

ENTSO-E Pilot Project Contribution to the Network Code on Electricity Balancing final target model

23 Sept 2013



Reliable Sustainable Connected

Purpose of the Pilot Projects



To enable learning for Network Code Implementation

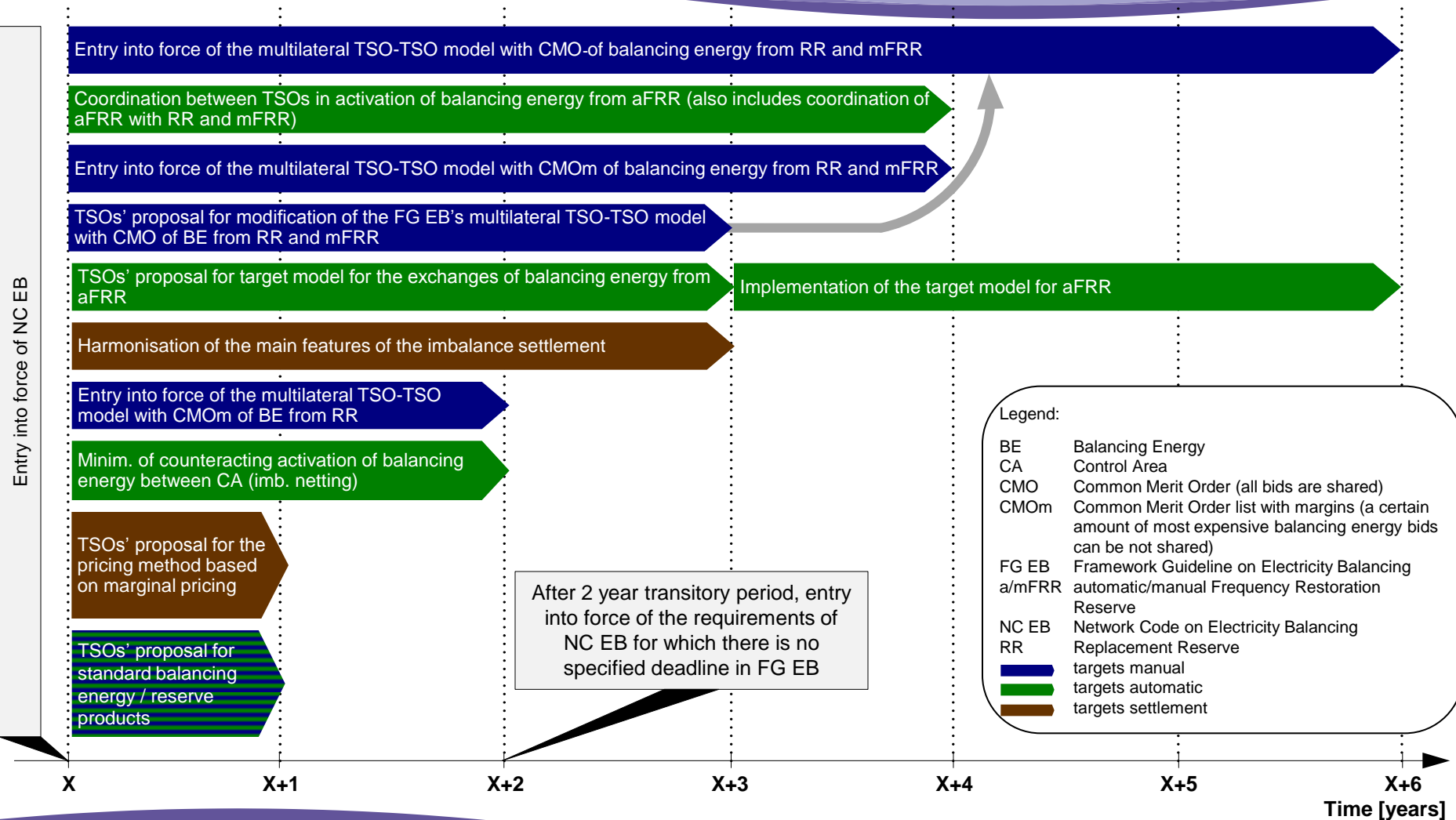


To expand and merge when appropriate for cross border harmonisation



To complement the steps to the final target model

A stepwise approach to the implementation of targets



A stepwise approach to the implementation of targets: 1 year




1. TSOs' proposal for the pricing method based on marginal pricing
2. TSOs' proposal for standard balancing energy / reserve products

Entry into force of NC EB

TSOs' proposal for the pricing method based on marginal pricing

TSOs' proposal for standard balancing energy / reserve products

Legend:

BE	Balancing Energy
CA	Control Area
CMO	Common Merit Order (all bids are shared)
CMOm	Common Merit Order list with margins (a certain amount of most expensive balancing energy bids can be not shared)
FG EB a/mFRR	Framework Guideline on Electricity Balancing automatic/manual Frequency Restoration Reserve
NC EB	Network Code on Electricity Balancing
RR	Replacement Reserve
	targets manual
	targets automatic
	targets settlement

X

X+1

X+2

X+3

X+4

X+5

X+6

Time [years]

A stepwise approach to the implementation of targets: 2 years

3. Entry into force of the multilateral TSO-TSO model with CMOM for Balancing Energy from RR
4. Minimisation of counteracting activation of Balancing Energy between Control Areas (Imbalance Netting)

Entry into force of NC EB

Entry into force of the multilateral TSO-TSO model with CMOM of BE from RR

Minim. of counteracting activation of balancing energy between CA (imb. netting)

TSOs' proposal for the pricing method based on marginal pricing

TSOs' proposal for standard balancing energy / reserve products

Legend:

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CMO	Common Merit Order (all bids are shared)
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	targets manual
	targets automatic
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X

X+1

X+2

X+3

X+4

X+5

X+6

Time [years]

