



Electricity Commission

Reserve Generation Proposal
Peter Calderwood

Outline



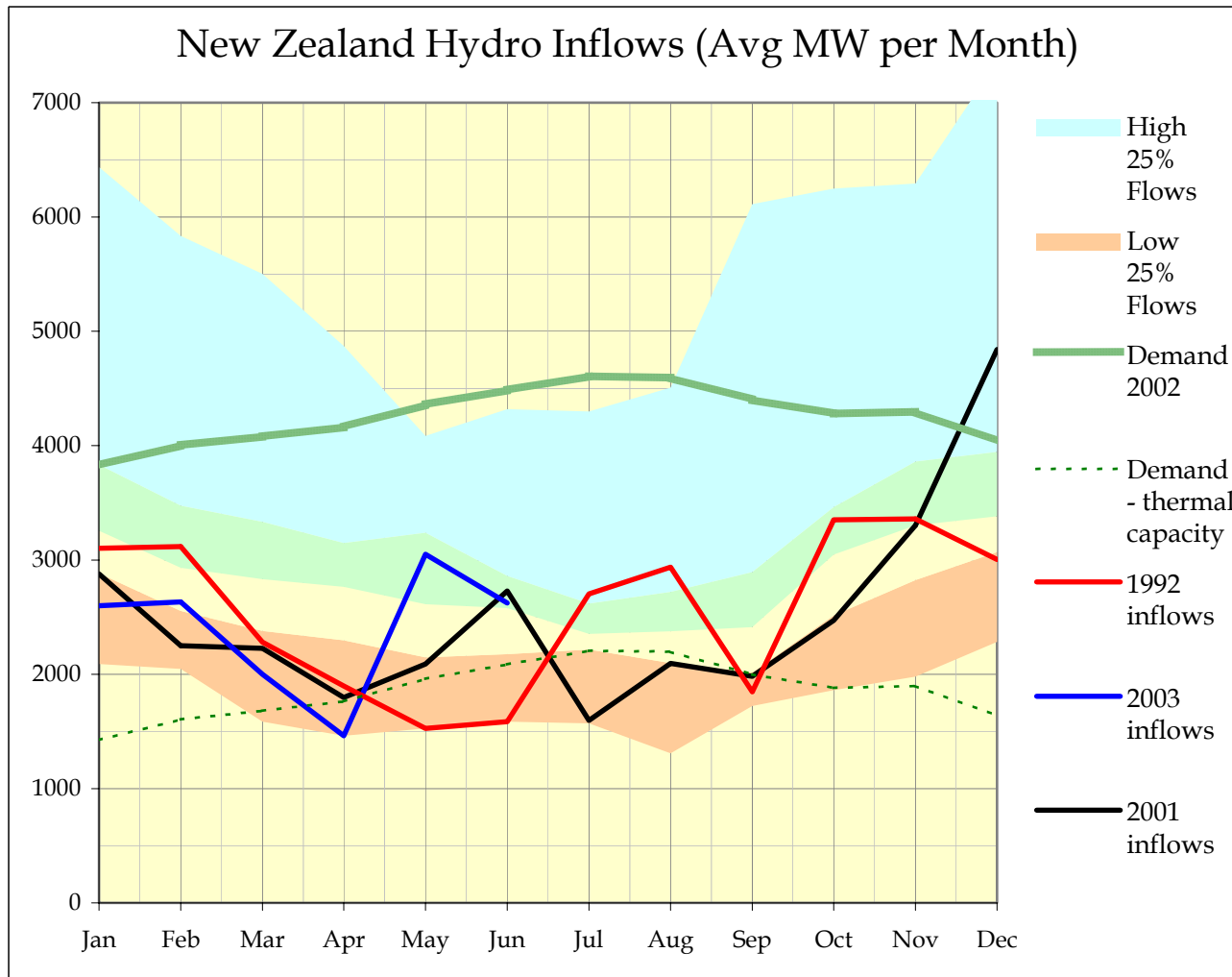
- **Nature of Dry Year Risk**
- **History of Dry Years**
- **Thermal Hydro Firming Plant**
- **The Next Five Years**
- **Reserve Generation Discussion Paper**
- **Conclusions**

Nature of Dry Year Risk



- **Inputs into Hydro Lakes are very volatile**
- **NZ has limited long term storage**
- **Thermal Plant has typically backed up Hydro**

