Southeast Electricity Network Coordination Centre (SEleNe-CC)

The Regional Coordination Centre (RCC) for SEE

Dr. Stelios Kromlidis
Director of Operational Business Department

20 June 2024

Outline of the Presentation

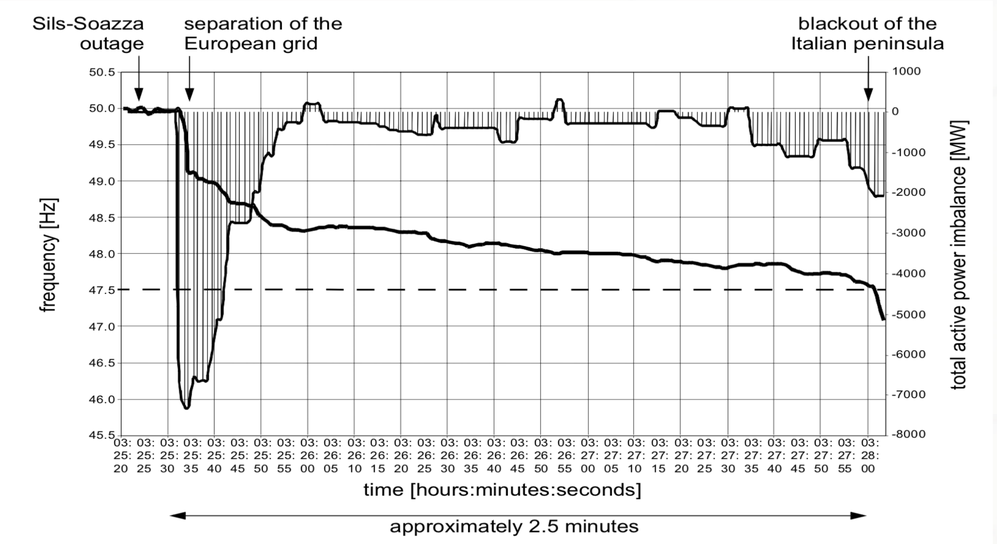
- Regional Coordination Centres (RCCs) – Why do we need them?

  (Significant Blackout cases that led to their creation)
- RCCs in Europe
- What is the role of the RCCs
- The Southeast Electricity Network Coordination Centre (SEleNe-CC)
- Provided Services

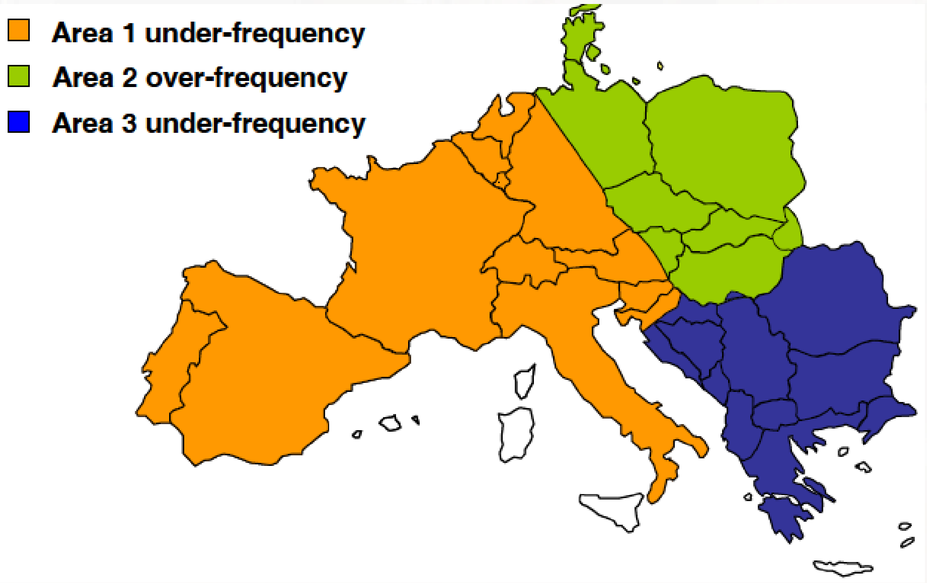
SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

New Regional Coordination Structures
Main triggering events

- **28th September 2003: Black-out in Italy**
- At 03:01. Italy imports bulk power (mainly from Switzerland)
- Cascading disconnection north interconnectors due to a SC (loading was 85%) with **€1.2 billion worth of damages**



- **4th November 2006: The worst incident in Europe**
- at 21:38 a series of unfortunate events led to the separation of the European network into 3 parts
- The event led TSOs to closer cooperation and relevant measures

