



TECHNISCHE  
UNIVERSITÄT  
WIEN



# 20 Years of electricity markets in Europe – lessons learned

Reinhard Haas

Energy Economics Group (EEG)  
Technische Universität Wien

1. Introduction
2. Historical milestones
3. First market experiences
4. How prices developed / Development of sub-markets and prices
5. Market coupling and market splitting
6. Does the MC-pricing principle work ?
7. The renewables directive
8. Conclusions

# 1. INTRODUCTION

## Motivation:

- Directive EU 1997: A common market for electricity (and natural gas)
- The European industry (and ...) should benefit from competitive prices
- Ultimate goal: ONE joint european electricity market
- Highly volatile electricity prices

**Liberalisation:** Customers may choose their supplier

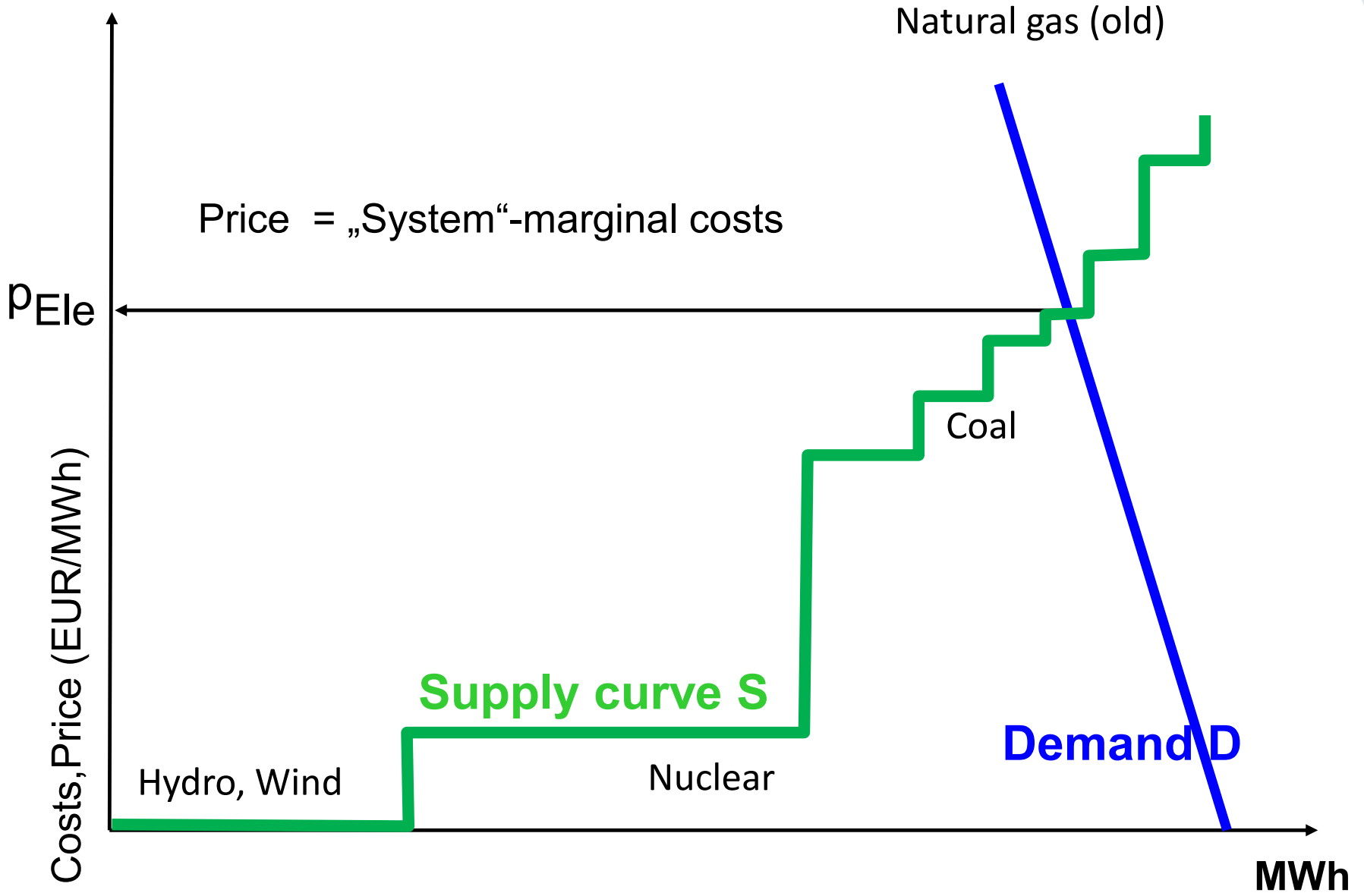
**Competition:** Many generators exist and compete in the wholesale market

**Deregulation:** The market determines the prices (on wholesale and on retail level)

# 2. HISTORICAL MILESTONES EUROPE

1971	Norway	Voluntary bilateral pool
1989/1990	UK	Liberalisation and privatization: Mandatory pool
1992	Norway	Foundation of Nord pool (voluntary spot market, futures market)
1996	Norway; Sweden	Sweden joins Nord pool (Voluntary spot market, futures market)
1996	EU-15	European Council of Energy Ministers and Parliament reached agreement on a market liberalisation directive
February 1997	EU-15	This " <i>Directive concerning common rules for the internal market in electricity</i> " (Directive 96/92/EC) became valid while waiting up to two more years for its transposition by countries
1998	Spain	Introduction of a Spanish centralised pool
1998	Poland	Introduction of TPA (market opening: 22%)
1998	Germany	100% market opening in one step
February 1999	EU-15	Directive went into force after a 2 years transposition delay: Market opening due the directive in Austria, Belgium, France, Italy, Spain, Portugal and The Netherlands between 30% and 35%
2001	Austria	100% market opening (in a second step)

# BASIC PRINCIPLE OF COMPETITION: PRICE = SYSTEM MARGINAL COSTS

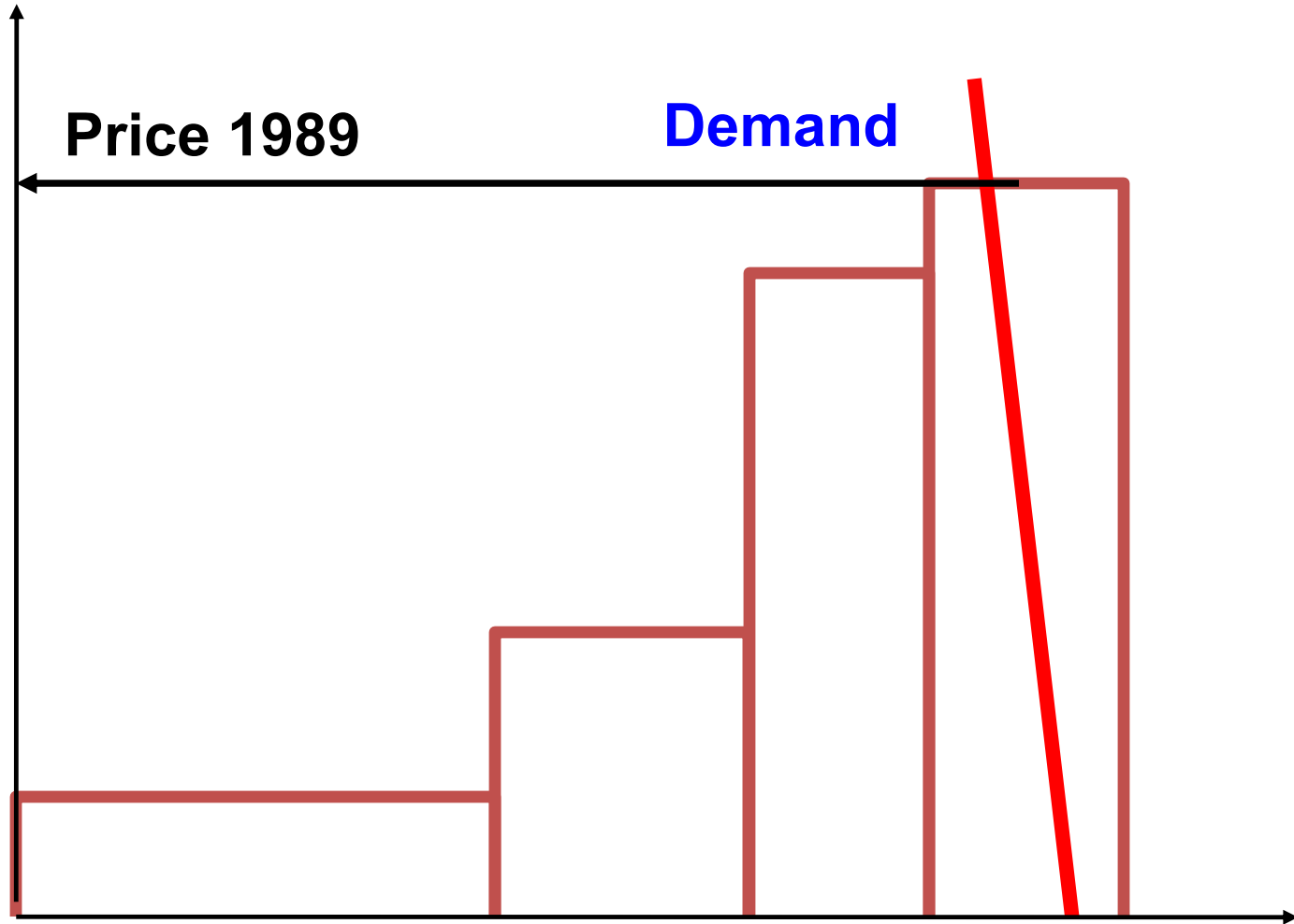


\* At the beginning of Liberalisation → high excess capacities of power plants and only „moderate“ interconnections

