

Using Geothermal Energy for Kiln Drying Operations



19 September 2018
WoodTECH 2018 – Rotorua - Day 2 - Session 5
Brian Carey



Who am I ...

- **Brian Carey**
- **GNS Science**
 - Geothermal Resource Management Specialist
- **IEA Geothermal**
 - Executive Secretary



IEA Geothermal



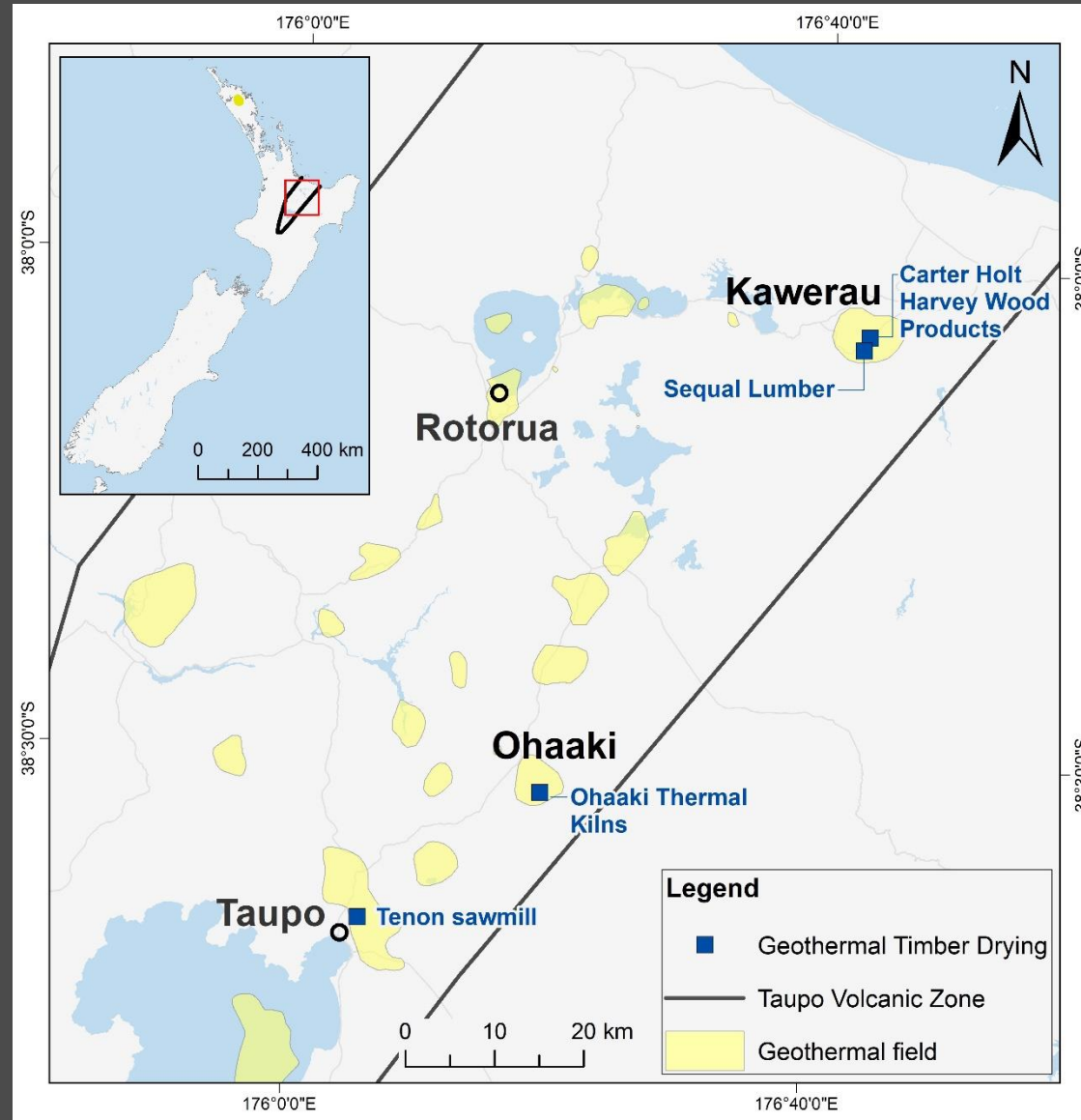
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Value adding using Geothermal Energy

- **These Companies :**
 - Carter Holt Harvey Wood Products
 - Sequal Lumber
 - Tenon Taupō
 - Ohaaki Thermal Kilns
- **Understand and value Geothermal**
... and will gain more from geothermal energy in the future....

