

New Zealand's Geothermal Renaissance

the key to our renewable future



contact



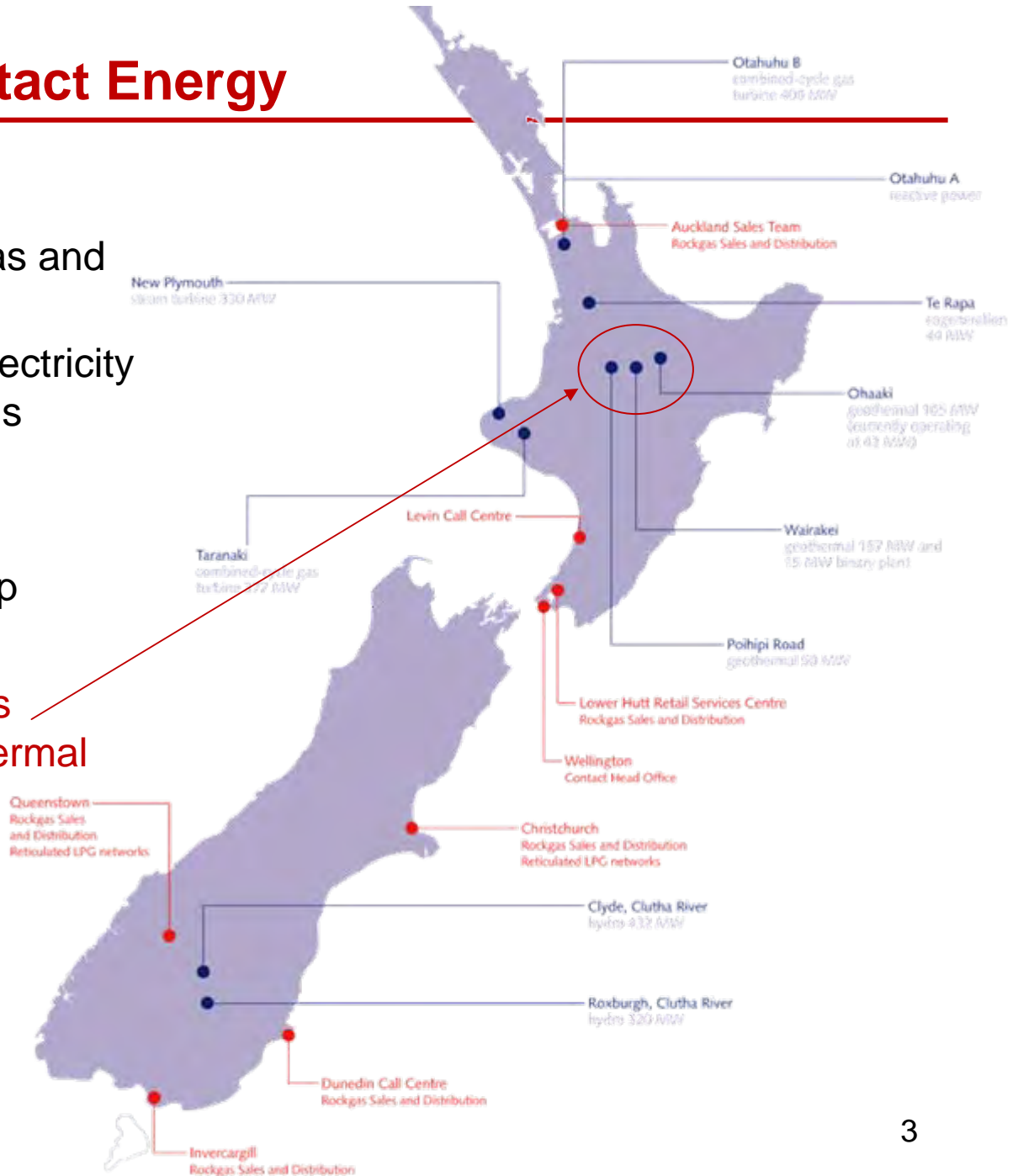
Roadmap

- Context
 - Contact
 - New Zealand's place on the geothermal stage
- The geothermal renaissance underway
 - the New Zealand Energy Strategy and climate change
 - Contact's geothermal plans
- Full steam ahead
 - Critical success factors
 - Reclaiming centre stage



