

# The Changing Face of New Zealand Business and Energy Efficiency

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Presentation to the EMANZ Conference

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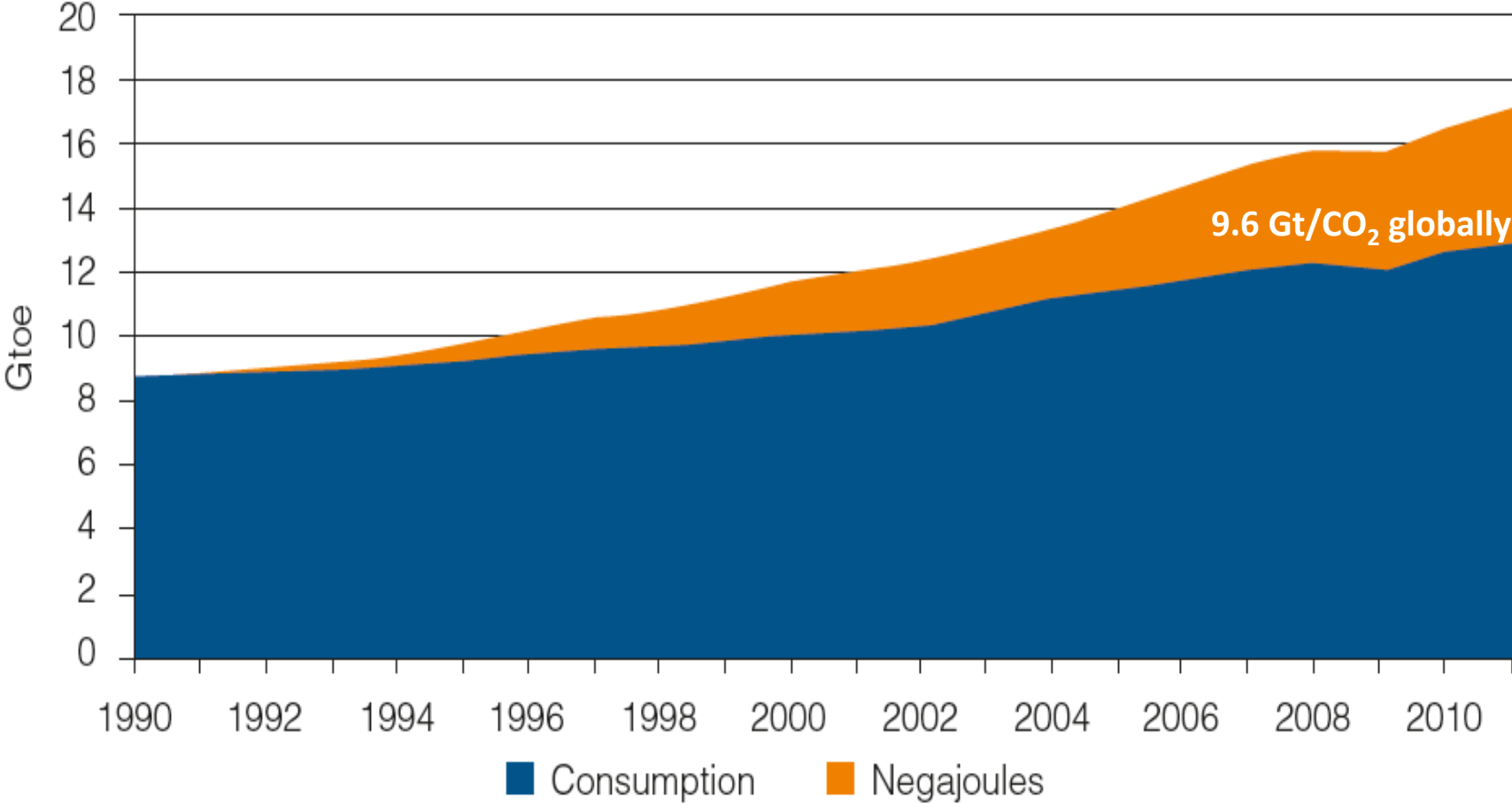


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# Outline

- Some global context
  - World Energy Perspectives: Energy Efficiency Policies
  - World Energy Scenarios to 2050
- What's happening at here in New Zealand?
  - the Energy Trilemma
- Has the energy efficiency problem been solved?

