TERRE

Trans European Replacement Reserves Exchange

Future Power Market Platform

April 14th 2016

Overview of TERRE Design

Product

- 30min Full Activation Time
- No defined ramping period (max 30mins)
- Scheduled 15min block which can be linked together
- Max duration is 1hr
- Block settled & exchanged
- Large variety of bid formats

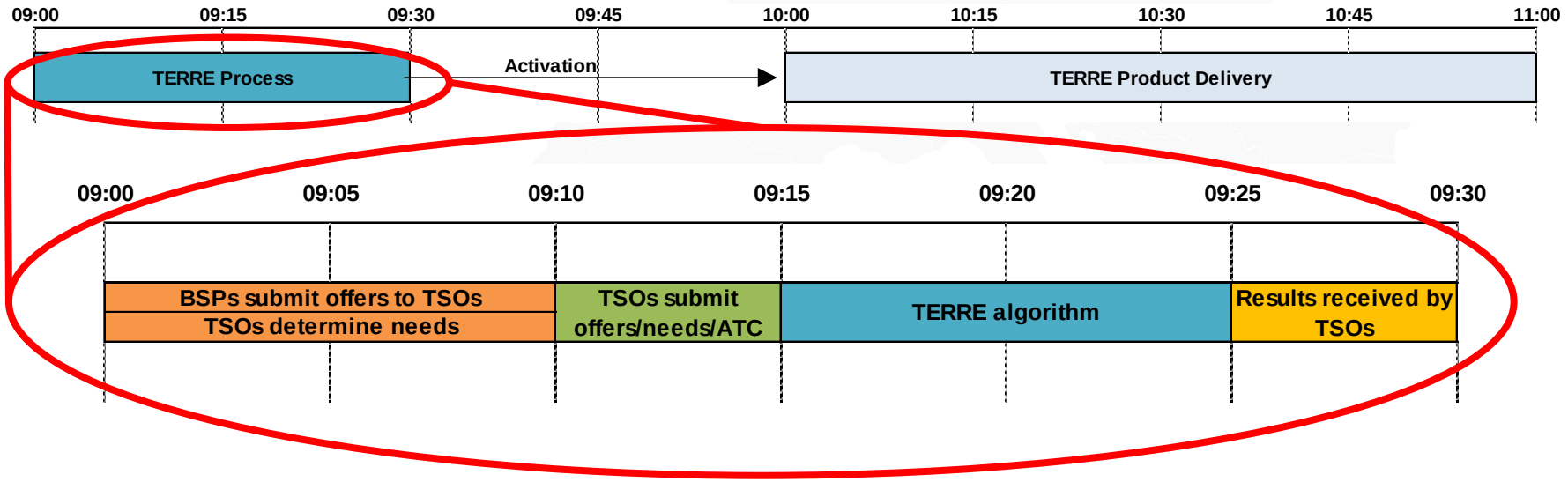
Algorithm

- Single clearing
- Netting of TSO needs
- Elastic TSO demand
- Counter-activations permitted
- Social welfare maximisation
- Similar to DA algorithm
- No detailed network model

Settlement

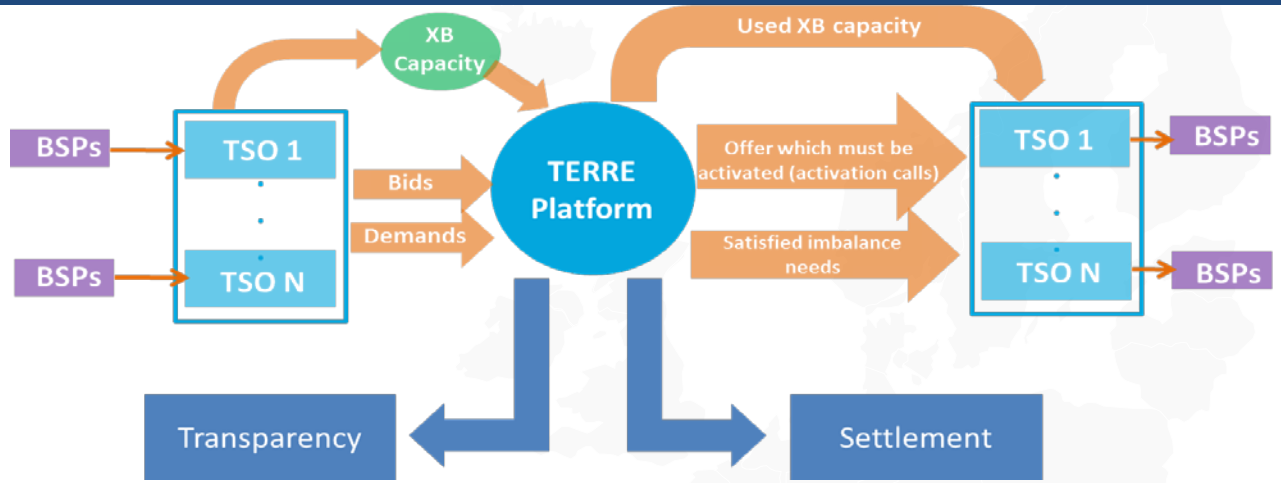
- Pay as cleared
- One price for upwards & downwards activations
- No caps/floors (negative price)
- XB Bal Energy Marginal Pricing
- Focus on TSO-TSO balancing energy
- Congestion rent generated