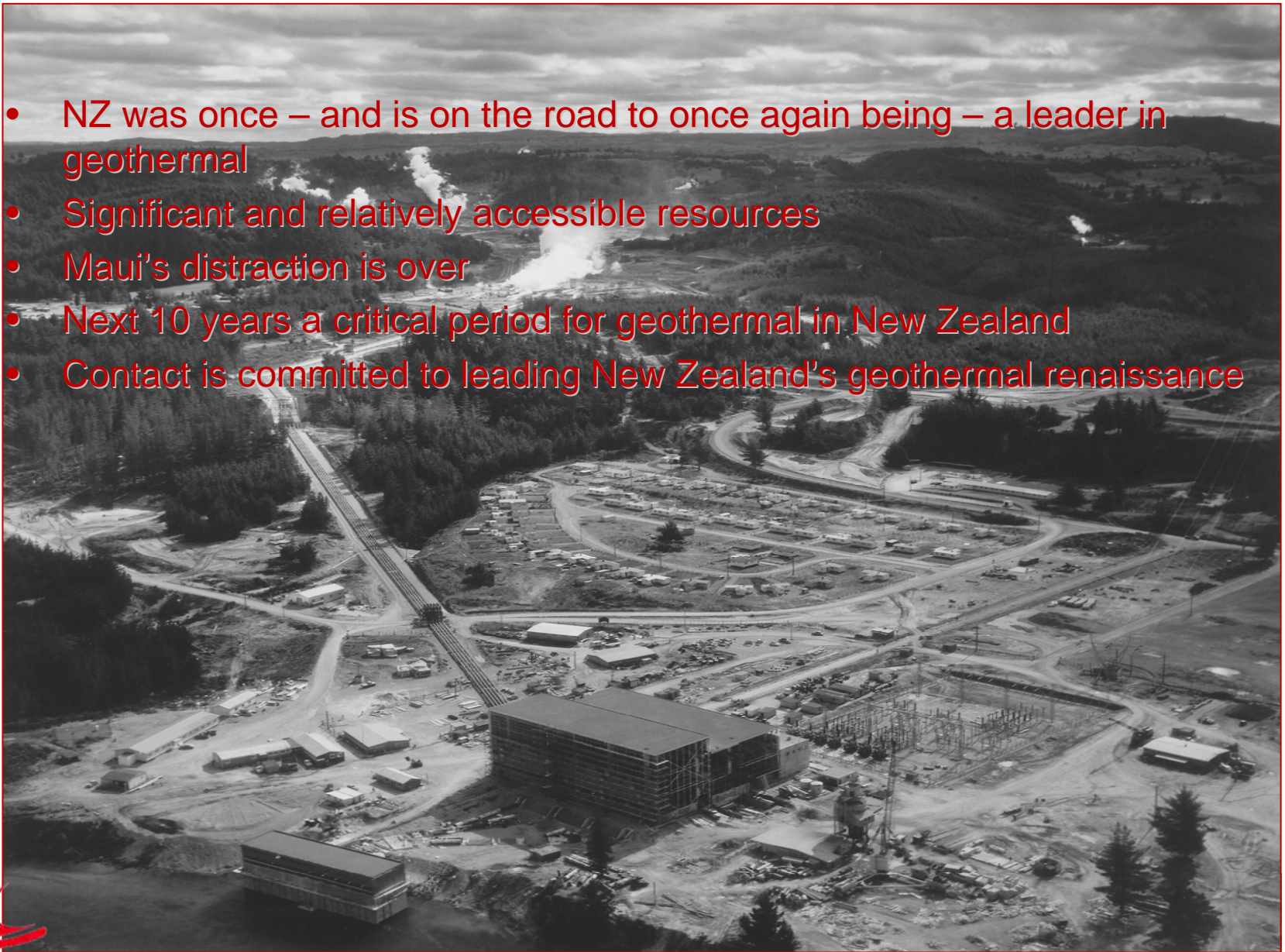
Snapshot of Contact Energy

- 635,000 electricity, gas and LPG customers
- 28 per cent of NZ's electricity from 10 power stations
- 1,000 staff
- 85,000 shareholders
- \$5.2 billion market cap
- **Generates 5% of NZ's electricity from geothermal**



