

Marine Turbine Project Kaipara Harbour New Zealand

prepared for

AWATEA

Marine Energy Resource Consenting Workshop

2nd Annual Conference

Thursday 4 December 2008;

Lambton Room, Intercontinental Hotel,

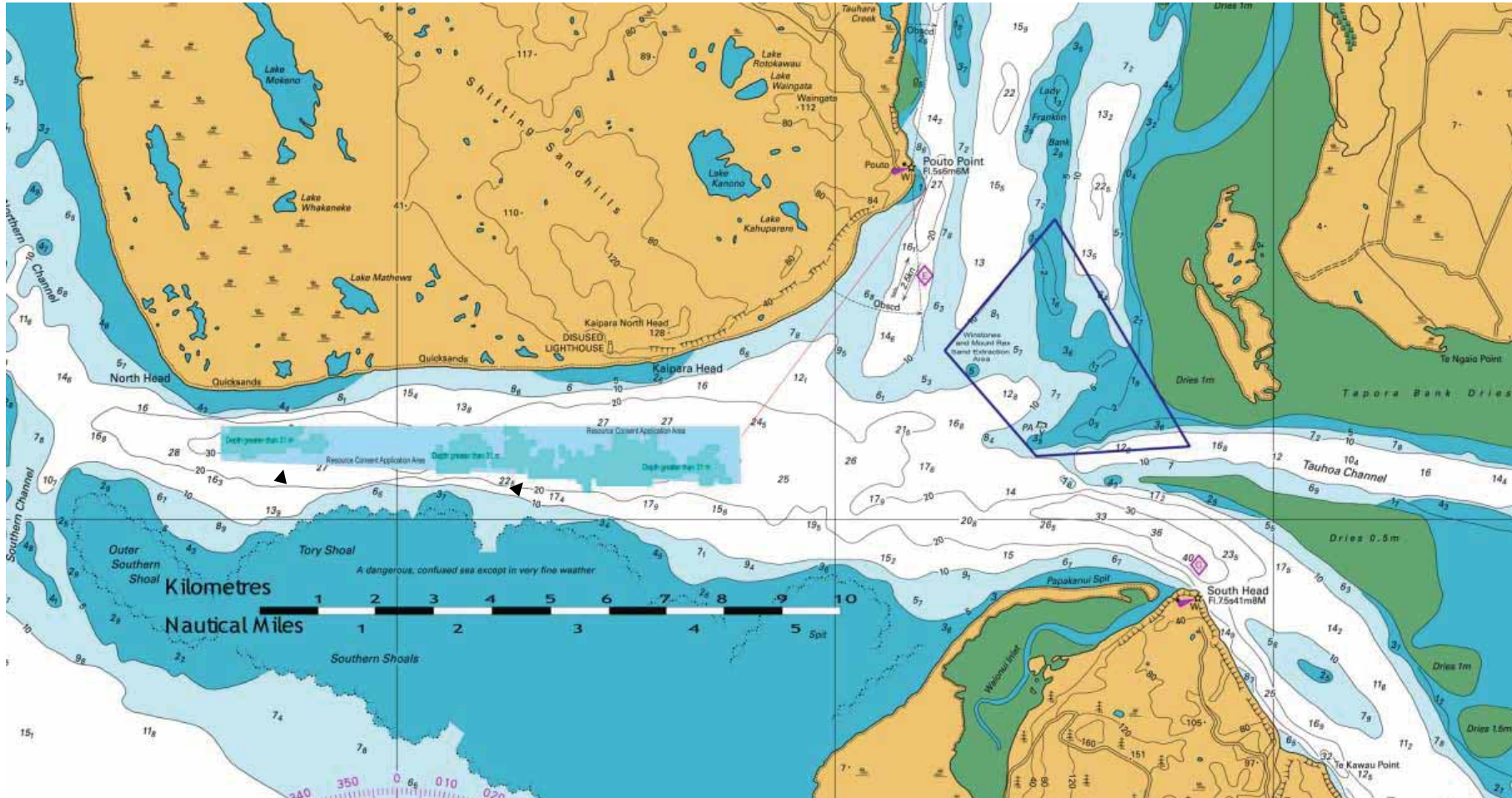
Wellington



Crest Resource Consent History

2005	Jul	Consultation commences
2006	Jul	First Applications lodged
	Aug	Receipt of First s92 request
2007	Jul	Revised application – reflects iwi issues inter alia
	Nov	Second s92 request
	Dec	Third s92 request
2008	May	Hearings
	Aug	Decision from NRC Committee
	Sep	Appeals
		Opposition - Iwi, Local Resident
		Conditions only – Crest, DOC
2009	Jun	Environment Court

