Energy Solutions For Industry

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Session 3 : Energy Trends

# Biofuels – Friend or Foe ?

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# Living Energy

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**Established in 2003**

**Emerged out of Carter Holt Harvey (origins in 2000)**

**Won last two large wood boiler projects in NZ (9MW and 22.5MW)**

**Installed 6 out of the 7 woodchip boilers funded under EECA's school programme**

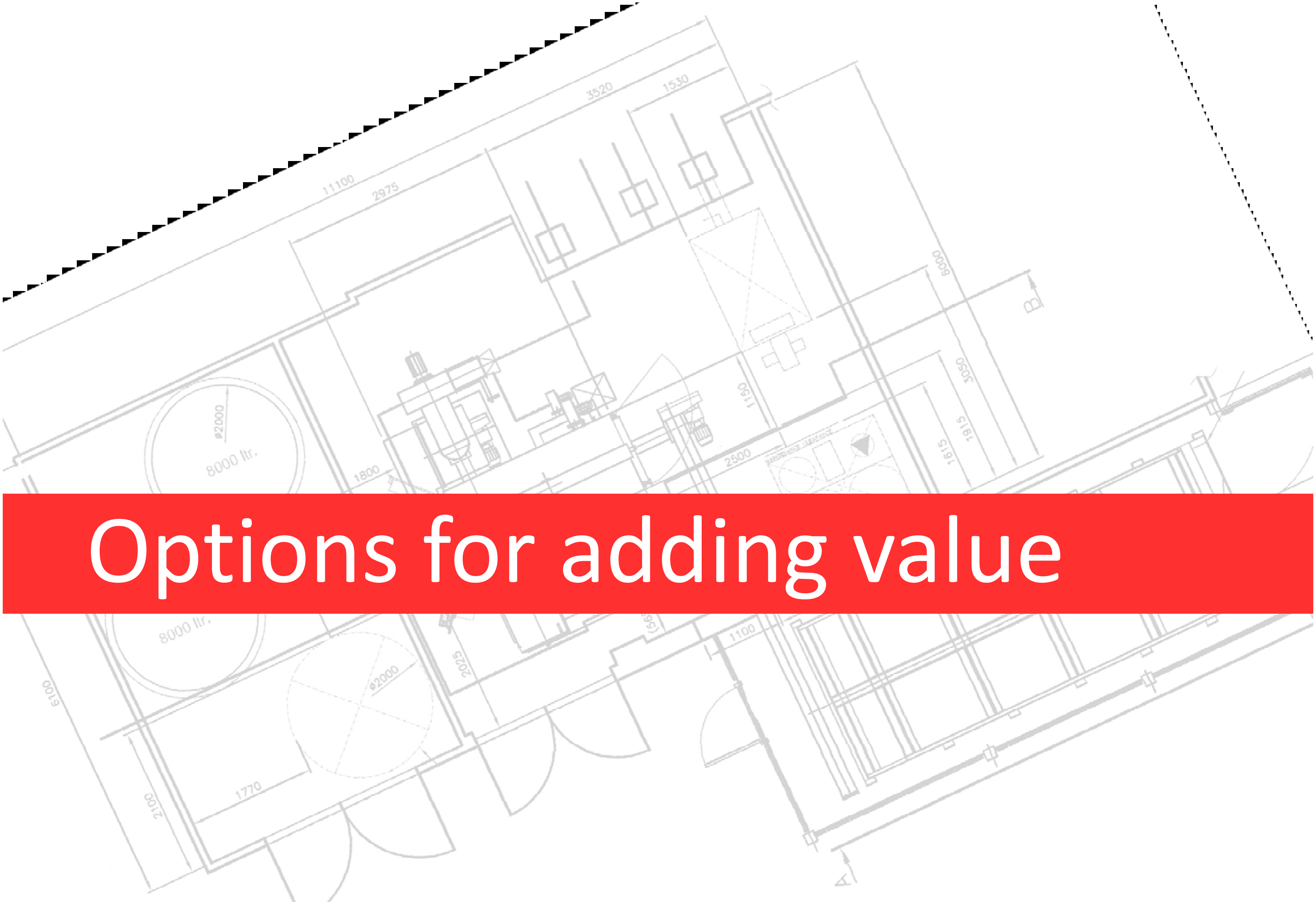
**Partnered with Visdamax, Hargassner and Binder**

***Specialists in supplying wood chip boilers and supplying fuel, under "HSA's"***


# BANZ

BIOENERGY
Association of New Zealand Inc.