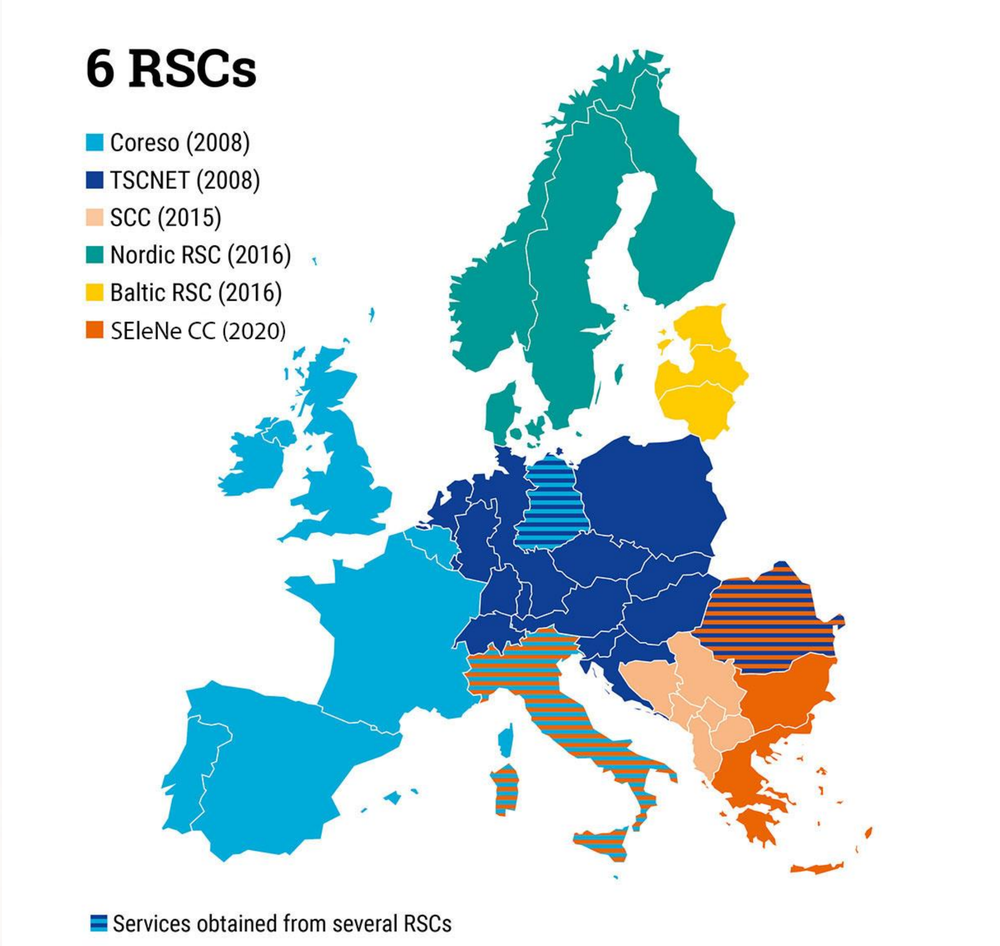


SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

RCCs in Europe

- **SEleNe-CC is the last Coordination Centre to be established in May 2020.**

- Coreso (2008), located in Brussels
- TSCNET (2008), located in München
- SCC (2015), located in Belgrade
- Nordic (2016), located in Copenhagen
- Baltic (2016), located in Talin, Riga, and Vilnious
- SEleNe-CC (2020), located in Thessaloniki



