Market and network studies: project assessment provisional results

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Reliable Sustainable Connected

Contents

- Network callenges of 2030 – vision 1 and vision 4
- Grid modelling areas and methodology
- Projects
  - from TYNDP 12
  - new projects (at NMD database)
  - Third party - Third party projects - presentation available, from secretariat
- Project assessment results – summarized for areas
  - Map
  - Indicators
- Examples of studies

Challenges for grid modelling in Vision 4

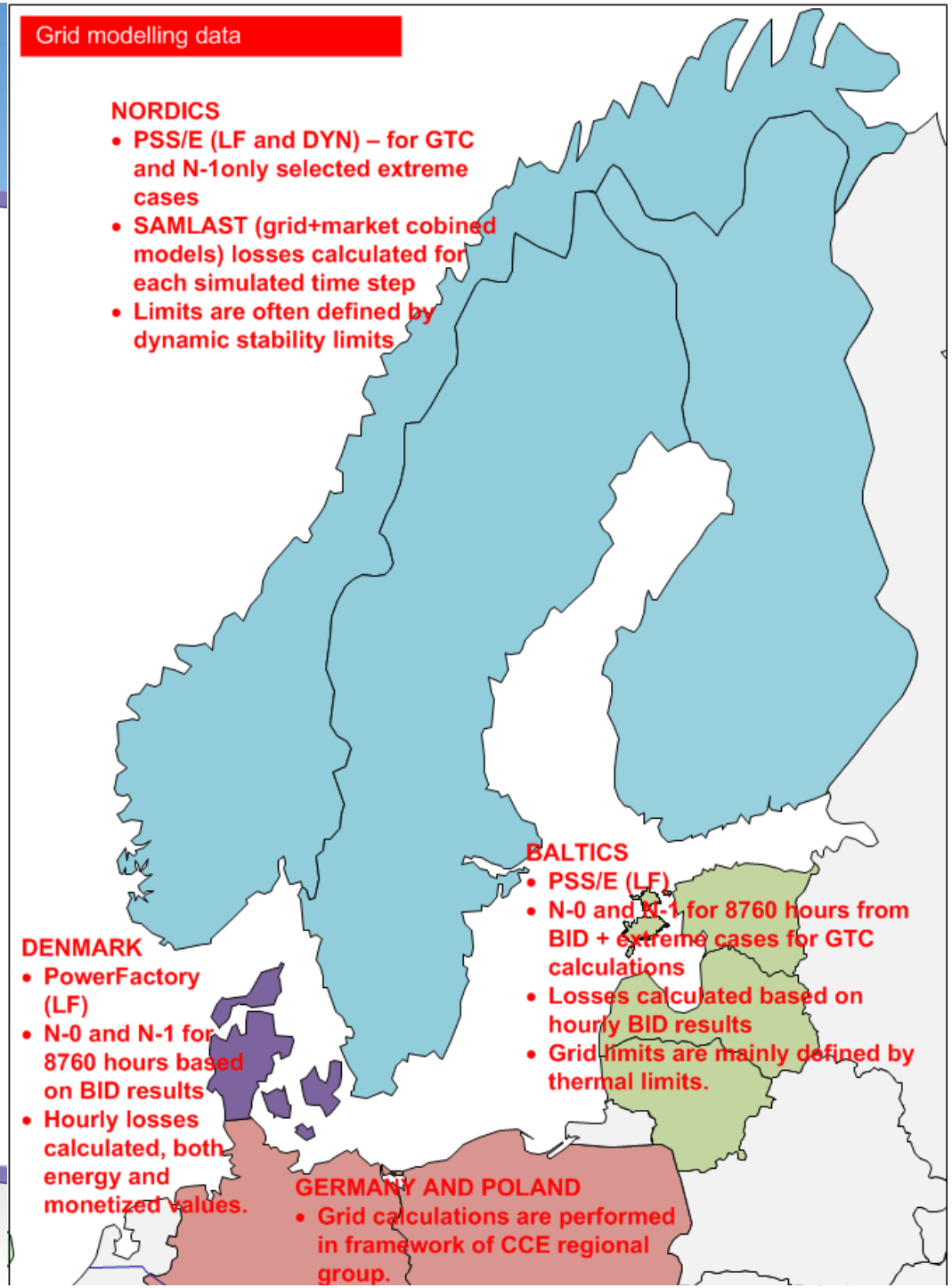
- Market needs – higher price differences

- Network needs - Flow patterns are changing (generation allocation is changing– RES – new offshores, pump storages etc.)

- Vision 4 – requires lots of internal grid strengthening to implement new generation (under this vision the costs of internal reinforcement are not observed).