NZ Hydro Inflows

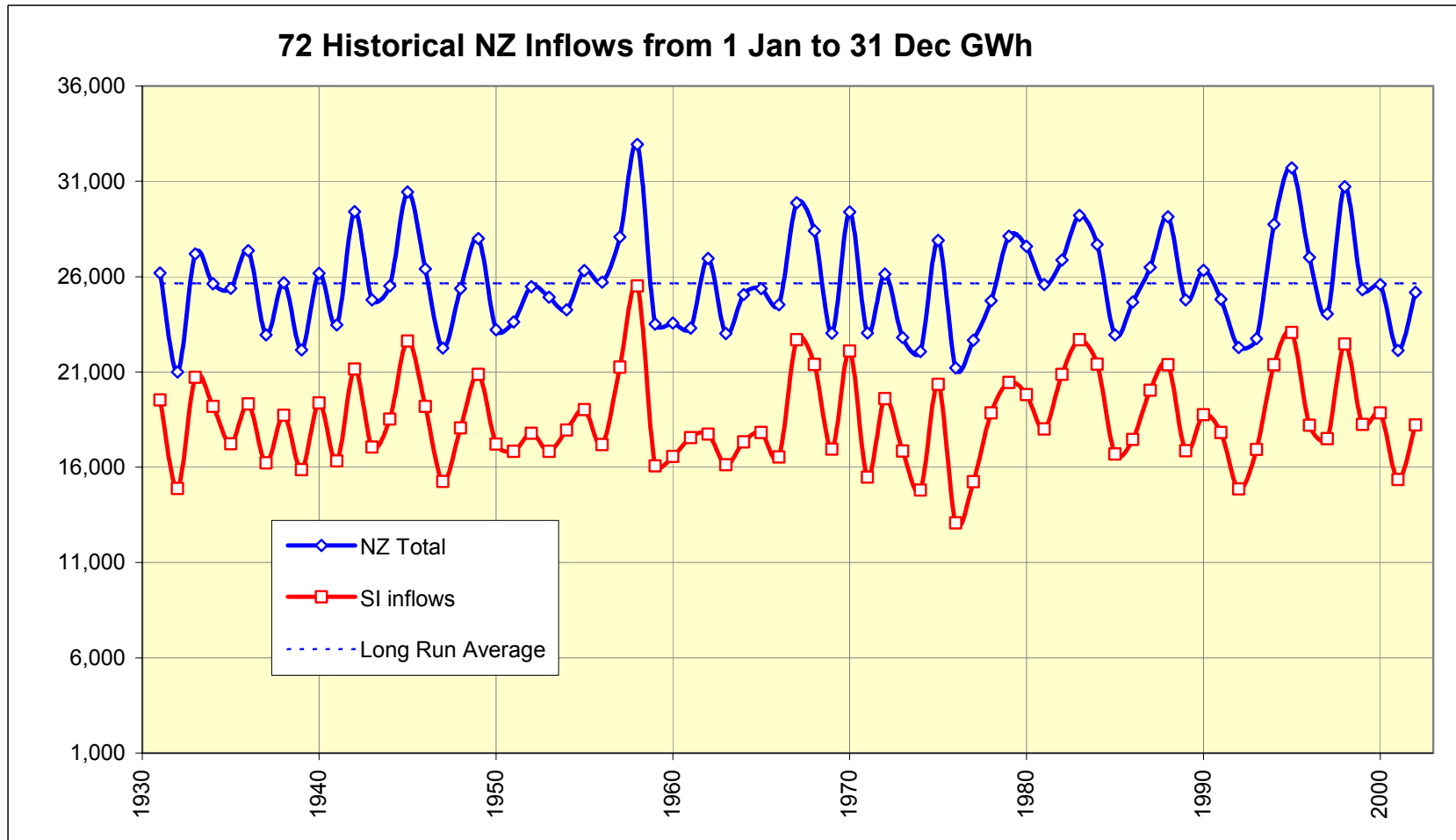


Critical Factors for Dry Year Security



- **Use of thermal capacity during summer and Autumn.**
- **Reliable ‘Energy’ capability of the thermal plant to ramp up – Hydro Firming**
- **Typically provided by Huntly and New Plymouth**
- **Previous Oil Fired Plant did not run even in dry years due to high operating costs.**

