

Budapest Energy Summit, 3 December 2018

ENERGY LEADERS PANEL – ENERGY IN TRANSITION

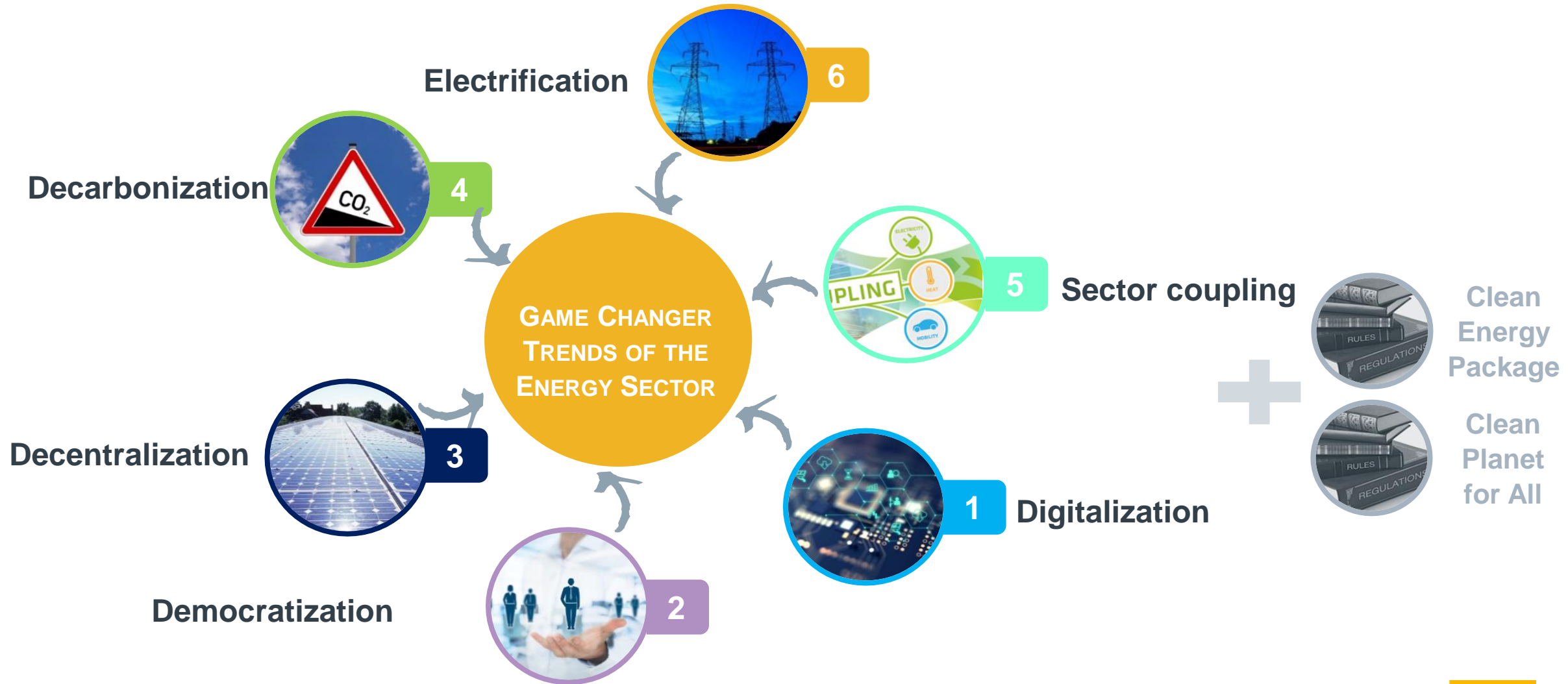
György Kóbor
MVM Group

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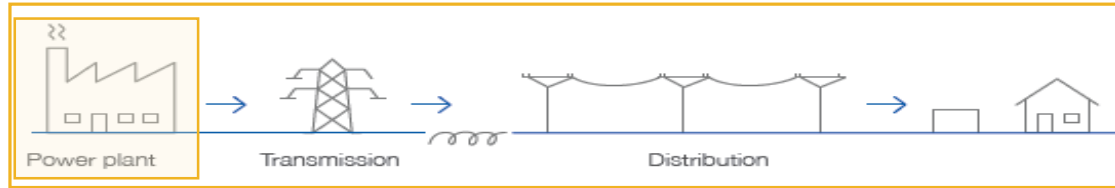
WE PERCEIVE AT LEAST 6 MEGATRENDS OF THE ONGOING ENERGY TRANSITION



