

Shareholder Update – Local Activity

12 April 2019: Environmental Clean Technologies Limited (ASX: ECT) (ECT or Company) is pleased to announce the launch of its steam and boiler package division with a focus on providing integrated solutions to the steam, hot water and process heating industry.

Key points:

- Attractive target markets with long term scale and demand dynamics
- Leverage current production assets through the Coldry High Volume Test Facility (HVTF)
- Growth opportunities through vertical integration of fuel supply, plant & equipment, finance and service offerings.

Following extended commercial trials with multiple businesses in Victoria and Tasmania, ECT has confirmed its commitment to a long-term business model which aims to deliver:

1. An integrated approach to the production of steam, hot water and process heat requirements
2. Installation of new multi-feedstock biomass boilers
3. Operation & maintenance of new and old boiler systems.

ECT Chairman Glenn Fozard commented, “It is apparent that the market for utility-scale steam and hot water is in desperate need of a solution that can deliver capital upgrades and fuel solutions that are reliable and economical. At present, no other companies are offering fully integrated steam and boiler solutions to Victorian and Tasmanian customers.

“Local businesses reliant on steam, hot water and process heat generation have been suffering terribly from skyrocketing gas prices and a shortage of efficient alternative fuels, resulting in an energy affordability and reliability crisis. This uncertainty is impacting the viability of many businesses. It also means ageing infrastructure is not being replaced as companies are reluctant to outlay capital on new equipment without long term access to viable fuel alternatives. ECT solves the problem of fuel price volatility, fuel reliability and capital outlay concerns and allows these companies to focus on their core business while we take care of their utility energy needs.”

The attached investor presentation outlines the target market and the opportunity for the Company’s steam and boiler package division, driven by its Coldry solid fuel product and associated services.

Leverage Current Assets

The new ‘steam services’ division aims to expand the client base, leveraging the current output of the Company’s Coldry HVTF northwest of Melbourne, and underpinning anticipated expansion to 35,000 tpa.

The estimated investment required to lift capacity from ~15,000 tpa to 35,000 tpa is \$1.5M to \$2.0M, with anticipated recurring revenue of up to \$13M pa and potential once-off revenue of \$10M to \$20M for new boiler system installations.

Growth Opportunities

Given the level of interest received to date and the successful rollout of the steam services business model to its first client (see announcement 9 August 2018), the Company is confident a sustainable commercial program exists based on its Coldry solid fuel product to supply energy-intensive industries impacted by rising energy costs.

In support of ongoing R&D for the Company's flagship India project and future projects like the previously announced Latrobe Valley Coldry demonstration plant (currently at feasibility study stage), the HVTF is targeting an increase to capacity of up to ~35,000 tonnes per annum.

The HVTF is solely an R&D facility and continuous production up to ~35,000 tonnes per annum will continue to add to the testing of critical features of both Coldry and Matmor in areas such as:

1. Pellet integrity and product quality determinants
2. Composite pellet and additives trials
3. Conditioning and drying profile optimisation (management of temperatures, flow rates and residence times)
4. Packed bed dryer design development for airflow management and optimisation
5. Overall system process improvements and equipment design review.

Importantly, all product sales from the HVTF will remain under the "Feedstock Rules" of the R&D tax incentive legislation.

In parallel to the activity at the HVTF, the Company continues to develop its feasibility study for the establishment of a large-scale Coldry demonstration plant in Victoria's Latrobe Valley.

It is envisaged that the Victorian demonstration plant will be designed to an output capacity of between 170,000 tpa and 300,000 tpa and will feature a zero CO₂ footprint, having no direct emissions.

At the minimum scale of 170,000 tpa, the Company believes there is ~70,000 tpa of initial demand from the steam, hot water and process boiler industry, making the balance of ~100,000 tpa available to emerging high-value downstream applications.

About steam, hot water and process heating

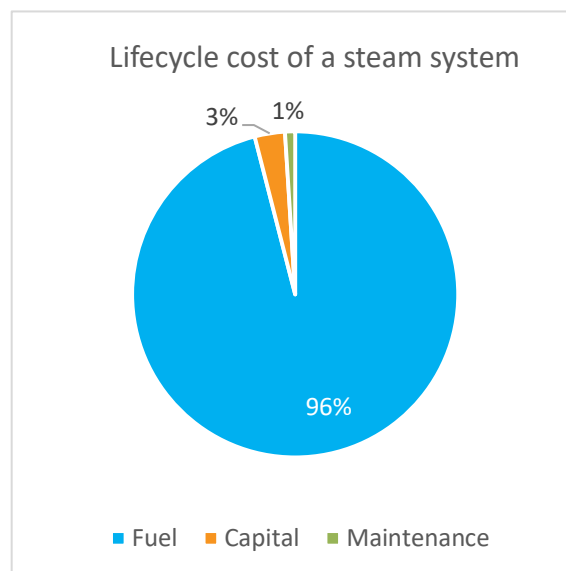
Steam, hot water and process heating are critical inputs for many industries. They are intended to provide convenient, reliable and cost-effective energy essential to business processes.

Being such an indispensable part of a business requires these systems be run at their optimum efficiency, providing the best performance, safety and energy efficiency possible.

The chart opposite highlights that the cost of fuel consumption in a steam system accounts for most of the lifetime cost of ownership. It makes good business sense, therefore, to run an energy-efficient system and to ensure a thorough lifetime cost of ownership analysis when deciding whether to upgrade existing or invest in new plant.

The benefit of investing in a new boiler system with multi-feedstock capability is the ability to substitute Coldry solid fuel for expensive natural gas or LPG, significantly lowering the lifetime cost of ownership.

New equipment requires a substantial capital outlay to realise the fuel cost savings over time, so ECT has partnered with finance firm BE Power to deliver a zero upfront cost solution for new systems and upgrades,



Source: Sustainability Victoria BEST PRACTICE GUIDE - Energy Efficiency: Steam, Hot Water and Process Heating Systems

factored into one monthly contract fee that aims to deliver savings of 15% per annum or more on business as usual.

About the solid fuel market

The Victorian industrial energy market is defined by the price and availability of appropriate energy sources. Until 2014, brown coal briquettes dominated the local market, followed by gas and biomass. The closure of the Morwell brown coal briquette plant in 2014 saw many businesses switch to gas and biomass. The price of gas has since doubled or tripled for many companies. Availability of biomass is variable, reducing the reliability of supply. Biomass typically has a lower energy density, and its ash contains elements that foul boiler systems, resulting in lower efficiency and increased downtime for maintenance.