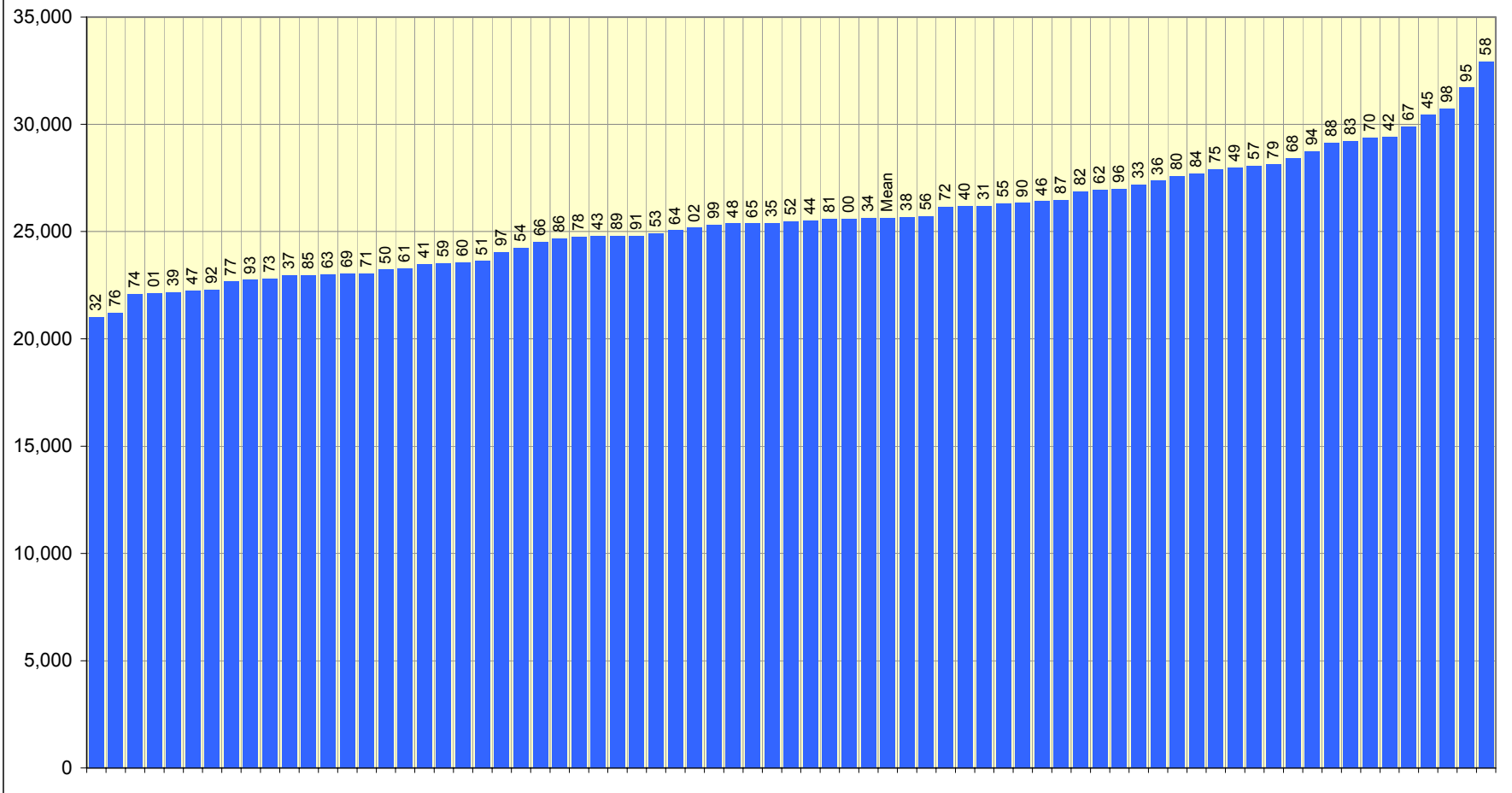
Calendar Year Hydro Inflows from 1931



Calendar Year Hydro Inflows by Dryness



72 Historical NZ Inflows from 1 Jan to 31 Dec GWh

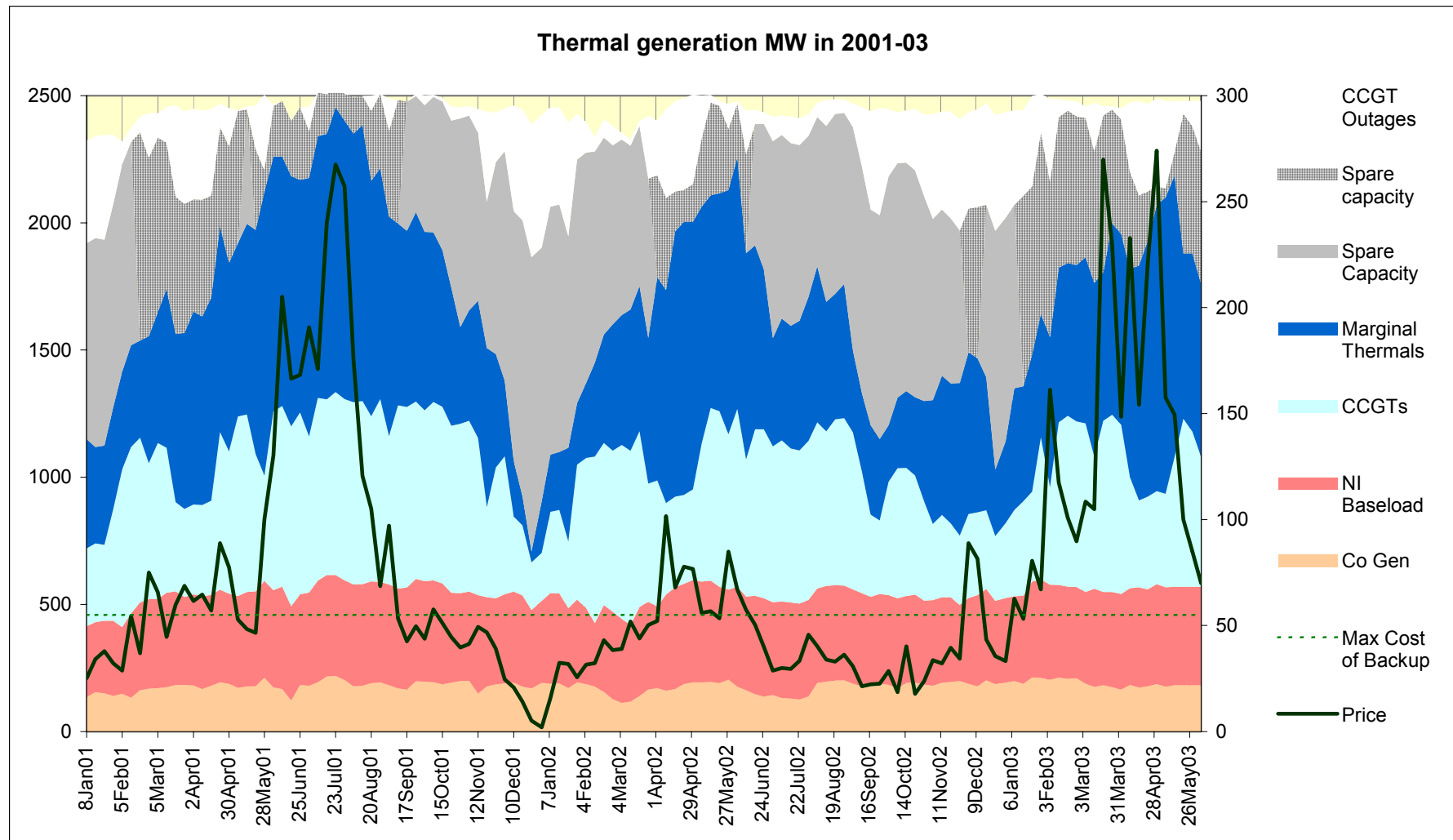


The last three dry years 1992, 2001, 2003

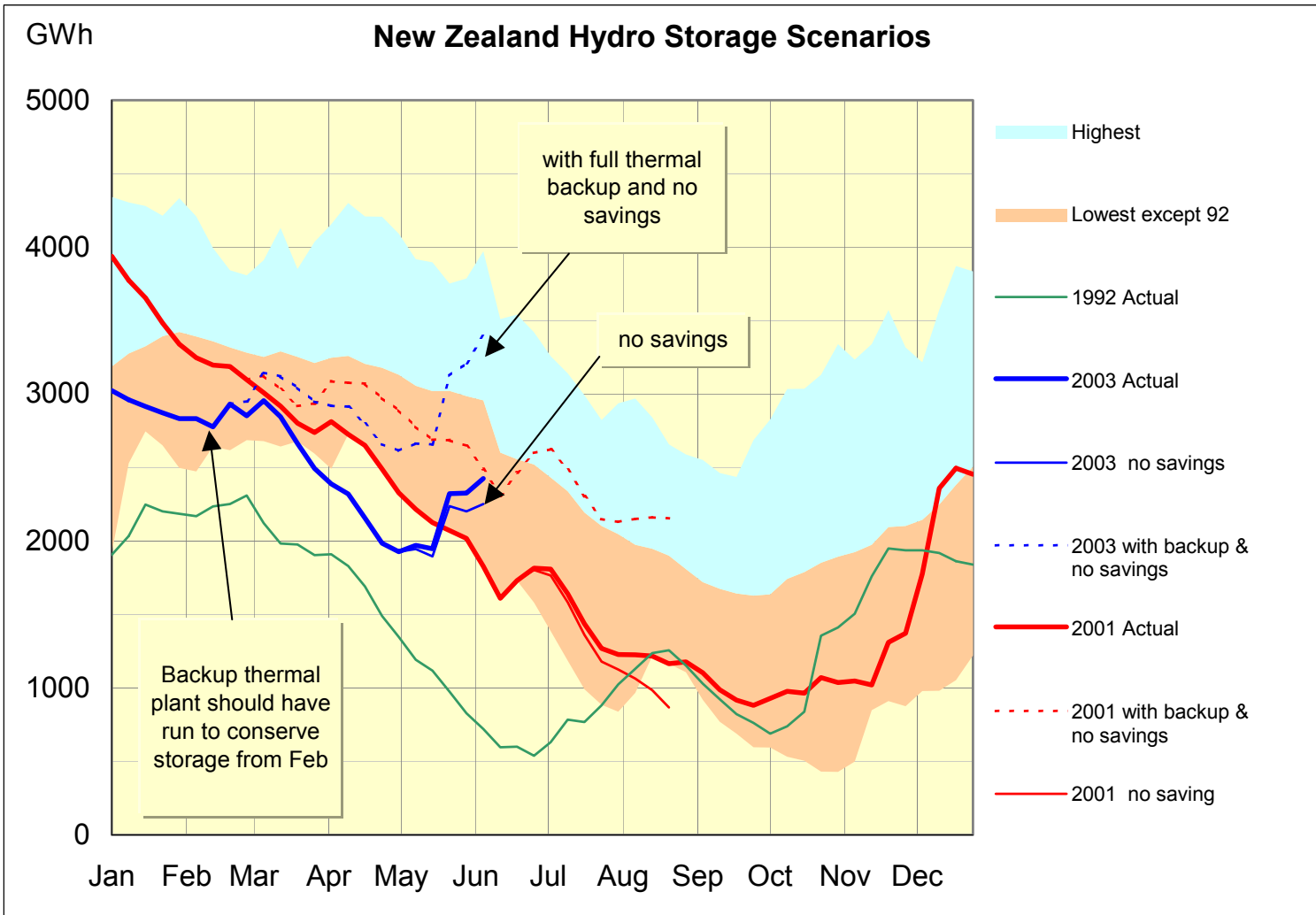


- **Lack of Generation Capacity was not a problem.**
- **Low Inflows combined with another factor.**
- **1992 – central planning managed system failed to commit hydro firming early enough.**
- **2001 – New Plymouth and Huntly did not react to high spot prices.**
- **2003 – Same as 2001 with lack of back up fuel arrangements for Huntly.**

Thermal Generation Available for Firming



NZ Hydro Storage with Dry year Firming



Why did hydro Firming not run ?



- **Maui redetermination affected Gas Supplies**
- **Lack of Backup Coal Reserves**
- **Lack of Inter Generator Back up Contracts**
- **Poor understanding of the role of hydro firming**
- **Lack of Capital Market Pressures on SOEs.**

