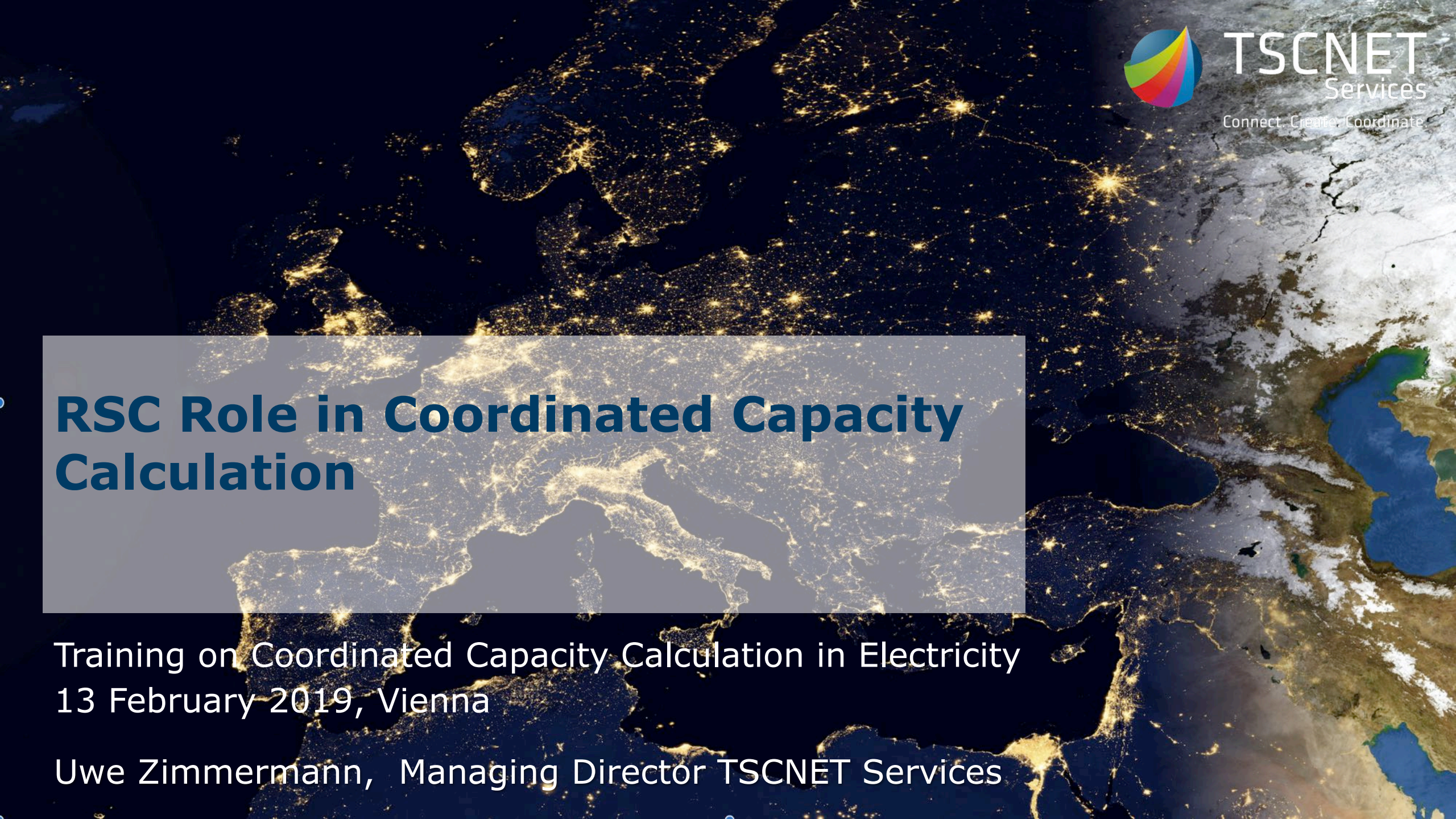


TSCNET Services
Connect. Create. Coordinate.

RSC Role in Coordinated Capacity Calculation

Training on Coordinated Capacity Calculation in Electricity
13 February 2019, Vienna

Uwe Zimmermann, Managing Director TSCNET Services

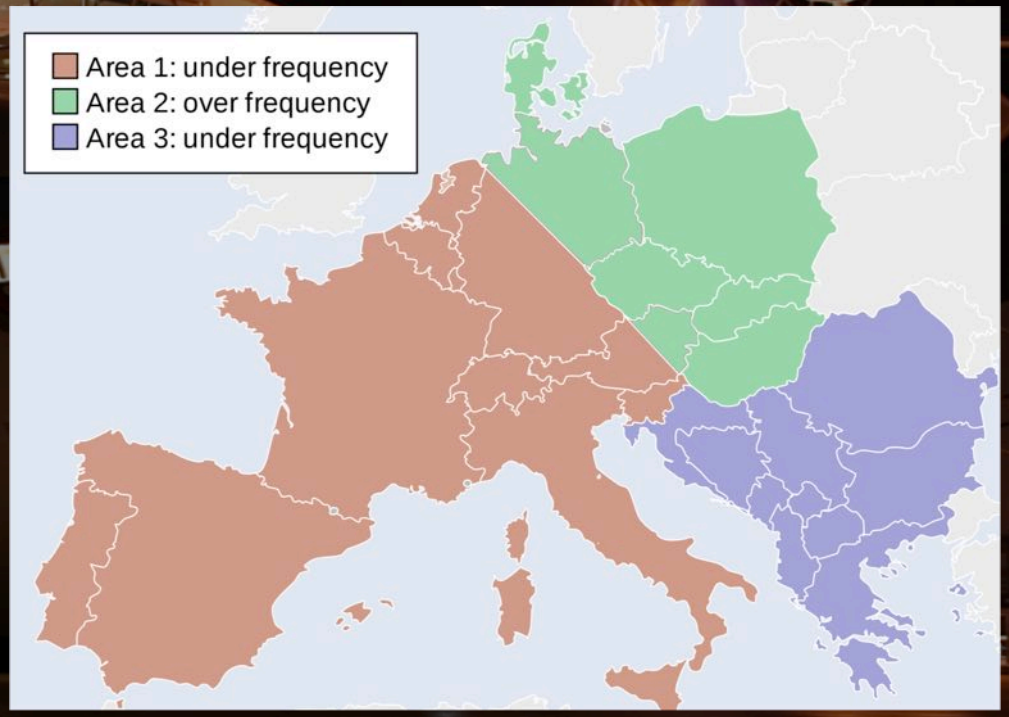
Why

Regional **S**ecurity **C**oordinator**s** –

have been created in Europe…

One of the reasons…

One of the reasons – Continental system split 04.11.2006

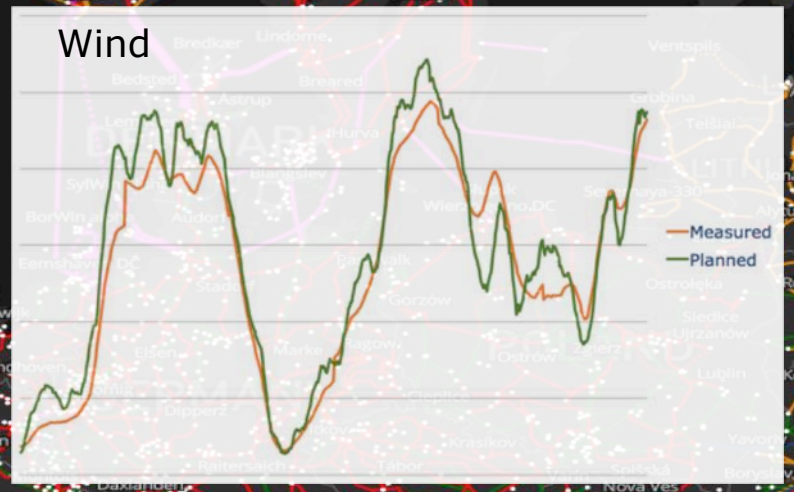


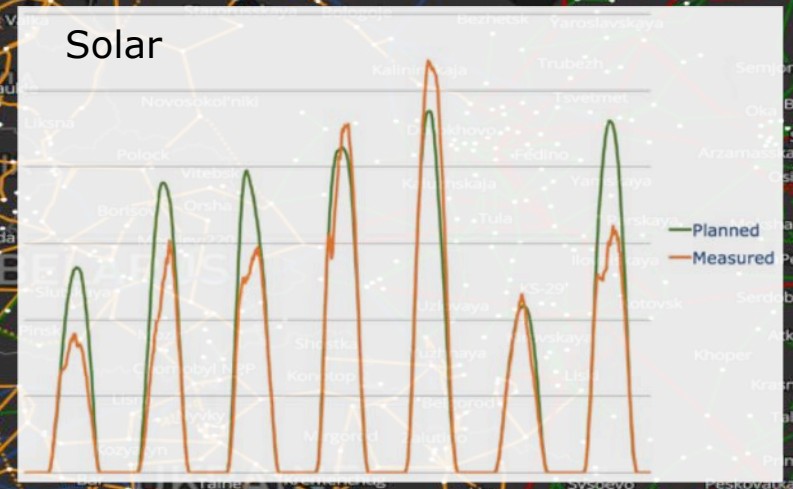
15 million European households affected by frequency drop!

