



Modelling the Impact of Transmission Charging Options

Project TransmiT Stakeholder Event

11th August 2011

Contents



- Background
- Objectives of the study
- Modelling methodology
- Key assumptions and data sources
- Project timelines
- Questions

Background



- On 27 May 2011 Ofgem outlined its proposed approach for Project TransmiT
- Ofgem issued tender for analytical support for Project TransmiT on 3 June 2011
- Project kicked off on 23 June 2011
- On 7 July 2011, Ofgem launched a Significant Code Review of electricity transmission charging
- Redpoint has been working with NGET and Ofgem on constraint forecasting using PLEXOS since October 2010

Objectives



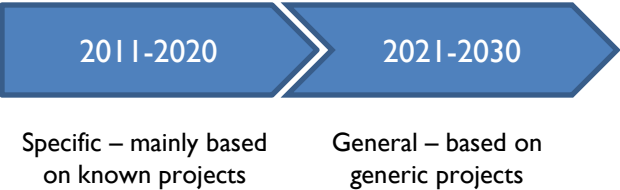
Three options

- Status Quo
- Improved ICRP
- Socialised

Two methodologies

- Perfect foresight
- Imperfect foresight (agent simulation)

Timeframes



Outputs

- Impact on consumer bills
- Impact on power sector cost
- Detailed outputs
 - wholesale electricity prices
 - capacity margins
 - generation mix
 - costs of constraints
 - incremental transmission cost levels
 - amount of renewable generation (by region)
 - total carbon emissions from generation