Chart



Turbines to be placed below 31 metre contour
Mouth is about 6 kilometres wide

Aerial

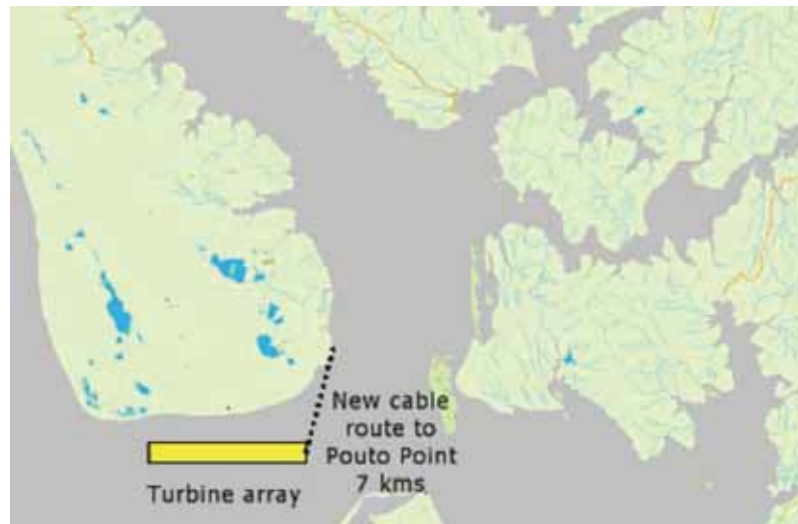


Bar protects the turbine area

Application changes

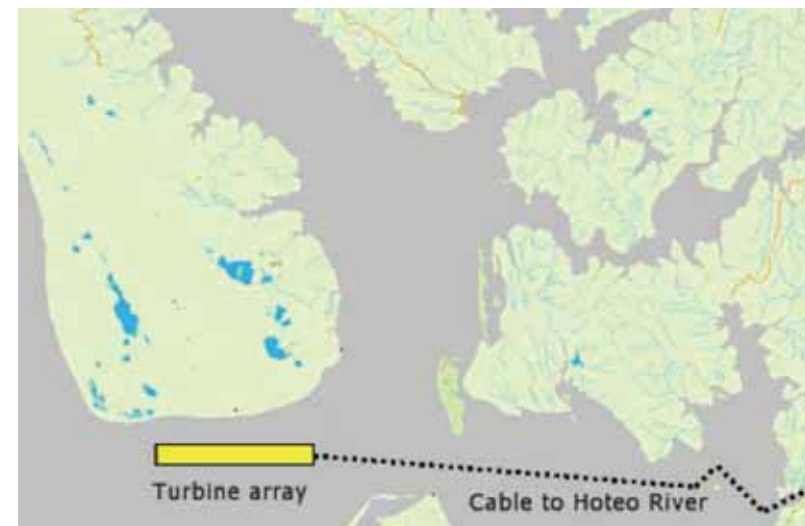
Revised

- Subsea cable 7 km to Pouto
- Turbines sited in 31m+ depth
- Located within 325 ha area
- Staged development - monitoring and approval before next stage
- NRC, Kaipara District, Northland Conservancy



Original

- Subsea cable 32 km to Hoteo running eastwards across the harbour
- Located within 1,225 ha area
- Concerns expressed by iwi and others
- In ARC, NRC, Rodney Jurisdictions
- In two DOC Conservancies



Why the Kaipara Harbour?

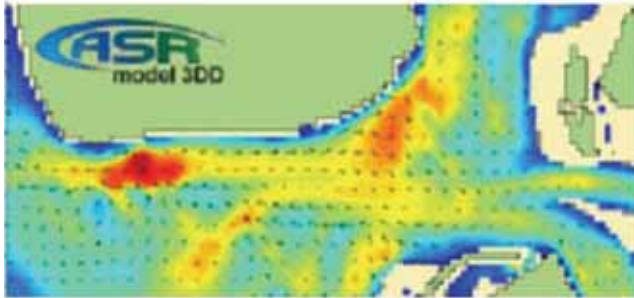
	Millions of cubic metres of water per day	Average current metres per second
Kaipara	1,990	1.12
Manukau	918	0.92
Hokianga	228	0.81
Whangarei	164	0.54
Raglan	46	0.59