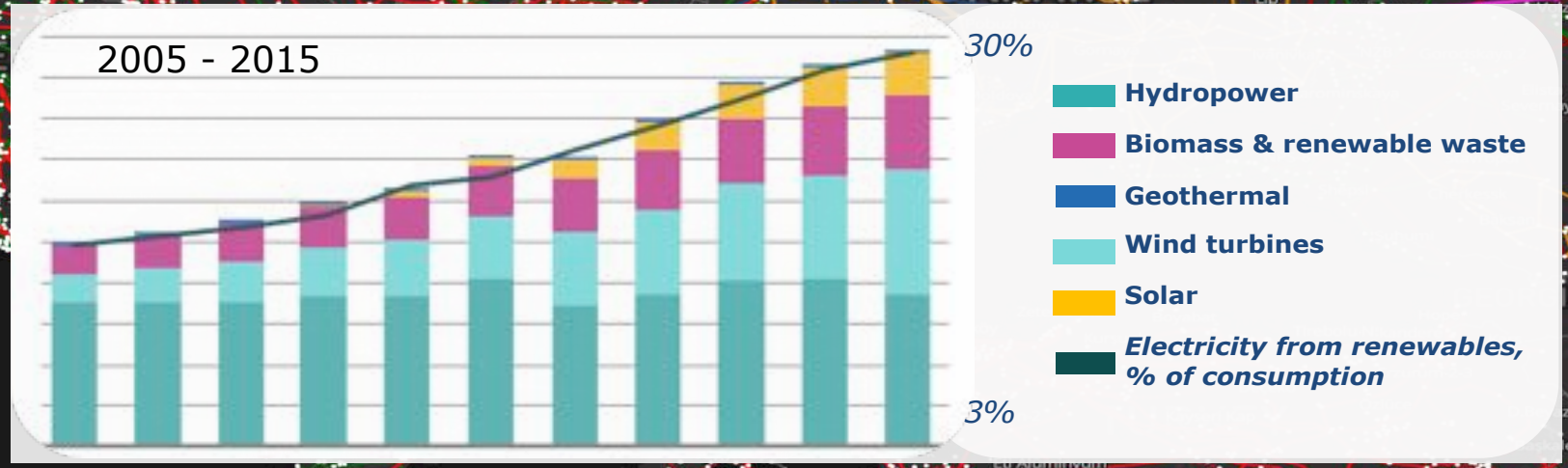
Security of Supply

Increase of electricity exchanges and their volatility by

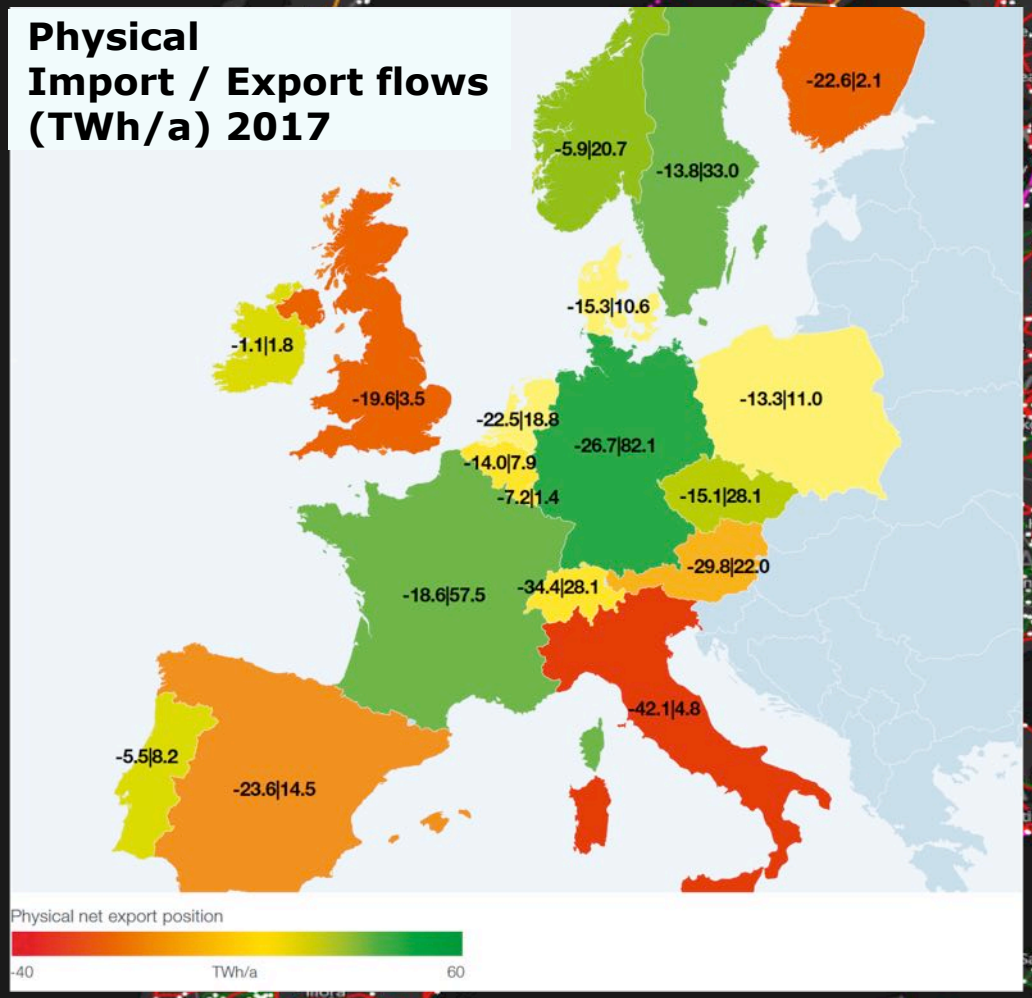
- Evolution of Internal Electricity Market
- Regional market integration
- Renewables integration
- Nuclear phase-out & decarbonization

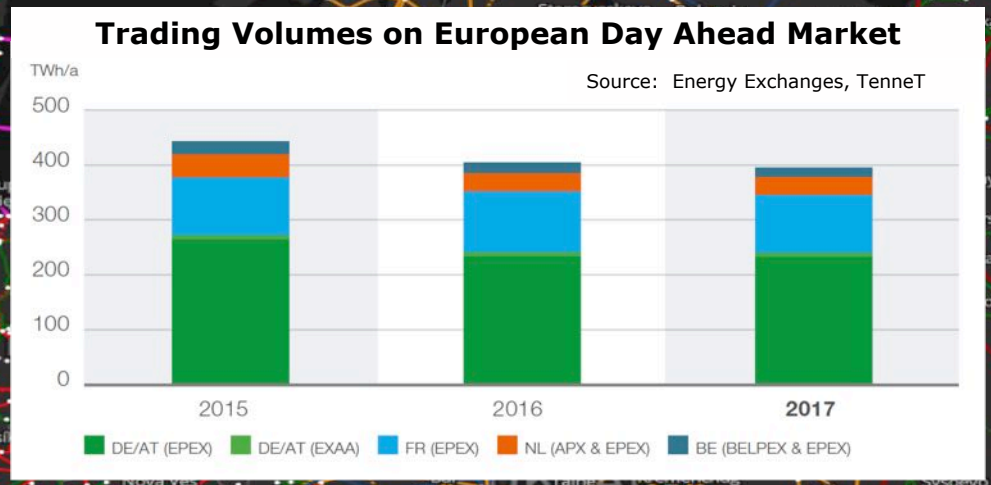


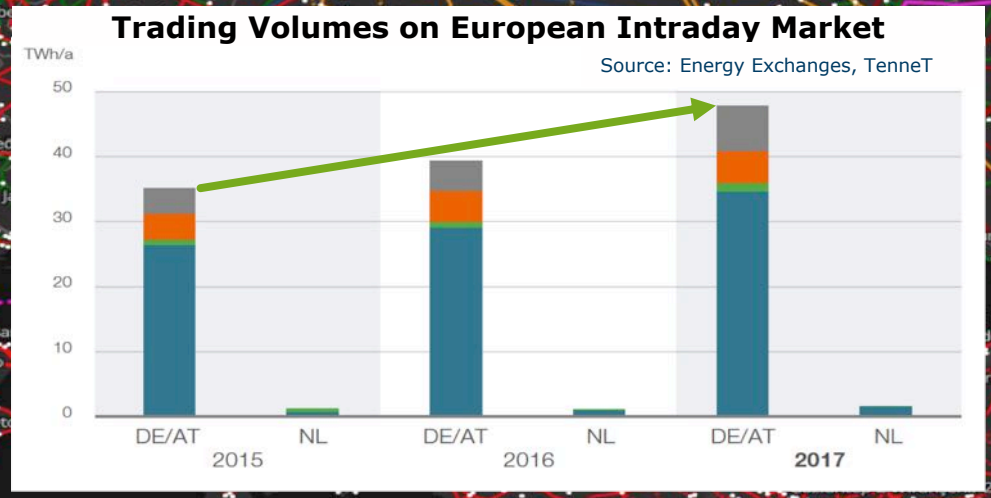




Electricity trading in Europe







Past Developments on Regional Coordination

- 04.11.2006 European System Split
- 2007 UCTE decision to improve TSO coordination
- 2008 Launch of the TSO Security Cooperation (TSC)
- 2013 Start of TSC Joint Office activities
- 2014 Foundation of TSCNET Service GmbH
- 2014 ENTSO-E: Future TSO Coordination for Europe
- 2016 ENTSO-E: MLA on the participation in RSC(I)
- 2015 - 17 Network Guidelines & Regional Security Coordinators