Grid models in RGBS

- Baltic Sea region consists of **3 different synchronous areas**: Nordics, part of Continental Europe and Baltics connected to Russian IPS/UPS.
- **4 different Subareas** are modelled and several modelling tools are used to perform network calculations based on the same assumptions and market modelling results.
- Market modelling results are basis for running grid simulations - Vision 1 and 4 market modelling completed.
- Grid modelling for Vision 1 and 4 is still in process, therefore provisional results will be presented.



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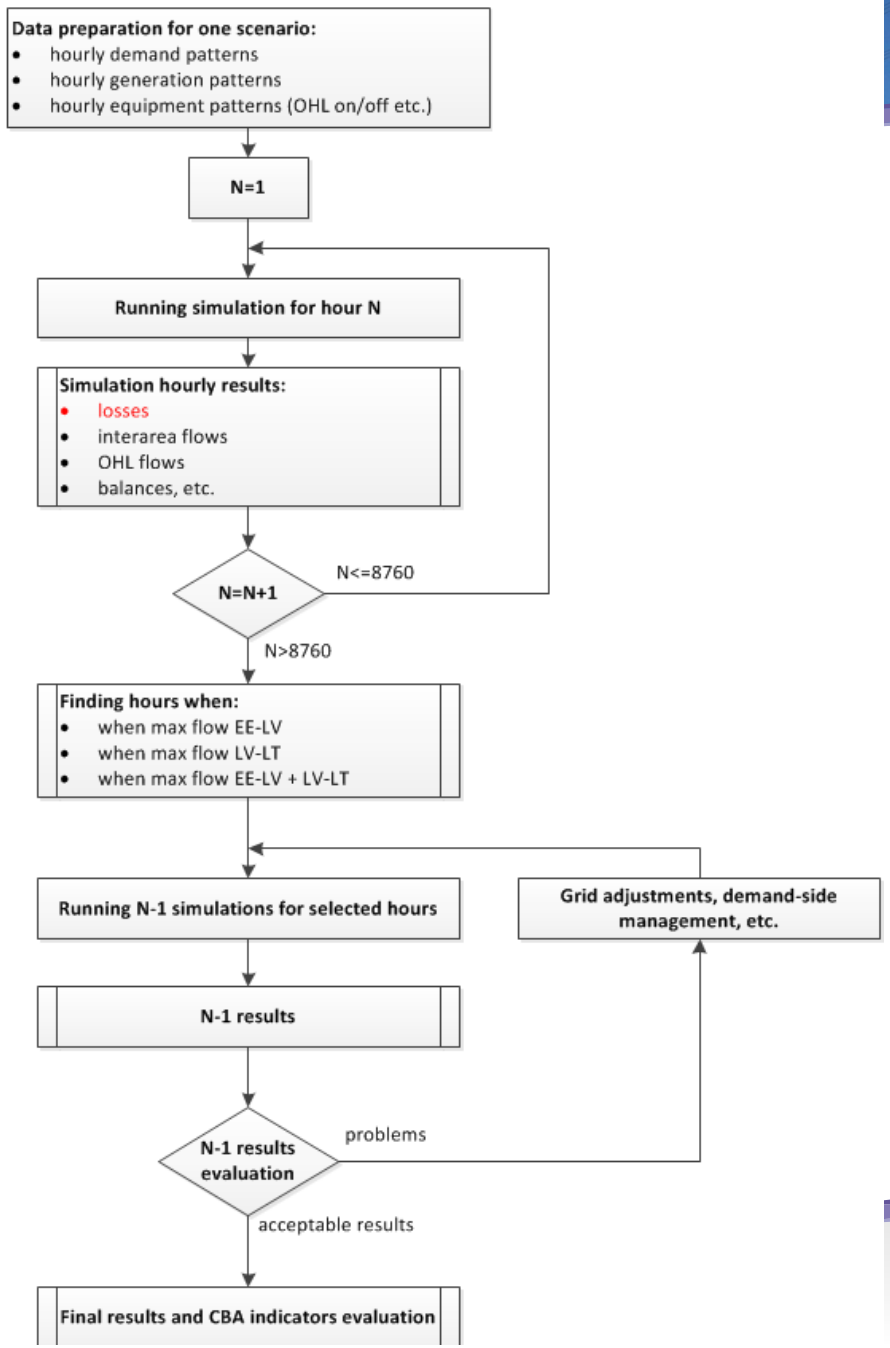
Example of hourly calculation algorithm

Grid calculations are performed by network models using BID market modeling output data for each hour of the year. Normal regime mode and N-1 mode calculations are performed to check different system operational criteria (eg. thermal limits, accepted voltage range, steady state stability etc.).