A stepwise approach to the implementation of targets: 3 years

5. TSOs' proposal for modification of the FG EB's multilateral TSO-TSO model with CMO of Balancing Energy from RR and mFRR

6. TSOs' proposal for target model for the exchanges of Balancing Energy from aFRR

7. Harmonisation of the main features of the Imbalance Settlement

Entry into force of NC EB

TSOs' proposal for modification of the FG EB's multilateral TSO-TSO model with CMO of BE from RR and mFRR

TSOs' proposal for target model for the exchanges of balancing energy from aFRR

Harmonisation of the main features of the imbalance settlement

Entry into force of CMO model with CMO of BE from RR

Minim. of coupling between CA (imb. netting)

TSOs' proposal for the pricing method based on marginal pricing

TSOs' proposal for standard balancing energy / reserve products

Legend:

BE	Balancing Energy
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X

X+1

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X+4

X+5

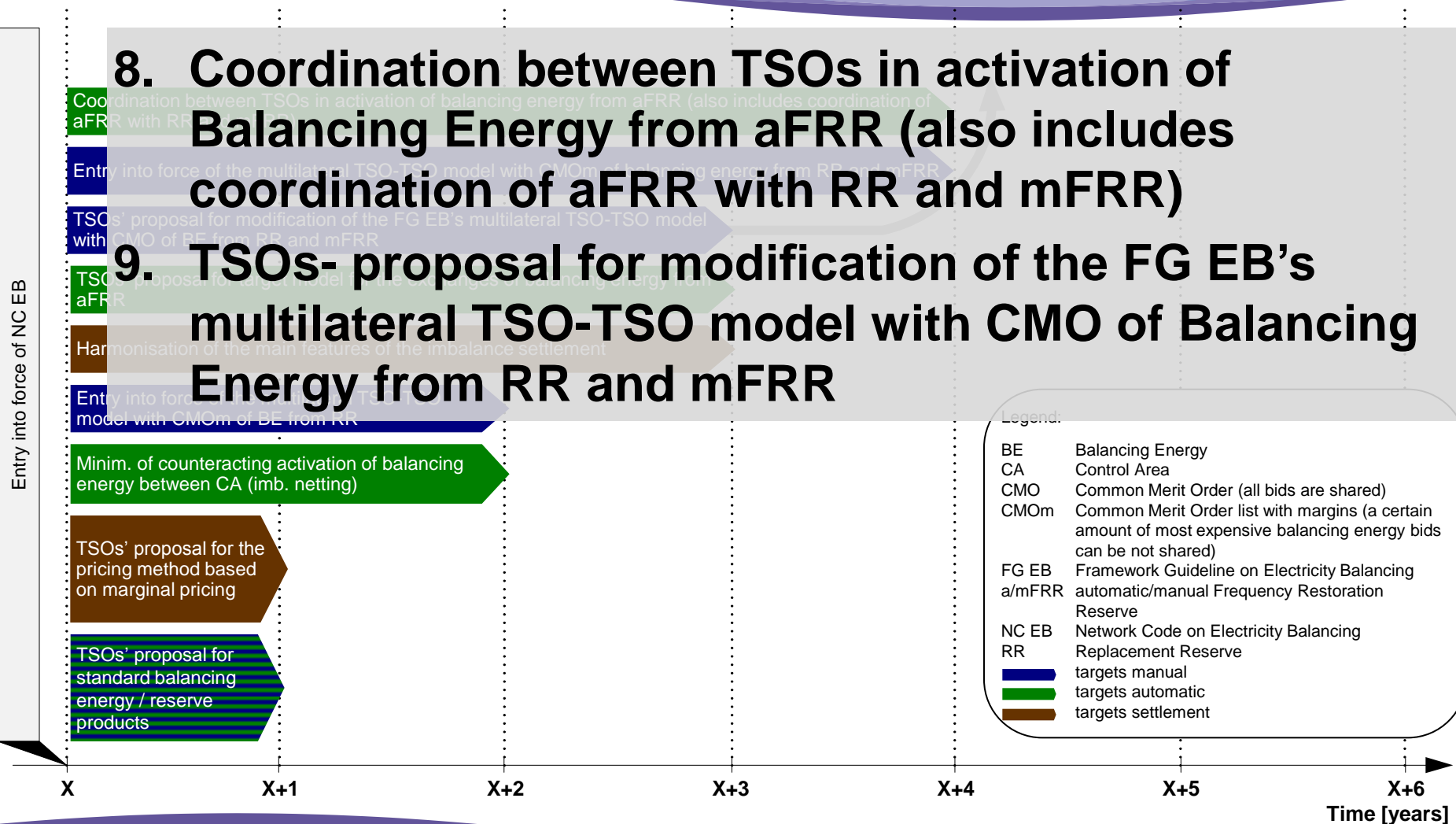
X+6

Time [years]