SEleNe CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

The Role of RCCs

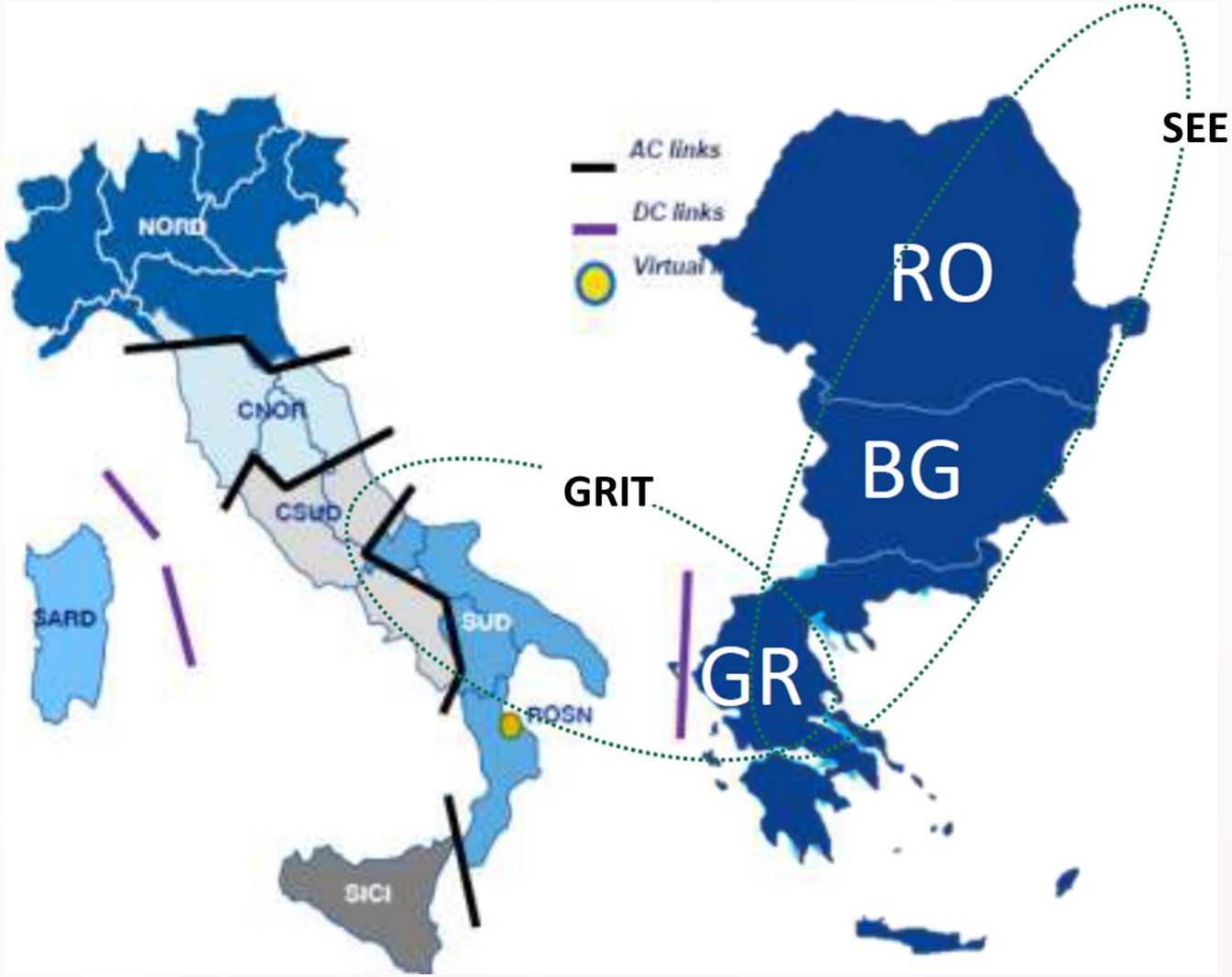
- **Integration of renewable sources** (intermittency)
- **Increase in cross-border exchanges** (predictability)
- **RCCs coordinate high-voltage electricity flows** (for the TSOs)
- This has to be done whilst **safeguarding security**
- And **with transparency** (for the markets and consumers)
- **RCC activities consist in performing analyses, recommending and coordinating solutions (both in the short and long term) for TSOs in different areas in Europe**

The Southeast Electricity Network Coordination Centre

SELENE-CC serves the TSOs of:

- Bulgaria (ESO-EAD)
- Greece (IPTO)
- Italy (Terna)
- Romania (Transelectrica)

- Shareholders: ESO-EAD, IPTO and TERNA (33,33% each)
- 24 highly qualified employees
- 24h/365d continuous operation
- **Esperia:** subsidiary for Italy and GR-IT based in Rome



SELENE-CC became a RCC on 01/07/2022

Services Provided by SELENE-CC

1. ***Common European grid model delivery*** *(Individual Grid Models from TSOs → Common Grid Model)*

