

# The Smart Grid and Smart Metering

## Polish Perspective

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**ERRA Chairmen Meeting**

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1. **Specific Polish situation**
  - Current situation
  - Risks related to possible solutions
  - „Smartness” related to EU law
  
2. **Smart Grid**
  - Philosophy and Perspectives
  - Smart Grid as an „emergency exit” from current state
  
3. **Smart Metering**
  - Definition
  - Cost / Benefits Analysis
  
4. **Regulatory activities**
  - Feasibility Study
  - Declaration

## Current situation and the nearest future of the Polish energy sector from technical point of view

- Structure of power plants ( geographical distribution and coal dominance )
- Average age of power plants
- Reduction of current margin of power dynamic reserve in the system
- Unsteady generation diffusion inside the network (on the medium and low voltage levels) – massive investment as a condition of connection, increase of dispatching problems
- Increasing of imbalance between geographical distribution of load and generation
- Insufficient transmission and distribution capability

According to traditional manner, we must build (or rebuild) massive structures in generation and network areas

All above mentioned kinds of investment have to be realised during a very short time because of expected power imbalance, with all negative price consequences

**This picture is not too optimistic already, but legal influence on the future will make it much more complex**

## Risks related to possible solutions in the traditional manner

### Coal:

- economical risk of continuity of current technologies and locations for generation (new kind of stranded costs)
- social risk regarding the reduction of coal mining
- according to EU law – necessity to CCT development (CCS for example)

### Natural gas:

- political risk regarding increased dependency of power production from gas due to one-direction supplies

### Nuclear:

- social risk because of the „Czernobyl trauma”

### Biomass:

- risk of competition to the food market
- risk of environment degradation (overload of forest biomass exploitation and total ineffectiveness of reduction of deposit of CO<sub>2</sub> according to current legal rules, focused on co-burning in large power plants)

### Wind:

- risk of overinvestment on network
- risk of system disturbances because of instability of wind power

### Other renewable sources:

- limited possibility to solve system problems because of small scale of applications

## Specific Polish situation

**Risks related to possible solutions in the traditional manner is not only Polish problem, it is common situation of many European countries, UK for example:**

***„... With gas too risky, coal too dirty, nuclear too slow and renewables too unreliable, Britain (similar like Poland) is in a bind. ...”***

***„...All this leaves Britain in a hole. The lights are dimming, but green targets are an argument against new coal plants, security-of-supply concerns make gas dicey, lack of time rules out nuclear, and worries about practicality dog renewables....”***

[both above: The Economist , Aug 6th, 2009]



