

International Workshop on
Dynamic Stability Challenges of the Future Power Grids

09/02/2025 – Baltic Power Systems
Synchronisation with Continental Europe

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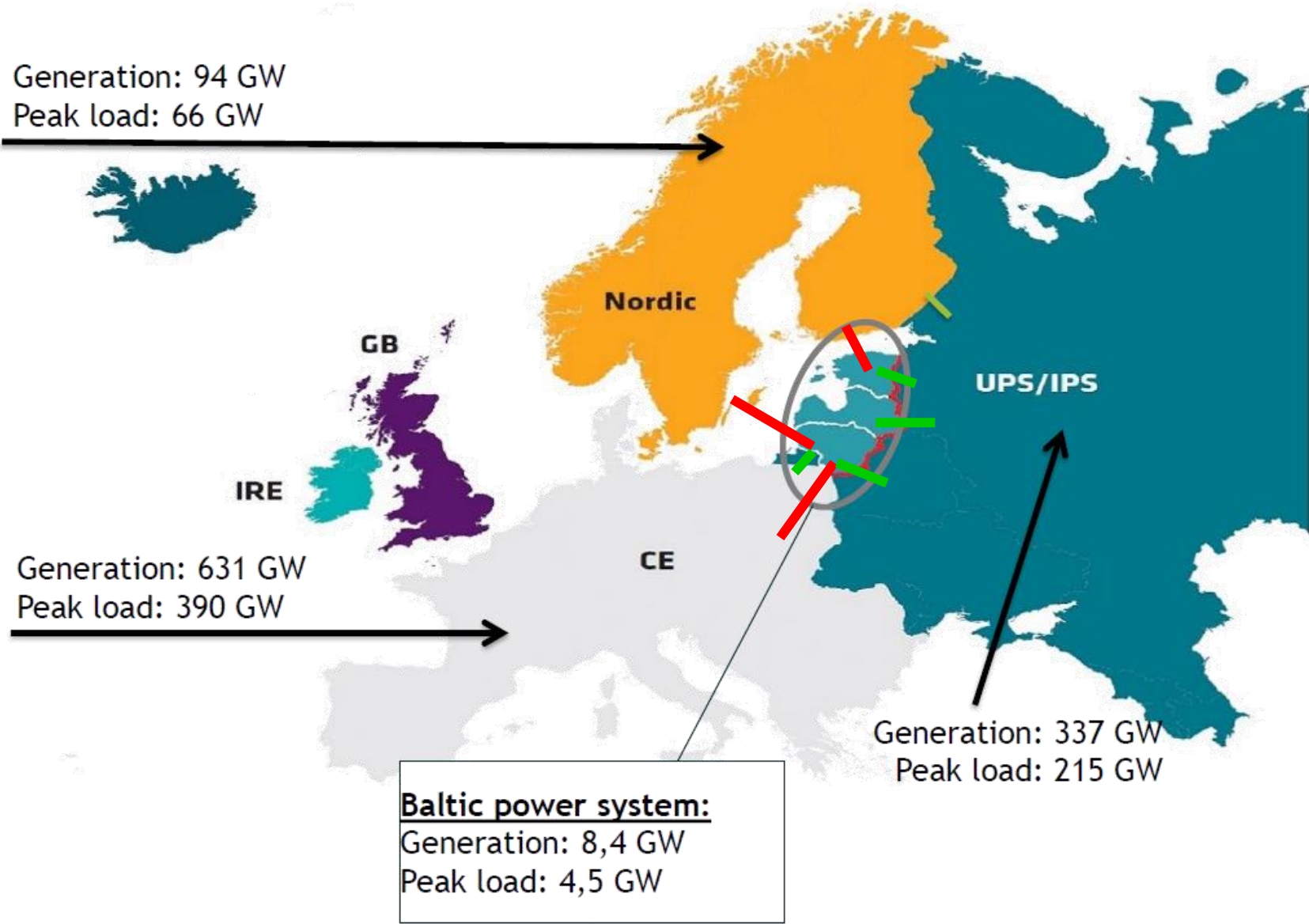
Litgrid



