

Better data to improve the strength of Energy Indicators

A national perspective from New Zealand's recent experiences

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Some facts about New Zealand

Natural Environment:

- Area: 267,707 km²
- Exclusive Economic Zone: 4.4 million km²
- Surrounded by ocean
 - Nearest neighbour 3hrs flight away
- Mountainous
- High rainfall
- Windy



Some facts about New Zealand

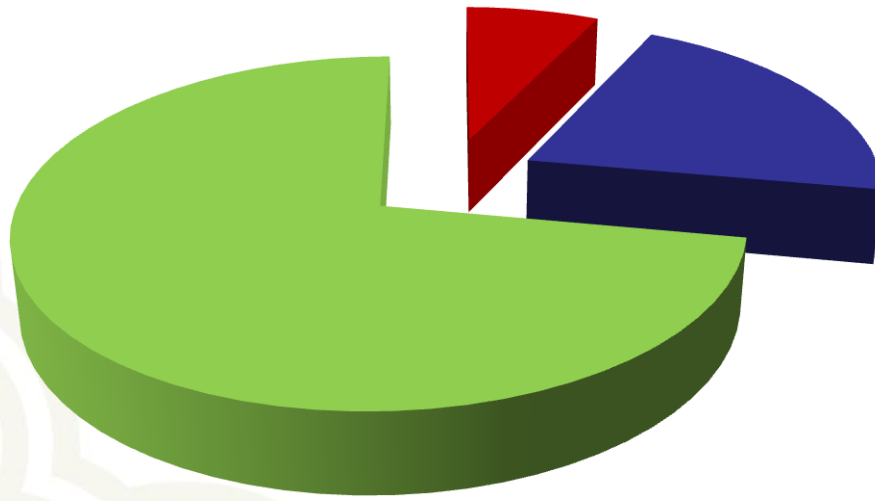
People & Economy:

- 4.4 million people
- 6.2 million dairy cattle
- 31.1 million sheep
- Importance of primary exports and tourism
- Importance of 'clean green' image
- Much industry involved in processing

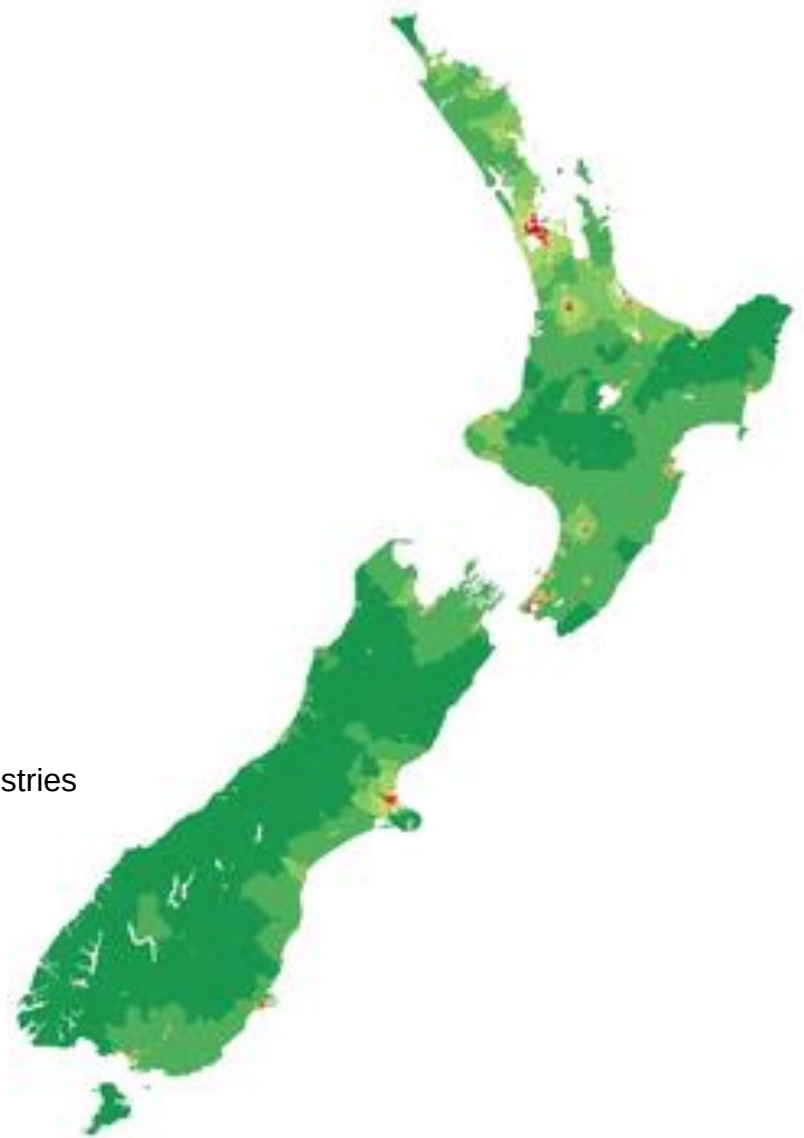


Some facts about New Zealand

GDP by Sector:



■ Primary industries ■ Goods producing industries ■ Services industries



Some facts about New Zealand

Implications for energy:

- Fairly unique amongst developed countries:
 - Large distance from markets
 - = International transport costs & security of energy supply important
 - Very large EEZ
 - = potential for resources, wave power
 - Small dispersed human population
 - = High car ownership, low public transport usage
 - High proportion of energy from renewables
 - = 38% of primary energy, 74% for electricity
 - Predominance of primary industries
 - = Agriculture responsible for almost half of GHG emissions

New Zealand's Energy Strategy

Goal: to make the most of our energy potential

Priorities	Areas of Focus
Diverse resource development	<ul style="list-style-type: none">• Embrace new energy technologies• Develop petroleum and mineral fuel resources• Develop renewable energy resources
Environmental responsibility	<ul style="list-style-type: none">• Best practice environmental management for energy projects• Reduce energy-related greenhouse gas emissions
Efficient use of energy	<ul style="list-style-type: none">• Better consumer information to inform energy choices• Enhance business competitiveness through energy efficiency• An energy efficient transport system• Warm, dry, energy efficient homes
Secure and affordable energy	<ul style="list-style-type: none">• Competitive energy markets• Oil security and transport• Reliable electricity supply

Background: Energy Statistics

- Before 2006....
- Mostly compiled & published under legislative power
- Large number of users (govt. & research organisations)
- Need for good data increasing, but quality uneven:
 - excellent coverage of supply, poor coverage of use
- Asymmetrical nature of populations
 - No. of suppliers small, no. of users is extremely large
- So statistics available largely based on modelling & use outdated assumptions
- Reviews in 1983, 1996 & 2002 had highlighted gaps

A solution: Domain Planning

What are domain plans?

- An important part of coordinating development of official statistics
- Take a long term view, instead of reacting to issues
- Develop a coordinated plan, instead of tackling issues on a piecemeal basis
- Provide a structured, systematic approach where statistics span several agencies or sectors
- All agencies cooperate, share responsibility & agree priorities, instead of taking single agency view

Domain Planning

Key areas for domain plans to cover:

- Identify key policy and research questions
- Identify data sources and information needed to answer these questions
- Identify problems limiting ability to get information needed
- Think strategically (at least 5 years ahead)
- Identify key priorities and how to address them

Energy Domain Plan

Why an energy domain plan?

- Energy policy of growing importance internationally:
 - Resource constraints impacting on energy supply
 - Emissions and climate change
- Additional New Zealand specific issues:
 - Changes in energy sector
 - Different industry profile to other developed countries
 - Environmental & overseas trade perceptions
- Gaps highlighted in previous reviews particularly for energy uses

Energy Domain Plan

Domain Plan for Energy Sector 2006–2016

- Analysed energy information sources in NZ
- Proposed initiatives to cover significant gaps
- Outlined statistical priorities for the energy sector and a strategy for addressing these to 2016.
- Developed by:
 - Statistics NZ
 - Energy Efficiency and Conservation Authority (EECA)
 - Ministry of Economic Development (MED)
 - Ministry of Transport and other organisations.

Energy Domain Plan

Identified 12 enduring topics of importance:

- Security of energy supply
- Sustainable energy sources
- Capacity to innovate and adopt new technologies
- Effective market conditions supplying energy services
- Accessible and affordable energy services
- Energy conservation and efficiency
- Environmental stewardship in energy supply, distribution and use
- Local government need for energy statistics
- Industry energy trends and use of statistics
- Household energy trends and use of statistics
- Transport energy needs, conservation and efficiency
- International comparisons

Energy Domain Plan

Priorities for development	Summary of Domain Plan Decisions for Enduring Topics	Security of energy supply	Sustainable energy sources	Capacity to innovate and adopt new technologies	Effective market conditions supplying energy services	Accessible and affordable energy services	Energy conservation and efficiency	Environmental stewardship in energy supply, distribution & use	Local government need for energy statistics	Industry energy trends and use of statistics	Household energy trends and use of statistics	Transport energy needs, conservation & efficiency	International comparisons
	Priority ranking for enhancement	10	12	7	11	9	4	6	5	2	3	1	8
	Degree to which topic area needs currently met	4	4	2	4	3	1	3	1	1	1	1	2
		Ability for proposed developments to inform topic area(s)											
	1. Rolling end-user surveys						H	H	M	H	H	H	H
	2. Enhance DPFI Survey						M	M		M		H	M
	3. Enhance data integration with sectorial projects						M	M		H	H	H	M
	4. Develop Energy Database	L	L			M	L	L		M	M	M	L
	5. Input/Output Tables						L	L		M	M	M	
	6. Develop Transport Energy Database						L	L				M	M
	7. Enhance electricity demand data									M	M		
	8. Classifications alignment									L	L	L	M
	Degree to which topic area needs would be met	4	5	2	4	3	4	4	2	4	4	4	4