Process of simulations in PSS/E for CBA indicators evaluation



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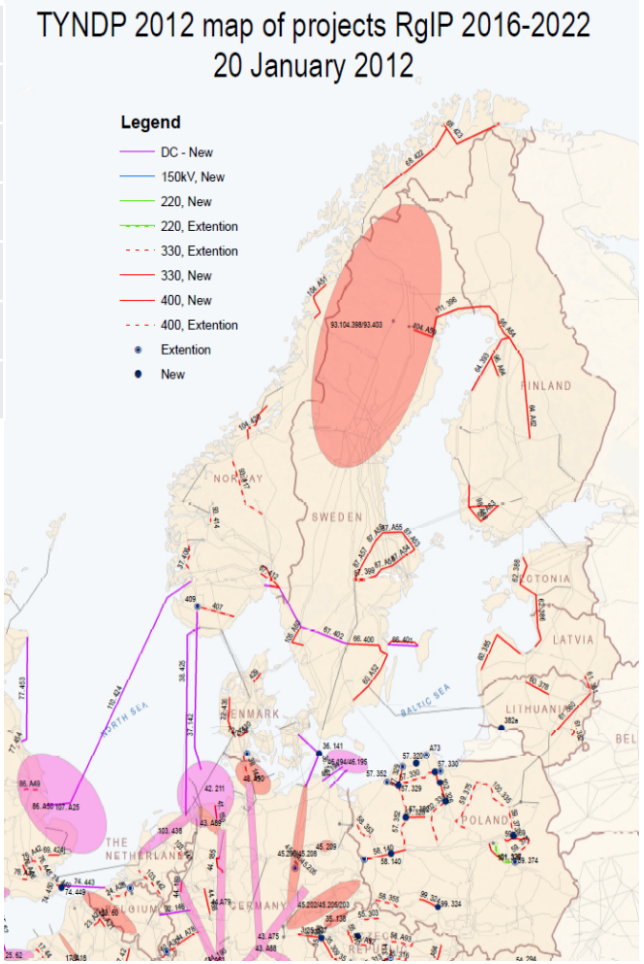
Projects reassessed– from TYNDP 2012

TYNDP 2012				
36	Kriegers Flak CGS	DK2	DE	400
59	LitPol Link Stage 1	PL	LIT	500
123	LitPol Link Stage 2	PL	LIT	500
60	Nordbalt phase	LIT	SE4	700
62	Estonia-Latvia 3rd IC	EST	LAT	500
111	3rd AC Finland-Sweden north	FIN_N	SE1	500/800

