

Electricity Market Integration 2.0 in Central and South East Europe

Changes in European Energy Market Landscape

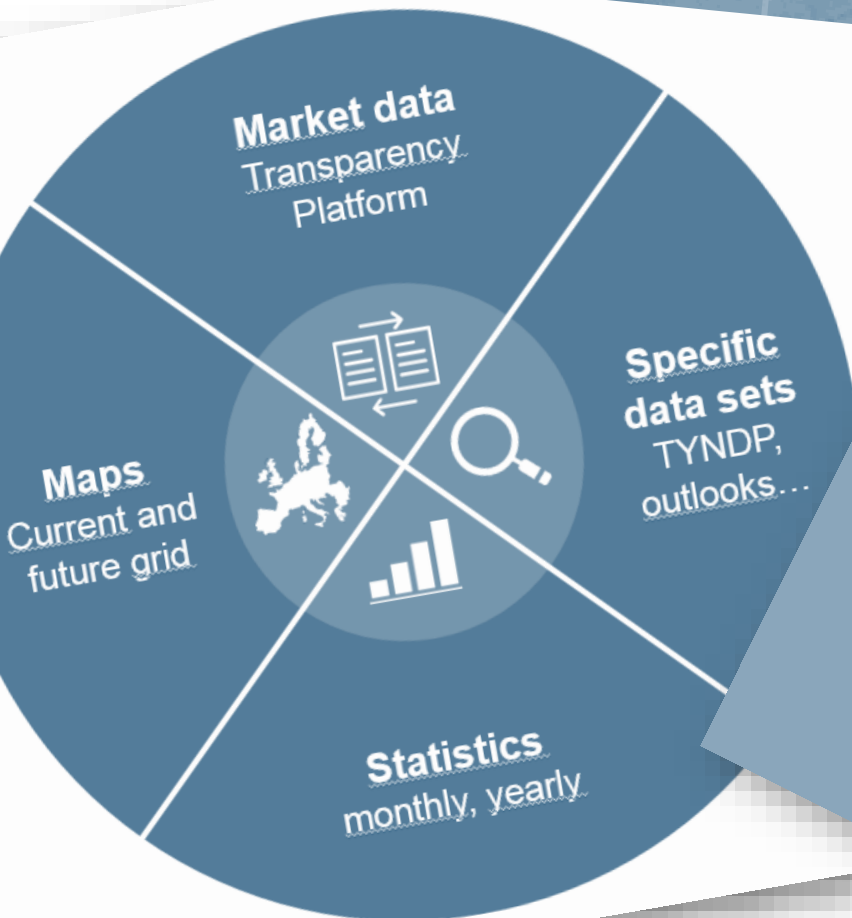
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Secretary General, ENTSO-E

