

# CRL Energy Ltd

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Chief Executive CRL Energy  
Chairman Energy Federation of New Zealand  
World Energy Council



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# CRL Energy Ltd New Zealand

- What is CRL Energy Ltd all about?
- With whom we work and on what.
- How it all gets done.
- How to get hold of us!



# CRL Energy Ltd New Zealand

- **CRL Energy Ltd** is an energy and environmental research, consulting and testing company, with specialist knowledge in all aspects of the energy chain and a strong testing and analytical capability.
- We offer research, consultancy and laboratory testing services to the energy, resources, and environmental industry sectors.
- We have specialist knowledge in new energy technologies such as hydrogen and biomass conversion, a strong history in all aspects of fossil fuel energy, particularly coal-related research.
- Our Resources Group is involved in the sustainable development of coal, coal seam gas and minerals
- CRL Energy is a Telarc Registered Supplier to ISO9001. Our IANZ accredited chemical laboratories, and energy test centres provide a solid practical basis for all our work.



# CRL Energy Ltd New Zealand

- CRL Energy Limited is owned by:
  - Coal Association of New Zealand (50%)
  - Genesis Energy (50%)
- We have several research contracts with the Foundation for Research, Science and Technology
- Key customers
  - FRST , Tech NZ, MED, MfE , PCE
  - CANZ and NZ mining companies
  - NZ Energy companies
  - Major Energy Users
  - EFNZ and World Energy Council
  - International Companies and organisations

# CRL Energy Ltd New Zealand

## ➤ Staff of 40+

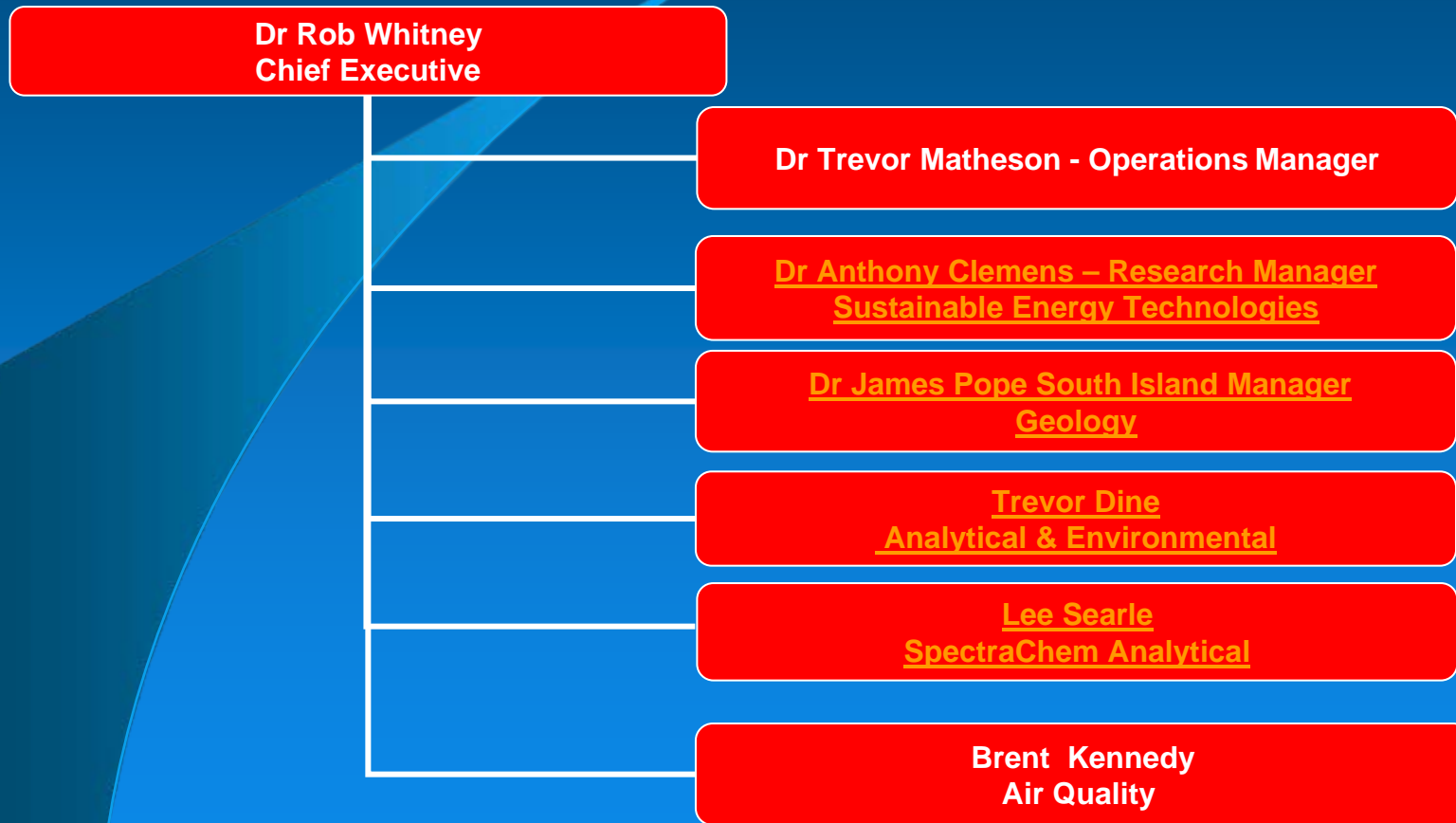
- 10 PhDs
- 11 post graduates
- 11 graduates and postgraduates
- 7 technical qualifications