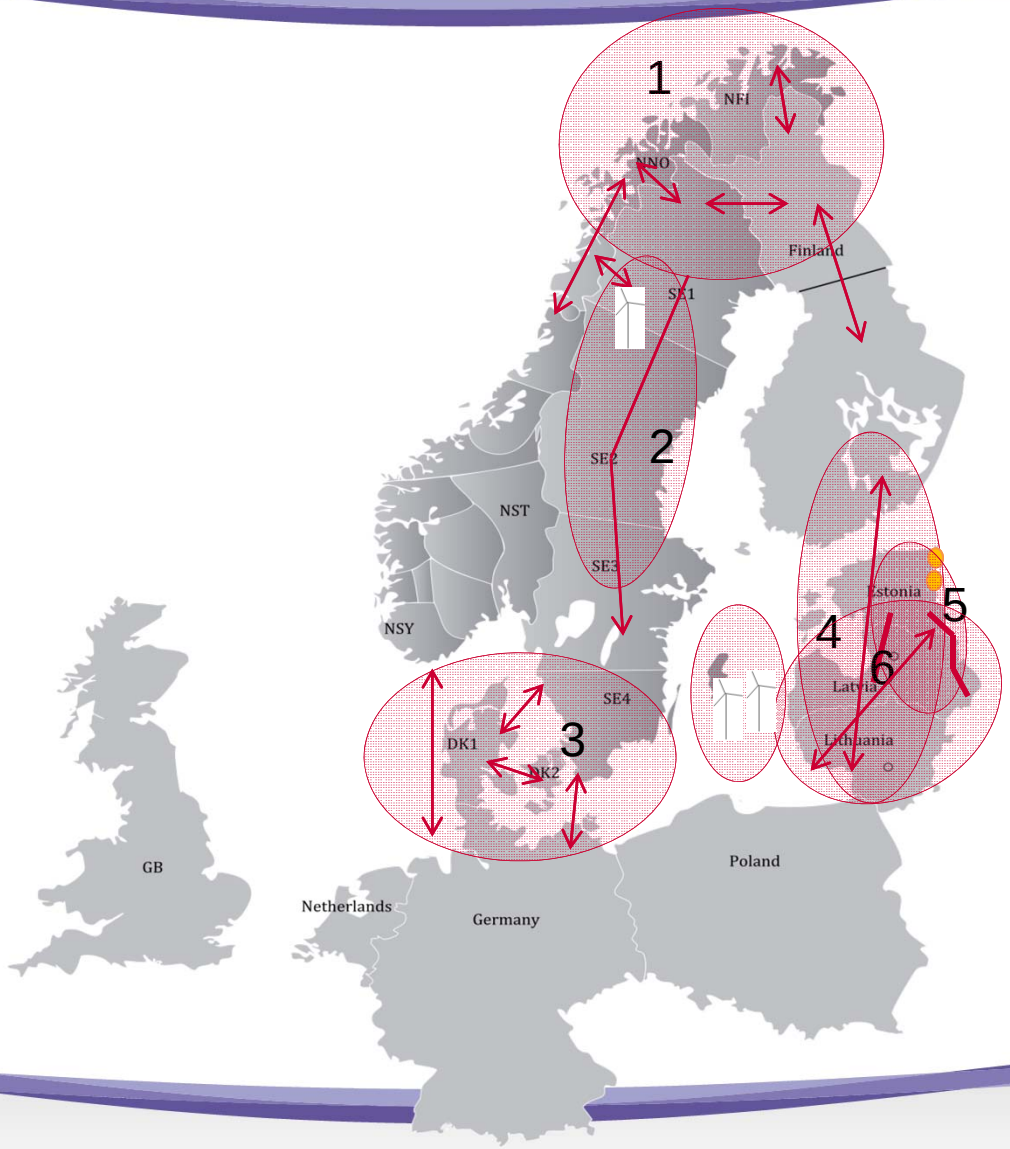


New Projects candidates – from exploratory phase & 3rd party projects

New Long Term Project candidates– from exploratory phase				
180	NNO-SE2	NNO	SE2	750
178	SE3-DK1 variant 1	SE3	DK1	700
176	SE4-DE	SE4	DE	600
175	(Great Belt) Storebælt 2	DK1	DK2	600
179	Kontek 2	DK2	DE	600
166	DK2-PL	DK2	PL	600
170	Baltic synchronization project	LIT	State border	600
163	Baltic corridor (EE-LV-LT)	EE	LIT	600
126	COMBO SE1-SE2 and SE2-SE3	SE1	SE3	800/700
3rd Party				
P7	Kruonis storage - 225 MW (P T1)	LIT	-	250 MW
P8	Muuga storage - 500 MW (P T2)	EST	-	500 MW

Identified areas of interest for 2020-2030 horizon

2. Arctic area – new consumption and RES
2. North-south flow through Norway/Sweden/Finland
3. Increased capacity Nordics – Continental Europe/UK
4. North-South through Baltic states
5. Power flow control on Russian border
6. Baltics synchronous operation with Continental Europe



WHY A 3RD PARTY PROJECTS PROCEDURE?

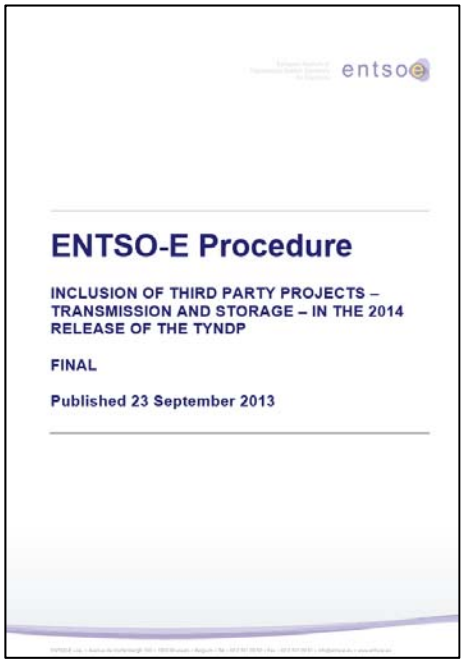
January – March 2013:

Due to Regulation (EU) No 347/2013 ENTSO-E published in January 2013 the procedure for inclusion of the 3rd party projects in the TYNDP 2014, which tackled **only** the **non-ENTSO-E transmission projects,** giving the possibility to Project Promoters to submit their applications.