# 3. FIRST MARKET EXPERIENCES



Price/  
MWh

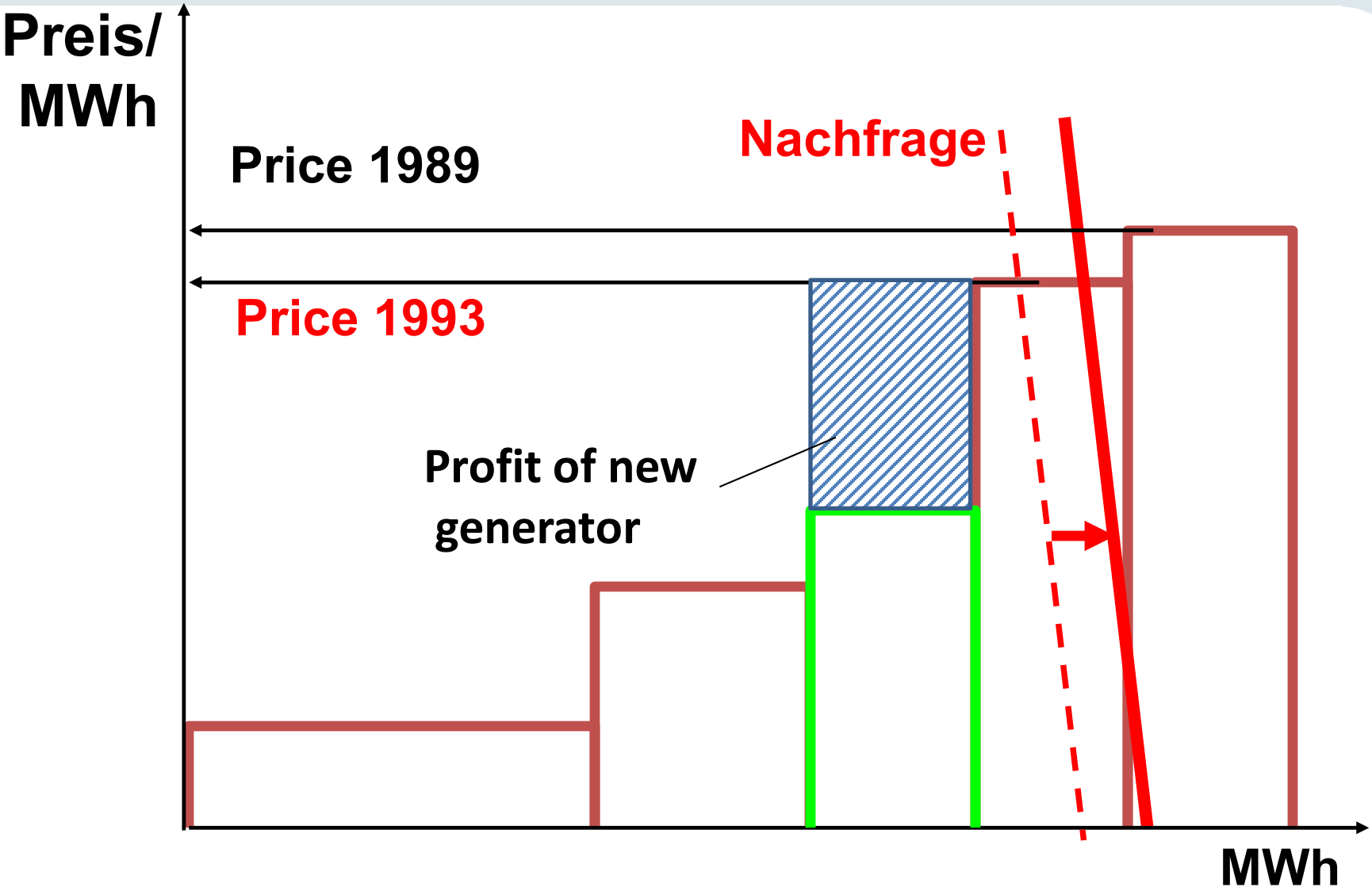


Price 1989

Demand

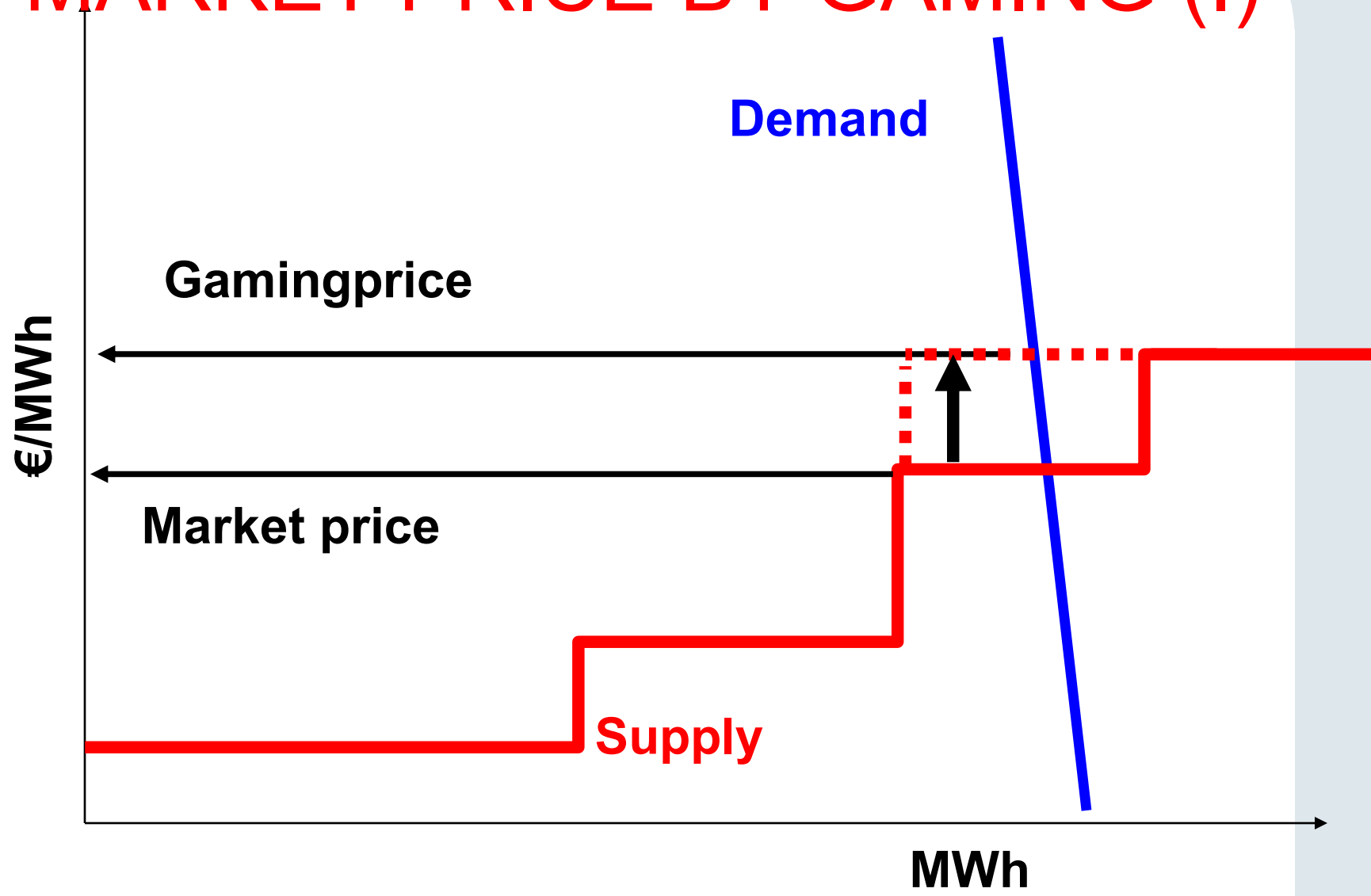
MWh