# Moderate energy efficiency progress worldwide...

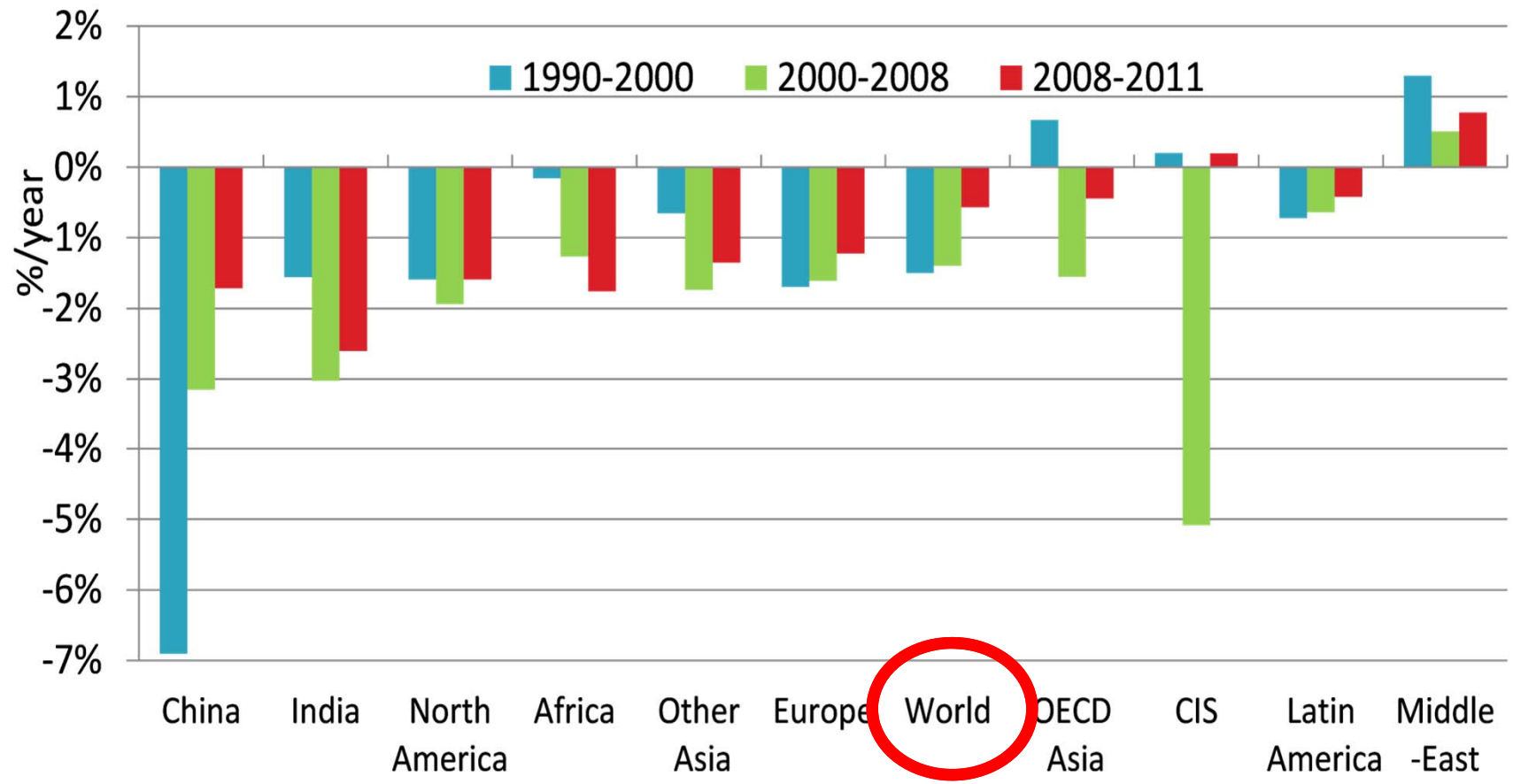


Improvements in primary energy intensity, 1990 to 2011

Source: World Energy Perspectives: Energy Efficiency Policies



.....but there are big regional disparities...

