



**Asia-Pacific
Economic Cooperation**

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Agenda Item: 8

Energy Emergency Response in New Zealand

Purpose: Information
Submitted by: New Zealand



**54th Energy Working Group Meeting
Wellington, New Zealand
22-23 November 2017**



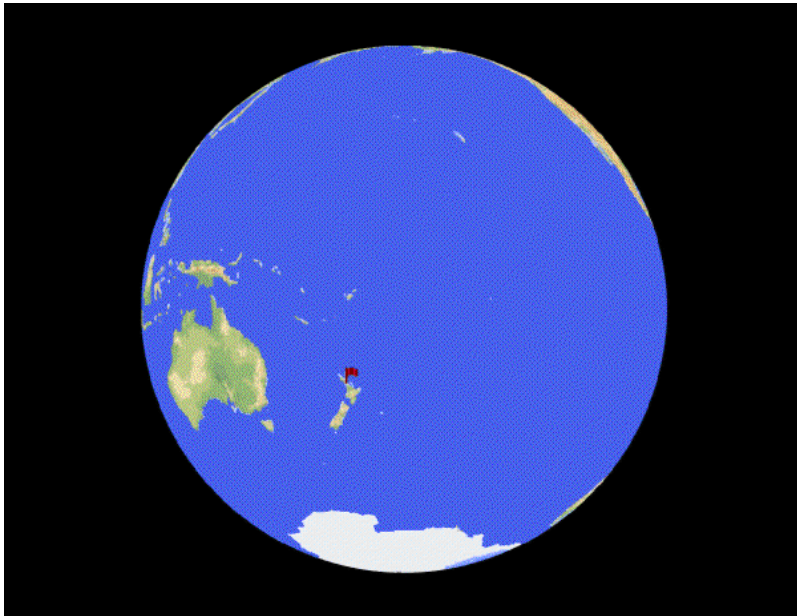
**MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT**
HIKINA WHAKATUTUKI

Energy emergency response in New Zealand

APEC Energy Working Group
November 2017



New Zealand's place in the world



- Small population (4.7 million)
- Two islands a long way from anywhere
 - no import of gas or electricity
- In the 'Roaring Forties' and Pacific 'Ring of Fire'
- Good hydro, wind and geothermal resources
- But geological and climatic challenges / hazards

Not only natural hazards ...

A cut pipeline is causing a jet fuel shortage at Auckland Airport. Here's what we know so far

Last updated 09:58, September 18 2017

Workers repairing the damaged Maui pipeline

Matt Rilkoff · 00:48, Oct 27 2011



URGENT REPAIRS: This aerial photograph taken late this morning shows the damaged section of the Maui gas pipeline exposed and ready to be replaced.

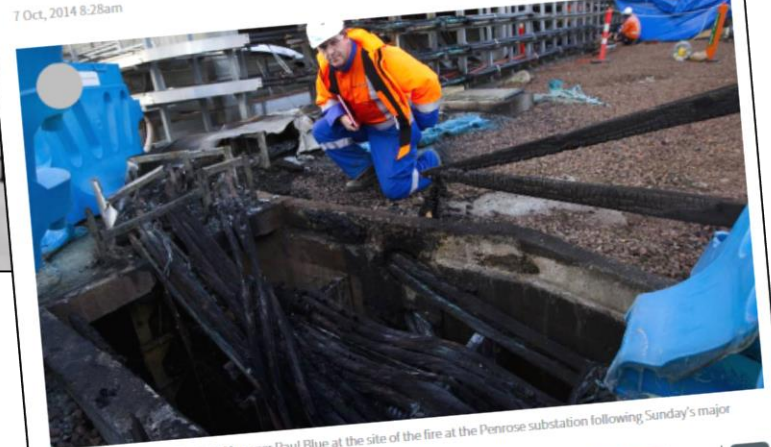
CAMERON BURNELL

Gas supplies to industrial consumers look set to be partially restored this afternoon as workers gingerly work towards repairing the damaged Maui pipeline in north Taranaki.

