Operational Planning and Scheduling Code

Stakeholders Workshop

23 MAY 2012

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Reliable Sustainable Connected

Highlights

- Operational Planning and Scheduling: „What is it?“
- Roadmap
- Operational Planning and Scheduling Code contents
- Discussion

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Operational Planning and Scheduling: „What is it?“

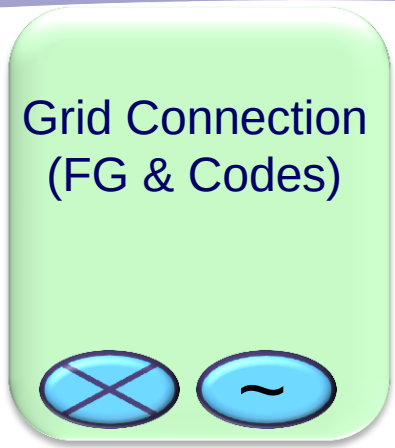
Activities and processes to prepare power system operation, aiming at:

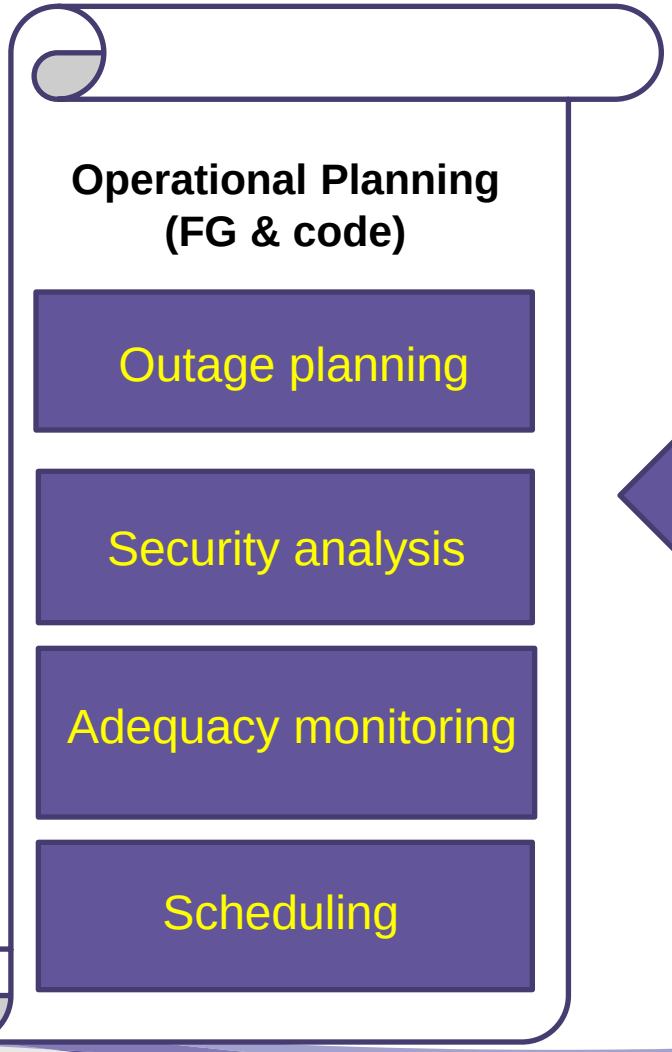
- *ensuring power system security in accordance with operational security principles;*
- *enabling electricity markets in accordance with CACM;*
- *integrating conventional and renewable generation.*

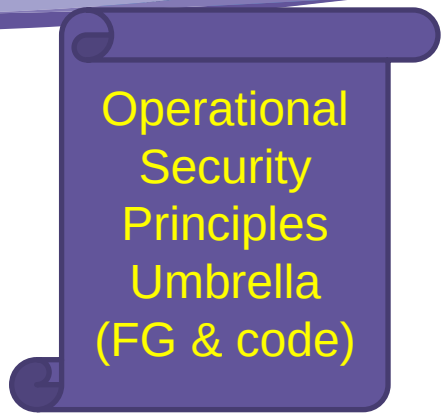
Activities covering multiple timeframes from more than year ahead until close to real time.