Coldry solid fuel is an ideal fuel for businesses requiring large volumes of process heat.

Further, Coldry doesn't conflict with the Victorian government's renewable energy target, as neither wind nor solar are suitable for generating reliable, affordable process heat to such industries.

In this respect, the Company is competing directly with the availability and prices of natural gas and biomass alternatives, which given the current supply-demand profile, look like remaining high and possibly escalating, well into the future.

Beyond supplying energy-intensive industries such as agriculture, the Company sees potential to grow its Coldry capacity in Victoria over time to support several potentially high-value applications, including:

- High-efficiency, low-emission (HELE) power generation to deliver reliable, affordable electricity
- Hydrogen production
- Upgraded coal products such as activated carbon, PCI (pulverised coal injection) coal, and hydrocarbon liquids and gases.
- Integration with 'Waste to energy' solutions that require a stable baseload fuel source.

These higher-value applications can generate jobs and improve productivity while reducing the emissions intensity of Victoria's world-class brown coal resource.

Coldry is the ideal solid fuel

Coldry is a lower cost, lower emission, brown coal-based solid fuel with high energy and volatile rating.

Coldry performs well as a high performance standalone solid fuel or in a blend to improve the efficiency of other biomass fuels such as woodchip, pyrethrum, sawdust, crop stubble and bagasse.

Coldry can also be infused with anti-fouling agents to counteract some of the boiler performance issues experienced when using certain biomass feedstock (like pyrethrum, crop stubble and bagasse).

Coldry can be tailored specifically to suit the application, from highly dense briquettes to our higher-porosity 'baseline' pellet. The objective is to expend as little energy as required to produce the right product for the application. This benefit is passed on to the customer in the form of improved fuel combustion and increased boiler efficiency.

Coldry is sourced from local, abundant brown coal supplies and features a consistent specification. Supply agreements in place with Energy Australia (Yallourn) and Maddingley Brown Coal (Bacchus Marsh) ensure long-term access to supply.

Next Steps

Over the coming months, the Company aims to establish further steam service contracts while developing capacity at its HVTF northwest of Melbourne.

As sales are achieved and contracts are implemented, the intent is to drive the development of the Latrobe Valley project to support further scale and revenue opportunities in the local market.

For further information, contact:

Glenn Fozard – Chairman info@ectltd.com.au

About ECT

ECT is in the business of commercialising leading-edge energy and resource technologies, which are capable of delivering financial and environmental benefits.

We are focused on advancing a portfolio of technologies, which have significant market potential globally.

ECT's business plan is to pragmatically commercialise these technologies and secure sustainable, profitable income streams through licensing and other commercial mechanisms.

About Coldry

When applied to lignite and some sub-bituminous coals, the Coldry beneficiation process produces a black coal equivalent (BCE) in the form of pellets. Coldry pellets have equal or superior energy value to many black coals and produce lower CO₂ emissions than raw lignite.

About Matmor

The Matmor process has the potential to revolutionise primary iron making.

Matmor is a simple, low cost, low emission production technology, utilising the patented Matmor retort, which enables the use of cheaper feedstocks to produce primary iron.

About the India R&D Project

The India project is aimed at advancing the Company's Coldry and Matmor technologies to demonstration and pilot scale, respectively, on the path to commercial deployment.

ECT has partnered with NLC India Limited and NMDC Limited to jointly fund and execute the project.

NLC India Limited is India's national lignite authority, largest lignite miner and largest lignite-based electricity generator.

NMDC Limited is India's national iron ore authority.

Areas covered in this announcement:

ECT (ASX:ECT)	ECT Finance	ECT India	India Project	Aust. Project	R&D	HVTF	Business Develop.	Sales
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ENVIRONMENTAL CLEAN
TECHNOLOGIES LIMITED

Steam & Boiler Package Solutions

Entering a ~\$2B
Energy Market

April 2019

*"Bridging the gap between today's use of
resources and a zero-emissions future"*



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Forward looking statements are only predictions and are not guarantees of performance. Wherever possible, words such as "may," "would," "could," "will," "anticipate," "believe," "plan," "expect," "intend," "estimate," "aim," "endeavour" and similar expressions have been used to identify these forward looking statements. These statements reflect the Company's current expectations regarding future events and operating performance, and speak only as of the date of this material. Forward looking statements involve significant known and unknown risks, uncertainties, assumptions and other factors that could cause our actual results, performance or achievements to be materially different from any future trends, results, performance or achievements that may be expressed or implied by the forward looking statements, including, without limitation, changes in commodity prices and costs of materials, changes in interest and currency exchange rates, inaccurate geological and coal quality assumptions (including with respect to size, physical and chemical characteristics, and recoverability of reserves and resources), unanticipated operational difficulties (including failure of plant, equipment or processes to operate in accordance with specifications or expectations, cost escalation, unavailability of materials and equipment, delays in the receipt of government and other required approvals, and environmental matters), political risk and social unrest, and changes in general economic conditions or conditions in the financial markets or the world coal, iron and steel industries.

The materiality of these risks and uncertainties may increase correspondingly as a forward looking statement speaks to expectations further in time. Although the forward looking statements contained in this material are based upon what the Company believes to be reasonable assumptions, the Company cannot assure investors that actual results will be consistent with these forward looking statements. These forward looking statements are made as of the date of this material and are expressly qualified in their entirety by this cautionary statement. We do not intend, and do not assume any obligation, to update or revise these forward looking statements, unless otherwise required by law. Prospective purchasers are cautioned not to place undue reliance on forward looking statements. This presentation is for information purposes only and does not constitute an offer to sell or a solicitation to buy the securities referred to herein.

Overview

Entering a ~\$2Bn pa energy market.

1

Steaming ahead...

The utility steam, hot-water and process boiler industry is stagnant, fragmented and weighed down by high fuel cost, poor reliability and inefficiencies. **Our mission is to change that!**

2

Market size and revenue potential

A surprisingly large market, ripe for disruption. Overview of the target market segments and revenue potential.

3

Delivering Solutions

Owning & operating a boiler is a headache and money pit for most businesses. We address the energy trilemma: Economic security, energy security and environmental outcomes.

4

Our competitive advantage

Our people. Our consultative approach. Our commitment to delivering outcomes and reducing costs.