# ENGLAND 1993

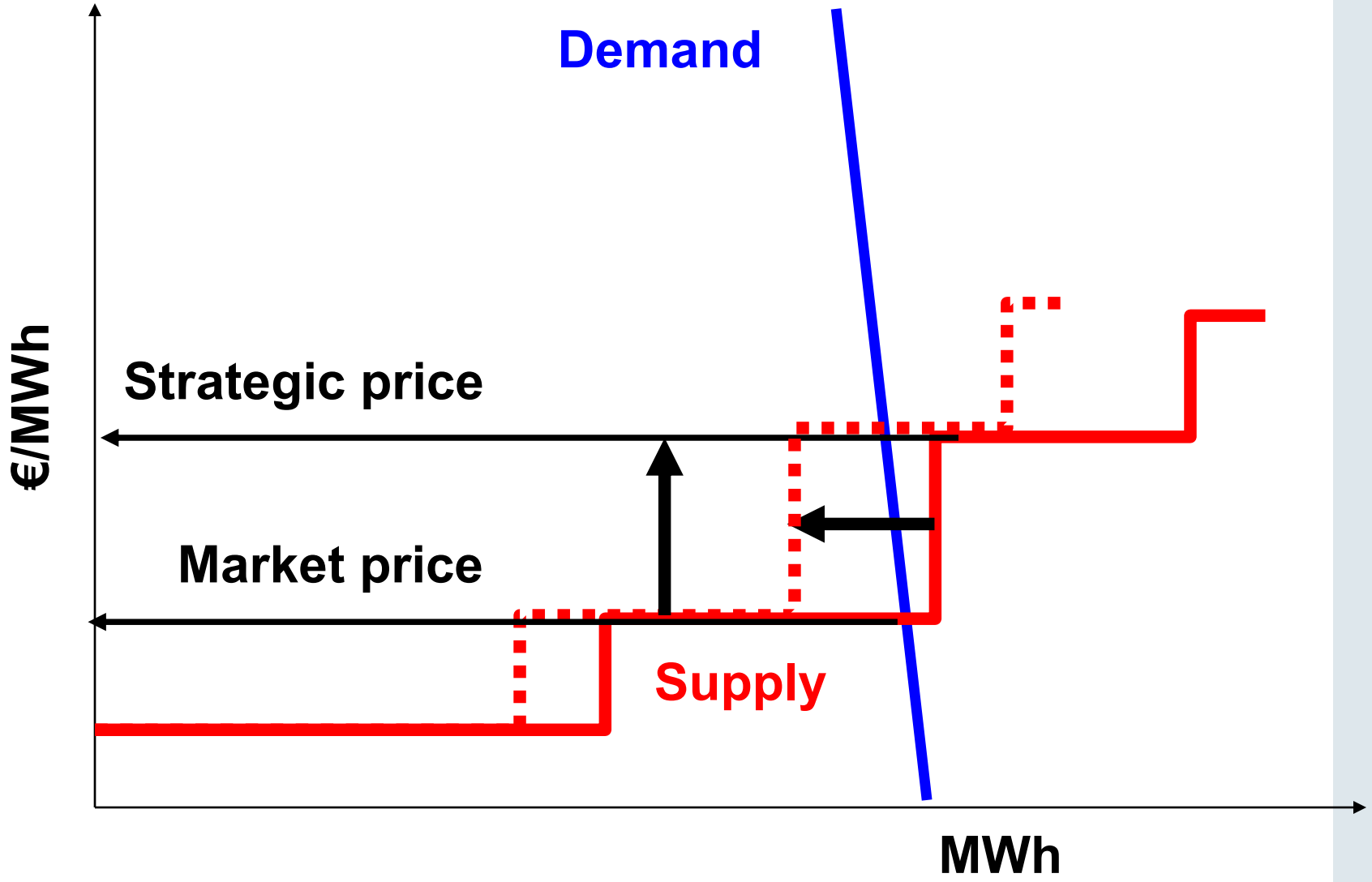


→ Market price high, new capacities cheap

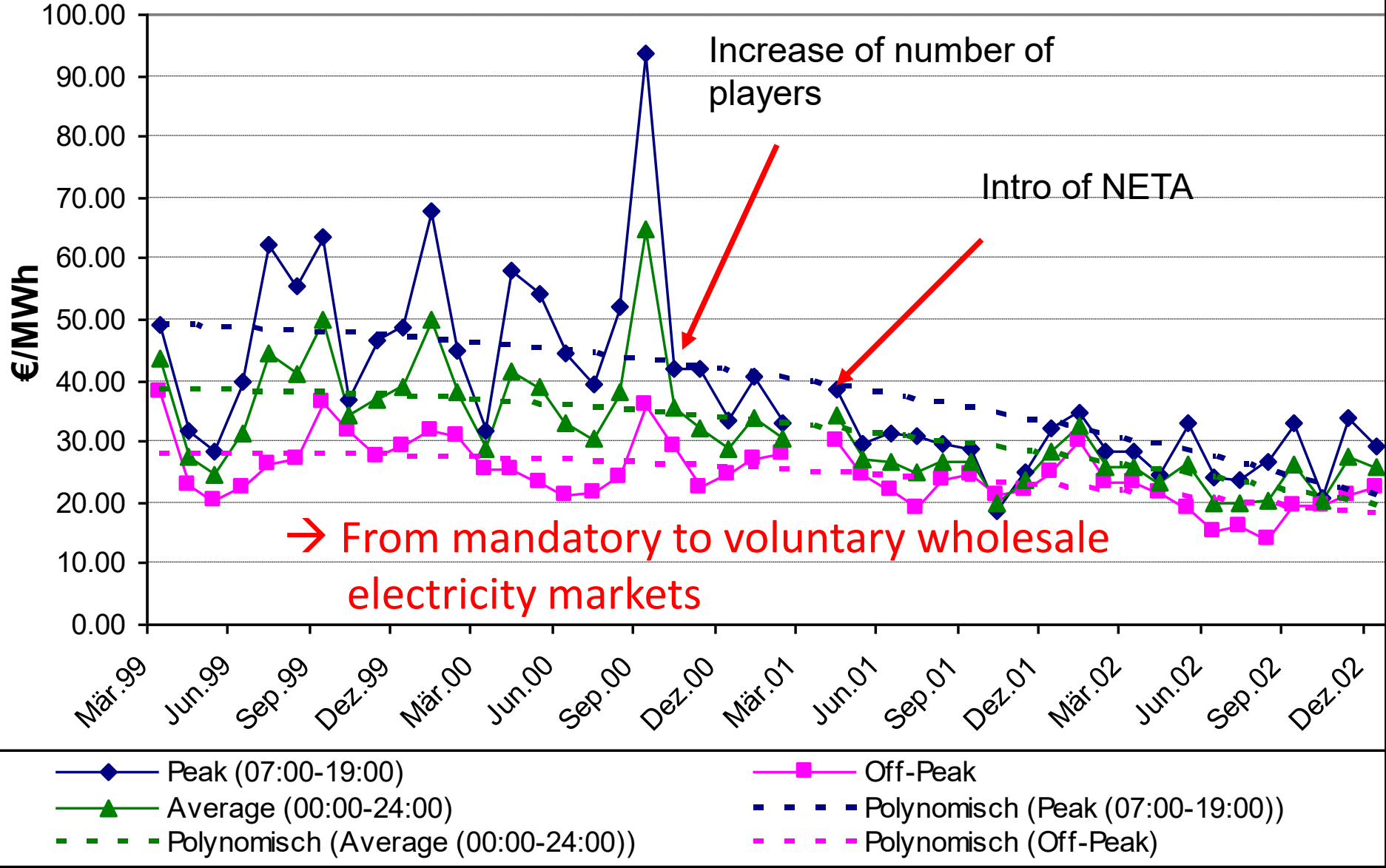
# INCREASED MARKET PRICE BY GAMING (I)