TSCNET Services - Facts & Figures

- Started as a TSO project in 2008
- Legal entity founded 2014, Munich
- Role of Regional Security Coordinator (RSC) and Coordinated Capacity Calculator
- 24/7 operation
- > 50 employees
- 15 TSO shareholders
- 12 countries & bidding zones
- > 120 GW connected renewables

What the RSCs are doing today

Foundation of RSCs

3rd EU Energy Package 2009

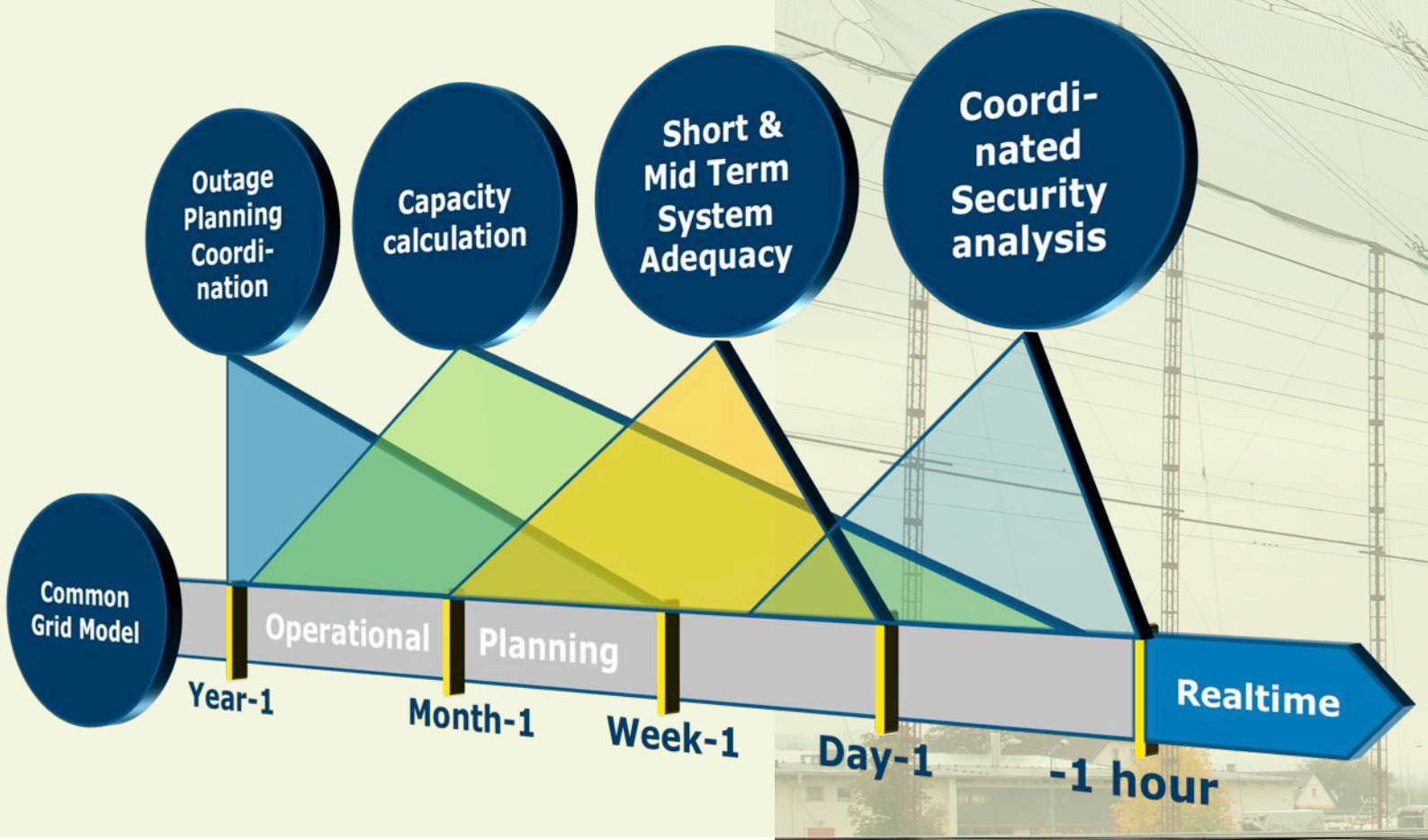
4 Network Codes - obligations on security coordination assigned to TSCNET

Clean Energy Package to set forth achievements on the level of Regional Coordination Centers

- Coordinated Security Analysis (CSA)
- Capacity Calculation (CC)
- Short & Medium Term Adequacy (SMTA)
- Outage Planning Coordination (OPC)
- Common Grid Model (CGM)
- Critical Grid Situation (CGS) & Emergency Restoration Coordination service (ER)