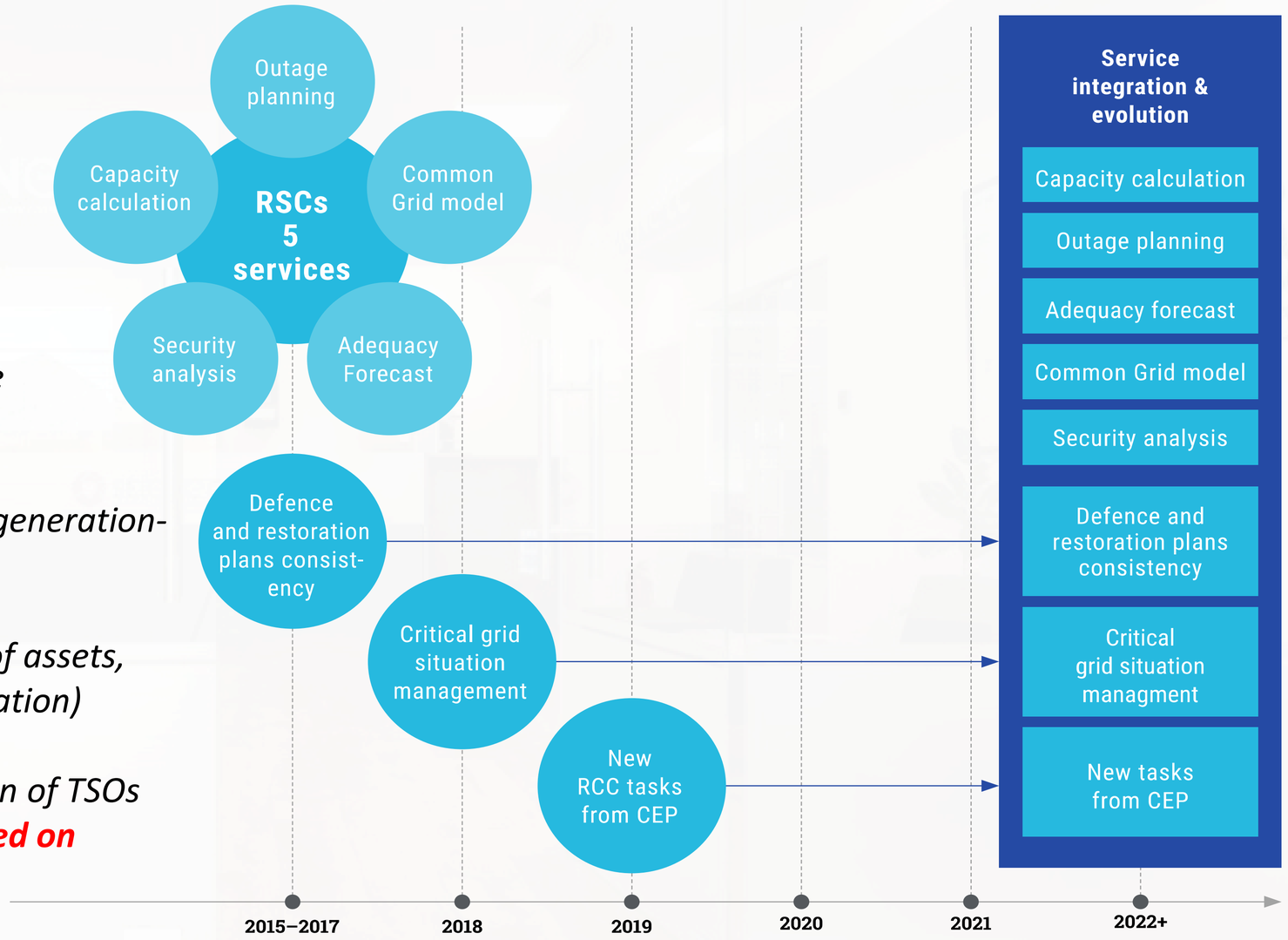
2. ***Coordinated Security Analysis*** *(focus: flows)*

3. ***Coordinated Capacity Calculation*** *(input for the day ahead markets),*

4. ***Short-term Adequacy*** *(short term matching of generation-load for one week ahead; link with balancing)*

5. ***Outage planning coordination*** *(optimized use of assets, incl PST (Phase Shifter Transfo) and HVDC coordination)*

6. ***Critical grid situations management*** *(facilitation of TSOs in handling of rare but very severe events) –* ***Started on March 2023 – No charge to TSOs***



SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

CGM (Common Grid Model) – UCTE & CGMES

- **Scope**: To enable studies using an overview model of the entire European Power System to all TSOs

- **Each TSO** provides an accurate representation of their own grid model (a computer model that contains information regarding grid topology, generation pattern, load consumption, thermal and voltage limits).
  This is the so-called **Individual Grid Model** (IGM)

- **RCCs** receive IGMs from TSOs across Europe and **merge** everything together to create **CGM**, that represents the **electricity grid at European level**

- This way all relevant parties (TSOs, RCCs) have a **common** and **accurate** “picture” about the European power system. Therefore, they can study grid behavior under several cases/contingencies

- CGMs are created a year, a week, two days, and one day in advance and they are updated several times during the actual delivery day