# INCREASED MARKET PRICE BY GAMING (II)



# England & Wales

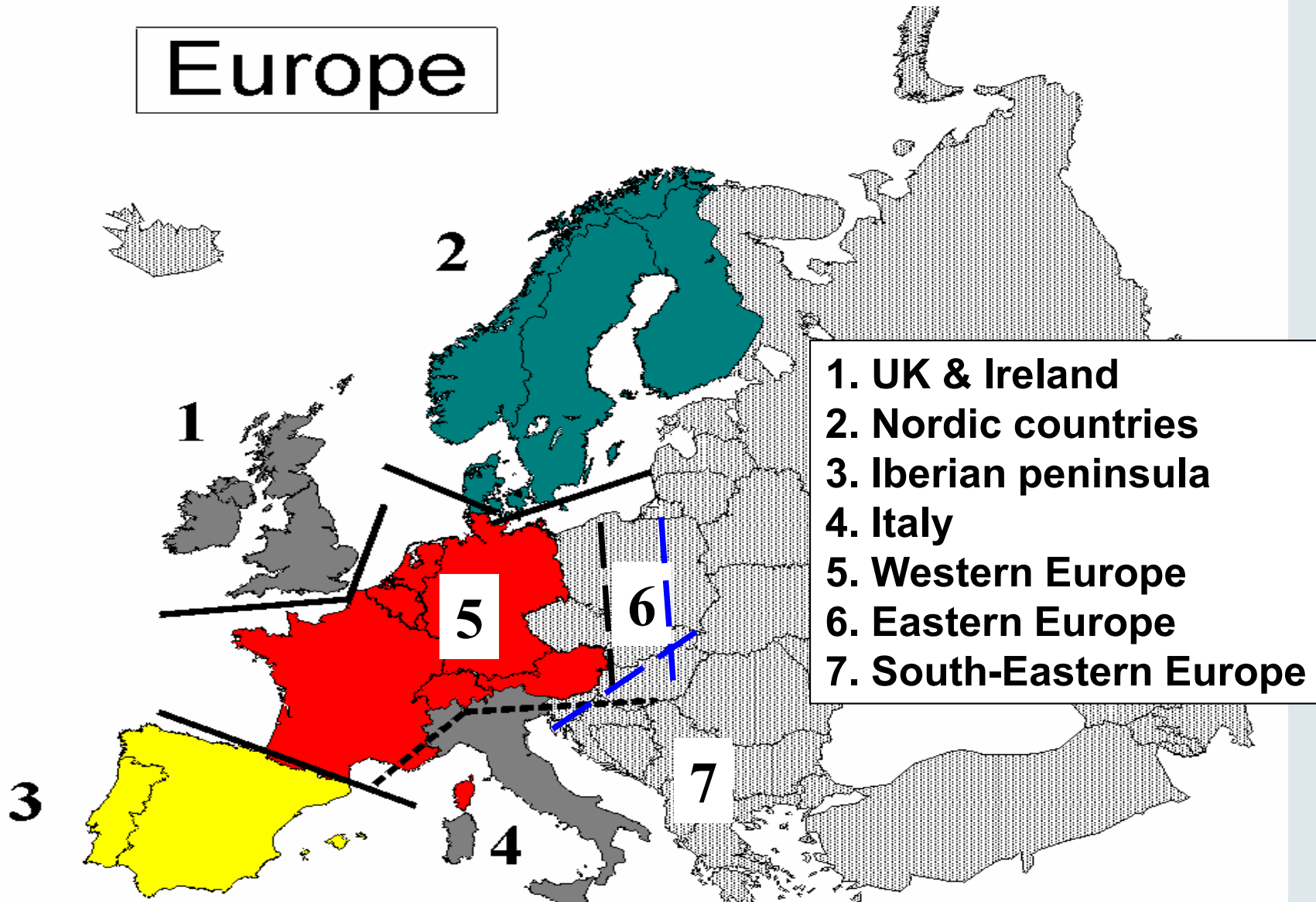


## **Newbery 1998, S. 745:**

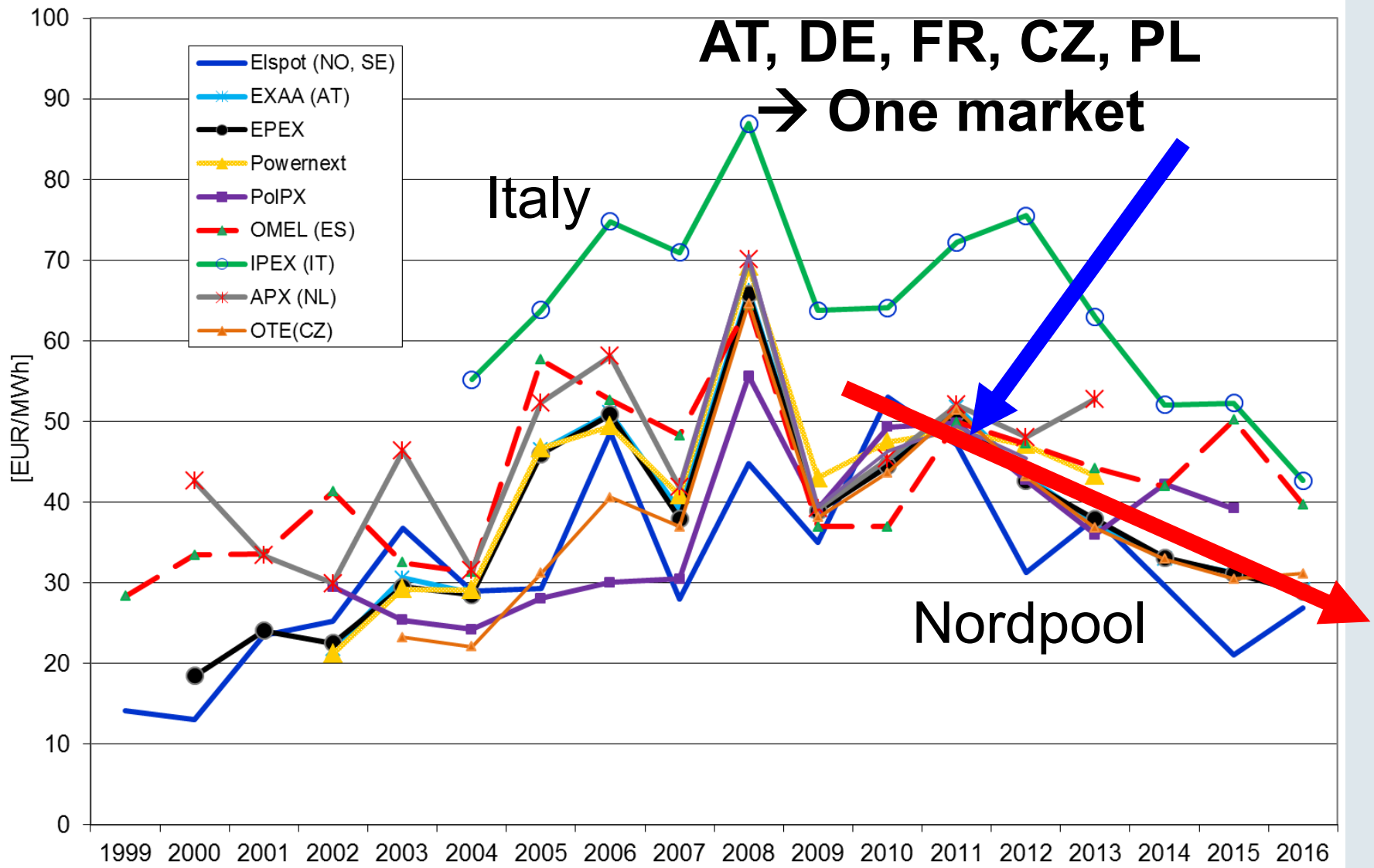
*„Competitive market forces are the prime mover driving efficiency gains. ... (There) is evidence that competition rather than privatisation is the source of the benefits“*