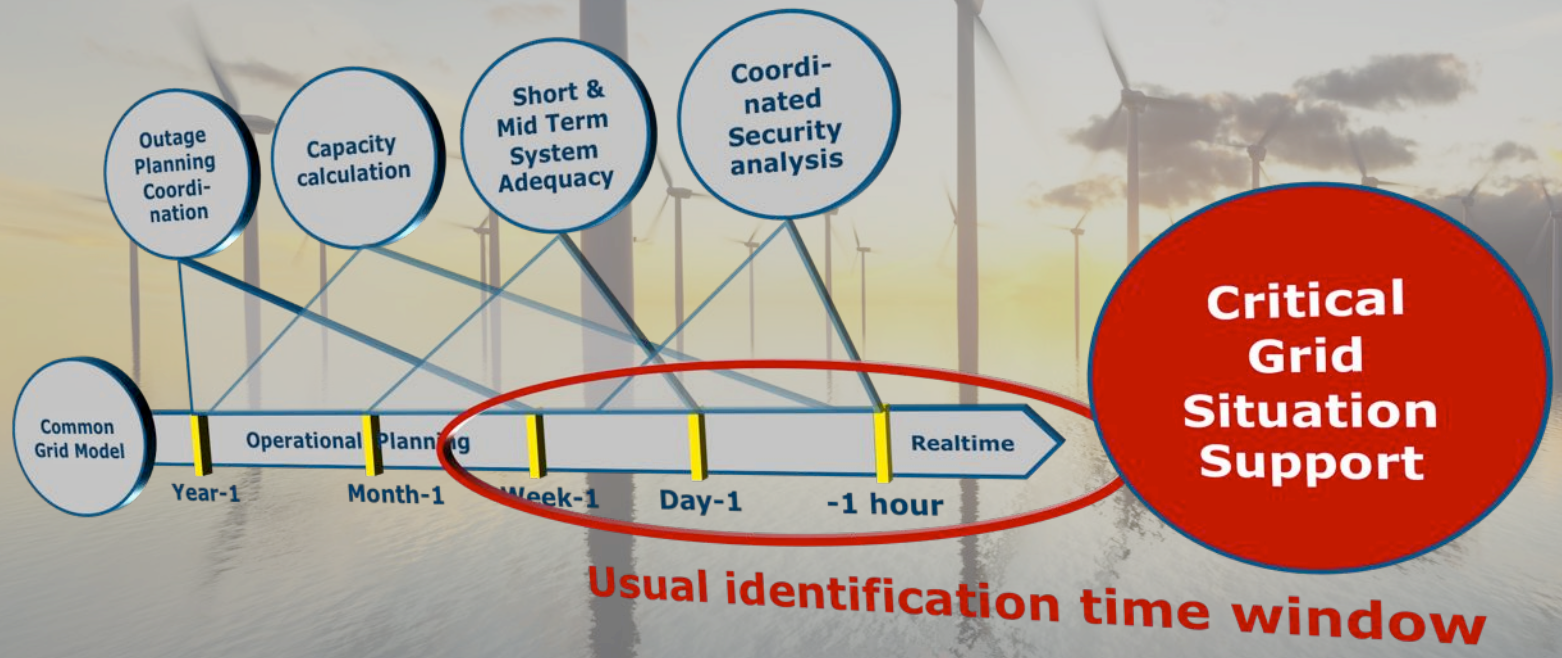
photo www.50hertz.com

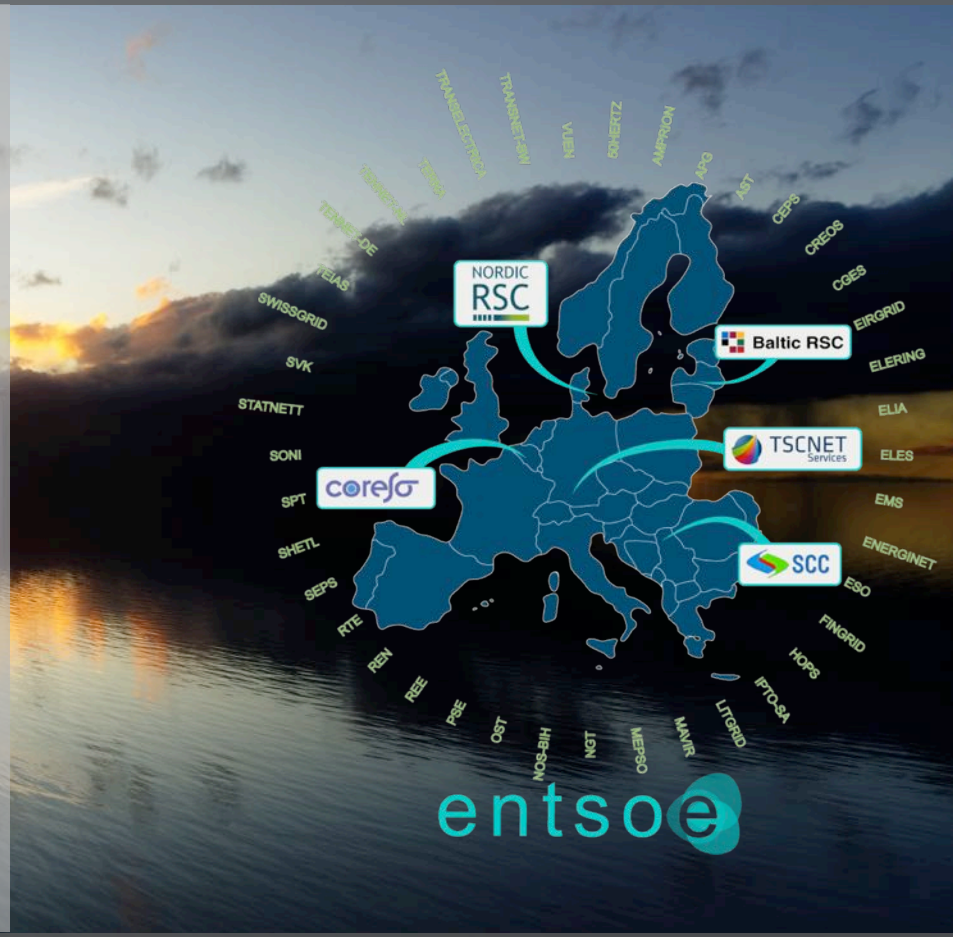
Linkage of operational RSC services



RSCs exclusively act in the non-realtime operational planning time frame.
All RSC services address the same electrical system and are not independent.

Critical Grid Situation Support





Significant deviations from forecast can lead to a Critical Grid Situation (CGS).
RSCs provide TSO support in escalation and solution management using results of all services.

European Regional Security Coordinators 2019

NORDIC RSC http://nordic-rsc.net/

Baltic RSC

TSCNET Services Connect. Create. Coordinate.

coreso

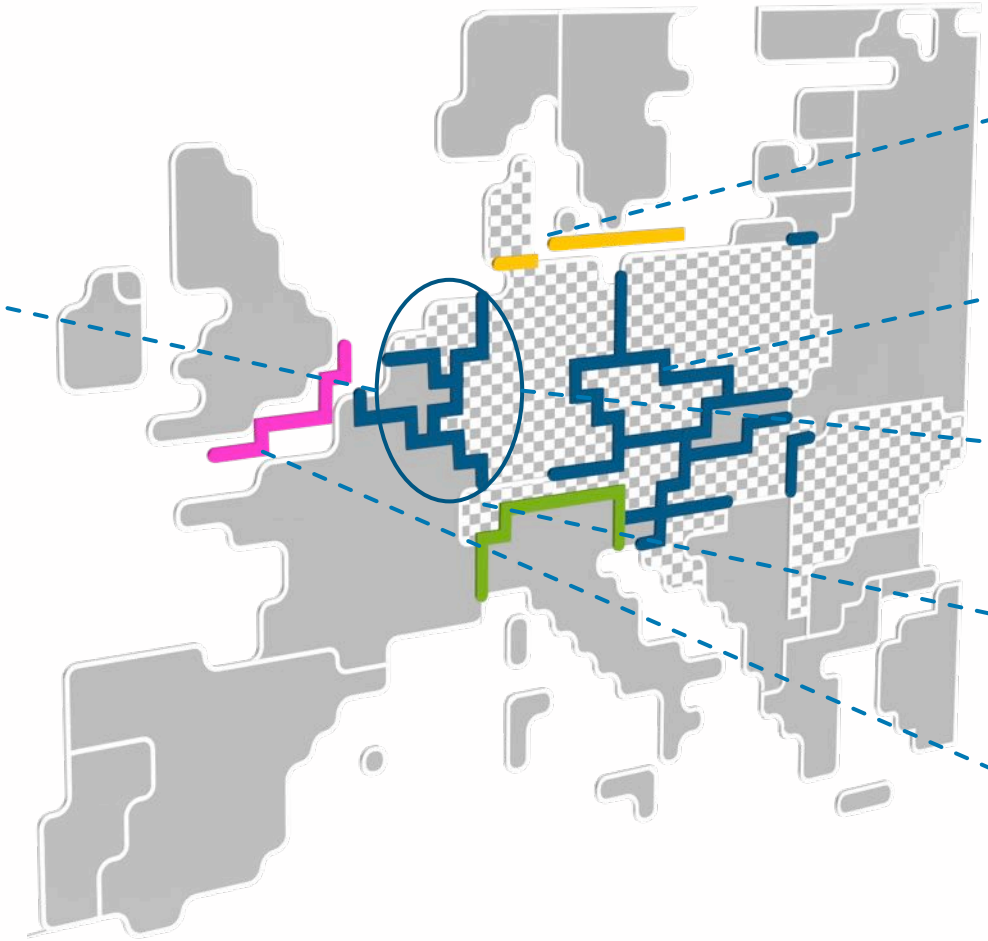
SCC

RSCs are cooperating with each other

TSCNET Activity Areas

CWE Flow-based Capacity Calc.

TSO Security Cooperation



CCR HANSA

CCR CORE

CWE (formally no CCR)