- Industry Association
- Represents various sub groups
  - Bio-Gas
  - Liquid Fuels
  - Pellets
  - Wood Fuel
- 250+ members



# Options for adding value

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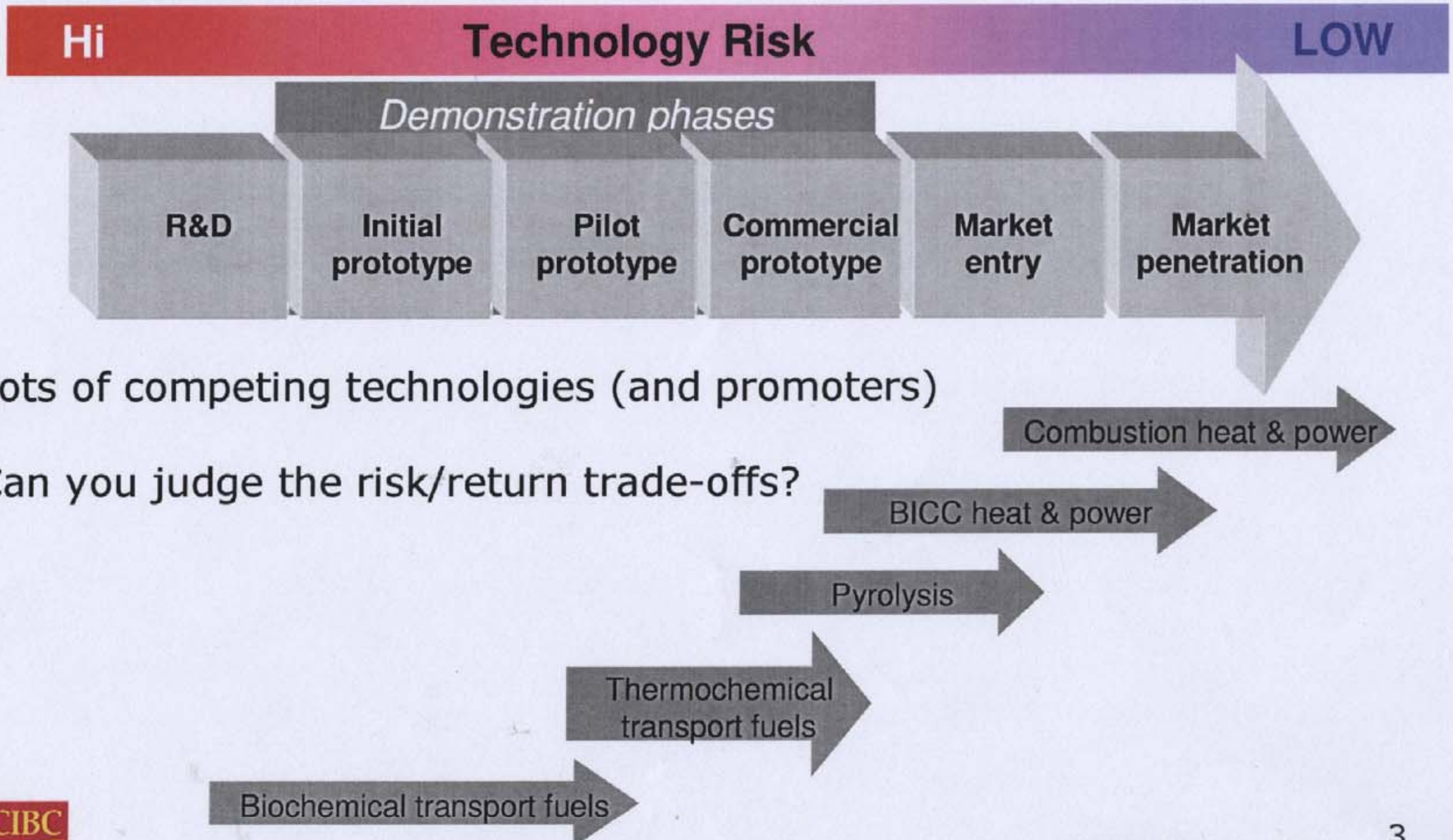
# Current Status of Bio-energy Technologies




- Lots of competing technologies (and promoters)
- Can you judge the risk/return trade-offs?

# Summary of Possibilities

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| *Option* | *Comments* |
|---|---|
| Pellets | Possible if lots of shavings. Standards being established. High value. |
| Briquettes | Much easier than pellets and lower capital. Firelogs same. |
| Bio-Oil | Now offered here. Creates high value product. |
| Bio-Ethanol | Various breakthroughs still needed. Pulp mill scale. |
| Gasification | Now offered in NZ. Suits small scale (<1MWe) with heat needs. |
| Combustion | Good 'ol combustion. Hard to beat for process heat. |
| ORC | Combustion based. Takes advantage of thermal oil. Low R&M. Good if need hot water (up to 90$^o$C). Good to 1.5MWe. |
| Conventional CHP | Steam-based, only economic at medium/large scale (above 3MWe). "Pure Power" Generation does not stack up. |
| Off-site Sales | Zero capital needed. Can focus on core business. Needs to find a way to market. |

# Massive World-wide Investment

- US$155,000,000,000 invested in clean energy in 2008
- More than two-thirds went to renewable energy projects, from geothermal and wind to solar and biofuels
- NZ Bio-diesel has $36m, over 3 years
- NZ has $8m over 5 years for wood energy.   35c/pp/py