Policy levers

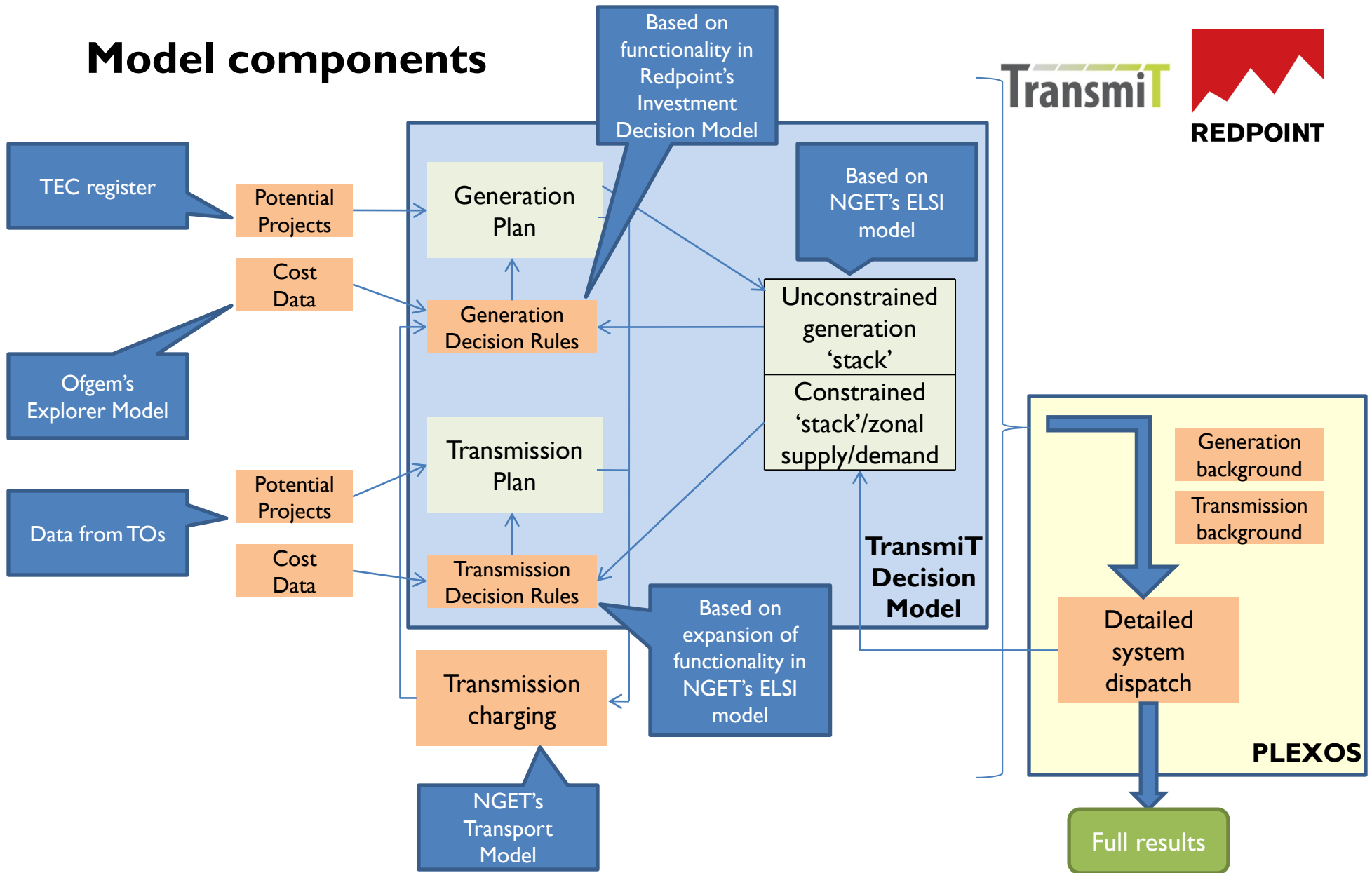


Wide set of policy levers to be covered by modelling framework

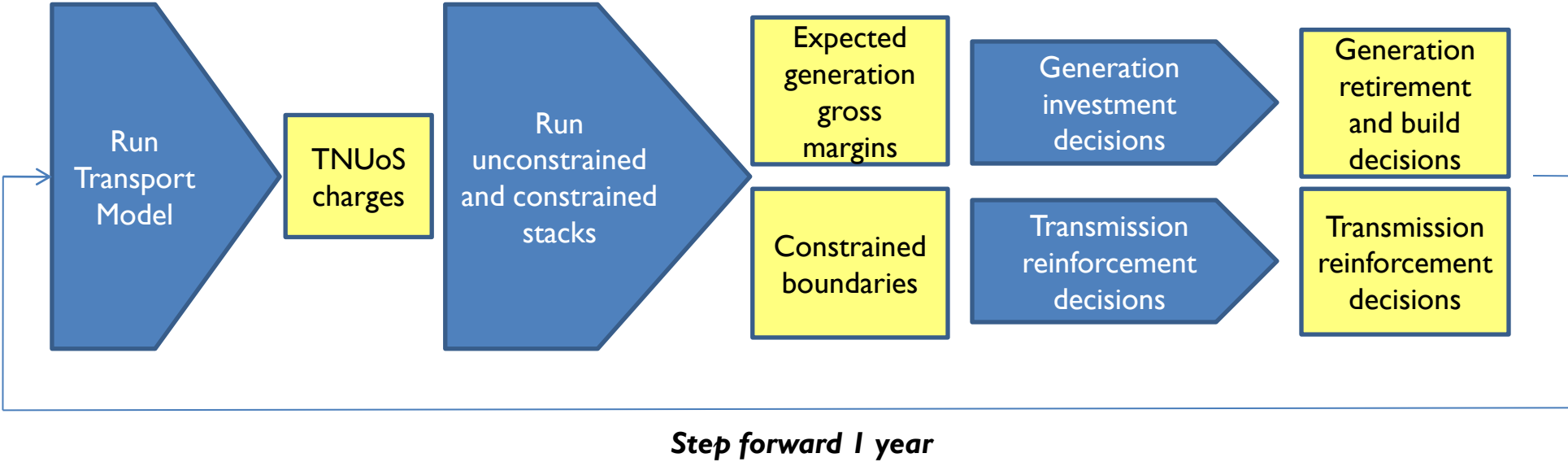
	Wider investment	Local asset charges	Connection charges	G:D split	Capacity or energy (wider tariff)	Capacity or energy (residual tariff)	Grand-fathering	HVDC lines: choice of cost components in Expansion Factor	HVDC lines: treatment in load flow modelling	Treatment of offshore connection assets	Island charging	Regional security factors	Constraint costs	Losses
Status Quo	Locational	Asset specific	Shallow	27:73%	Capacity	Capacity	No	TBD	TBD	TBD	TBD	Status Quo (1.8)	Socialised	Average, i.e. non locational (pre-P229)
Improved ICRP														
Socialised														