September – October 2013:

ENTSO-E opened a second window for submissions (considering both transmission and storage projects) for the inclusion of third party projects in the TYNDP 2014, based on the Regulation published on 15 May 2013:

- TYNDP the sole base for the PCI selection – starting with the second PCI list, to be finalised mid 2015
- Inclusion of storage projects in ENTSO-E TYNDP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ENTSO-E Procedure

INCLUSION OF THIRD PARTY PROJECTS – TRANSMISSION AND STORAGE – IN THE 2014 RELEASE OF THE TYNDP

FINAL

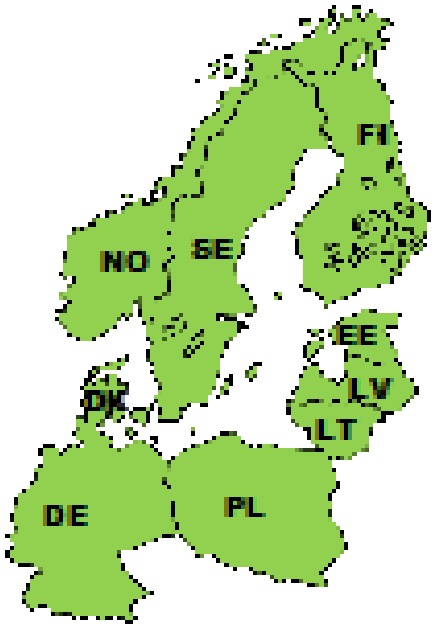
Published 23 September 2013

- **Complete 3rd party projects assessment will be published in the TYNDP 2014 report for the public consultation phase**

Focus on Baltic Sea Region

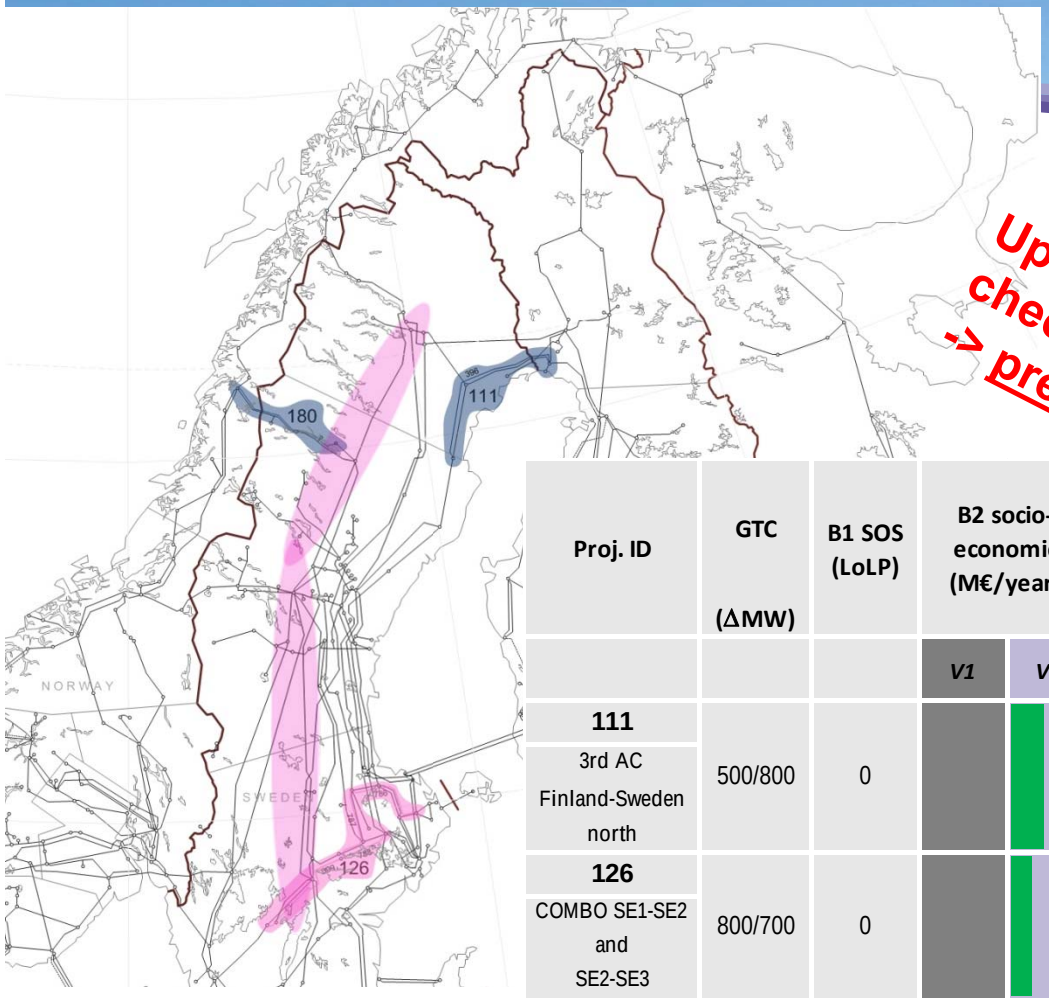
2 projects submitted from 3rd party projects promoters in the Baltic Sea region:

- ✓ **2 Storage projects, both in First PCI Union List**
- ✓ ***Estonia* and *Lithuania* involved countries**