THE INCUBATION OF NEW TECHNOLOGIES, THE BOOM OF RENEWABLES WILL TRANSFORM THE TRADITIONALLY ESTABLISHED SYSTEMS STRUCTURE

Decentralization

Upstream driven centralized system

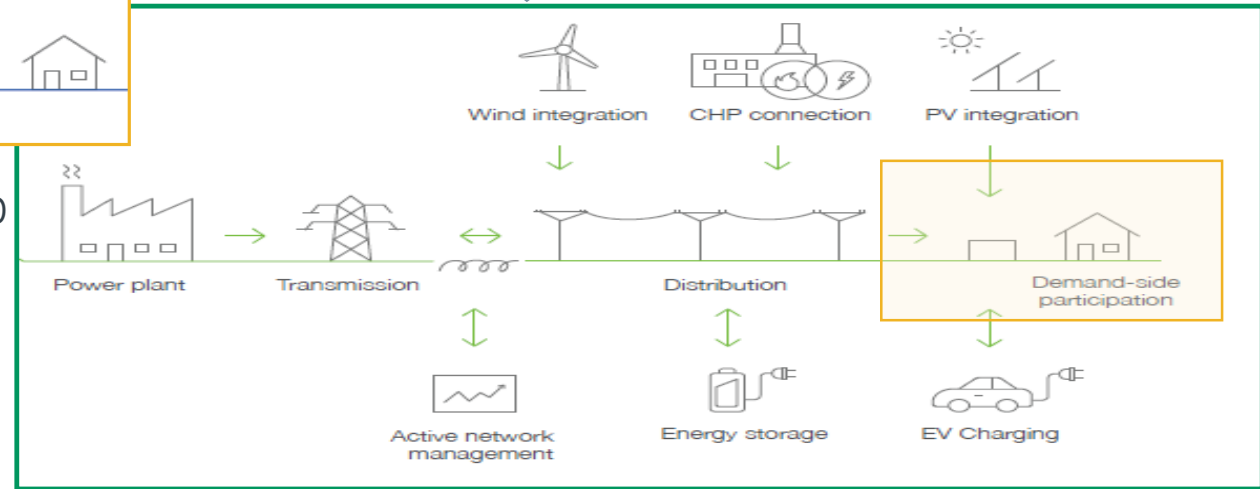


BASE LOAD GENERATION
 FLEXIBILITY
 RESERVES

TRANSMISSION
 GRID DEVELOPMENT

MVL & LVL DISTRIBUTION