Only one definition of each option can be fully modelled within Project TransmiT timelines – required by beginning of September

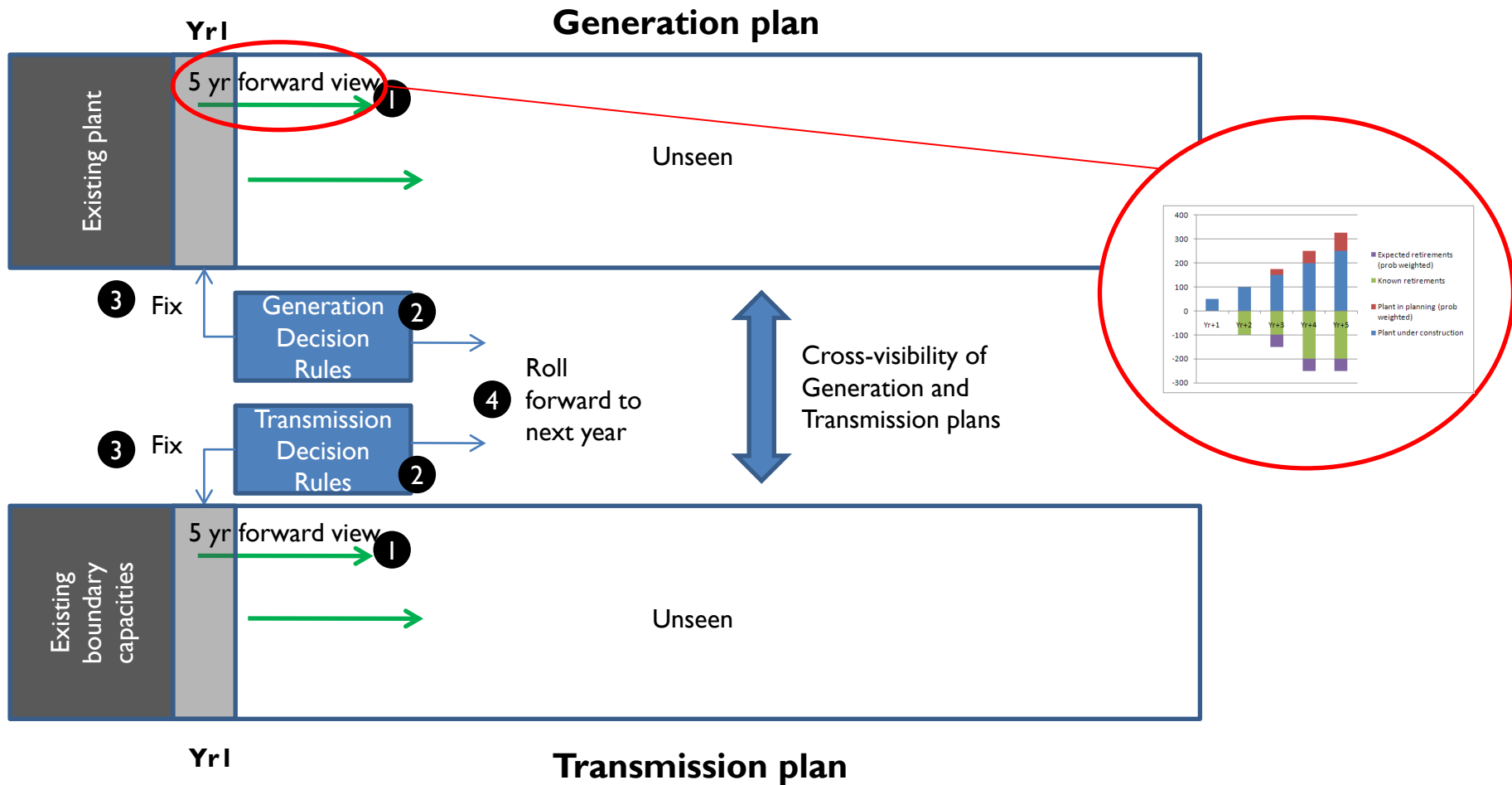
Model components



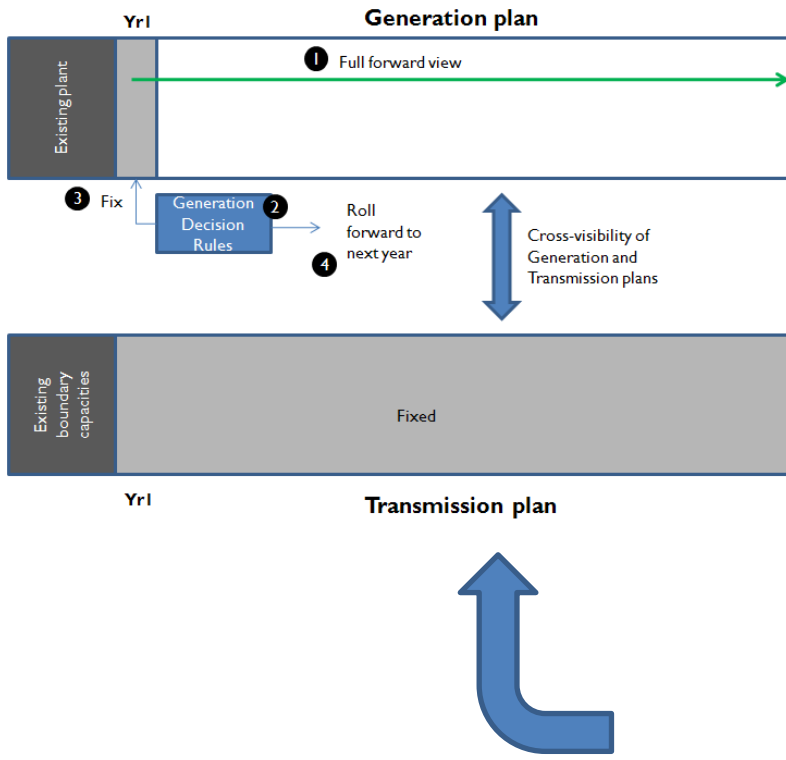
Simulation steps



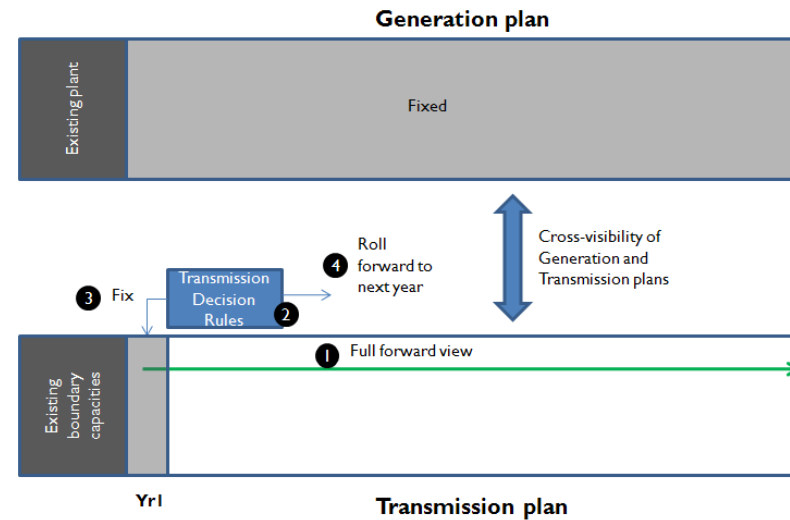
Agent simulation/non-perfect foresight



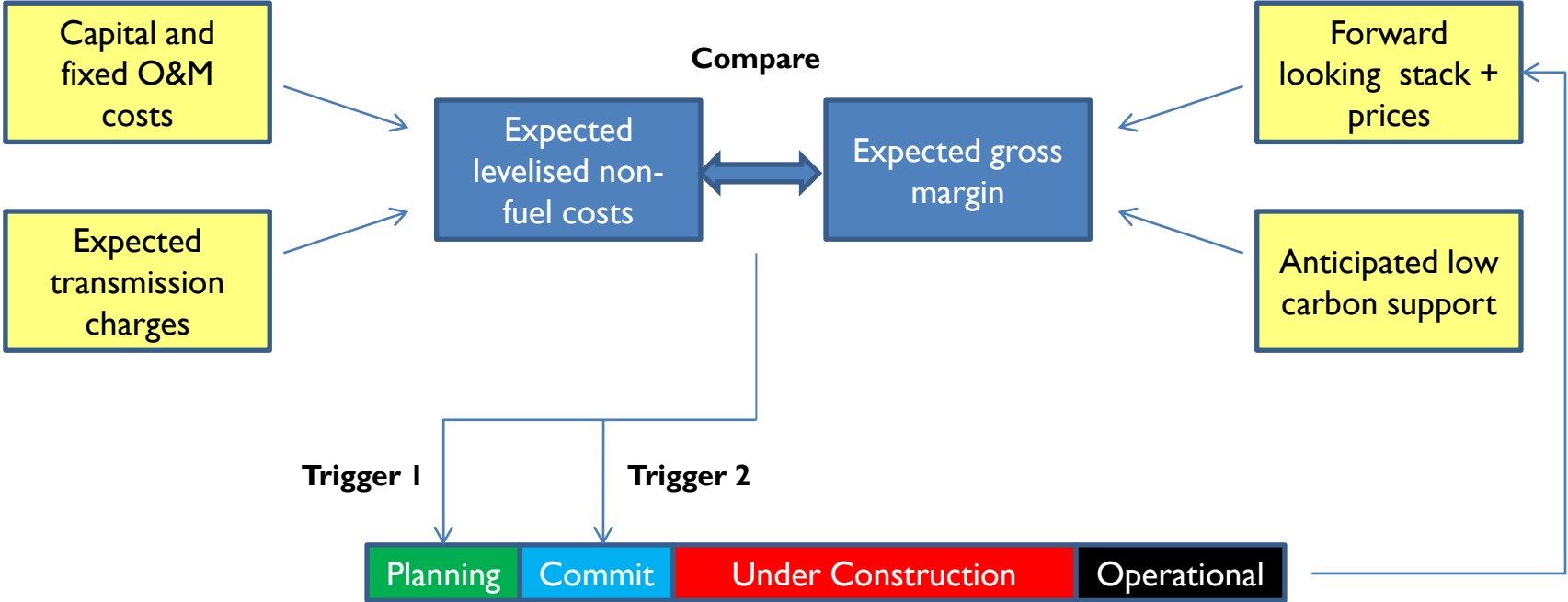
Perfect foresight