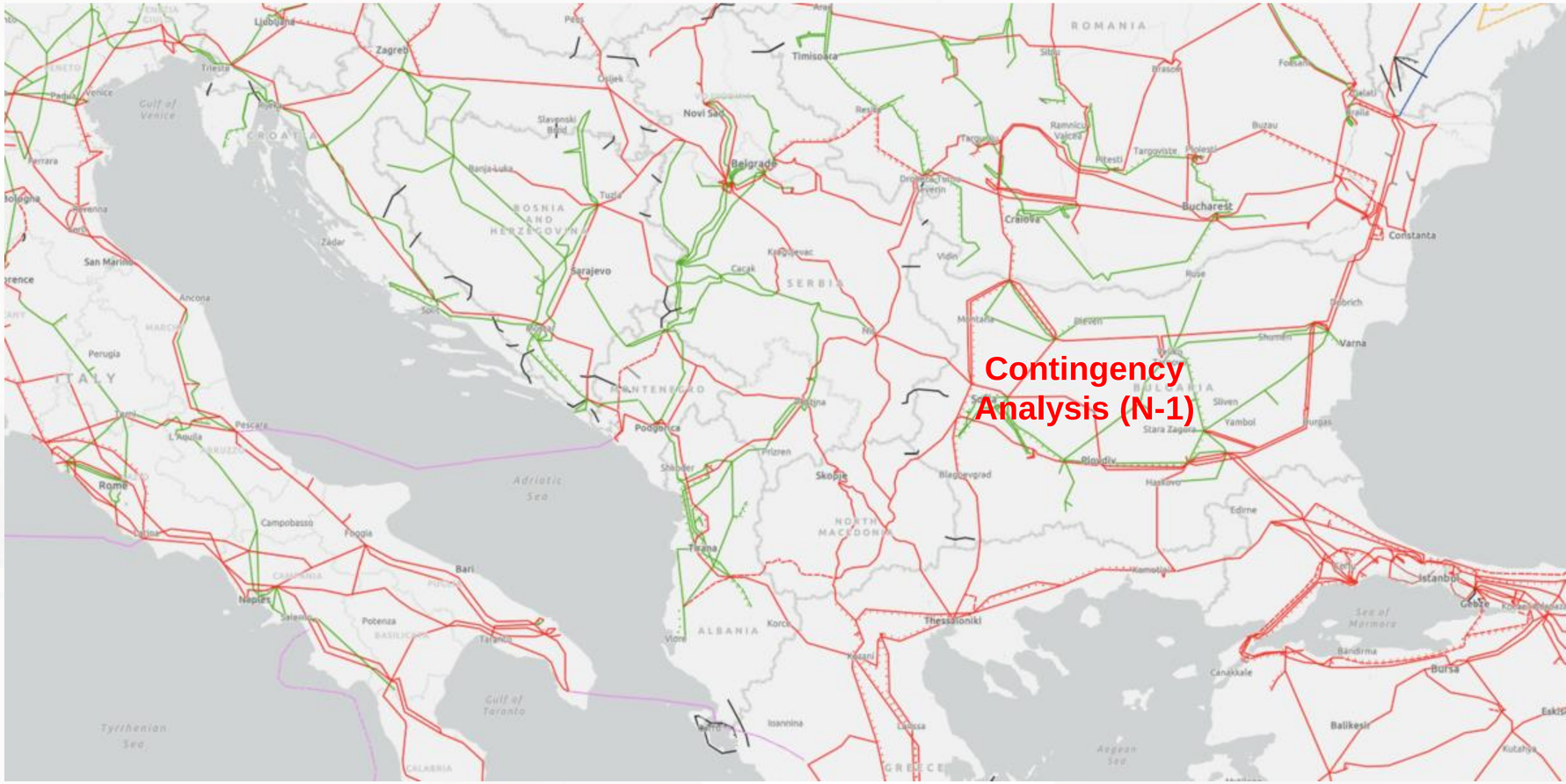
SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

CSA (Coordinated Security Analysis)

Scope:
Identify potential operational security risks (N-1, N-x conditions) **one day in advance**.

- over-, under-voltage
- congestion issues

Added value:
Determine preventive **Remedial Actions** in advance
Minimise decisions that shall be taken during real time operation.