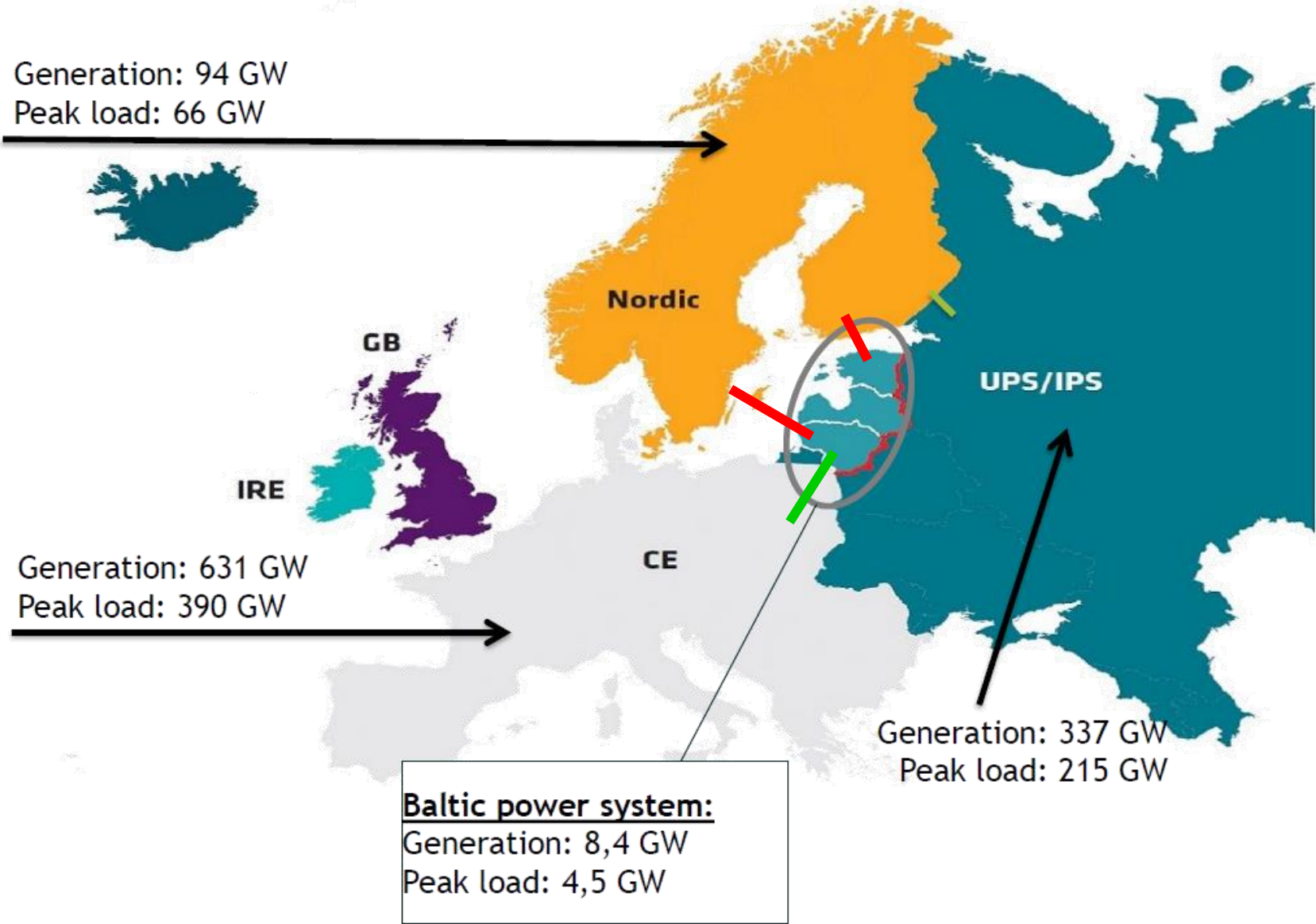
Tuesday, September 9th 2025, Rome, Italy