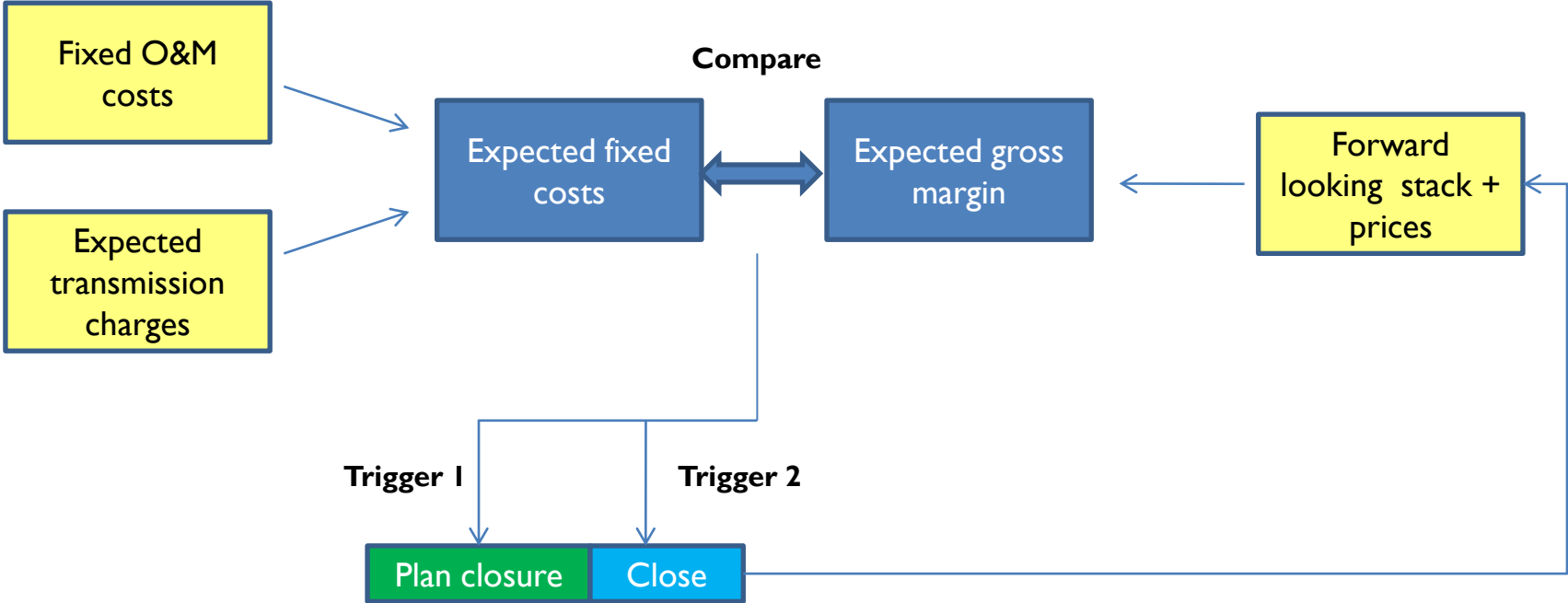
Iterate to converge



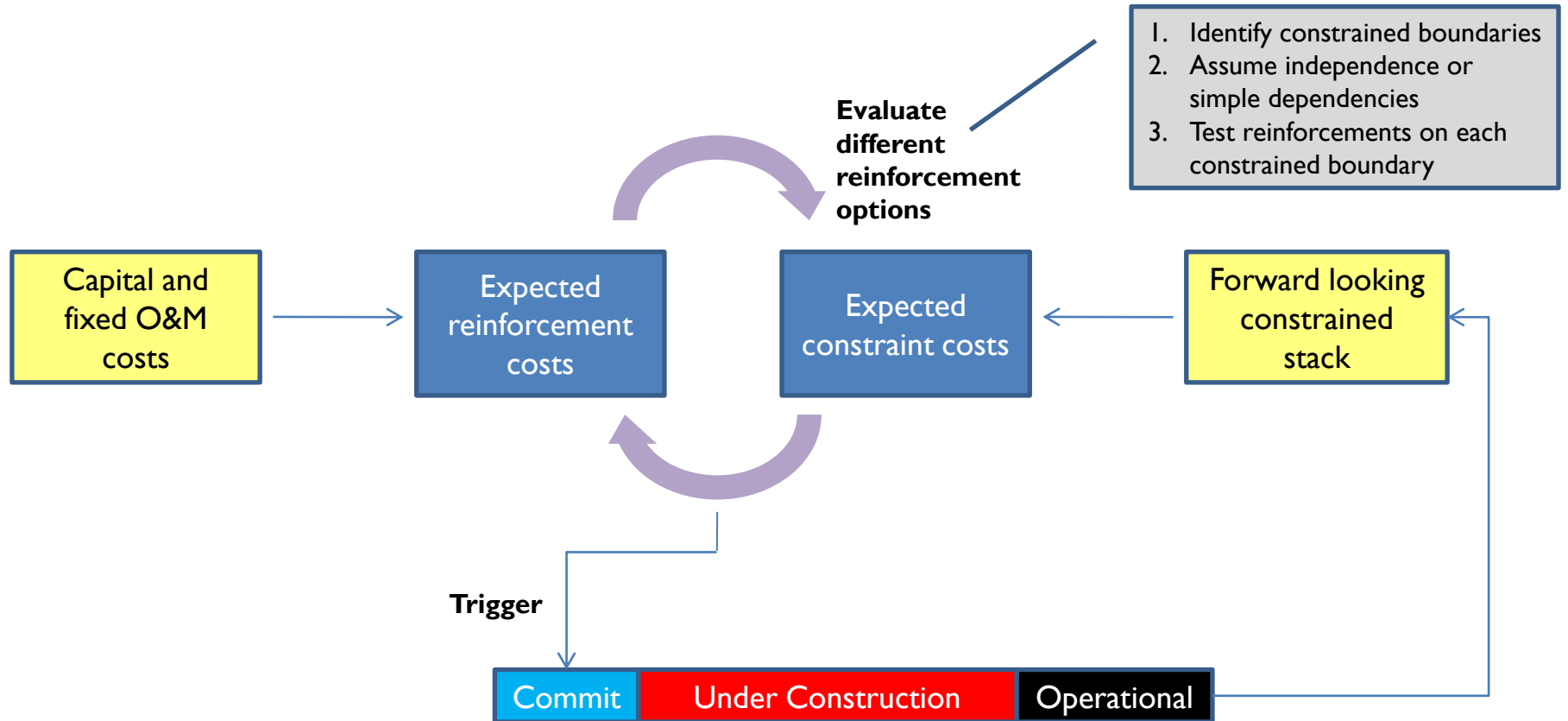
Generation Decision Rules – New Build



Generation Decision Rules – Retirements



Transmission Decision Rules



Key assumptions

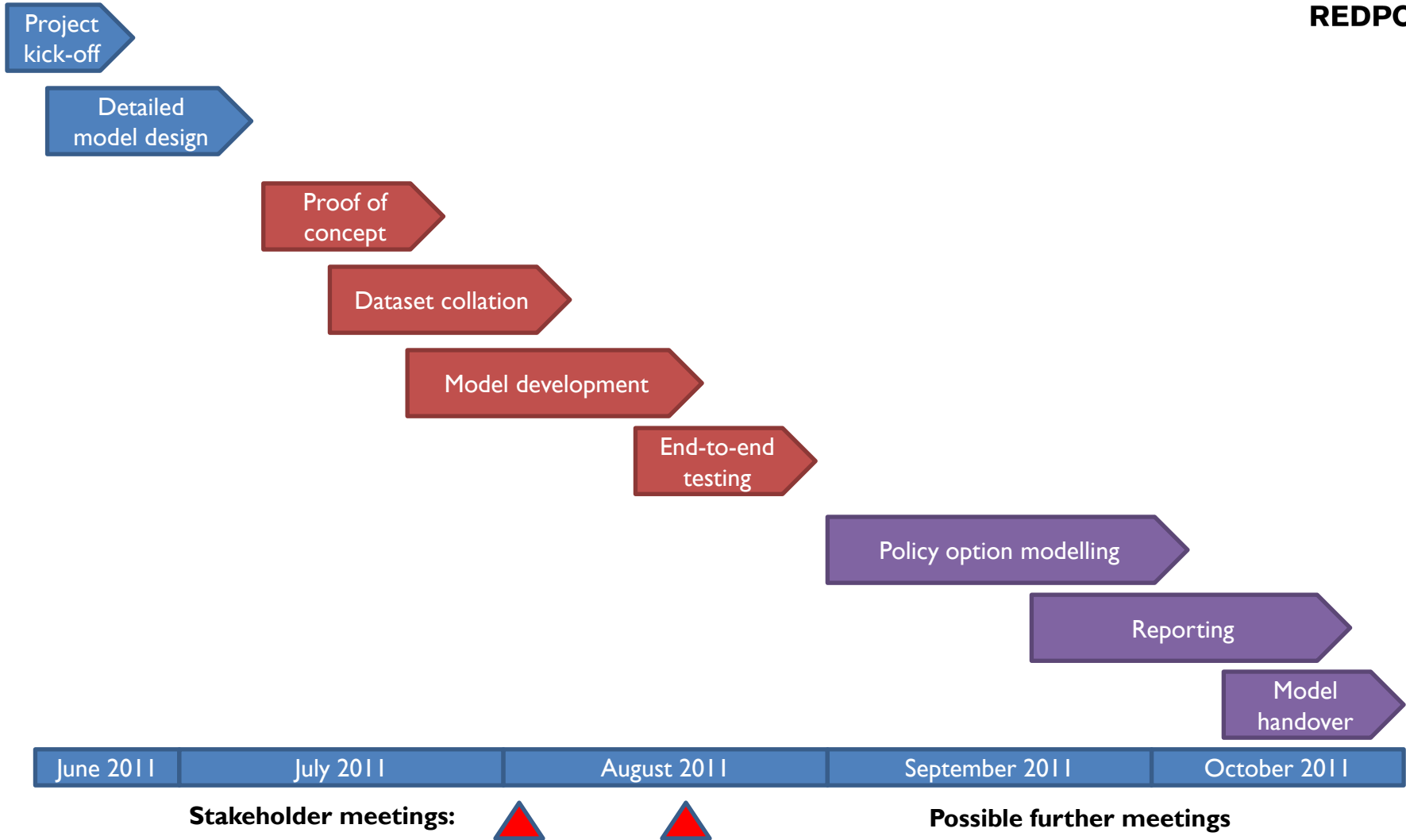


- Treatment of renewables
 - Aim to equate renewables volumes across options by adjusting (implied) support levels