CCR ITALY North

CCR CHANNEL

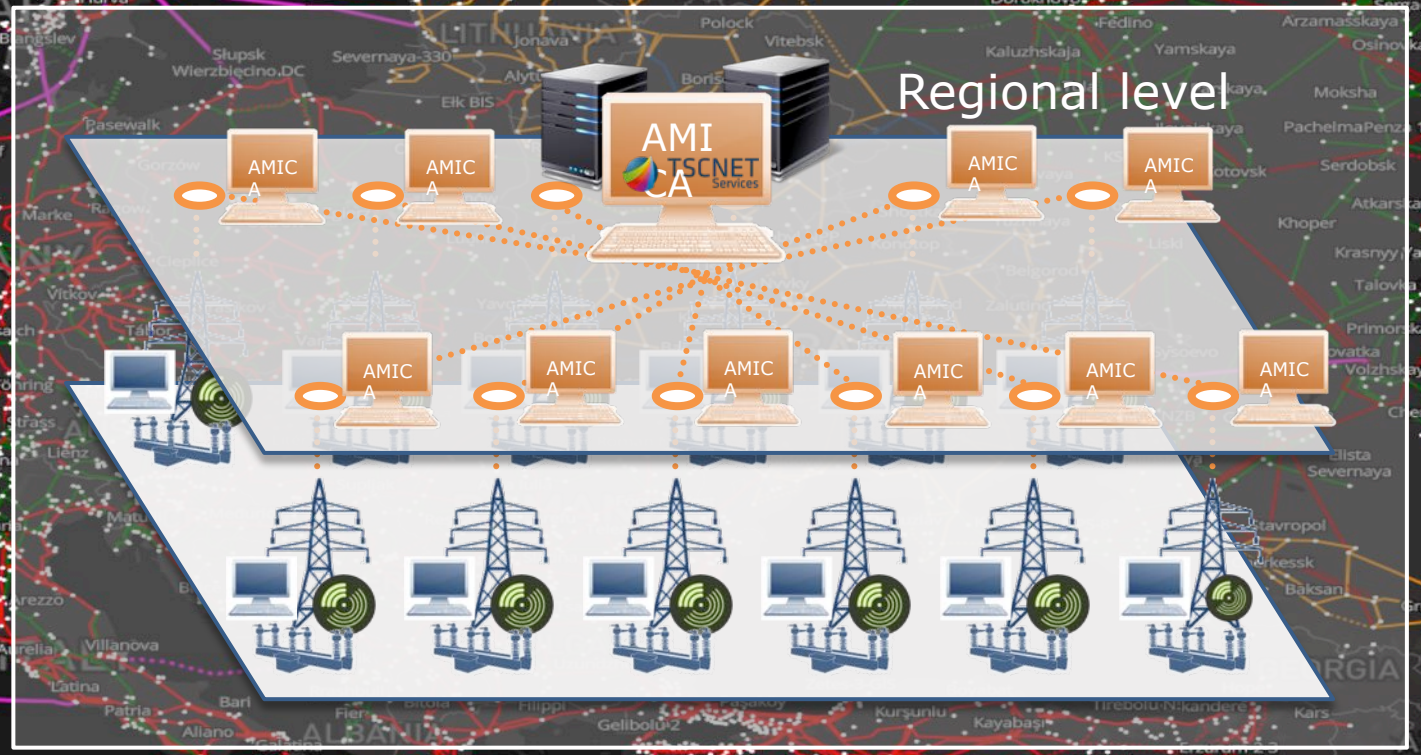
Service is **live**

Services under development

Actual Security Coordination between TSCNET & TSC TSOs

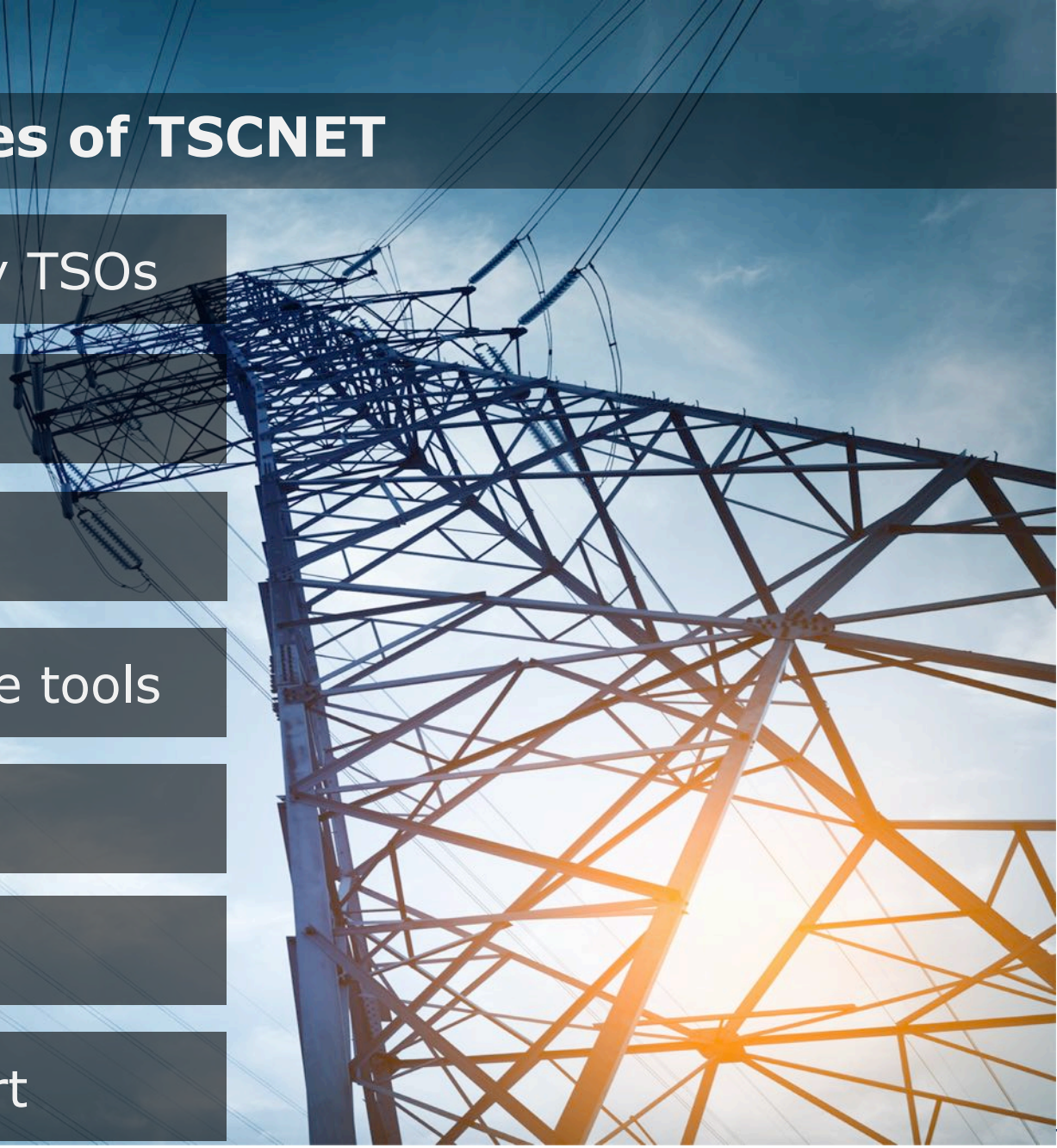
Common tool for data exchange and security assessment (AMICA)

- **27** TSOs' networks
- **24** Continental European countries
- **31,000 elements**, 16,900 monitored
- **7250** contingency scenarios per timestamp
- Full **integration in TSO control rooms**
- **Hourly rolling forecast**
- Connected day and night - **24/7**



Core competences of TSCNET

- Implementation of methodologies defined by TSOs
- Development of software tools
- Design of RSC-RSC and RSC-TSO processes
- Design & operation of IT solutions & software tools
- Analytical support, quality management
- Optimization & forecasting concepts
- 24/7 service operations, service level support



Capacity Calculation Implementation in Continental CCRs

APPROACH

Legally governed by CACM & FCA GL

Input data delivered by TSOs

Methodologies drafted by TSOs

Processes aligned between TSOs and RSCs

Solutions implemented by RSCs

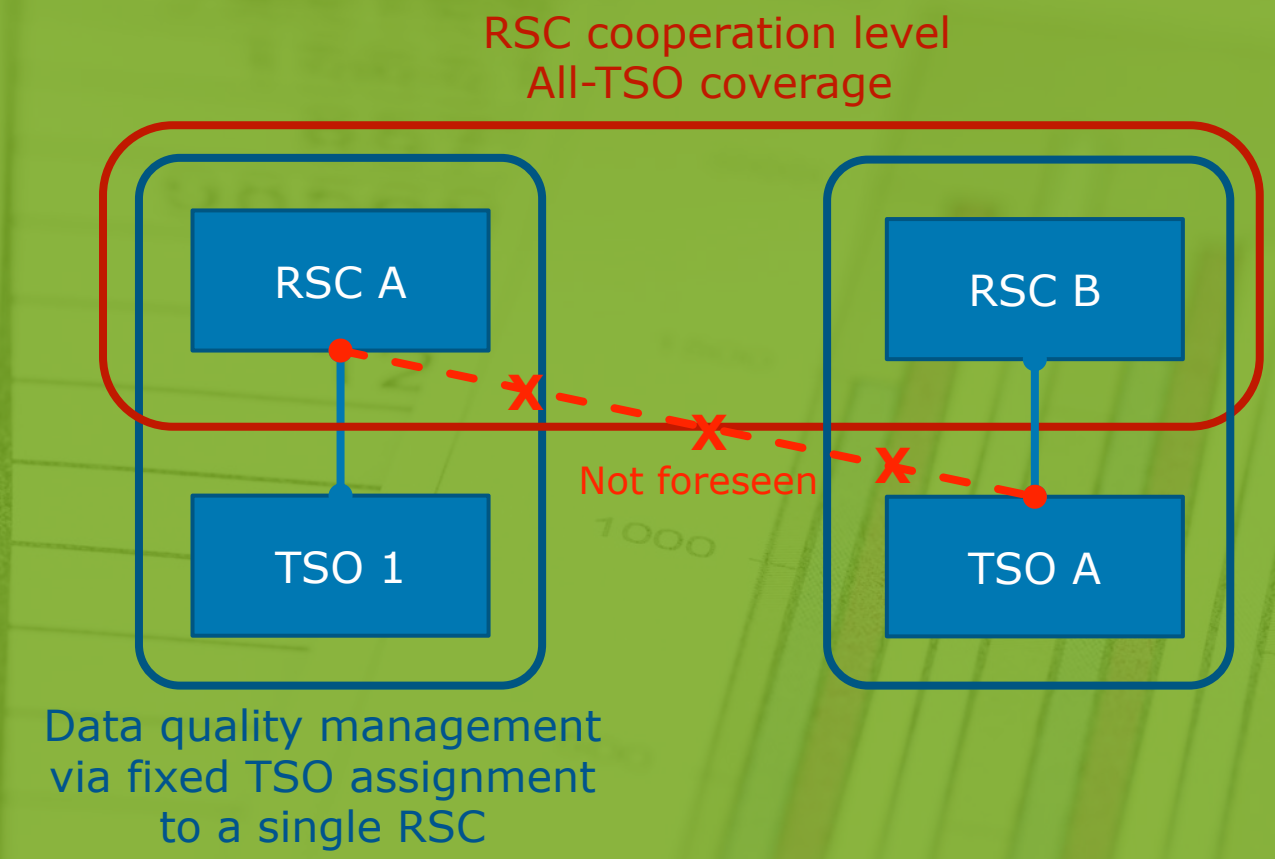
Consultation by NRAs

Experimentations in regular mode

Regulatory approval by NRAs

Operations by RSCs

Operation with 2 RSCs



TSCNET Solution for Capacity Calculation (1)