Acting Energy and Resources Minister Hekia Parata told a media conference in Auckland this morning there were adequate gas supplies already in the pipeline north of the breach to allow some major gas users - including dairy factories - to be brought back on line.

Auckland blackout: Shock to the system - Why did it happen?

9 minutes to read



Transpower Regional Services Manager Paul Blue at the site of the fire at the Penrose substation following Sunday's major blackout. Photo / Jason Owenham

NZ Herald



Governance of NZ energy markets

- Electricity, natural gas and petroleum fuels are supplied in competitive markets
- Electricity and gas markets are regulated by several agencies
 - Commerce Commission regulates monopoly electricity lines and gas pipelines
 - Electricity Authority promotes competition, reliability and efficiency through industry code and market facilitation measures
 - Gas Industry Company has similar role, but recommends (rather than makes) gas governance regulations and rules
- Fuel sector is largely unregulated
- MBIE administers the government's Oil Emergency Response Strategy
- All energy suppliers have duties as 'lifeline utilities' under Civil Defence and Emergency Management legislation



Intervention in markets sometimes required

- Many types of events challenge and may threaten supply
 - dealing with minor events is 'routine' for infrastructure and supply chain managers
- But some events result in major disruption for consumers
- Infrequent events are not routinely observed and effective management relies on expert assessment of likelihood
- Market clearing prices mediate supply and demand most of the time, but not always
- Emergency response measures typically involve non-price demand management interventions

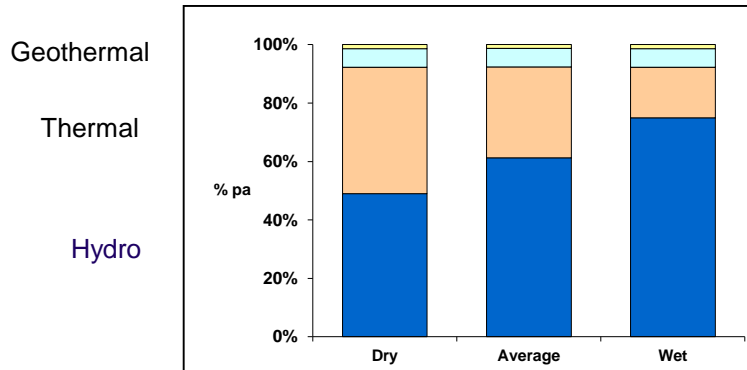


Hydro inflow variability is a key electricity supply risk



Usually around 60% of total generation
But ...

- Small storage capacity (10% of annual demand)
- Big difference between wet and dry years
- Inverse correlation between main inflows (spring/summer) and main demand (winter)
- Most of storage in South Island, most demand in North Island
- Spot prices volatile
- Substantial thermal backup required
- 'Dry' periods in 1992, 2001, 2003, 2006, 2008, 2012, and 2017



