# Union College Visit

12 December 2014

# Presentation outline

- The Electricity Authority and electricity market structure
- Retail competition - Craig
- New technology - Ron
- Efficient price signals – Greg/Tim
- Financial Transmission Rights and Dispatchable Demand- Beverly
- Hedge markets - Richard

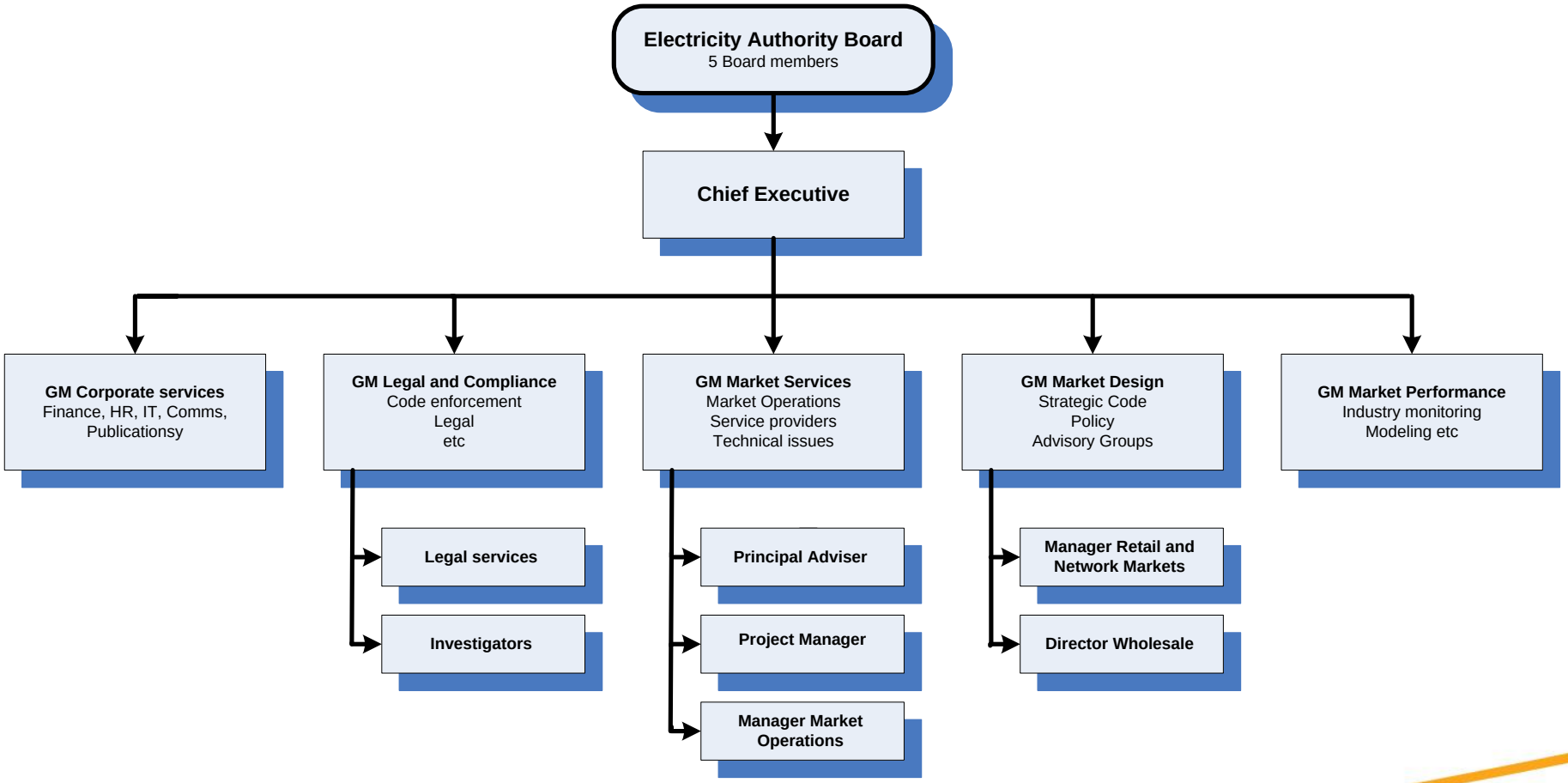
# The Electricity Authority

- Is an independent Crown entity responsible for the efficient operation of the New Zealand electricity market. Is the electricity market regulator
- Regulates the electricity market by developing and setting the market rules, enforcing and administering them and monitoring the market's performance
- Is a third tier legislator
  - Sets policy
  - Makes market rules (Code) that is enforceable
  - Regulates and operates the electricity market

# Core functions of the Electricity Authority

- Enforce certain parts of the Electricity Industry Act, certain regulations under the Act and makes and enforces the Code
- Contracts with service providers to manage operational aspects of the electricity market and the electricity system
- Monitors and assess market performance
  - Focus on competition, reliability and efficiency and long term benefit to the customer
  - Publishes information
  - Ad-hoc reports as market events occur
- The Authority also
  - Appoints and services the Security and Reliability Council
  - Manages the Rulings Panel
  - Investigates and makes decisions on undesirable trading situations

# Governance - Electricity Authority structure



# Authority objective is specified in s15 of the Act

**Statutory Objective**

For the long term benefit of consumers

| Promote Competition | Promote Reliable supply | Promote Efficient operation |
|---|---|---|

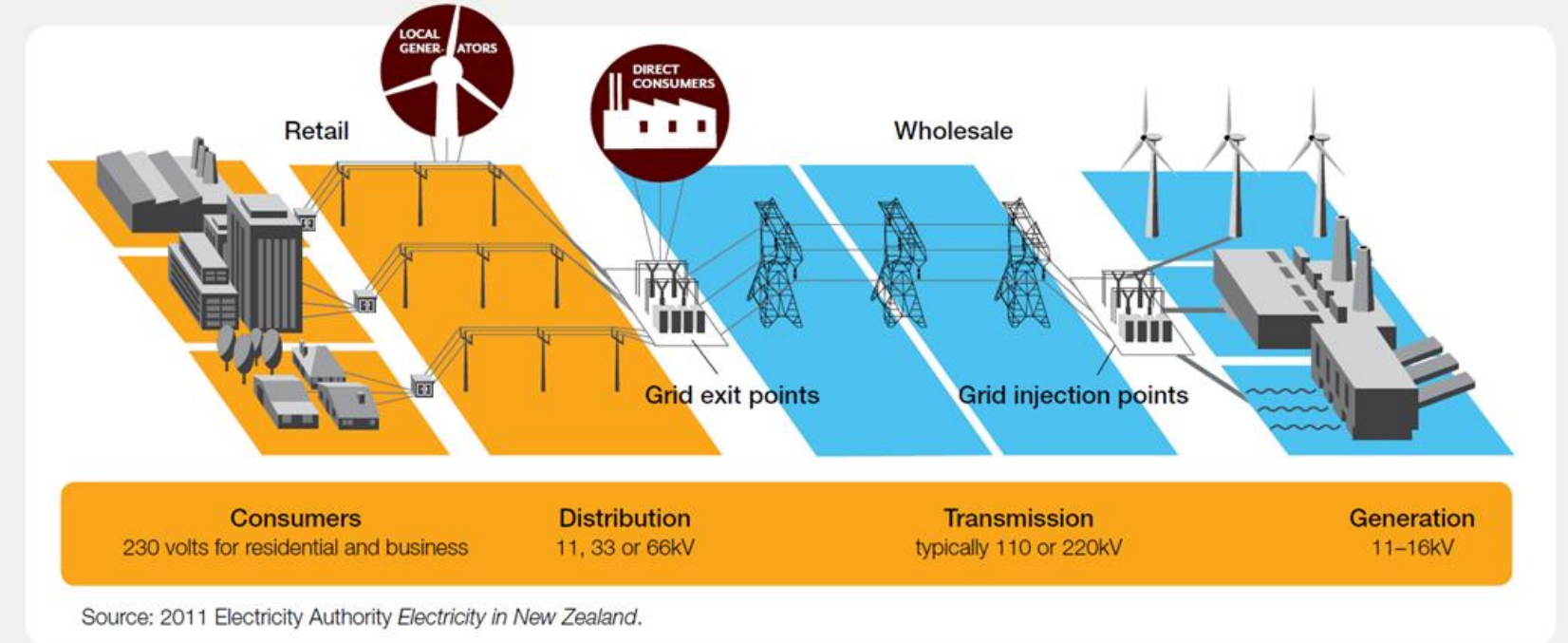
**How**

| Reducing barriers | Facilitating consumer participation | Providing efficient price signals | Promoting flexibility & resilience | Fit-for-purpose market services | Increasing compliance with the rules |
|---|---|---|---|---|---|