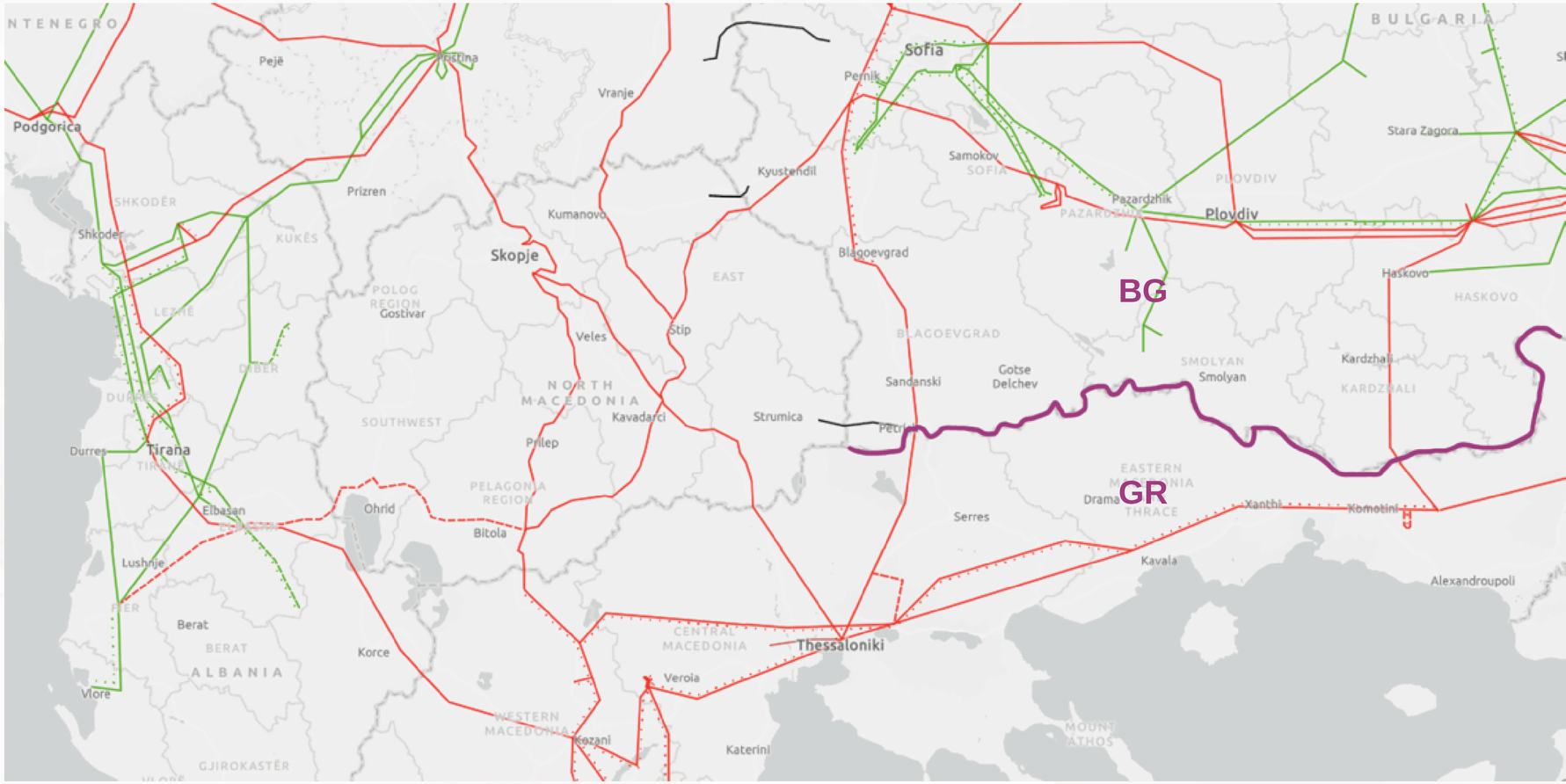
SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

CCC (Coordinated Capacity Calculation)

Scope:
For **BG-GR**, **GR-IT**, and **RO-BG**, SEleNe CC computes the max available cross-border capacity for:

- the current day, 1 and 2 days ahead,
- 1 month and 1 year ahead.

Added value:
Provide Net Transfer Capacity to the **Market** energy platforms taking into consideration SEE grid security.

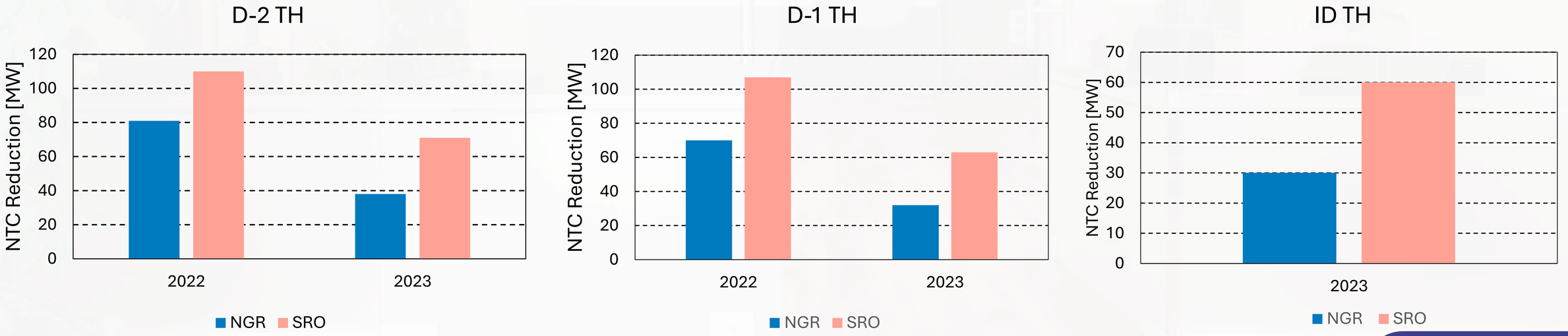


Coordinated Capacity Calculation

- The average reduction between the calculated NTC by the RCC tool and the validated NTC by the TSOs is presented for **all Time Horizons; D-2, D-1 and ID and for NGR and SRO**.

- ✓ The average NTC reduction by the TSOs is **92** MW for 2022 and **49** MW for 2023.
- ✓ The calculations are trusted by the TSOs, as NTC reduction is low.