## The 3 x 20 Package of EC:

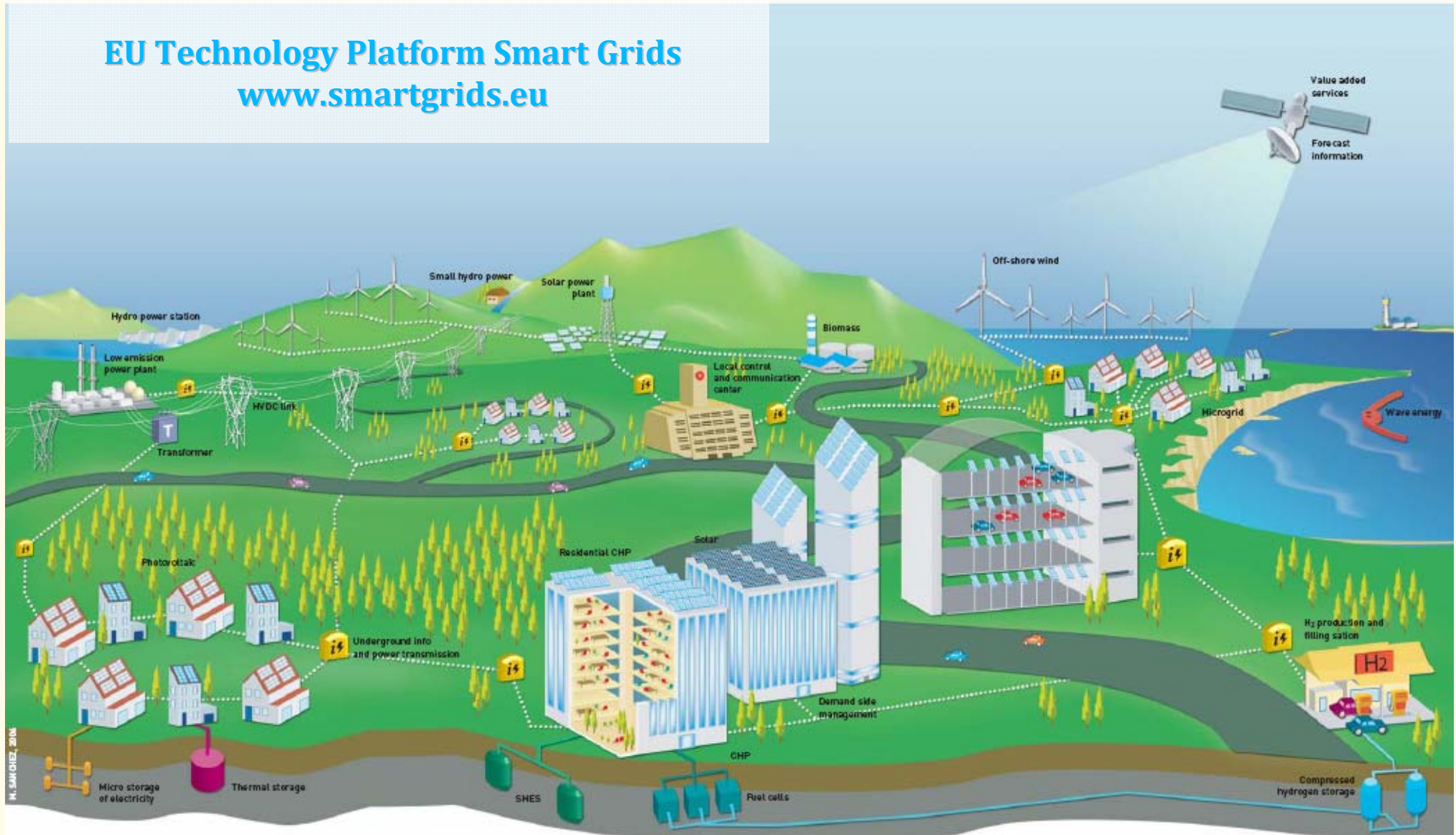
- necessity to decrease of CO<sub>2</sub> emission - switch off a big part of generation (fit jet) in 2016, due to emission limits (deep decreasing of power system balance) perspective
- necessity of development of renewable generation, specially wind farms on-shore and off-shore
- necessity of improving energy efficiency (decreasing losses f.e.)

The III Liberalisation Package of EC the useful tool to realise targets above mentioned

***A Smart Grid is an electricity network that can intelligently integrate the behaviour and actions of all users connected to it - generators, consumers and those that do both - in order to efficiently ensure sustainable, economic and secure electricity supply.***