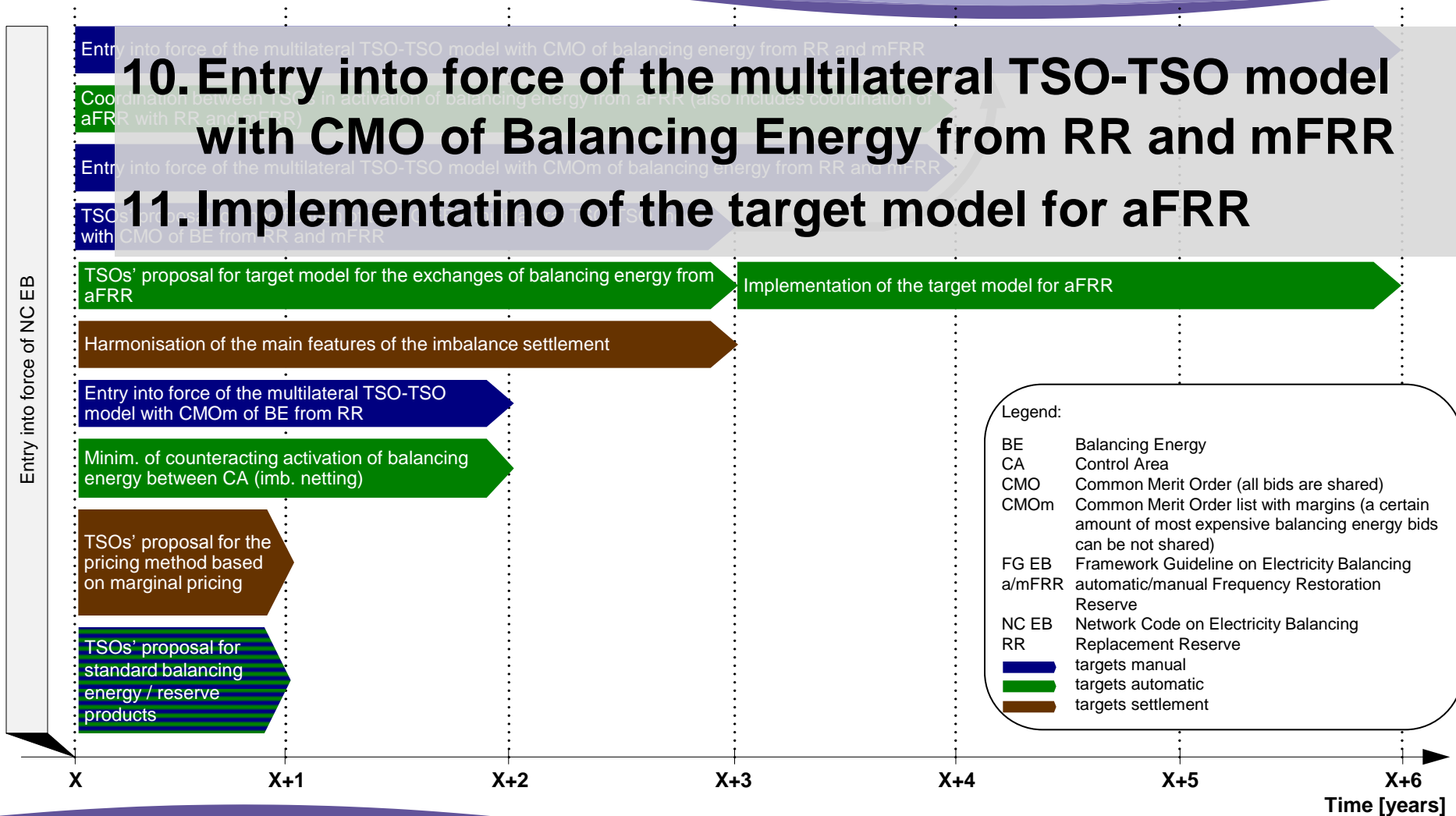
A stepwise approach to the implementation of targets: 4 years

8. Coordination between TSOs in activation of Balancing Energy from aFRR (also includes coordination of aFRR with RR)

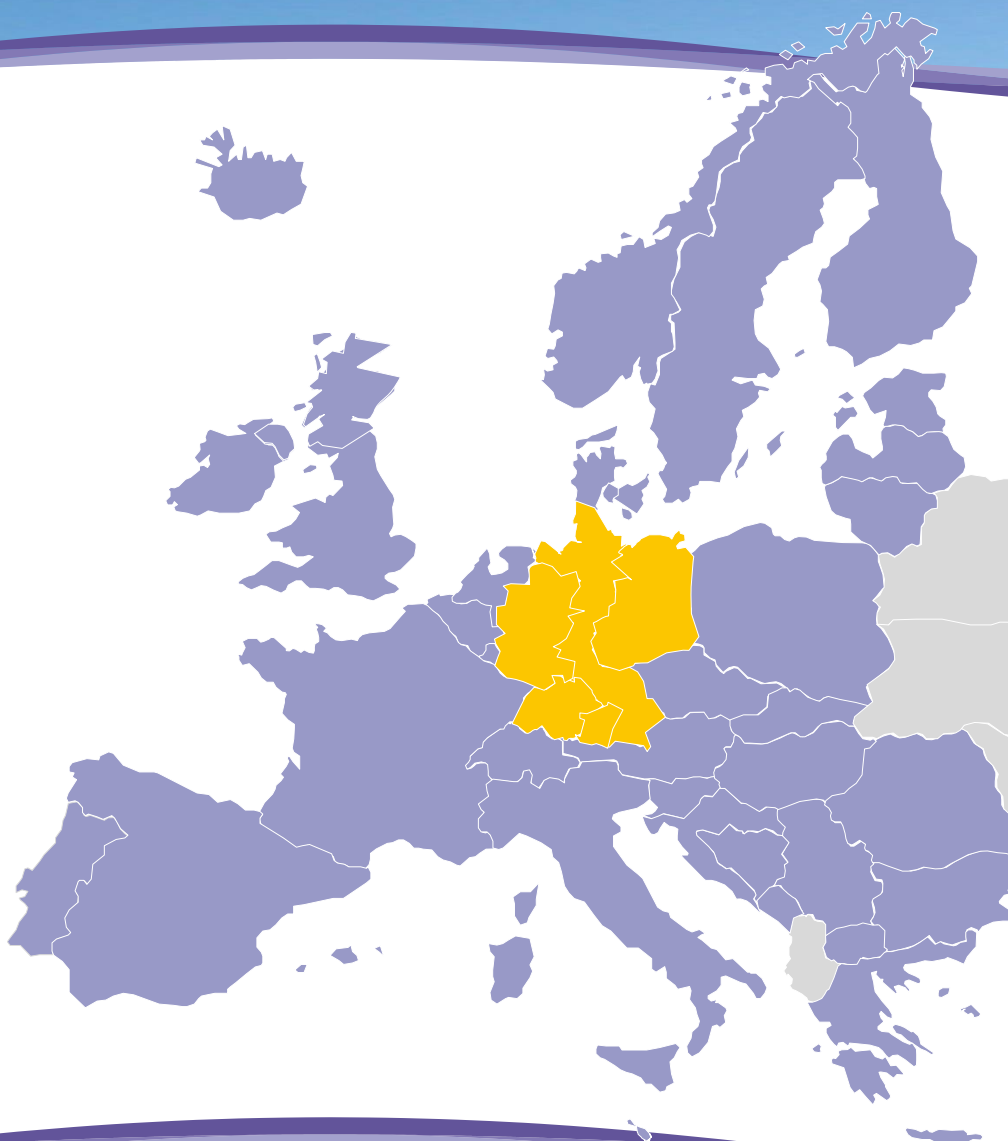
9. TSOs- proposal for modification of the FG EB's multilateral TSO-TSO model with CMO of Balancing Energy from RR and mFRR