Talk about geothermal timber drying @ four locations (blue)

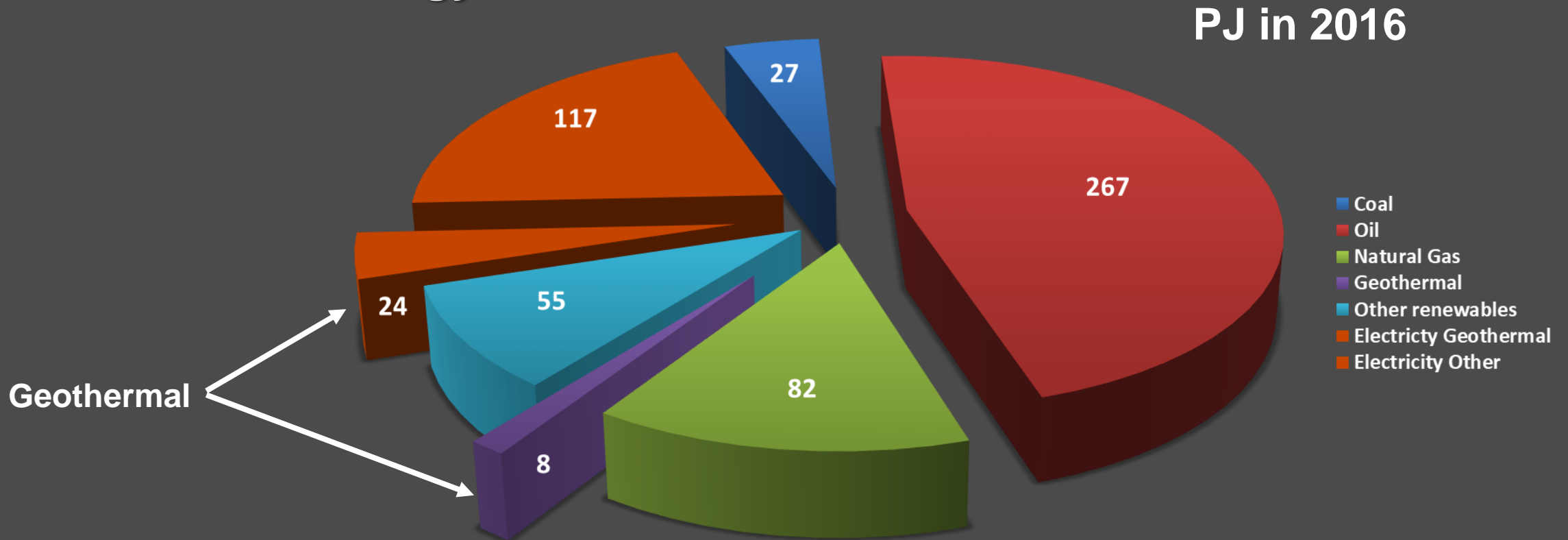


Also Talk about

- **Geothermal Energy use in New Zealand**
- **Future of Kiln Drying**
 - Fit with Geothermal Energy
 - Product Credentials
- **Contacts**
 - For you to follow up

New Zealand - Geothermal Energy

- Both electricity and direct process use
- Geothermal electricity 17% of the total in 2017
- Consumed Energy



Geothermal and Kiln Drying Timber



Carter Holt Harvey Wood Products - Kawerau



- Log intake 630,000 m³ per year
- Sawn Timber 350,000 m³ per year
- Over 180 employees
- Geothermal steam used for decades to Kiln Dry sawn product
- A number of batch kilns
- Kilns operating on cycles between 80 to 140 °C
- Geothermal Steam supplied by Ngati Tuwharetoa Geothermal Assets Ltd

Tenon - Taupō



- 400,000 tonnes a year of logs processed
- Drying 150,000 m³ timber per annum
- 9 batch kilns
- In 2006 moved to Geothermal Kiln Drying
 - Replaced a natural gas fired system
- Using two phase geothermal fluid to provide heat to the kilns
- Kilns run at 180 °C and 150 °C
- 265 Employees