- Treatment of nuclear
 - Assume same nuclear build programme under all options
- Treatment of other EMR policy options
 - Assume 450 g/kWh Emissions Performance Standard throughout
 - Assume Strategic Reserve for capacity mechanism
- Choice of boundaries
 - Assuming fixed boundaries throughout modelling time horizon
 - Unique mapping between TNUoS and system zones
- Status Quo policy decisions
 - HVDC bootstraps: awaiting policy decision on charging
 - Offshore: assuming radial connections
 - Island connections: new TNUoS zones?

Key data sources

Data	Main source
Fuel and carbon price assumptions	Ofgem Explorer scenarios
Demand profile and growth	Ofgem Explorer scenarios
Future interconnection	Ofgem Explorer scenarios
Existing plant data and costs	NGET constraints model
Target generation mix	NGET Gone Green scenario
Renewables resource availability and maximum build rates	NGET Gone Green scenario/ARUP
Regional wind output profiles	NGET
Balancing Mechanism bid-offer pricing assumptions	NGET constraints model
Gas transport charges by zone/region	National Grid Gas
Generation investment data (capital costs, O&M costs, technical parameters, cost of capital etc)	PB Power/Mott MacDonald /Arup studies for DECC
Onshore transmission investment data (known projects with capital costs, O&M costs, cost of capital, construction time etc)	Transmission Operators
Offshore transmission investment data (capital costs, O&M costs, cost of capital, construction time etc)	Offshore Transmission Review

Overall project plan



QUESTIONS?