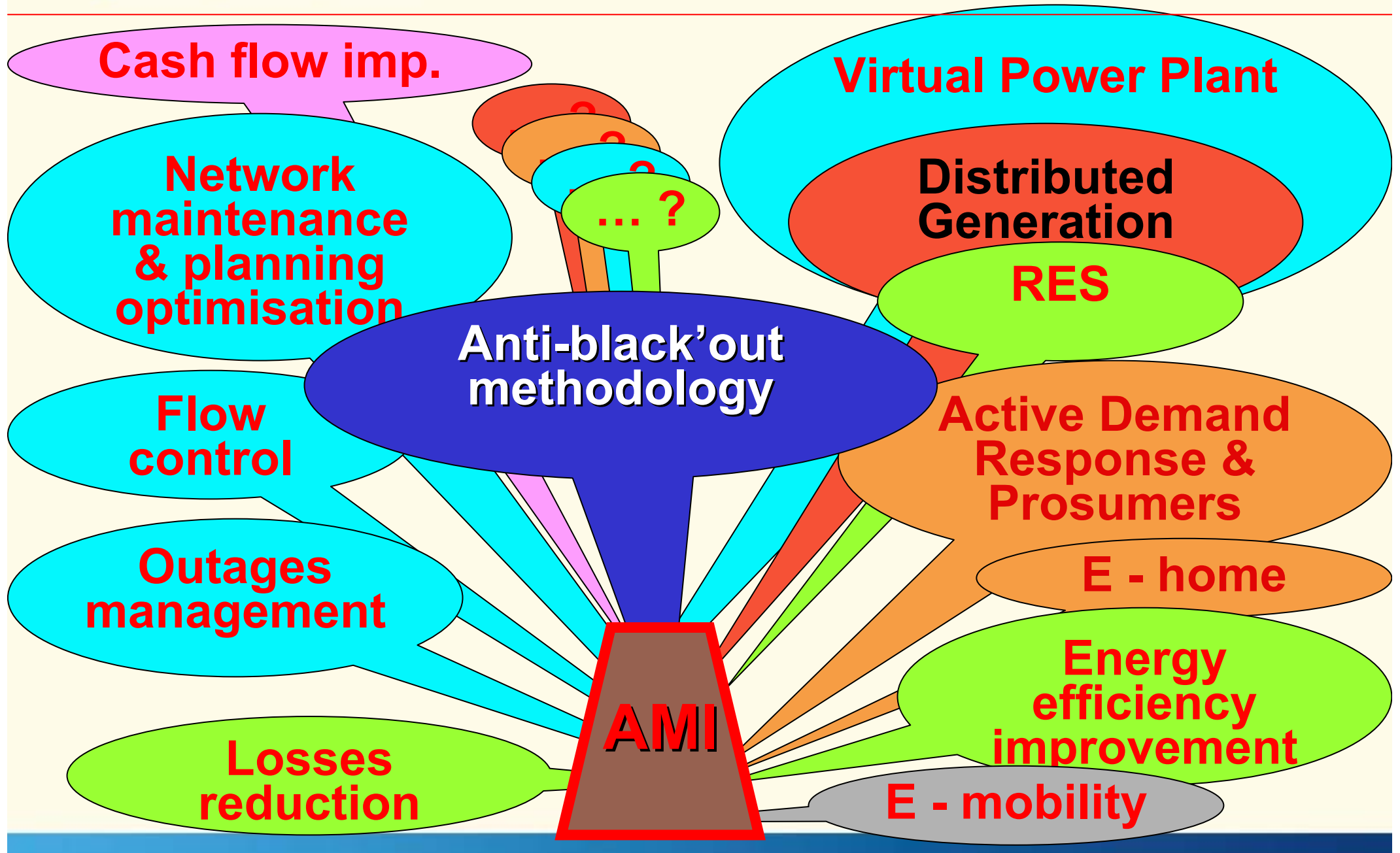
# Smart Grid Philosophy

EU Technology Platform Smart Grids  
[www.smartgrids.eu](http://www.smartgrids.eu)





