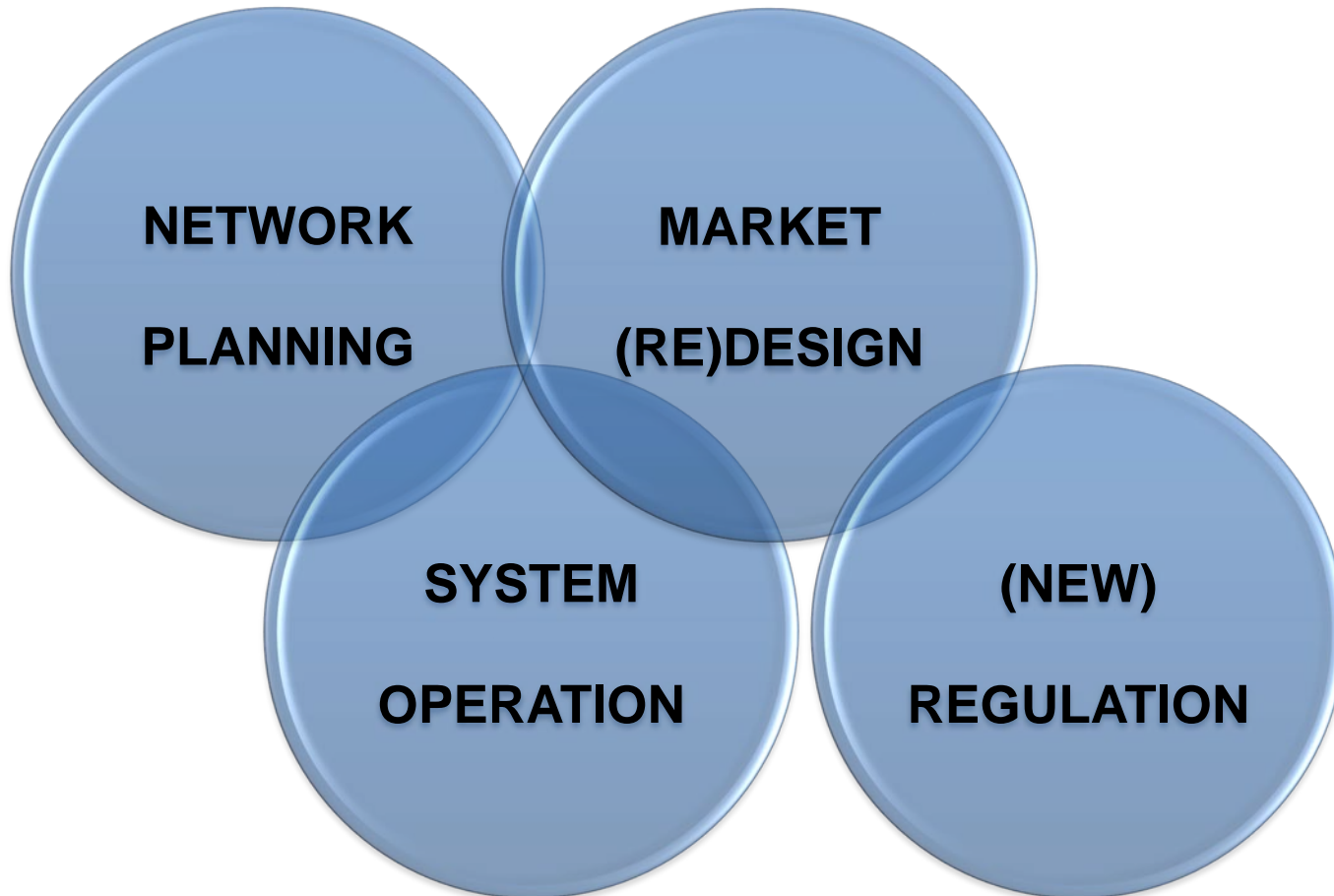


**54% DEMAND FROM WIND  
DURING 24 HOURS**

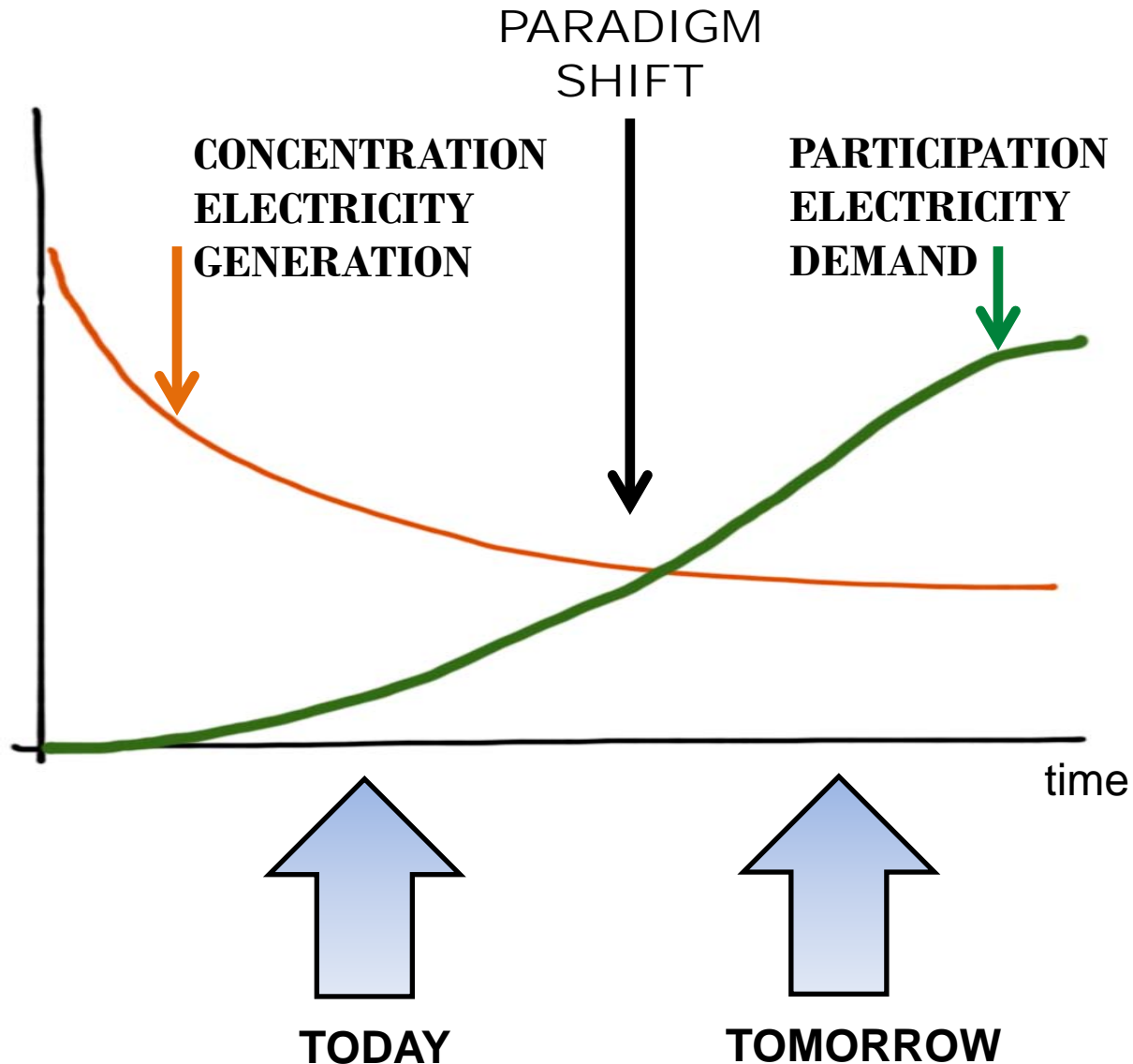
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## HOW TO DEAL WITH HIGH PENETRATION OF RENEWABLES