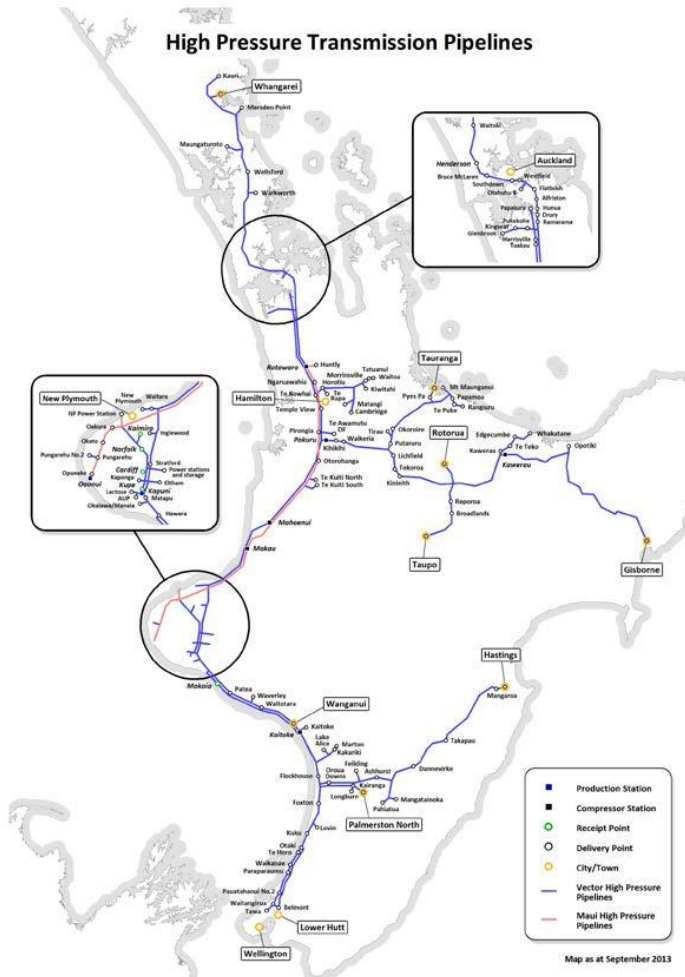
Electricity emergency response

New Zealand and South Island Hydro Risk Meter

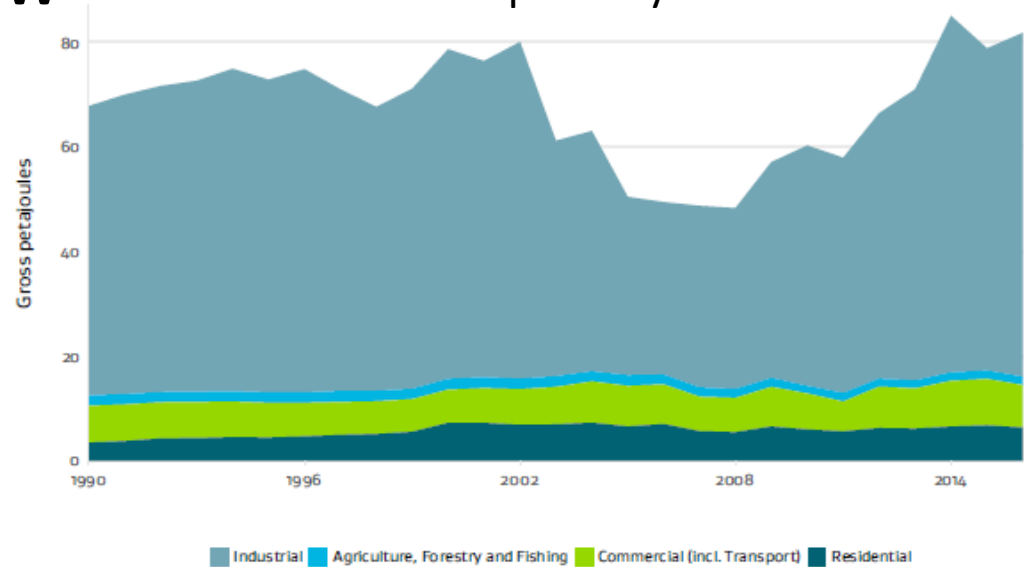
- Electricity Authority has overall responsibility for security and reliability
- System Operator (Transpower) plans, exercises, monitors and activates emergency response measures
- Supply and demand kept in balance through:
 - market clearing dispatch prices for energy and reserves
 - public conservation campaign triggered when shortage risk exceeds codified threshold
 - last resort actions (under-frequency load shedding, rolling outages)
- Regulatory mechanisms augment market-based incentives
 - Stress test regime and customer compensation regime