 METERING
 UTILITY SERVICES

Downstream driven decentralized system



UTILITY
 SIZE
 RES

BASE LOAD GENERATION
 FLEXIBILITY
 RESERVES

TRANSMISSION
 GRID DEVOP

DRM
 AGGREGATION
 RES
 INTEGRATION

STORAGE
 ACTIVE GRID MGMT

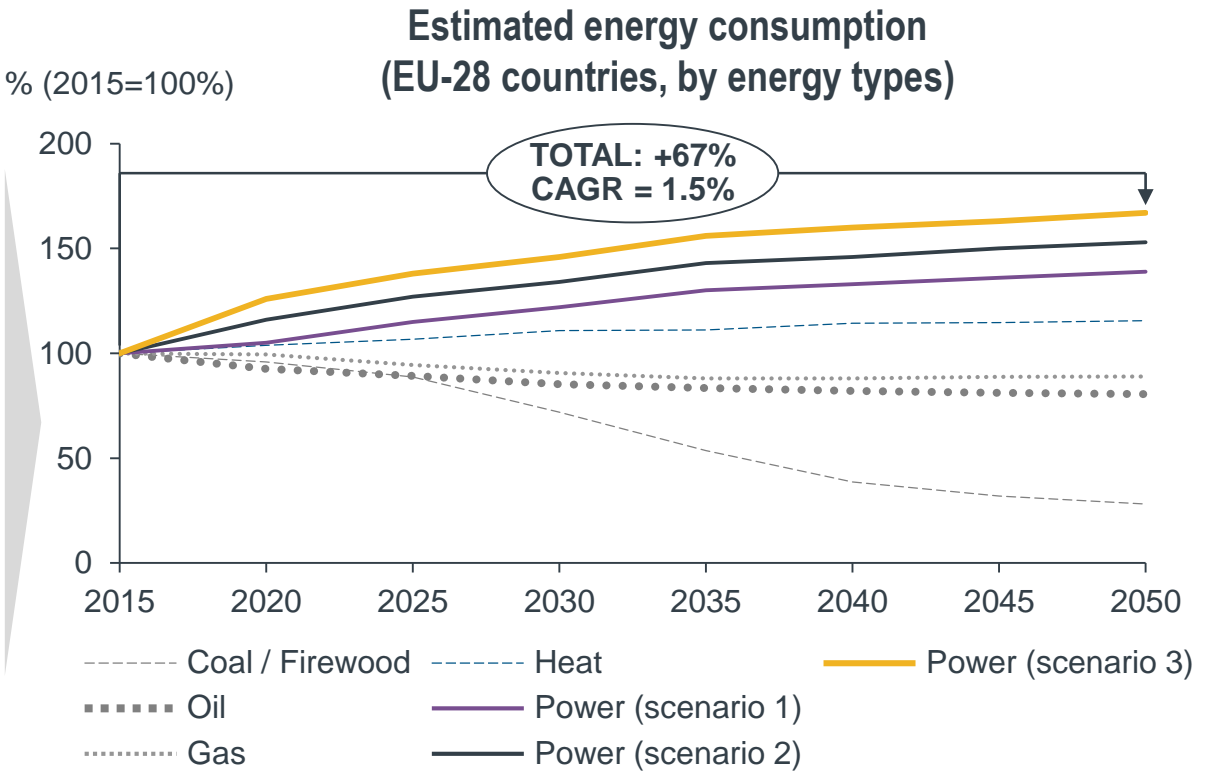
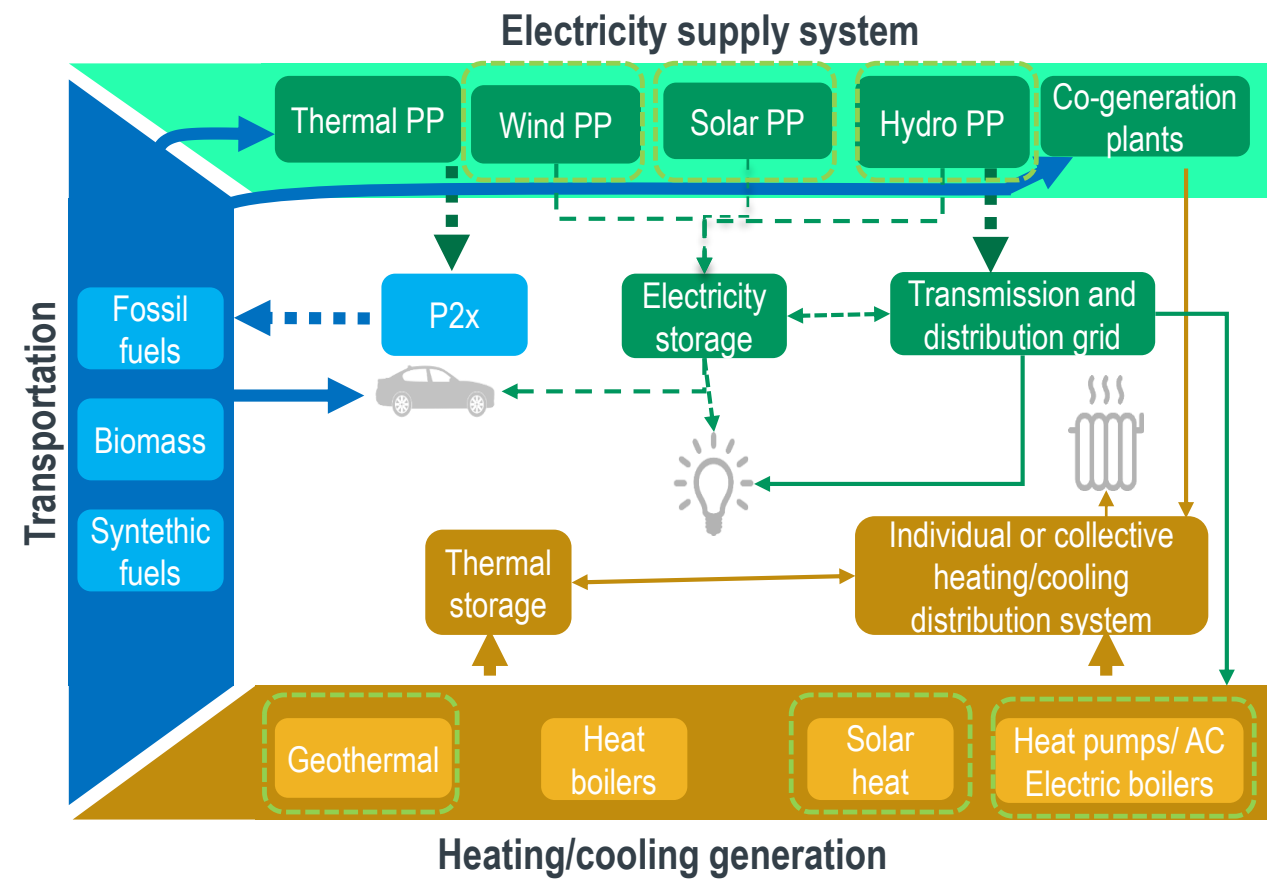
DSPP
 HEMS
 EV