# NZ electricity market structure

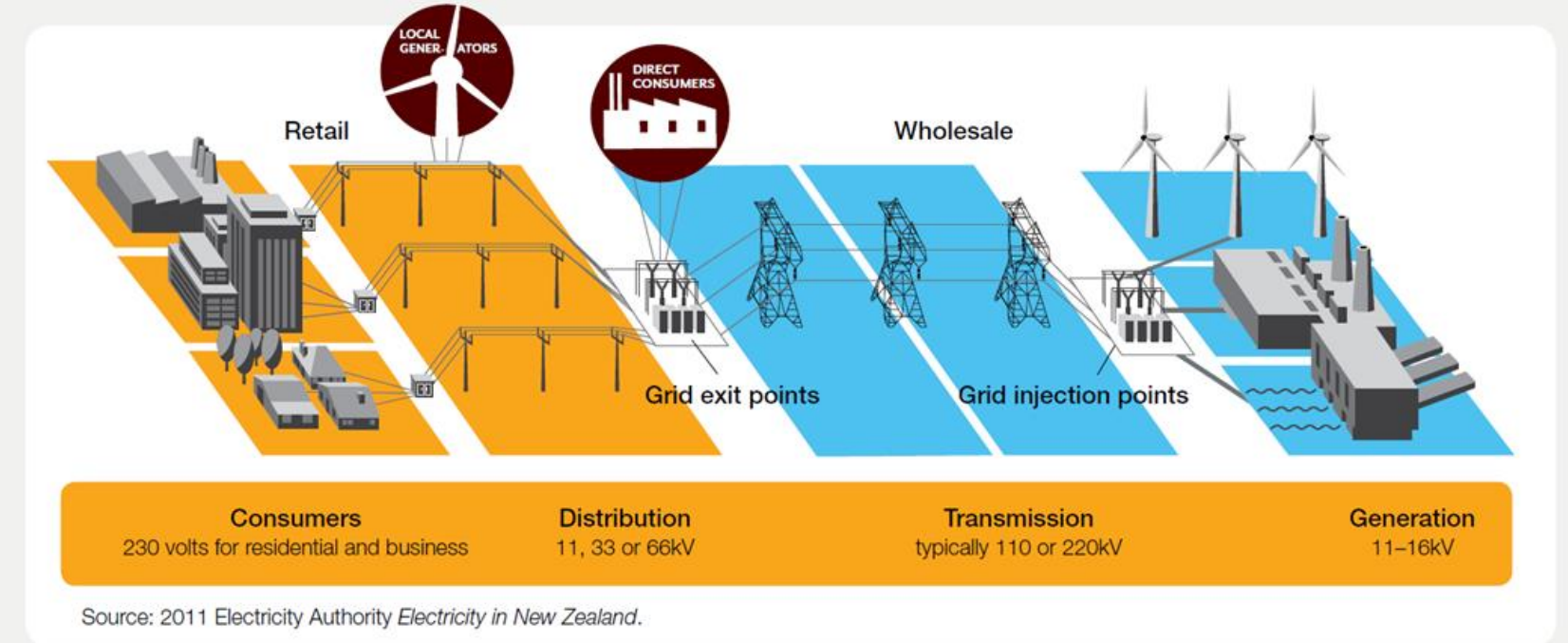
- Energy only market
  - Retail competition
  - Limited competition at start (1 October 1996)
  - Fully competitive on 1 April 1999
- Comprises monopoly and contestable elements
- Contestable market structure is a mixture of arrangements
- Customers have choice of retailer and choice of retail tariff

# Electricity market structure



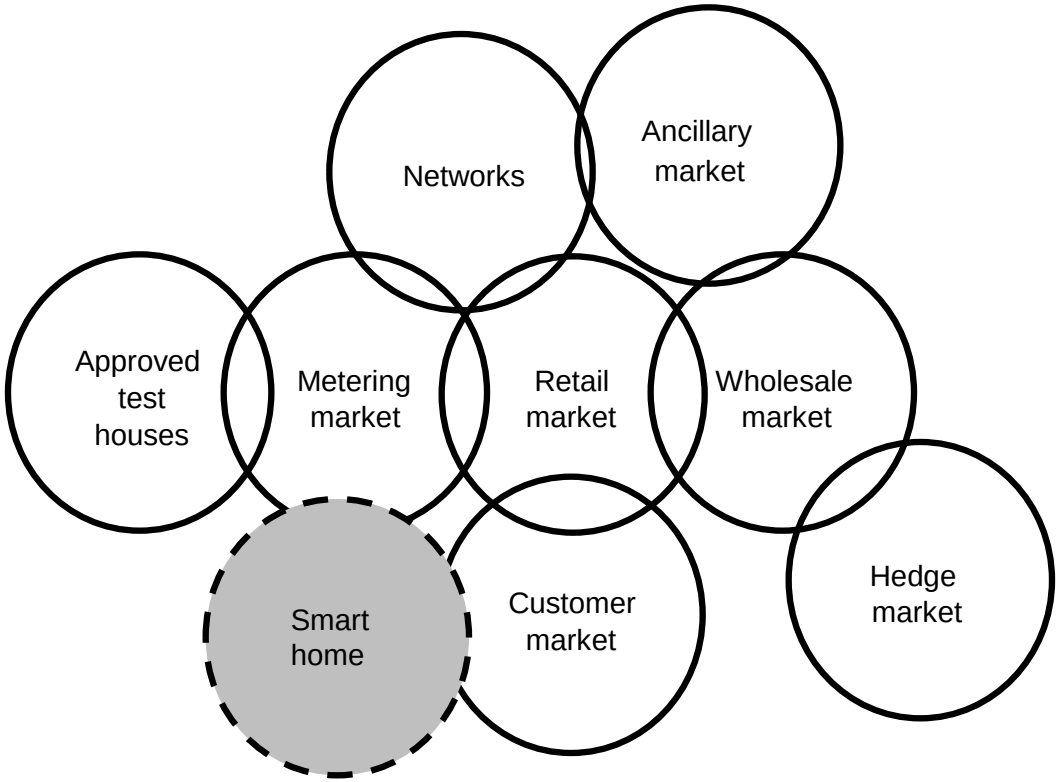

- Monopoly market participants comprise
  - Local networks (31)
  - Embedded networks (44)
  - Grid owner (1)
  - System operator (1)

# Electricity market structure




- Contestable market participants comprise
  - buyers (35, of which 25 are type 1 retailers), 5 are customers purchasing directly)
  - 5 new entrant retailers in last 12 months
  - sellers (17, of which 7 are also grid connected)
  - meter component owners (lots)
  - metering equipment providers (17 of which 8 are AMI providers)
  - metering test houses (14)
  - MOSP (8)