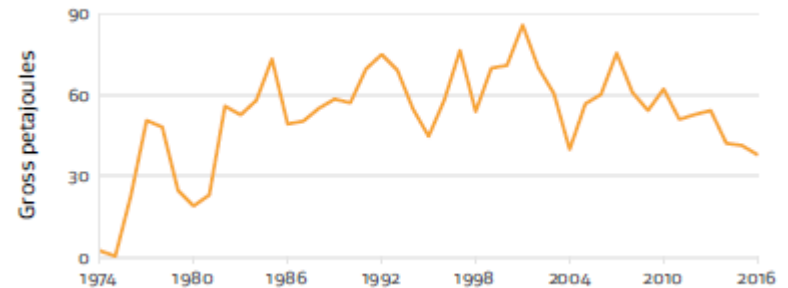
Natural gas overview



Gas consumption by sector



Gas used for electricity generation



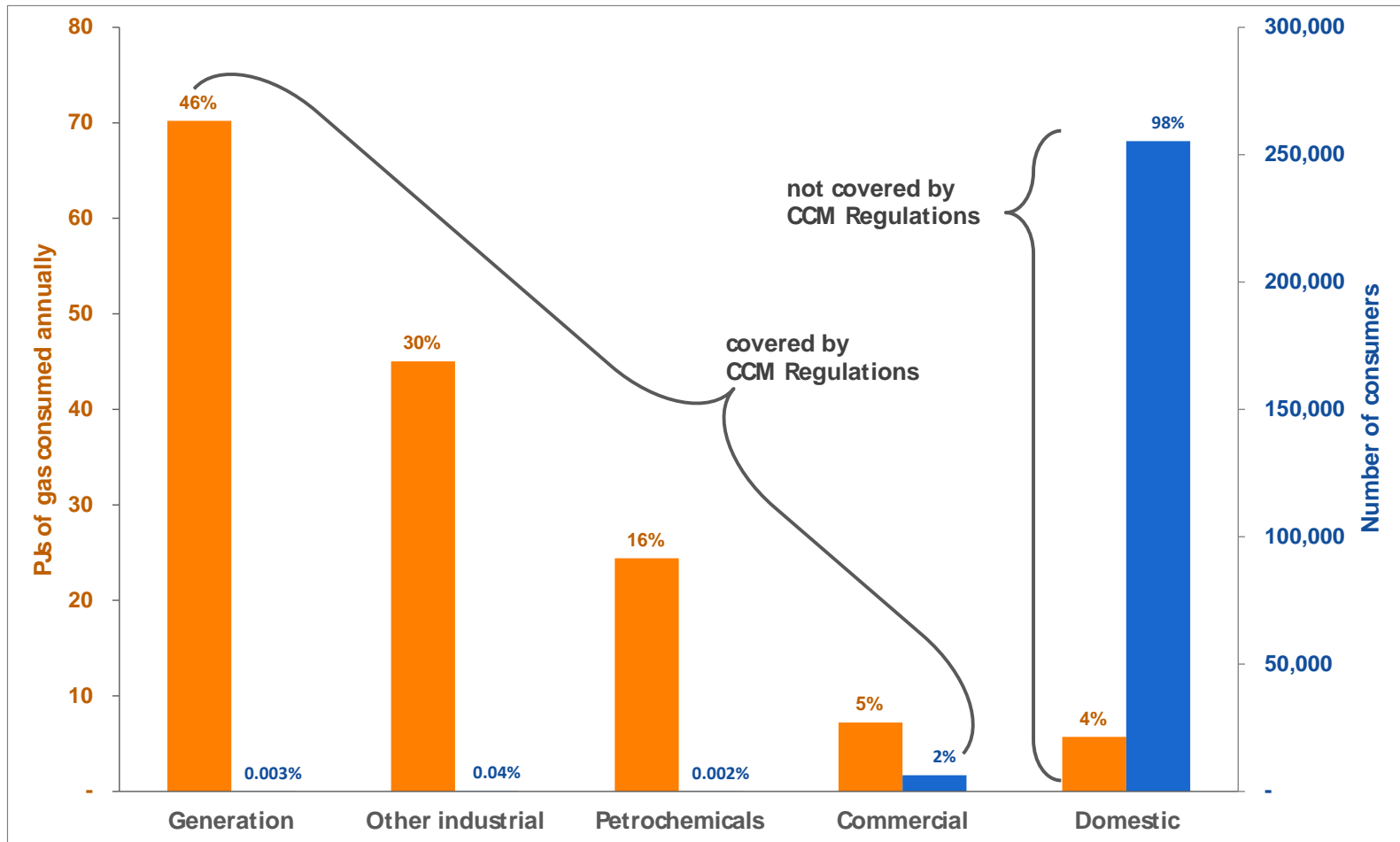
Gas critical contingency regulations

- Critical Contingency Operator contracted to plan, exercise, and activate
- Activated when pressure in system falls below critical threshold
- CCO can direct consumers to curtail demand (pre-defined bands)
- Domestic consumers not generally affected

<i>Curtailment Band</i>	<i>Consumption</i>	<i>Description</i>
<i>0</i>	<i>N/A</i>	<i>Gas off taken for injection into storage</i>
<i>1</i>	<i>More than 15TJ per day</i>	<i>Consumers supplied directly from the transmission system and that have an alternative fuel capability.</i>
<i>2</i>	<i>More than 15TJ per day</i>	<i>Consumers supplied directly from the transmission system and that do not have an alternative fuel capability.</i>
<i>3</i>	<i>More than 10TJ per annum and up to 15TJ per day</i>	<i>Large industrial and commercial consumers</i>
<i>4</i>	<i>More than 250 GJ per annum and up to 10 TJ per annum</i>	<i>Medium industrial and commercial consumers</i>
<i>5</i>	<i>More than 2TJ per annum</i>	<i>Consumers with essential services designations</i>
<i>6</i>	<i>250 GJ or less per annum</i>	<i>Small commercial consumers</i>
<i>7</i>	<i>Any</i>	<i>Consumers with critical care designations</i>