2nd Central and South East Europe Energy Policy Forum
30 May 2017, Budapest

ENTSO-E : Implementing the 3rd Package

European Network Codes



REGIONS



TEN-YEAR NETWORK
DEVELOPMENT PLAN 2017

TYNDP 2017

MAIN REPORT

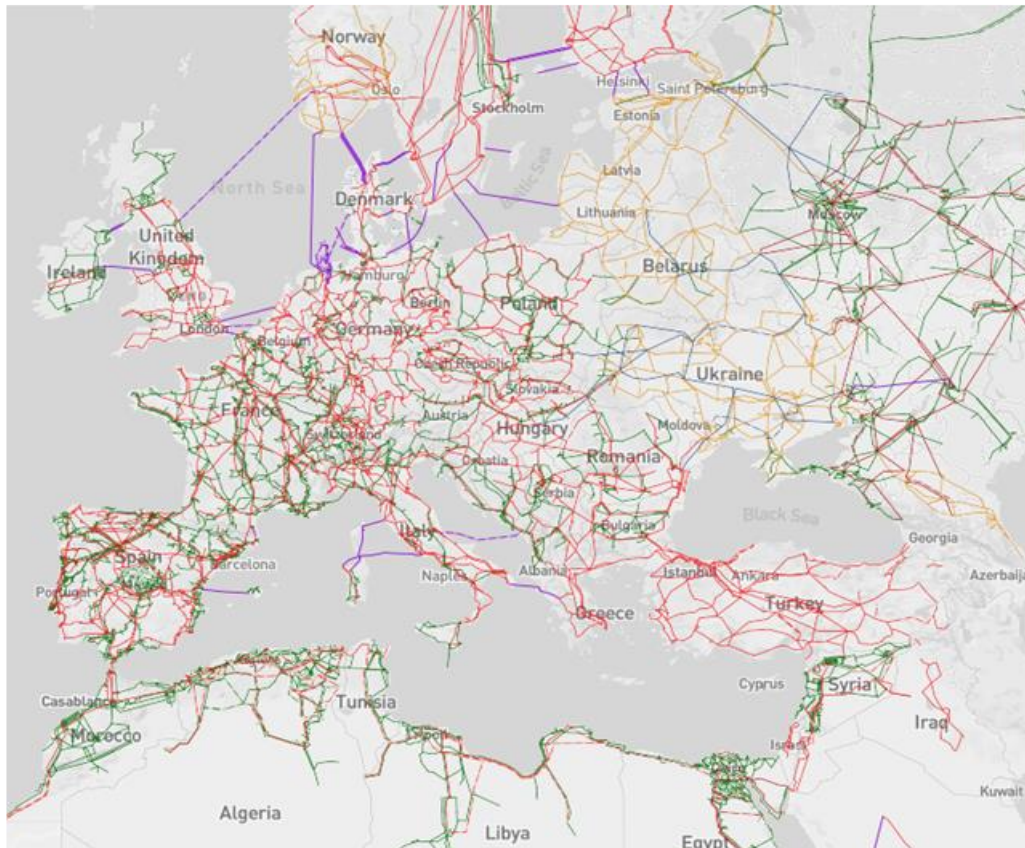
ENTSO – A FAIR
PARTNER TO ALL!

entsoe

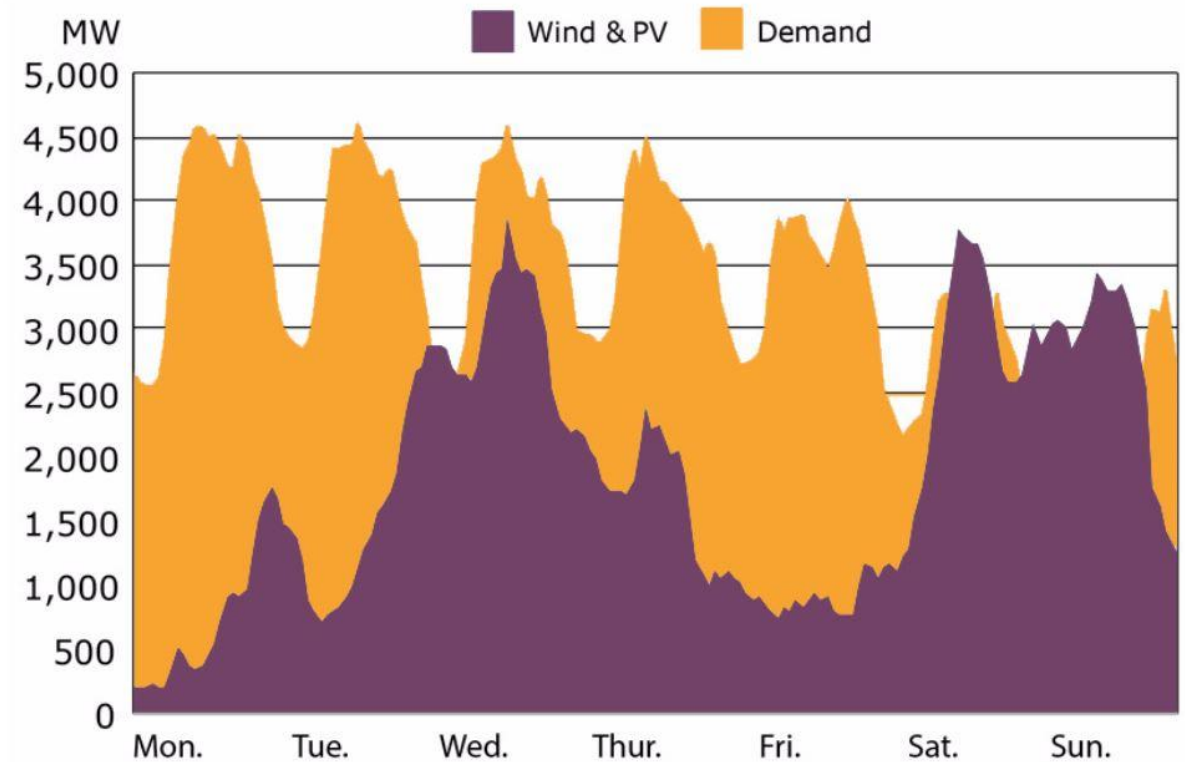
Mid-term Adequacy
Forecast @ a glance
2016 Edition

Growing complexity into Energy System Flexibility Management

Large Scale Interconnections



Distributed Energy Resources Integration



September 2016 in Denmark, one week
(source Energinet.dk)

Where are we today ?