PERUN

Day-ahead Flow-based Capacity Calculation

Integrated solution for CGM merging, Remedial Action Optimization and Capacity Calculation, minRAM application, CNEC selection

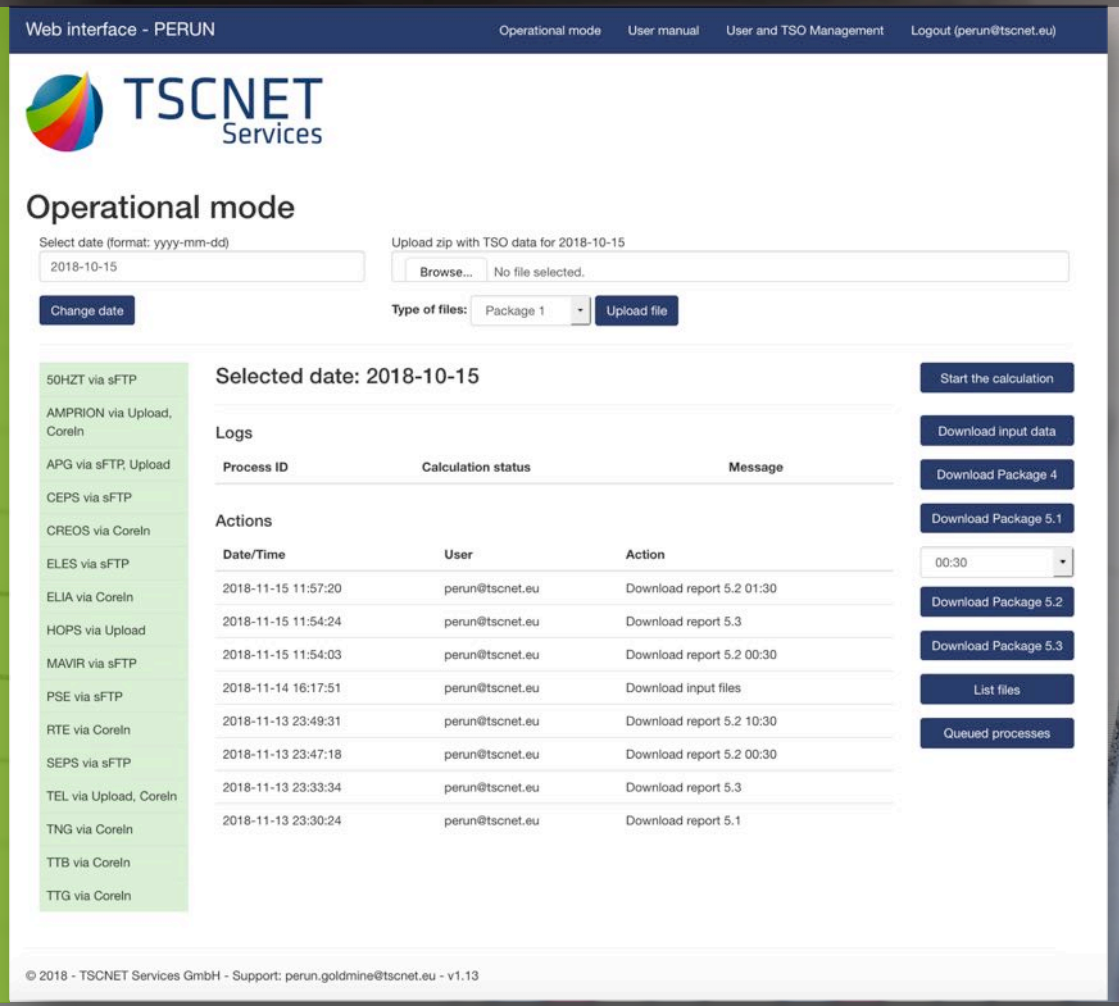
Modular & highly adaptable approach
Integration with tools of other RSCs

Fully automatic

Multi-user site platform for RSCs and TSOs

Secure web interface encrypted (HTTPs/ SSL)

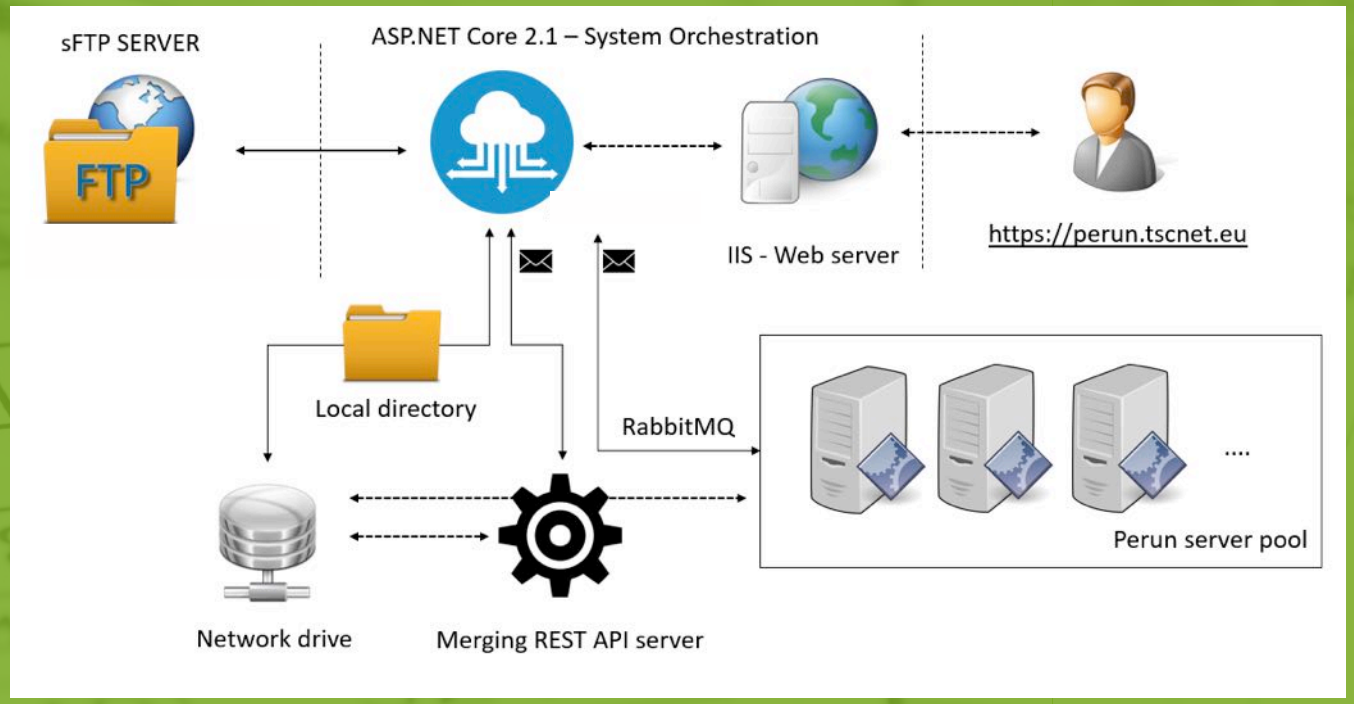
100% ownership of source code by TSCNET



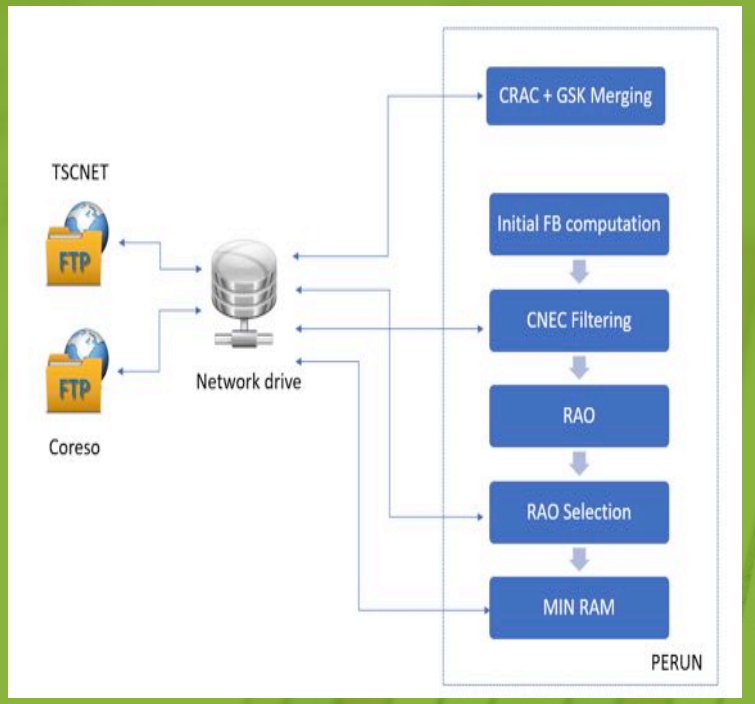
The solution is highly adaptable basis for the experimentation in CORE CCR.