New Zealand's place on the geothermal stage

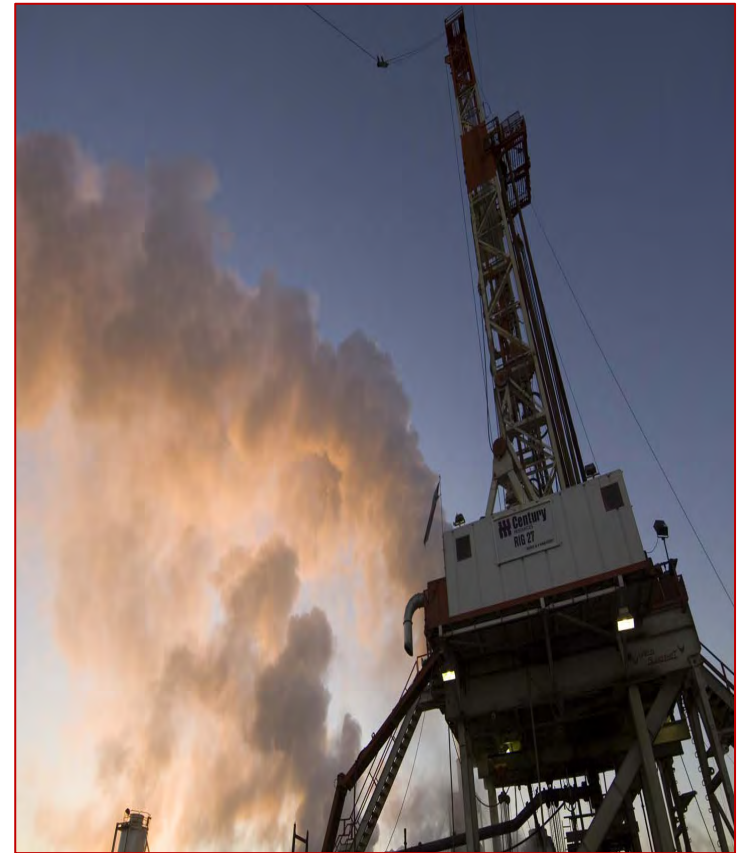
- NZ was once – and is on the road to once again being – a leader in geothermal
- Significant and relatively accessible resources
- Maui's distraction is over
- Next 10 years a critical period for geothermal in New Zealand
- Contact is committed to leading New Zealand's geothermal renaissance



Wairakei circa 1950s

Contact's commitment to geothermal

- Contact's number 1 investment priority
 - Not just new power stations
 - But also repowering existing plant
- Activity over the last 12 months:
 - Poihipi operated at full capacity (50 MW)
 - Ohaaki exceeded 60 MW: 7 new production wells, 2 re-injection wells, a number of work-overs
 - Wairakei: 4 new production wells, 2 re-injection wells, work-overs continue
- Contact's drilling programme is only increasing
- Contact's geothermal generation is expected to double in 5 years



Ohaaki exemplifies Contact's focus on geothermal

- Opened in late 80's
- Capacity: 108 MW
- Steamfield decline and limited investment
- Reduced to 21 MW by 2006
- Extensive drilling program