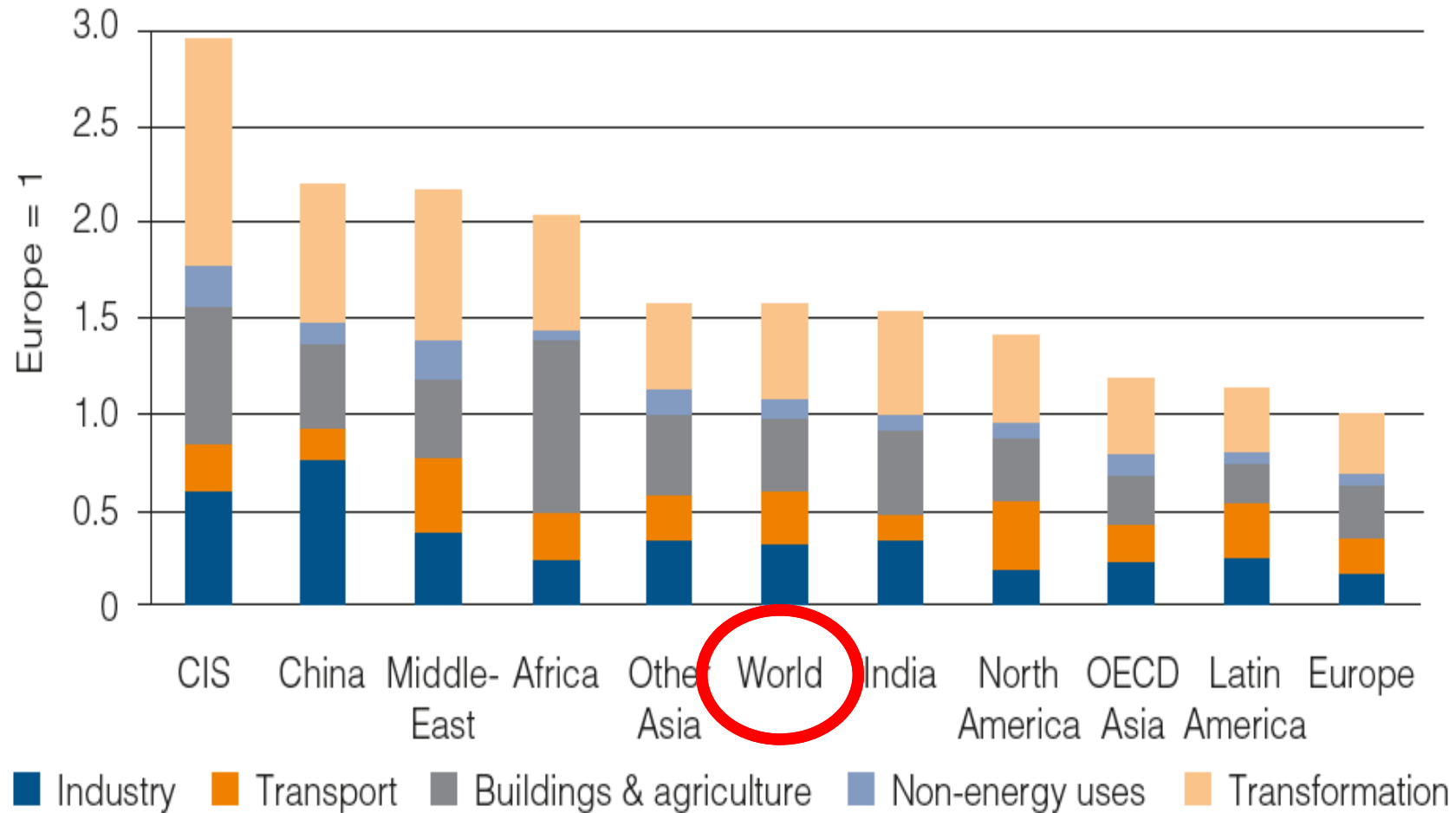


Change in energy intensity by region

Source: World Energy Perspectives: Energy Efficiency Policies



# .....and challenges in transport...



Industrial sectors shares in primary energy intensity (2011)

Source: World Energy Perspectives: Energy Efficiency Policies



## World Energy Council Scenarios: the stories

- two scenarios stories, exploratory, different and equally probable rather than good and bad

### **Jazz:**

Market & trade based, consumer driven, decentralized decision making, focussed on access and affordability. Achieving growth through low cost energy. Governments facilitate GHG actions.

### **Symphony:**

Government led, “orchestrated”, voter driven, focussed on environmental goals and energy security, national and regional measures to increase share of renewables in energy mix. Binding international agreement on GHG emissions.

# Brief outline of the two scenario stories

Jazz	Symphony
Price-conscious consumers	Environmentally-minded voters
Competitive markets pick technologies	Governments pick technology winners
Higher GDP due to efficient market practices.	Lower GDP due to non-optimal economic policies
Increased exports due to <b>free-trade</b> strategies	Reduced exports/imports due to <b>nationalistic</b> strategies
Main players are multi-national companies, banks, venture capitalists	Main players are private- and public sector companies, local governments, NGOs
Carbon market grows more slowly from bottom up, based on regional, national and local initiatives.	Carbon market is top down based on an international agreement, with commitments and allocations.

## Storyline and quantification assumptions

	Jazz	Symphony
<b>GDP growth</b>	<b>Higher</b> (3.54% pa CAGR, PPP)	<b>Lower</b> (3.06% pa CAGR, PPP)
<b>Population</b>	<b>Lower</b> (2050 = 8.7 billion)	<b>Higher</b> (2050 = 9.3 billion)
<b>Efficiency/ Intensity</b>	<b>Increasing</b> (-2.29% pa (primary, PPP))	<b>Increasing more strongly</b> (-2.44% pa (primary, PPP))
<b>Climate policy</b>	<b>Limited</b> Prices (2050): 23-45 USD/tCO <sub>2</sub>	<b>Stronger</b> Prices (2050): 75-80 USD/tCO <sub>2</sub>
<b>Resources</b>	Better access to <b>unconventionals</b>	More expensive <b>unconventionals</b>
<b>Technology support</b>	Limited; energy choice based on free markets	support for <b>nuclear, large hydro, CCS</b> and <b>renewables</b>
<b>Technology innovation</b>	Further development of CCGT decentralized power (SPV)	Focused R&D programs (esp. CC(U)S, solar PV)



# Result highlights

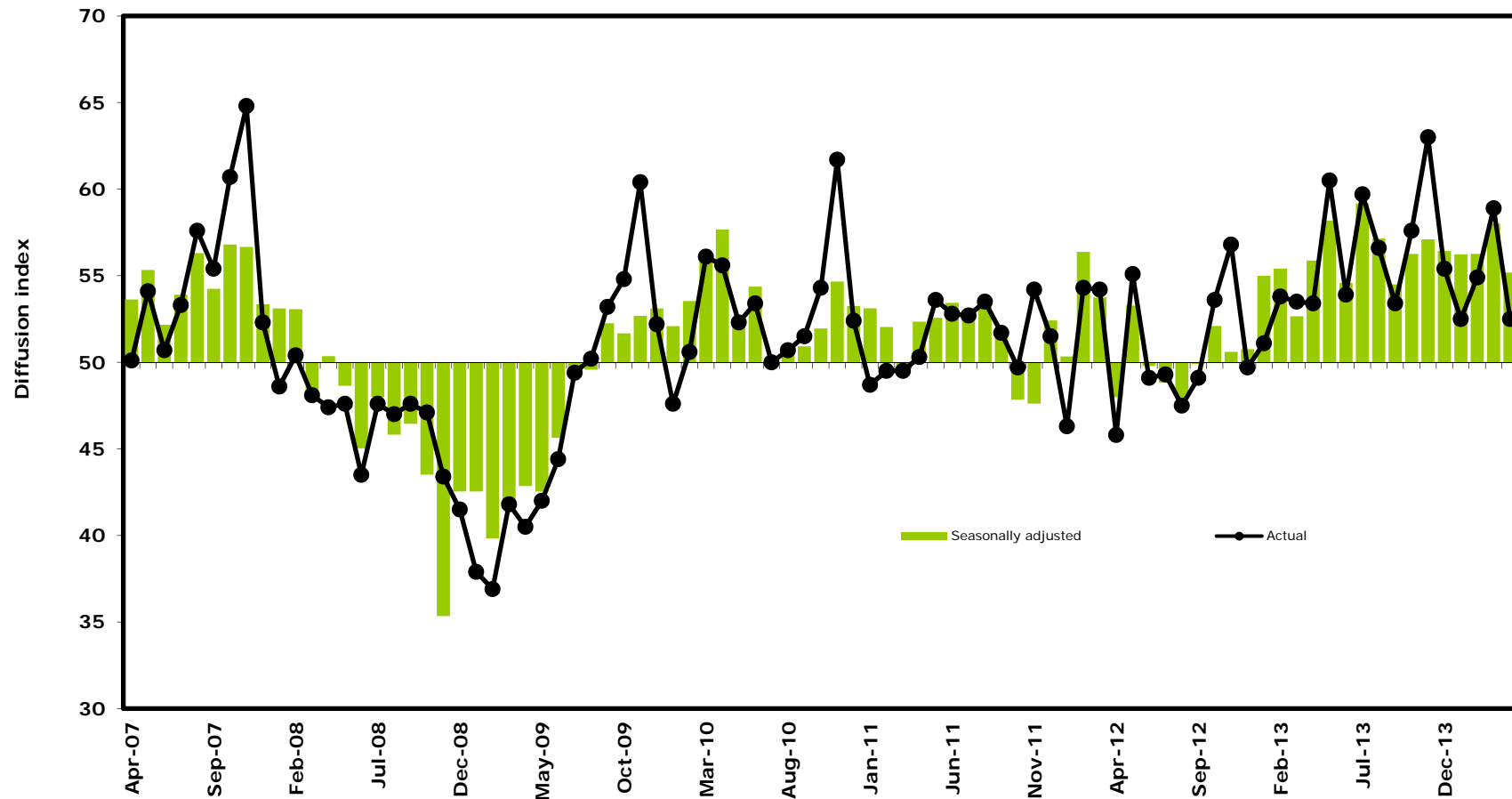
	2010	Jazz, 2050	Symphony, 2050
<b>Final demand</b>	373 EJ	+69%	+31%
<b>Fossil fuels *</b>	80%	77%	59%
<b>Renewables *</b>	15%	19%	29%
<b>CO2 emissions [Gt CO2/yr]</b>	30.5	44.1	19.1
<b>Solar **</b>	0.2%	6%	16%
<b>Wind **</b>	2%	8%	8%
<b>Nuclear **</b>	13%	6%	15%
<b>Hydro **</b>	7%	11%	16%