- Introduction
- History
- Implementation of Synchronisation Project
- Conclusions

Till 08/02/2025. Synchronously and asynchronously



From 09/05/2025. Synchronously or asynchronously



2004-2025

01.05.2004

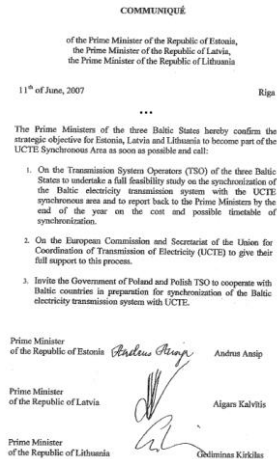
Baltic joined EU and NATO



With possibility to use support from EU Funds

11.06.2007

Baltic Primer Ministers signed Communiqué



2009-2023

Baltic and Polish TSOs synchro studies, where in 2018 concluded about inertia and frequency requirements



28.06.2018

Baltic States and Poland Primer ministers and EU president signed synchro political roadmap for synchro in the end of 2025



2019

27.05.2019. Connection Agreement with Catalogue of Measures for start of synchro in the end of 2025

20.06.2019 Political Roadmap



2021-2022

COVID-19 War in Ukraine

03/2022

Urgent synchronisation Agreement

2023

Accelerated synchronisation

25/07/2023 – Baltic MS Agreement
01/08/2023 – Baltic TSOs CA

3/08/2023 – Baltic Primer Ministers MoU

09/2023 – Amendments to the Connection Agreement and CoM

11/2023 – Accelerated synchro roadmap approval

07/2024

Non renewal of BRELL agreement

10/07/2024 – Ministries decision

16/07/2023 – Baltic TSOs signed letters

17/07/2024 – letters sent out

08/08/2024 – delivery of the letters to RU/BLR

08/2024-02/2025

Preparation and work of CoM fulfilment

Baltic TSOs personnel training

26/11/2024 – RGCE decision

08/02/2025 desynchronisation from BRELL

09/02/2025 synchronisation with CE

Implementation of Synchronisation projects

Baltic Synchronisation project implementation was divided into two following Phases:

- ✓ **Phase I** – internal transmission network infrastructure reinforcements in the Baltic States. This phase costs and benefits were evaluated by the first CBA completed in 2018 – Security of Supply. Co-financed by CEF.
- ✓ **Phase II** – infrastructure investment items recommended by the dynamic and frequency studies prepared by Baltic and Polish TSOs. Costs and Benefits of Phase II are evaluated by the second CBA in 2019 – SEW. Co-financed by CEF.
- ✓ **Catalogue of Measure** – investments items, identified in the Catalogue of Measures, identified by ENTSO-E in 2019 under Connection Agreement, related for power system operation.

Invaluable political and financial support from EU and Member States:

- ✓ CEF co-financing, totally for EE, LV, LT un PL 1.7 billions EUR for all phases;
- ✓ RRF and RePowerEU financing - 200 MEUR
- ✓ Modernisation Fund - 100MEUR