# NZEM is a mix of contestable market arrangements

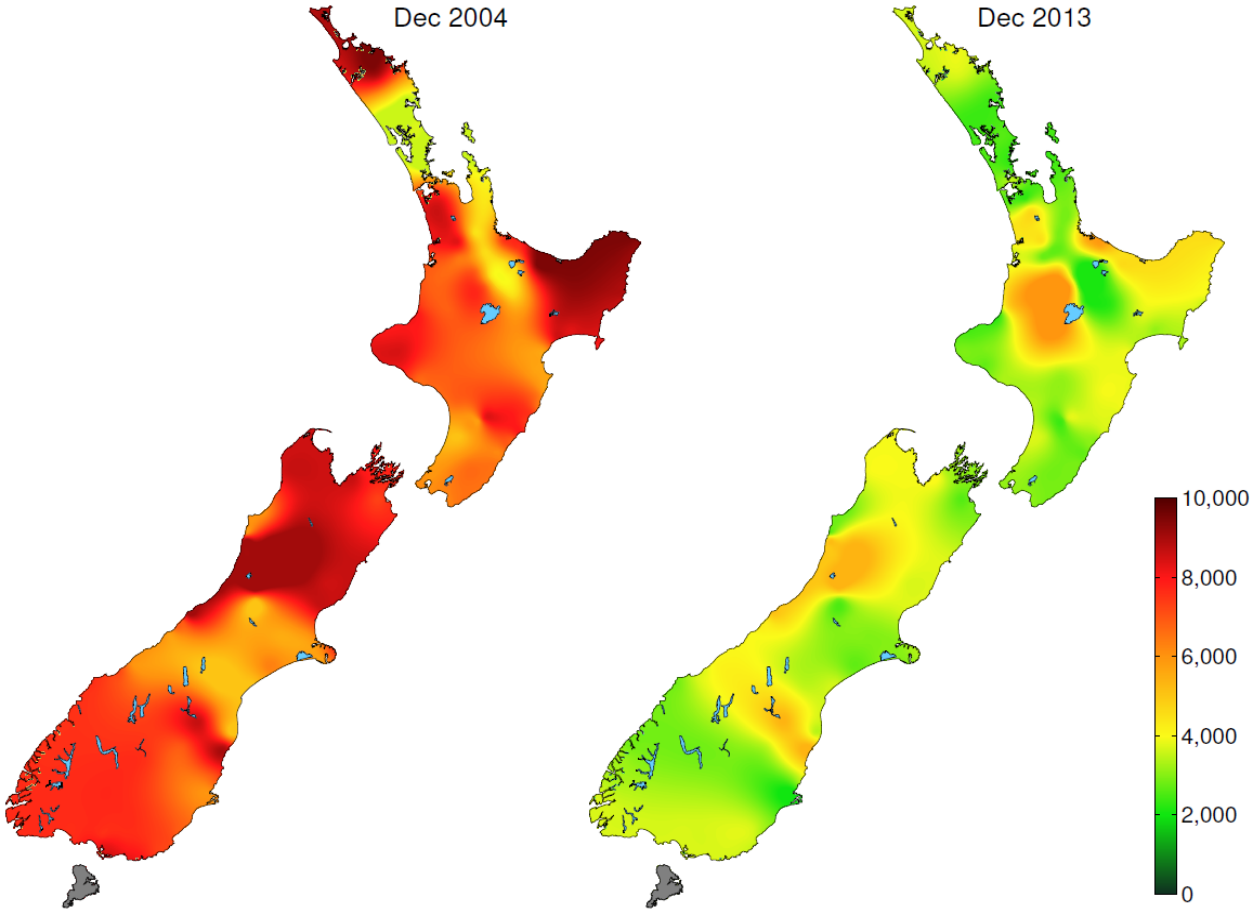


# Settlement in the NZ electricity market

- Most of market is vertically integrated generator/retailers
  - 67% of actual consumption is retailed by vertically integrated generator retailers who purchase another 13%.
  - 20% of actual consumption is retailed by non-generating retailers
- Three stages of settlement
  - physical settlement monthly on 7th business day of month
  - primary financial settlement monthly on 20th of month
  - secondary financial settlement
- Primary physical and financial settlement is volume/nodal price/trading period
  - 253 pricing nodes (533 nodes calculated)
  - 184 physical settlement nodes
  - also includes ancillary services, constrained and FTR

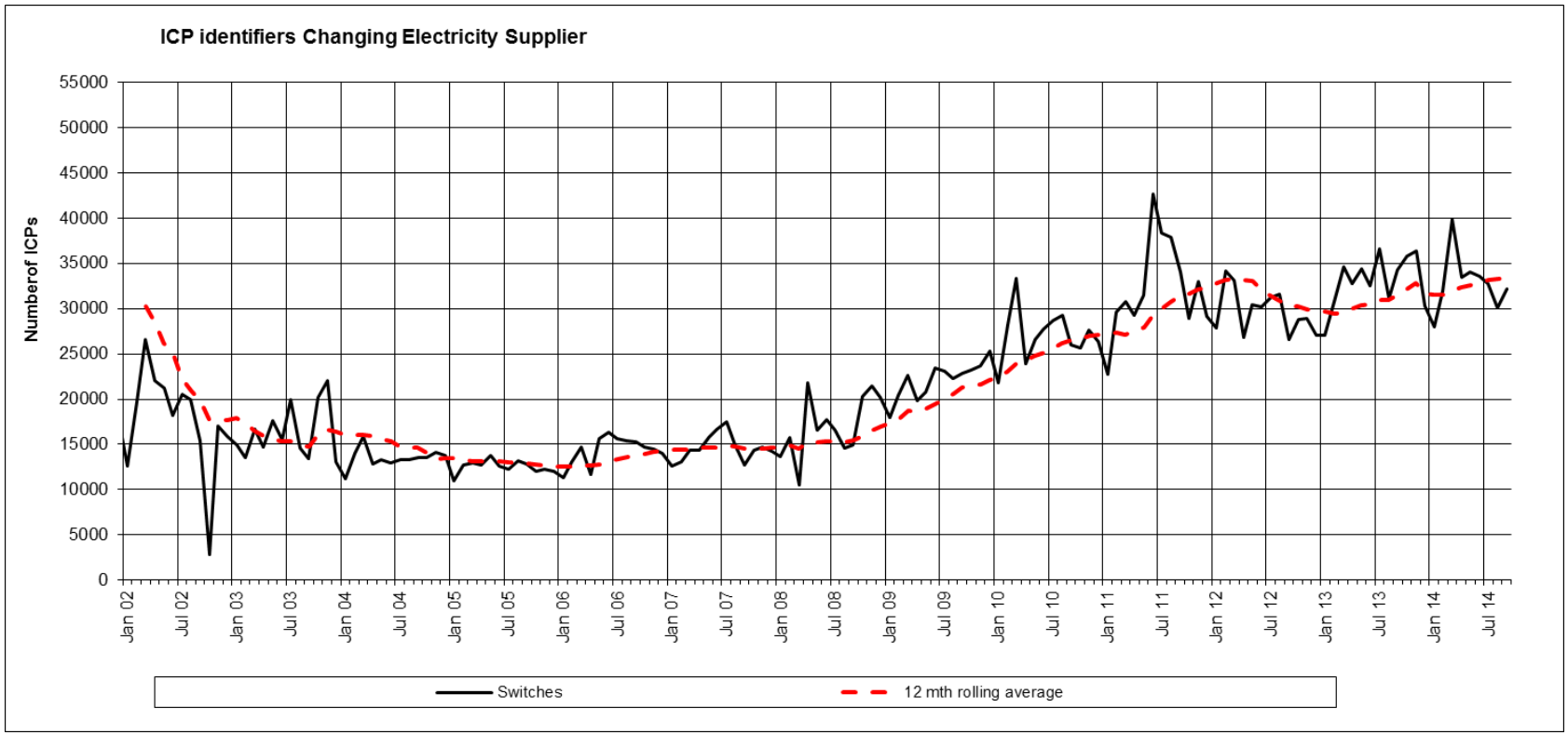
# Retail competition

# Retail competition is working



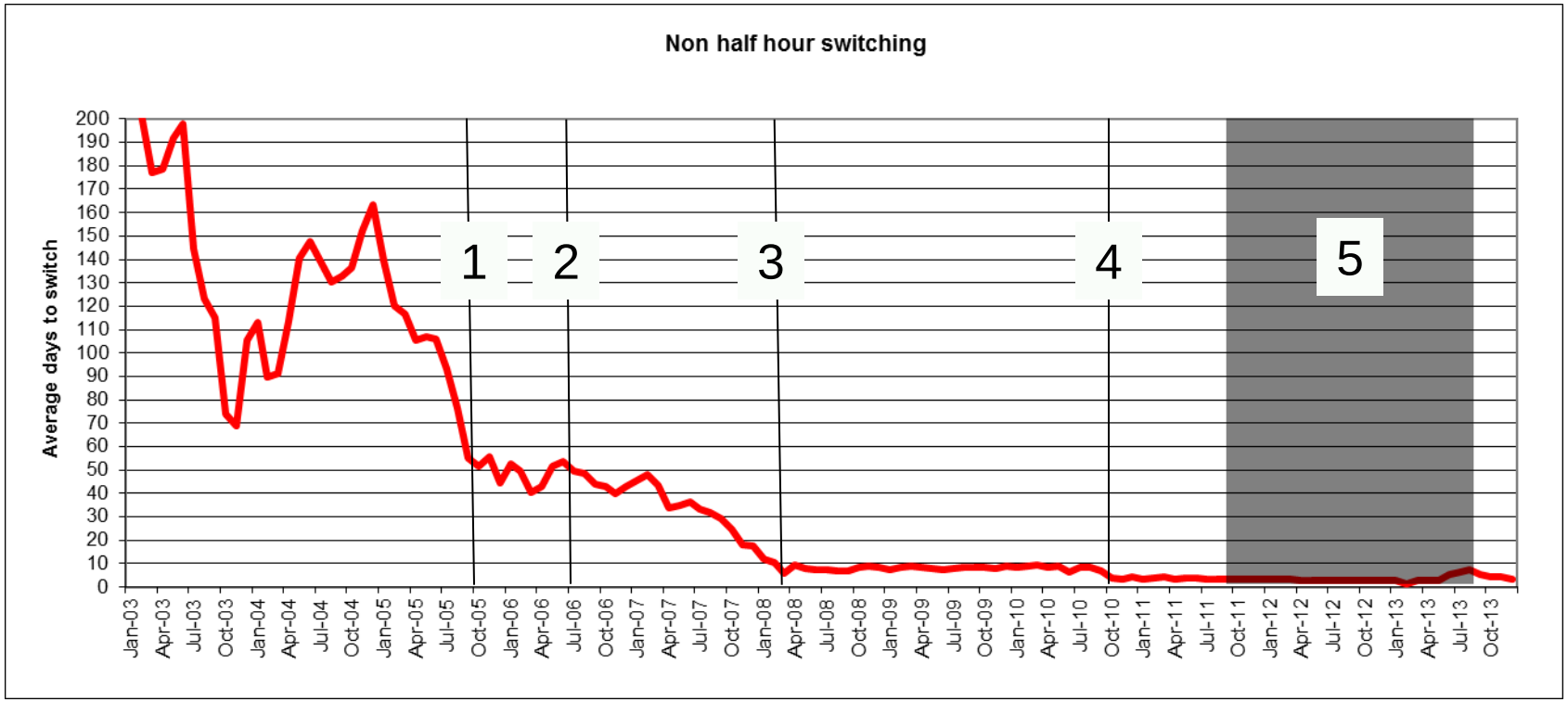

HHI refers to the Herfindahl-Hirschman Index. This index is the sum of the squares of the market shares of every retailer in a market. For example, if there are two retailers and one has 80% market share and the other has 20% then the HHI = 80x80 + 20x20 = 6,800. If they each had 50% market share then HHI=5000