- Now at 60 MW
- Very attractive economics



Renaissance drivers

- Energy demand continues to increase
- Maui
- Climate change
- Economics

Fuel Type	Key issues	LRMC (c/kWh)
Geothermal	Base load, very low carbon intensity, significant potential remains	5 – 6
Wind	Good resources, consenting challenges, system volatility will need to be managed differently	8.5 – 10
Hydro	Untapped cost effective opportunities remain	8.5 – 10
Gas	Efficient, base load, domestic resources unknown, carbon, discouraged by the New Zealand Energy Strategy	8 – 11
Tidal and wave	Emerging	~ 20



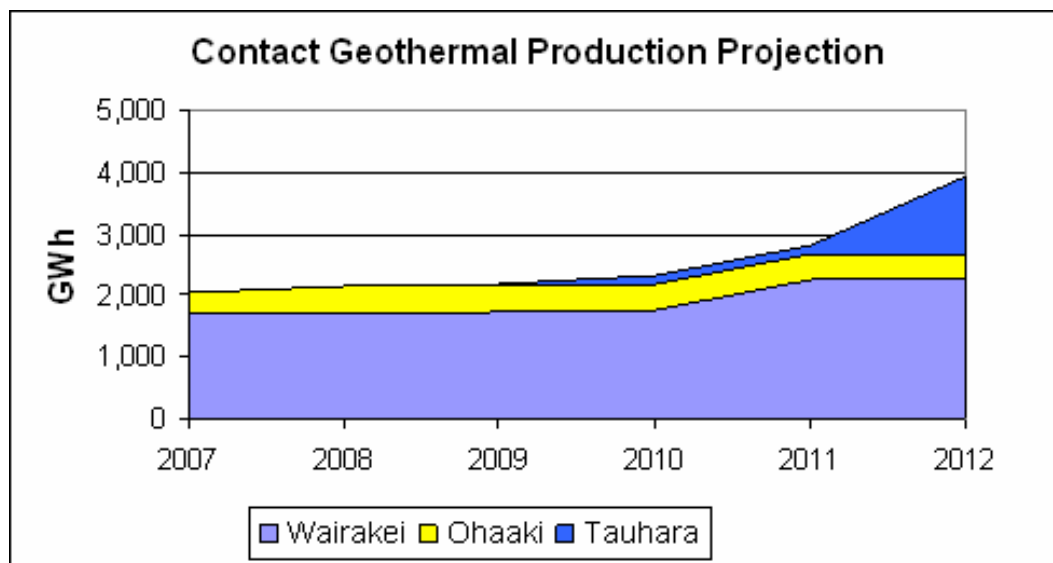
NZES and Emissions Trading

- The NZES sets out the future path for New Zealand's energy sector
 - Target of 90% renewables by 2025
 - Ambitious but achievable
 - A moratorium on new thermal power stations (?)
- Emissions trading scheme appears durable
 - Cross party political support
 - Electricity prices will rise – providing a boost for renewables
 - Key policy design issues continue to be worked through
- Geothermal development is critical
 - The 2025 target will only be achieved with significant new geothermal capacity
 - Very soon
 - The only baseload renewable energy that can displace thermal plant - critical to reducing thermal generation and ensuring security of supply