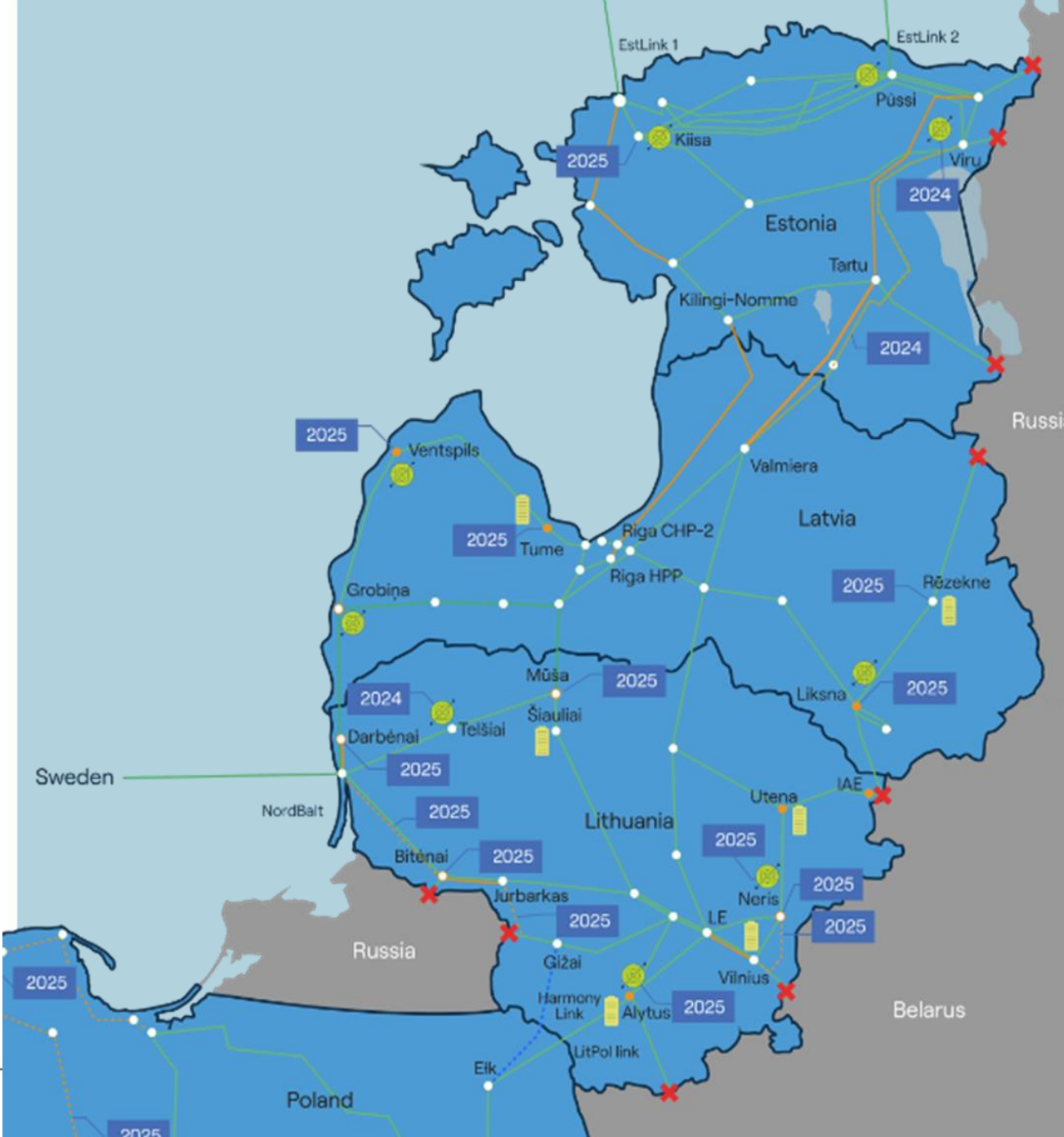
330kV transmission network reinforcement

	Totally planned	Status 08/02/2025	Status 12/2025
Estonia	3	3	-
Latvia	2	2	-
Lithuania	4	1	3

	Status 08/02/2025	Status 12/2030
Harmony link	-	1

BESS implementation

	Totally planned	Status 08/02/2025	Status 12/2025
Estonia	-	-	-
Latvia	80MW	-	80MW
Lithuania	200MW	200MW	-



Implementation of Synchronous Condensers

Scope:

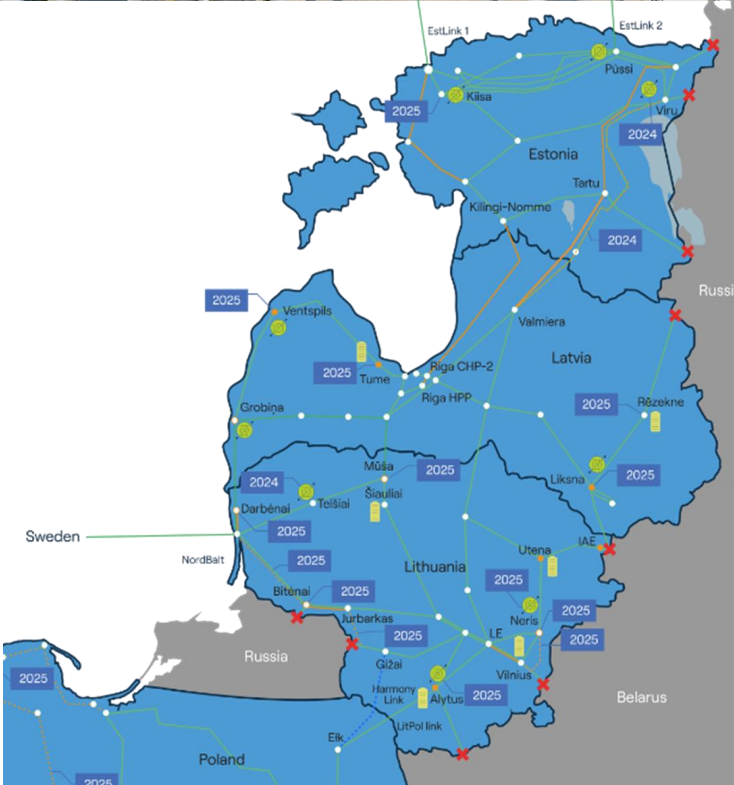
9 synchronous condensers (SC) will be constructed in Estonia, Latvia and Lithuania to provide 17 100 MWs of additional grid inertia.

3 SC in each country will provide at least 5700 MWs of inertia.

	Totally planned	Status 08/02/2025	Status 12/2025
Estonia	3	3	-
Latvia	3	1	2
Lithuania	3	2	1

Status on 8/02/2025, totally in operation 6 SC from 9:

- **Estonia:** all 3 synchronous condensers (Kiisa, Pussi, Viru) were completed.
- **Lithuania:** 2 of 3 synchronous condensers (Alytus and Telšiai) were completed.
- **Latvia:** 1 of 3 synchronous condenser (Grobiņa) was completed.