# Retail competition is working




- Number of customers choosing a new retailer steadily increasing since 2006
- Last 12 months about 20% of customers switched
- Number of new entrant retailers entering market with new products

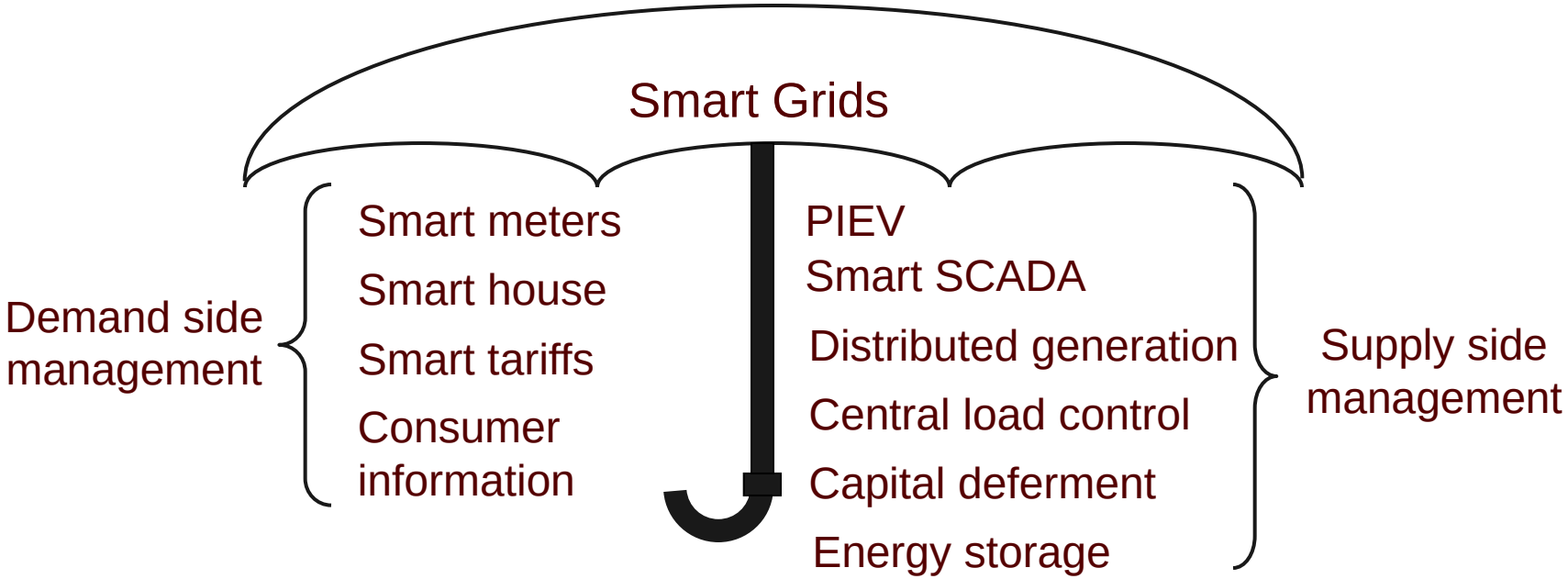
# Smart customer switching




- 1 – First industry led data clean-up process completed
- 2 – Regulator signalled intent to enforce switching regulation, use of estimates commenced
- 3 – Global reconciliation and monitoring became effective
- 4 – Regulator required 50% within 5 business days and 100% within 10 business days
- 5 – Regulator put in place new metering rules and data cleanup – no impact to switch period

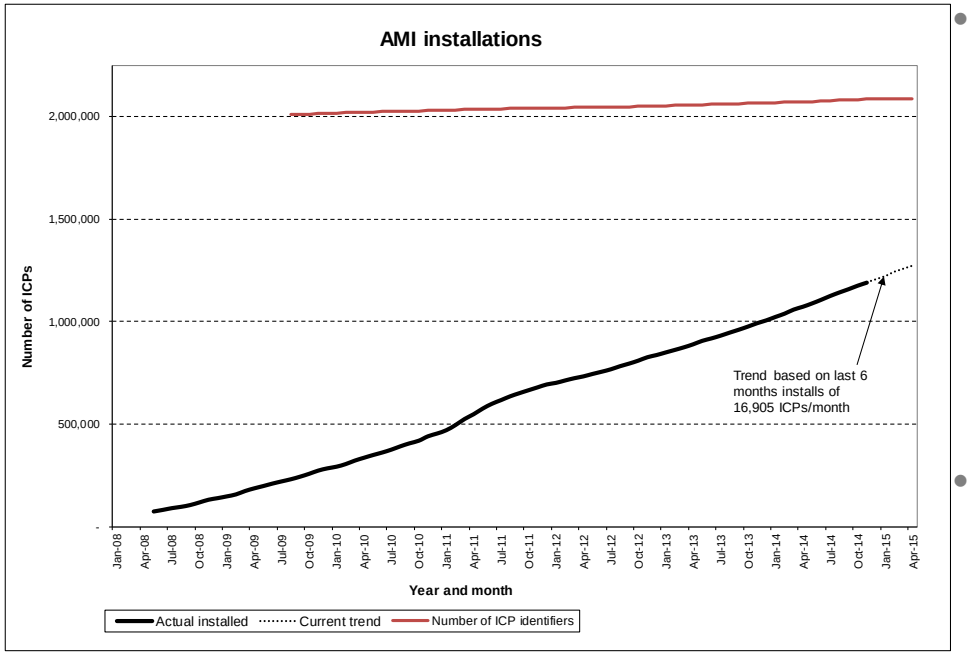
# New technology

# New technology




- Each technology is in different stages of maturity
- Economic benefit of technology varies

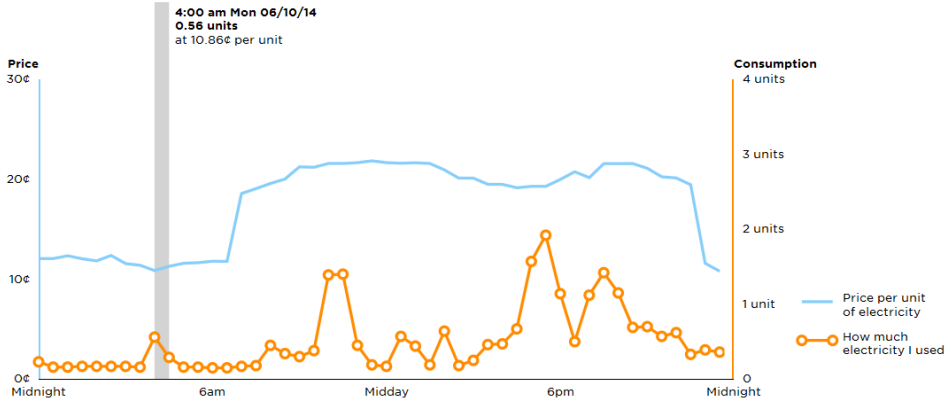
# AMI installations as at 30 November 2014

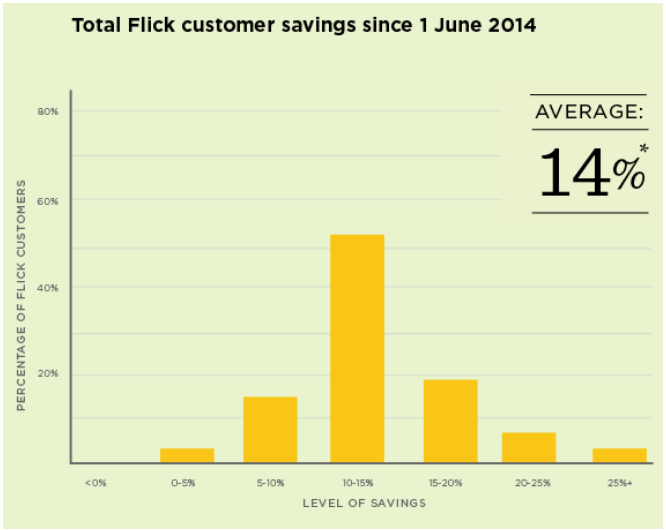



*57% of customer installations have AMI (communicating) installations operational*

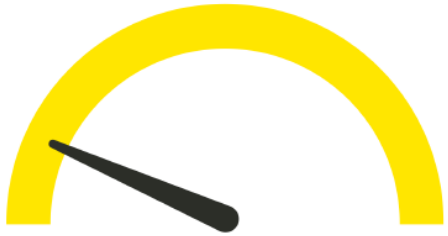
- NZEM rollout
  - signalled regulatory requirements and expectations early to market
  - costs and benefits initially realised by traders
  - AMI takes a long time to roll out
  - regulated agreements
  - opt out/in and customer customers
  - process changes have been disruptive
- Either rolling out AMI or intending to roll out AMI
  - 8 MEPs owned by networks
  - 3 MEPs owned by retailers
- AMI being used in customer settlement
  - 21 retail brands
  - most still use NHH meter readings
  - only 2 retailers use HHR AMI meter readings for invoicing and market settlement