# 4. HOW PRICES DEVELOPED IN EUROPEAN ELECTRICITY SUB-MARKETS

Europe

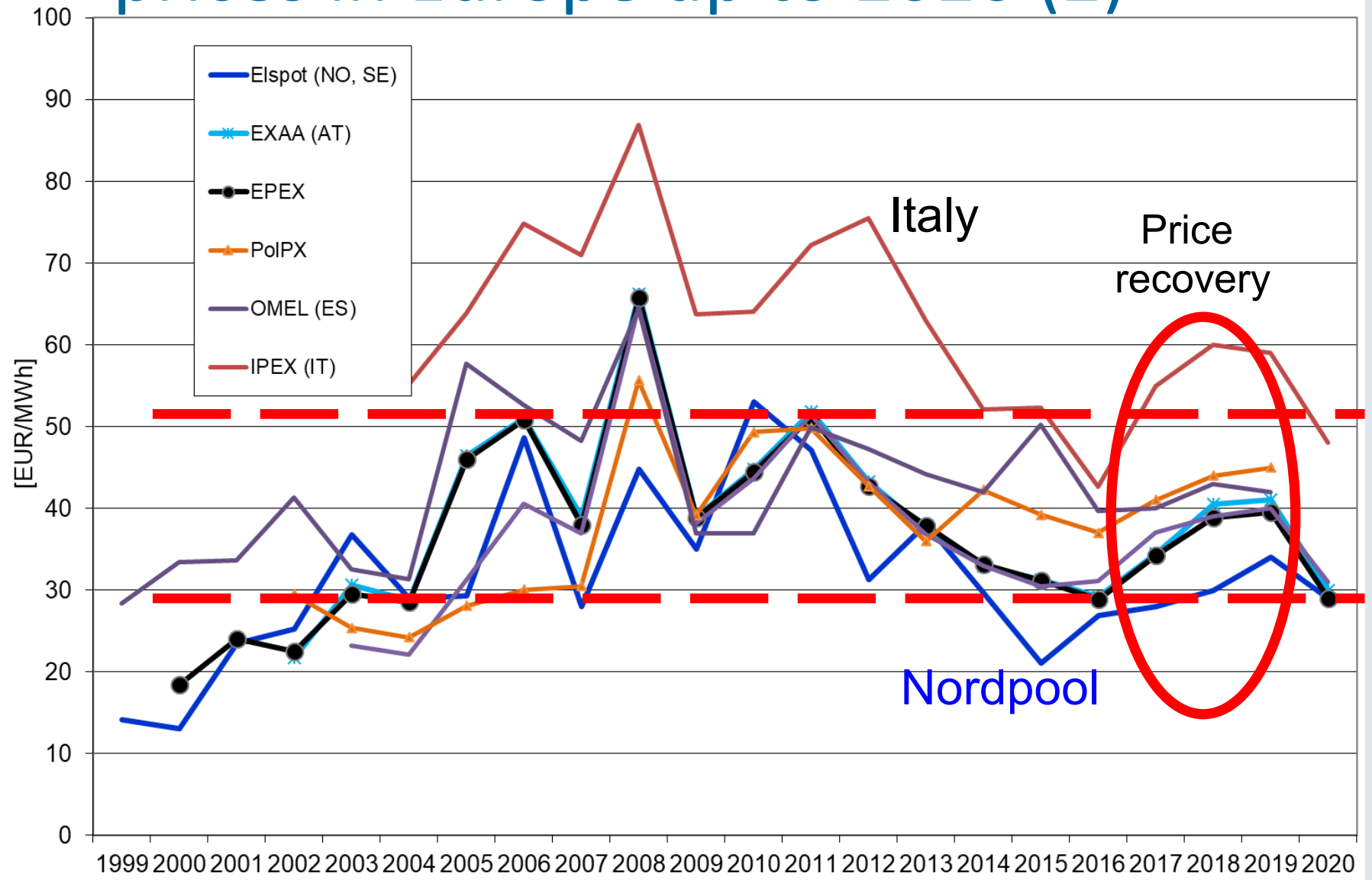


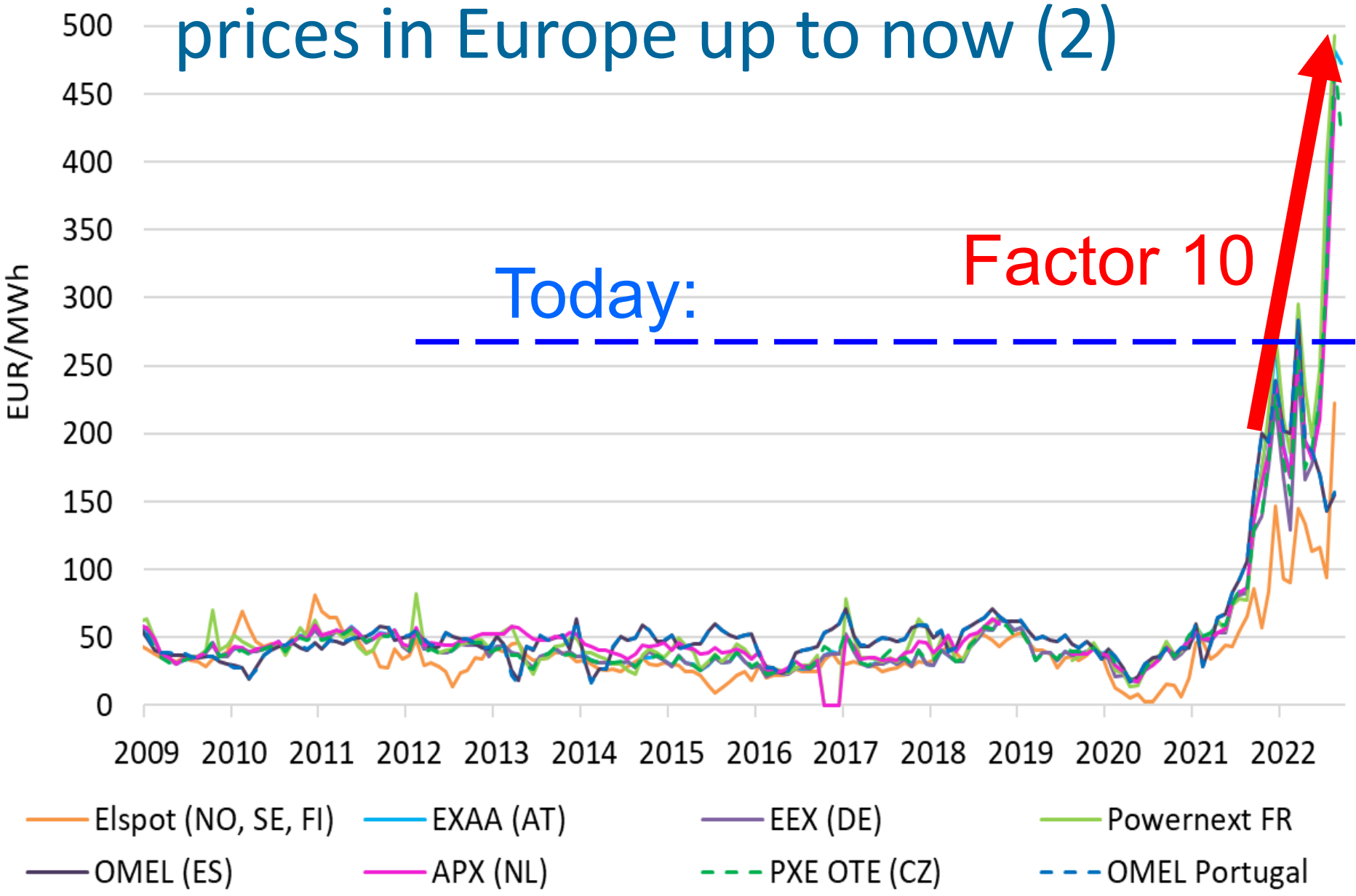
# Development of day-ahead electricity prices in Europe up to 2016 (1)





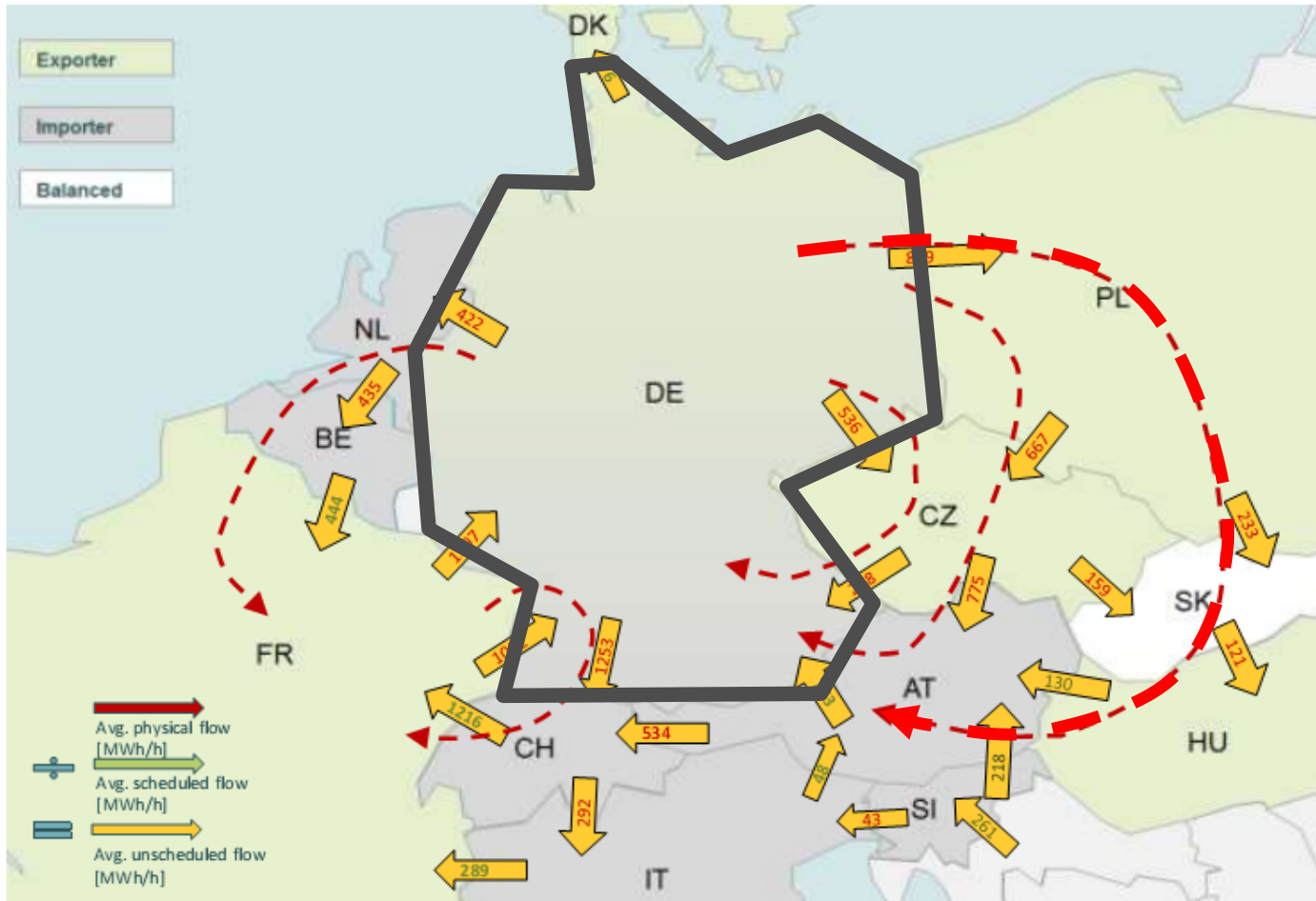
# Development of day-ahead electricity prices in Europe up to 2020 (2)