5

Meet the team & partners

We've assembled a team of energy and engineering experts and partners to deliver our mission.

6

Indicative Case Study

Delivering a sustainable >15% saving in operating cost and with biomass, a 30% drop in CO₂ emissions.

7

The business opportunity

Establishing initial volumes via our Coldry HVTF as a springboard to establishing a larger Coldry plant in the Latrobe Valley to restore energy affordability and reliability and improve revenue margins.

8

Business Strategy & Performance Metrics

Mapping sales growth to capital upgrades for enhanced capacity and operational cash flows.

1 | Steaming ahead...

ECT is pleased to announce the launch of its steam and boiler package division with a focus on providing integrated solutions to the steam, hot water and process heating industry.

Following extended commercial trials with multiple businesses in Victoria and Tasmania, ECT has confirmed its commitment to a long-term business model which aims to deliver:



Integrated approach to steam, hot water and process heat production

- ✓ Optimisation of fuel mix
- ✓ Maximise efficiency
- ✓ Multi-feedstock flexibility
- ✓ Inbuilt fuel security
- ✓ Reduce CO₂ emissions
- ✓ Reduce costs
- ✓ Reduce business disruption



Installation of new multi-feedstock solid-fuel biomass boilers

Replacement of ageing or operationally expensive steam systems

- ✓ Improved efficiency
- ✓ Lower running costs
- ✓ Better environmental outcomes
- ✓ Design and construction

Parallel installations with expensive Natural Gas or LPG systems

- ✓ Improved energy security
- ✓ Reduced business disruption
- ✓ Lower overall running costs



Operations & maintenance of new and old boiler systems

- ✓ Controlling costs
- ✓ Ensuring compliance
- ✓ Fuel supply chain management

1 | Steaming ahead...

ECT's clients are business that require steam or hot-water as part of their operations.

Typically these utility heat systems are critical to the operations, running continuously in support of the core business. These systems are also typically not core to the skill set of the business and represent one of the largest costs behind labour, often higher than electricity.

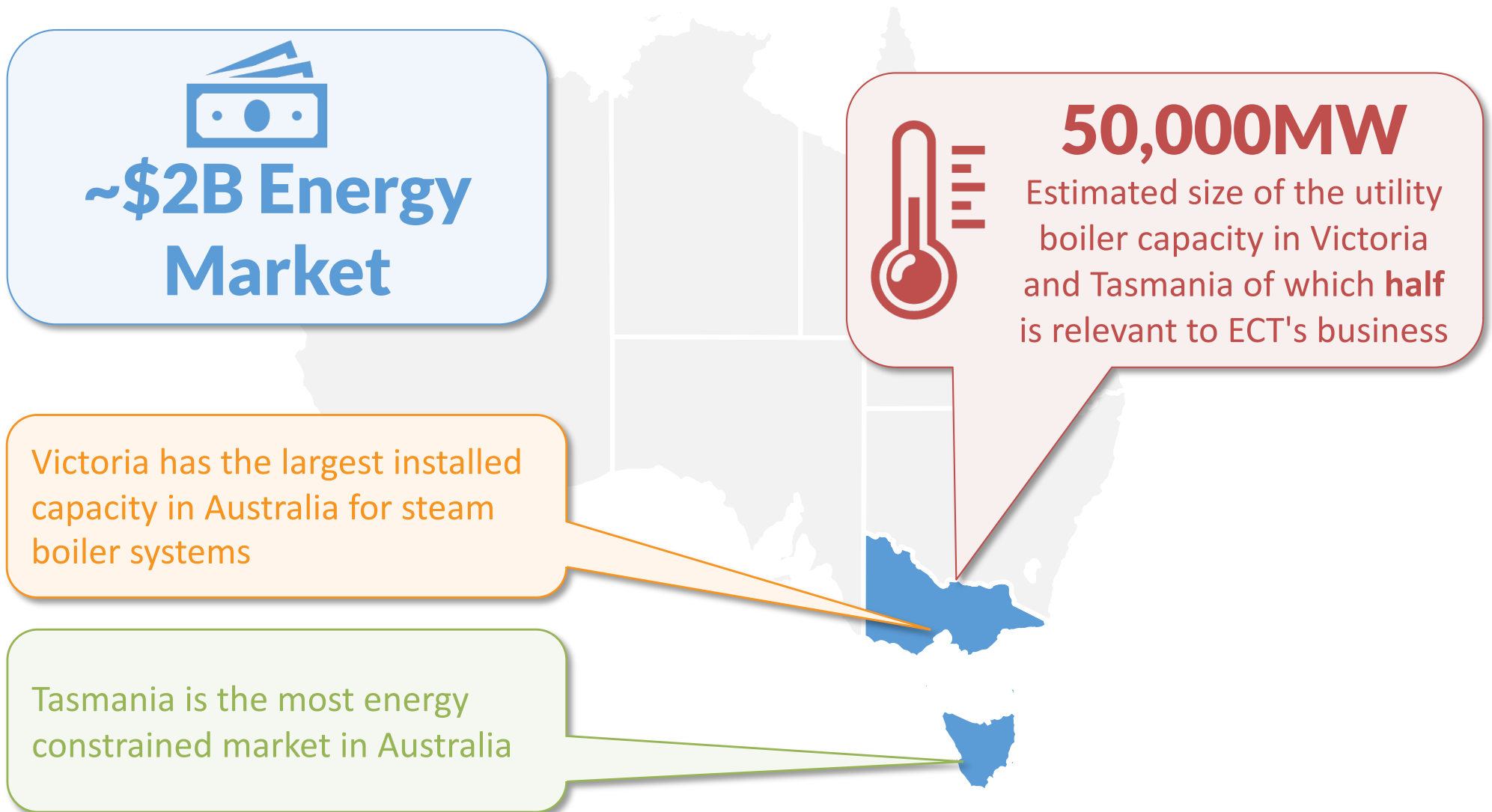
These customers include:

- Brick and tile manufacturers
- Meat processors
- Dairy food manufacturers
- Construction timber mills