➢ **Non-discriminatory procedure for 3rd party projects inclusion in TYNDP**

Nordics



Updates and consistency check needed
-> preliminary results BS

Proj. ID	GTC (ΔMW)	B1 SOS (LoLP)	B2 socio-economic (M€/year)		B3 RES increase (ΔMWh)		B4 Losses increase, ΔMWh (MEur)		B5 CO2 decrease (ktons)		B6 Resili-ence (0-6)	B7 Robust ness/fl ex (0 - 6)
			V1	*V4*	*V1*	*V4*	*V1*	*V4*	*V1*	*V4*		
111 3rd AC Finland-Sweden north	500/800	0										
126 COMBO SE1-SE2 and SE2-SE3	800/700	0										
180 NNO-SE2	750	0									NA	NA

Baltics

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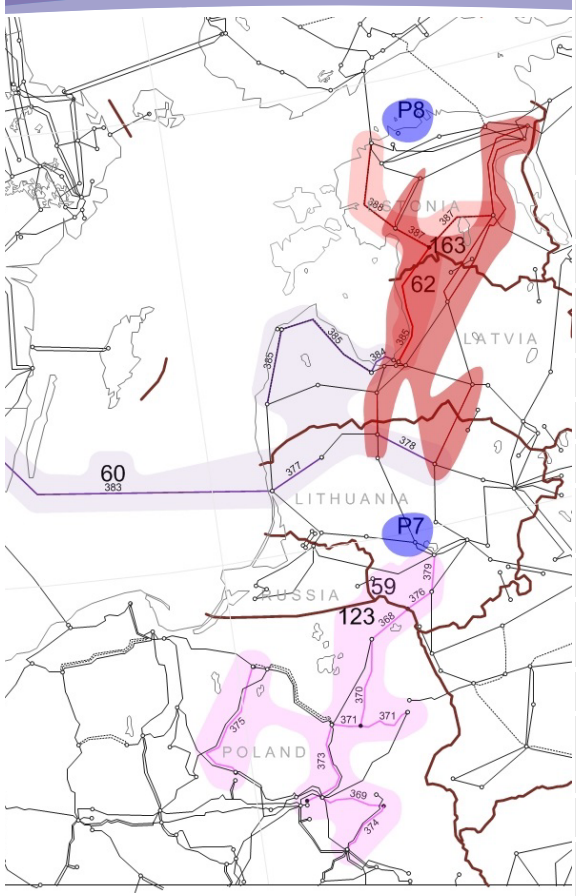

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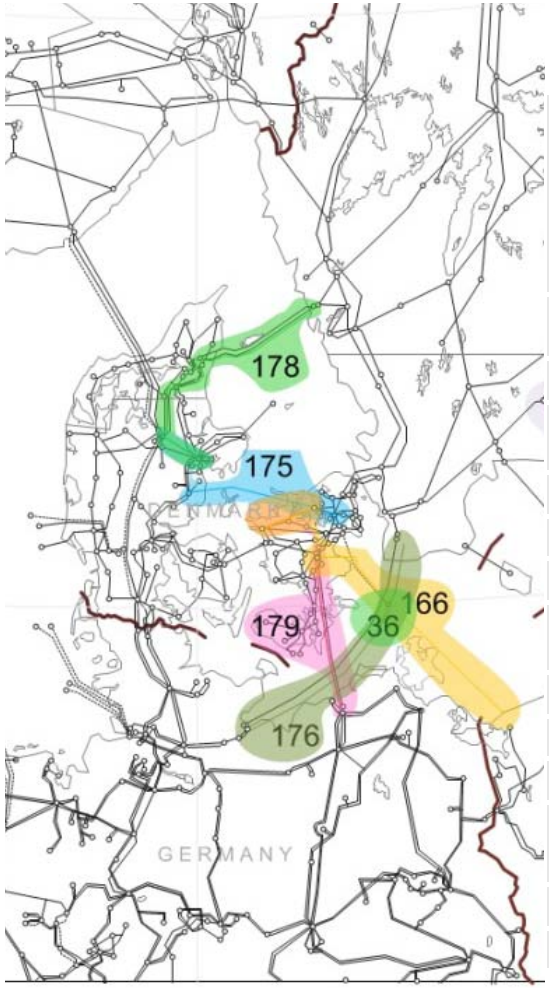
			V1	V4	V1	V4	V1	V4	V1	V4		
59 LitPol Link stage 1	500	0										
60 Nordbalt phase 1	700	0										
62 Estonia-Latvia 3rd IC	500	0										
123 LitPol Link Stage 2	500	0										
163 Baltic corridor (EE-LV-LT)	600	0										
170 Baltics synchronization	SYNCHR +600MW	NA					NA	NA			NA	NA
P7 LIT pump-storage	250 MW Pumping	0										
P8 EST pump-storage	500 MW Pumping	0										