Source: EDSO for smart grids

The primary perspective of the energy systems change: in the past upstream was in focus, whereas in the future downstream components will be game changers

DECENTRALIZED SYSTEMS AND THE WIDESPREAD USE OF RENEWABLES WILL DRIVE THE COUPLING OF THE ELECTRICITY SECTOR WITH HEATING/COOLING AND TRANSPORTATION, FURTHER BOOSTING ELECTRIFICATION

Electrification & sector coupling



Source: European Committee, reference scenario 2050 (2016), Eurelectric

An extensive coupling of neighbouring sectors will be necessary to meet the new challenges of the electricity systems



DUE TO DIGITALIZATION THE OFFTAKERS WILL BEHAVE MORE LIKE REAL CUSTOMERS FACILITATING MARKET ENTRY FROM OTHER INDUSTRIES

The future arena of competition: customer homes and enterprise processes

Smart home equipment

nest Google SAMSUNG

Self supply of energy with rooftop solar panels

SolarCity

IKEA

Price and service comparison platforms

verivox

Use of electric vehicles

BMW i. Nissan Audi Chevrolet dyson Tesla

Digital utilities, digital customer journeys

POWERSHOP

Self storing energy in wall box accumulators provides energy independence for customers








BMW i. SIEMENS Tesla IKEA SAMSUNG

Energy efficiency solutions to help decreasing energy bills

acciona

The key success driver will be the control over the direct customer relationship

AS NEW SERVICES EMERGE, VALUE CREATION SHIFTS DOWNSTREAM CLOSE TO THE CUSTOMER

| | Generation & wholesale | Transmission | Distribution | Metering | Retail | Services „behind the meter” | Distributed generation |
|---|---|---|---|---|---|---|---|
| | Traditional utility services | | | | | New services | |
| Revenues for traditional utility | 30-40% | 15-20% | 40-50% | 0-10% | 0-5% | 0-2% | 0-2% |
| Drivers of value shift | Lower plant utilization | Investment in grid, lower regulated remuneration | | Smart meter AMI* services | IT systems, self service applications | Smart equipment, IT | Distributed generation equipment installation and leasing |
| Direction of shift |  |  |  |  |  |  |  |
| Future revenues with distributed energy | 20-30% | 10-15% | 20-30% | 5-15% | 5-10% | 0-10% | 15-20% |

* AMI = Advanced Metering Infrastructure

Source: Boston Consulting Group (2014, USA)

Customer oriented value creation will be necessary to maintain competitiveness



Thank you for your attention!