# What's the rest of the world doing ?

- Sweden sources 28% of its total energy from wood

- Obama has made US$800m available for bioenergy

- District Heating heats over 100 million people in Europe

- Biomass supplies 70% of this in Denmark

- The Directorate General for Energy of the European Commission predicts that across the EU, ***investment in bioenergy will create 838,780 new full-time jobs by 2020, 58 times more jobs than any other type of renewable energy.***

# Automatic wood heating in Europe

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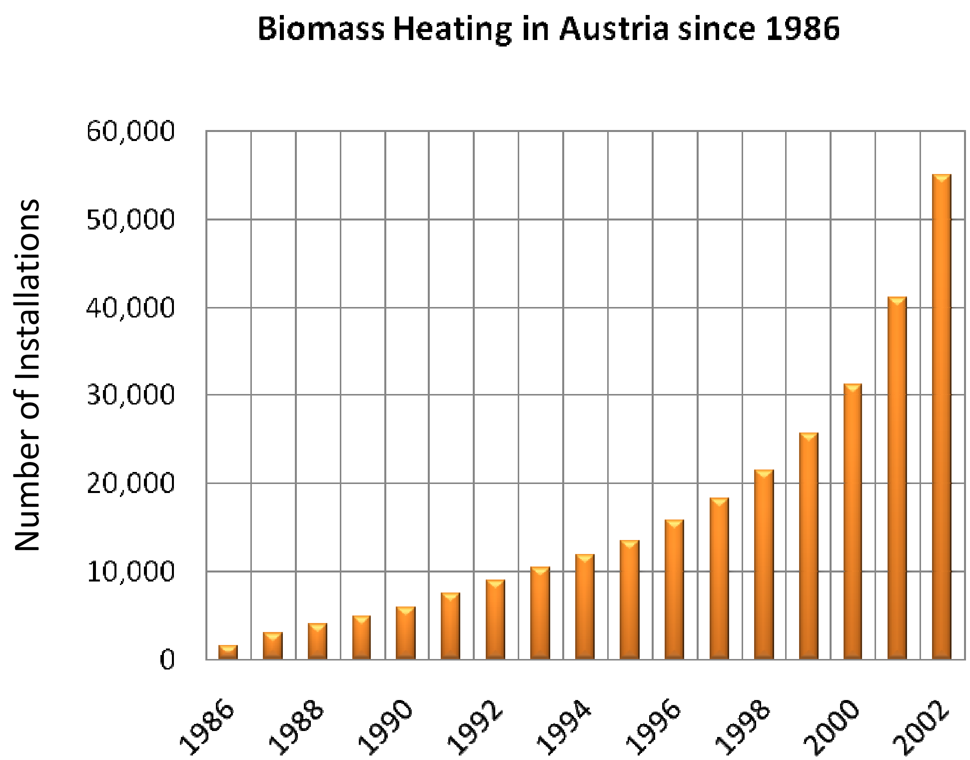
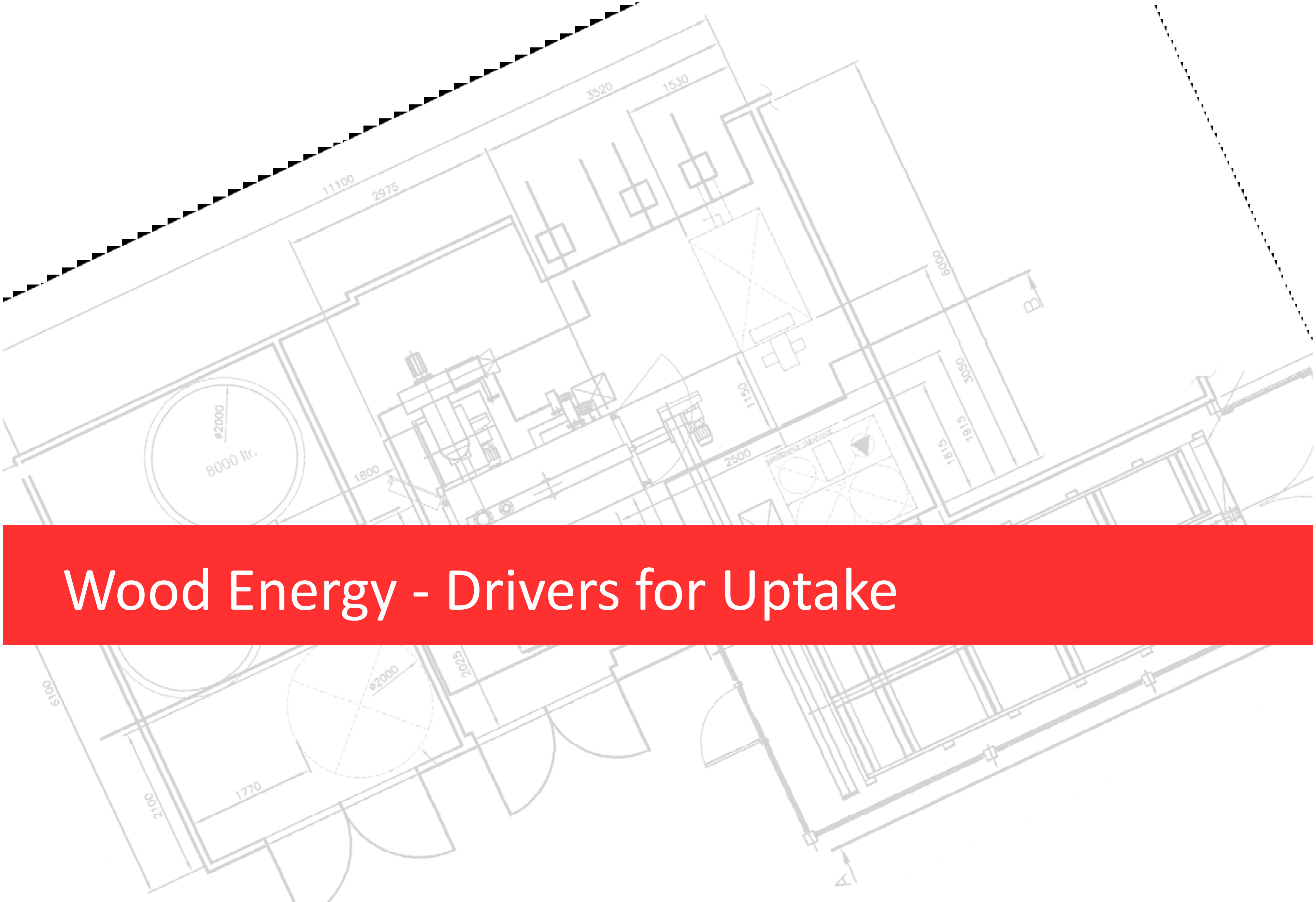
Automatic wood heating is now a major industry in most Northern European Countries