Scandinavia-CE

Updates and consistency check needed
-> preliminary results BS



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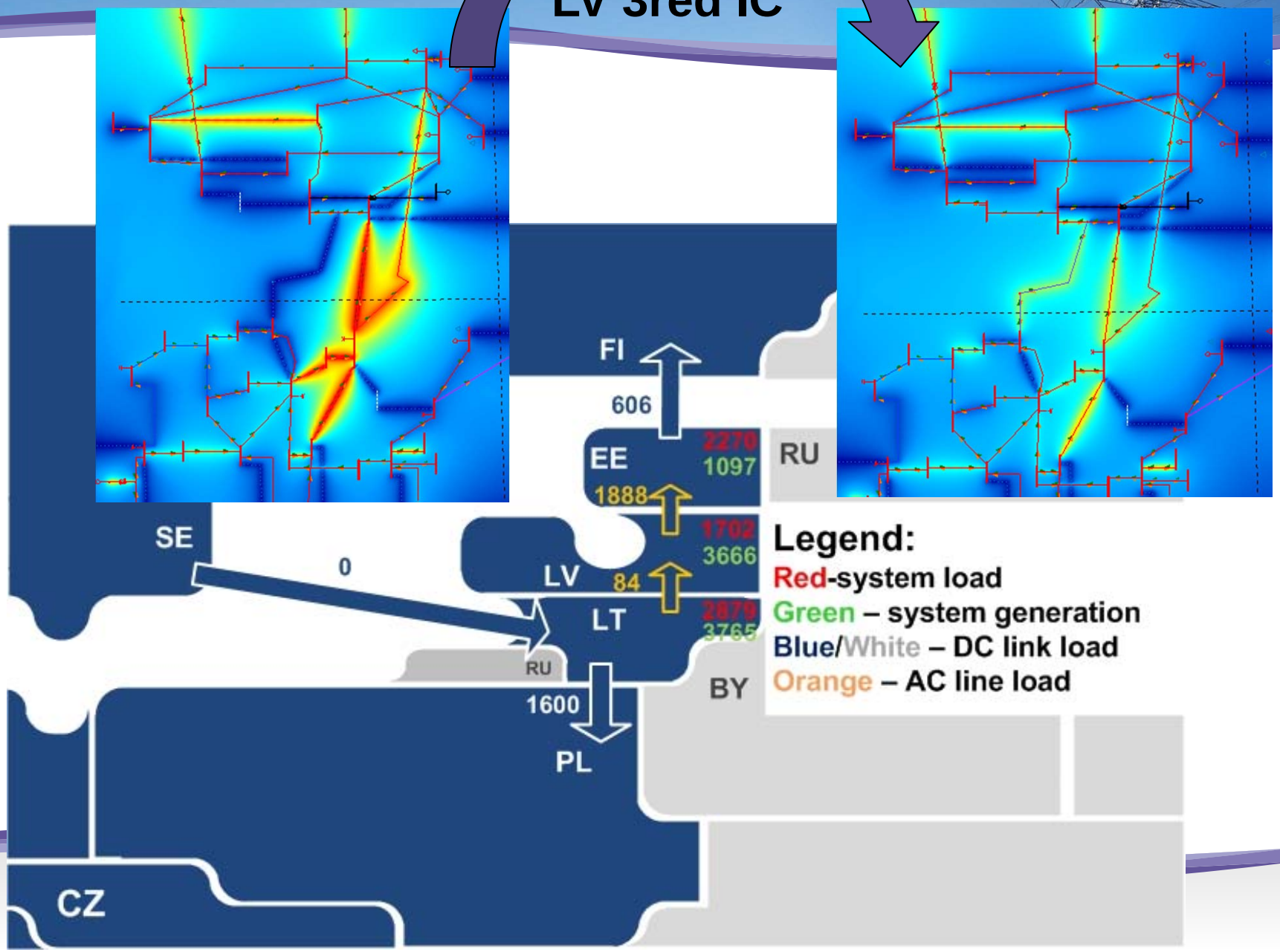
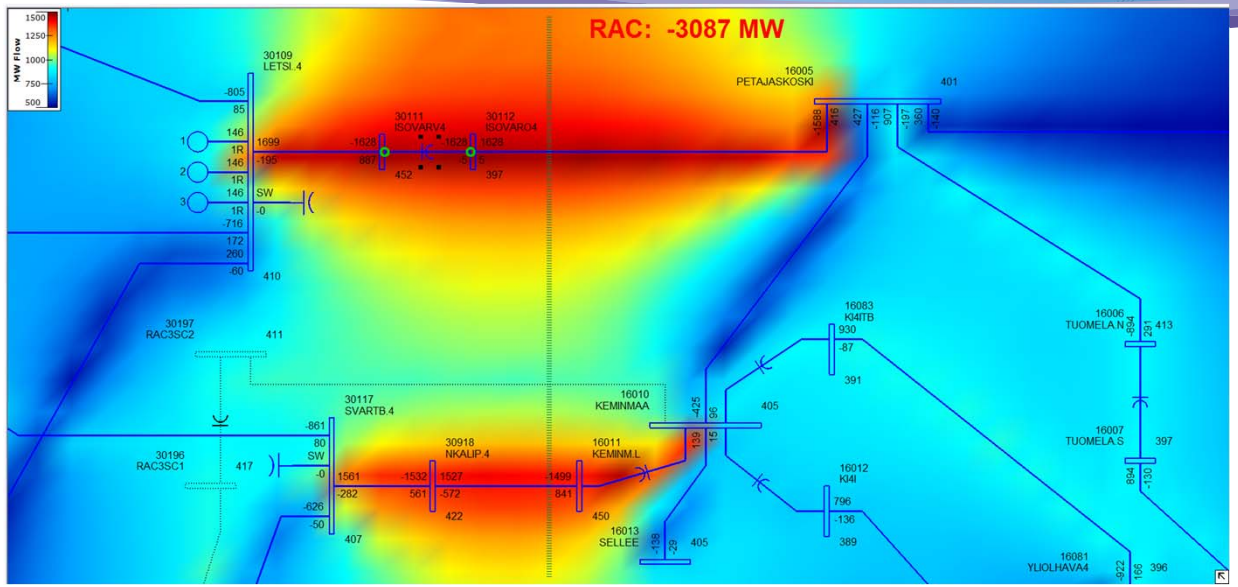
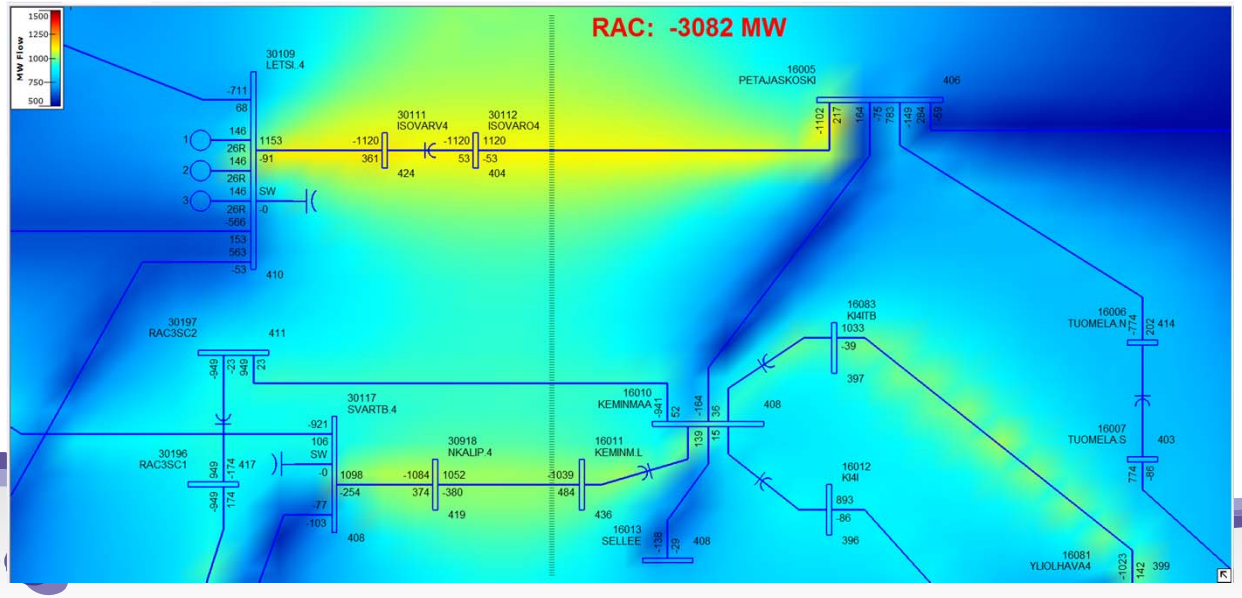
			V1	*V4*	*V1*	*V4*	*V1*	*V4*	*V1*	*V4*		
36 Kriegers Flak CGS	600/400 MW offshore	0										
166 DK2-PL	600	0										
175 (Great Belt) Storebælt 2	600	0										
176 SE4-DE	600	0										
178 SE3-DK1 variant 1	700	0										
179 Kontek 2	600	0										

Snapshot calculation example on grid model

Adding EE-LV 3red IC



Snapshot calculation example on grid model

Adding SE-FI 3rd AC-circuit