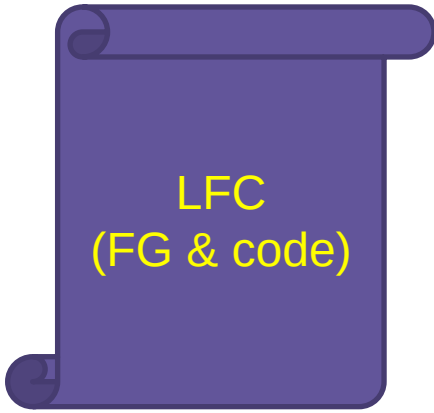
Requiring coordination between TSO’s and interactions with grid users.

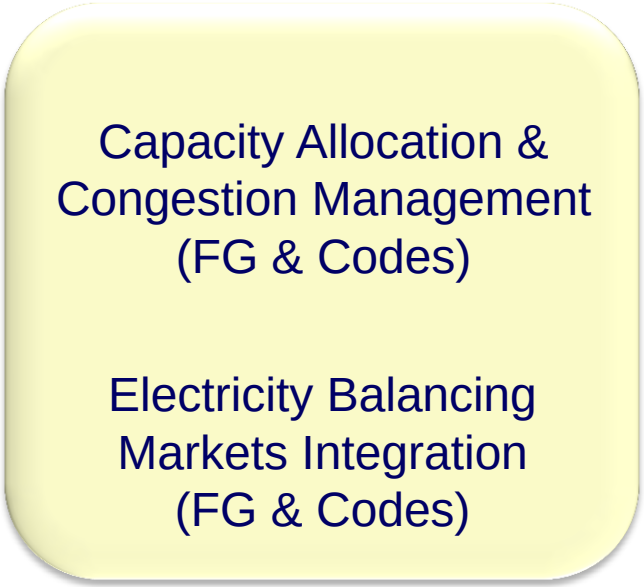
Scope and interactions











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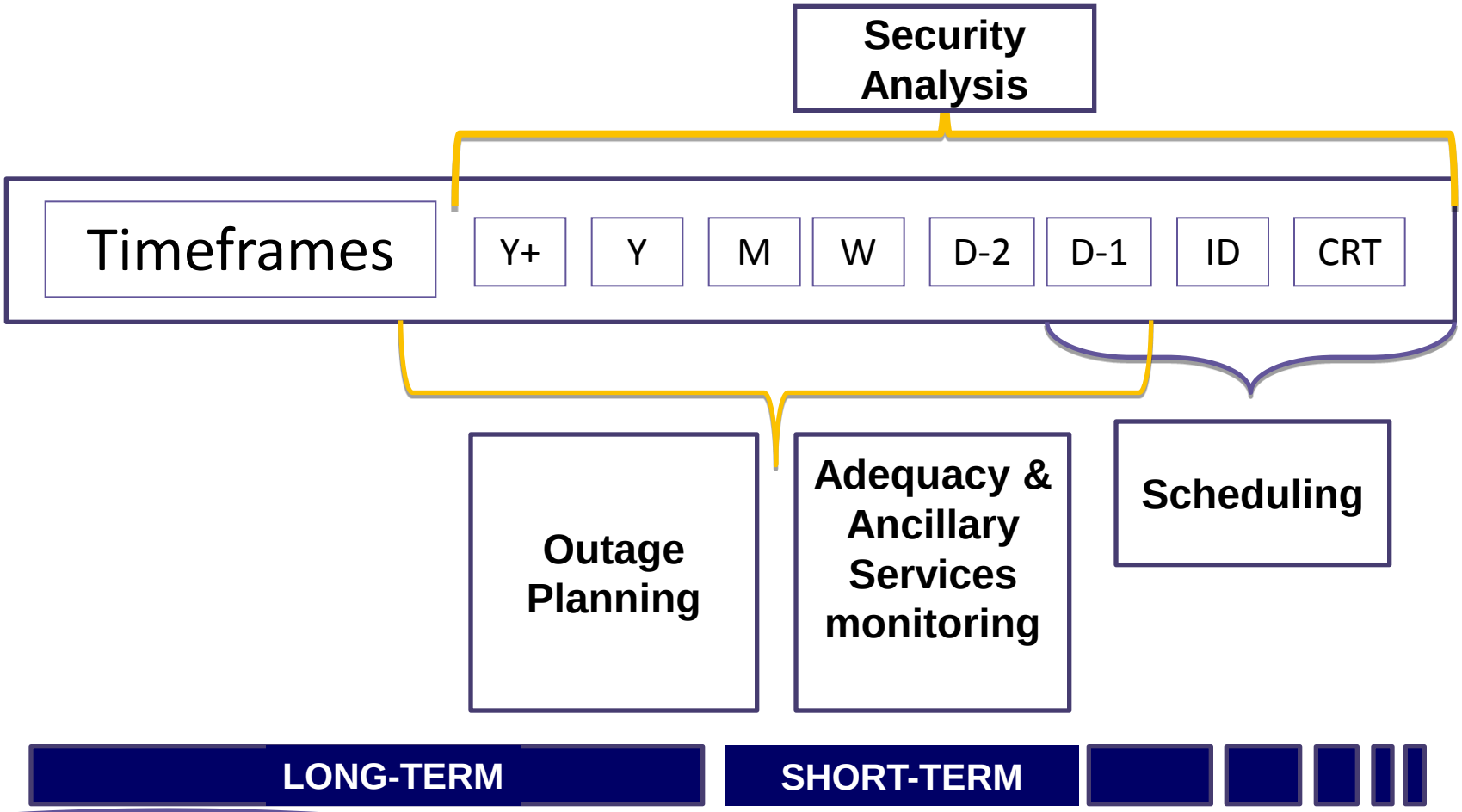
Timeframes

