

Security and Reliability Council

27 April 2011

(Transpower System Operator)



*Keeping the lights on
24 hours a day, 7 days a week*

SYSTEM OPERATOR

Keeping the energy flowing

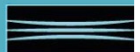
TRANSPOWER

Transpower New Zealand Ltd The National Grid

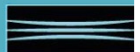


Agenda items

- Power System Performance
- Security of Supply
- System Operator Performance
- Joint Work Plan
- Market System Update



Power System Performance



Environment

Medium to 5 year view

Regulatory context

- The System Operator role
- Self-commitment market design

System Operator's approach

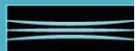
- *To deliver a secure power system and an efficient electricity market to support New Zealand's economic and social wellbeing.*

The SO Way

Our focus is on our approach and results.

‘the SO Way’ means we:

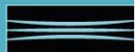
- *Make the system operator an **excellent** place to work*
- ***Listen and talk** with customers*
- *Know our stuff – we are **competent***
- *Demonstrate **leadership** at all levels*
- *Are willing to be held **accountable***
- *Demonstrate issue and subject **ownership***
- ***Approachable, proactive, positive and innovative***



Strategic Issues

Medium to 5 year view

1. Managing a more dynamic grid
 - Running a grid closer to limits
 - New technologies (SPS, RPCs, HVDC, SFT)
2. Probabilistic or deterministic system operation
 - Keep the lights on
3. Support of the market
 - Gone are the days of being able to dispatch and run the market manually
 - Avoid 'big bang' approach to market systems development
 - SO supports current market initiatives



Strategic Issues_(continued)

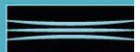
Medium to 5 year view

4. The evolving generation mix

- Balancing the power system with intermittent generation
- Changing characteristics of the power system
 - Reduced inertia
 - Storage and firming
 - Location of generation

5. Enabling customer response

- Demand response as a means to manage price risk and as a security product

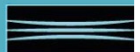


Strategic Issues_(continued)

Medium to 5 year view

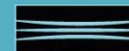
6. Industry organisation

- Smart grid technologies
- Controls across organisational and physical boundaries

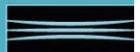


SO Work Program

1	Grid Owner introduction of area-wide reactive power controllers
2	Commissioning of major grid investments – e.g HVDC
3	Variable and then dynamic line ratings
4	Improving systems to monitor and manage voltage and transient stability
5	Updating SCADA applications (which are approaching end of life)
6	Improving under frequency management (AUFLS, Instantaneous Reserves)
7	Improving wind and load forecasting
8	Systems and processes to implement Authority's market development initiatives
9	Systems and operational controls – demand side and load controllers
10	Improving visualisation and information provision
11	Automatic Generation Control (AGC)
12	Improving modularity of market systems



