



Smartgrids: a solution for all problems

Ronnie Belmans, Professor
KULeuven; chairman Elia

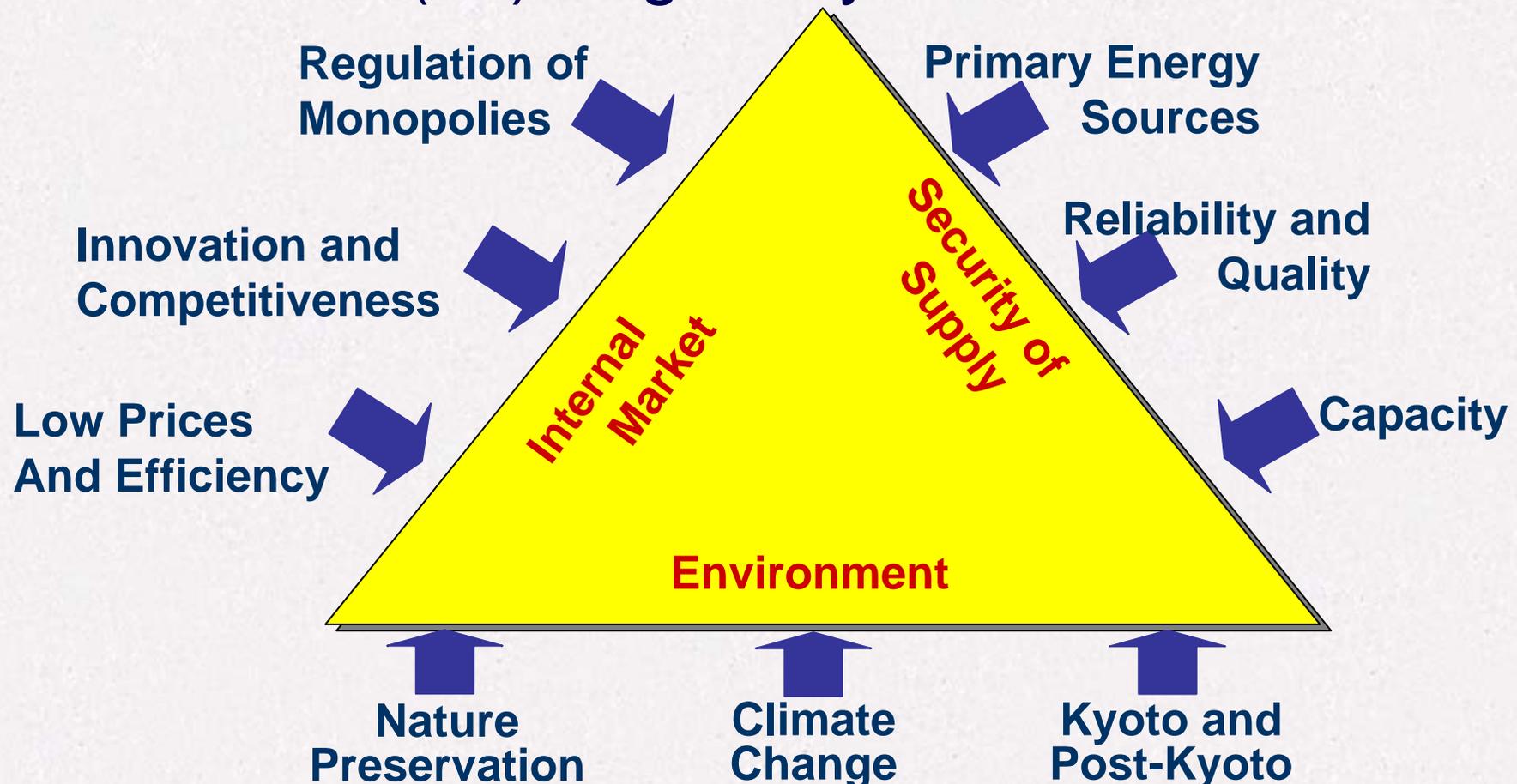
World Forum on Energy Regulation IV
Athens, Greece

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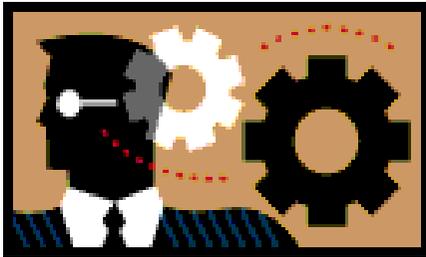
Why smartgrids?