# 5. MARKET COUPLING VS MARKET SPLITTING

# Loopflows



Source: THEMA Consulting Group, based on data from 16 TSOs

## Average unscheduled flows (2011-2) in MWh/h

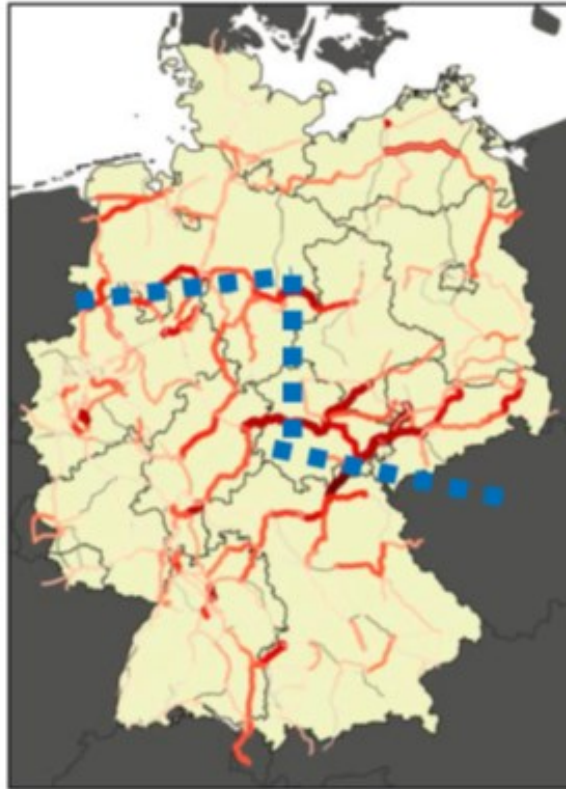
Source: [http://ec.europa.eu/energy/gas\\_electricity/studies/doc/electricity/201310\\_loop-flows\\_study.pdf](http://ec.europa.eu/energy/gas_electricity/studies/doc/electricity/201310_loop-flows_study.pdf)