\* Shares in total primary energy supply

\*\* Shares in electricity production

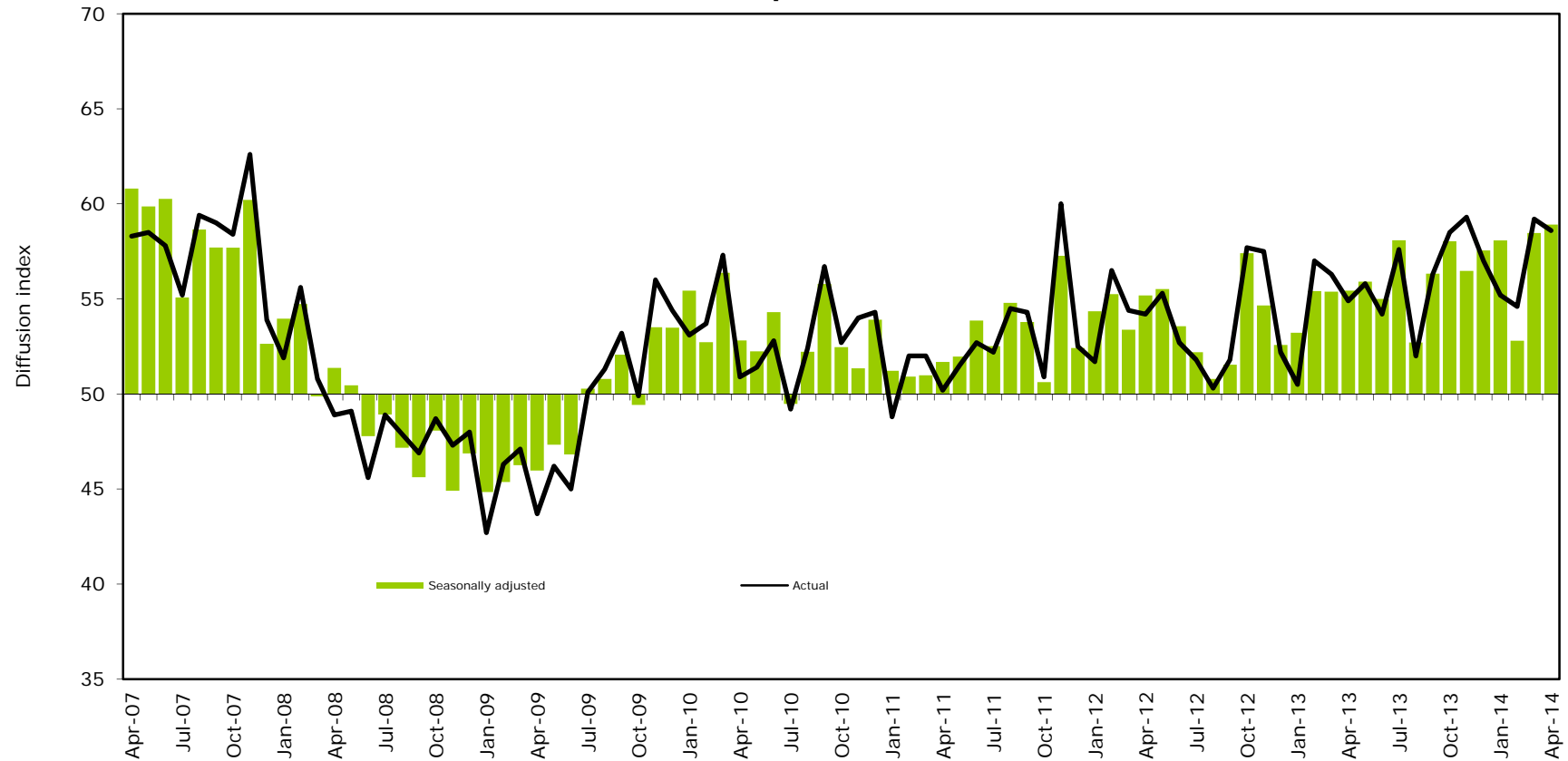
# The Overall Economy - Manufacturing

BNZ - BusinessNZ Performance of Manufacturing Index Time Series (Apr 2007 - Apr 2014)