- 20-20-20 (30) targets by “to-morrow”



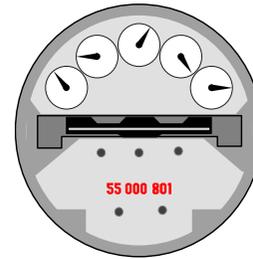
Stakeholders



Technology providers



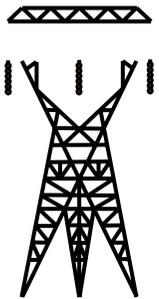
Users



Energy service providers



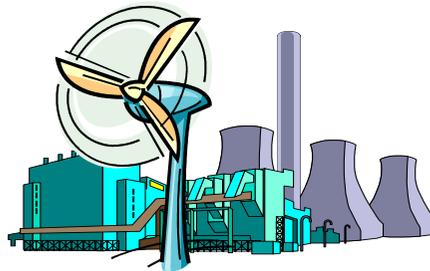
Researchers



Network companies



Traders



Generators



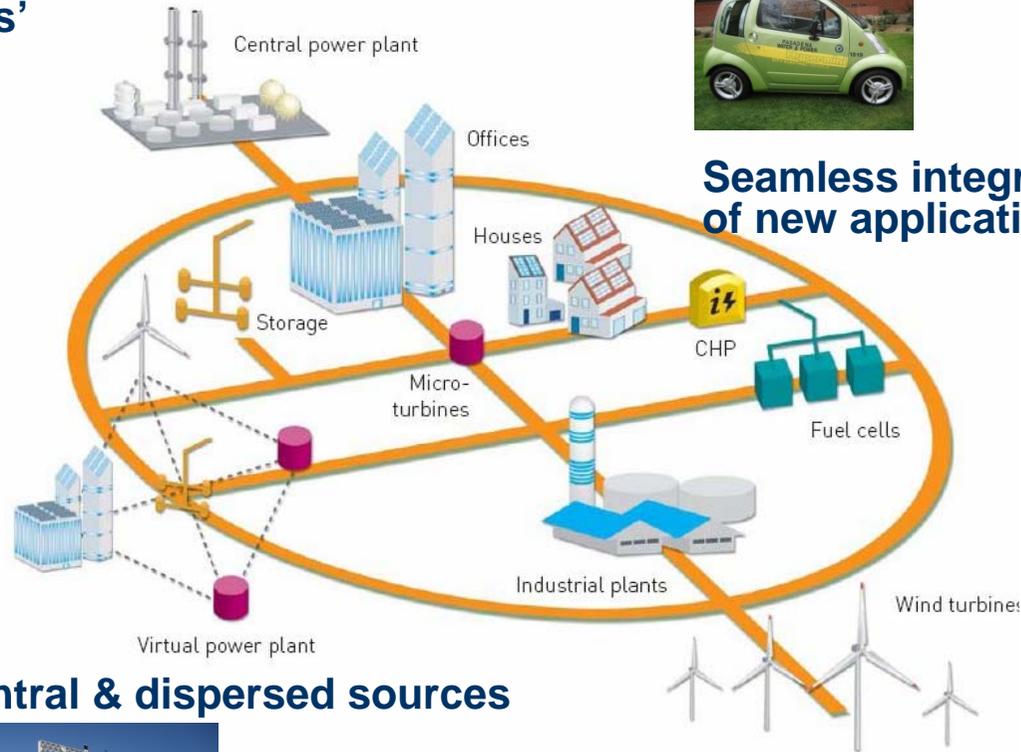
Regulators



Governmental agencies

How may the future look?