Security of Supply



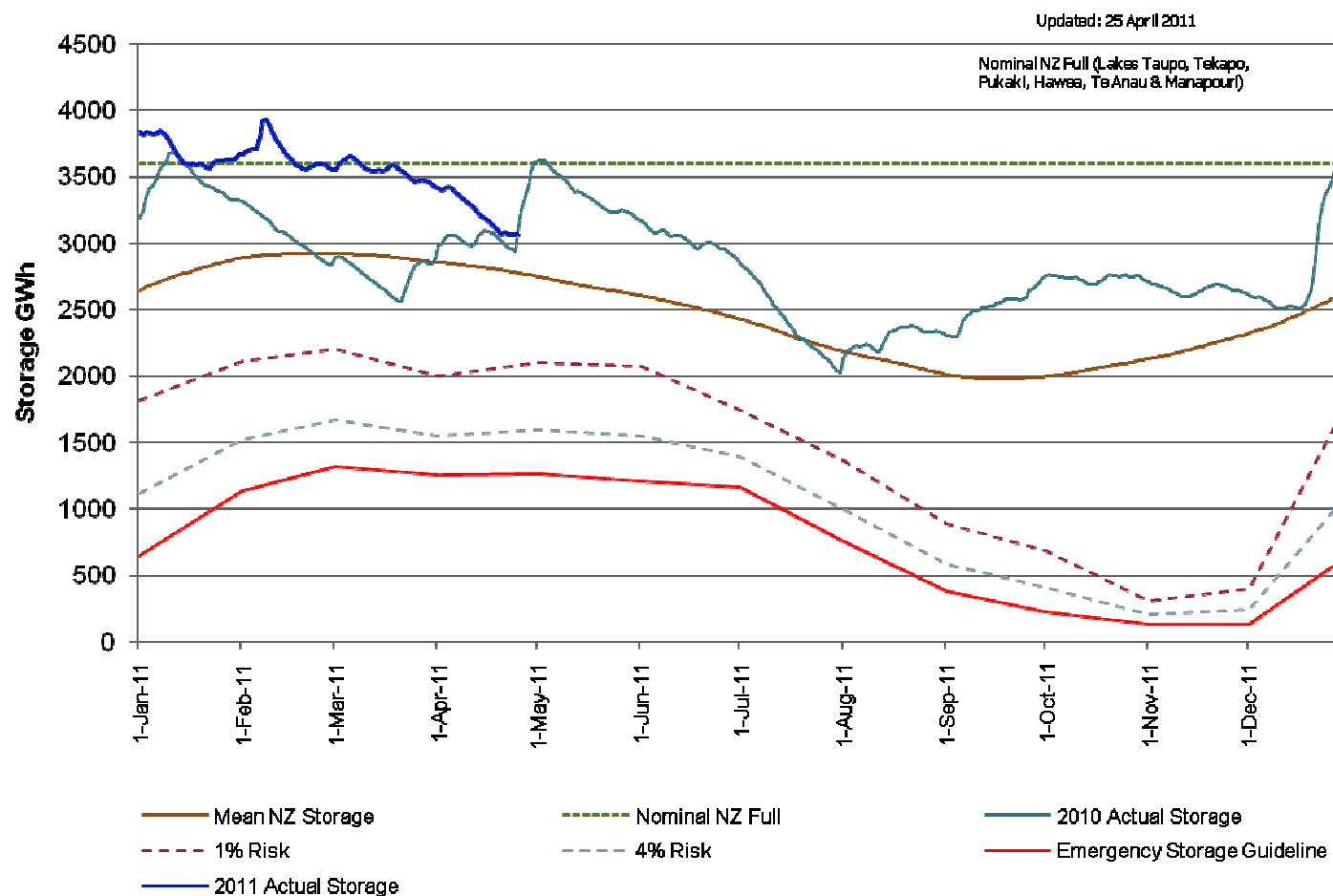
Information

- Code requires System Operator to:
 - prepare, consult on, and publish an annual security assessment against energy and security standards
 - publish information to assist interested parties monitor:
 - hydro and generating capacity and availability of transmission assets
 - hydro storage, primary fuel, and ancillary services
 - publish modelling data and methodologies used to prepare
 - the annual security assessment
 - Information published
 - maintain an information policy that describes the above
- System Operator only receives information provided voluntarily
- Participants may and do undertake own research

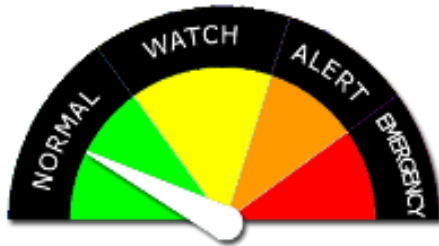


Hydro Risk Curves

NZ Actual Controlled Storage and Risk Curve



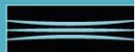
Risk Indicators: Risk Meter



- **Normal:** No apparent risk of shortage
- **Watch:** Small risk of shortage in the next few months
- **Alert:** Moderate risk of shortage in the next few months
- **Emergency:** Significant risk of shortage in the next few weeks