# Smart Grid Perspectives

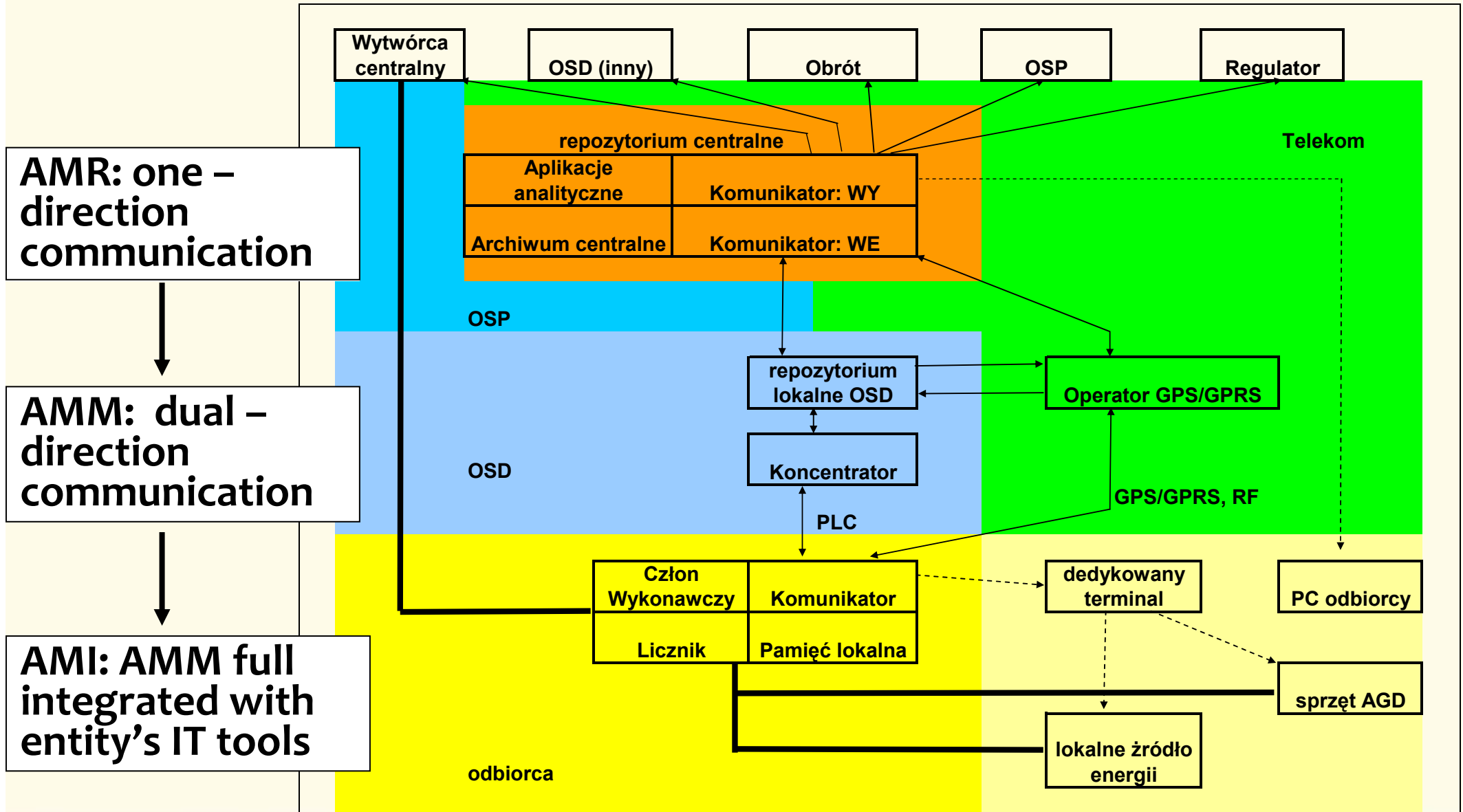


**The first step to a Smart Grid is Smart Metering**

**What means „the Smart Metering“:**

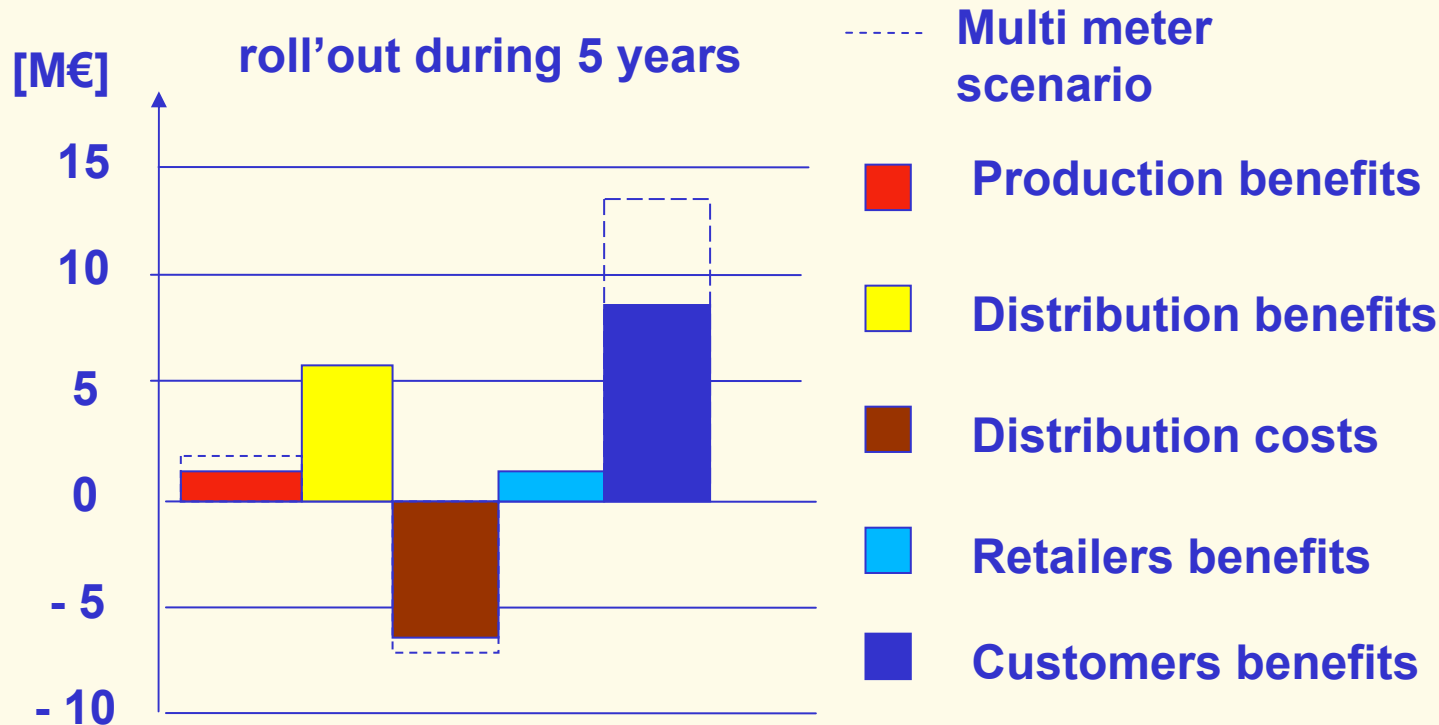
- dual side flow of information
- real time (if necessary) of measuring and information collecting and exchange
- three levels of needed meters' deployment :
  - inside a grid
  - at the delivery points (on the borders of a certain DOS's grids)
  - at all customers and other system users

