Energy Solutions For Industry

LivingEnergy

Experiences from a Wood Boiler Supplier

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Topics

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1. Living Energy
2. **Learnings / Observations - from 3 Case Studies**
3. Other Experiences / Observations
4. Summary

1. Living Energy

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- Established in 2003
- Installed over 40,000kW of wood boiler capacity (28 boilers)
- Boilers for full range of wood fuels : chip, pellet, sawdust and hog-fuel
- Can supply the wood fuel only, or full ‘Heat Supply’ (cents per kWh)

3. Some Case Studies – and Learnings

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- Swimming pool
- Hospital & Rest Home
- Waste Water Treatment plant

Case Study 1 : Swimming Pool

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Thames Centennial Pool

	Prior	Now
Heat Source	Electric Heat Pumps	Wood Chip (200kW)
Annual Bill	$120,000	$20,000


CENTENNIAL POOLS
6
7
PLEASE WALK


Befüllschnecke
Leistung
50 m³ / h
HARGASSNER

Case Study 1 : Thames Pool

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Take-aways

- Paradigm shift to get away from heat pumps
- Lucky to have a community-minded sawmill
- Fuel Supply Conundrum - no other demand
    - Setting logs aside to dry would make sense
    - But no economies of scale, and no cash !
    - Need a bigger local customer

A wood fuel depot

- Logs stacked for air drying prior to chipping

Courtesy : WENZ

Case Study 2 : Hospital / Rest Home

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Little Sisters of the Poor, Sacred Heart, Dunedin

	Prior	Now
Heat Source	LPG	Wood Chip
Boiler Size	900kW	300kW
Annual Bill	$250,000	$70,000


binder

Case Study 2 : Hospital

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Take-aways

- Professional & reliable fuel supplier
- It was worth the effort to get a large fuel store
- Smaller boiler works well (was 900kW, now 300kW)
- NZ struggles against European economies of scale

.....This may play out in the wood boiler supply sector

Case Study 3 : Sewage Plant

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Kapiti Coast Waste Water Treatment Plant

	Prior	Now
Heat Source	Diesel	Wood Pellets (or chip)
Annual Bill	$450,000	$200,000


SCANIA

Case Study 3 : Water Treatment Plant

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Take-aways

- Takes a passionate champion to push project
- Big CO_2 savings – 24% reduction in KCDC's carbon footprint
- Consultants very hard to persuade – risk averse

3. Our own Learnings

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- Gas, coal, LPG, diesel & elec are still ‘default’
- Consultants are ‘safety first’
- A lot more education is required
- Scarcity of capital – or competition for capital – is a major issue (short term view)
- So BOOT options are worth considering

4. Our own Learnings - Operational

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- Get the wood boiler sizing right !

Some examples of sizing ‘corrections’ :

Site	Old boiler	Wood boiler
Thames High School	700kW	300kW
Golden Bay High / Pool	700kW	350kW
Westland High School	2 x 450kW	1 x 500kW
Dunstan High School	1200kW	650kW
Dunstan Hostel	1000kW	250kW
Hospital in Dunedin	900kW	300kW

840kW recommended…

Optimising the wood boiler size saves installation and operating costs.
It also extends the life of the boiler….