Scenarios ➔ Forecasts ➔ Schedules ➔ State Estimation

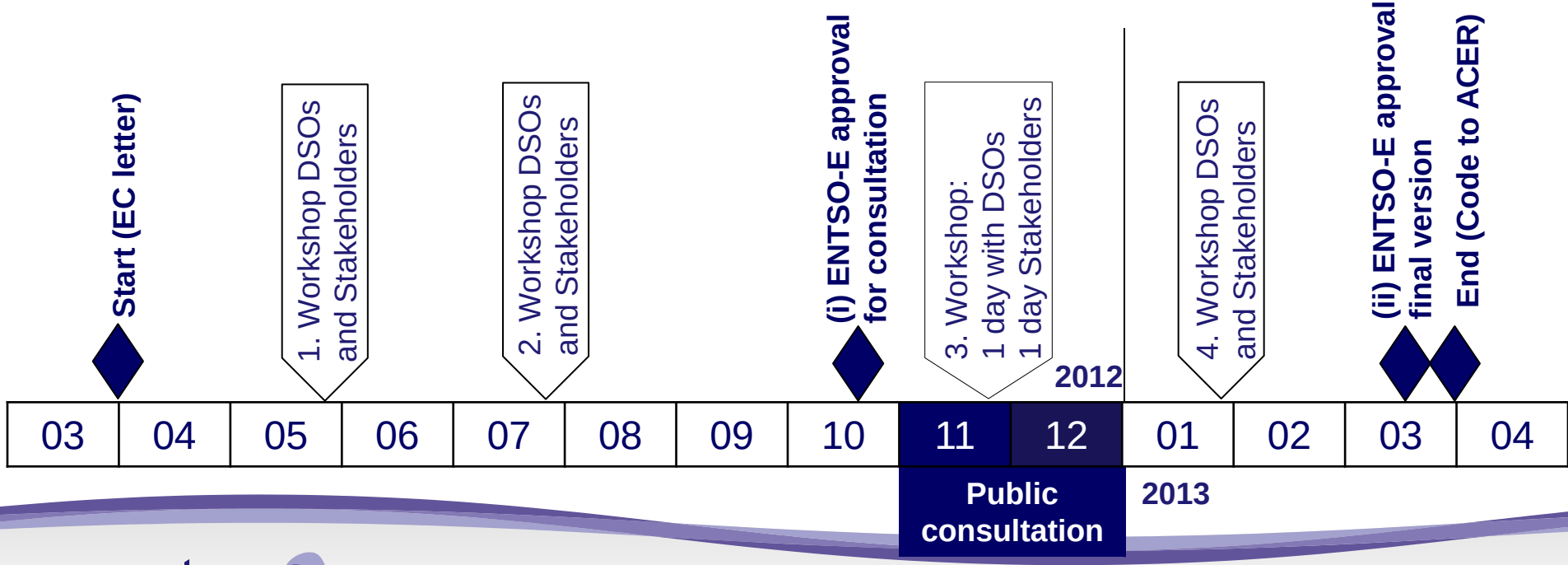


Highlights

- Operational Security: „What is it? “
- **Roadmap**
- Operational Planning and Scheduling Code contents
- Discussion

Operational Planning and Scheduling Code Roadmap

- **Start 04/2012, End 04/2013**
- **2 approvals by ENTSO-E: (i) consultation, (ii) final**
- **4 Workshops, public consultation, active discussion**



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Operational Planning and Scheduling Code Structure

Articles 1-6 — General Provisions: Subject matter, Definitions, Scope, Regulatory aspects, Confidentiality, Relation with National Law

	Security assessment Articles 8-14	Outage planning Articles 15-25	Adequacy Articles 26-33	Scheduling Articles 34-37
Requirements In all timeframes	Building Scenarios and Elaborating Common Grid models	REGIONAL COORDINATION	Pan-European seasonal coordinated adequacy assessment	Schedule notification
	Performing coordinated security analysis and setting up remedial actions	Planning process framework	Adequacy and ancillary services monitoring	Schedule coherency verification

Articles 31-41 — Compliance — Derogations — Final provisions

Year-ahead Common Grid Models: Scenarios

Development of scenarios: coordinated task for all TSO's together

Scenario 1

High wind Europe
High sun Europe
Summer season
Weekday peak load
High North to South flows in Europe

Net positions

FR -3000	DE + 8000	BE -500
IT -2300	ES +800	GB -500
NL +1200		

Scenario 2

Low wind Europe
No sun Europe
Summer season
Weekend off-peak (night) load
Low cross-border flows

Net positions

FR +200	DE -100	BE +130
IT -240	ES +10	GB -50
NL +400		

Scenario 3

Low wind Europe
Low sun Europe
Winter season (extreme cold)
Weekday peak load
High imports FR and DE