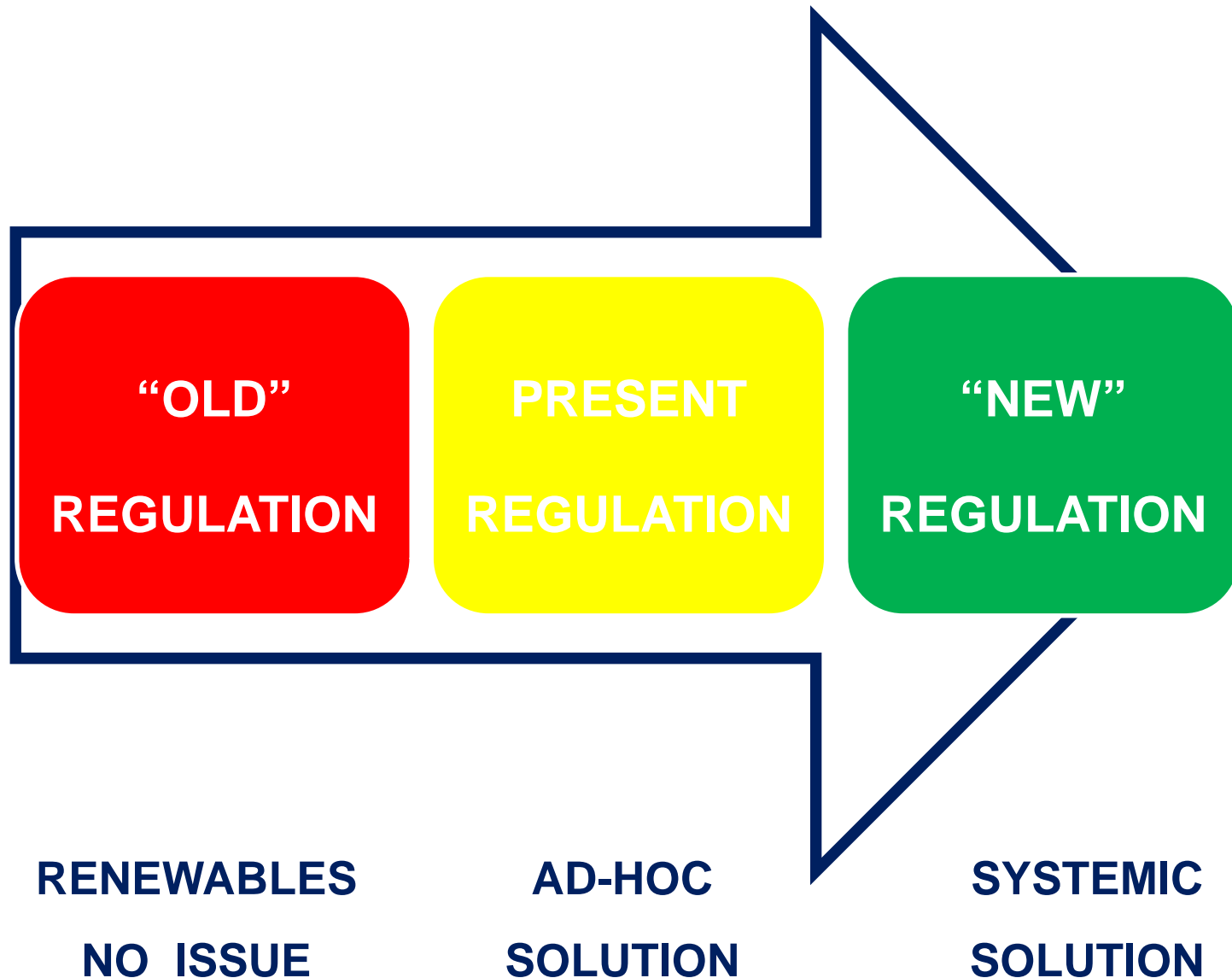
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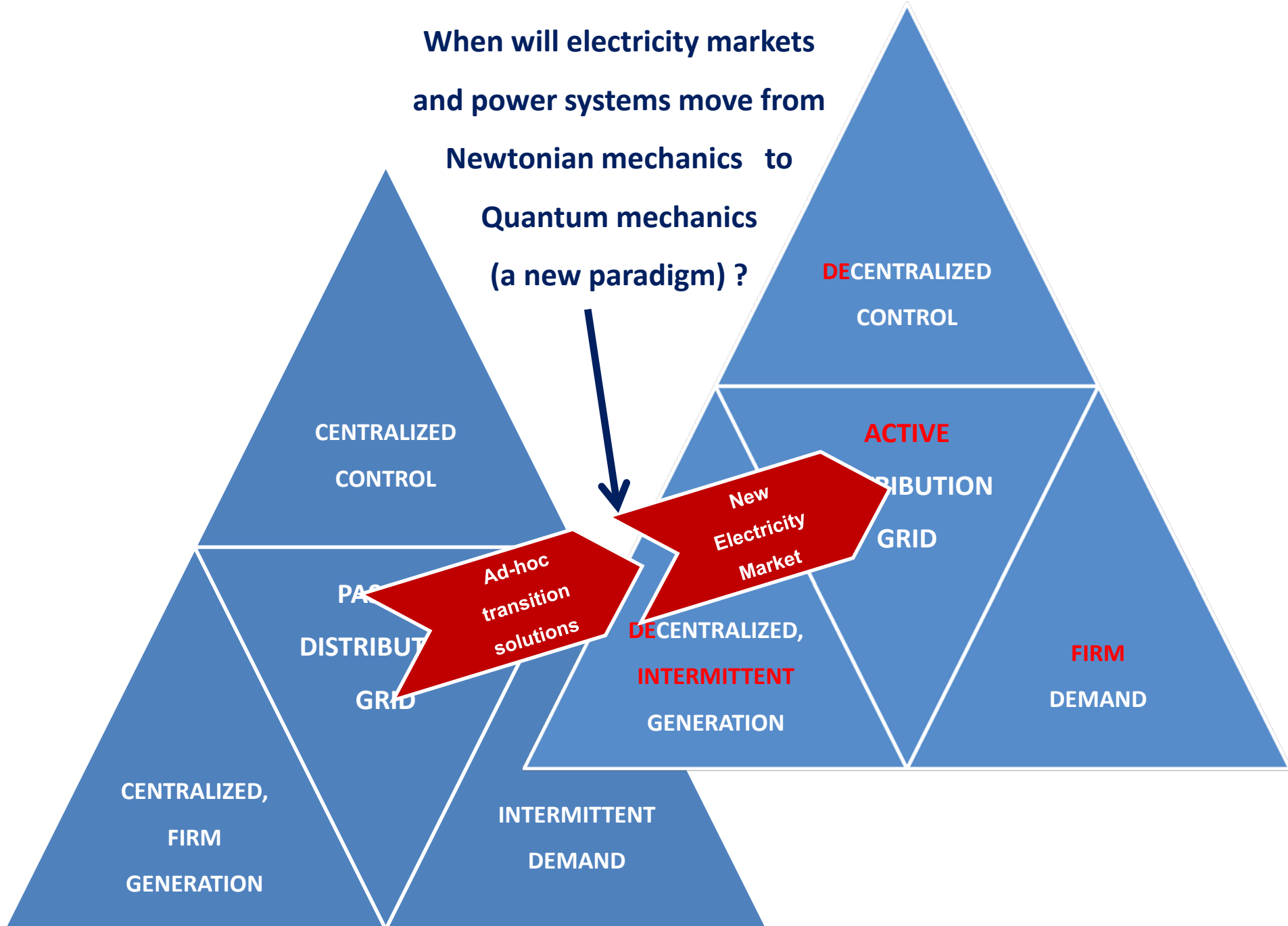
RENEWABLES IS ONE MORE ISSUE CHALLENGING PRESENT ELECTRICITY SYSTEMS, MARKETS AND REGULATION.

TODAY ELECTRICITY (SYSTEMS, MARKETS, REGULATION) FACE MANY CRITICAL CHALLENGES (WEATHER-DEPENDENT GENERATION, DEMAND PARTICIPATION, ELECTRIC VEHICLES, STORAGE, EFFICIENCY, ETC.); ADDRESSING THEM ONE-BY-ONE WILL NOT DELIVER AN APPROPRIATE SOLUTION.

## RENEWABLES IN (REGULATORY) CONTEXT



When will electricity markets  
and power systems move from  
Newtonian mechanics to  
Quantum mechanics  
(a new paradigm) ?





# It will be a very different market place



G. de Chirico