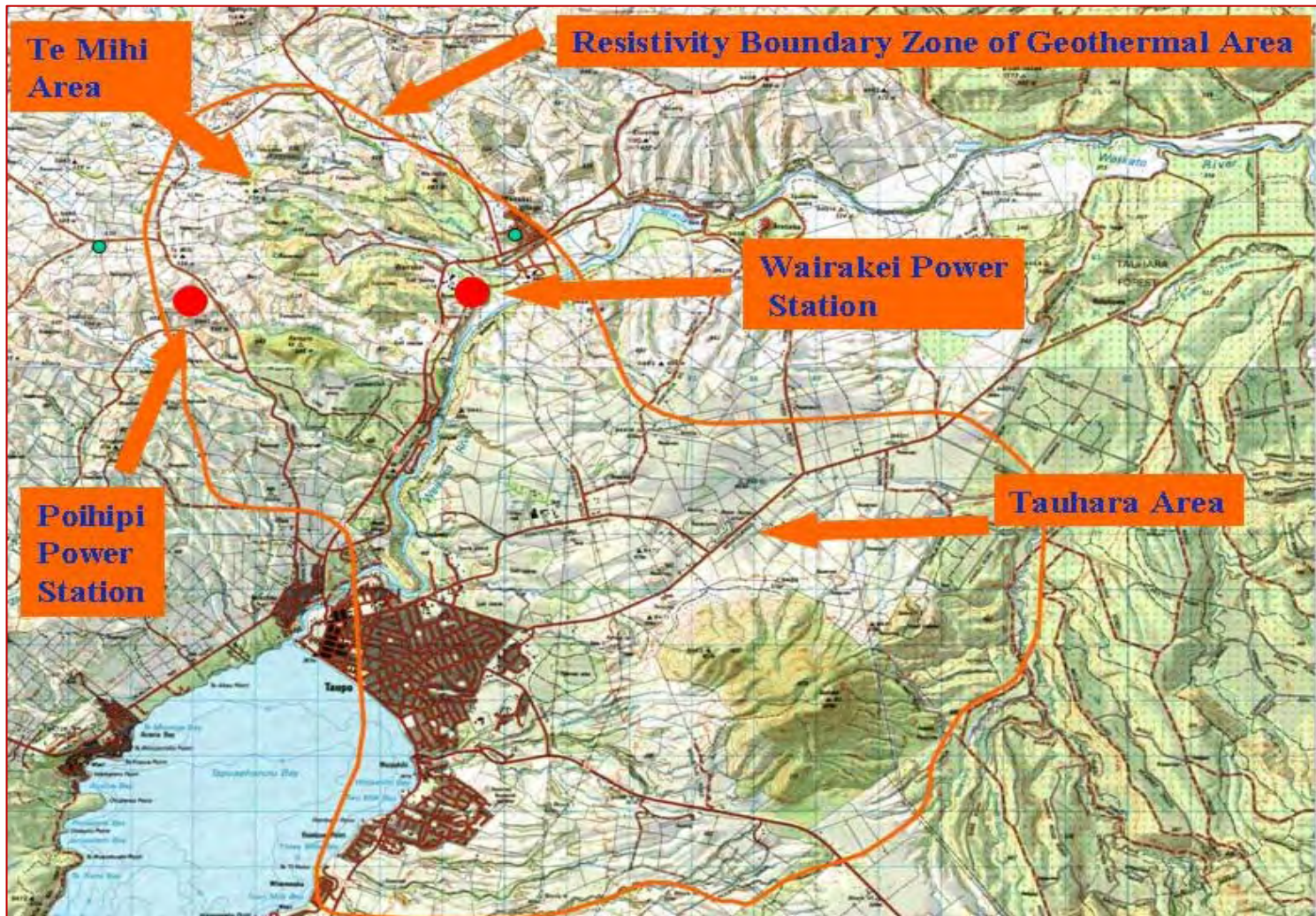


Contact's geothermal expansion plans

- Currently generating at 265 MW
- 470 MW of new capacity is in advanced stages of development
 - 225 MW Te Mihi project: After phasing out Wairakei – a net addition of 60 MW
 - 225 MW Tauhara project
 - 20 MW binary project at Centennial Drive using existing consents
- In excess of \$1 billion of new investment in geothermal



The Wairakei – Tauhara System



Te Mihi Project

- Consent applications filed in July
- Consents expected mid-2008
- 3 x 75 MW
- Will use steam from current Wairakei consents
- Re-injection will reduce discharges to river
- Construction in two stages - first 2 units on line in 2011



Tauhara Project

- Recent Tauhara appraisal wells have been very encouraging
- Consent applications will be filed mid-2008
- 3 x 75 MW
- On line in 2012



TH-12 vertical discharge

(433 t/hr at a well head pressure of 20.5 barg)



Centennial Drive Project

- A new project for Contact
- 20 MW binary plant
- Will utilise existing consents
- \$75 million of investment
- In operation by 2010