- Very large harbour – ability to use part of the area
- Bar at entrance prevents use by deep draft vessels
- Strategically important location for Northland power supply
- Limited commercial activity

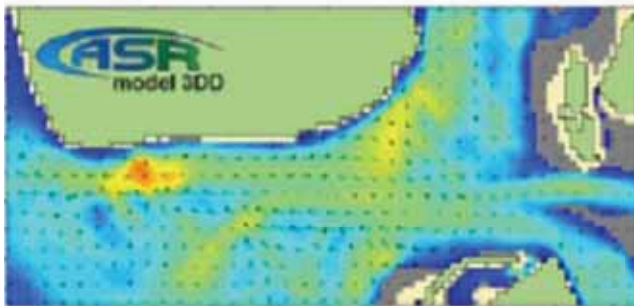
- Tidal range 2.68 m – 1.52 m
- Tidal compartment 1,990 million m³ - 1,130 million m³
- Surface area total 947 km², perimeter 612 km
- Swells typically 1.5 to 2.5 m in height from SW and W

Currents

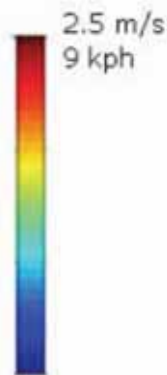
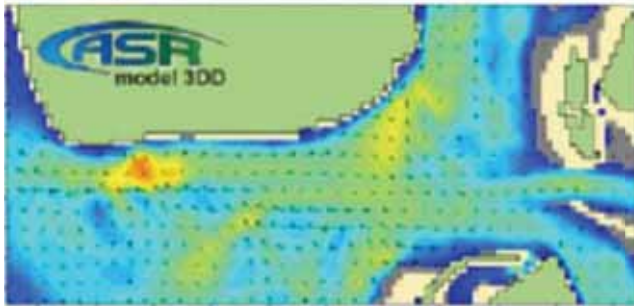
Spring tide