# AMI enabled retail competition

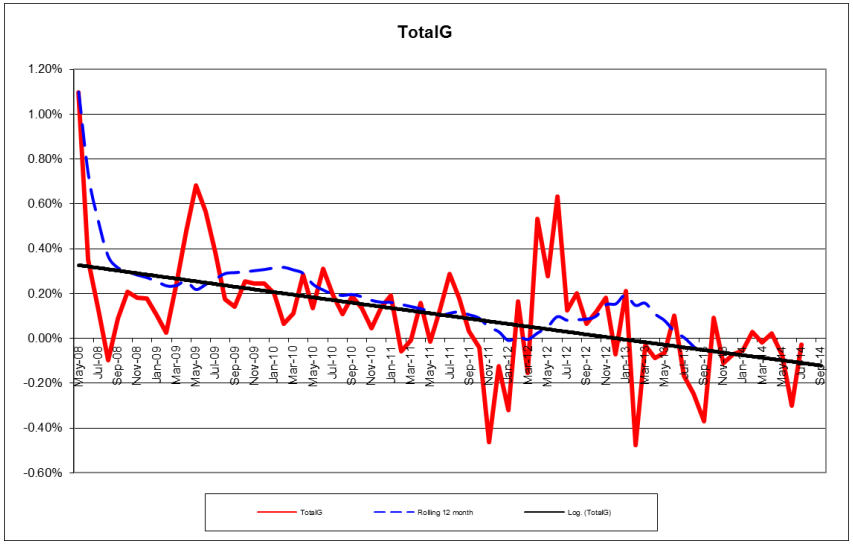



- Flick is a new entrant retailer that uses 30 minute AMI information to invoice customers at wholesale cost (48 different prices per day, every day)
- Flick provides web browser access to customers to keep track of their expenditure and the savings made on Flicks tariff
- Customers receive incentives from the p ow cost w



# Reconciliation and distributed generation

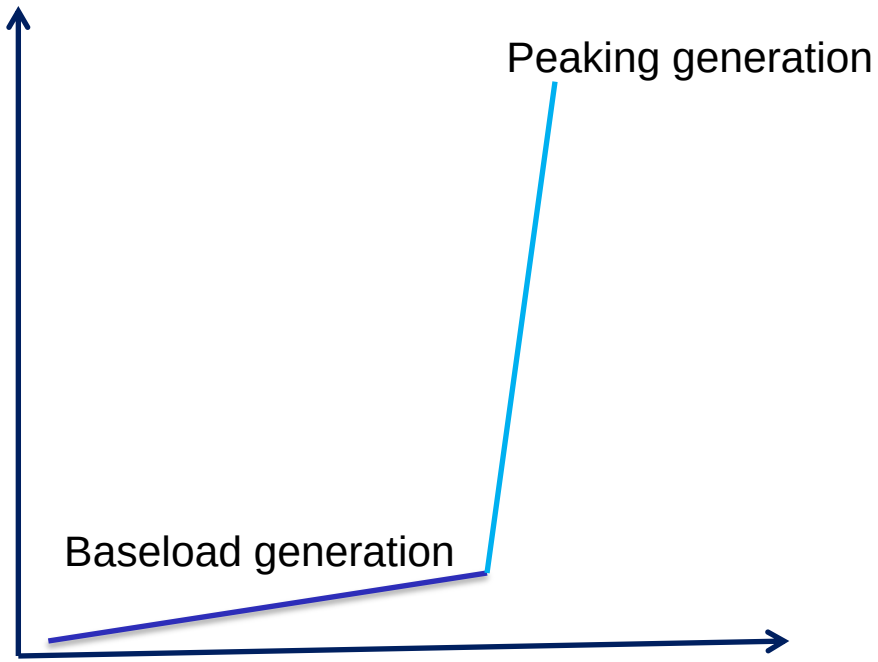



*UFE decreasing markedly as AMI is being installed*

- NZEM uses full global reconciliation
  - traders provide consumption information
  - identifies unaccounted for electricity (UFE)
  - All buyers and sellers to NZEM do so on same terms
  - monthly revisions to 14 months
- Reconciliation model solves for 378 NSPs by trading period and allows for
  - grid connected generation
  - any amount of embedded generation
  - grid connections to local networks
  - interconnections between local networks
  - interconnections to secondary networks
    - customer networks
    - network extensions
    - embedded networks

# Efficient price signals

# Efficient price signals



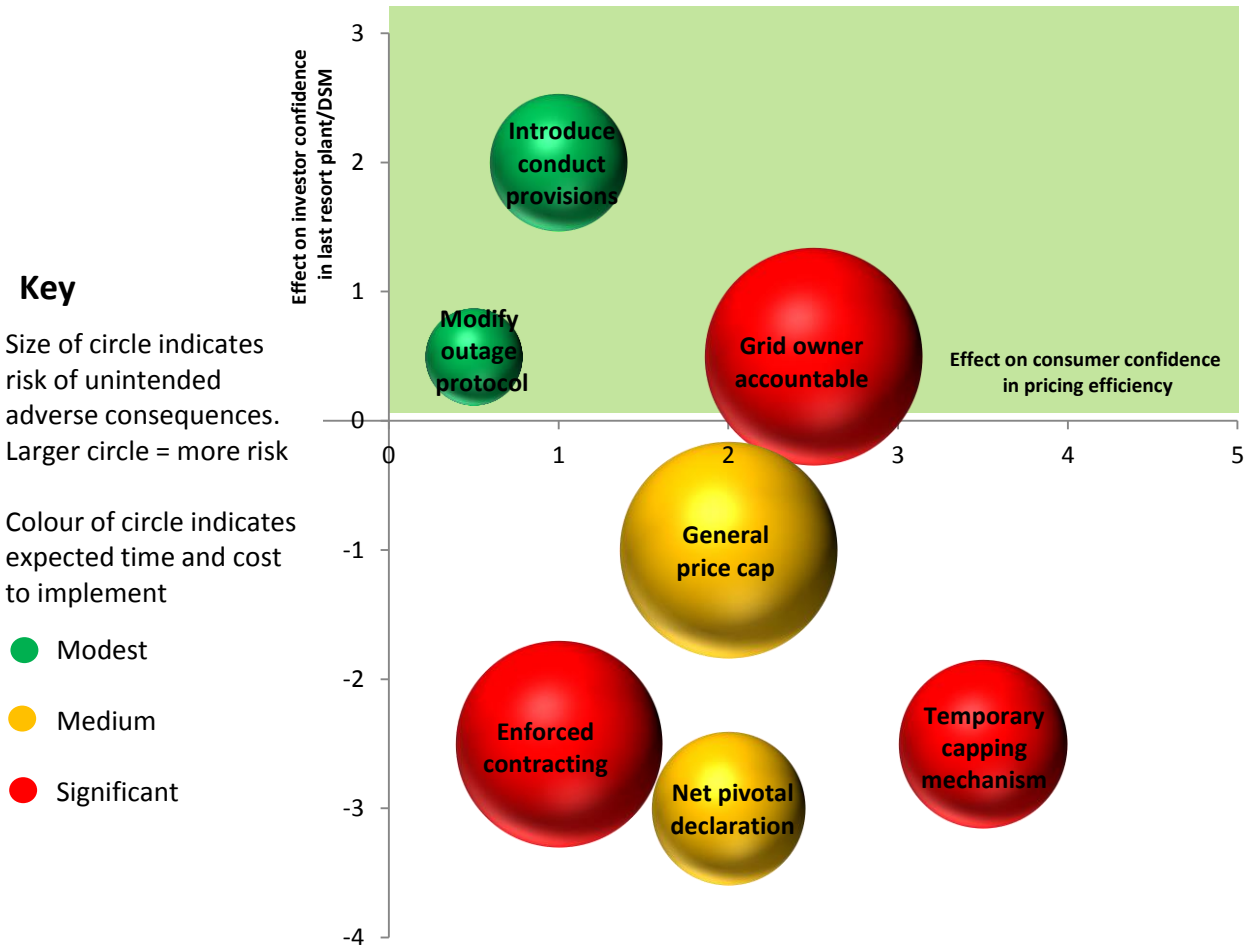
# Two issues

- Pivotal pricing
- Review of spot market

# Pivotal pricing

- Occasions where competition weak and prices very high
- Industry advisory group asked to investigate
- Options have trade-offs

# Pivotal pricing



# Pivotal pricing

- Trading conduct provision
  - Required to meet high standard of trading conduct when making offers
  - Deemed to comply if in safe harbour:
    - Offer all available capacity
    - Make changes to offers as soon as it can
    - When pivotal either offers don’t cause prices to rise, offer prices are consistent, don’t benefit from price rise