Net positions

FR -4000	DE - 3500	BE +1500
IT -2300	ES +800	GB -500
NL +2400		

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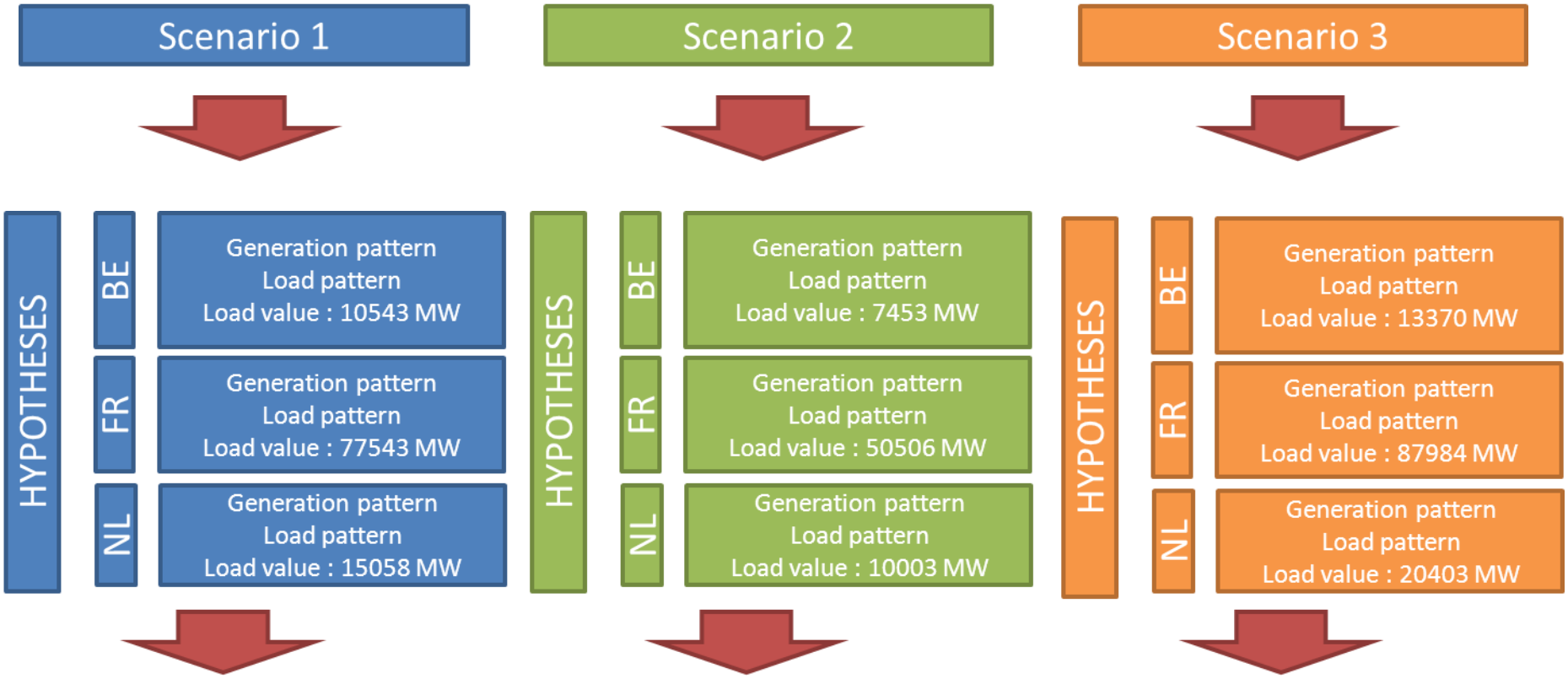
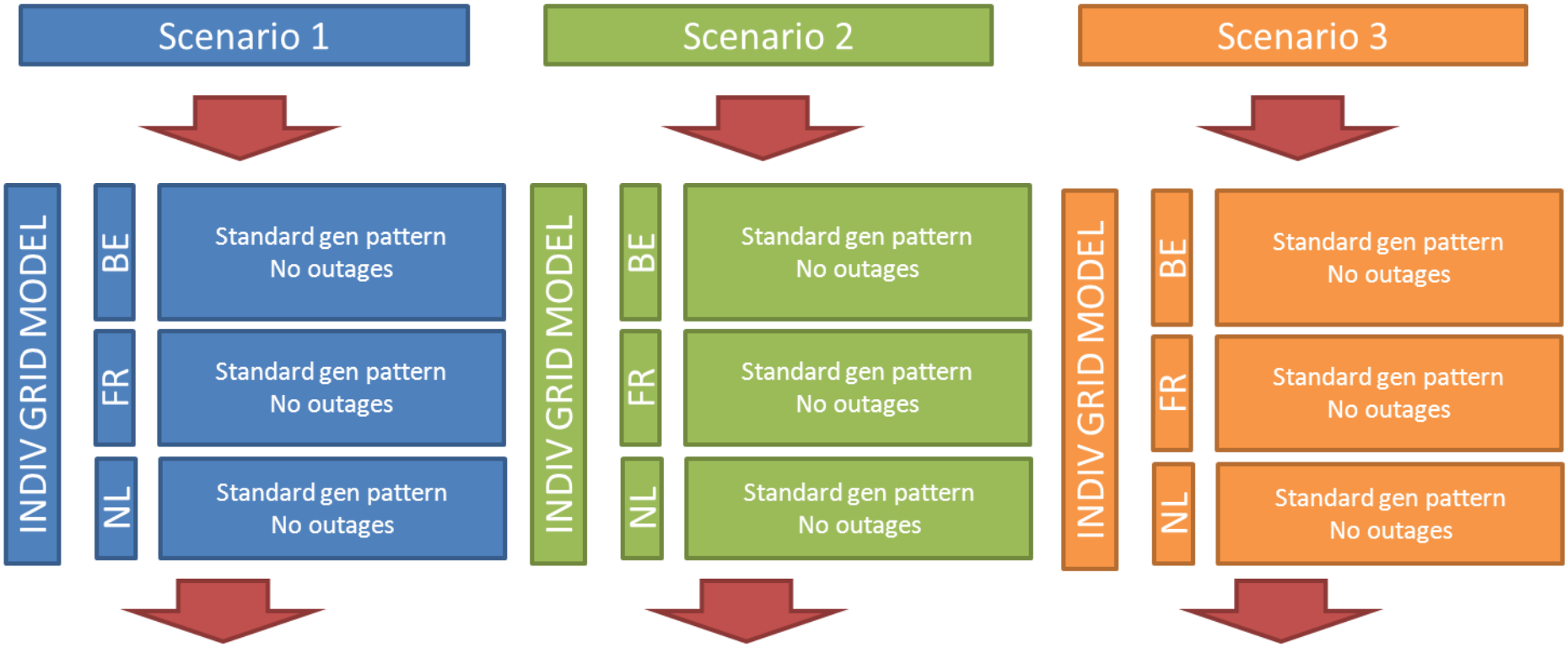
Year-ahead Common Grid Models: Hypotheses