A stepwise approach to the implementation of targets: 6 years



Pilot 1: CMOs for mFRR and aFRR with real Time Flow Based congestion management



50Hertz Transmission GmbH,
Amprion,
TenneT TSO GmbH,
TransnetBW GmbH

How will this project contribute to the intermediate/final target model?

1. Functioning project for Imbalance Netting as well as CMOs for aFRR and mFRR with an upgrade to a flow based approach.
2. Deep study about implications of marginal pricing versus pay as bid
3. Functioning coordination of different cooperation initiatives (GCC and IGCC) and its improvement.

entsoe

Pilot 2: Cross-border market for FCR based on TSO-TSO model



APG
Swissgrid

How will this project contribute to the intermediate/final target model?

1. Pioneer experience regarding CMO FCR reserve interchange using a TSO -TSO scheme.
2. No need to increase current TRM value's (then XB capacity reservation is not an issue).
3. Reserve Procurement Optimization Function
The function implemented in this project is similar to the Reserve Procurement Optimization Function described in the draft of the Network Code on Electricity Balancing. This function considers local differences in products, thus it is not required to harmonize all product characteristics (e.g. not divisible bids, conditional bids). The function could process standard products as well as specific products.
4. Intention to extend cooperation to other TSOs.

A tall, lattice-structured high-voltage power transmission tower stands against a clear blue sky. The tower has a central vertical section and two large, horizontal cross-arms on each side, forming a cross-like shape. Several power lines are visible extending from the tower towards the horizon. The bottom of the image shows a blurred, light-colored ground surface.

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Pilot project 3: E-GCC, the scope of the project is imbalance netting



CEPS
SEPS
MAVIR

How will this project contribute to the intermediate/final target model?

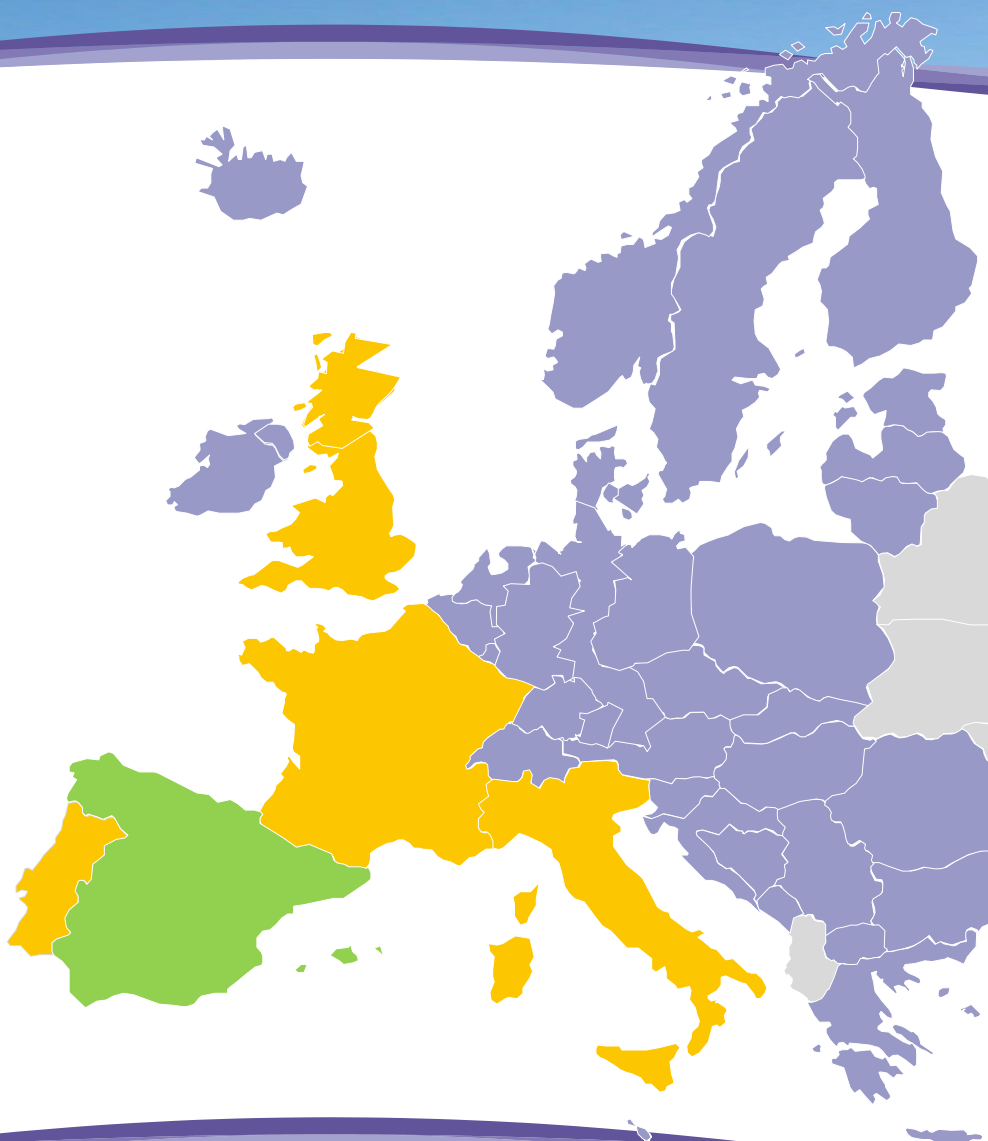
1. Evaluation of the current pricing mechanism with possible outcome to change the pricing system
2. Reduction of aFRR activated energy
3. Possibility to join a bigger CoBA regarding imbalance netting product.