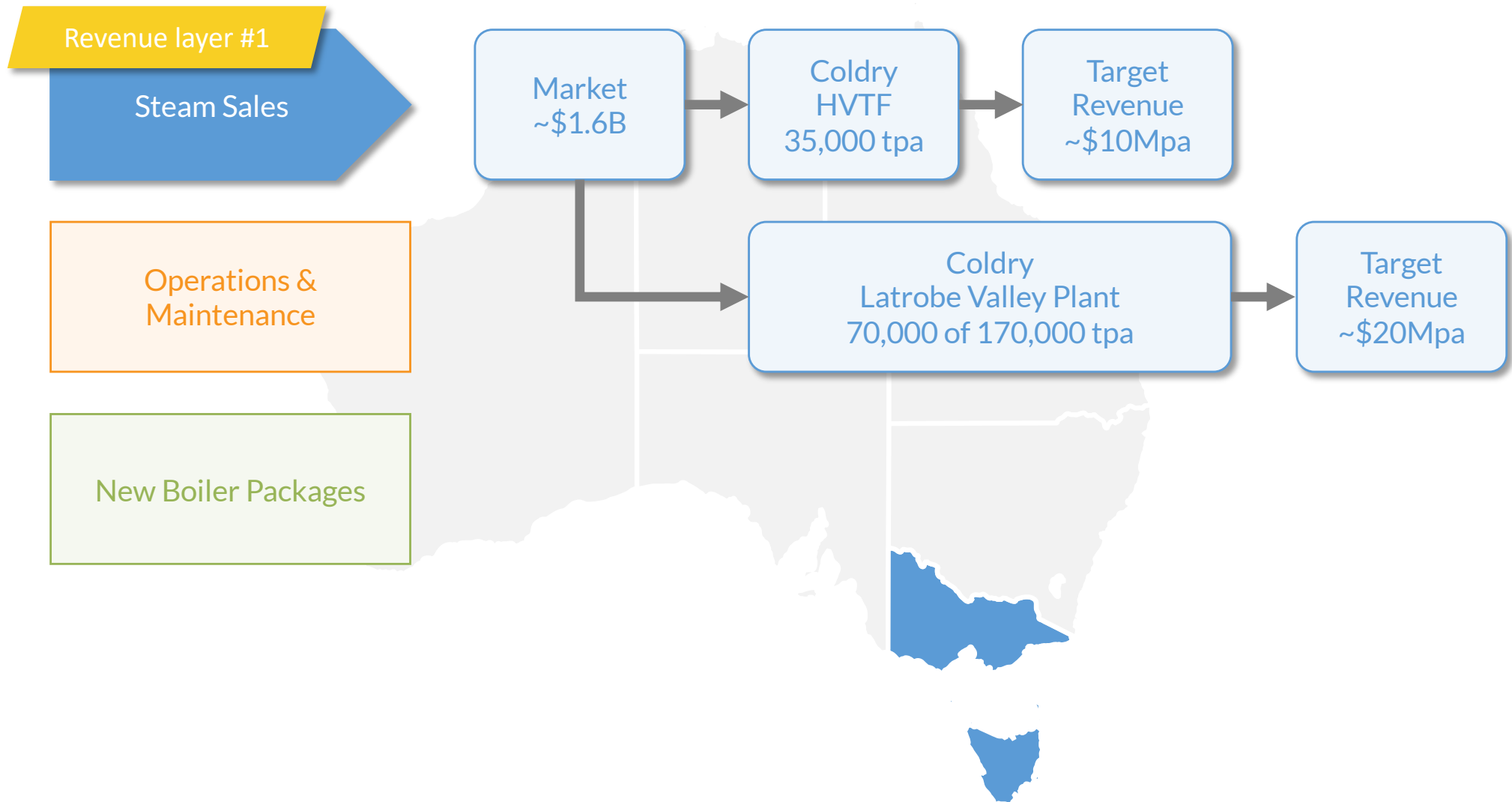
...to name but a few.