Development of hypotheses: individual task for each TSO

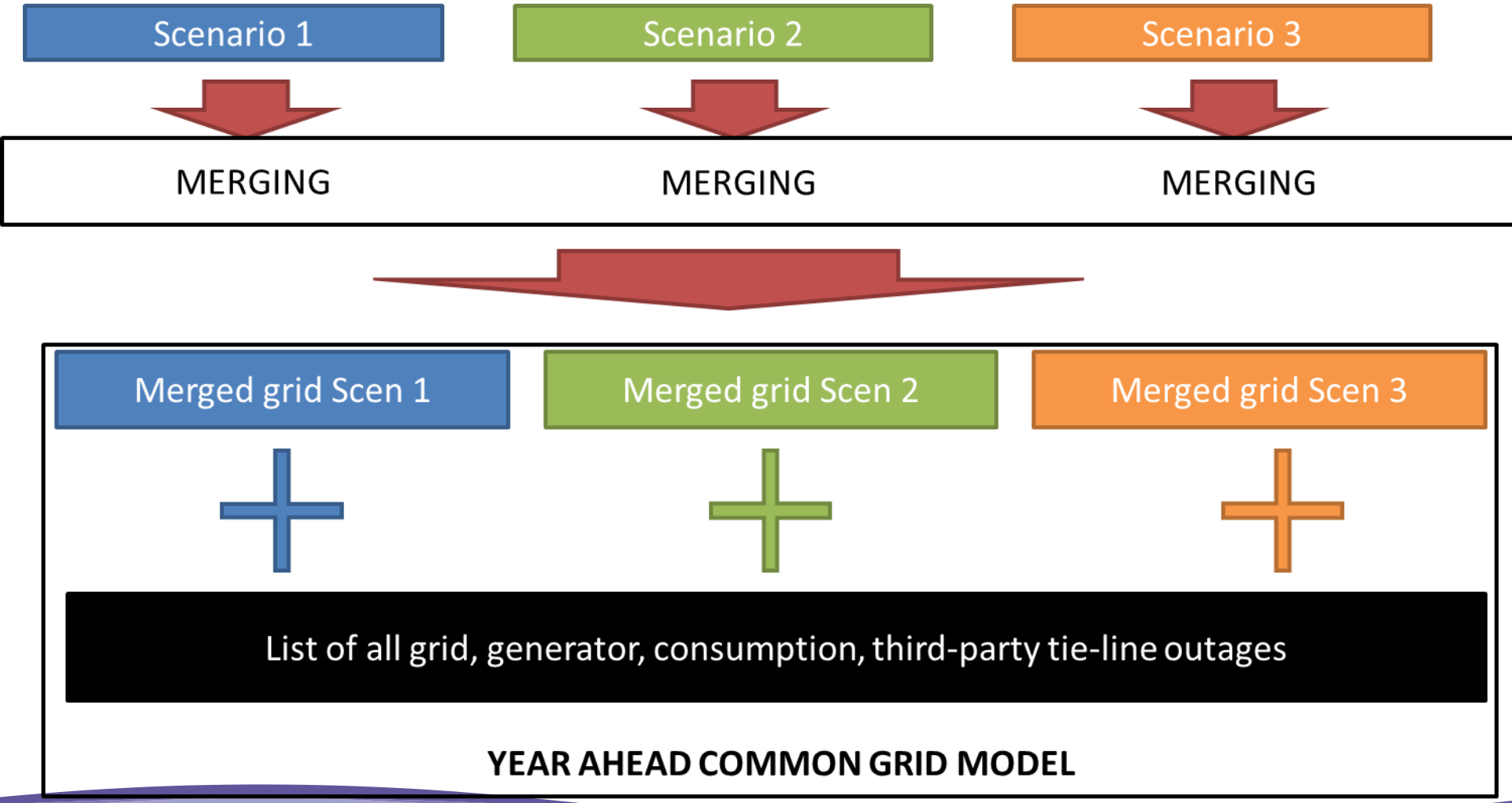


Year-ahead Common Grid Models: Individual Grid Models

Development of Individual Grid Models: individual task for each TSO



Year-ahead Common Grid Models: Merging



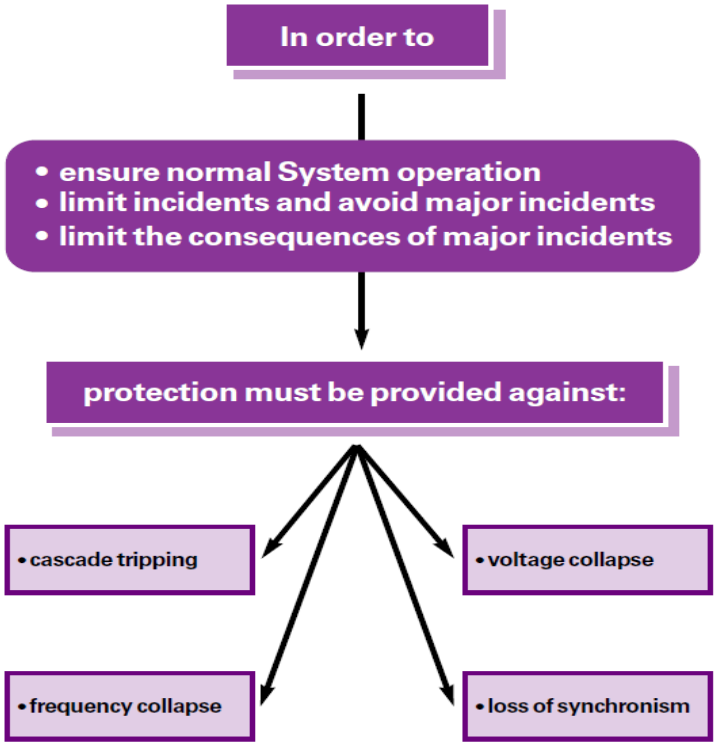
Security Analysis: content

DATA FOR SECURITY ANALYSIS

Article 8 YEAR-AHEAD SCENARIOS AND COMMON GRID MODEL
Article 8.1 DEFINITION OF YEAR-AHEAD SCENARIOS
Article 8.2 CONSTRUCTION OF YEAR-AHEAD INDIVIDUAL GRID MODELS
Article 8.3 CONSTRUCTION OF YEAR-AHEAD COMMON GRID MODELS
Article 8.4 UPDATES OF YEAR-AHEAD COMMON GRID MODELS
Article 9 WEEK-AHEAD GRID MODELS
Article 10 DAY-AHEAD AND INTRADAY GRID MODELS