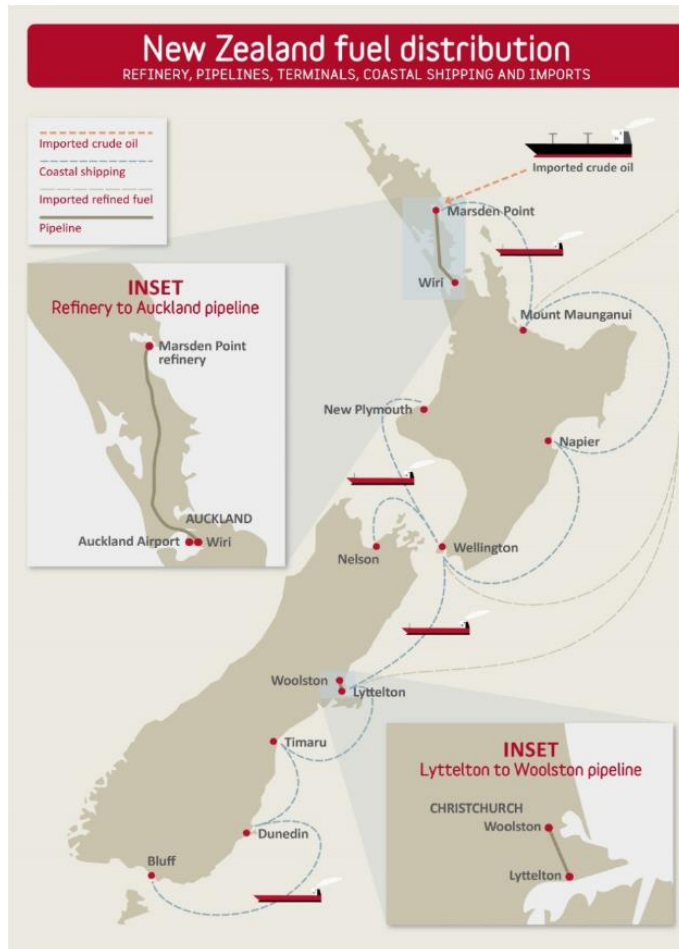
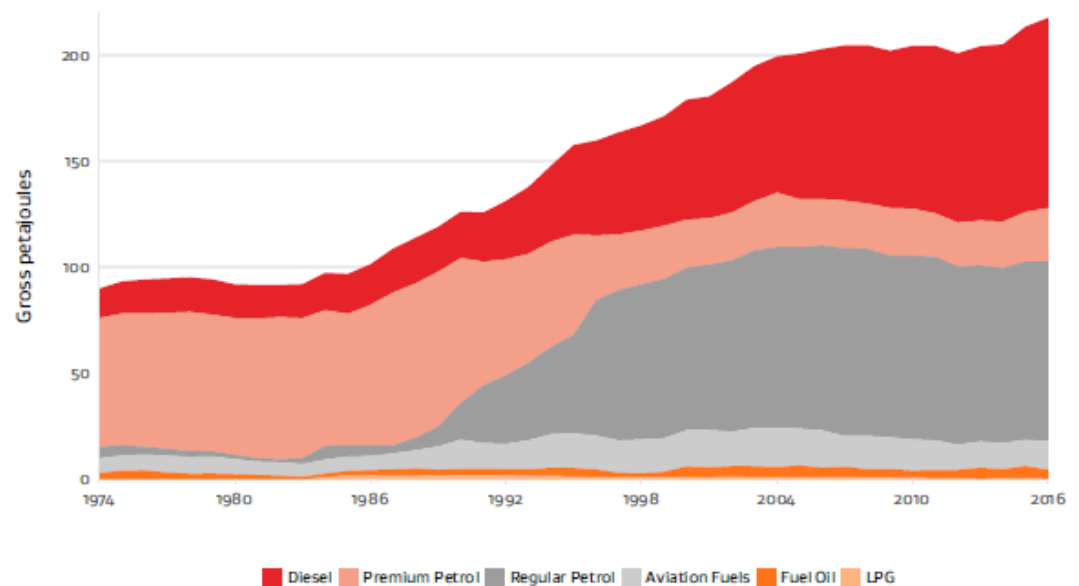
Consumers subject to curtailment



Fuel supply overview

- 1 refinery
- Distribution by pipeline and coastal shipping
- 10 terminals
- Some direct product imports

Oil products consumed for domestic transportation



Fuel emergency response

- Industry leads response to supply disruptions
- Strategy guides how Government will
 - Respond to serious international or domestic supply disruption.
 - meet NZ's IEA obligations.
- Measures/options include
 - Stock release
 - Fuel specification relaxation
 - Voluntary demand restraint
 - Mandatory demand restraint ('restricted purchase scheme')

Oil Emergency Response Strategy

Government Response to an Oil Supply Disruption



July 2008



Restricted purchase scheme

- Menu of regulatory instruments designed to signal the Government's effective and timely management of an oil emergency
- Objectives:
 1. Reduce anxiety and improve public confidence about access to fuel
 2. Improve confidence that first responder and other critical services (health) will continue to function uninterrupted
- Potential measures:
 - Retail restrictions (e.g. no fuel sales to containers, per-visit sales limit)
 - Identification of priority fuel users and uses
 - Authorisation of some coordination activities
- Forthcoming review to better align measures and decision processes with those under National Civil Defence Emergency Management Fuel Plan

Summary

- Most supply risks are well managed by suppliers
- Regulation can provide additional resilience incentives and assurance
- Government intervention also required during severe disruptions
- Objectives of emergency response arrangements
 - prioritise available supply to critical services
 - promote quick recovery to minimise social and economic harm
 - promote public confidence and reduce anxiety
- Reviews underway or planned
 - September 2017 fuel pipeline outage affecting Auckland Airport
 - resilience to significant natural hazards (especially earthquake, tsunami, volcanic eruption events)