Tenon Reports



- **Dec 2006**
 - CEO in press release reported
- **2007 Taupō Times reported**
 - Tenon transitioned from natural gas to geothermal
 - Reduced CO₂ emitted by 28,000 tonnes per year,
 - Reduced operating costs by NZD 1.2 Million per year,
 - Increased timber drying capacity by 5 %

Smart Phone Moment

- 2017 Tenon – See what they say
– Start at 50 secs



<https://www.youtube.com/watch?v=yzDhDvViPI0&feature=youtu.be>

Sequal Lumber - Kawerau



- 70 Employees
- Custom cutting – 400 sizes
- Sawn Timber 75,000 m³ per year
- Using geothermal steam for Kiln Drying since 2014
- 4 Kilns
- Rhys Arrowsmith
 - “Knowing the wood is dried in an environmentally friendly manner using direct use geothermal just completes the picture for customers”

Ohaaki Thermal Kilns - Broadlands

- Established in 1990
- Uses heat from geothermal water ex the Ohaaki Power Station
- Custom Timber Drying
- And a firewood business
 - Ohaaki Heat



And the Future of Drying



Geothermal Pipeline

Find a geothermal pipe !

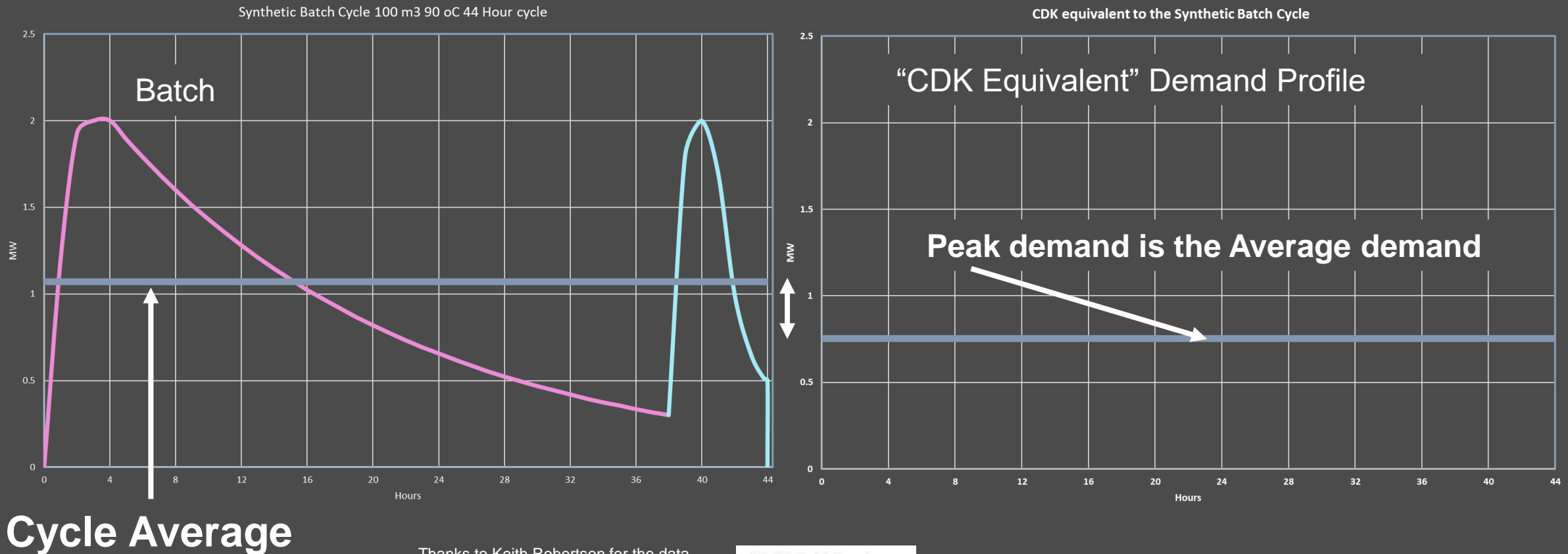


And the Future of Kiln Drying

- **Continuous kilns (CDK)**
 - Softwoods, medium to large annual volumes
- **CDK Reduced energy per volume dried compared to Batch**
 - 1.7 GJ / m³ of dried and conditioned timber
 - 25 to 30 % less energy per volume compared to batch kilns
- **CDK – essentially constant energy demand**
 - **Average** heat energy demand equals **Peak** demand
 - Fantastic match for a geothermal supplied kiln