Sustainability

- **260 GW** of RES connected
- **25 GW** in 2016
- **>10 GW** of EU demand side response



Competitiveness & Social Welfare

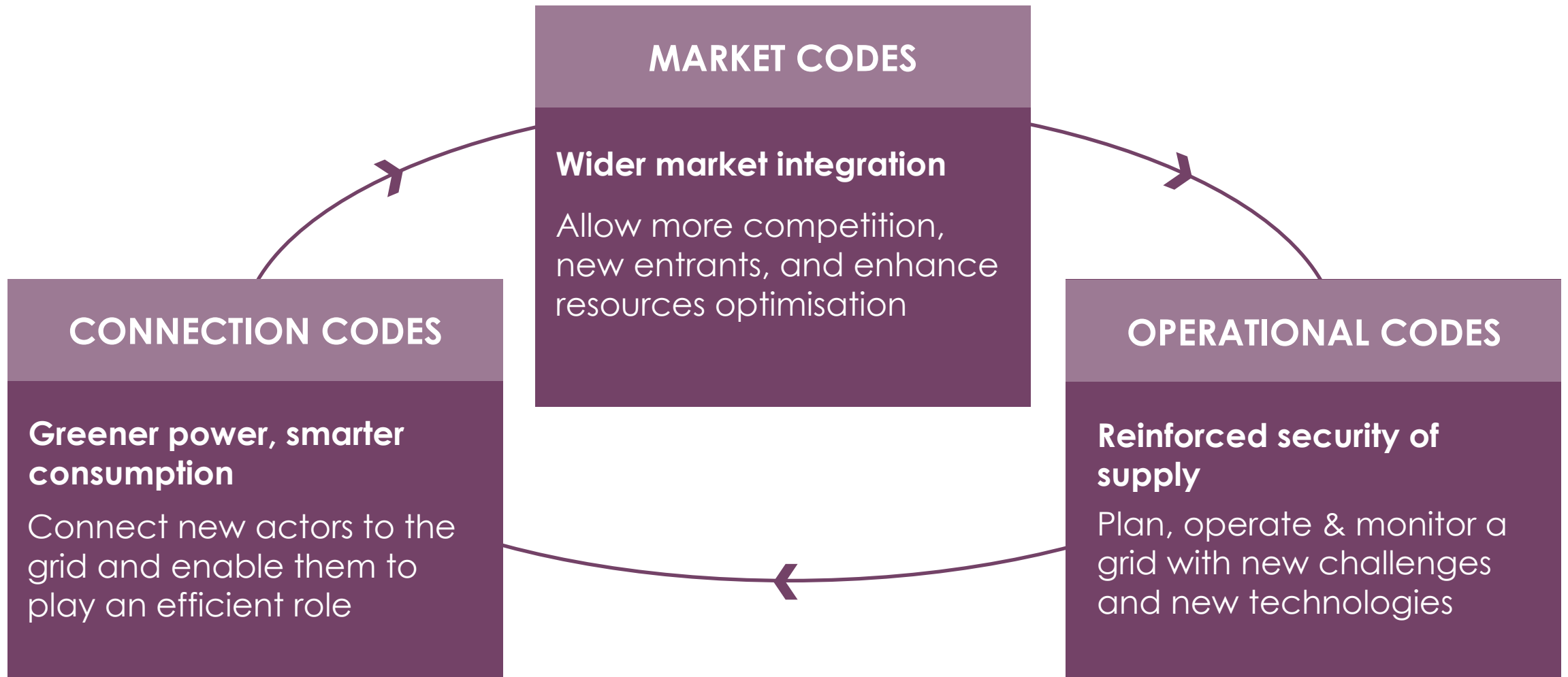
- **23 states** and **85%** of European consumption market coupled
- **10 million** data files made available yearly for **2500** daily users of ENTSO-E transparency platform