- Now over 100,000 installations in Austria alone
- Many hundreds of thousands of systems now operational across Europe
- From domestic scale to large industrial scale (10MW+)
- Austria installed $650m worth of automated woodfuel systems in 2006

**<u>Outside</u> the WPS (schools, pools, hospitals, food processing, glasshouses etc etc)**





# Wood Energy - Drivers for Uptake

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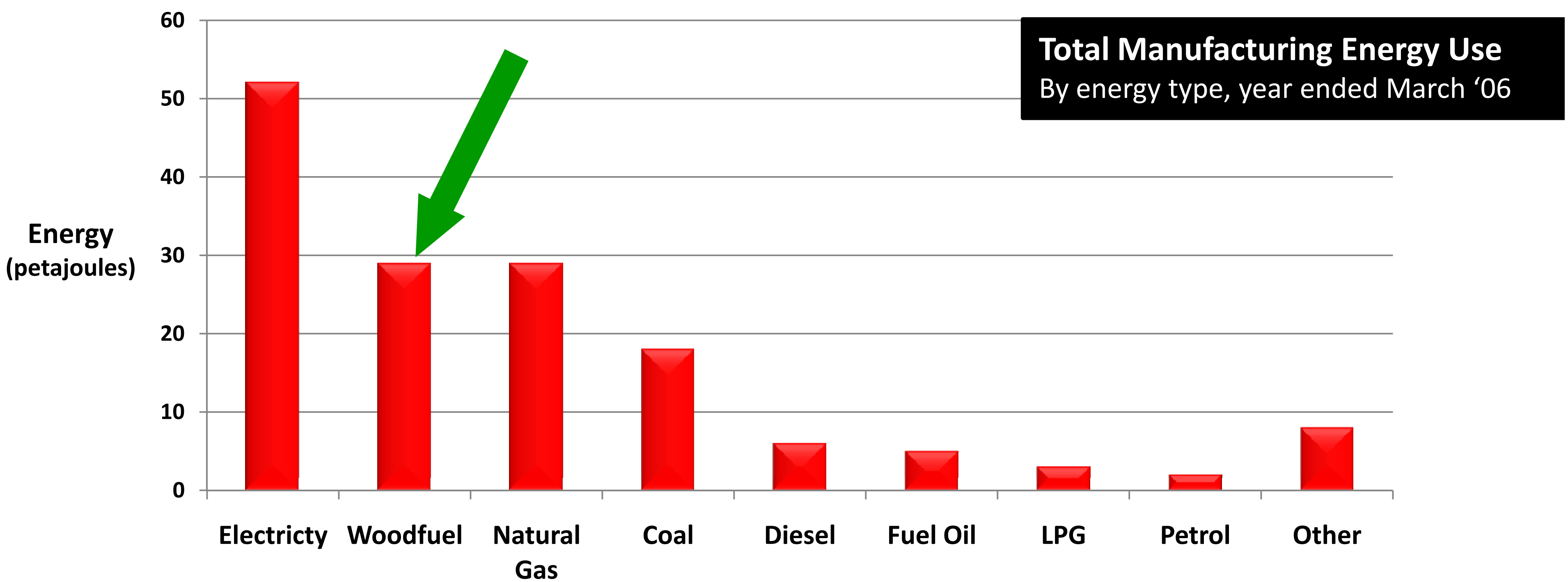
# Drivers for Uptake