## ➤ Offices at:

- Lower Hutt- Main laboratories, gasifier, combustion testing
- Christchurch- Resources Group, Lyttelton laboratory
- Hamilton- Air Emissions team at Ruakura
- Greymouth- Coal and water laboratory



# Organisational Structure



# Sustainable Energy Technologies

- Technical Literature Reviews
- Flow Sheet Development
- Economic Viability Studies
- Technical Viability Studies
- Experimental Programme Design and Execution
- Pilot Plant Design Construction and Operation
- Fundamental Modelling
- Systems Modelling
- Materials Testing
- Environmental Impact Studies
- Organising Workshops / Conference
- Project cost control - Acquisition of Co-Funding



# Sustainable Energy Technologies (Hardware)

- Fluidised Bed Gasifier (one tonne per day)
- Gas Clean up and Conditioning (Membrane) Test Facility
- Syngas Desulphurisation unit
- Fix Bed Catalytic Reactor system
- Combustion Test Facility
- Stack gas desulphurisation unit
- Corrosion Rig
- Pelletizer
- Briquetter
- Bio-pyrolyser
- EnergyScape

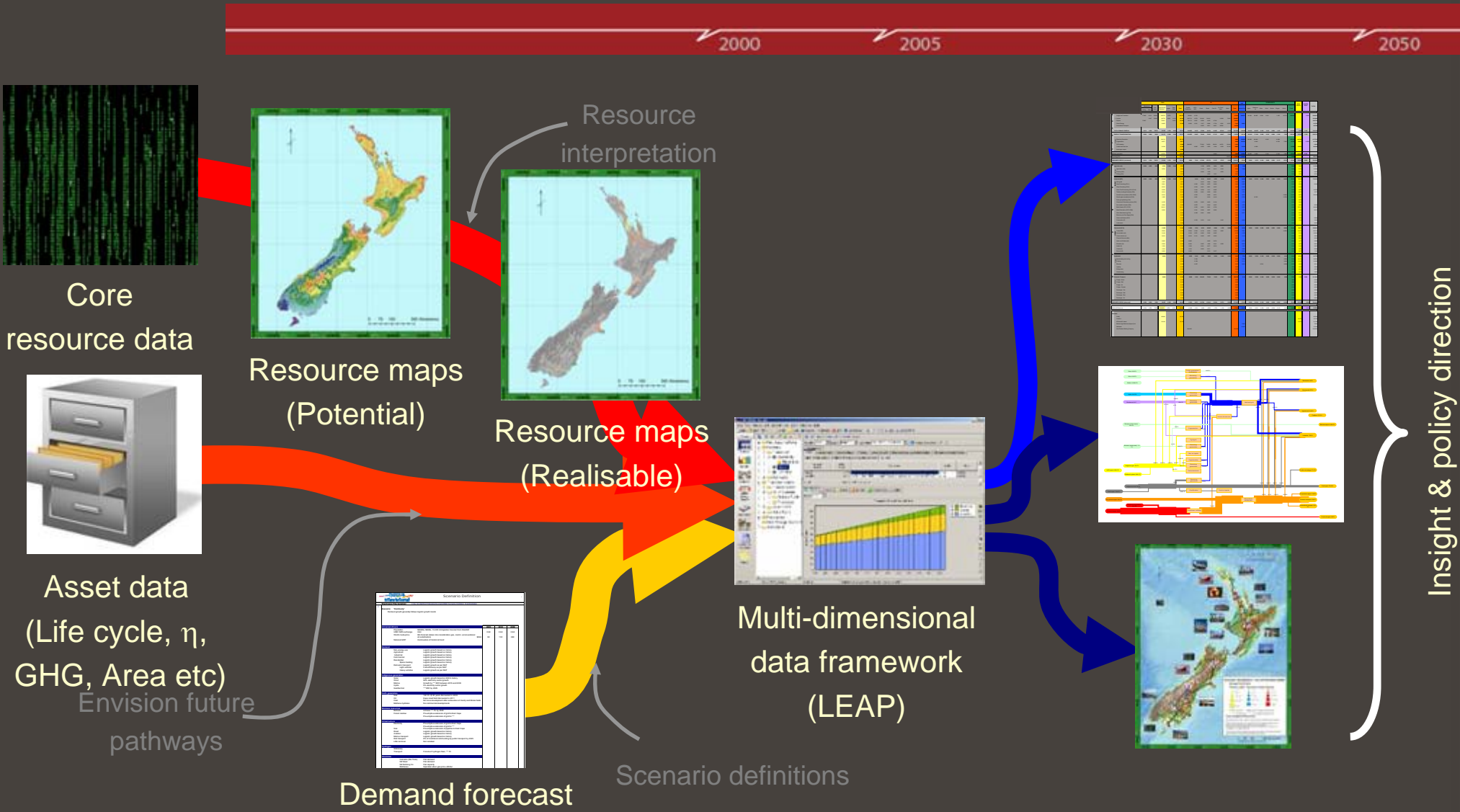


# EnergyScape

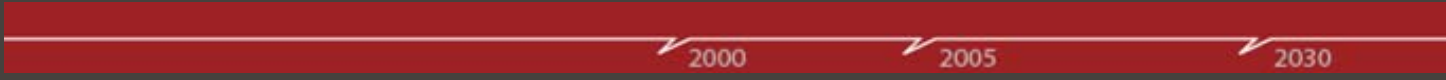
2000 2005 2030 2050

- EnergyScape is a new tool to help people understand and visualise the flow of energy in New Zealand.
- The EnergyScape project explores what New Zealand's energy systems might look like in 2030 and 2050.
- The EnergyScape platform, brings together data on production, distribution and conversion of energy and consumption of electricity, petroleum, gas etc into a tool which connects the different systems to each other and visualises the result (LEAP).
- EnergyScape provides an accessible, transparent and robust platform for evaluating planning options and future energy scenarios