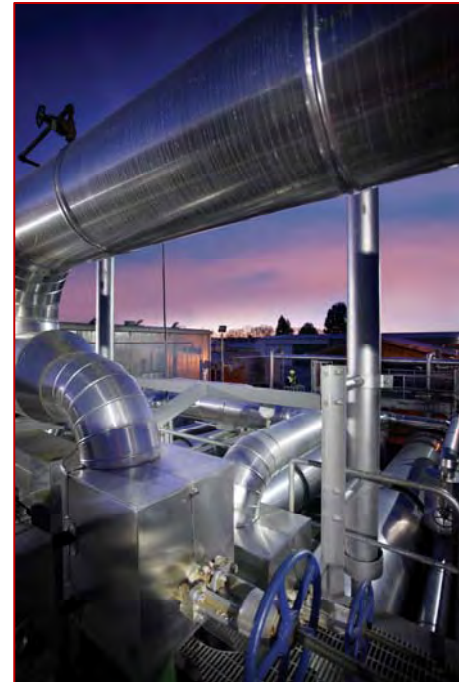


Wairakei's binary plant - similar to that planned for Centennial Drive in 2009



Geothermal direct heat

- Electricity generation is not the only opportunity - major scope for greater application of geothermal direct heat for industry
- Contact's 20 MW direct heat project at Tenon's Taupo wood processing plant has been an environmental and economic success story
- Replaced natural gas, cut Tenon's fuel bill (and carbon footprint) and led to significant efficiency gains
- Winner of environmental (EECA) and engineering (IPENZ) awards
- An economic edge for Taupo; could help attract other industry



Full steam ahead?

- The country needs low-carbon, base load and relatively inexpensive energy quickly
- New Zealand's significant geothermal resources are able to meet growth in demand
- Companies are prepared to invest
- What are the constraints?



The RMA, NZES and ETS

- Reconsenting of the existing Wairakei power station took more than 6 years and cost more than \$10 million
 - If consenting delays now affect new geothermal developments, then new coal or gas plants will be needed to ensure security of supply and New Zealand will not come close to meeting its 90% renewables target
- Policy has set the stage
 - Critical success lies in execution

Two examples:

- Consent processes
 - Project management resources
 - Decision making capacity
 - Prioritisation of consent applications
- A clear and durable framework for determining the market price for carbon
 - Investors will take carbon price risk
 - Provided there is regulatory certainty



Reclaiming centre stage

- Maui clearly impacted NZ's leadership position on the global geothermal stage
- NZ's geothermal renaissance is clearly underway
 - And has the potential to put NZ back in front
- “After an initial surge, then a quiet period, geothermal energy is again at the forefront of commercial and sustainable energy developments. Geothermal's time is now.”
(Brian White, Executive Officer NZGA)
- Geothermal is an area in which NZ has the resource and the skills to be a world leader
 - Unlike wind and gas-fired generation, NZ has core capabilities in geothermal development



Collaboration and capability

- A key question is how do we accomplish this?
 - Attracting people into the industry
 - Investment in capability
 - Advanced geothermal study and research
 - Supporting the NZ Geothermal Association
 - Building the NZ Geothermal Institute
 - Industry collaboration and skill sharing