Pilot project 3: road map



Pilot project 3: e-GCC focused on Imbalance netting (CEPS, SEPS and MAVIR)	2013												2014												2015																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Pilot project 4: TERRE, Trans-European RR exchange

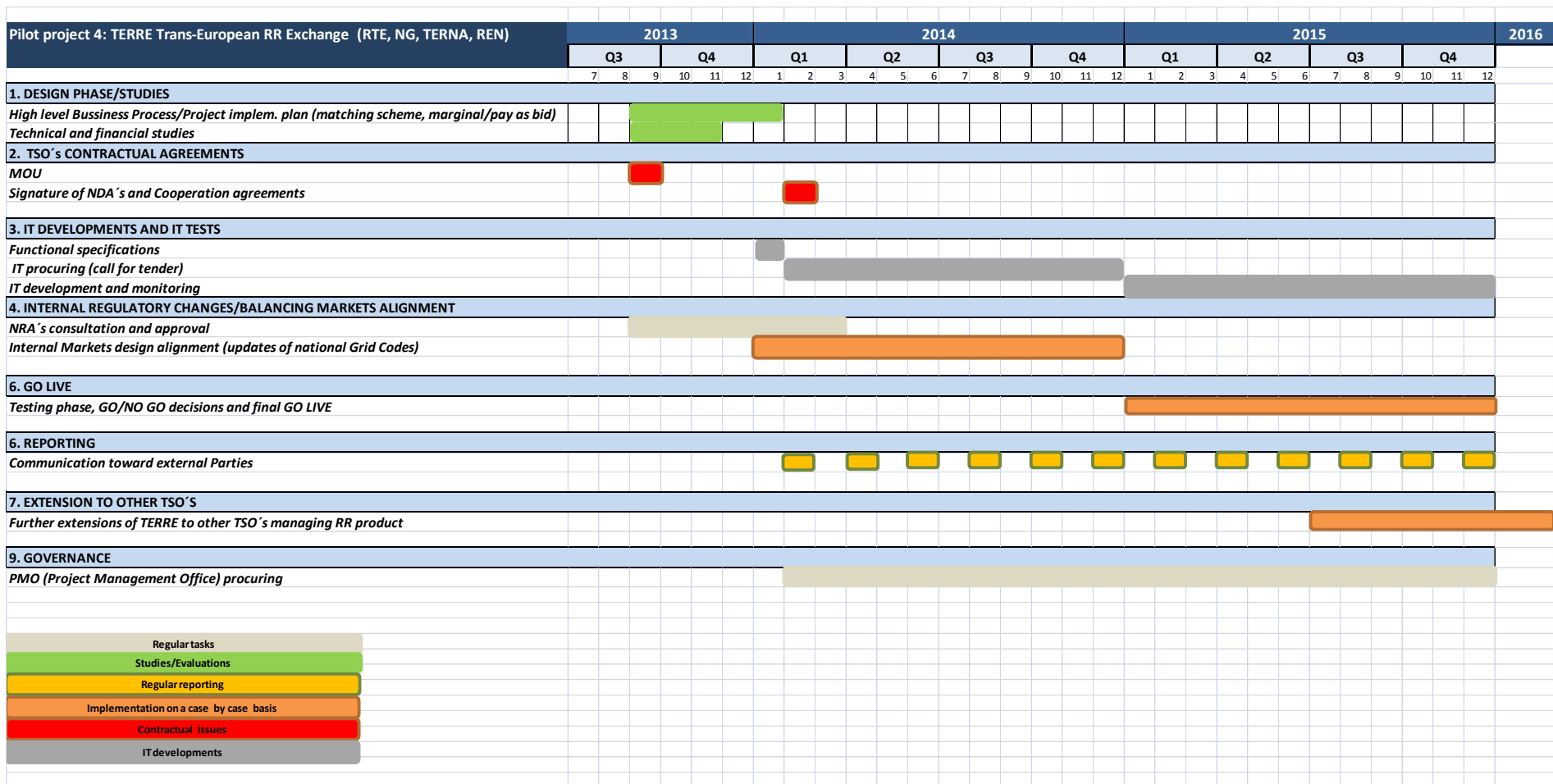


RTE, NG, Terna, REN, (REE)