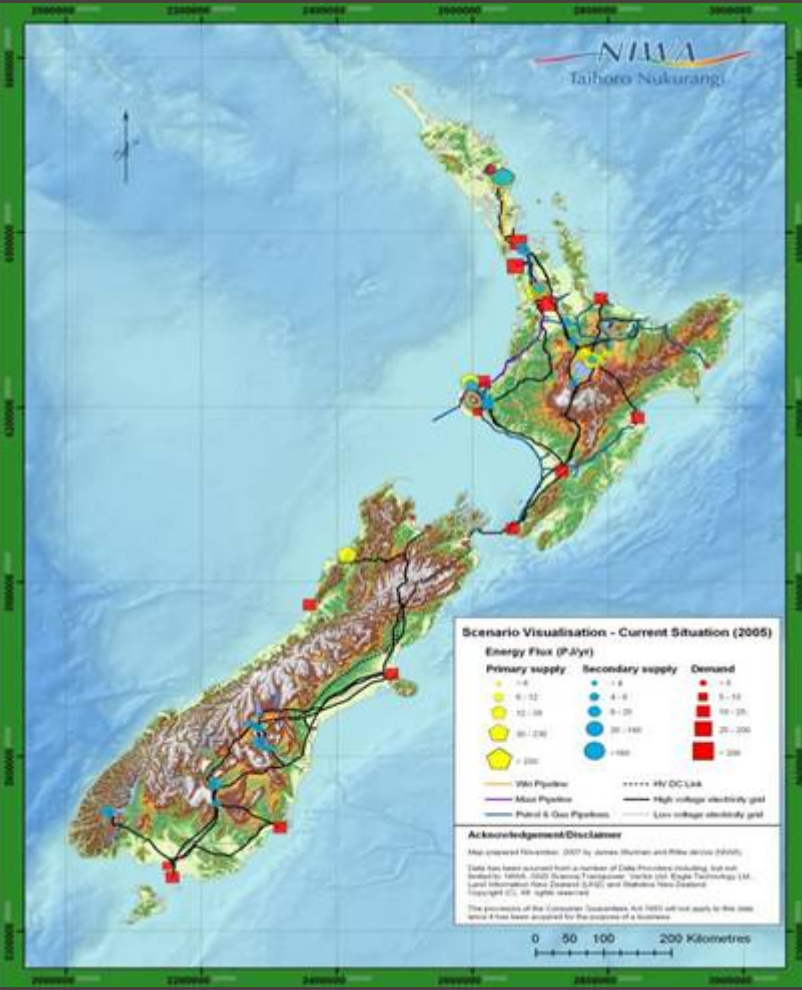
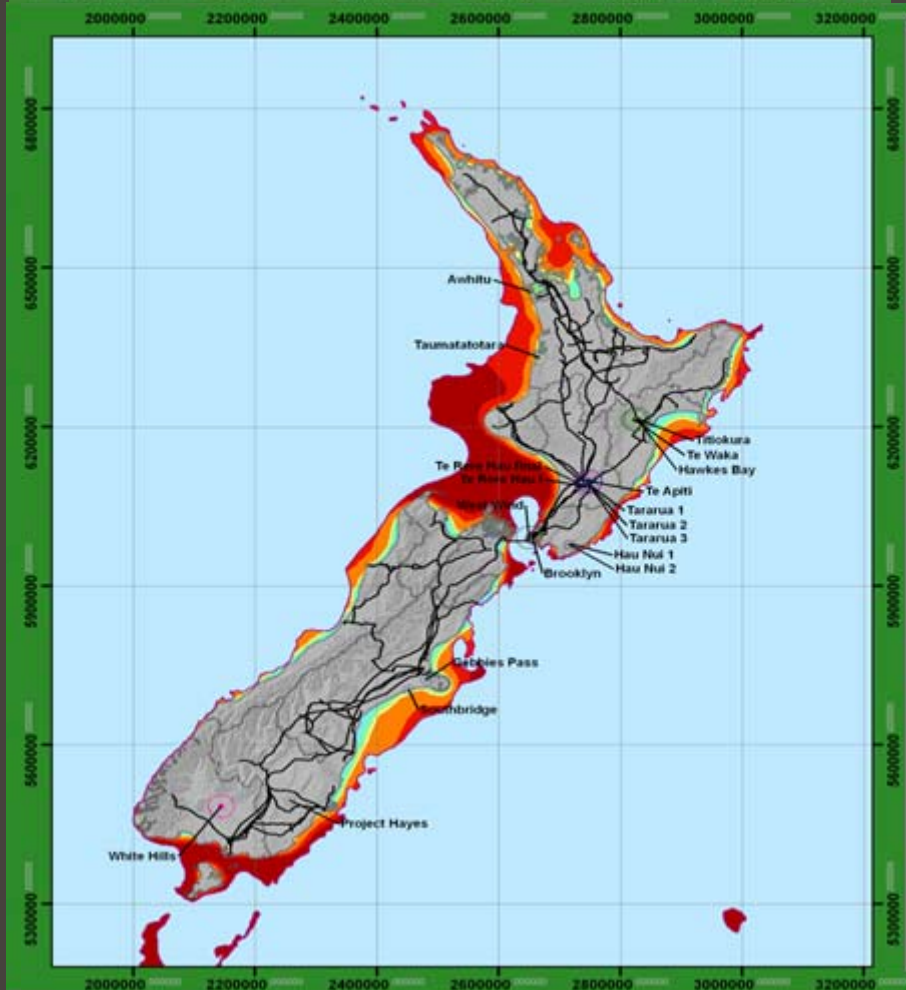
# EnergyScape framework