4. Our own Learnings - Operational

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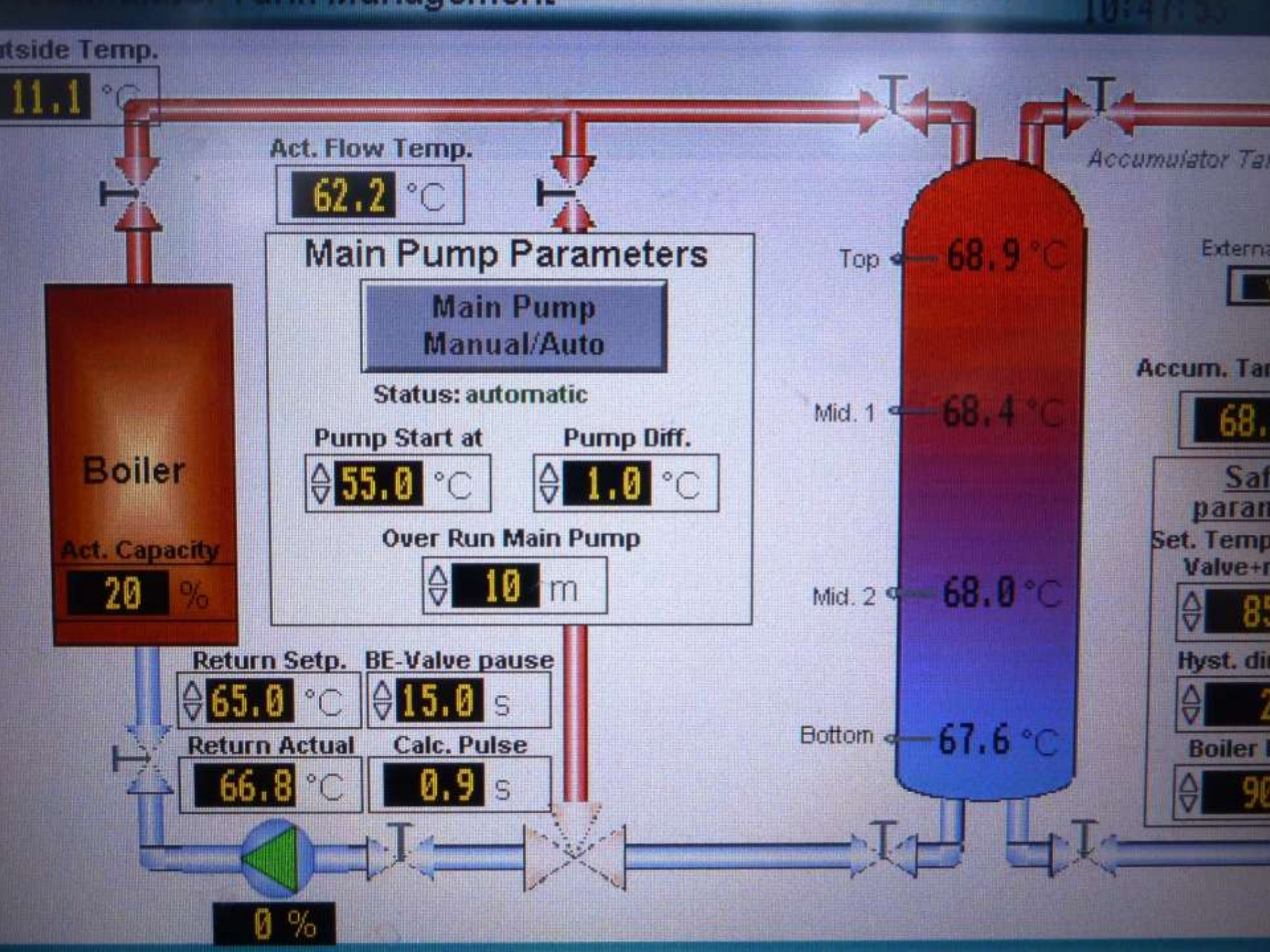
- Get the wood boiler sizing right !
- Use an accumulator tank, if funds allow


tside Temp.
11.1 °C
Act. Flow Temp.
62.2 °C
Main Pump Parameters
Main Pump Manual/Auto
Status: automatic
Pump Start at
55.0 °C
Pump Diff.
1.0 °C
Over Run Main Pump
10 m
Boiler
Act. Capacity
20 %
Return Setp.
65.0 °C
BE-Valve pause
15.0 s
Return Actual
66.8 °C
Calc. Pulse
0.9 s
0 %
Top
68.9 °C
Mid. 1
68.4 °C
Mid. 2
68.0 °C
Bottom
67.6 °C
Accumulator Ta
Accum. Ta
Set. Temp
Valve+
Hyst. di
Boiler

4. Our own Learnings - Operational

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- Get the wood boiler sizing right !
- Use an accumulator tank, if funds allow
- Need dry'ish fuel if daily start-ups are required
- 300mm thick insulation is not do-able here….

4. Our own Learnings - Operational

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- Get the wood boiler sizing right !
- Use an accumulator tank if funds allow
- Need dry fuel if daily start-ups are required
- 300mm thick insulation is not done here
- A large fuel store is worth investing in
- Sometimes just bowl the building – and start again

4. Our own Learnings - Operational

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- Get the wood boiler sizing right !
- Use an accumulator tank if funds allow
- Need dry fuel if daily start-ups are required
- 300mm thick insulation is not done here
- A large fuel store is important
- Sometimes just bowl the building – and start again
- Do not blow fuel! Tip is best, next best auger

4. Our own Learnings

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- Safety is paramount : Need a physical burn-back barrier

Safety Features :