REQUIREMENTS AND COORDINATION FOR SECURITY ANALYSIS

Article 11 GENERAL PROVISIONS FOR SECURITY ANALYSIS
Article 12 PROVISIONS FOR YEAR-AHEAD AND UPDATED SECURITY ANALYSIS
Article 13 PROVISIONS FOR DAY-AHEAD, INTRADAY AND CLOSE TO REAL-TIME SECURITY ANALYSIS
Article 14 COORDINATION, INCLUDING PREVENTION AND REMEDIAL ACTIONS



Outage Planning : A coordinated process between TSO's and Grid Users

Coordination between all parties for specific projects:
Focus on sharing available information, on a **best effort** basis, **without a firmness** obligation
building of new power plant, main substation works, large power plant maintenance works

> Year ahead

Creating a **reference outage plan** for the coming year, including significant generation, load and grid outages

Year ahead

Changes to the reference outage plan can be **requested by TSO's or Grid Users;**
These are subject to respect power system security constraints while taking into account economical consequences

Year → before real time

At this stage, "forced events" have to be taken into account

Real Time

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Outage Planning: content

REQUIREMENTS FOR OUTAGE PLANNING: CO-ORDINATION

Article 15 DETERMINATION OF OUTAGE PLANNING REGIONS
Article 16 REQUIREMENTS FOR REGIONAL COORDINATION
Article 17 LIST OF RELEVANT THIRD-PARTY OWNED TIE-LINES, GENERATION AND CONSUMPTION UNITS
Article 18 LIST OF RELEVANT GRID ELEMENTS WITH IMPACT ACROSS BORDERS
Article 19 COMMON TSO PLATFORM FOR COORDINATED OUTAGE PLANNING

REQUIREMENTS FOR OUTAGE PLANNING: PROCESSES

Article 20 REQUIREMENTS FOR MORE THAN YEAR-AHEAD OUTAGE PLANNING
Article 21 REQUIREMENTS FOR YEAR AHEAD OUTAGE PLANNING
Article 22 REQUIREMENTS FOR PLANNED UPDATES TO THE YEAR-AHEAD OUTAGE PLANNING
Article 23 REQUIREMENTS FOR UNPLANNED UPDATES TO THE YEAR-AHEAD OUTAGE PLANNING
Article 24 REQUIREMENTS FOR REAL-TIME EXECUTION OF THE OUTAGE PLANNING
Article 25 COMPLIANCE TO DEADLINES AND REVISION

Adequacy and Ancillary Services: content

REQUIREMENTS FOR ADEQUACY

Article 26 REQUIREMENTS FOR ADEQUACY IN GENERAL
Article 27 REQUIREMENTS FOR PAN-EUROPEAN ADEQUACY SEASON-AHEAD
Article 28 REQUIREMENTS FOR ADEQUACY FROM SEASON AHEAD TO WEEK AHEAD
Article 29 REQUIREMENTS FOR ADEQUACY WEEK AHEAD
Article 30 REQUIREMENTS FOR ADEQUACY DAY AHEAD AND INTRADAY

REQUIREMENTS FOR ANCILLARY SERVICES

Article 31 REQUIREMENTS ANCILLARY SERVICES IN GENERAL
Article 32 REQUIREMENTS ANCILLARY SERVICES DAY AHEAD AND INTRADAY
Article 33 REQUIREMENTS FOR ANCILLARY SERVICES BEFORE REALTIME

Scheduling: content

Article 34
GENERAL PROVISIONS

Article 35
REQUIREMENTS FOR NOTIFICATION OF SCHEDULES BETWEEN MARKET PARTICIPANTS AND SCHEDULING OPERATORS

Article 36
REQUIREMENTS FOR COHERENCY OF SCHEDULES

Article 37
REQUIREMENTS FOR PROVIDING INFORMATION TO OTHER TSOs, REQUIRED FOR FURTHER PROCESSING

Key Processes related to system security based on the results of scheduling

- **Load Frequency Control**
- **Balancing**
- **Common Grid Model**
- **Security Analysis**

Thank you for your attention !

Questions for the discussion

1. **Is anything critical for Operational Planning and Scheduling missing ?**
2. **How do you address the provisions on Operational Planning and Scheduling processes concerning interaction with TSO's ?**
3. **How do you see the fulfilment and implementation of provisions specifically addressing your organisation ?**