- **Wood-based fuel provides around 19% of energy for Manufacturing**
- **Well utilised in the wood processing sector**
- **Under-utilised in other energy-intensive sectors, so far**
- **Obstacles have been cheap fossil fuels and lack of Policy**




Source : Statistics NZ

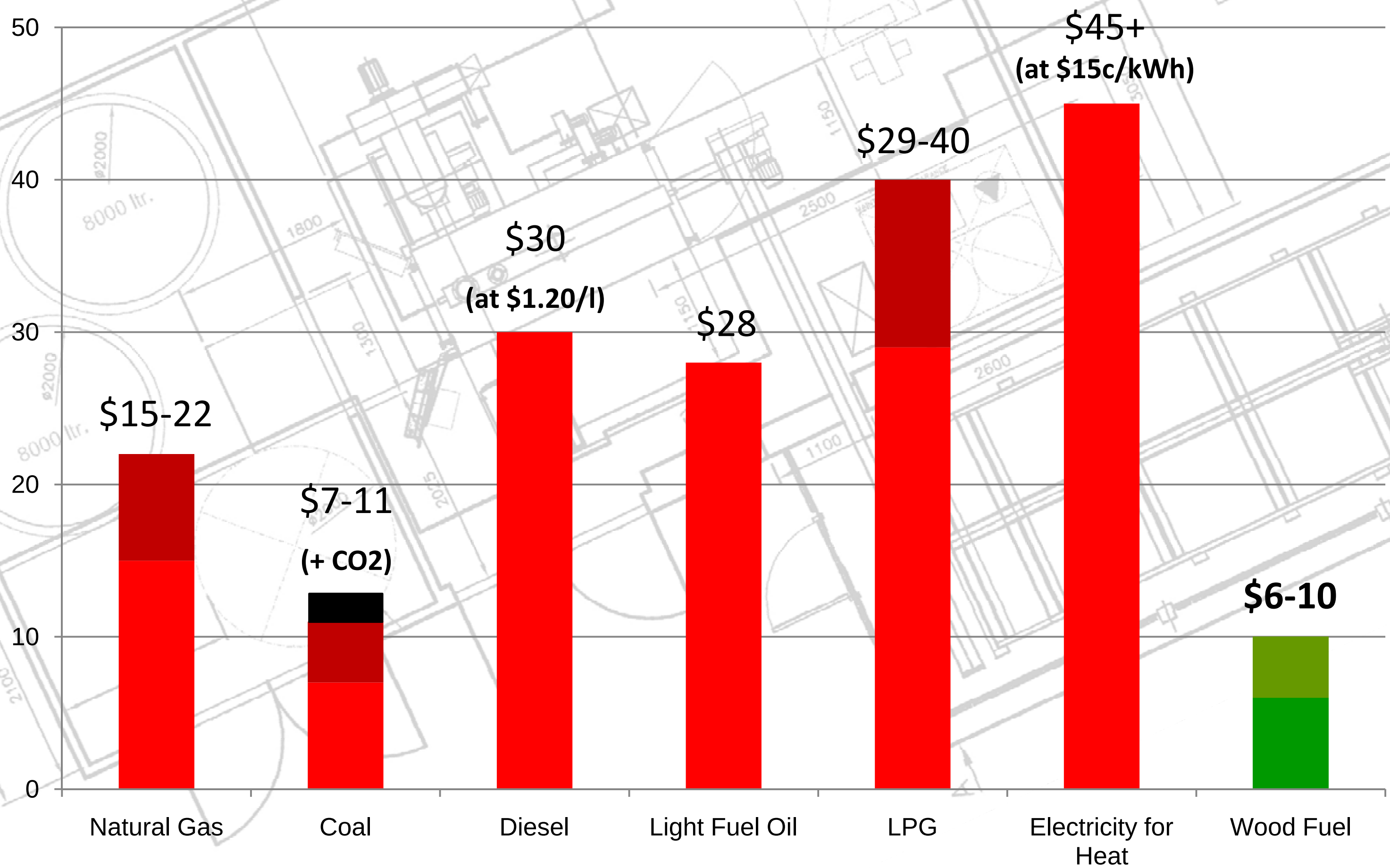
Drivers for Uptake

# No 1 : Fossil Fuel Prices

**Decline of Maui, increase of oil price, domestic coal etc...**

**Projects that were not attractive 2-3 years ago, might be now**

## Fuel Price Comparisons (Commercial users)



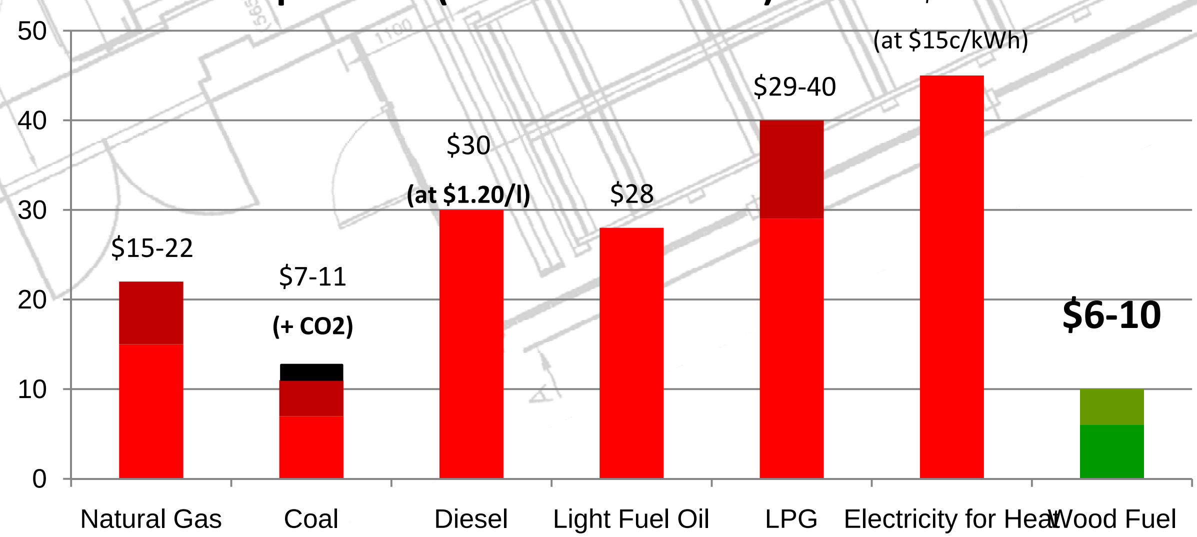
## Drivers for Uptake

## Example of Changing Economics

**“Projects that were not attractive 2 years ago, might be now”**

- **The economics have changed quite rapidly :**
  - **Company using LPG**
  - **In 2003 at $0.40/litre = 13 year payback**
  - **Now at $0.80/litre = 3 year payback**

**Fuel Price Comparisons (Commercial users)**



# Other Drivers

- NZ Air Quality Standards (PM10 from coal)
- Sustainability
- Energy Security (USA)
- Rural jobs (Europe)
- PR and PERCEPTION :
  - "Carbon Intensity" of products
  - Food Miles
  - Clean Green image

Market Share

Tesco 100% Pure Squeezed Orange Juice 1L