Burn-back flap and dousing tank

4. Our own Learnings - Operational

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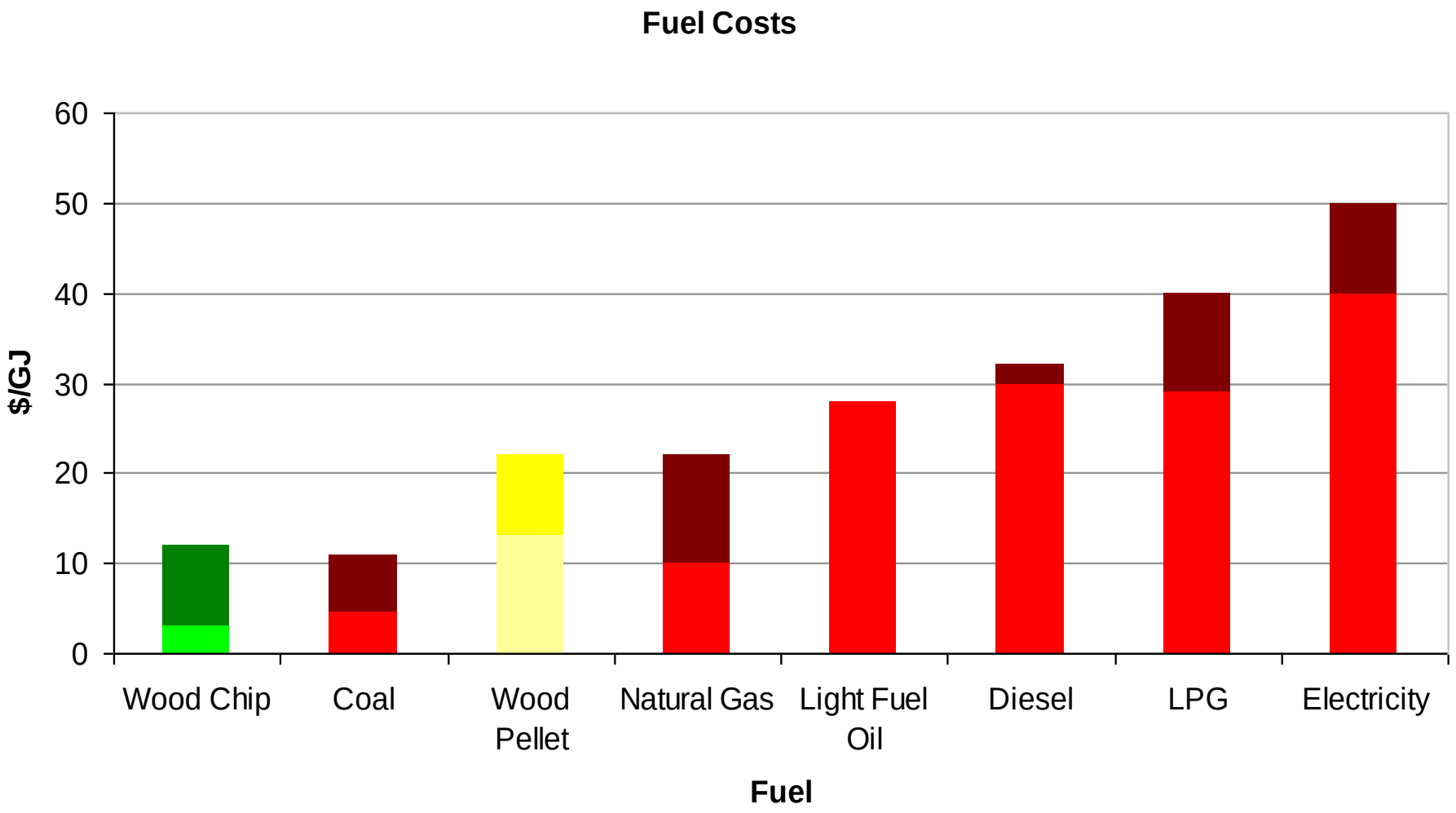
- Safety is paramount : Need a physical burn-back barrier
- There is room for regulation here
- 6 boilers in one day is possible !!
- European Advisers = better project outcomes
- Cheap conversions are debatable (e.g. Rotorua)
- Boilers have proved reliable and efficient
    - 100 tonnes of coal = 100 tonnes of wood chip
- Fuel supply is not just about price

Wood energy is cost-effective – but capital is scarce !!



Summary

- We have just scratched the surface : 1% of boilers
- Wood energy is a very cost-effective “CO2 abater”…
- ….and offers multiple other benefits to NZ Inc
- But capital is precious, certainly in the private sector
- And gas and coal is cheap !
- So users need to take a long term view, or do BOOT
- Or be encouraged to by long-term bi-partisan policy

THANKYOU