# The Overall Economy - Services

BNZ - BusinessNZ Performance of Services Index Time Series (Apr 2007 - Apr 2014)



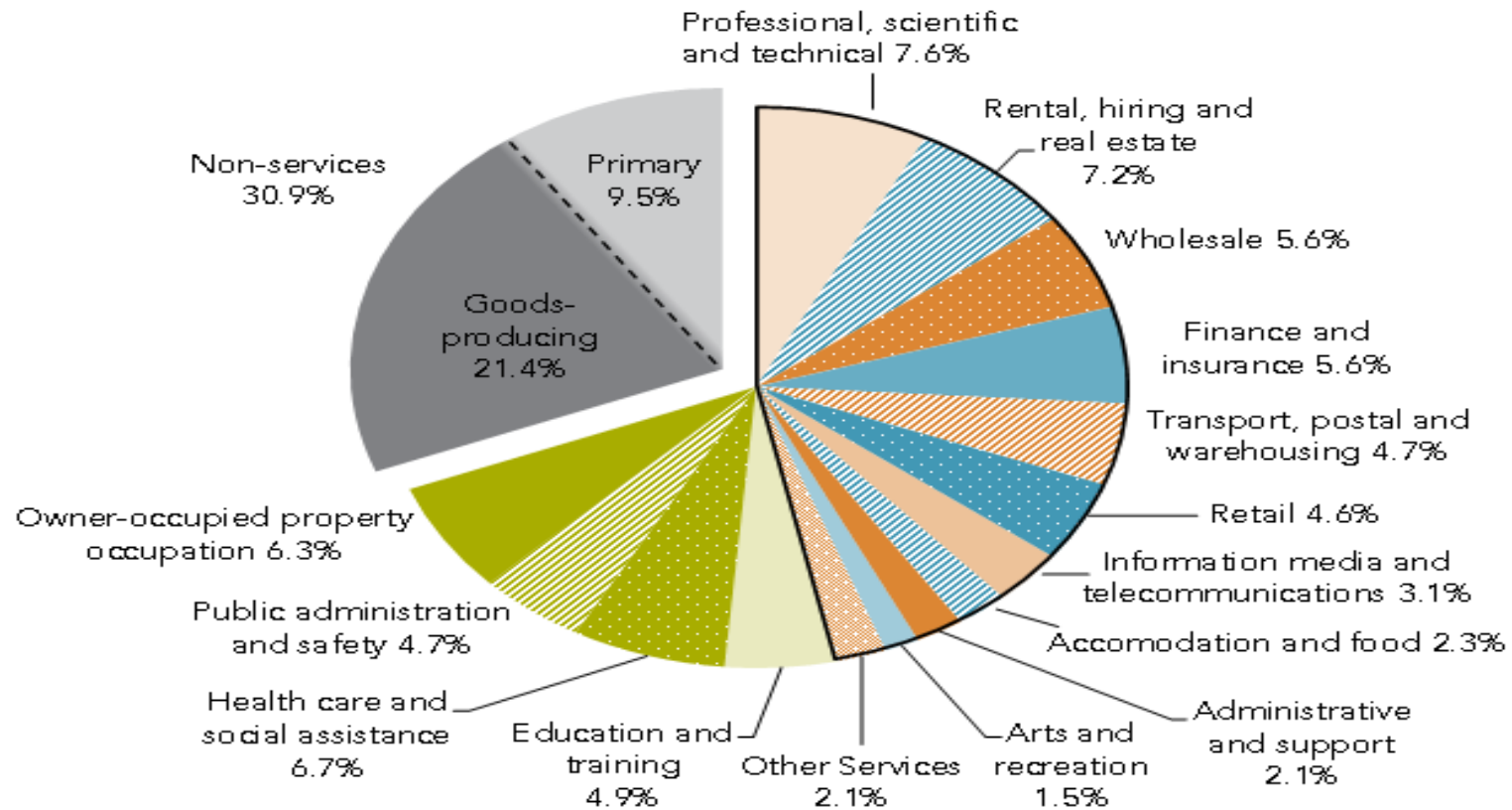
# The New Zealand Economy

- A raft of good news
  - current annual growth rate of ~ 3 percent
  - best terms of trade since early '70s
  - business confidence at 20 year high
  - unemployment is just over 6 percent and falling
  - wages growing faster than inflation
- New Zealand has managed the recovery since the global financial crisis better than many others
- business environment continues to improve, consumer confidence is strong, and business confidence highest point since 1999

## The Changing Face of Business

- Talking about the ‘survivors’ of the GFC
  - used recession to resize, reshape
  - used high dollar to import capital goods, so retooling, more productive, *energy efficient*
  - if not Asia-facing, waiting for growth in EU, North America
- There are no manufacturers any more?!
  - part of a complex global supply chain