TSCNET Solution for Capacity Calculation (2)

PERUN



Architecture



Data exchange overview

The solution is accessible by TSOs and RSCs.

TSCNET Solution for Capacity Calculation (3)

VESNA

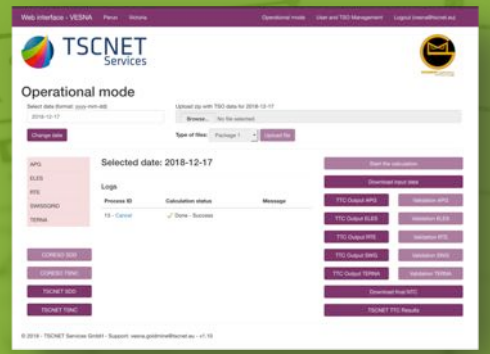
Intraday coordinated NTC Capacity Calculation

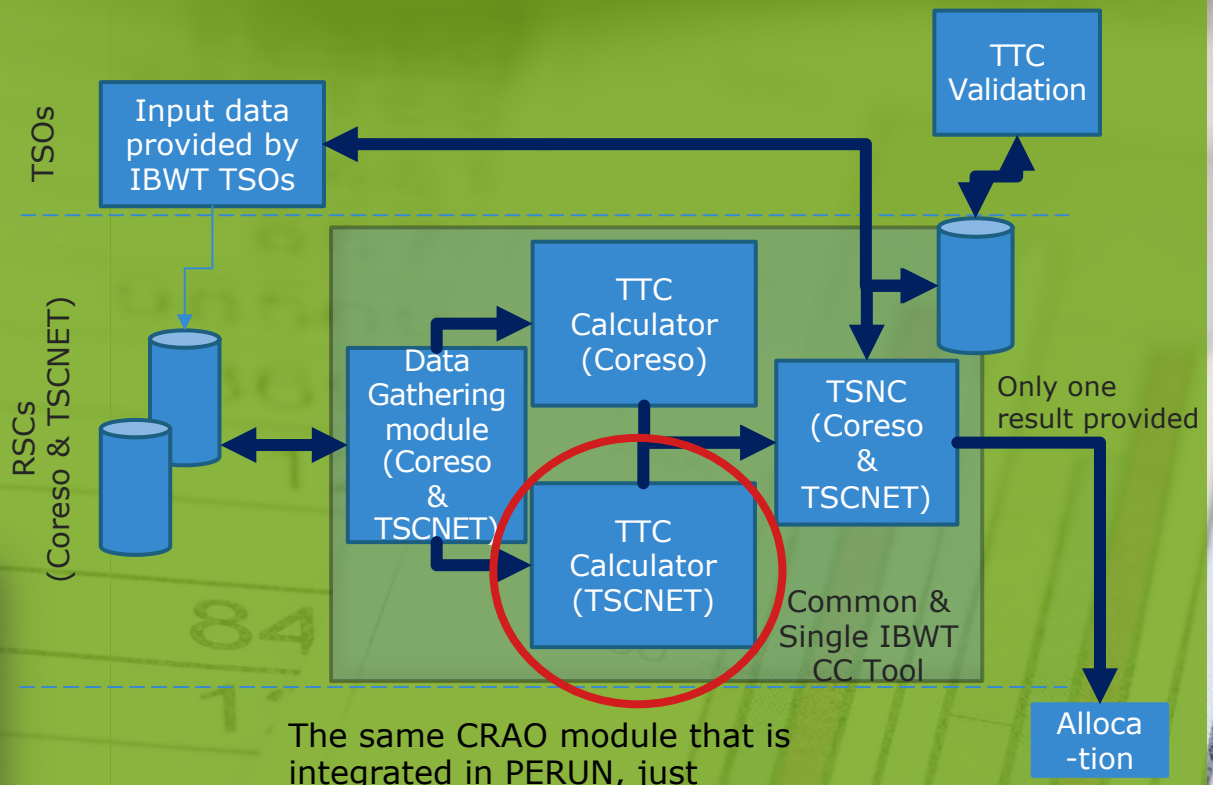
Status: internal parallel run

Shares PERUN modules

Integration with tools of other RSCs

Fully automatic





The same CRAO module that is integrated in PERUN, just localize for IBWT to cover regional specifics.

The solution is basis for the experimentation in CCR Italy North (IBWT).

TSCNET Solution for Capacity Calculation (4)

VICTORIA

Long-term Capacity Calculation

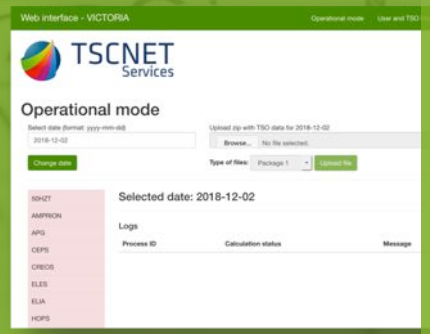
Coordinated NTC calculation

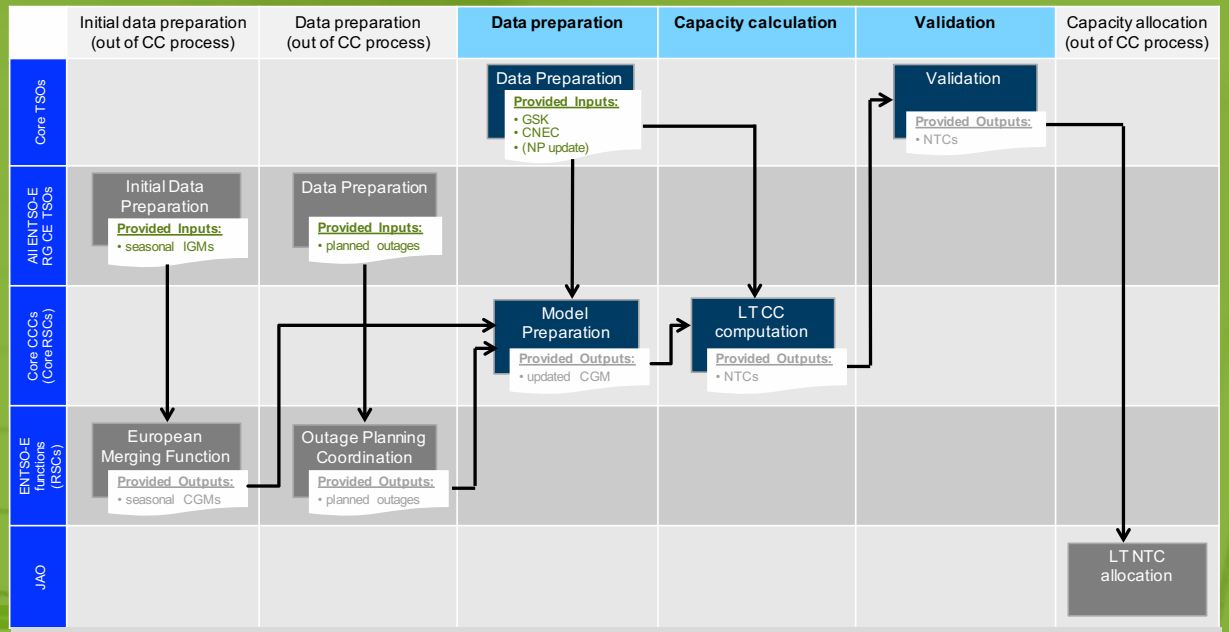
Status: robust experimentation

Based on modules and architecture of PERUN, module for TSO validation

Considers long-term scenarios according to FCA GL

Fully automatic





Default scenarios (i.e. CGMs, according to CGMM Art. 3):

winter peak	spring peak	summer peak	autumn peak
winter valley	spring valley	summer valley	autumn valley

\+ Add planned outages (from OPC) to the respective default scenario

The solution is applied for the experimentation in CORE CCR.