The Next Five Years



- **NZ's dry year problem is not Capacity**
- **It is having sufficient back up energy in the form of hydro firming.**
- **NZ has sufficient hydro firming capacity;**
- **It just needs to run when needed;**
- **Owners need to make suitable arrangements for fuel; and**
- **Respond to Spot Market signals.**

How can we be sure this will happen?



- **Owners of firming plant should enter 'insurance' or 'backup' style contracts.**
- **Intervention by Gouvernement direction to own SOEs.**
- **Additional Capacity will be required in next 3-4 years.**
- **The most appropriate form of this capacity is base load.**

Government Discussion Paper



- **Electricity Commission to tender for ‘security reserve’.**
- **Reserve is to back construction of hydro firming plant.**
- **Reaction to lack of market to respond in 2001 and 2003.**
- **Direction is not what is needed.**

Effect if Introduced



- **High Marginal Cost Plant will be built that is not needed.**
- **Market Price will be capped which will in turn lower average price of energy.**
- **Required base load generation including renewables may be deferred or not built.**
- **Reserve generation will need to run to cover lack of investment in efficient base load plant.**

What could the Commission do?



- **Monitor Requirement for Reserve Generation**
- **Monitor fuel availability to ensure Reserve Generation can run.**
- **Be market maker for any shortfall.**
- **Commission to Buy and Sell Not just buy if there is shortfall of insurance market.**
- **Customers should be free to make own decisions on reserves.**
- **Could buy early action on base load plant.**

Conclusion



- **We do not have a generation capacity problem.**
- **We have a problem dispatching hydro firming early.**
- **Appropriate Contract between generators would fix.**
- **Base Load generation is needed within 3-4 years.**



Electricity Commission

Reserve Generation Proposal
The End