.....everyone *is* a service business now



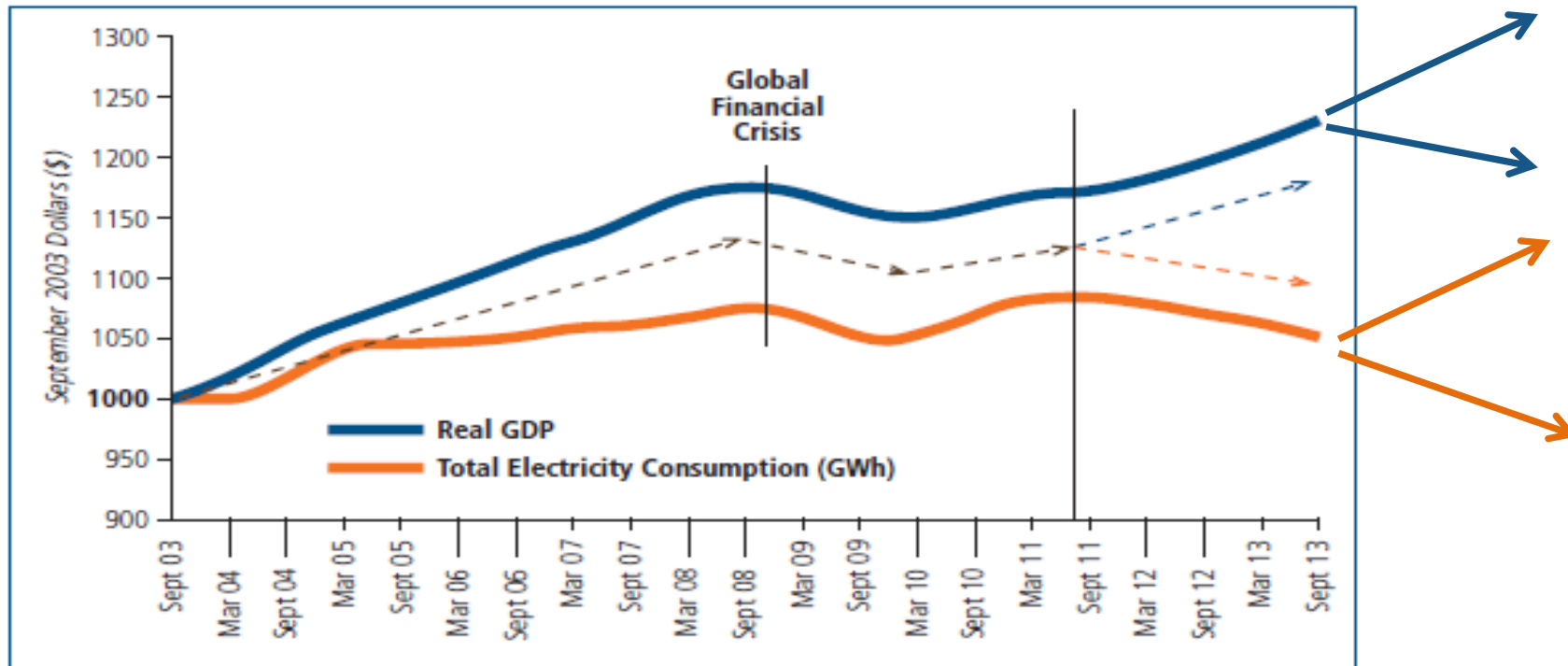
Source: New Zealand Productivity Commission

- Services around 70% of New Zealand's GDP – and growing
  - USA, UK ~ 80%

# Permanent or Back to the Future?

New Zealand economic output less energy intensive

**Growth in electricity consumption and real GDP (2003 – 2013)**



Source: EA, NZIER, ENA Analysis, PwC Analysis

Note: Real GDP and electricity consumption are 12 month rolling averages



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# Balancing the 'Energy Trilemma'

## Energy Security

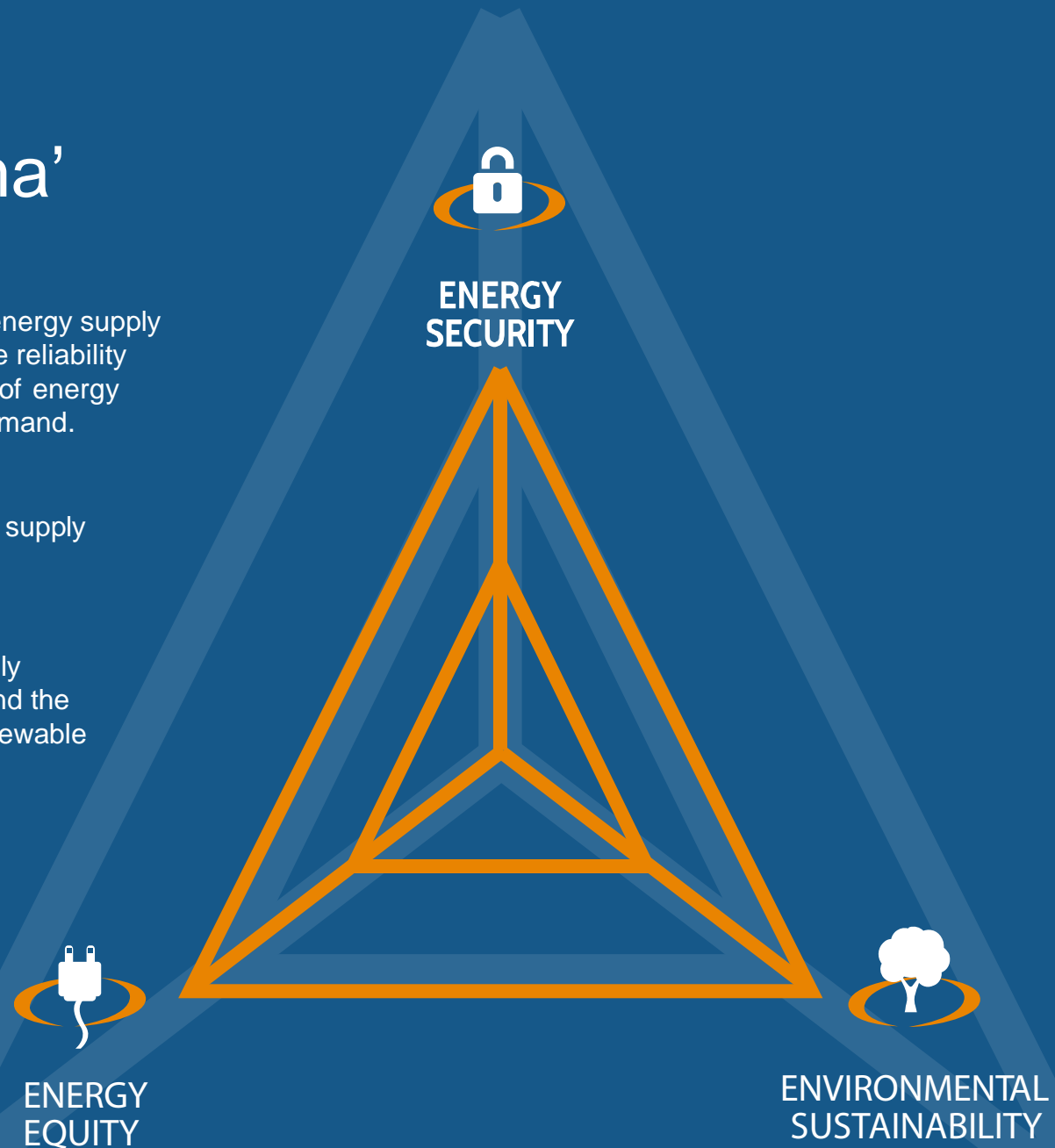
The effective management of primary energy supply from domestic and external sources, the reliability of energy infrastructure, and the ability of energy providers to meet current and future demand.