Geothermal Institute Class of 1993



The Welcome page of the Geothermal Institute: Darajat



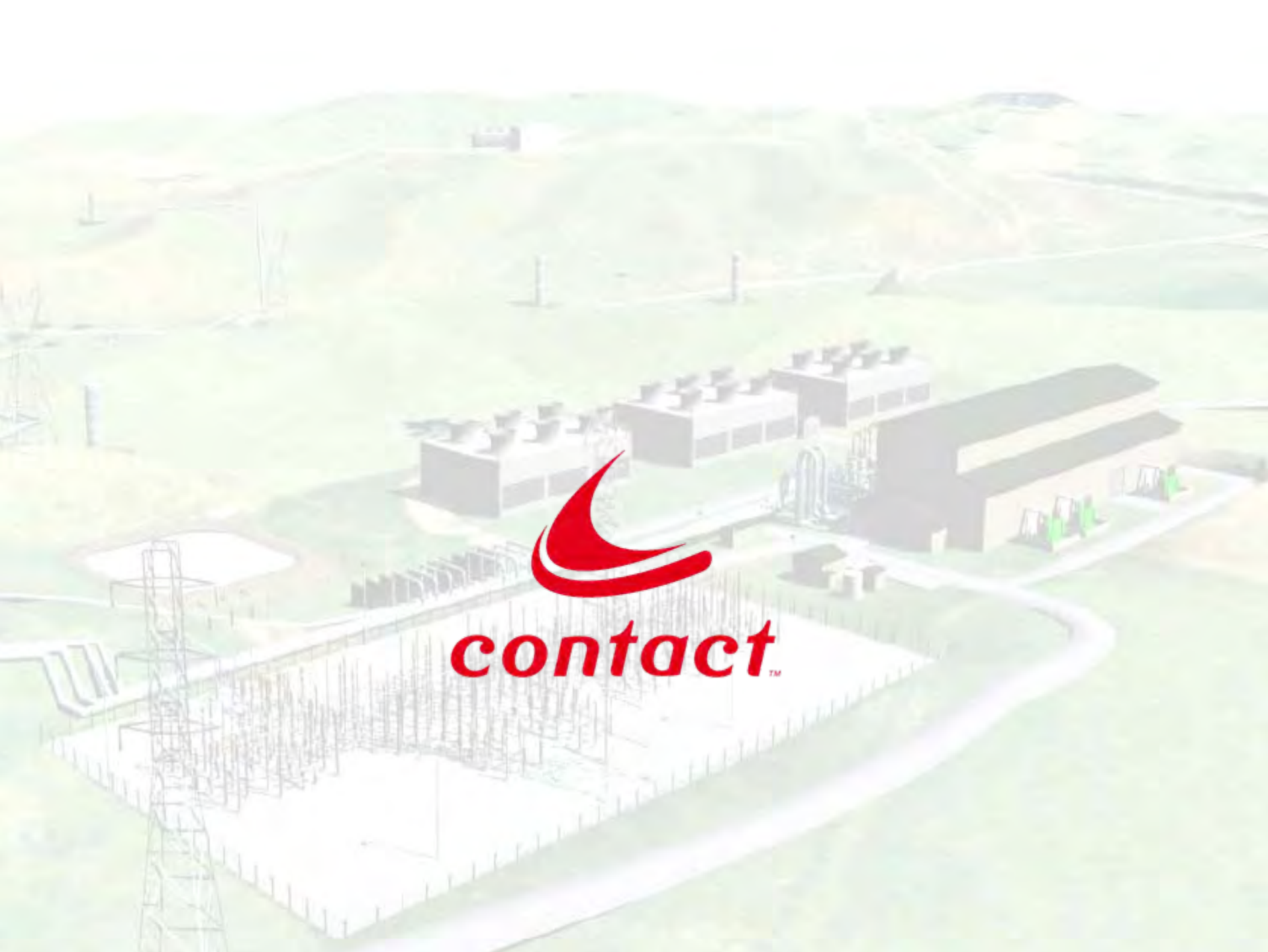
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Conclusion

- Geothermal has never been more important to New Zealand's future
- The New Zealand Energy Strategy goals of a secure electricity supply with 90% renewables are highly dependent on significant and rapid develop of New Zealand's geothermal resources
- If consenting processes support this, then New Zealand will see much greater development of geothermal energy over the next 20 years
- Contact is well advanced in planning major new geothermal investments
- New Zealand has a wealth of geothermal expertise, but the industry must now invest in capability to ensure we have the skills for major future development - and reclaim centre stage
- Partnerships and alliances between Government, regulatory authorities, geothermal developers and institutions such as the Geothermal Institute are vital if New Zealand is to benefit from the potential of our geothermal resource





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