**Multi-directional
'flows'**



**Seamless integration
of new applications**

**End user real time
Information & participation**



**Central & dispersed
intelligence**



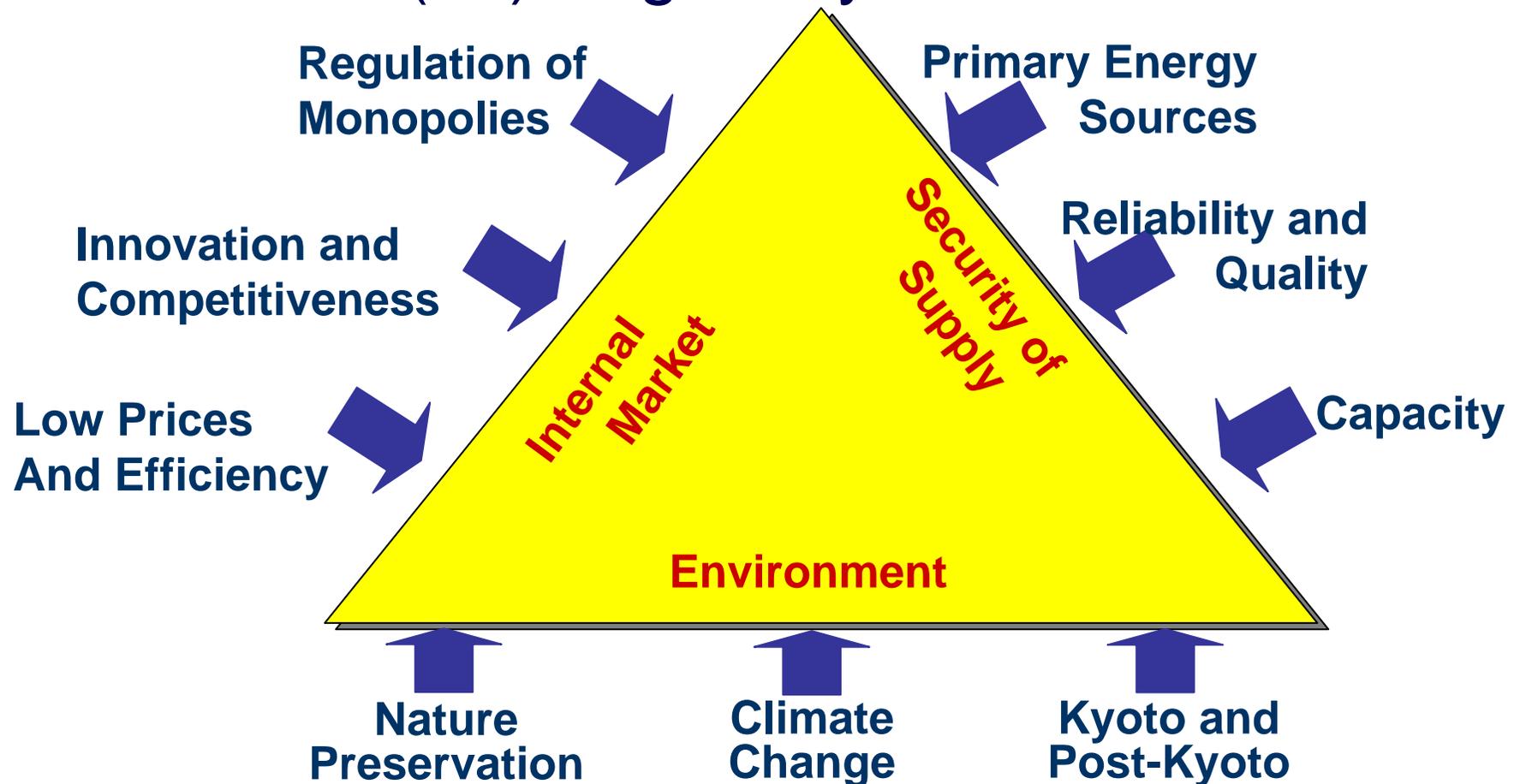
Central & dispersed sources



**Smart materials
and power
electronics**

Why smartgrids?

- 20-20-20 (30) targets by “to-morrow”



What did the present system cost?

To remember:

- 430 million people served
- 2500 TWh used

- 560 GW installed capacity @ 500€/kW = 280G€
- 230.000 km HV network @ 0.4M€/km = 90G€
- Approx. 5.000.000 km MV+LV network

- 1500€ investment per EU citizen

- Largest man-made system

Does it work?

Technical miracles of the 20th century

1. **Electrification**
2. Automobile
3. Airplane
4. Safe and Abundant Water
5. Electronics
6. Radio and Television
7. Agricultural Mechanization
8. Computers
9. Telephone
10. Air Conditioning and Refrigeration
11. Interstate Highways
12. Space Exploration
13. Internet
14. Imaging Technologies
15. Household Appliances
16. Health Technologies
17. Petroleum and Gas Technologies
18. Laser and Fiber Optics
19. Nuclear Technologies
20. High Performance Materials