Security of supply

- **NO** multi-state interruptions recent years
- **Up to 300** coordinated tasks/day in a RSC
- **Hundreds** trained employees in TSCnet and Coreso programs

Striving for Pan European Grid & Market Operation harmonisation



Case #1: Promote wholesale markets

DAY-AHEAD MARKETS

- **1 B€** in social welfare
- **~100 M€/year** of benefits from flow-based in CWE
- **84%** efficient use of capacity given to the market
- **1500 TWh**(~50% of consumption) traded on exchanges



INTRADAY MARKETS

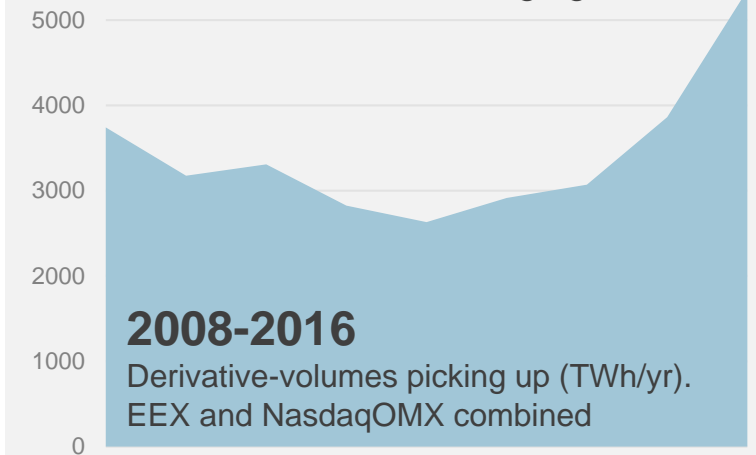
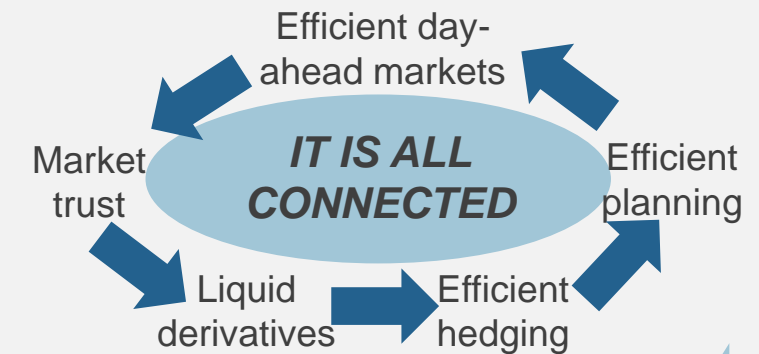
- **120 TWh** traded on main power exchanges in 2016
- **3,6%** average annual volume growth last 5 years

STATES WITH INTRADAY MARKETS

- ✓ **Continuous trading**
- ✓ **Auctions**
- ✓ **Interim solutions before EXBID**



DERIVATIVES MARKETS



Case #2: Update and integrate balancing markets

Annual benefits:

~ 220 M€

Replacement reserves in the Nordics since 2003

~ 260 M€

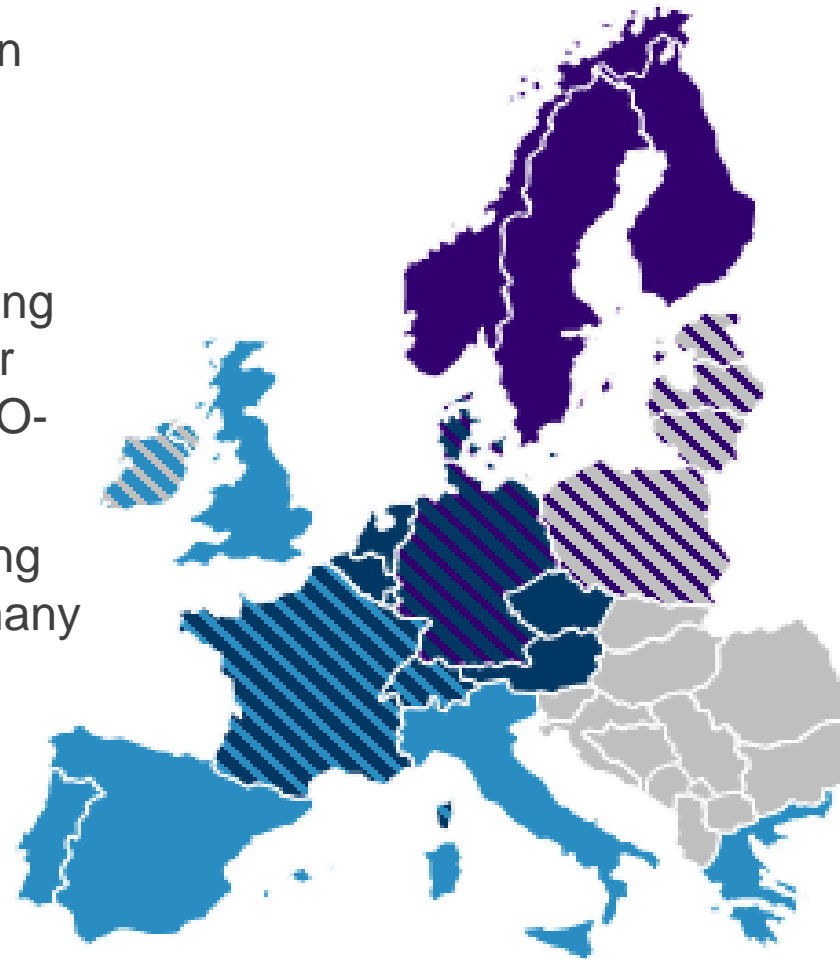
Common reserves, netting and common merit order implemented across TSO-areas in Germany

~ 80 M€

Pilot on imbalance netting within and around Germany (IGCC)

~ 120 M€

Pilot on replacement reserves across the Continent (TERRE)



*Theoretical benefits
of full integration of
balancing markets*

Up to 3 Bn€

Case #3: Secure operations with regional cooperation

Regional Security Coordinators:

1. Capacity calculation
2. Security analysis
3. Common grid model
4. Adequacy forecast
5. Outage planning

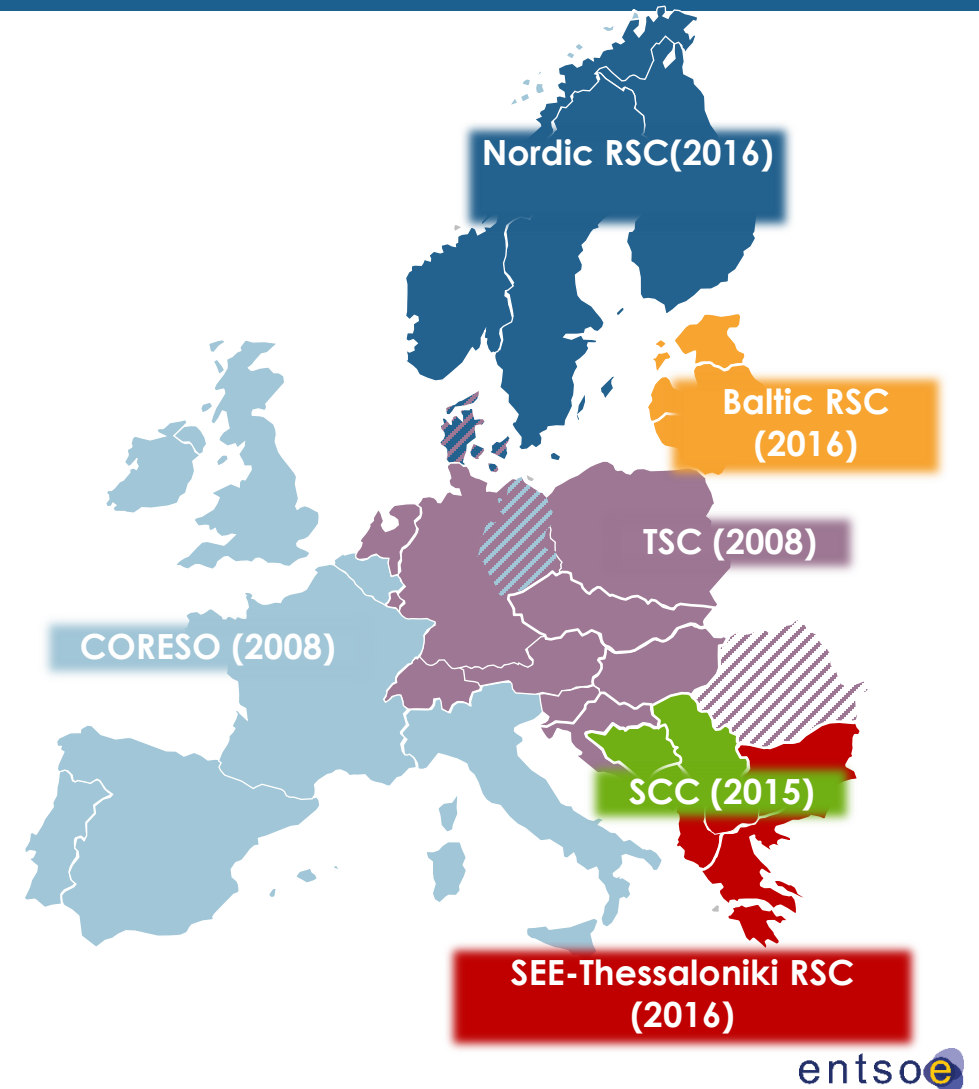
*partially operational
in CORESO and
TSCnet*