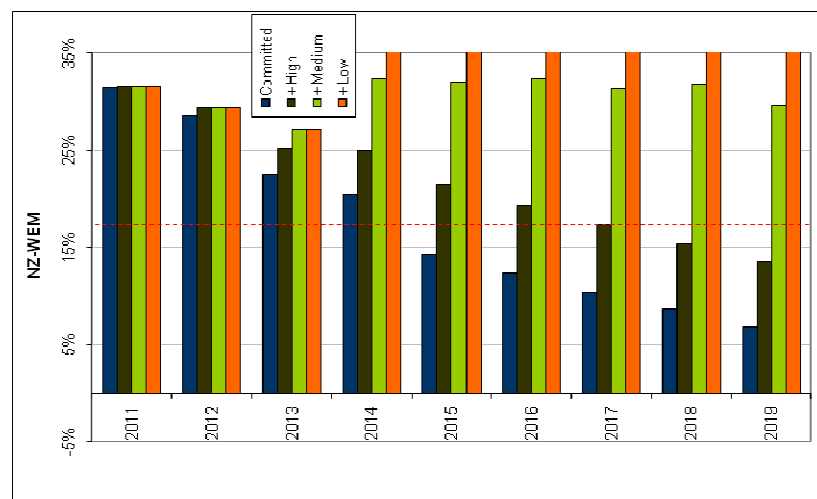
Comment

- Simplistic
 - Accessible to those less familiar with industry jargon
 - Creates cliff edges
- Assumed to align with hydro risk curves
- Opportunity for System Operator to convey risks not apparent with hydro risk curves?
 - Unseasonal snow melt
 - Inflow trends and climatic impacts (e.g. La Nina)
 - Heighten risk of plant or fuel failure
 - Short term demand trends in demand
 - Commissioning uncertainties
 - Reflect market risk assessment as reflected in spot prices



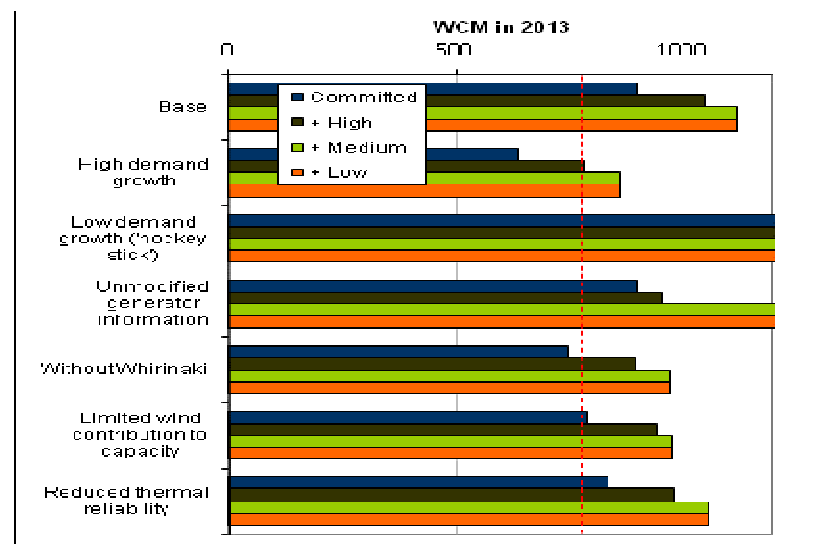
2011 Annual Security Assessment

New Zealand Winter Energy Margin



- Base case scenario, existing plus committed investment (Stratford, Te Uku, Mahinerangi 1 (30MW)) – meet NZ winter energy margin
- From 2013, including removal of 1 Huntly unit, and any of:
 - High demand
 - Removal of Whirinaki
 - Historically low inflows
 requires further investment

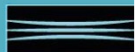
New Zealand Winter Capacity Margin



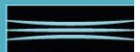
- Base case winter capacity margin - similar picture to base case winter energy margin
- Capacity margin may not be met in 2013 without further investment if there is:
 - High demand growth, or
 - Whirinaki is removed from service

Development plan

- Security of Supply Forecasting and Information Policy
 - Review initial policy
 - Review security of supply monitoring metric
 - Incorporate introduction of scarcity pricing
- Emergency Management
 - Review of initial policy
 - Include gas supply failures (gas contingencies)
 - Include relationship with civil emergencies
- Conservation Campaign – Core elements of design
- Black start standard

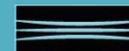


System Operator Performance

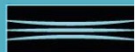


Performance

- Principle task is to 'Keep the lights on'
- Assessment
 - Delivery of operations
 - Delivery of CAPEX plan
- Proposal is for a more consistent set of measures and a single assessment process