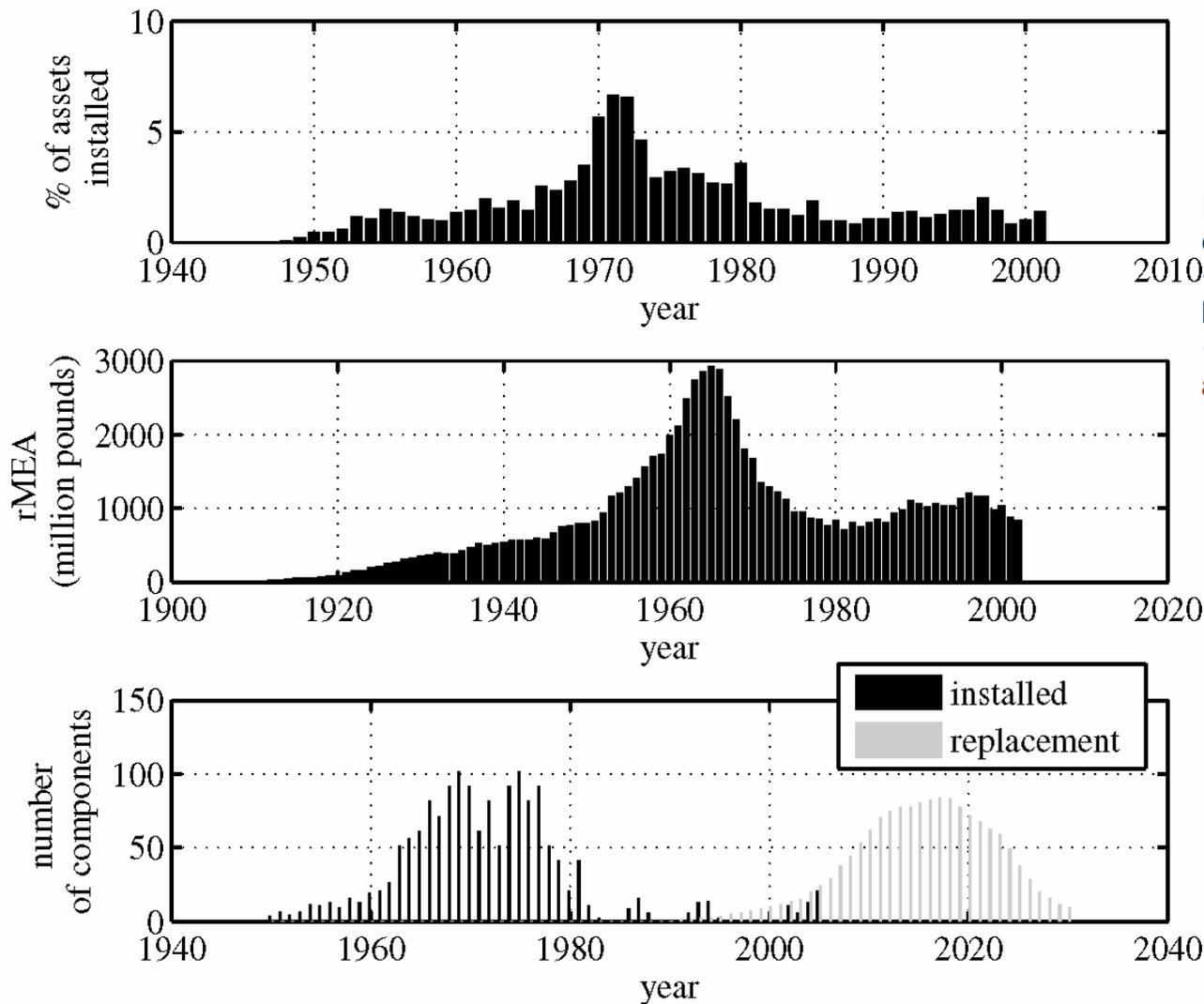


**Still...
new generation paradigms
& ageing assets pose a serious challenge...**

What will it cost?