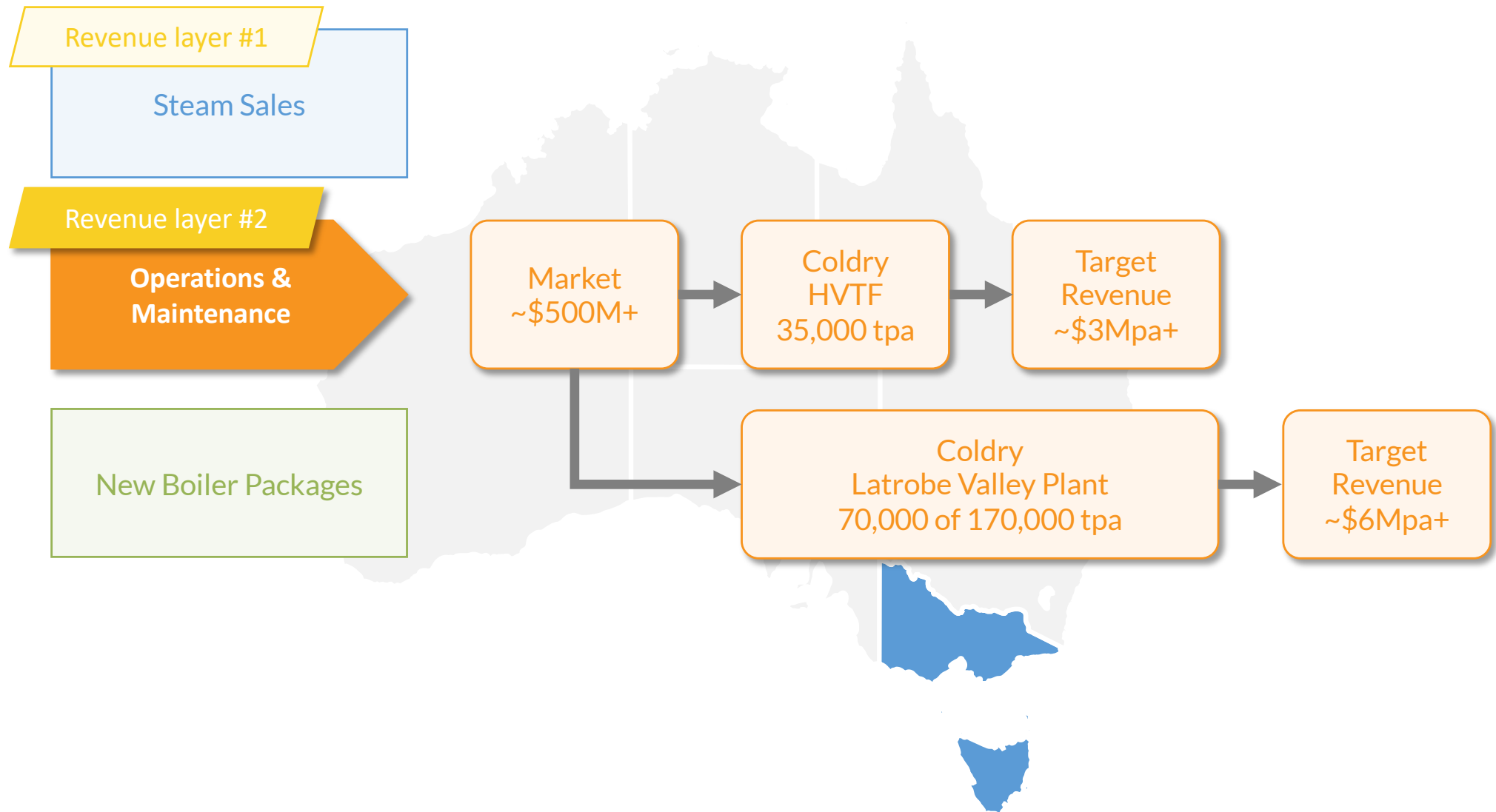
2 | Market size & revenue potential



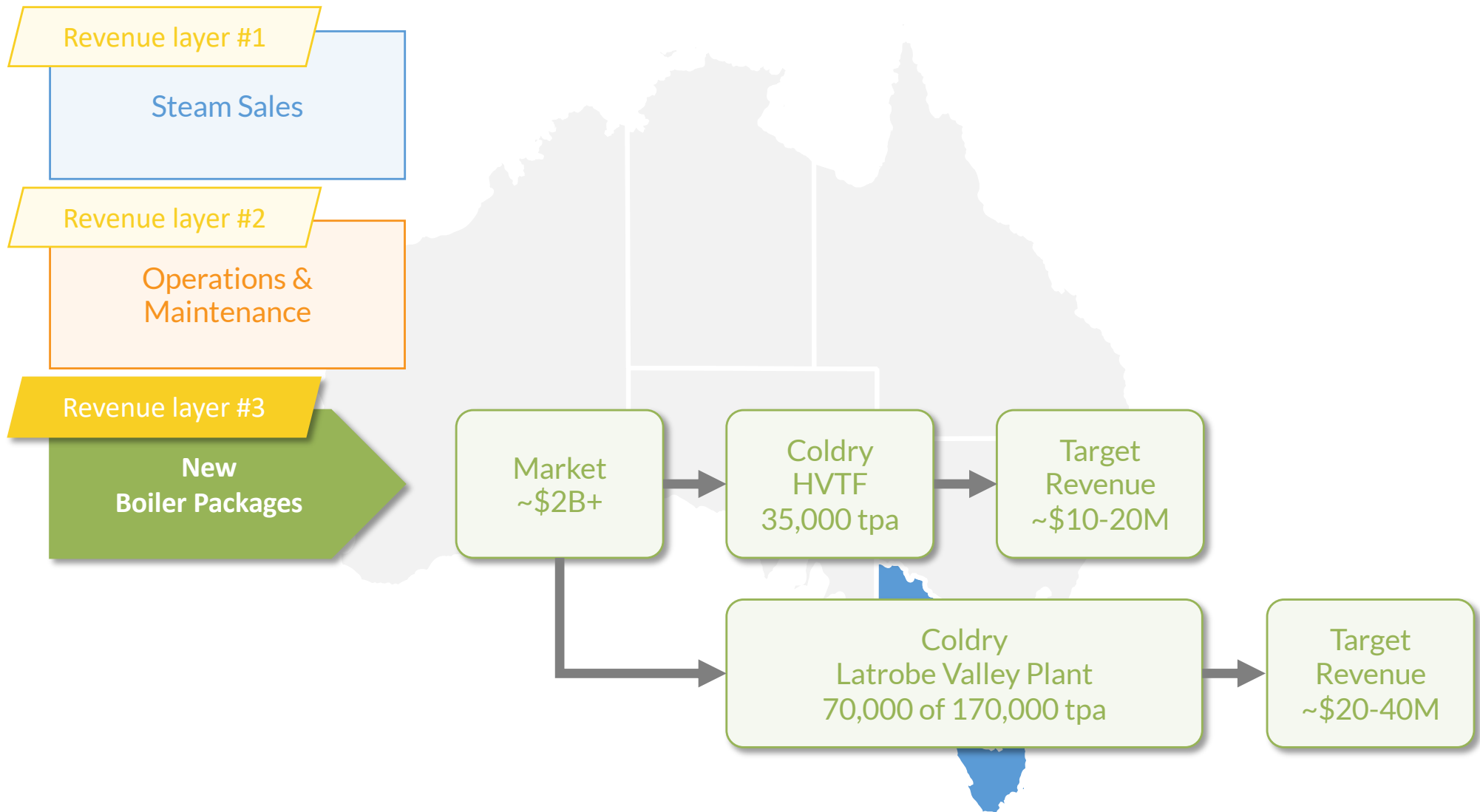
2 | Market size & target revenue



2 | Market size & target revenue



2 | Market size & target revenue



3 | What problems are we solving?

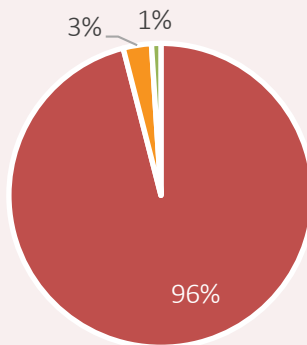


Economic Security

Lifetime total cost of ownership

- Fuel
- Equipment financing
- Operating & maintenance costs
- Boiler efficiency
- Compliance

Lifecycle cost of a steam system



Source: Sustainability Victoria

■ Fuel ■ Capital ■ Maintenance

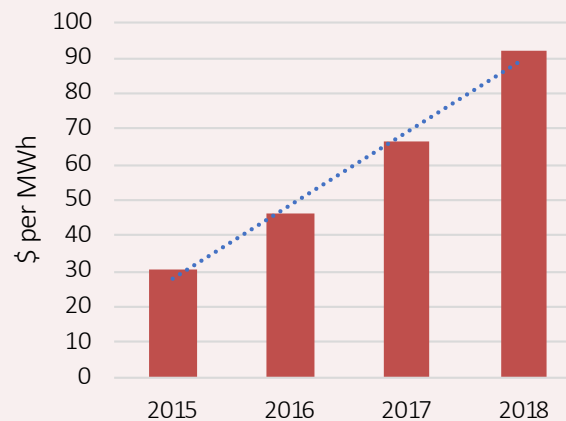


Energy Security

Increasing costs in conventional energy

- Gas – wholesale cost has doubled since 2015, forecast to increase further
- Electricity – wholesale cost has tripled since 2015, forecast to remain high