Timing & Scheduling



Overview of TERRE Design

Process

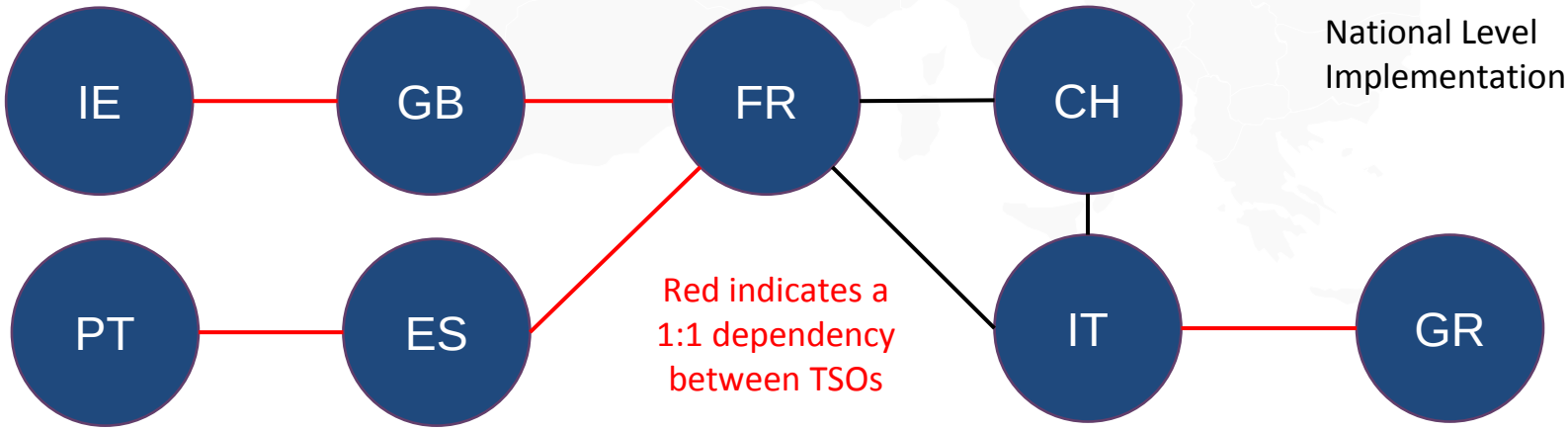


Implementation Approach

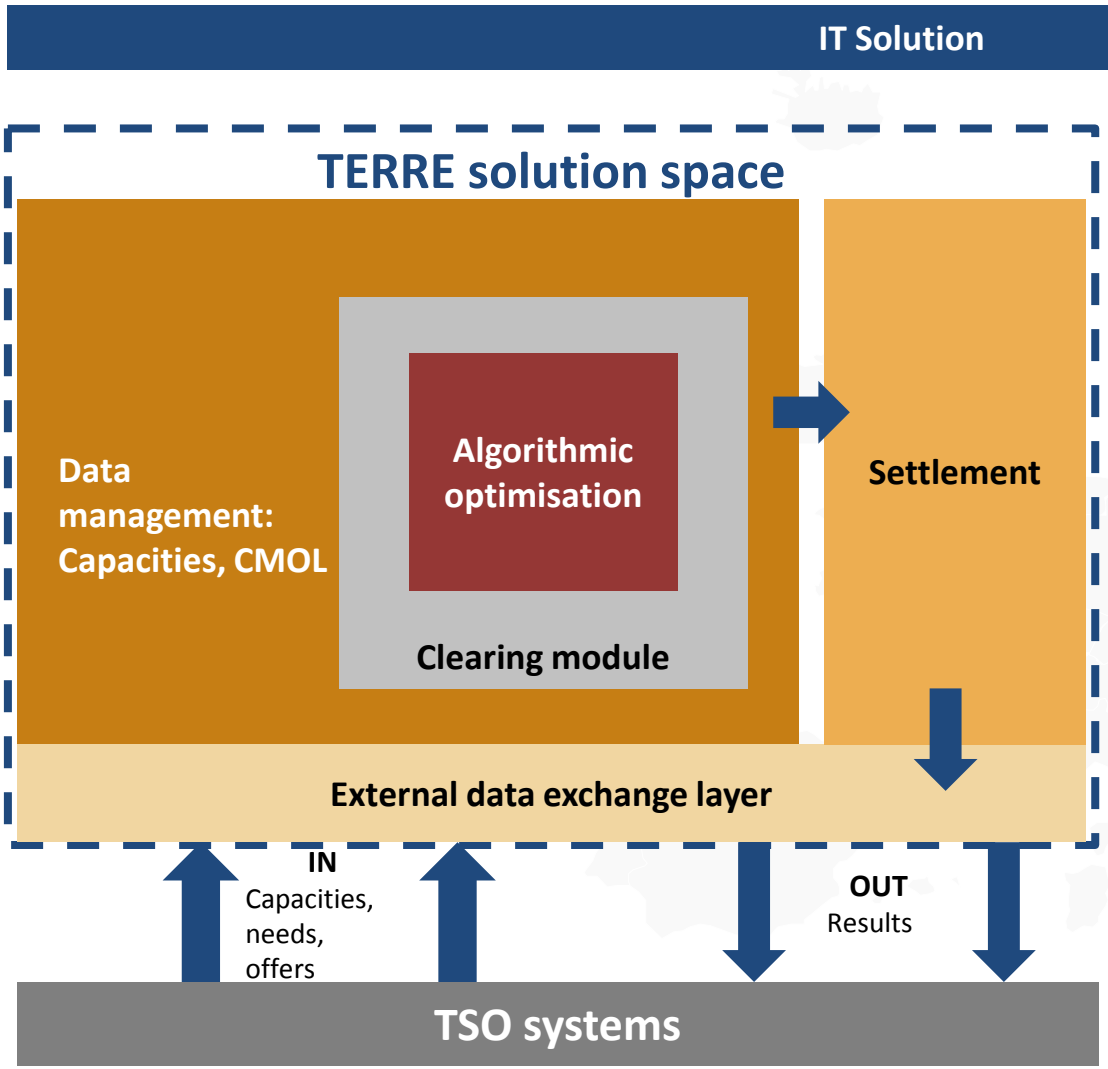
CoBA Level Implementation

RR CoBA Platform

National Level Implementation



Overview of TERRE Design



Denotes data exchange interface

Other inter-module interfaces could be APIs for performance

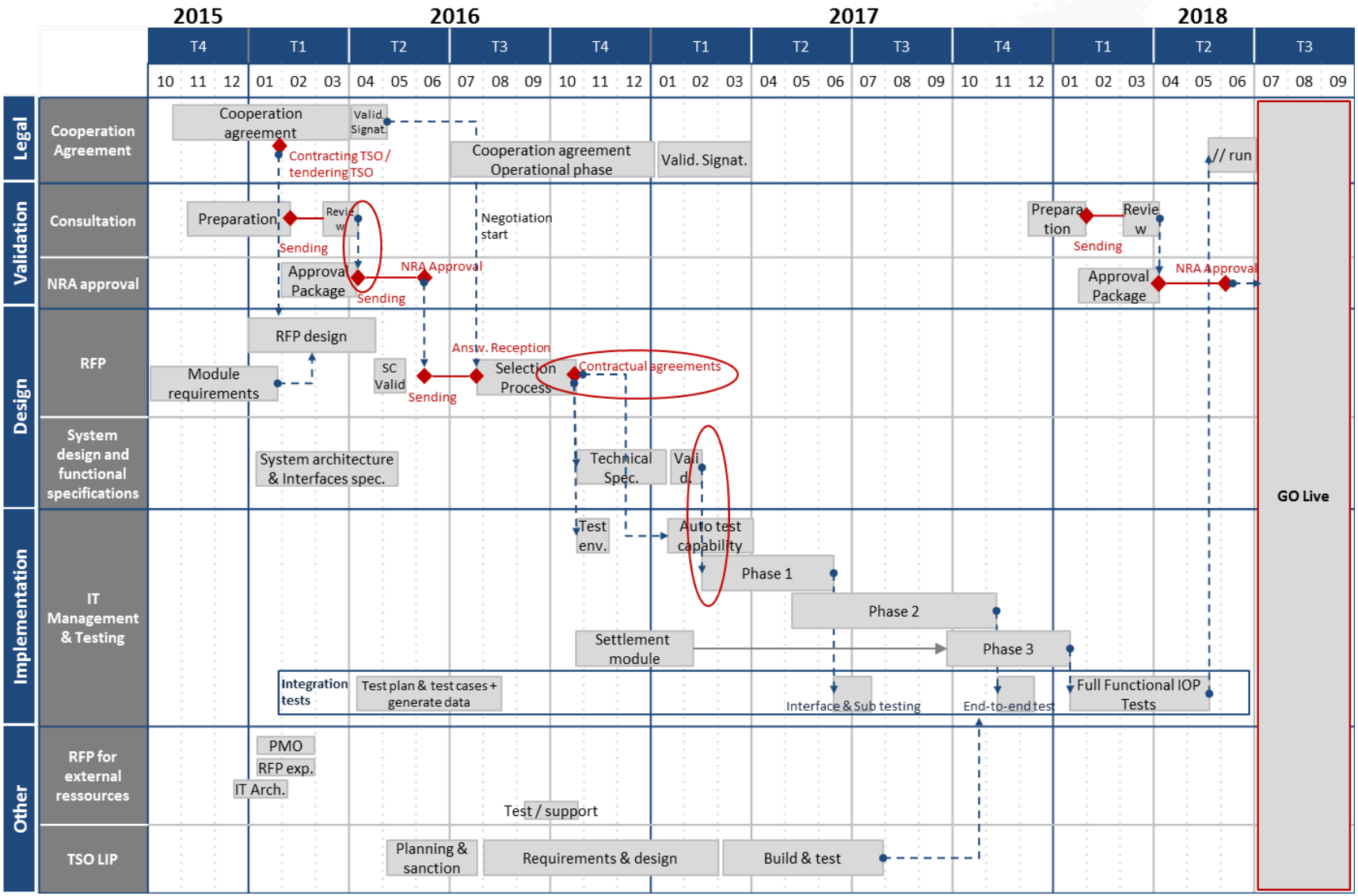
Key Aspects

mFRR and/or RR product can be optimised by the platform

Different CoBAs using the same and/or different types of product can be optimised by the platform using different CMOL

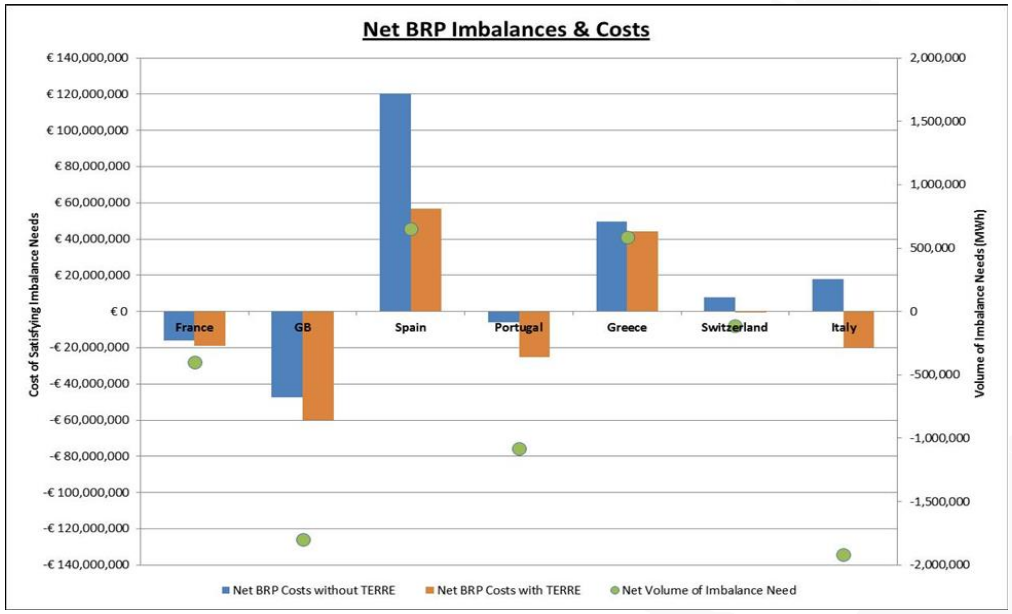
It is also **possible to have one single Merged CMOL** for the same type of product, **for TSOs from different Cooperation**

TERRE Implementation Plan



Impact of TERRE

Cost Benefit Analysis



- CBA using 2013 historical data
- Simulations of balancing with & without TERRE using historical ATC
- Main conclusions:
  - ~€150m reduction in balancing costs
  - All member states benefit (varies)
  - Shift of welfare from BSPs to BRPs
  - Costs of ~€27m for EU & national implementation
- Challenge to get results reflective of future state (e.g. change in behaviour)

More detailed info can be found at - https://consultations.entsoe.eu/markets/terre

Challenges

- Managing internal congestions with simplified EU algorithms – need for pre-assessment & filtering
- Agreement on national elements that need to be harmonised (BEGCT, TSO-BSP settlement)
- Maintaining a fully optimised system with an EU algorithm only optimising one process (RR)
- How to manage in parallel a national 'implicit' multi-part balancing products with an EU explicit products
- NC EB timescales – any delays in the project will result in EU target (Q2 2018) being missed
- Ensuring scalability for the future to mFRR processes, and to further develop the algorithm (to include grid info)