The carbon footprint of this juice is 360g CO2 per 250ml serving and we have committed to reduce it
By comparison, the footprint of Tesco long-life orange juice is 240g per 250ml serving
This is because more energy is used to chill and transport 100% pure juice
working with the Carbon Trust
360g
CO2
per 250ml
serving
Compared
to Long-Life
Juice
240g
INNOCENT P/APPLE
BANANA & COCONUT
SMOOTHIE 1 LITRE
innocent
pure fruit smoothie
pineapples,
bananas &
coconuts
Tropicana
Smoothie

# So where are the opportunities ?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# Isn’t it Obvious ?

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- NZ has a **lot** of energy intensive industry
  - Food processing
  - Wool scouring
  - Milk processing
  - etc

Around 3,000MW of boilers

- NZ has a **lot** of low value wood
  - Log Making Residues
  - Branchwood
  - Pulp logs etc etc

# Some NZ Boiler Statistics

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| | |
|---|---|
| Total NZ Boiler Capacity - just over 1kW per capita | 4,900 MWth |
| Heat Plant in Wood Processing Sector | 1,798 MWth (40%) |
| Wood-Fired Boilers in NZ Wood Processing Sector | 1,323 MWth (27%) |
| Total Wood Fired Boilers outside WPS | 8MW + 4MW + ? |

