

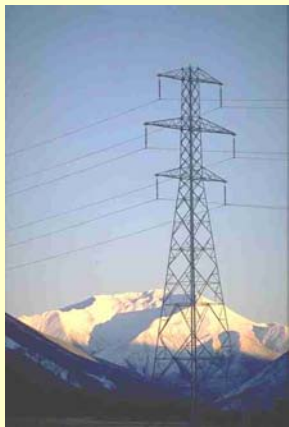


# Defining service as a foundation for transmission investment

Bill Heaps & Robert Reilly  
Transpower New Zealand  
HEPG April 2003



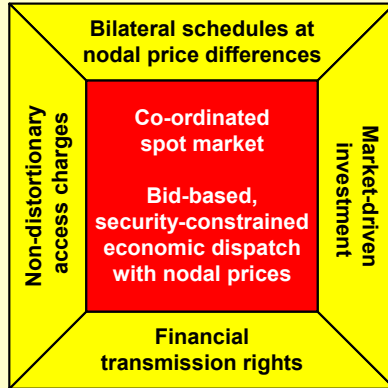
## Presentation Overview



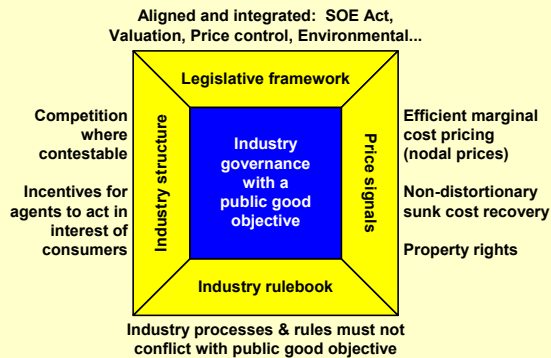
- Framework of an efficient market
- Historic Service Definitions
- Benchmarking
- Problems in contracting for new investment
- Design of new Industry Rules
- Proposed Service Definition
- Transpower obligations
- Next Steps
- The Service Delivery Plan
- Issues for further development



# Framework for an efficient market

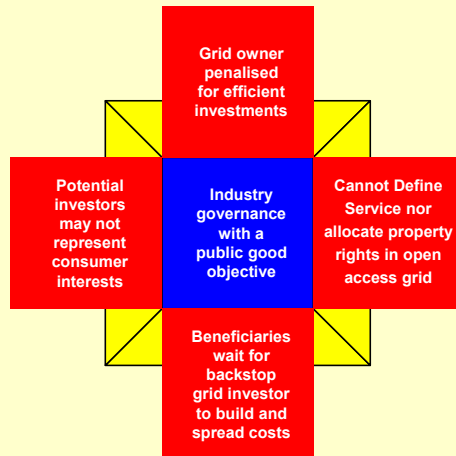


# Framework for efficient investment





## Market failures in efficient investment



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## Historic Service Definitions

- **1982-98 The “dead grid” model:**
  - bundled services - provision of assets
  - very little risk taking
- **1999 onwards:**
  - unbundling of services into Transmission Asset Owner and System Operator elements but no further
  - customer connection contracts deal with provision of an interconnected network, with capability specified at Grid Exit points
  - System Operator services specified in service provider agreements with NZ Electricity Market

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## Benchmarking

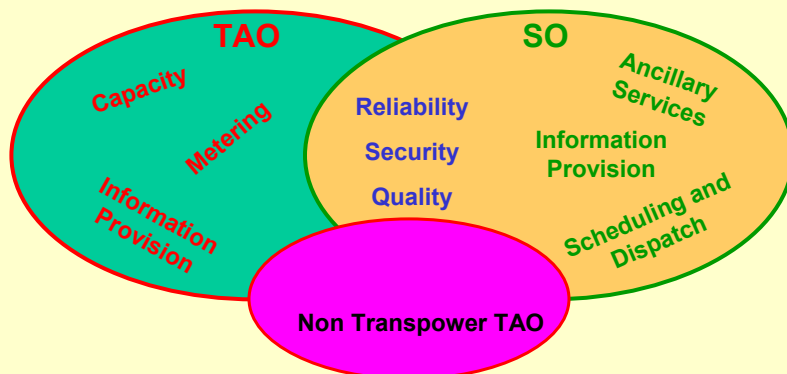
Looked at service aspects of nine international subjects:

- **Transmission service is resolved into a number of broad elements:**
  - ancillary services, dispatch and other system operator services
  - interconnection
  - connection
- **The service definition of those elements often results from wider regulatory obligations**
- **Performance obligations are broadly limited to “Good Industry Practice” or similar**
- **Liability limited to direct losses from negligence**

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## Service Definition - Unbundling ?



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## Design of New Rules - Part F

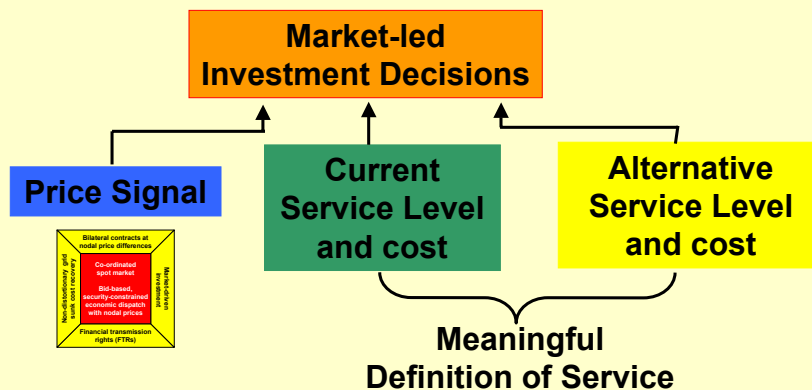
- **Agree service definitions, measures, & levels for existing transmission service**
  - unified definition of terms
  - measures and levels to be incorporated into transmission contracts
  - transmission pricing follows separate, parallel process
- **New framework for agreeing changes in service**
  - provides structure for multi-lateral agreement where appropriate
  - voting structure prevents “holding out”



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Part F can be seen conceptually as a means of delivering market-led investments



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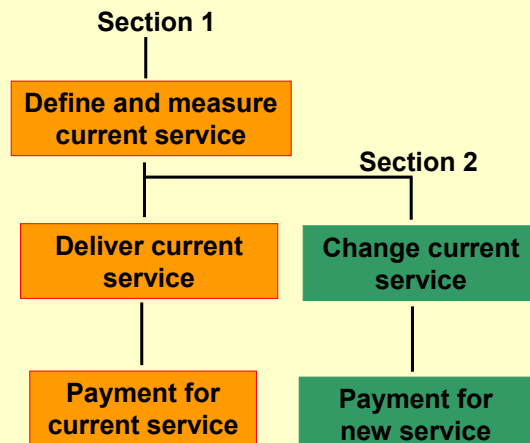
## Part F of the Proposed Rulebook

- **Defines processes to**
  - Agree service definitions
  - Set the current level of service against the definitions
  - Provide a delivery plan for system investment to continue to meet the current service levels
  - Agree a change to the existing service levels
    - Increase or decrease in transmission service
    - Install a transmission substitute
    - 75 % vote wins the day
    - Public good backstop for unacceptable decreases in service
  - Determine pricing methodologies