x7 potentially critical situations detected by CORESO with proposed solutions



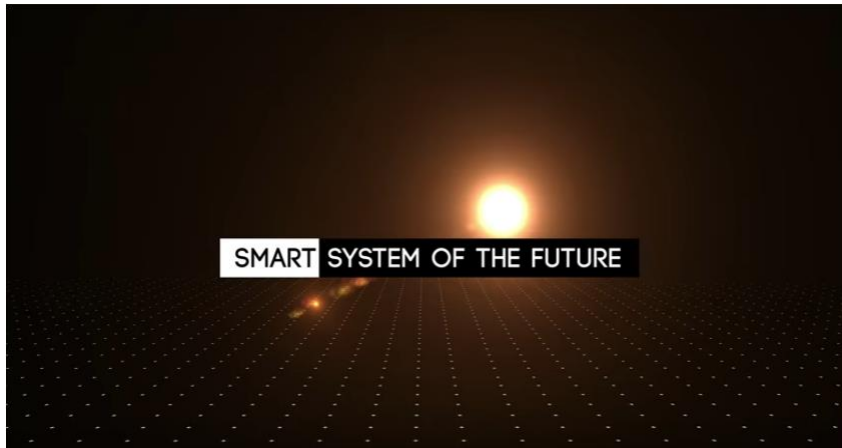
4000 remedial actions proposed/implemented/year in Coreso