## Energy Equity

Accessibility and affordability of energy supply across the population.

## Environmental Sustainability

Encompasses the achievement of supply and demand side energy efficiencies and the development of energy supply from renewable and other low-carbon sources.





# 5 Top Energy sustainability index

- 1 Switzerland
- 2 Denmark
- 3 Sweden
- 4 Austria
- 5 United Kingdom
- 6 Canada
- 7 Norway
- 8 **New Zealand**
- 9 Spain
- 10 France

AAA score  
AAB score



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## Top 5 Energy equity

- 1 United States
- 2 Canada
- 3 Australia
- 4 Luxembourg
- 5 France

Energy equity

## Top 5 Energy security

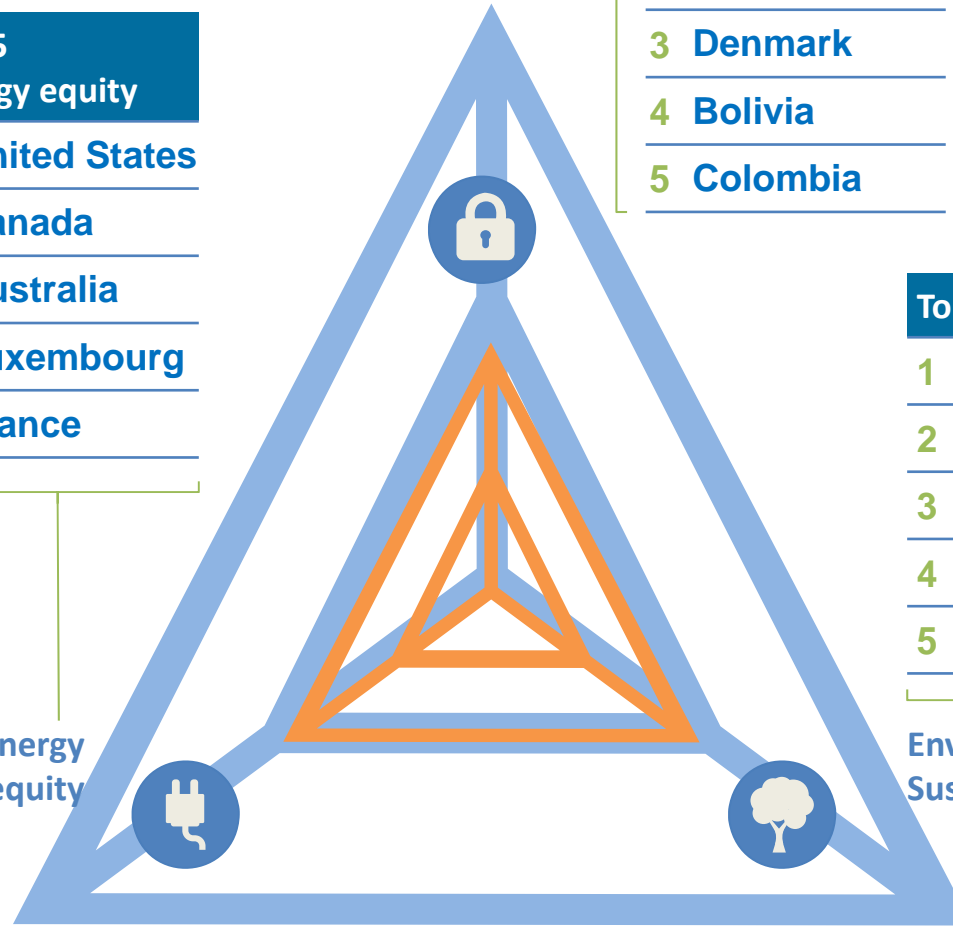
- 1 Canada
- 2 Russia
- 3 Denmark
- 4 Bolivia
- 5 Colombia