Victorian average wholesale electricity price

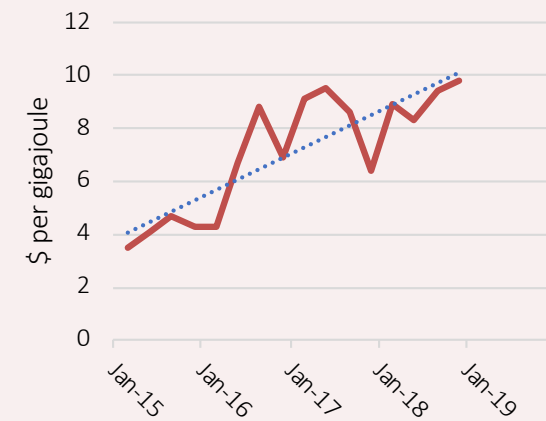


Environmental Security

To manage lifetime total cost of ownership it's essential to run an energy-efficient system and select the right fuel.

A strategic capital investment in a new, efficient boiler system can pay for itself in fuel savings.

Victorian gas market average daily weighted prices by quarter



3 | What problems are we solving?



Economic Security



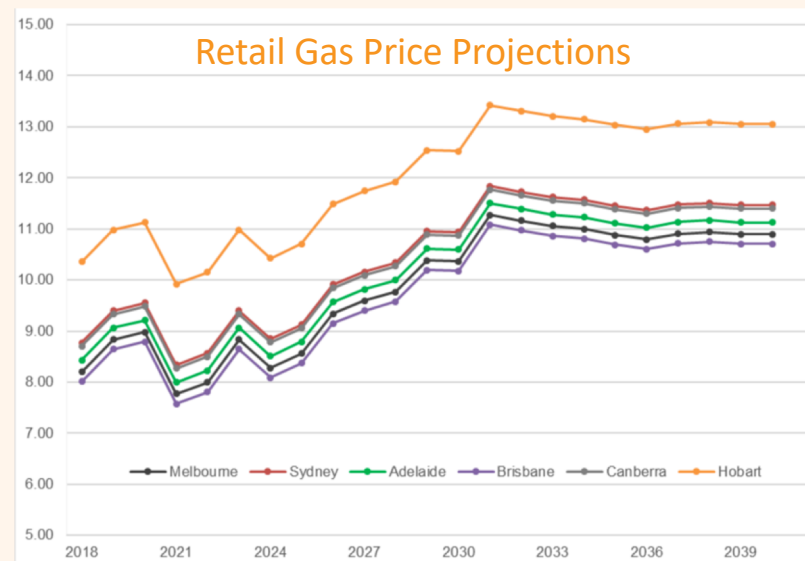
Energy Security



Environmental Security

- **Fuel mix constraints**
 - Regional and seasonal biomass fuel availability
 - Limited fuel choice
 - Boiler design limitations –single fuel designs
- **Biomass can be cheap, but:**
 - Supply is notoriously unreliable
 - Transport cost per GJ is high
 - Highly variable quality & composition
 - Increased fouling, causing increased downtime and maintenance
- **Gas is expensive**
 - Supply constraints
 - Parity pricing
 - AEMO forecasts shortages from 2022
- **Black coal from NSW and QLD:**
 - Uneconomic to transport to Tasmania and Victoria
 - Combustion performance issues due to boiler design

"Eastern Australia is expected to have the closest link to LNG netback prices due to a relatively tight supply/demand balance and competition for supply between domestic and LNG markets. This is reflected by an estimated change in contract price formula whereby the domestic price has a relationship to an LNG/oil reference price such as Brent [oil]."



Source: CORE Energy & Resources, Delivered Wholesale Gas Price Outlook 2019-2040, Figure 5.29

3 | What problems are we solving?



Economic Security



Energy Security



Environmental Security

Biomass – the inconvenient truth:

- Higher CO₂ emissions than Coldry-fired systems due to higher moisture content and lower energy density
- Increased transportation CO₂ footprint due to low energy density
- Higher inefficiencies due to low energy density, high moisture
- High fouling properties due to chemical composition
- Larger handling, stockpiling and transportation challenges
- Net-carbon neutral assumption for biomass is now debunked*

"Legislators say biomass is carbon neutral but scientists disagree"

Scientific American – 23rd March 2018

"Its bad for the climate"

"Wood-fired power stations produce more greenhouse gas emissions than burning coal to get the same energy."

"Burning wood for electricity is globally being recognised now as an incredibly damaging strategic error."

ABC News article, "Why burning trees may not be a good choice for the environment" 23rd Nov 2018

*When biomass waste is used to fuel boilers, it may be considered true biomass and for short cycle crops may also be CO₂ neutral, but when biomass feedstocks are specifically harvested to generate energy, sustainability is compromised, CO₂ neutrality is lost and other applications for the use of that biomass are displaced.

4 | Our competitive advantage



- **Reliable fuel supply:**
 - Sourcing & logistics
 - Supplement, substitute or blend existing fuel with Coldry
- **Turnkey boiler systems packages:**
 - Cost control
 - Reliability
 - Accountability
 - Australian Standard 2593 compliant: Boilers - Safety management and supervision systems
- **Financing of capital upgrades:**
 - Drives greater efficiency gains
 - Amortised into operational cost savings
- **Expert team:**
 - Integrating system design & install, maintenance, system analysis, upgrades, fuel supply, boiler operations and equipment experts into one offering
 - Integrated approach delivers superior outcomes
- **Biomass green credentials**
 - Multi-feedstock systems maintain compliance with biomass requirements for carbon credits
 - Maximising efficiency and minimising CO₂ intensity
 - Lower CO₂ intensity than biomass-only
- **Customer outcome focused:**
 - Consulting-based approach
 - Solution-focused
 - Long term commitment to the customer

5 | Meet Our Team & Partners



Warrick Boyle

Chief Engineer



Orion Coyle

Team Leader and
Boiler Specialist



Josh Doherty

Electrical and
Automation



Daniel Hughes

Fabrication, Installations and
Maintenance

Strategic Partners



Finance



Boiler plant, parts &
engineering



Logistics



Fuel Supply and LV Project Partner



Specialist Boiler
Operations

Are you interested in becoming a strategic partner? Call us to discuss.