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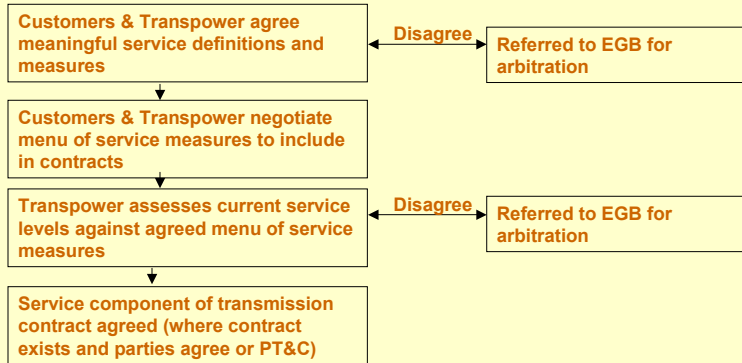
## Sections 1 and II of Part F works like this:



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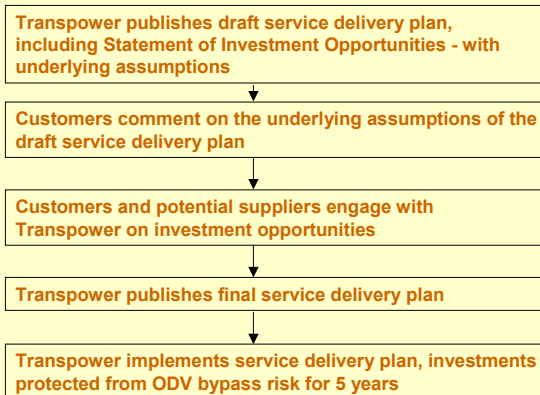
## Process for Agreeing Service Levels



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## Agreeing Expenditure to meet Service Levels



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## Service Definition Structure

- **Transmission services may be described as a set of service definitions, with associated service measures**
  - e.g. for power quality, “Transpower will use reasonable endeavours to achieve service levels which relate to power quality at a point of service”
- **For each service measure there will be one or more measurable quantities**
  - e.g. deviations outside voltage range during steady state
- **Each measurable quantity can have service levels established**
  - e.g. +/-2.5%

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## Proposed Grid Owner Service Definitions

- **Connection**
- **Transport**
  - Reliability
  - Power Quality
  - Capacity
  - Security
  - Meet Offtake Demand
- **Management of Outages**
- **Additional Services**



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## Connection

Permit customer's assets to be connected

- may include SCADA system interconnection



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## Transport - Reliability

The degree of continuity of the conveyance of electricity at a point of service

- extent of planned and unplanned interruptions
- extent of unserved energy (%) over a year
- extent of momentary interruptions
- provision of information about reliability performance

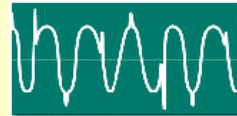
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## Transport - Power Quality

### Voltage magnitude and waveform shape

- Deviations of voltage magnitude outside operating range
- Step changes
- Momentary voltage fluctuations
- Voltage flicker and harmonics
- Voltage imbalance
- Provision of information about power quality



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## Transport - Capacity

### The maximum rate of energy transfer of assets at the point of service

- Linked to historic service, and valuation process
- Presently dimensioned in MW @ given power factor
- Defined for “normal conditions”
  - all relevant plant in service
  - generation available to be dispatched
- **NB: Does not necessarily consider the capacity of the interconnected grid**

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## Transport - Security

The expected ability of the grid assets to convey energy to or from a point of service under various contingencies

- Design redundancy level at point of service
- Extent of planned outages of specified assets
- Extent of unplanned outages of specified assets
- Provision of information about security

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## Transport - Meet Offtake Demand

Meet demand, while maintaining agreed redundancy and voltage range

- Extent to which:
  - demand is met
  - redundancy levels are met
  - voltage range objective is achieved
- Provision of information about meeting offtake demand

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## Management of Outages

- **Publication of Outage Protocol**
- **Manage outages in accordance with the Protocol**
- **Consult with customers before making material changes to the Protocol**

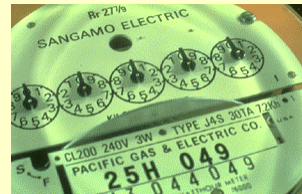


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## Additional Services

- **Provision of Special Information**
  - power system investigation, analysis & reporting services
- **Provision of metering (Part D of Rules)**
- **Financial products**