# Smart Metering Definition





# Smart Metering Costs/Benefits Analysis

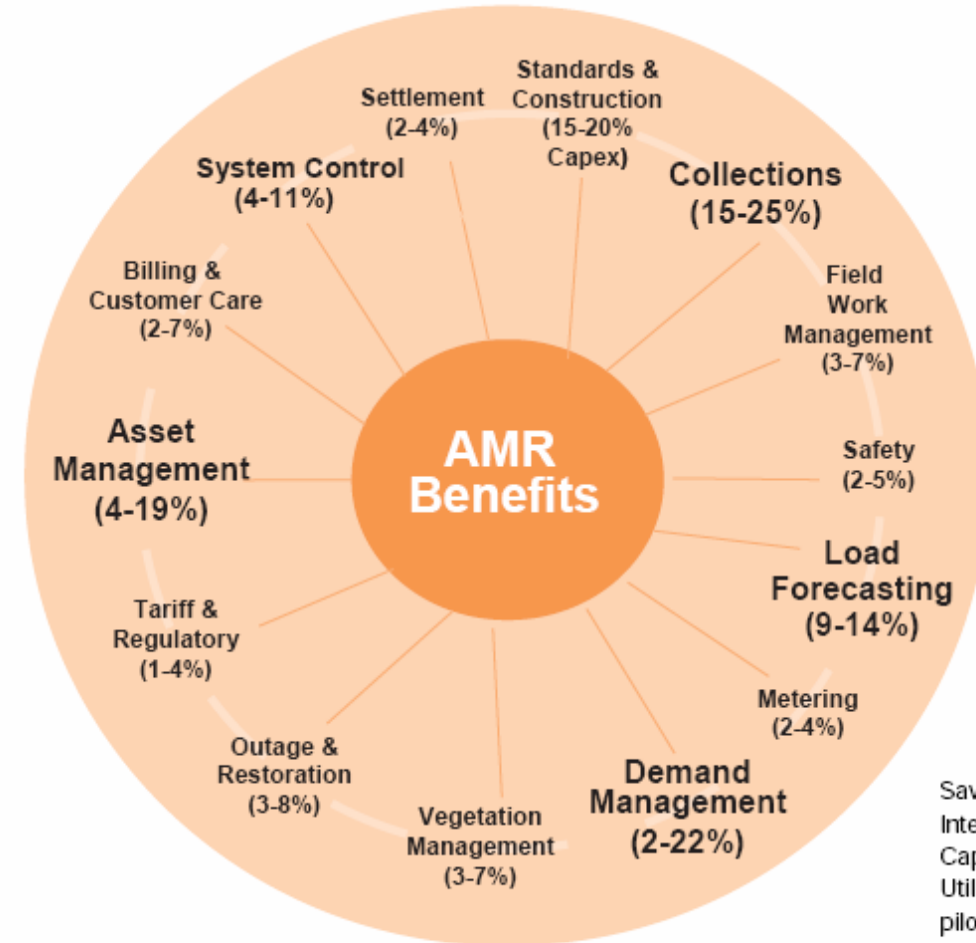


Za: Oliver Huet, EDF R&D, Smart Metering technologies: a fast moving frontier; Florence School of Regulation, 06/02/09,

**(Important it is reverse of typical situation: externalisation internalities)**

## DSO benefits dividing

### AMR Drives Benefits



Savings Percentages based on Interviews conducted by Capgemini with North American Utilities having deployed AMR pilot projects. Calculation based on the assumption that AMR is fully integrated and utilized