Validated NTC Reduction [2022 & 2023]

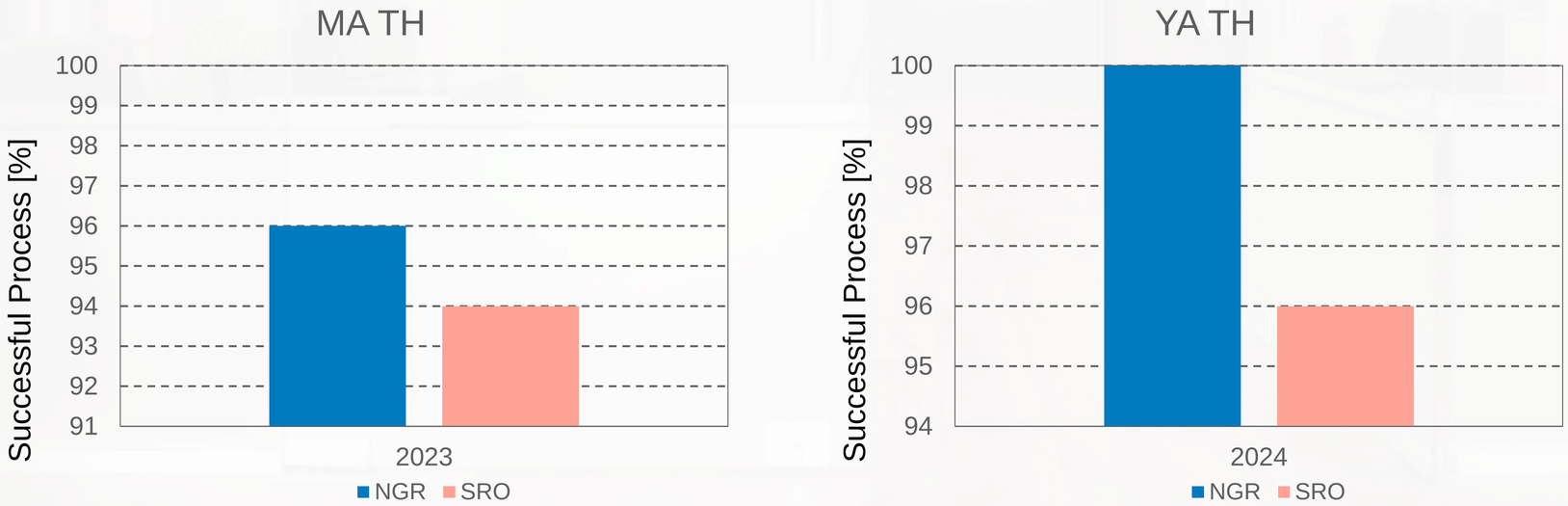


SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

Coordinated Capacity Calculation

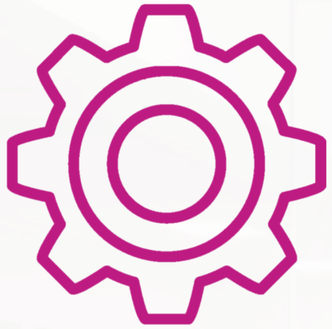
- The Long Term Capacity is calculated in a **coordinated manner for Month Ahead (MA) and Year Ahead (YA) Time Horizon.**
- The efficiency of the CC process for MA and YA Time Horizon and for NGR and SRO borders is presented.
- ✓ The process is successful for more than **97%** of the examined periods.

LT CCC process success rate [2023 & 2024]



SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

Security under all conditions



Outage Planning Coordination (OPC)

Scope:
Identify outages of elements and production units that
affect neighboring countries;
Ensure coordination in outage planning to preserve the operational
security of the system one week up to one year in advance.

Added value:
Identify and **prevent** colliding outages that could bring the EU power system into unstable or insecure states

Short Term Adequacy (STA)

Scope:
Investigate if generation capacity meets demand on a week ahead basis

Added value:
TSOs are informed about adequacy issue.
Coordinated actions are taken to resolve or mitigate the energy deficit.

Critical Grid Situation (CGS)

Scope:
Initiate coordination among relevant TSOs in critical operational conditions, where **extraordinary countermeasures** are required.

Added value:
Provide **solutions** in security risks that can only be tackled through coordinated action among different TSOs.

SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

SEleNe CC presentation of Pan-EU services

- SEleNe-CC has obtained access to OPDE.
- Delivery of the CGM Pan-European service in a rotational fashion with other RCCs.
- CGM (in CGMES format) YA model delivery for the whole of Europe (ENTSO-E service).
- Delivery of the OPC Pan-European service in a rotational fashion with other RCCs.
- Delivery of the STA Pan-European service in a rotational fashion with other RCCs.

SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

Future RCC services I Status

Status

- 14 of 16 legal RCC tasks to be implemented, 2 remain optional
- For 8 existing ● tasks & obligations knowhow and capabilities are established at RCCs
- Basis for 8 new ● tasks & obligations has to be newly created – feasibility is key
- Complexity of operational tasks can become a challenge for human interaction & business continuity
- Strong focus on transparency & reporting

SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

Most challenging new Tasks

- Application of the “**70% rule**”

  Delayed in SE Europe due to the specificities of the region (incompatibilities with non-EU TSOs operating framework) - The Methodology has been approved and deployment will start in the coming months

- ROSC (Regional Operational Security Coordination) methodology - Remedial Actions Optimisation (RAO) and cost sharing among benefited TSOs in the SOR
- Regional sizing of reserve capacity requirements for balancing
- Sharing reserve capacities among TSOs of each SOR
- Facilitation of regional procurement of balancing capacity
- Contribution to Ten Year Network Development Plan (TYNDP) is very much important since RCCs have a broader view of every SOR;
- Identification of regional electricity crisis scenarios and contribution to restoration plans and activities

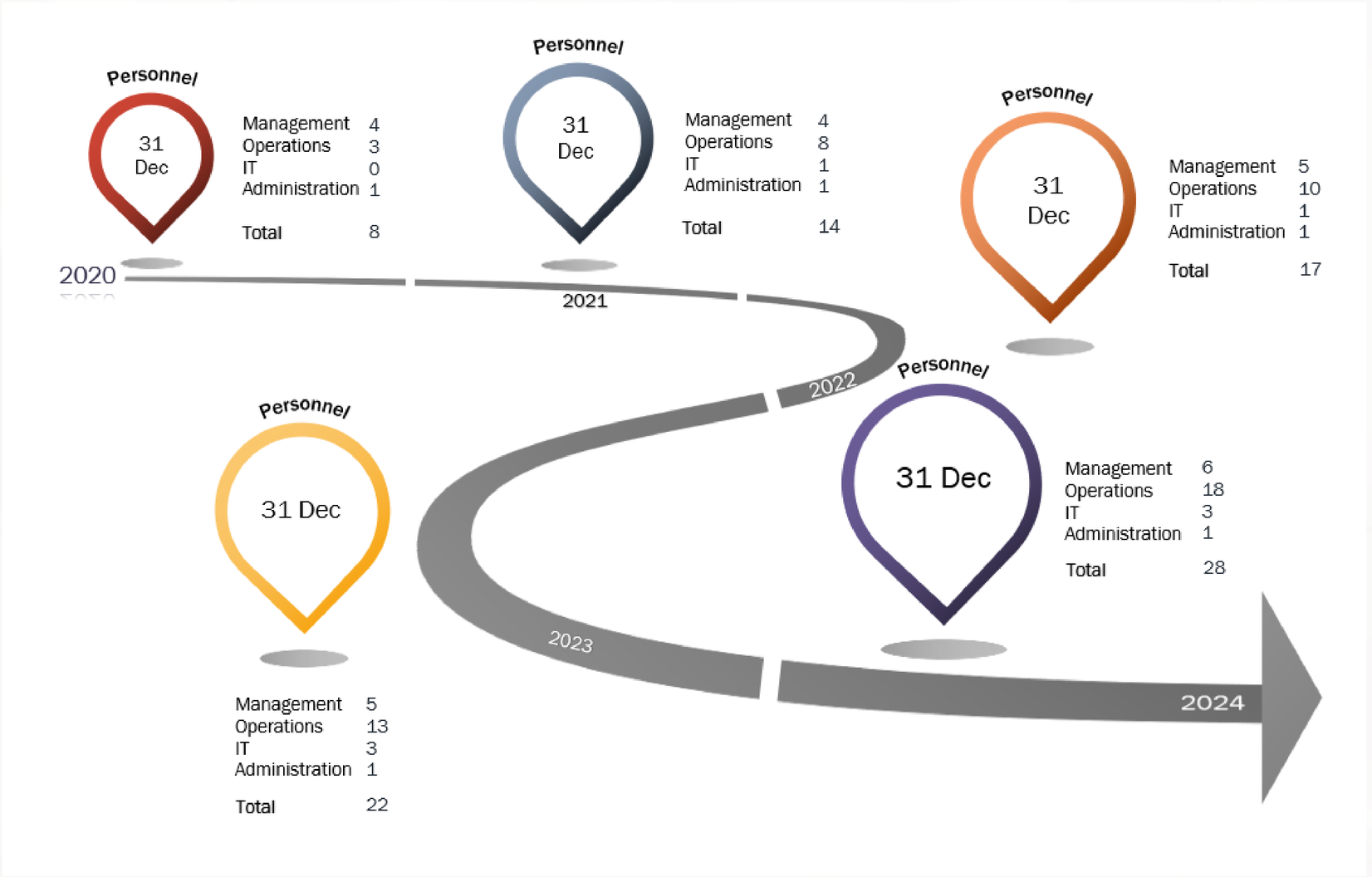
Roadmap

Future development — **2024 →** — Development of new services in the scope of RCC transition

ROSC | **70% rule** | **Reserve sizing** | **TYNDP** | **...**

SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

Progress In Numbers through Time



SELENE CC
SOUTHEAST ELECTRICITY NETWORK COORDINATION CENTER

Thank you very much for your attention

Dr. Stelios Kromlidis

s.kromlidis@selene-cc.eu

20 June 2024