**Wood is well-utilised, mature technology in NZ's WPS**

Source : 2008 Heat Plant Database, BANZ

# A lot of wood fuel available

**26 million tonnes of plantation 'fibre' is harvested per year**

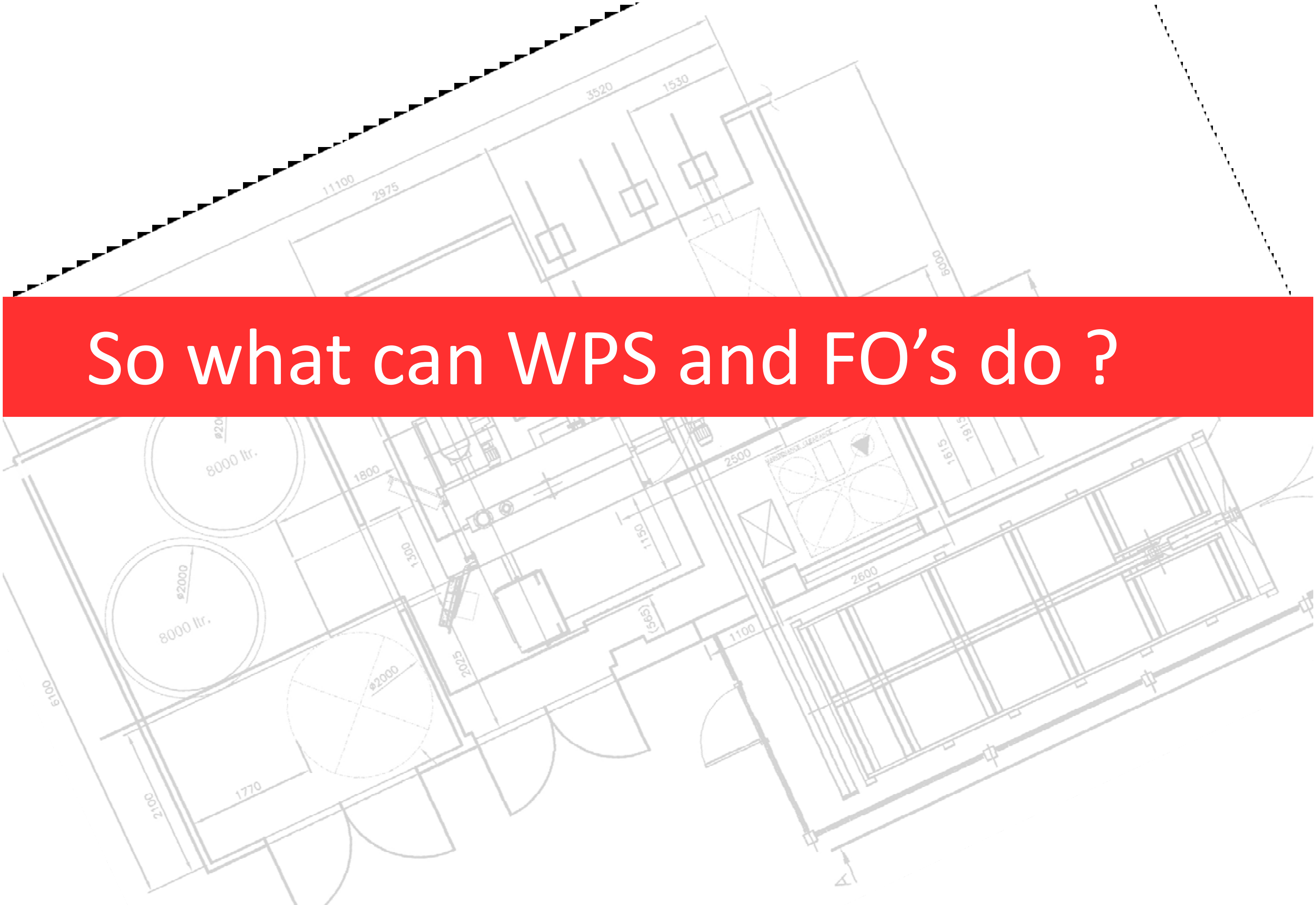
- **6 million tonnes of branchwood (25% of log tonnage)**
- **1 million tonnes of log making residue (4-5% of logs)**
- **2 million tonnes of wood processing residues**
- **3 million tonnes of wood chip (25% of Pr & A logs)**
- **4 million tonnes of pulp logs (20% of annual log harvest)**
- **and there's more in the "wall of wood"….**