**AMM total investment (with home terminals) :**  
**on LV:**

~ 7,5 mld PLN

**on MV and HV (75% of energy market):**

~ 70 mln PLN

**Individual AMM investment:**

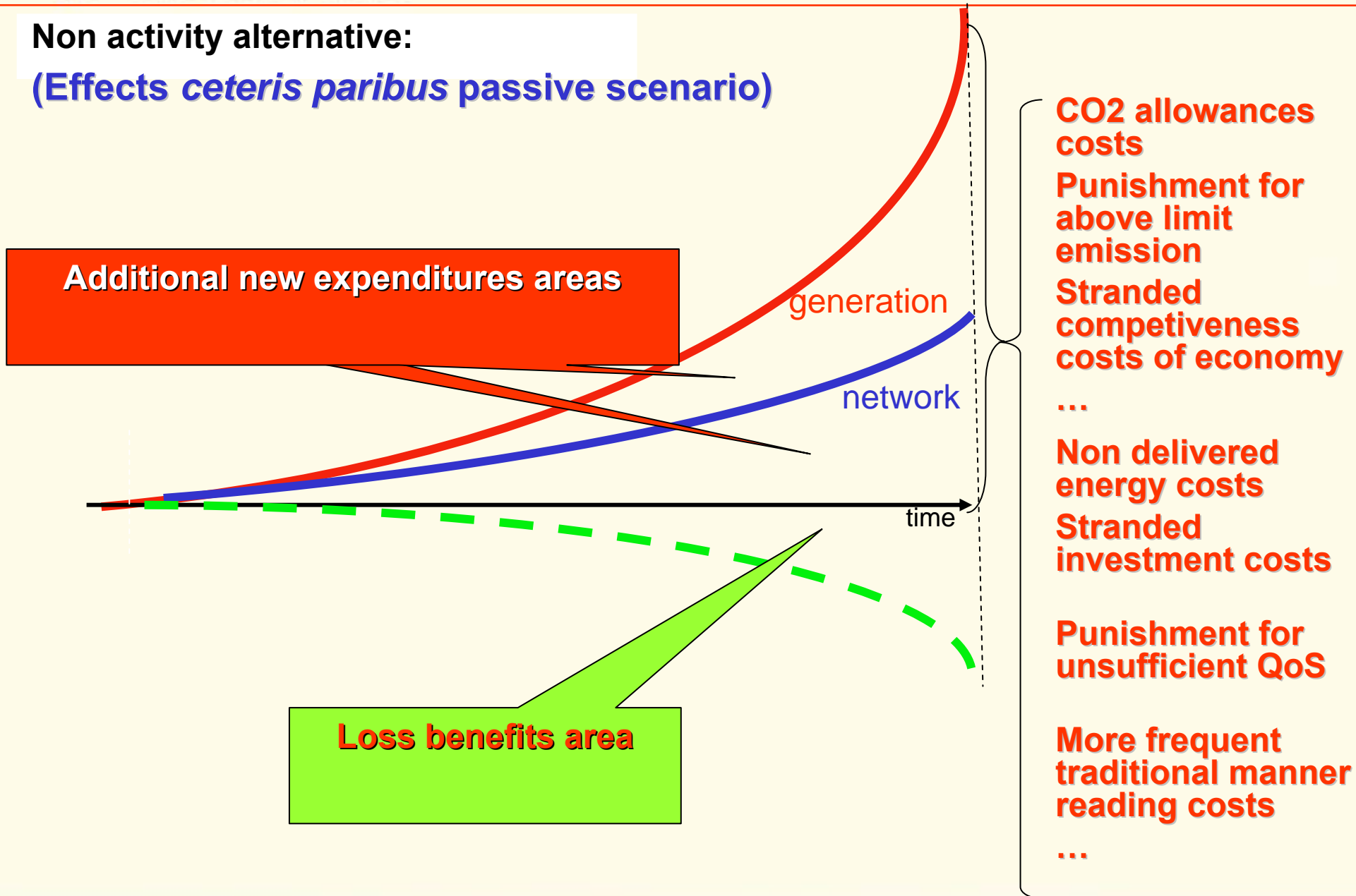
- on MV and HV ~ 2,5 tys PLN/unit

- on LV ~ 470 PLN/unit

[According Transition Facility PL2005/017-488.02.04]

# Smart Metering Costs/Benefits Analysis

Non activity alternative:  
(Effects *ceteris paribus* passive scenario)