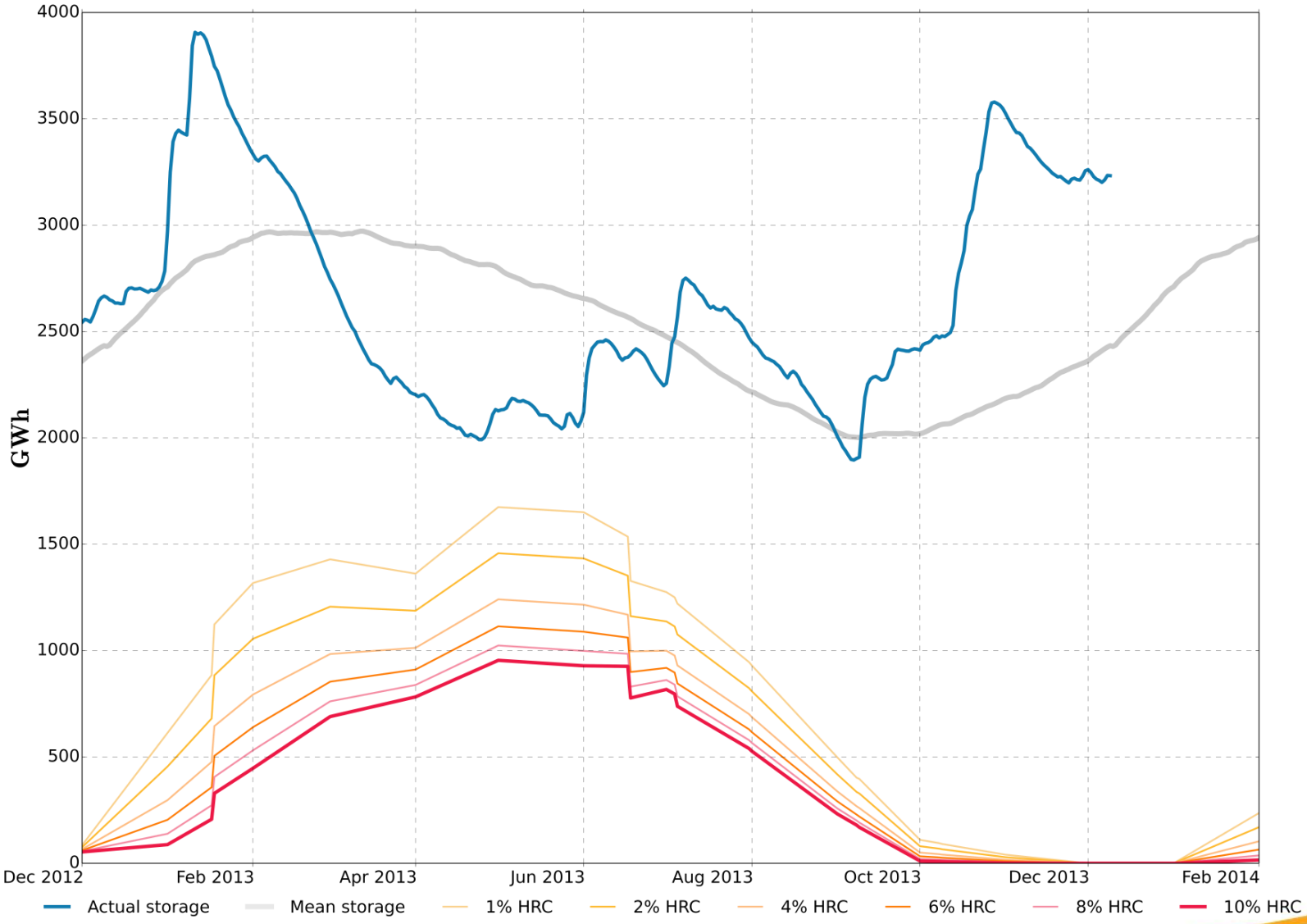
# Review of spot market

- Looking for options to improve retail competition

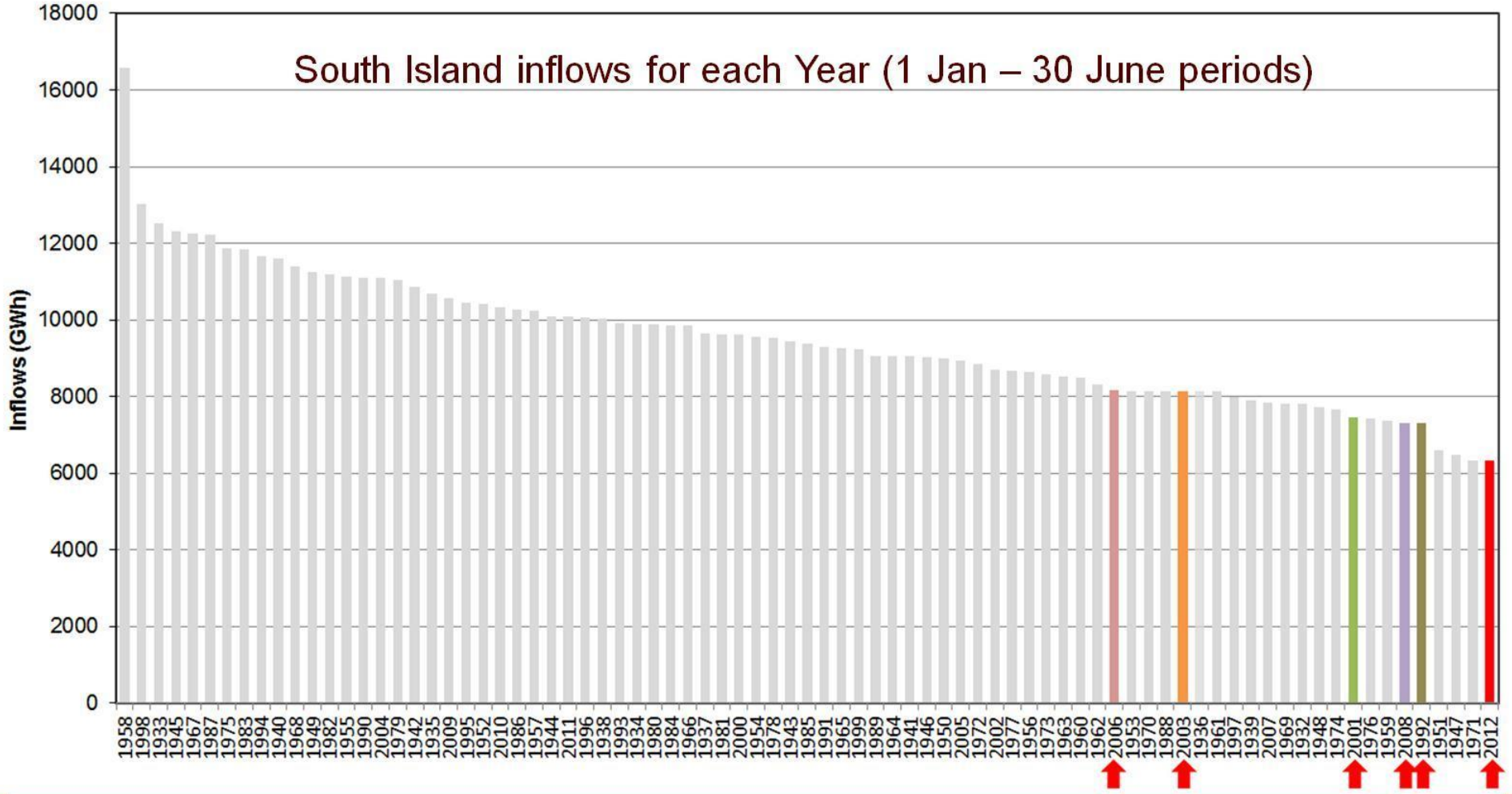
# Review of spot market

- Gens commit baseload plant to cover retail and hedge commitments
- Residual capacity offered at increasingly high prices
- Retail prices sticky downwards
- New retailers poach customers
- Gens are short and offer to sell hedge
- If prices offered are too high then gens begin to withdraw generation
- Prices spike more often, increasing attractiveness of hedges