Energy Use Surveys

Rationale:

- Offered most improvement to most topics
- Important to shed more light on modelled data:
 - Especially liquid fuel use in agriculture
 - ‘Unallocated’ and transport fuel use in energy balances
- Advantages of a statistical survey based on a national business register:
 - Comprehensive coverage
 - Can split by industry, type of activity
 - Allows for comparisons with other statistics (GDP etc.)

Energy Use Surveys

Design considerations:

- Level of breakdown required for outputs
 - Industry & energy type *versus* load & confidentiality
- Feasibility of gathering different types of information
 - Postal self-complete questionnaire
 - Data availability
 - Different nature of activities across industries
- Some specific issues:
 - Little prior data to inform sample design
 - Avoid double counting (contractors, investors, share milkers)
 - Separating business & personal energy uses
 - Joint ventures (off shore oil platforms)
 - Non-energy uses

Energy Use Surveys

Process:

- Joint agency development process
 - Strong joint governance group for direction (EDAC)
- Strong project management focus
 - Moved to a team experienced in new developments
- Thorough cognitive testing
 - Refined through multiple rounds
- Existing generic processing system
 - Flexible, user configurable, metadata driven
- Suite of surveys covering all industries across the New Zealand economy over 3 years (not households)

Energy Use Surveys

Results: 1) Full detailed results available from:

http://www.stats.govt.nz/browse_for_stats/industry_sectors/Energy.aspx

Energy Use Surveys

Results: 2) Energy Use by Fuel Type

Sector Use by Fuel Type (PJ)	Primary	Industrial & trade	Services
Electricity	8.6	65.1	29.2
Petrol	4.4	13.9	12.5
Diesel	21.3	67.2	9.4
Natural gas	3.0	33.1	5.3
Other petroleum products	3.2	27.2	1.3
Other	1.8	80.2	6.3
TOTAL	42.3	286.7	63.9

Energy Use Surveys

Results: 3) End uses for petrol & diesel

Petrol end uses (Percent of total)	Primary	Industrial & trade	Services
On-road	50	95	93
Off-road	44	2	5
Other	6	3	2
TOTAL	100	100	100

Diesel end uses (Percent of total)	Primary	Industrial & trade	Services
On-road	26	77	67
Off-road	57	14	22
Other	17	9	11
TOTAL	100	100	100

Energy Use Surveys

Results: 4) Energy saving initiatives

Energy saving initiatives (Percent of businesses)	Primary	Industrial & trade	Services
Monitoring use or cost	44	57	41
Setting targets	10	14	9
Information for staff	19	30	23
Signs or stickers	8	-	-
Initiatives recognition	12	-	-
Energy policy	9	15	11
Assigned responsibility	7	17	13
Energy audits	-	8	6
Bench-marking use	-	9	6
Energy management budget	-	9	10
Installing energy saving technologies	-	35	30
Other	1	2	2
No energy initiatives	46	33	46

Energy Use Surveys

Results: 5) Potential areas for energy savings

Where less electricity could be used (Percent of businesses)	Primary	Where less energy could be used (Percent of businesses)	Industrial & trade	Services
Electric motor power	12	Space heating	10	19
Water heating	20	Water heating	2	4
Refrigeration	11	Process heat	7	2
Lighting	23	Refrigeration	3	2
Other	1	Electronics, appliances, lighting	13	16
No further savings possible	51	Heavy machinery	6	1
No electricity used	16	Transport	26	12
		Other	2	2
		No further savings possible	30	43

Reflections

The +’s:

- Domain planning process to agree priorities
- Cross agency cooperation
- Successful survey development quicker, cheaper than anticipated
- Now more information to inform energy analysts

The –’s:

- Domain planning time consuming & resource intensive - how to refresh, update over time?
- Can’t always provide detail ideally required
- Household use still a gap

To find out more

Statistics New Zealand

http://www.stats.govt.nz/browse_for_stats/industry_sectors/Energy.aspx

Ministry of Economic Development

<http://www.med.govt.nz/sectors-industries/energy/energy-modelling>

Energy Efficiency and Conversation Authority

<http://www.eeca.govt.nz/>