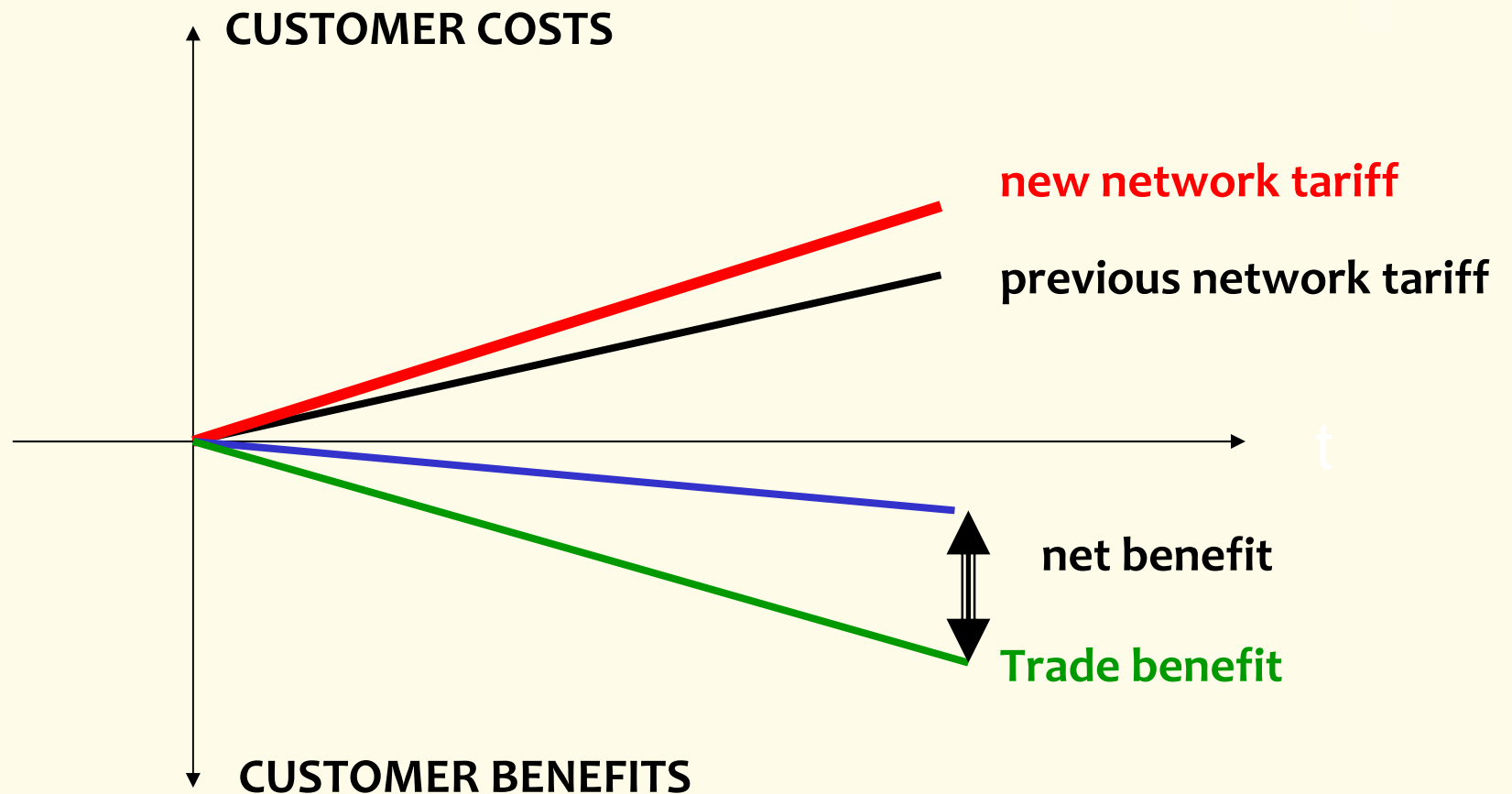




# Smart Metering Costs/Benefits Analysis

Agreeing development plans and tariff approval as a tool of investment financing

Approval scheme (roll'out effects):





## Feasibility study:

Transition Facility PL2005/017-488.02.04

Title: „Reinforcing the regulatory supervision of the energy sector”, component 1.

Time: January – July 2008

Product: Four reports:

1. Technical report
2. Cost report
3. Legal report
4. Social-economic report

First public presentation of results – December 2008

**Declaration** concerning the introduction of smart metering into the Polish power system:

Warsaw, 3 June 2009

signed by Presidents / Chairmen of:

Energy Regulatory Office,  
Consumers' Federation,  
Polish Consumers' Association,  
The Polish National Energy Conservation Agency,  
Consumers' Forum for Electricity and Gas

Many other bodies (administrative, academic and business) send access will



Energy  
Regulatory Office

**Thank you for your attention**