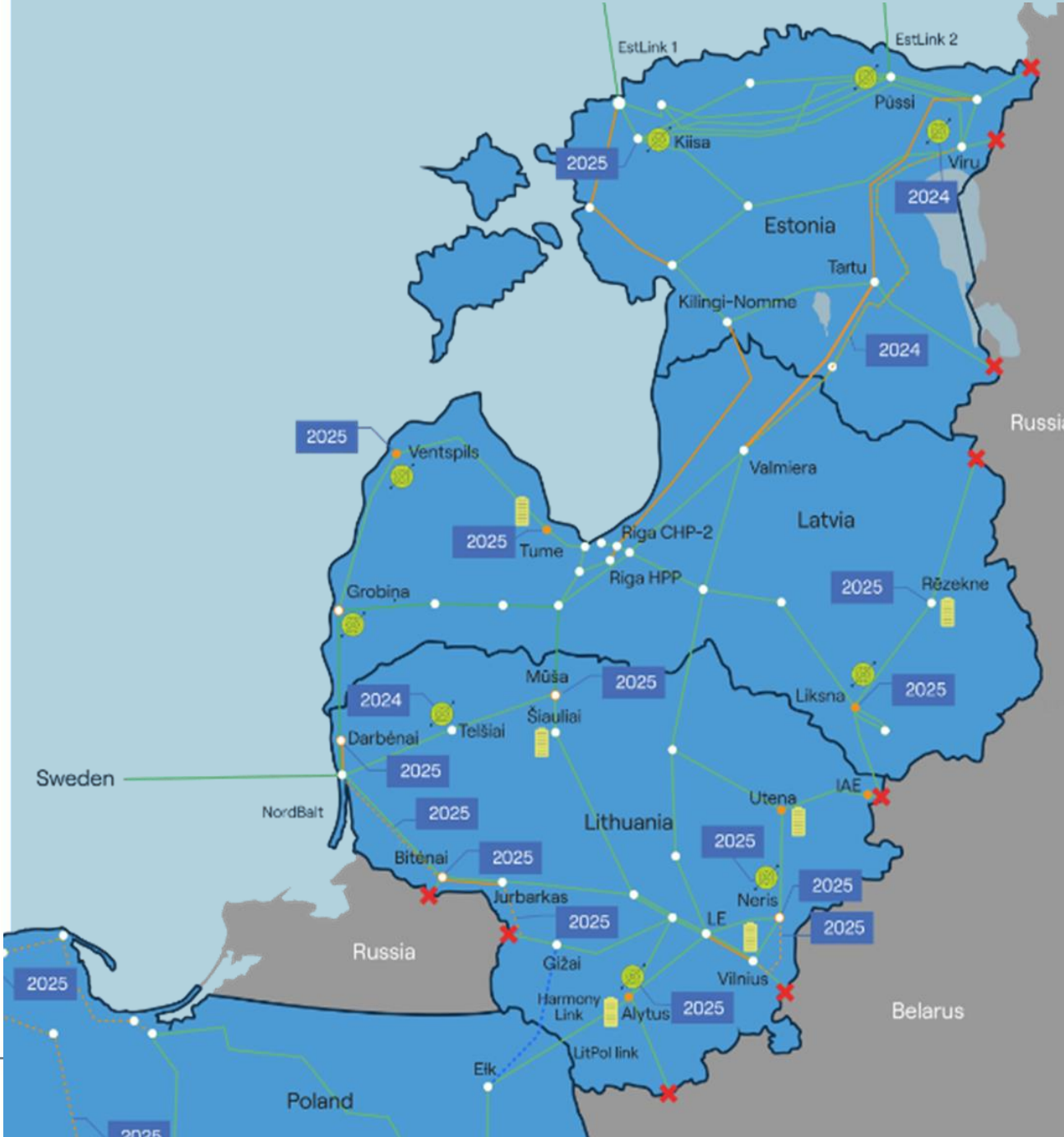


Implementation of LFC

	Status 08/02/2025
Estonia	+
Latvia	+
Lithuania	+

Other critical IT and infrastructure projects

	Totally planned	Status 08/02/2025	Status 12/2025
Estonia	100%	70%	95%
Latvia	100%	70%	99%
Lithuania	100%	70%	95%



Baltic desynchronisation, isolated operation test and synchronisation process

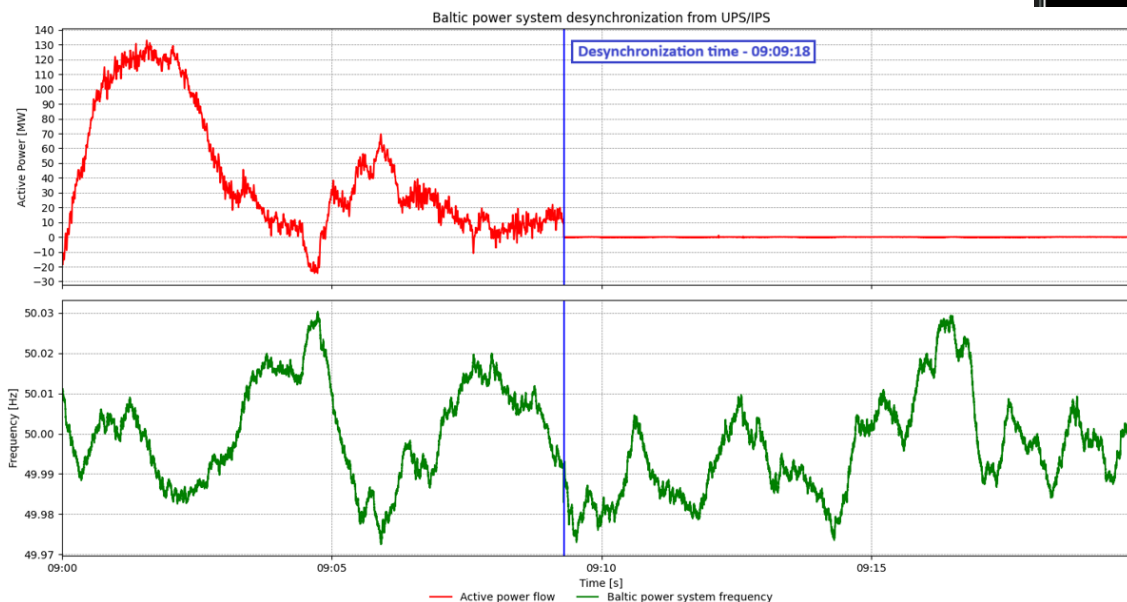
Date	Time (EET) Time (CET)	Operation mode	Activity
2025.02.07 (Friday)	00:00-24:00 23:00-00:00	Synchronous with IPS/UPS	Preparation for the test
2025.02.08 (Saturday)	06:00 – 07:25		Disconnection of Lithuania-Russia (Kaliningrad region) cross border lines
	07:25 – 09:00 6:25-08:00		Disconnection of Lithuania-Belarus, Latvia-Russia, Estonia-Russia cross border lines
	09:00 – 10:00 8:00-09:00	Isolated operation (Total 27 Hours)	Normal Operation (without additional disturbances)
	10:00-13:50		Performance frequency test (part 1)
	13:50-18:00		Performance frequency test (part 2)
	18:00-24:00		Normal Operation (without additional disturbances), preparation for synchronization with CESA
2025.02.09 (Sunday)	00:00-10:00		Performance of the voltage deviation tests (2 Part)
	10:00-11:00		Normal Operation preparation for synchronization with CESA
	11:00-13:00 10:00-12:00		Synchronization
	13:00-14:00 12:00-13:00		
	14:00		Synchronous operation with CESA „Trial operation“