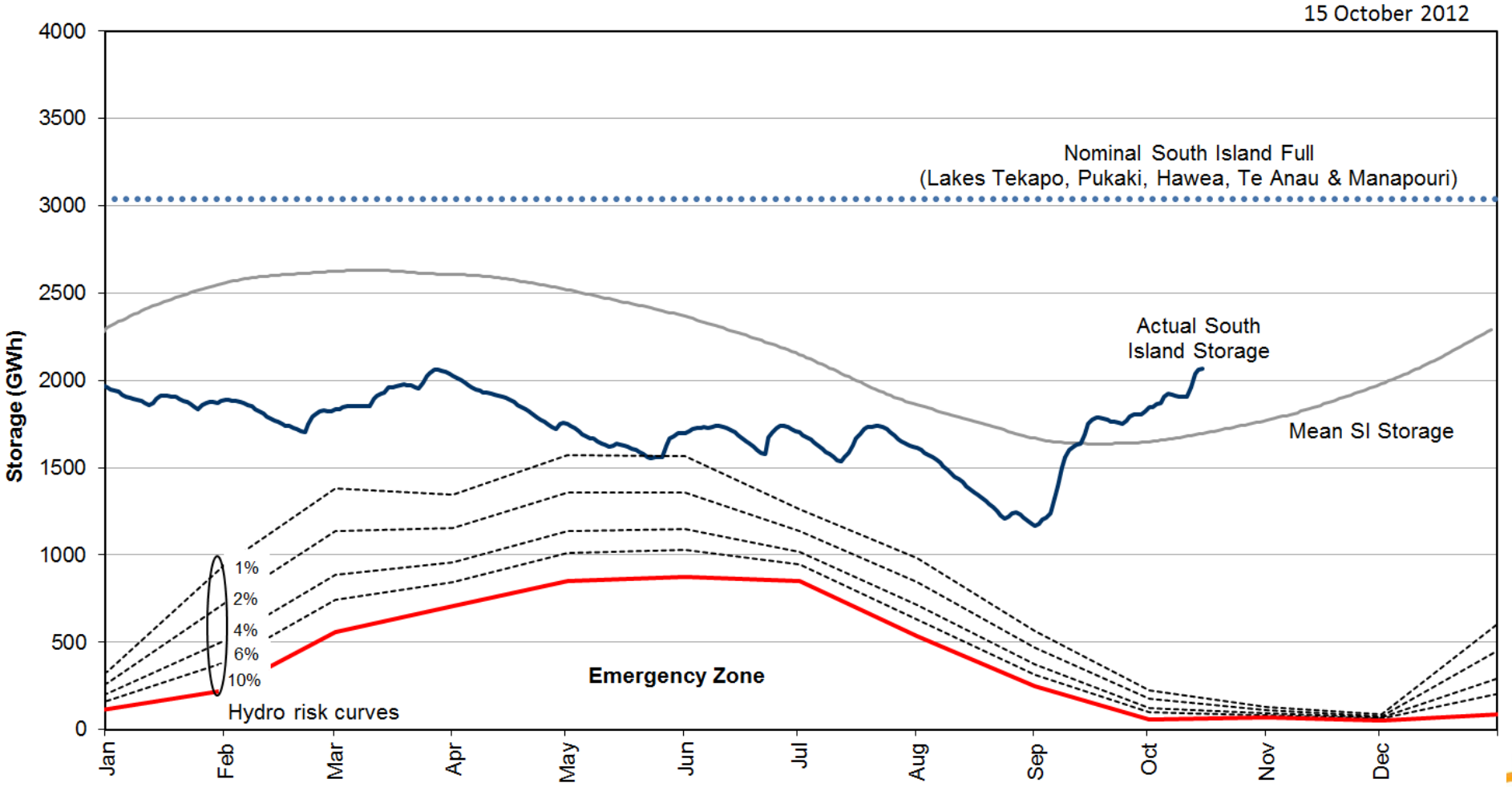
# 2013 Hydro Risk Curves



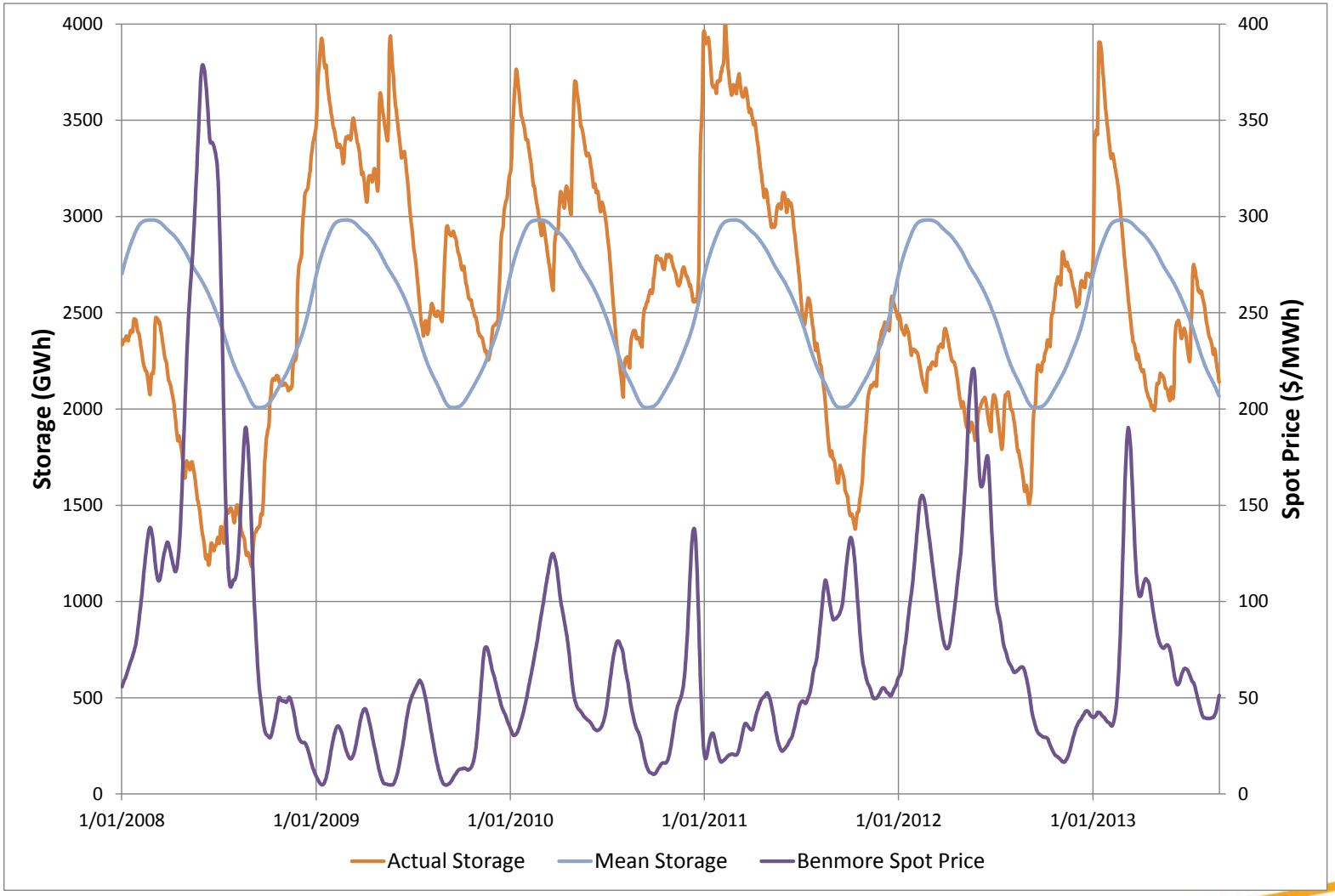
# 2012 inflows are the worst on record and many dry spells have occurred in last 12 years



# But SI lake levels were managed prudently in 2012



# Spot Price versus Storage



# Financial Transmission Rights and Dispatchable Demand

# Financial transmission rights

- FTR market introduced in June 2013
- Objective:
  - minimise locational price risk exposure to wholesale market participants
  - enhance competition in the retail and hedge markets
  - minimise barriers to entry for hedge customers and retailers

# Financial transmission rights

- What is a FTR?
  - A financial contract to hedge the locational price risk between pairs of nodes in the transmission network
- What products are traded in the FTR market?
  - Obligation FTRs
  - FTR options

# Financial transmission rights

- What are the trading locations for FTRs?
  - Benmore(SI) and Otahuhu(NI) initially
  - Islington(NI), Haywards(NI), Invercargill(SI) added in November 2014
- How are FTRs funded?
  - The accrued differences between the payments from purchasers and to generators.