**1% for Dairy Co**

***Wood residues could currently provide up to 45% of NZ's total energy demand***

**Perceptions of lack of supply security are unwarranted – but it is probably the key barrier**

# So what can WPS and FO’s do ?

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# Upgrade to access the $'s

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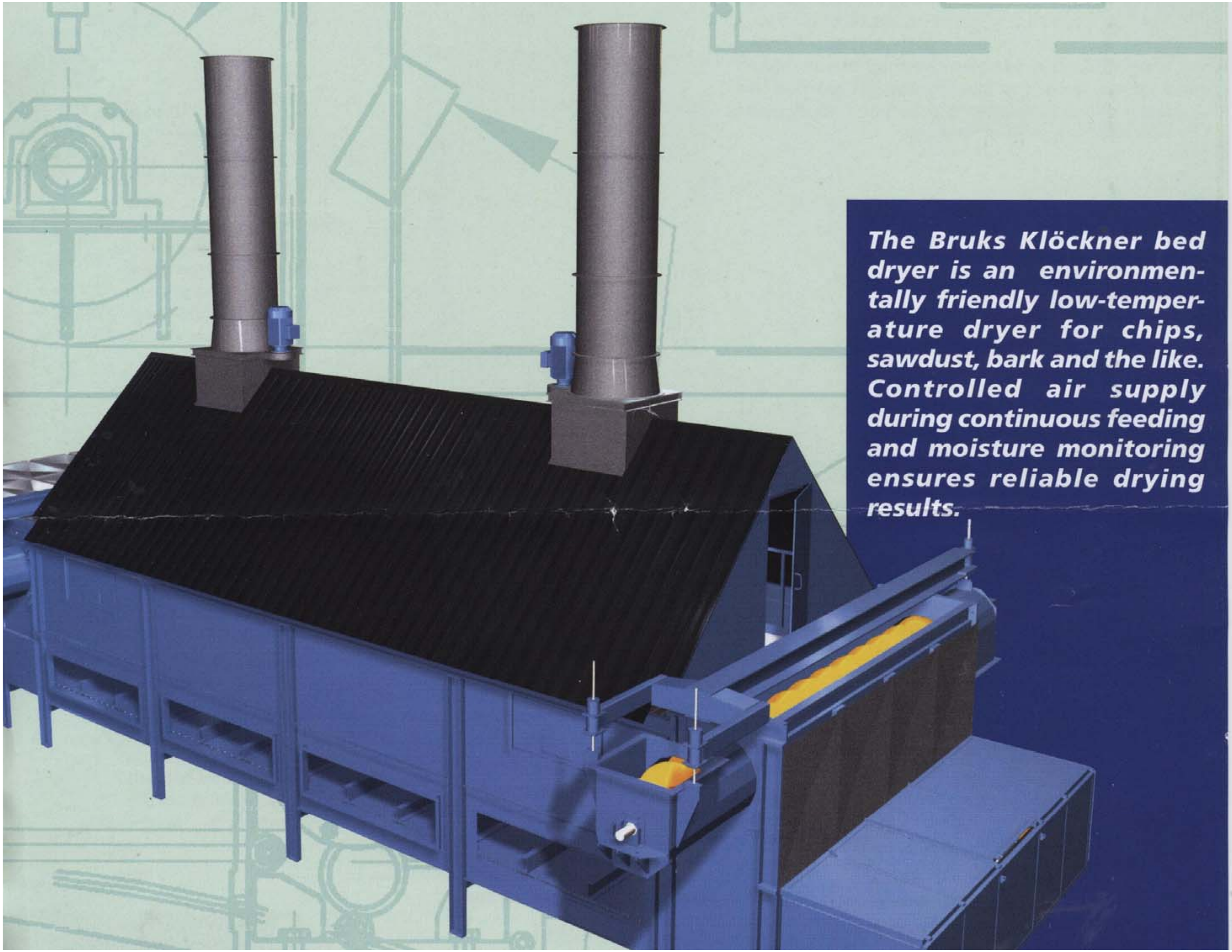
- **Consider how to upgrade any wood that is left over**
    - Consider densification options
    - As a minimum, cover your chip pad
    - Reduce risk of contaminants
    - Consider using waste heat to dry chip
        - rotary dryer, bed dryer etc
- Be willing to commit long term
- Be part of creating the demand.  Talk it up !
- Push your industry group



***The Bruks Klöckner bed dryer is an environmentally friendly low-temperature dryer for chips, sawdust, bark and the like. Controlled air supply during continuous feeding and moisture monitoring ensures reliable drying results.***

## What can Forest Owners Do ?

- Start to understand how to add value
  - Do some trials
  - Plan infrastructure
  - Treat it well
  - Understand the Biofuel Standards

- Talk it Up !

- Consider options upon re-planting
  - Douglas Fir
  - Eucalyptus
  - etc

# Friend or Foe - to P&P ?

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- Actually many co-benefits
  - Could be the most economic suppliers “fuel hubs”
    - Have Consents, and space
    - Have handling and chipping/hogging equipment
    - Have logistics expertise
    - Have waste heat
- Have the scale to recover lower value fibre and add value
- Adding value to forest is in the sectors long term interests

**The sector is well positioned to benefit**

# A vision for the future ?

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- Carbon sequestration of wood products is recognised
- Competing products face a realistic carbon charge
- The wall of wood makes it to market !
- Profitably !!

BUT

*Why can’t the wasted/low value fibre be worth $120/tonne ?*

**How to achieve this ?**

# How to get the value recognised

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The WPA and FOA need to :

- Send this Government a message : we need to do more !
- Push for meaningful legislation
  - Where the carbon sink value is better recognised *but also*
  - Where competing products face a realistic carbon charge <u>and</u>
  - Where the multiple benefits of bioenergy are recognised

Quadrupling the value of a third of the tree is probably the biggest productivity gain you'll ever get.

Recognise the opportunity – and fight for it !

# What’s the message to Government ?

- **Wood residues could currently provide up to 45% of NZ’s total energy demand**
- **It’s proven and practical**
- **There’s a massive potential demand**
- **It creates jobs, and bolsters rural communities**
- **It helps NZ Forestry back to health**
- **It helps NZ Inc become competitive**
- **Infrastructure is not just roads – it’s also industry core assets**
- **It helps NZ Inc counter the “Food Miles”**
- **It helps NZ’s clean, green image**
- **It reduces reliance on finite fossil fuels**
- **It’s part of a sensible shift towards renewable, sustainable energy sources**

**SO LETS GET SOME POLICY THAT TIPS THE PLAYING FIELD**

## Summary

- Bioenergy is an untapped resource – a lot more could be done
- FOA & WPA members should be the main beneficiaries
- Start to think about how to be ready for the opportunity
- Talk it up !
- Push your industry representatives harder, to push the cause

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