## Network flows (DCLF results):

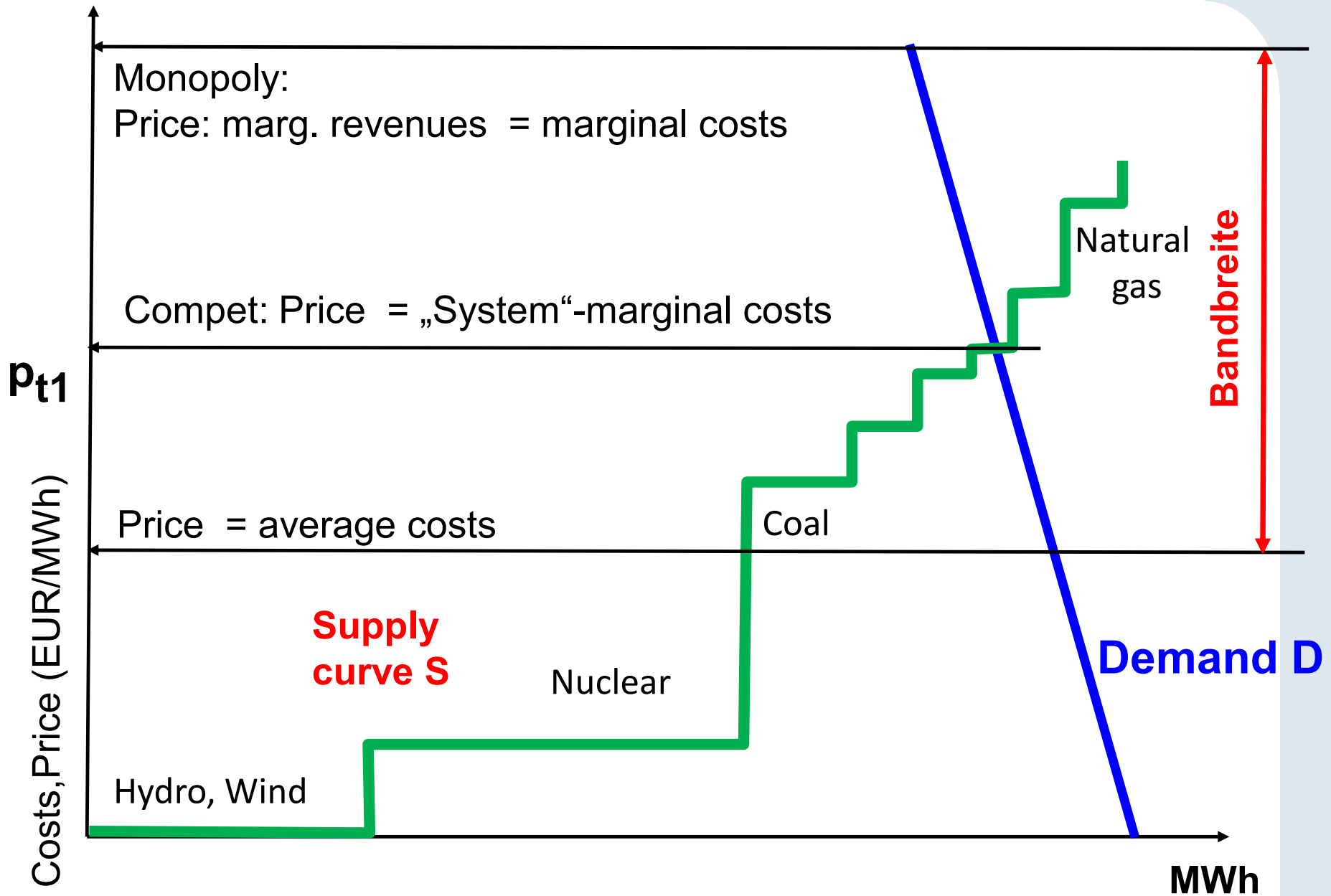
peak load  
low res

winter night  
high wind

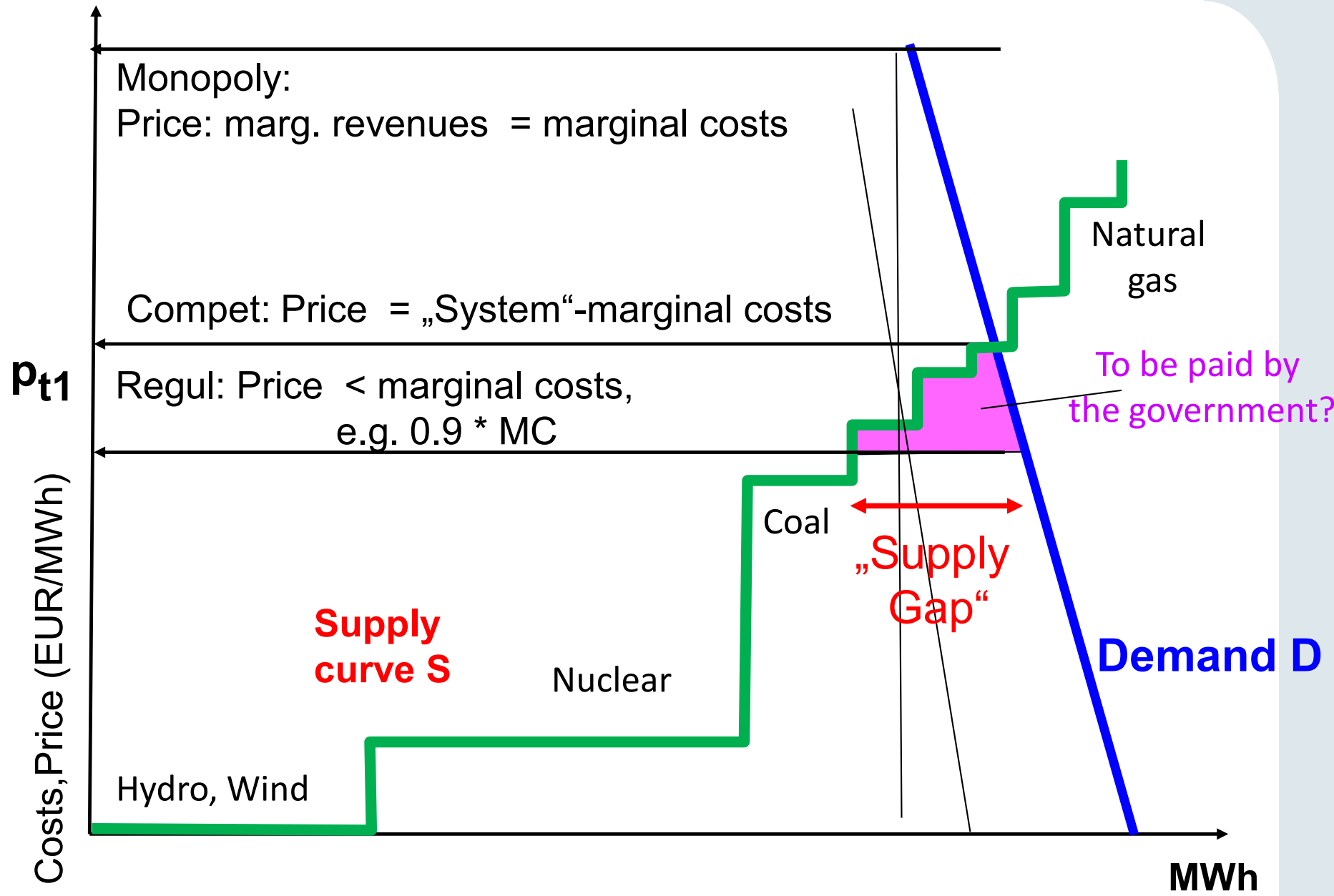
summer off-peak  
high PV



# 6. DOES THE MC-PRICING PRINCIPLE WORK ?



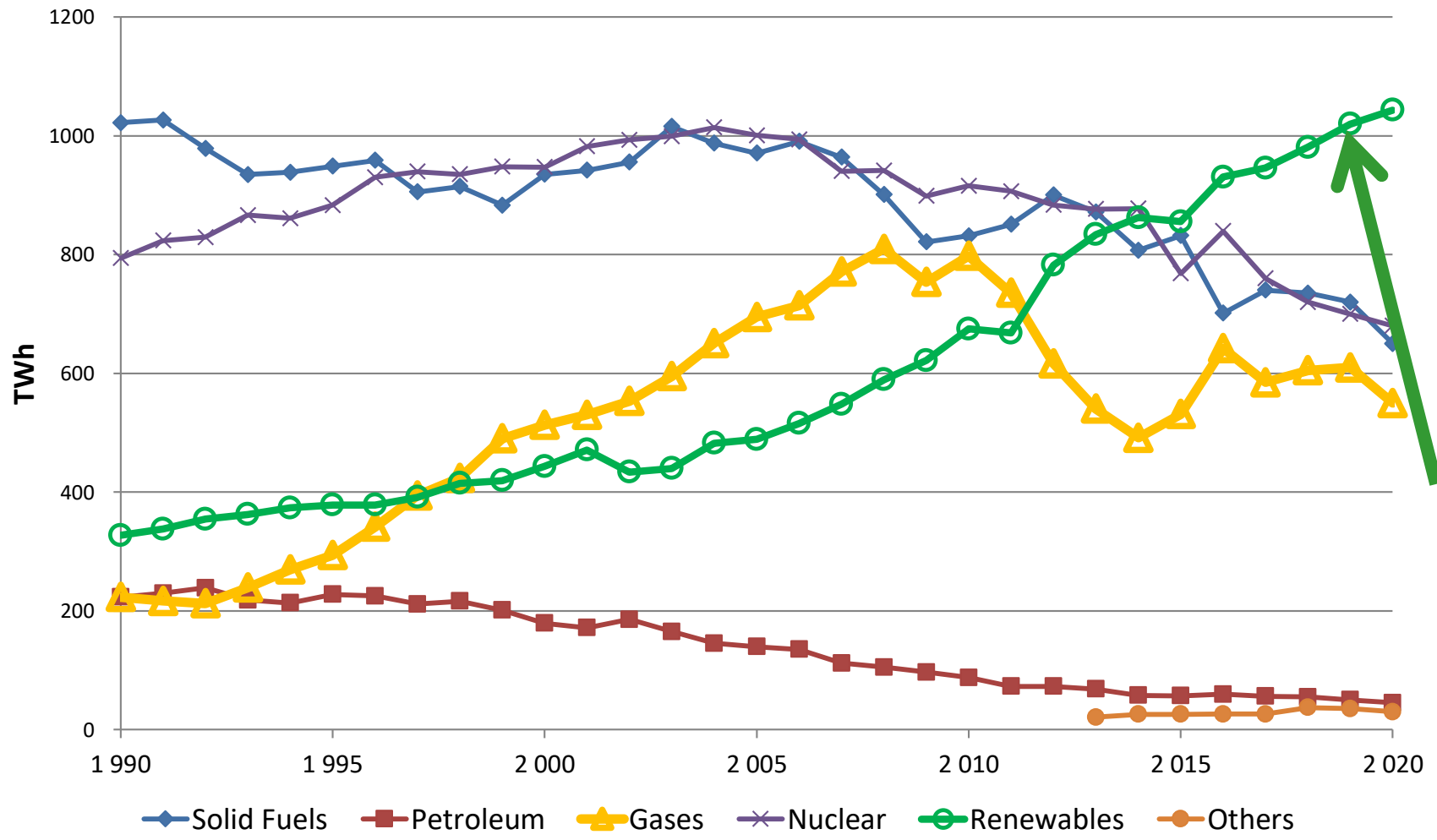
# 3.1. BASIC PRINCIPLE OF COMPETITION: PRICE = MARGINAL COSTS



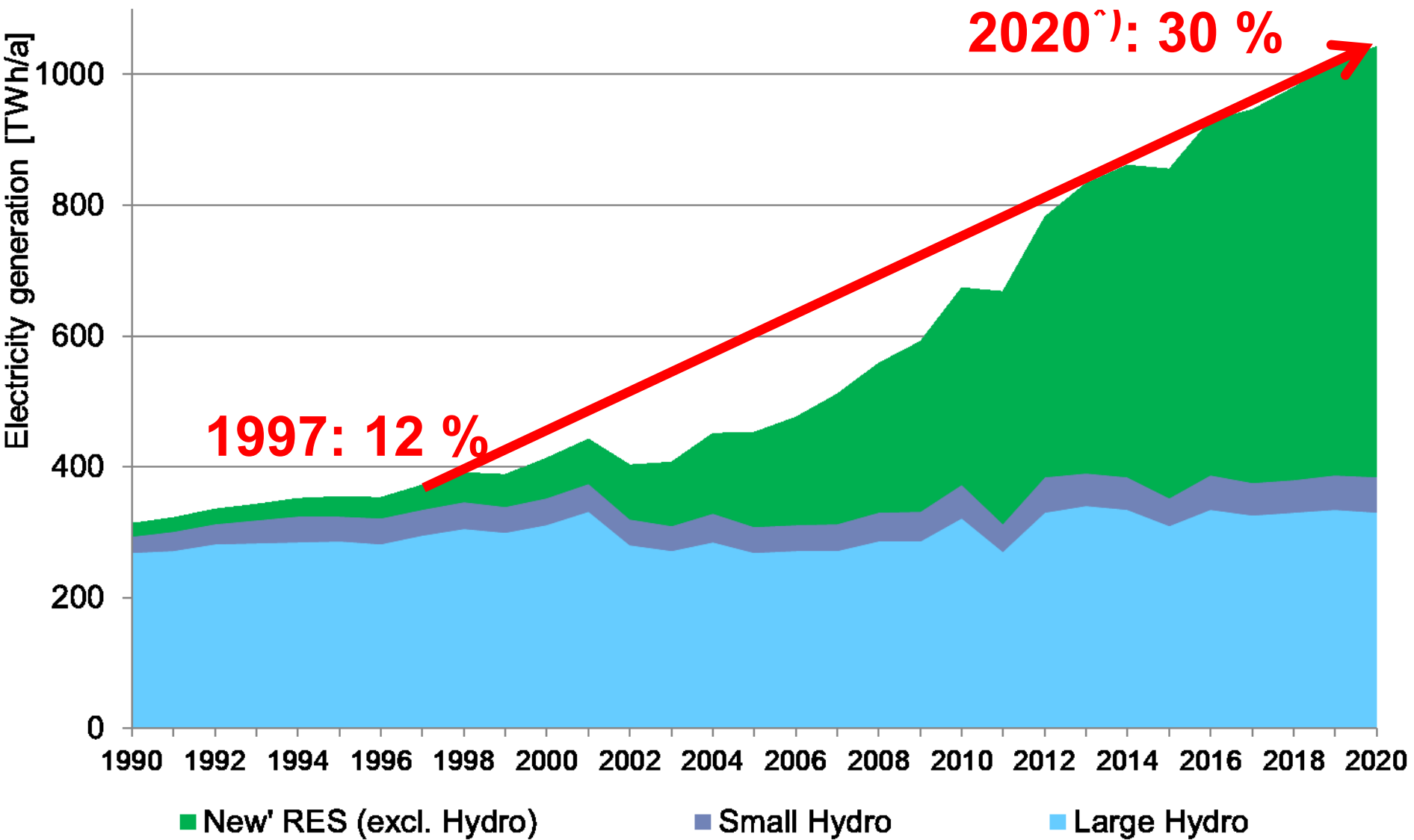


# 7. THE RENEWABLES DIRECTIVE

# Electricity generation EU-28



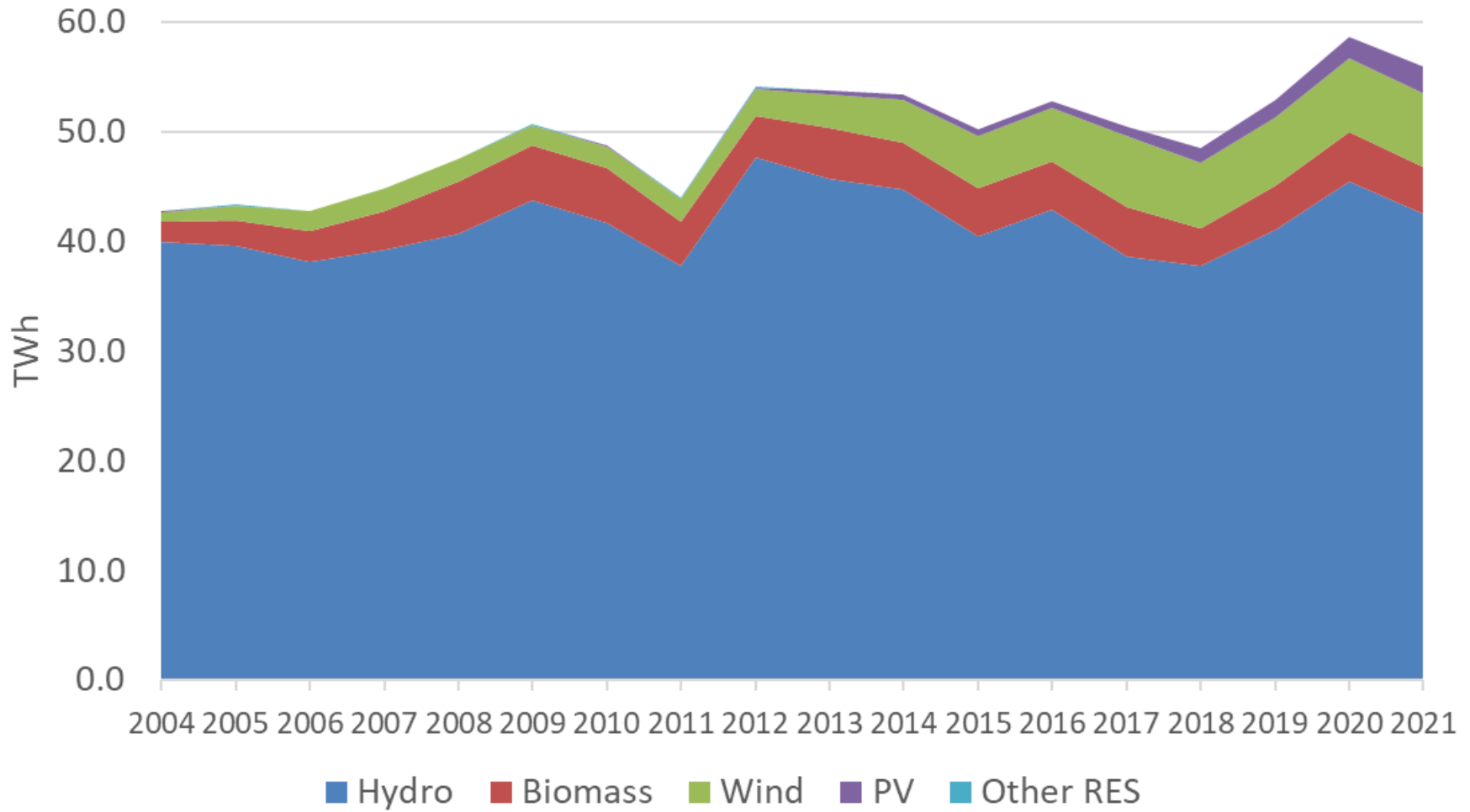
# EU-28: Electricity generation from RES



\*) 2020 preliminary

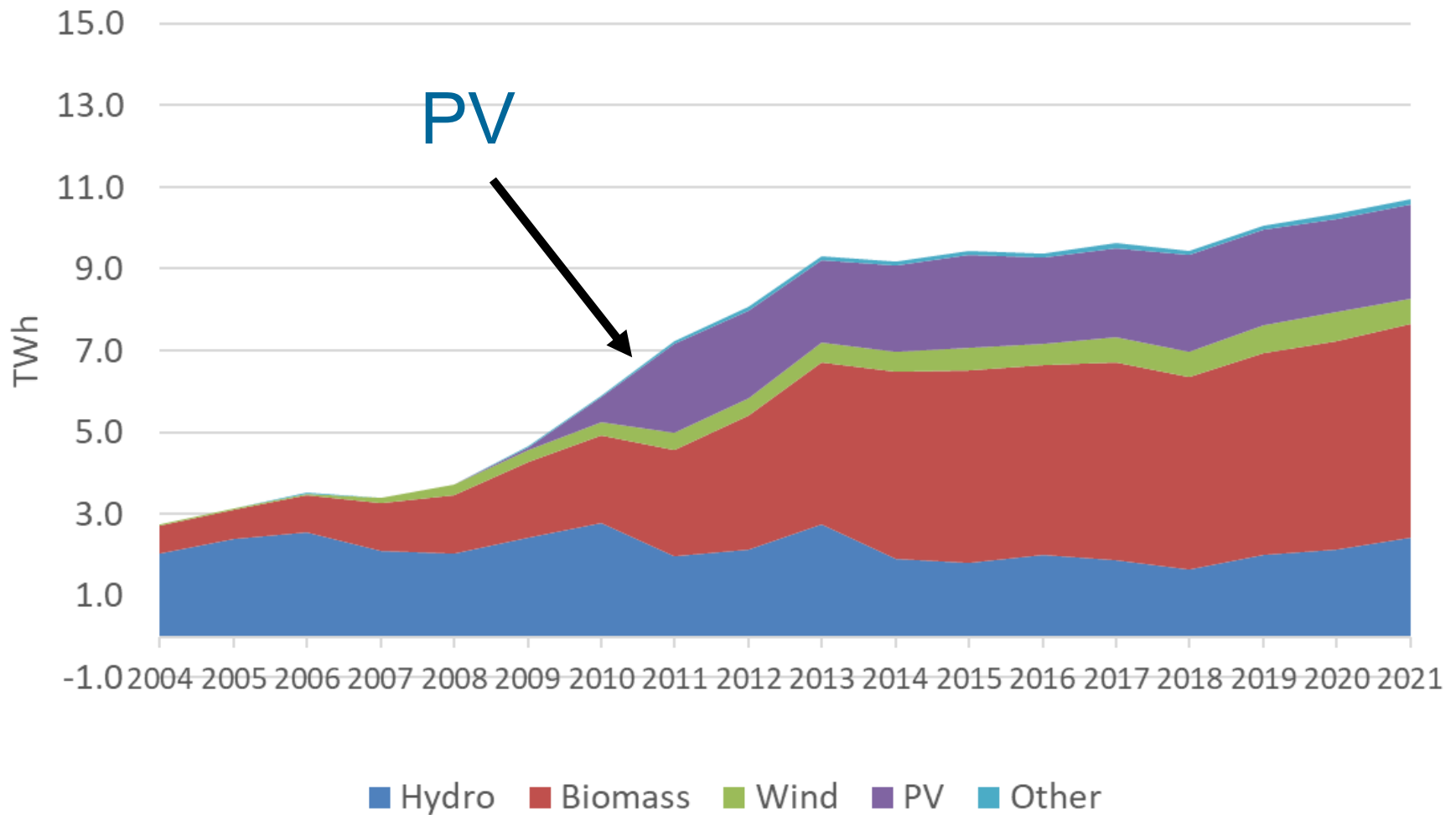
Source: EUROSTAT, own estimations

## Renewable electricity Austria



**Increase 2004-2021: 13 TWh**

Renewable electricity Czech Republic



Increase 2004-2021: 8 TWh

# Czech Republic vs Austria

## Austria:

Increase renewables 2004-2021: 13 TWh

= Increase of 30 %

## Czech Republic

Increase renewables 2004-2021: 8 TWh

= Increase of 290 % (!)

# 7. CONCLUSIONS

- Actually the electricity markets work
- Europe has benefitted around 20 years from competitive electricity markets
- Current extraprofits of some companies: not a problem of energy economics but the government
- Electricity prices will drop again but never to the levels of the mid 2010 years
- Renewables: a success story but ... much more efforts are needed!