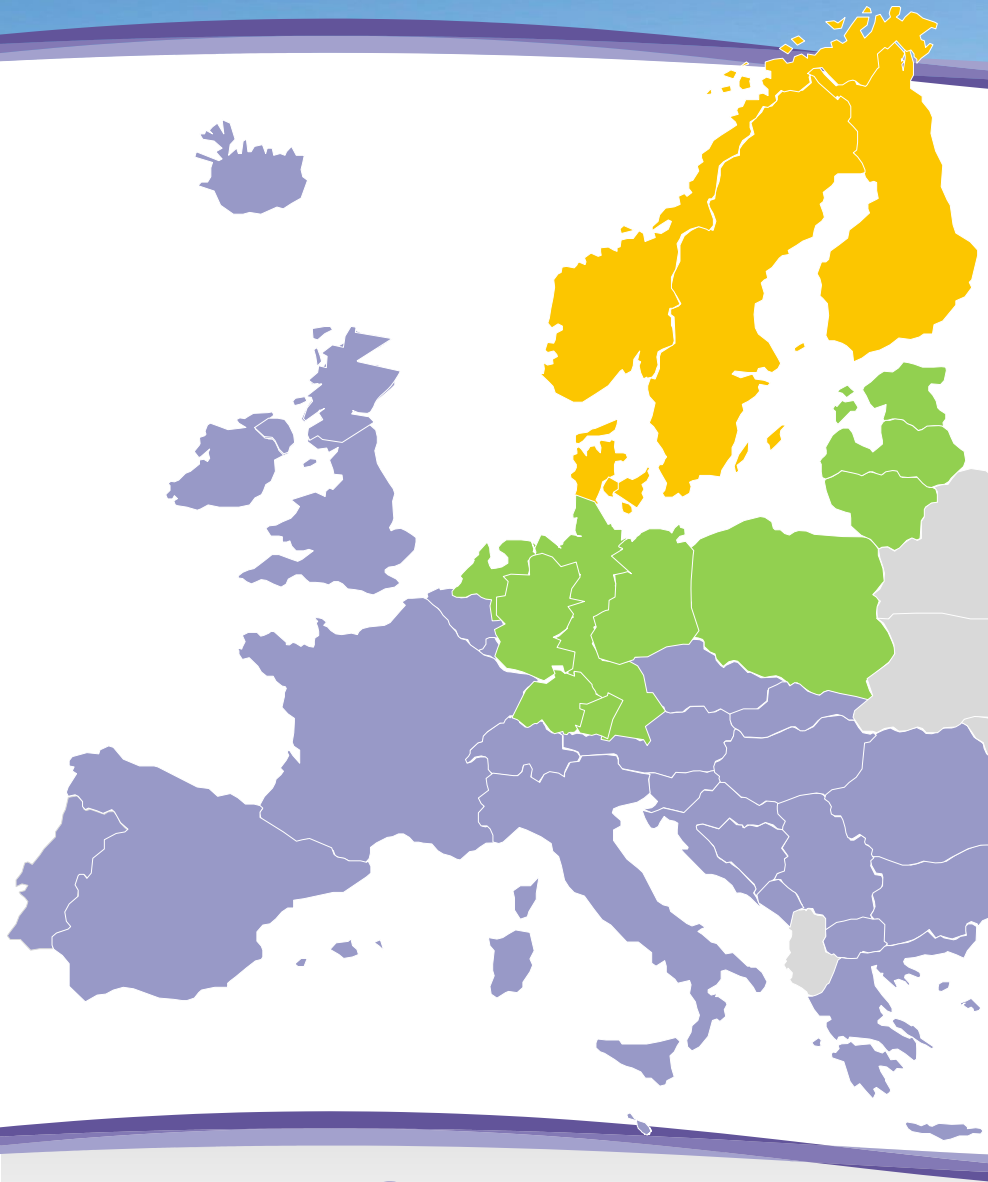
How will this project contribute to the final target model?

1. Pioneer initiative in Europe focused on RR product
2. It considers future extension of CoBA to other TSO's

Pilot project 4 road map



Pilot 5: Development of the Nordic balancing market for FRR(m)