TSCNET Solution for Capacity Calculation (5)

EXPERIENCES

Only a central capacity calculation for one CCR including all bidding zone borders is acceptable as it provides for both, maximization and simultaneous feasibility of capacities

Each CCR has different historical background of capacity allocation

CCRs have different needs due to structural and market situation

Methodological approaches are actually different

Flexibility of tool setting and tool chain is key for efficient experimentation support of TSOs

Modularization of software tools is key but no industry standard is yet available

New solutions are required for highly performant Remedial Action Optimization with complex optimization requirements

The solution is applied for the experimentation in CORE CCR.

Resources Employed @ TSCNET

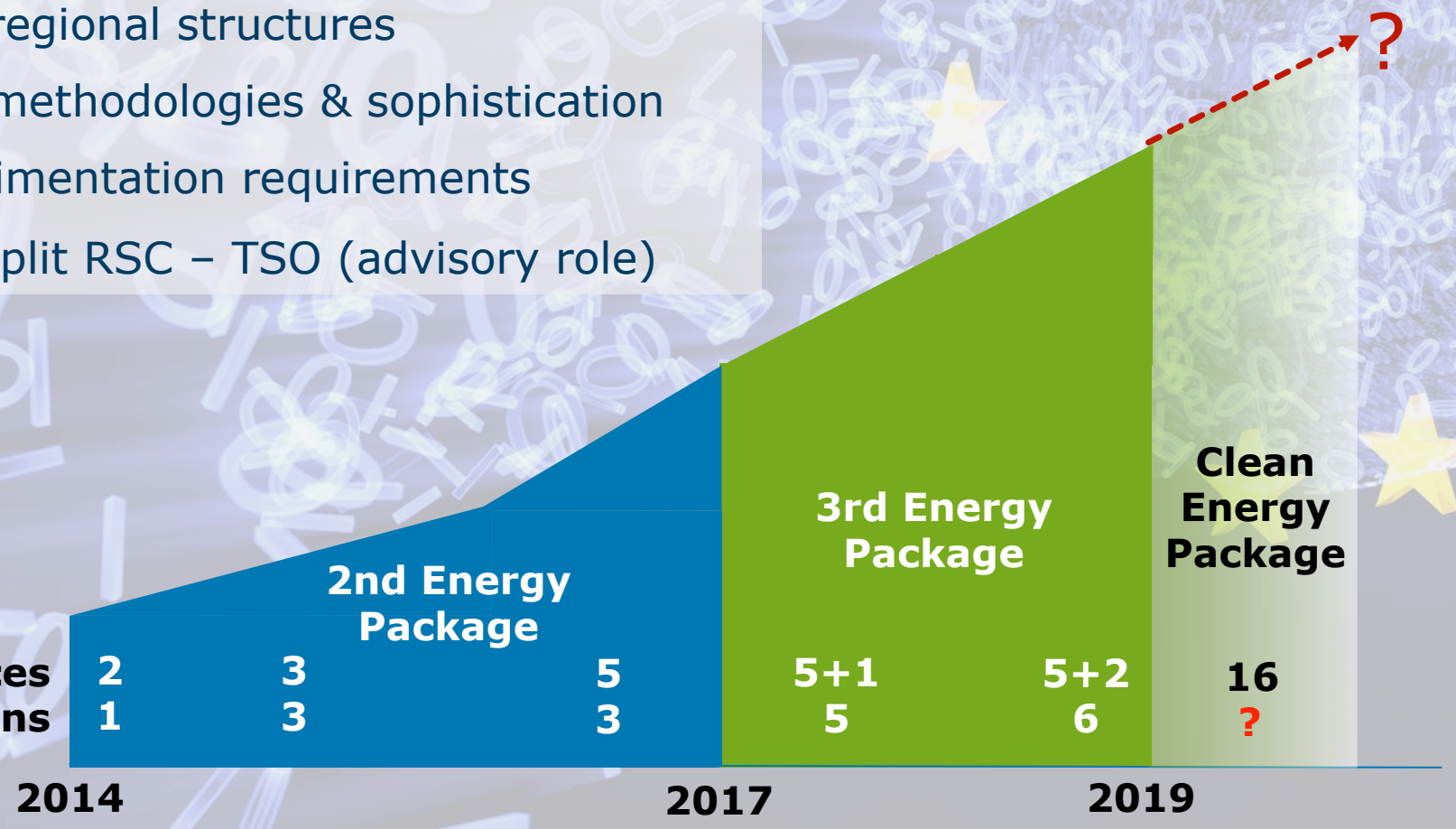
CHALLENGES

NEW regional structures

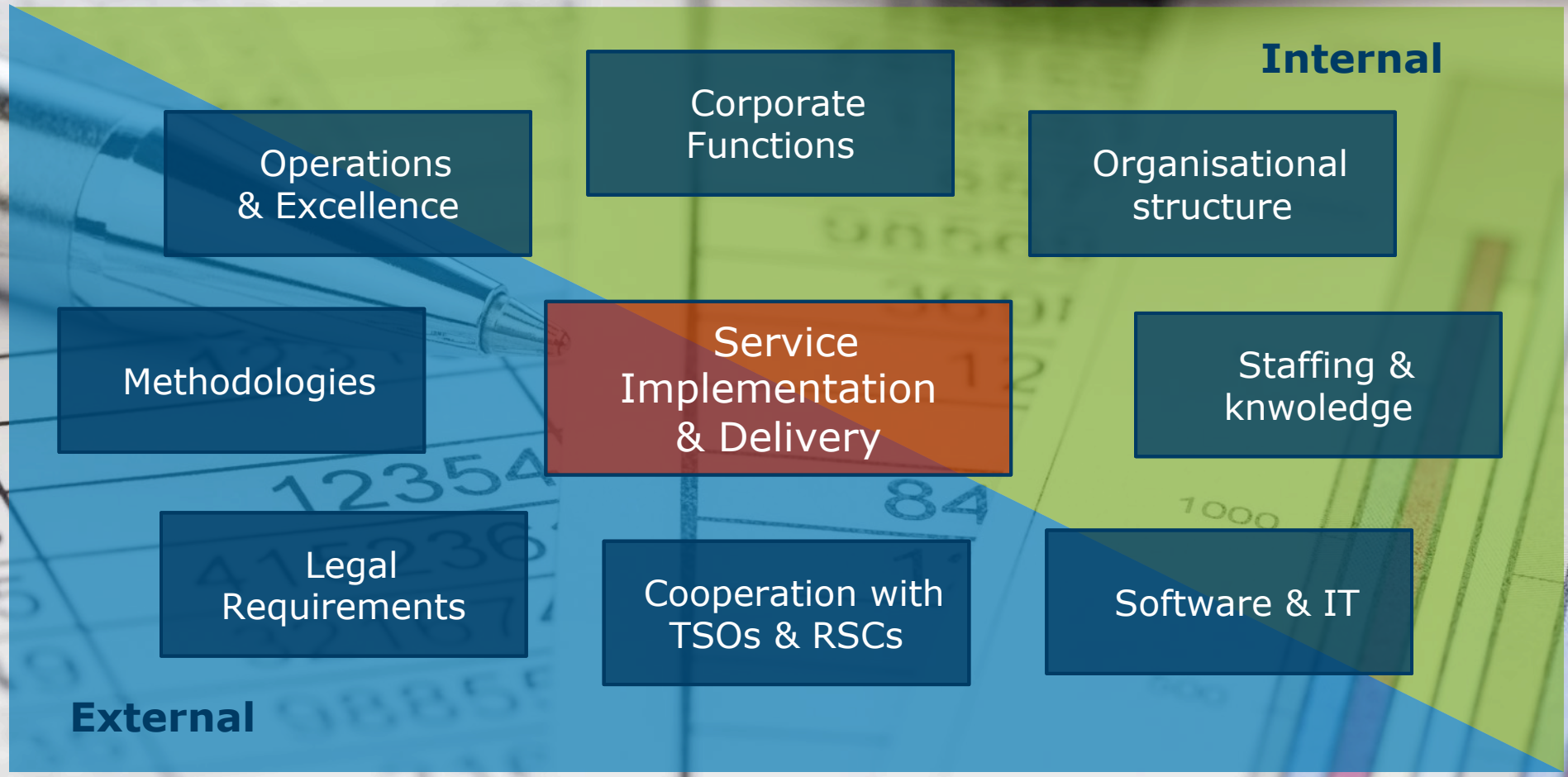
NEW methodologies & sophistication

Experimentation requirements

Role split RSC – TSO (advisory role)



Corporate Challenges from Activity Growth



Tranformation of young and small company into a professional service operator.

Governance Model

Customers

TSO Security Cooperation

Capacity Calculation Region

Service Level Agreements

Corporation & Shareholders

Corporate Bodies

TSCNET Services


TSCNET
Services
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