# Some Outputs...



Bottom up risks assessment of a base case potential





<http://www.crl.co.nz>



# CRL Energy Ltd - Contact Details

## <http://www.crl.co.nz/>

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# Analytical & Environmental (Capabilities)

## ➤ Laboratory Services

- Comprehensive analysis of solid fuels (IANZ accredited)
- Froth flotation
- Float/sink analysis
- Acid Rock Drainage Analysis
- Water and wastewater analysis (IANZ accredited)

## ➤ Air Quality

- Stack emissions testing (IANZ accredited)
- Total Particulate & PM10
- SO<sub>x</sub>, NO<sub>x</sub>, halides, metals and more.

## ➤ Ambient Monitoring

- Total Particulate & PM10 using High Volume samplers
- Total Particulate and PM10 using Beta Attenuation Monitor
- Sulphur dioxide
- Dust Deposition monitoring

# Analytical & Environmental (Hardware)

- Wheel Stand
- Drum Tumbler
- Froth Flotation Unit (Denver Cell)
- Float / Sink Unit
- Calorific Value Instrument
- Gas Combustion Analysers
- Gas Chromatographs
- Carbon Sulphur Analyser
- Atomic Absorption Spectrometer
- Ambient Sulphur Dioxide Monitoring Station
- High Volume Sampler (PM10)
- Drop / Shatter Test



# SpectraChem Analytical (SCA) (Capabilities)

- Industrial, Geological and Environmental Materials Analysis Service
  - Determination of major and trace elements in solid and liquid materials
  - Detection and characterisation of crystalline compounds
- SCA is ISO 17025 Accredited

# SpectraChem Analytical (Hardware)

- Three Wavelength dispersive X-Ray Fluorescent spectrometer (XRF)
- X-Ray Diffraction (XRD)



# Geology (Capabilities)

## ➤ Exploration services:

- Resource/reserve calculations
- Field mapping and sampling
- Determination of depositional environments and effects on coal quality
- Data validation and database creation (incl. ArcView)
- Geological model development (incl. SURPAC)
- Exploration programme management and development
- Drill hole target identification and Supervision
- Core logging and sampling
- Wireline log interpretation
- Coal seam gas sample collection and analysis
- Coal seam gas modeling (COMET3)
- Coal petrology and geochemistry
- Hydrogeology
- Report preparation for lodgment with Crown Minerals



# Geology (Capabilities)

## ➤ Environmental services:

- Environmental impact assessment
- Site assessment
- Development of monitoring plans
- Geochemistry
- Onsite monitoring
- Treatment system design
- Site remediation
- AMD research, a full range of static (ABA, NAG and sequential NAG) and kinetic AMD tests are available
- Design of sampling programme and Collection of samples
- On-site chemical testing
- On-site data loggers maintenance
- Prepare compliance reports for Regional Councils
- Preparation of resource consents
- Assessment and mitigation of mine drainage issues



# Geology (Hardware)

- Ring Mill normal and modified for CSG decommissioning
- Jaw Crusher
- Ovens and Ashing Furnace
- Leach Columns for determining reactions,
- Tailored AMD trial systems
- Temperature controlled room for CSG canisters
- Full workshop for AMD small to medium scale trial and CSG equipment design, manufacture and assembly
- CSG Canisters