# Financial transmission rights

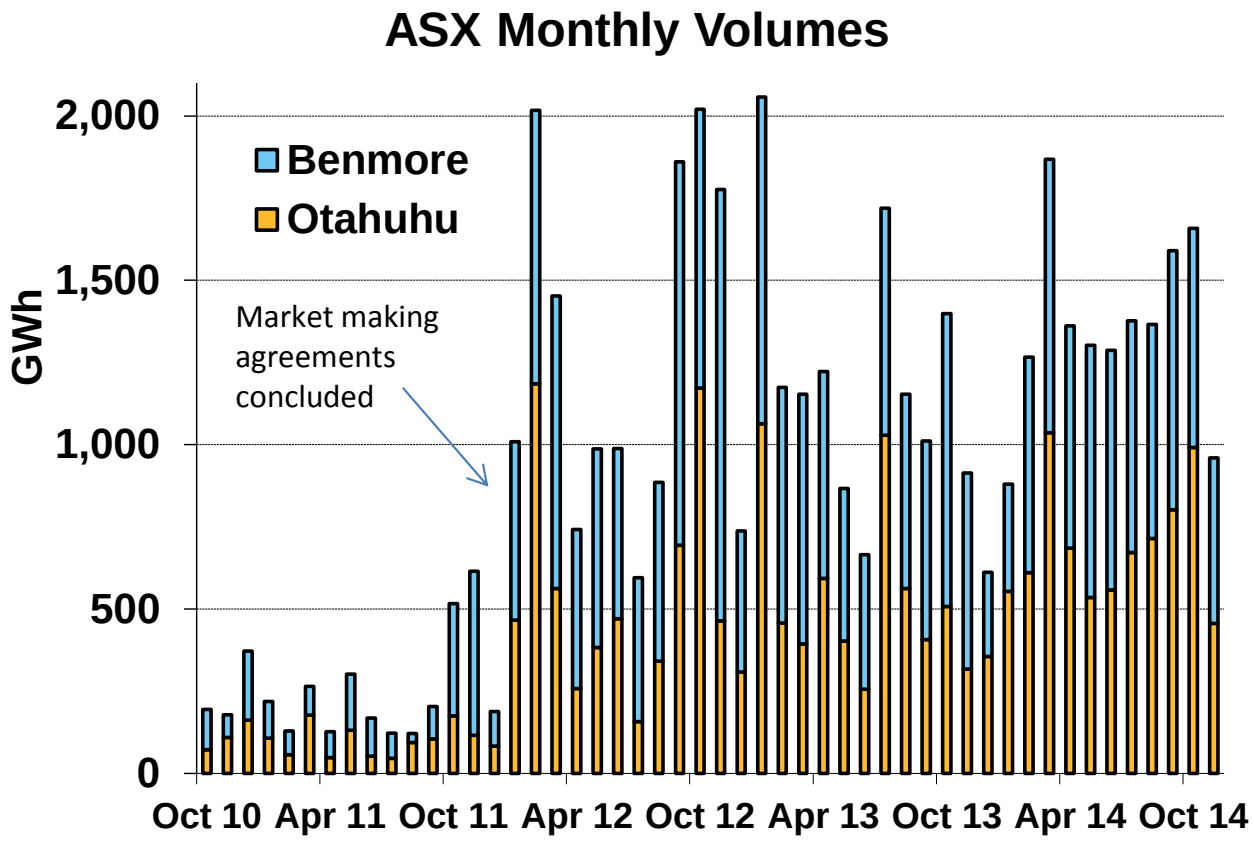
- FTR allocations
  - primary monthly auctions
  - secondary auctions
- What FTRs do not cover?
  - residual price risk exposure between injection or off-take node and the trading node of the FTR

# Dispatchable demand

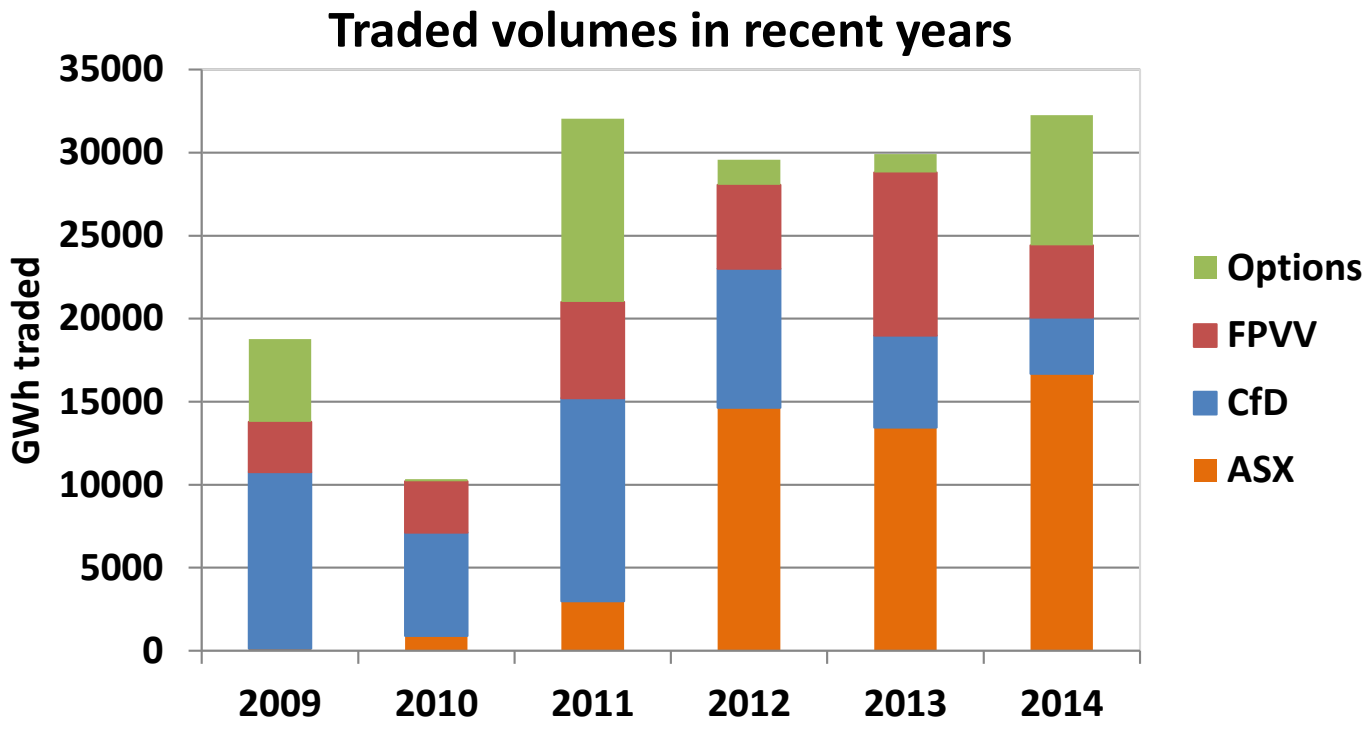
- Introduced 15 May 2014
- Facilitates competition from demand-side market participants in price setting
- Demand-side participants can react to price changes particularly during network emergencies
- Expectation is enhanced competition in the price formation process for the wholesale market

# Hedge markets

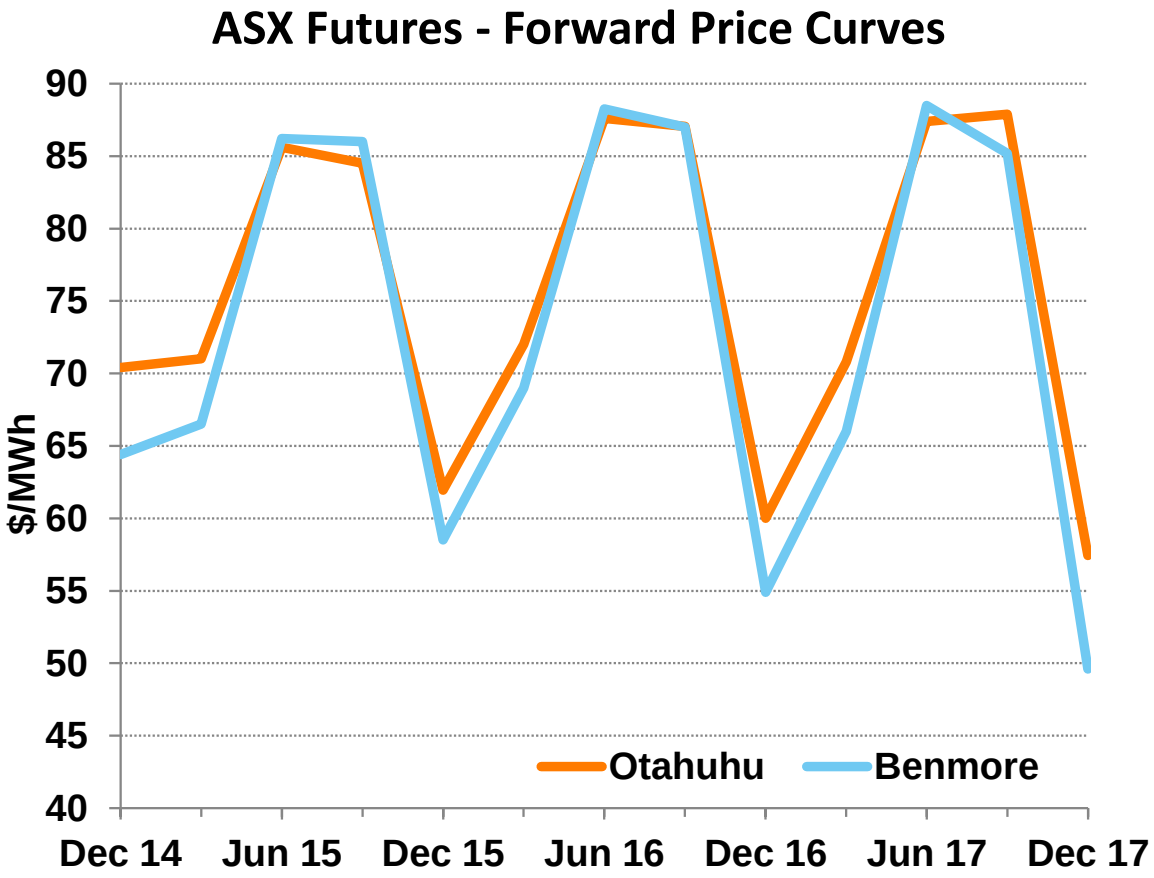
# Futures volume trading boosted with tighter market-making



# Futures trading accounts for half of all hedge contracts traded



# Forward price curve showing seasonal differences



# Discussion