Energy security

## Top 5 Environmental Sustainability

- 1 Switzerland
- 2 Costa Rica
- 3 Albania
- 4 Colombia
- 5 Uruguay

Environmental Sustainability

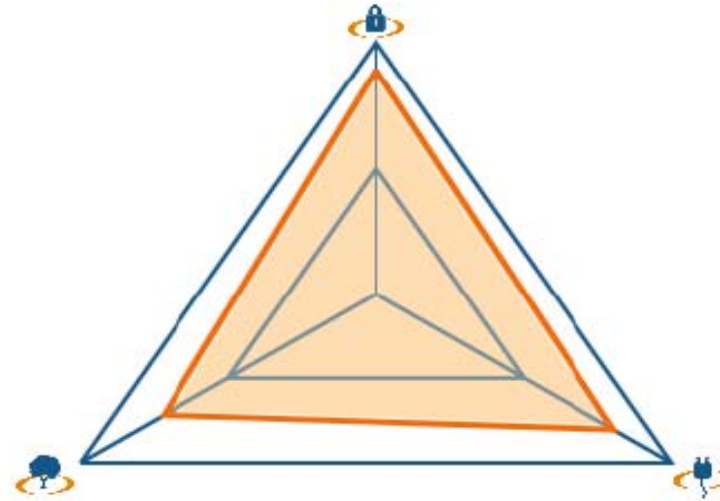


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# New Zealand Energy Trilemma Scores



	2011	2012	2013	Trend	Score
Energy security	20	19	15	↑	A
Energy equity	15	18	26	↓	A
Environmental sustainability	40	36	37	↓	B
<b>Overall rank and score</b>	<b>9</b>	<b>7</b>	<b>8</b>	<b>↓</b>	<b>AAB</b>

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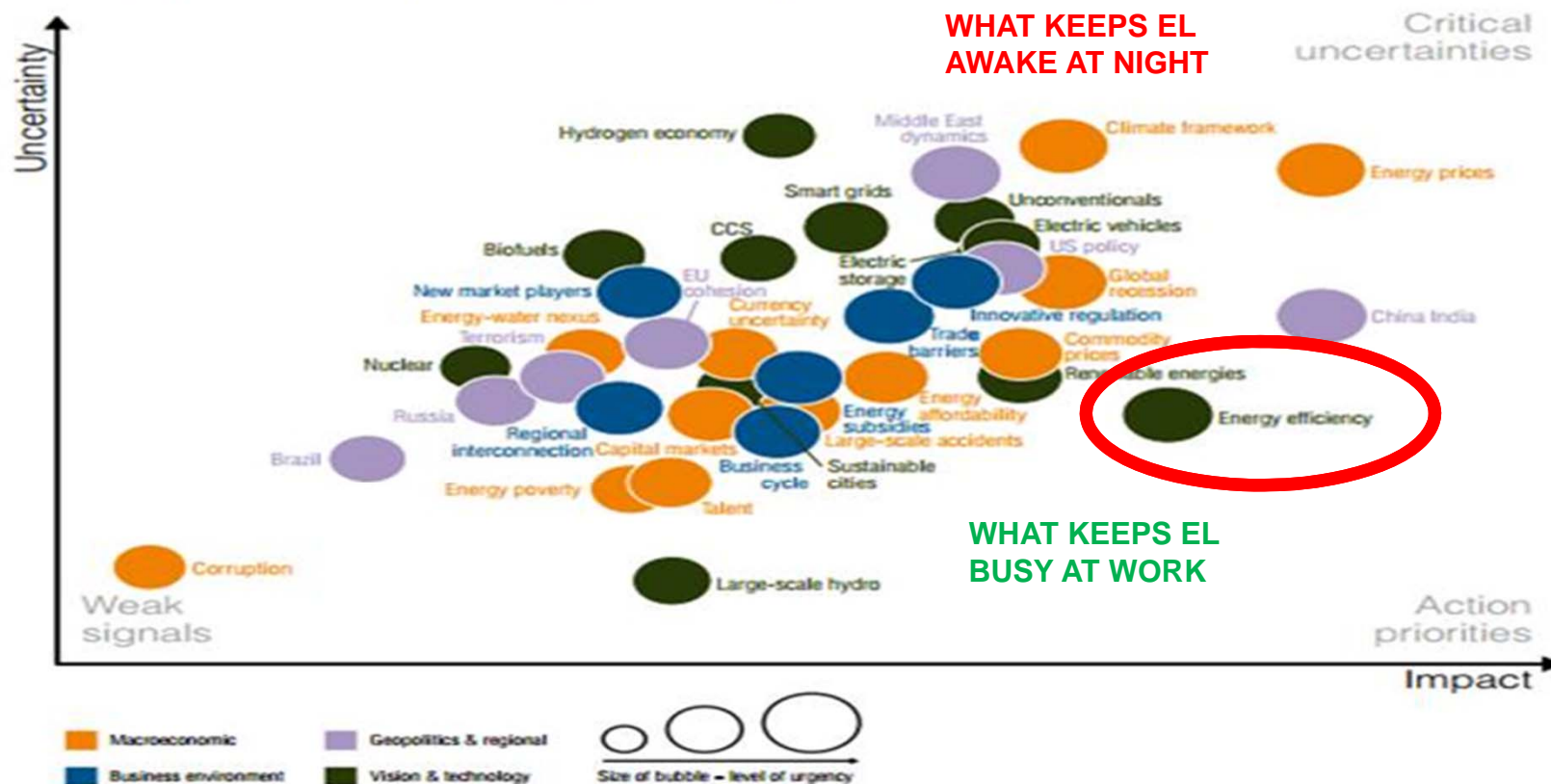
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# Are we there yet? The NZ Energy Issues Map

## NEW ZEALAND

Figure 31  
WEC's 2014 World Energy Issues Monitor: New Zealand



# Energy Efficiency – A pathway to Paris COP21?



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Thank you.  
Questions?

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