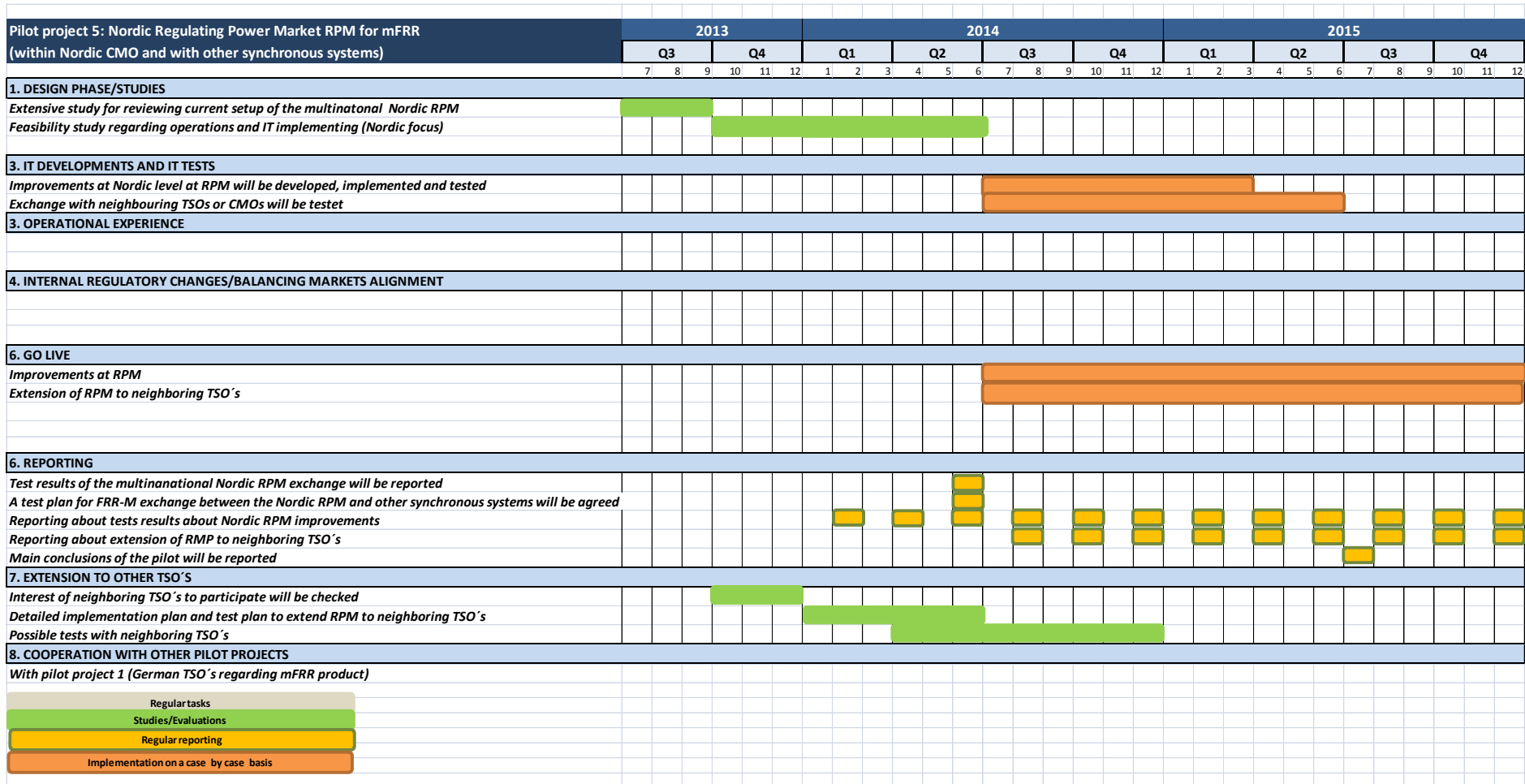


Statnett, Fingrid, Svenska Kraftnät, Energinet.dk. (Baltic TSOs, (PSE, TenneT TSO B.V., 50Hertz GmbH, Amprion, TenneT TSO GmbH, TransnetBW GmbH)

How will this project contribute to the intermediate/final target model?

1. Demonstrate and describe an existing multinational mFRR market with CMO
2. Make and report on improvements and increased harmonization of multinational mFRR market towards higher liquidity and efficiency. Also show ways to allow for more demand side participation and RES integration
3. Work and test for an extension of current Nordic balancing market towards neighbouring countries and pilots

Pilot 5: road map



Pilot 6: The interchange of cross border balancing reserve as well as cross border balancing energy of FRR(a) and RR



SEPS
MAVIR

How will this project contribute to the intermediate/final target model?

1. Harmonize settlement procedures (towards marginal price through a CBA)
2. Harmonization of balancing products
3. Analyze the possibility of co-optimization versus independent ATC.

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Pilot project 7: Cross border exchange of balancing energy from (both automatic and manual) FRR; liquid reactive balancing markets as an objective



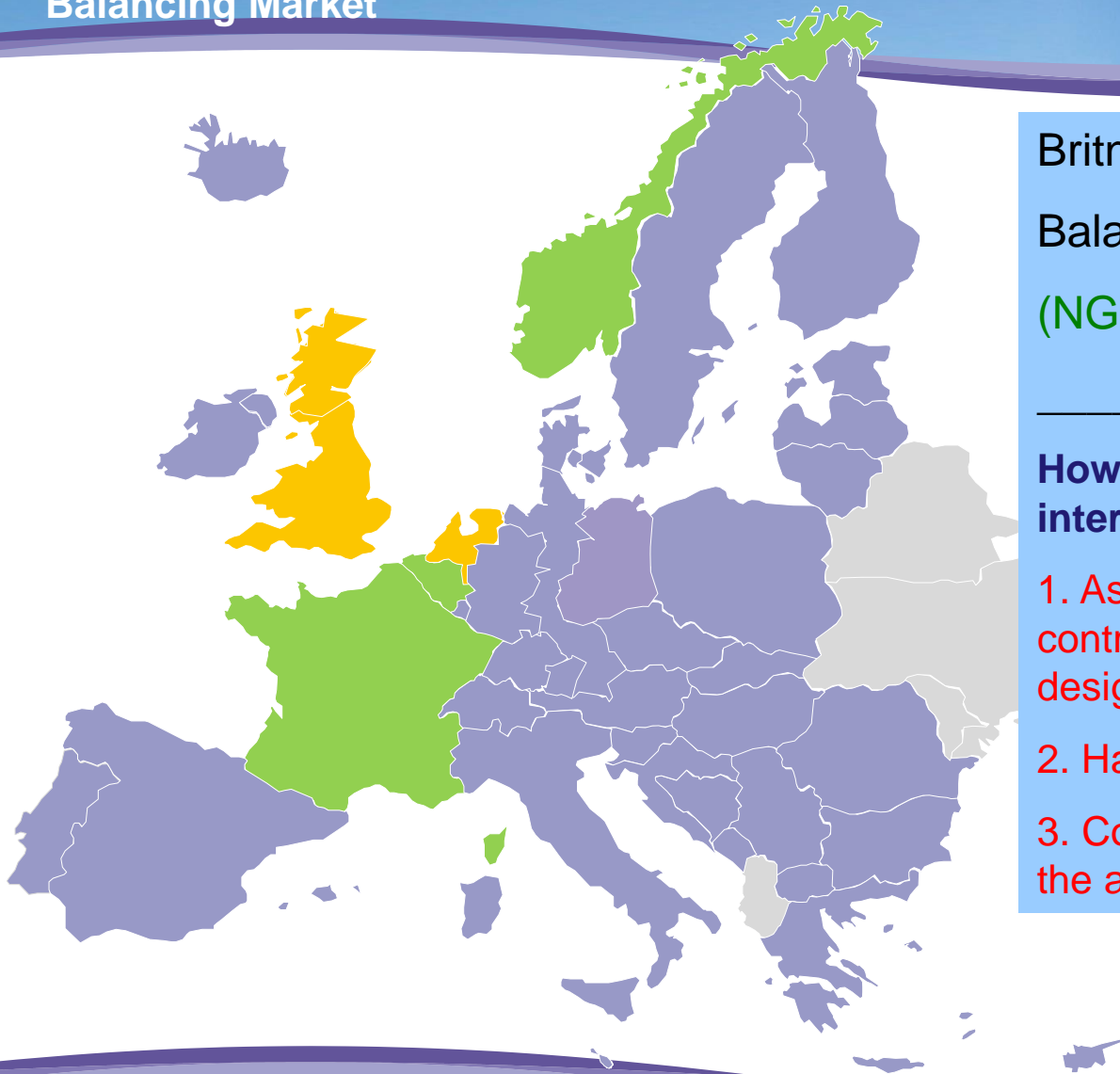
Elia
TenneT TSO B.V.