Compare With Batch Kiln Cycle Energy Profile

- Batch average heat energy demand ~50% of the peak requirement

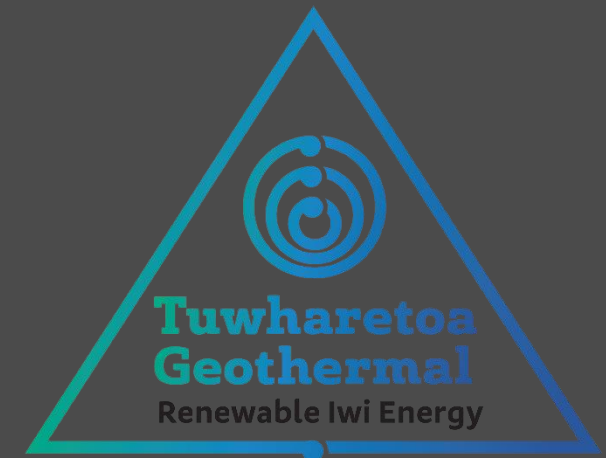


Future of Geothermal Kiln Drying

- **Even better suited to geothermal energy than today with :**
- **Continuous kilns (CDK)**
 - Perfect for geothermal
 - Constant load energy demand profile
- **Drying of hardwoods – some of the 1 Billion Trees**
 - Lower temperature and longer batch cycles for hardwoods
 - Perfect for geothermal

And what of your Product Credentials

- You have FSC
- What else are your customers demanding ?
 - Produced with renewable energy
 - Indigenous credentials
- Your own business ethos?
 - Sustainability
 - Low carbon energy
 - Products manufactured using renewable energy



Asaleo Care - Kawerau



<https://www.youtube.com/watch?v=oupL6mO0Usl&t=2s>

Product Credentials

- **Sequal business**
 - Sustainability
 - Low carbon energy
 - Products manufactured using renewable energy
 - Give more



Geothermal completes the picture

Interested in Geothermal - Find out more

- **Talk to me**
- **Contact Andrea Blair**
 - Bay of Connections
andy.blair@energised.nz
- **Contact Spence McClintock**
 - Ngati Tuwharetoa Geothermal Assets Ltd
spence.mcclintock@tuwharetoakawerau.co.nz
- **Want other information**
 - Geothermal Case studies – including industrial
 - Enter GNS Science Earth Energy in your [browser](#)
 - Go to www.nzgeoheat.nz

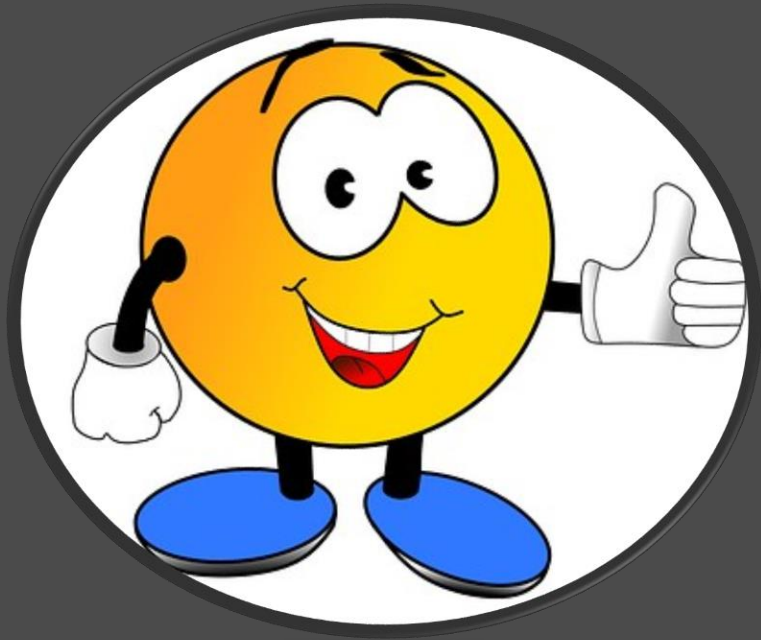


Woodtech 2018 Post Conference Mantra – page 7

- **Act**
- **Follow up**
- **Organise a short presentation**

..... speakX

That's me done for today !!!



Kia Ora

Find a geothermal pipe !