- Demand
 - Growth 2%/year = +1250 TWh until 2030
- Generation
 - Replacement & expansion 900 GW needed until 2030
 - RES 500 GW_{peak} needed until 2030
- Transmission & Distribution
 - Ageing assets, expansion and RES+DG integration
500G€ until 2030 needed
- Markets & Regulation
 - Data + information need > 20G€ investment
(based on 100€ per connection)

Money with or without Smartgrids: money needed



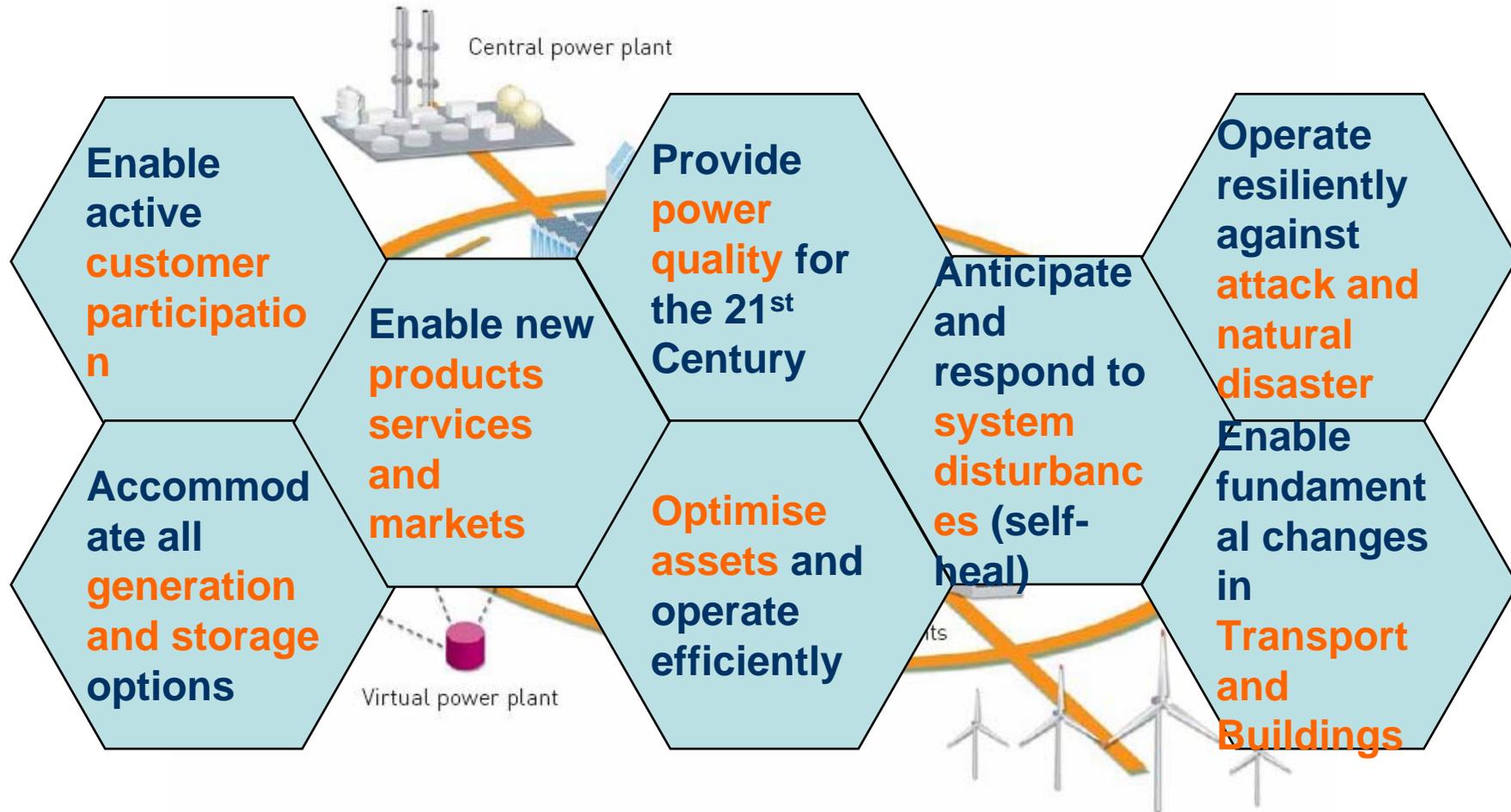
Installation wave in European distribution systems in the 60s & 70s
 → **Replacement wave** expected with business-as-usual approach
 → Opportunity for **new system architecture and operation** schemes

Customer is key?



Smart Grids extend beyond networks and will embrace **transport**, the **built environment**, the behaviours and engagement of **customers**, and will need **societal acceptance**.

Value for money



Conclusion

- Smartgrids are key in future energy system
- Grid has served society already 100 years
- Investments are needed anyway
- Avoid “more of the same”
- Avoid “value of death”
- Deployment projects needed
- Regulatory framework to assess the customer interest

Why smartgrids?

SmartGrids is part of the
Third Industrial Revolution

The best way to predict your future
is to create it

(Peter Drucker)