6 | Case Study - Steam package, existing boiler

Before

Fuel - Woodchips

- ✗ Variable quality
- ✗ High moisture, low energy
- ✗ Unreliable supply
- ✗ Continuous supplementary LPG

Plant

- ✗ Primary 4MW biomass boiler consuming woodchips, delivering ~2MW on average due to high moisture, low energy content and variable supply
- ✗ Sub-optimal configuration and constrained performance
- ✗ Feedstock limitations
- ✗ Supplementary 3MW gas-fired boiler consuming LPG, delivering ~2MW on average for load balancing

Solution

- System performance analysis and audit
- Implemented mechanical equipment and control system upgrade program
- Install new multi-feedstock system to support Coldry and biomass
- Switch low-efficiency, high CO₂ wood chips for higher efficiency, lower CO₂ Coldry solid fuel
- Performance tuning and optimisation
- Reduce and eliminate continuing need for supplementary LPG usage

Outcomes

- ✓ Delivered >15% saving in total cost of ownership, compared to business as usual
- ✓ Increased plant efficiency
- ✓ Decreased CO₂ by ~30%
- ✓ Convenience of one monthly service fee, including fuel, operations & maintenance
- ✓ Assist with financing of capital upgrades
- ✓ Less furnace fouling resulting in lower downtime
- ✓ New instrumentation & process monitoring
- ✓ Regular monitoring and servicing
- ✓ Operator training
- ✓ AS2593 compliance



6 | Case Study - Steam & new boiler package proposal

Before

Fuel – Natural Gas

- ✗ Expensive
- ✗ Future access uncertain
- ✗ Further price rises likely

Plant

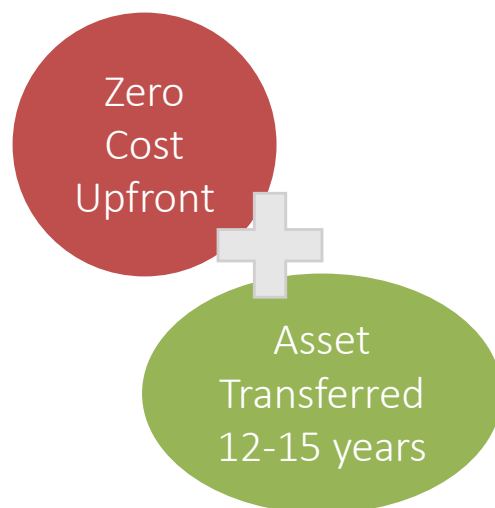
- ✗ 10 MW gas fired systems

Solution

- System performance analysis and audit
- 2 x 5MW multi-feedstock biomass boiler systems
- Coldry fired with ability to blend with local biomass where price and supply is feasible
- Fully integrated lead/lag system
- Eliminate day-to-day use of natural gas but retain the systems as a contingency
- Higher pressure boiler enables optional peak 'lopping' electricity cogeneration to mitigate power prices
- Lifetime total cost of ownership benefits

Outcomes

- ✓ Target >15% saving in total cost of steam generation, compared to business as usual
- ✓ Improved energy security
- ✓ Convenience and cost control:
 - One monthly fee
 - Zero upfront cost financing of new boiler system and capital upgrades
- ✓ Installation of 'best in market', John Thompson boiler systems
- ✓ Asset transfer of new boiler system after 12-15 years, free and unencumbered
- ✓ Regular monitoring and servicing
- ✓ Operator training
- ✓ AS2593 compliance
- ✓ Optional electricity generation to deliver savings on peak costs



7 | The business opportunity

ECT aims to vertically integrate fuel supply through to steam production, delivering a professional, reliable, turnkey solution for commercial and industrial heat and steam customers across Victoria and Tasmania.



Target Capacity 35,000tpa

Investment

\$1.5m-\$2.0m investment to reach 35,000 tpa capacity

Target Revenue

~\$13M pa and once-off revenue of \$10-\$20M from new boiler system installations