How will this project contribute to the intermediate/final target model?

1. Study to assess the feasibility and added value of the target model; exchange of aFRR and mFRR between 2 different bidding zones
2. Harmonisation of balancing products and settlement procedure.
3. Adequate balancing market design reducing balancing needs and fostering liquid ID markets.



Pilot 8: To test the feasibility of the BritNed Interconnector for Balancing with the fundamental differences in the way each member state has organised its Balancing Market

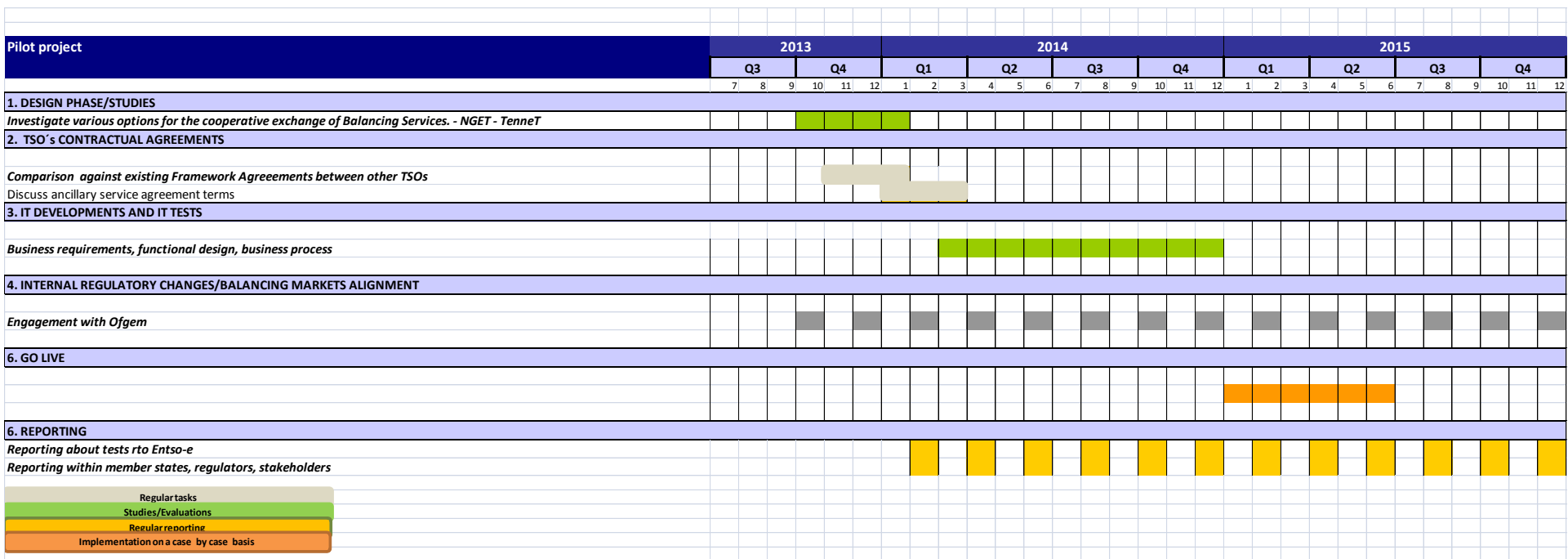


Britned / Tennet TSO
Balancing Services
(NGET – Tennet)

How will this project contribute to the intermediate/final target model?

1. Assess the feasibility of joining two control areas with differing market designs.
2. Harmonisation of products
3. Cooperation between TSOs to progress the aims of the Balancing Code

Pilot 8: Road map



Pilot 9: IGCC (Imbalance Netting and FRR(a))



50Hertz Transmission GmbH, Amprion, CEPS, Elia, Energinet.dk, TenneT TSO B.V., TenneT TSO GmbH, TransnetBW GmbH
(Swissgrid as IGCC member, any other interested TSO with a border to the IGCC area)

How will this project contribute to the intermediate/final target model?

1. Functioning project for Imbalance Netting will bring experience on operational procedures, TSO-TSO settlement and organisational issues.
2. Flow-based approach for Imbalance Netting, and aFRR - study on regulatory and market related aspects and case-by-case implementation.
3. Bring experiences about aFRR

Pilot 9: road map



Pilot project 9: IGCC (Imbalance Netting and Automatic FRR), 4 German TSO's CEPS, Energinet, Elia, Tennet NL												2013						2014						2015																		
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1. DESIGN PHASE/STUDIES																																										
WP1: Operational procedures - harmonize IGCC operation																																										
WP2: aFRR assistance - settlement model, regulatory and market constraints																																										
WP3: Upgrade of IGCC - studies to improve current ATC aproach towards Flow Based																																										
WP4: Imbalance Netting - settlement model monitor and social welfare evaluation																																										
6. GO LIVE																																										
WP1: Operational procedures - harmonize IGCC operation																																										
WP2: aFRR assistance - step by step implementation (through a CBA analysis GO/No GO)																																										
WP3: Upgrade of IGCC - implementation of Flow Based (through a CBA analysis GO/No GO)																																										
WP4: Settlement model adapting if necessary																																										
6. REPORTING																																										
WP1: Monitoring and reporting on technical performance and opertional experience																																										
WP2: Monitring and reporting on social welfare																																										
Studies/Evaluations																																										
Regular reporting																																										
Implementation on a case by case basis																																										