✖ Planned disconnection of 330kV overhead lines with third countries

✕ Currently disconnected 330kV overhead lines with third countries

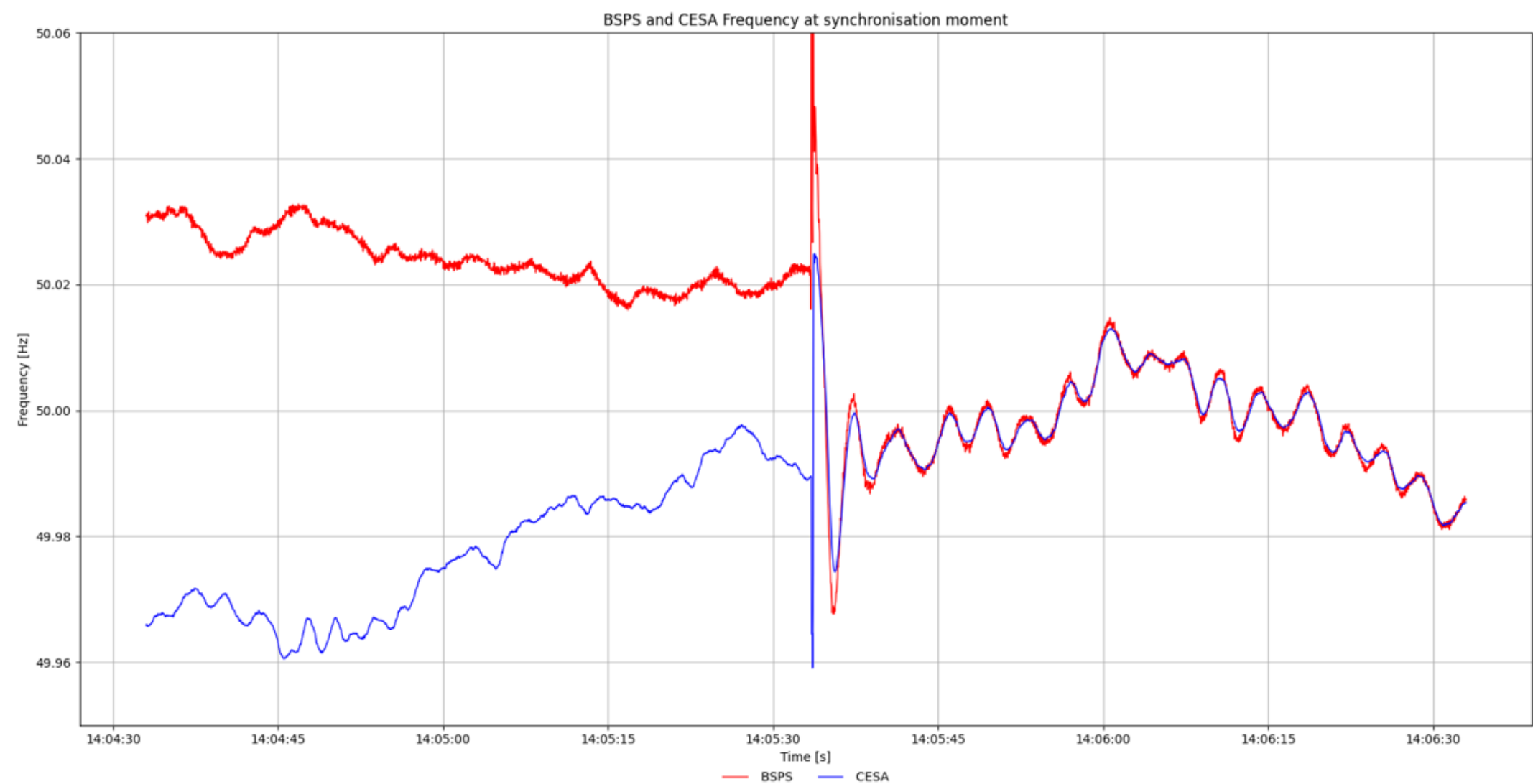


Baltic Systems desynchronisation 9:09 08/02/2025



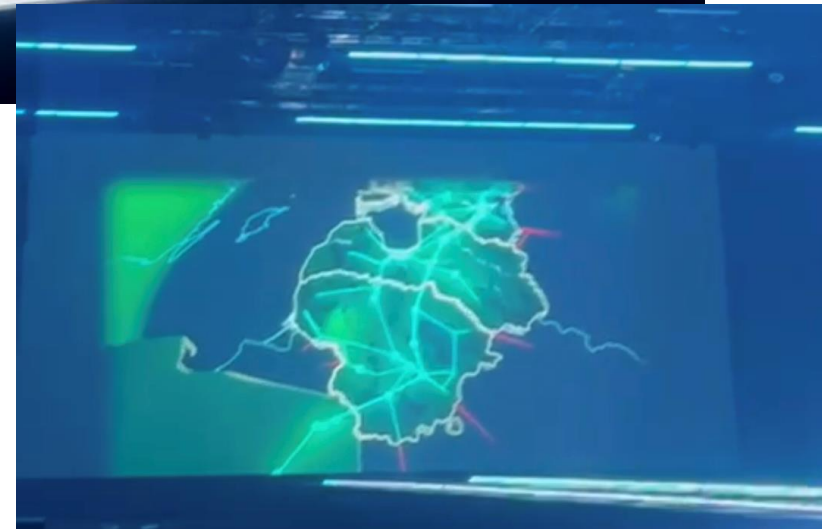
Total **Demand** – 3285 MW
 Total **Generation** – 3281 MW
 Total **Inertia** – 30742 MW/sek

Baltic Systems Synchronisation. 14:05 09/02/2025



Time of synchronization: 2025 02 09 14:05:33

Baltic Systems Synchronisation official opening



Conclusions

- Historical event for the Baltic States
- Project for almost 20 years
- Project is politically and financially supported by EC and Baltic Member States
- Project received several awards: ENTSO-E 2025-year project, PMI (USA) 2025 award in infrastructure nomination
- The implementation of big infrastructure projects was very big challenge from finance and timeline perspectives
- Despite COVID-19 pandemic and war in Ukraine, project implemented ~ 1 year before planned schedule
- 70% of the projects have been implemented before 09/02/2025, rest of the projects till 2025 and some of the projects till 2030
- The protection of synchronisation infrastructure, as critical infrastructure is one the next challenges in the Baltic States and Poland



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