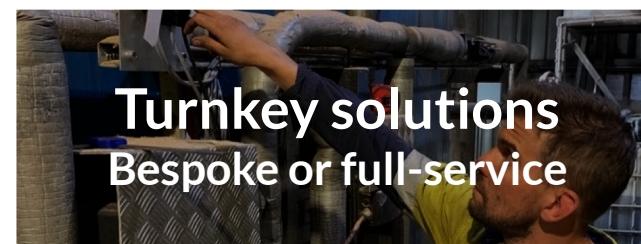


Target Capacity (min)170,000tpa

Steam & boiler business to use 70,000 tpa

Target Revenue

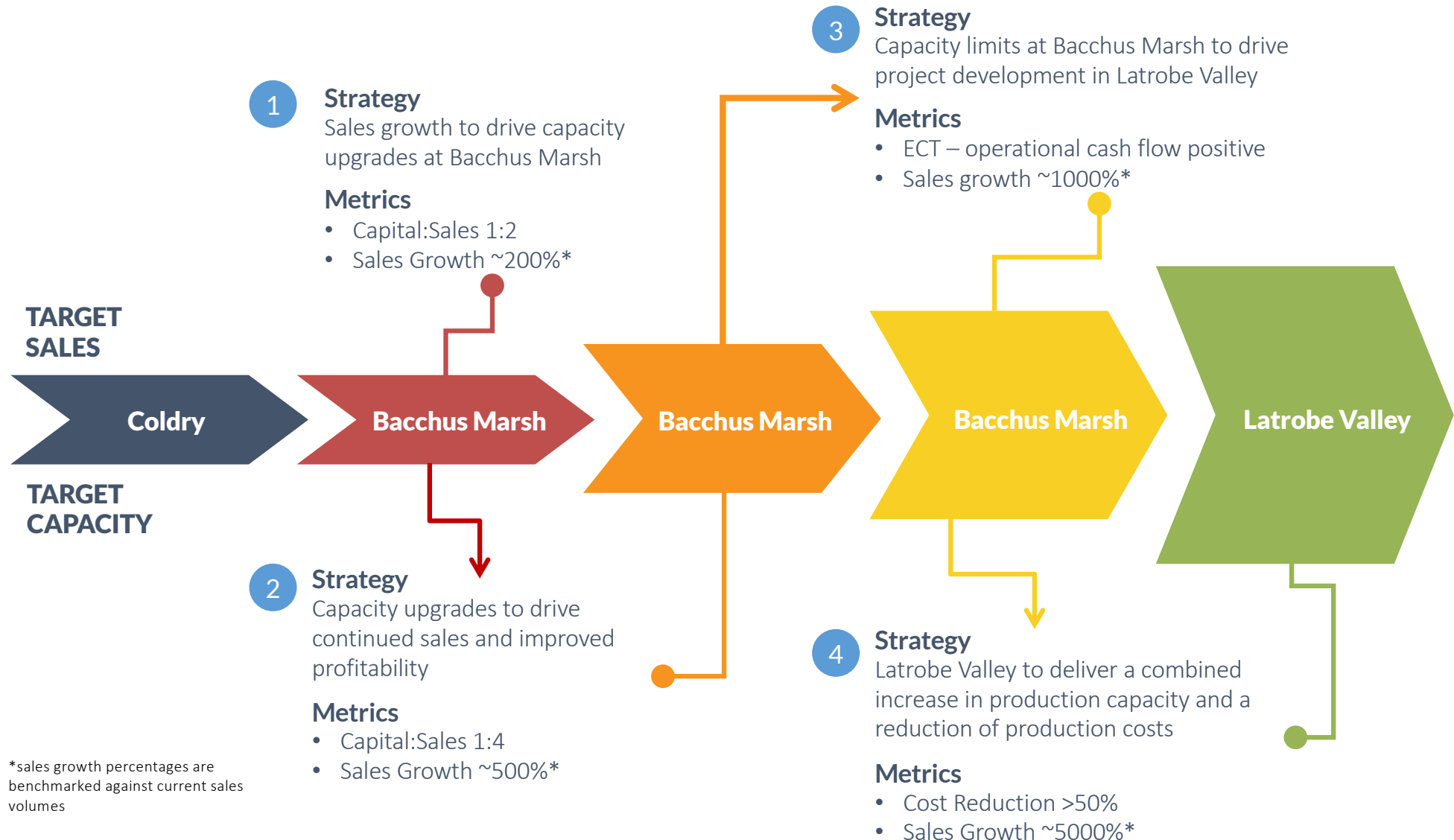
- Triples revenue exposure at only 41% of rated capacity
- Reduces cost of production by up to 60%
- Zero direct CO₂ footprint PLUS additional capacity for other offtake opportunities.

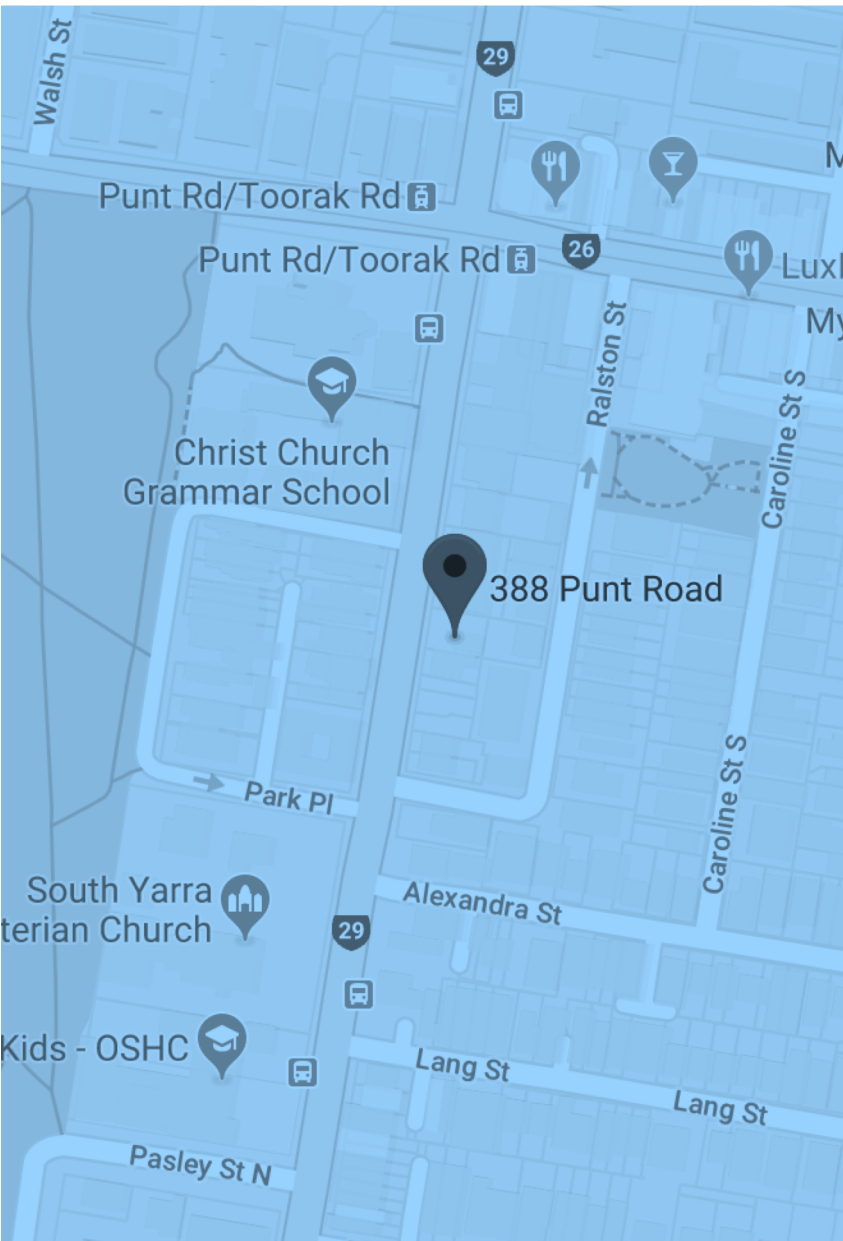


Turnkey solutions Bespoke or full-service

- Fuel supply
- Upgrades
- System diagnosis & optimisation
- New equipment
- Finance
- Operations
- Maintenance
- Compliance

8 | Business Strategy & Performance Metrics





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