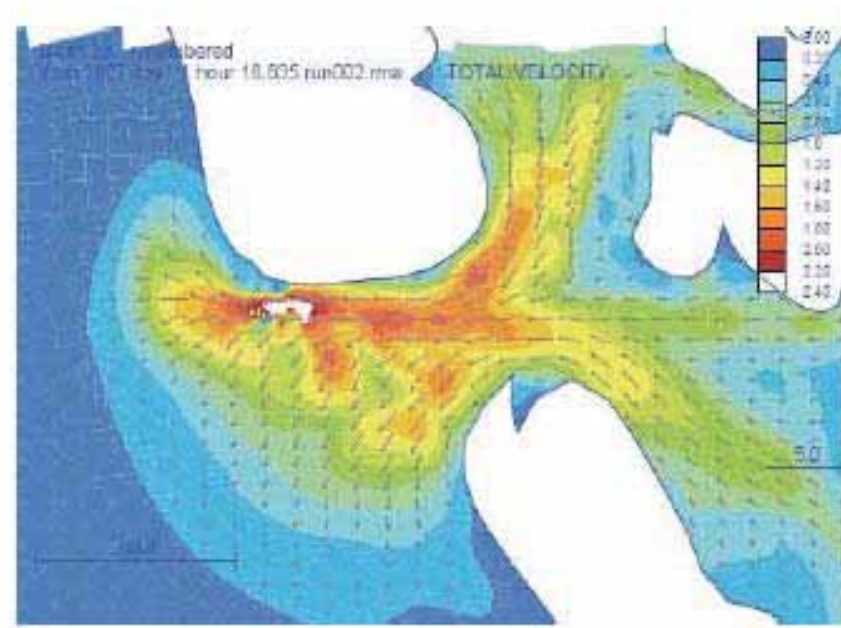
Mid tide



Neap tide

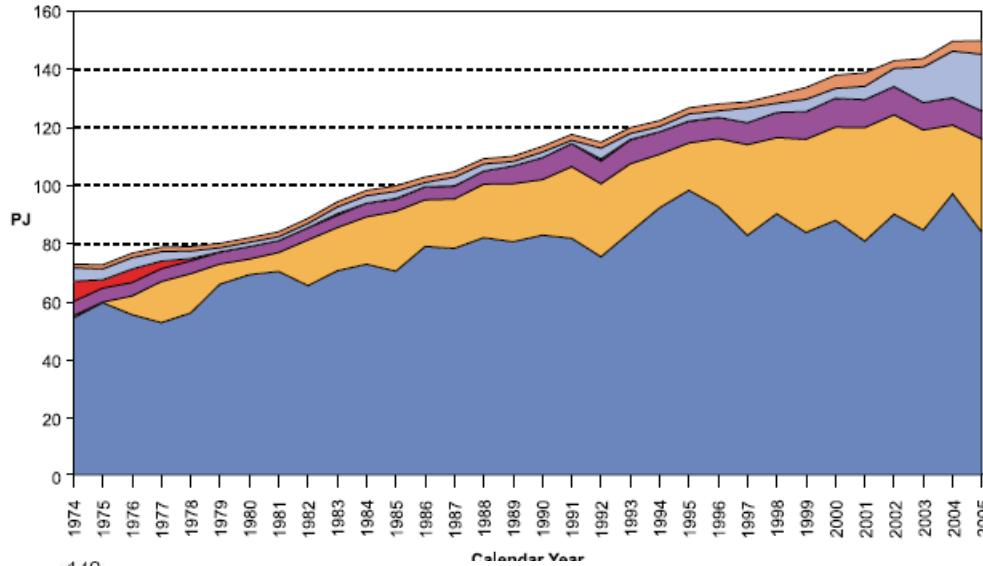


- At the seaward site in the harbour entrance, currents exceed 2 ms^{-1} for 20% of the time during the full tidal phase, or 40% of the ebb phase.
- Data for peak and average tidal flow velocities at various locations across the harbour provided input to computer models of harbour flows.

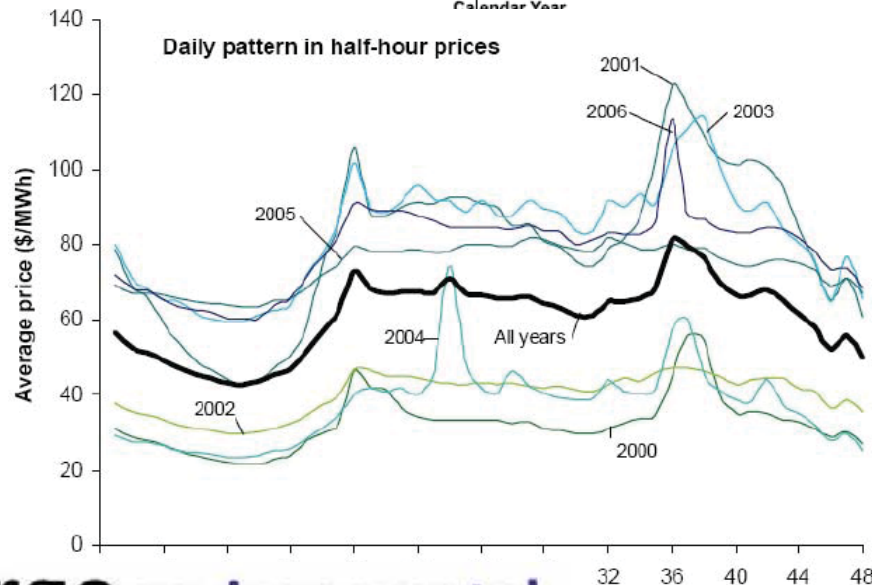


National issues

Chart G.4b: Annual Electricity Generation



- Security of electricity supply is a matter of serious concern in NZ
- To avoid demand exceeding supply, particularly in dry years, NZ requires new electricity generation equating to around 150 MW of installed capacity per year.
- The Crest project represents a significant component of this new generation



Regional benefits

- A single transmission line crosses the Auckland isthmus into Northland, and failure of this link causes economic and social disruption
- Transmission upgrades and new generation in or north of Auckland are the key factors that would maintain security of supply for the north
- The CREST Project would provide predictable, reliable electricity with a high probability that part of the daily tidal generation cycle would occur during peak demand periods
- Injection of up to 200MW at Dargaville would provide significant strategic benefit to the region

Local benefits

- The project requires upgrades to the electricity reticulation network in the Pouto/Dargaville region that would otherwise not be warranted in the foreseeable future
- Other local projects might be more viable as a result of the CREST infrastructure: windfarms, wave offshore west coast, light industry ...
- Directly associated service industry employment opportunities through marine operations, maintenance, marine monitoring etc.