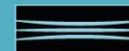
Joint Work Plan



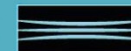
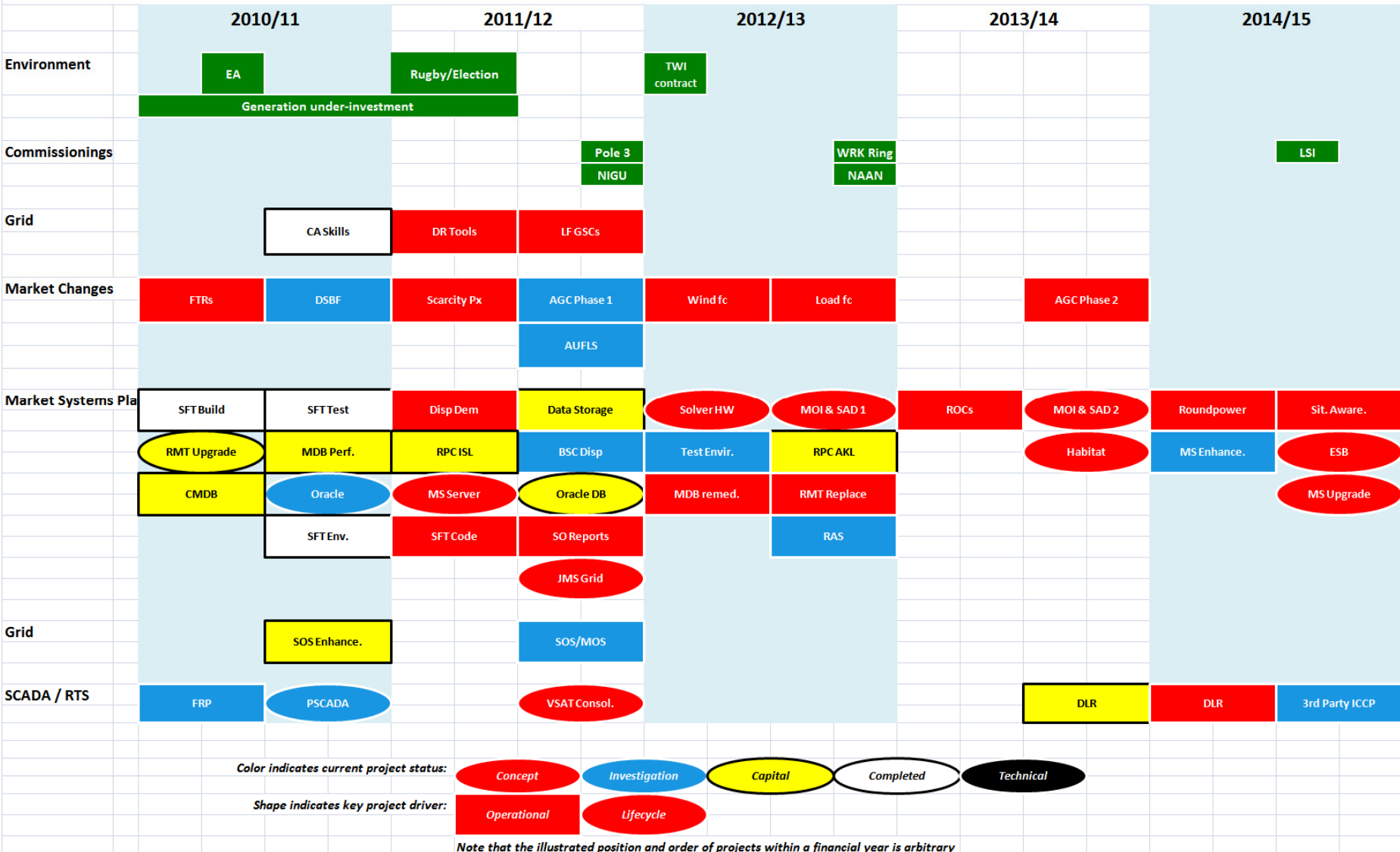
SO Work Programme (2011-12)

- Total programme list has 79 projects which have been categorised
- The demand categories are classified as:

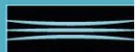
Category	No. of Projects
SO (Lifecycle)	11
SO (Grid Build/Support)	4
SO (TP Corporate)	2
SO (EA Development – Market)	5
SO (Development)	13
SO (BAU)	7
<u>Work programme total for 2011-12</u>	<u>42</u>



SO-IST Plan - Project delivery schedule



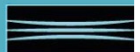
Market System Update



Market System Failure 20 Apr 2011

- 0700 Momentary loss of supply during standby generator test causes partial failure of market systems
- 0727 SO dispatch by phone - electronic dispatch suspect.
- 0823 CAN to market – notifying problems - publishing schedules, phone dispatch, bids and offers may not be incorporated in dispatch
- 0946 SAD initiated - dispatch via electronic dispatch facility
- 1021 CAN to market updating situation
- 1215 Dispatch via SAD based on SDS -updated CAN to market
- 1520 Market System restored – dispatch continues via phone –update CAN issued
- 1715 Full market system function restored (electronic dispatch)

- Power system testing and repair continued until 1400hrs Friday 22 April 2011 when power system and market systems returned to normal configurations.
- Final Pricing for 20 April recomputed - available 26 April 2011



End