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## Transpower's Obligations

- **Covered by general exclusions from liability**
- **Achieving levels is subject to contract**
  - for current services, standard is generally “reasonable endeavours”
  - no provision under current service for compensation for failure to meet levels
- **Obligations to achieve Service levels is subject to**
  - Transpower's actions as transmission provider only. It excludes any services Transpower provides it provides as System Operator

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## Example - exclusions from Reliability service measures

- **Factors outside Transpower's control including:**
  - Insufficient generation
  - customer's power factor
  - rule changes
  - conflict with rules and service level
  - connected parties failing to comply with obligations
  - connected party failing to provide correct information
  - plant or equipment managed by other parties not being available
  - de-energisation under contract or rules
  - lack of local quality agreement.

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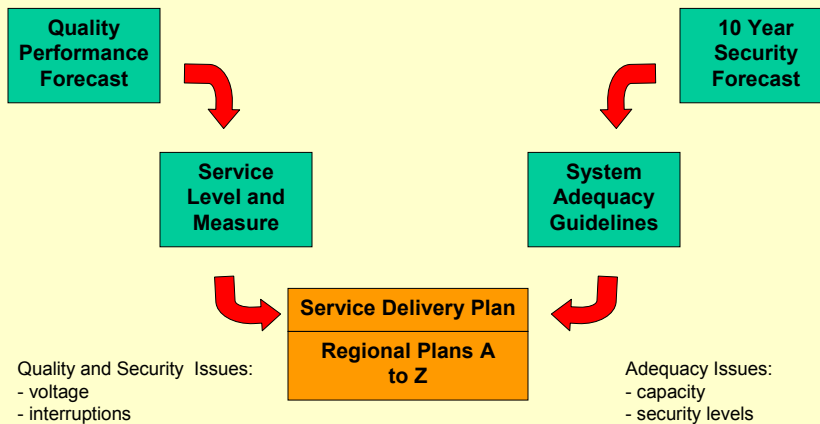
## Service Delivery Plan

- **Service Delivery Plan provides a proposed TP strategy for maintaining current service levels over a 10 year period**
- **Will include TP forecast peak demands by point of service, and other key planning assumptions**
- **Formulate the plan as a combination of:**
  - Forecasting the ability of the grid to meet 10 years of load growth
  - Assessing the ability of the grid to maintain other agreed existing service levels by comparing quality and performance statistics against contracted service levels at Points of Service.

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## Service Delivery Plan (cont'd)



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## Service Delivery Plan (cont'd)

- **Process to Develop the Service Delivery Plan:**
  - Segment NZ into regions (either geographical or electrical)
  - Write a plan for each region & publish for consultation
  - Include a statement of opportunities for each region setting out required investments to meet identified deficiencies:
    - Transpower's preferred option
    - Estimated cost of preferred option
    - Estimated transmission pricing for preferred option
    - Date for committal to preferred option
  - Transpower receives 5 year valuation shield for investments committed in accordance with this process

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## Issues for further development

- **Develop measurements and levels for aspects of the service for which there are no current measures and/or levels defined**
- **Respond to customer requests for a “point-to-point” transmission service**
- **Respond to customer requests to move beyond the “reasonable endeavours” standard, and for compensation for failure to meet service levels**
- **Develop the Service Delivery Plan process in accordance with the Rules**
- **Develop pricing methodology for current and new services**

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## Current Status

- Multi-headed regulation on transmission service standards is looking probable.
- Industry Rules to be put to referendum (not likely to succeed).
- Government impatience with the industry is significant.
- Government may move to appoint crown governance board.
- Crown governance board likely to adopt operational areas of the proposed rules (includes Part F).
- Work on service definitions is on hold pending resolution of governance structure.