New Strategic investments towards Digital



Energy Data Hubs & App Stores



New Generation Flow Based real-time markets



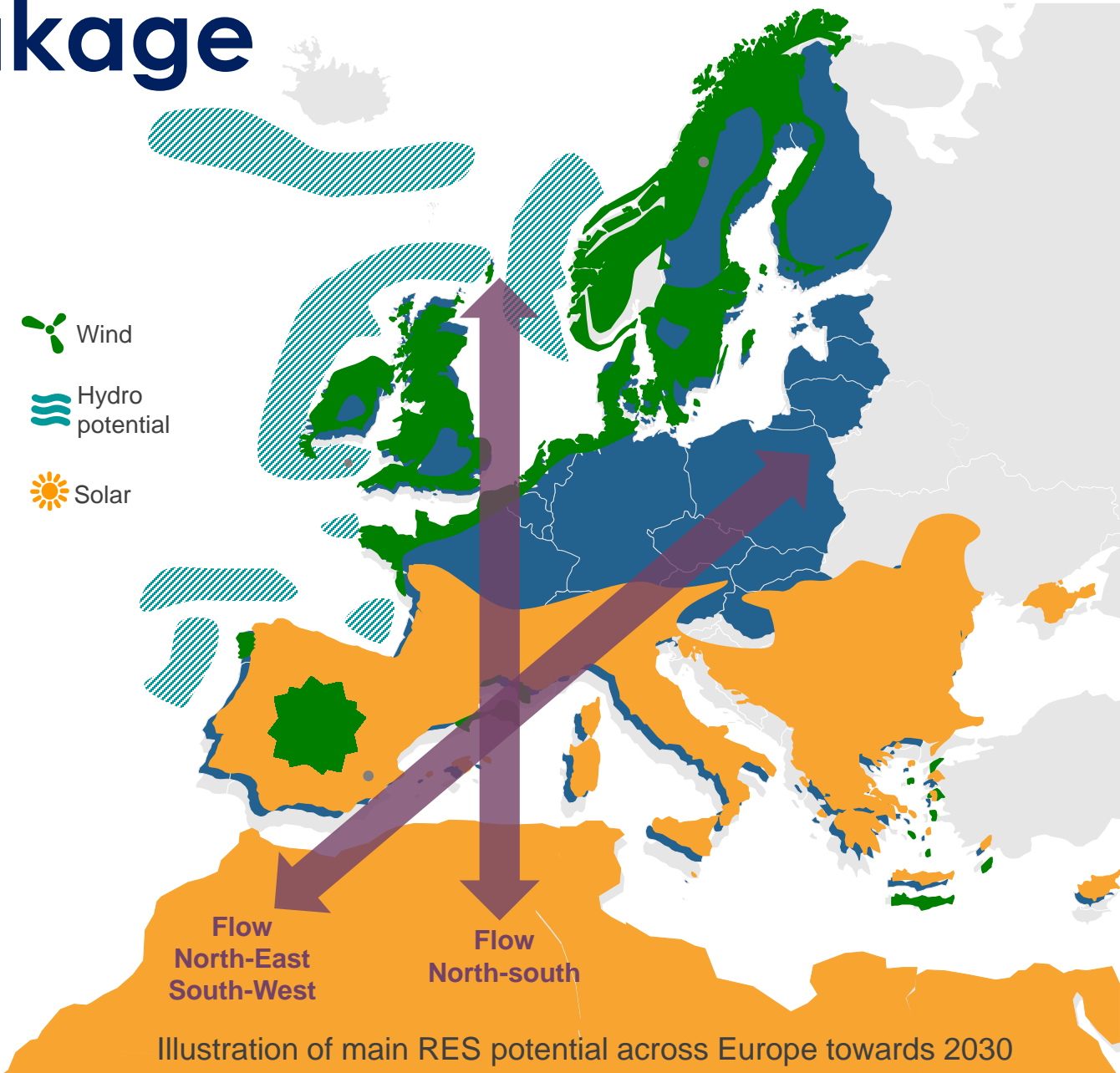
Reference Grid Architecture Model to support next Network Code deployments

What's after 2020 ? The Clean Energy Package

27% renewables by 2030 =
+/- 45% for the power system

Sector Coupling:

- Power
- Gas
- Transport

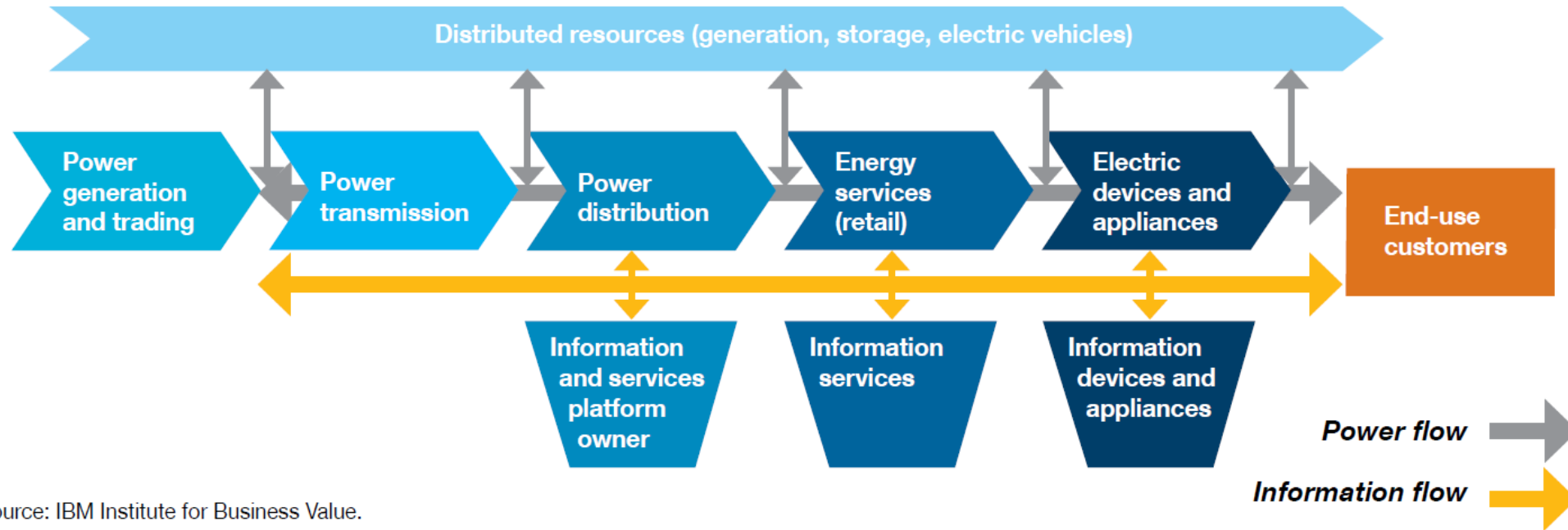


New Digital Energy Value Chain federation

Traditional electricity value chain



Emerging electricity value chain

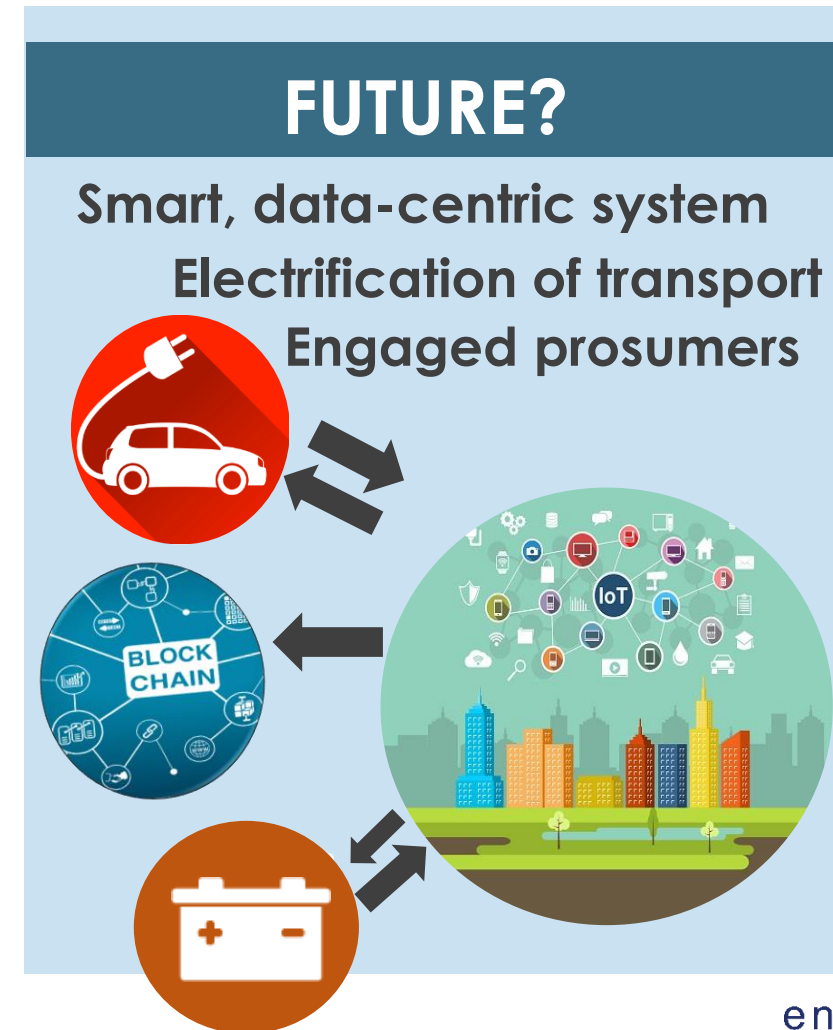
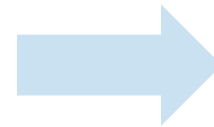


Source: IBM Institute for Business Value.

Figure 1: Traditional and emerging electricity value chain.

A new framework to address next European 4th Industrial Revolution

- Active customer
- Scarcity pricing
- Removal of price caps
- Easier supplier switching
- Risk preparedness framework
- European resource adequacy
- Ambitious Regional Cooperation



Prosumer value proposition becoming mainstream

Security of Supply



Lower bills



Climate protection



Interactive



New sector coupling



- Power with Gas / Combined Heat & Power
- Mobility with Power & Gas & Emission Trading
- TSO-DSO coupling
- Microgrid coupling at Gridedge through #Blockchain

THANK YOU FOR YOUR ATTENTION

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