Technology

- Several options for turbines
- No decision nor formal agreement in place
- Rapidly evolving
- New market entrants from major companies

Timescales

- **Four stages**

- Stage 1 up to 20 units
- Stage 2 40 units
- Stage 3 80 units
- Stage 4 200 units
- Staging subject to detailed review of effects within RMA s128

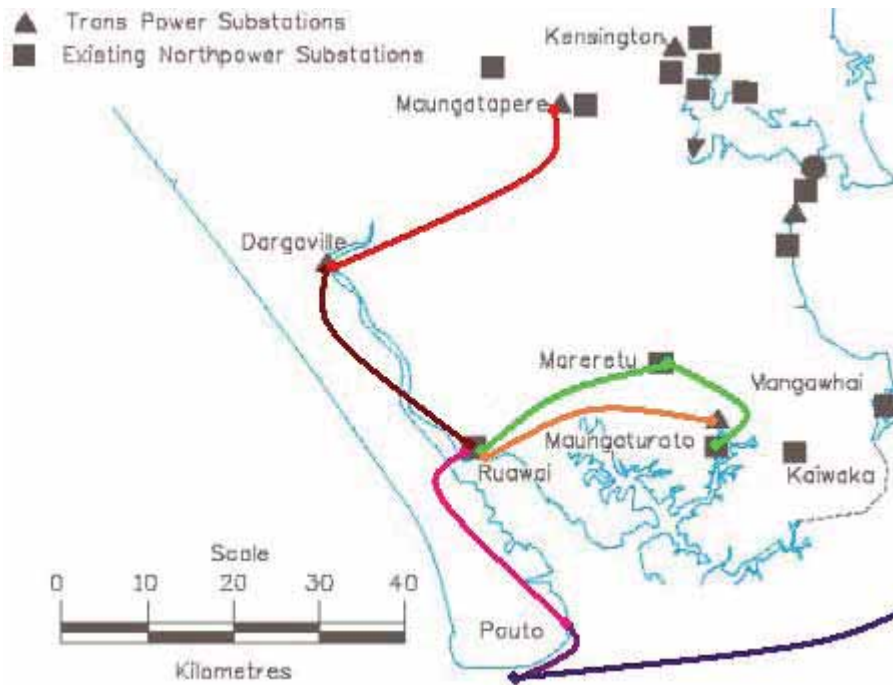
- **Timing**

- Stage 1 1-2 years including base monitoring
- Stage 2 2–4 years
- Stage 3 4-6 years
- Stage 4 6+ years

Adaptive Management

- Baseline monitoring
- A full monitoring plan developed in consultation with stakeholders and regulators, with elements to include:
 - Seabed bathymetry
 - Geotechnical
 - Benthic biology
 - Noise
 - Shoreline profile and erosion characteristics
 - Water velocities and levels
 - Recreational use
 - EMF
- Transition from one stage to next based on outcome of monitoring
- “Test” for transition: NRC to be satisfied that it is “very probable” that the project will “not cause significant adverse effects” – in consent condition.

Landside reticulation Certificate of Compliance



Matters for Appeal

- Iwi issues – denial of Tangata Whenua access, kaitiakitanga, manawhenua, manamoana and effects on enjoyment of customary ownership rights
- Hydrological and sediment issues
- Marine mammals
- Navigation safety
- Duration of baseline monitoring (3 years!)

Pitfalls

- Lengthy Tangata Whenua consultation – no fixed end-point - delayed project for about a year to allow for re-design to accommodate perceived concerns but in the end no resolution of issue and de novo at Environment Court
- Foreshore and Seabed Act 2004 –relevance to Crest project and to every other marine energy project
- Section 92 process – multiple requests – timeline implications
- Resources of Council staff- very capable individuals - but much else on their plate – CREST invited use of consultants but wasn't taken up until last minute.
- Marine energy projects have demonstrably minor effects and are reversible -- if a project has no discernible adverse effects there is a tendency in the resource consent process to focus on very minor/obscure issues just to try to find/justify effects assessment – consequential waste of resources.
 - Extracting energy out of the tidal flow – trivial in respect of mass energy flow available but CREST has to commission specialist model studies;
 - EMF - many cables around the world – plenty of evidence of no effects – but CREST required to provide all basic information.

Questions

