



Shareholder Update – Corporate Strategy

Targeting Positive Cash-Flow Inside 12 months

Wednesday 4 September 2019: Environmental Clean Technologies Limited (ASX: ECT) (ECT or Company) is pleased to provide the following update on its corporate strategy, targeted at achieving positive cashflow within the next 12 months.

Key Points:

- ECT targeting 12 months to cashflow positive
- 3-tiered approach involving organic growth, acquisitions and corporate restructure
- Initial focus on upgrades to Coldry high-volume test facility (HVTF) to enter char and syngas market to complement the Company's existing steam and boiler package business

ECT is in the business of researching, developing and commercialising leading edge technologies for upgrading low-rank and waste resources that can deliver both economic and environmental benefits.

The nature of research, development and commercialisation requires a clear long-term vision and considerable investment.

Developing capital-intensive first-of-a-kind technologies such as the Company's Coldry (zero-net emission brown coal drying), HydroMOR (low emission brown coal-based iron making), COHgen (low emission hydrogen production from brown coal) and CDP-WTE (low emission, waste-to-diesel using Coldry) processes is challenging.

Crucial to meeting this long term challenge is establishing operational cashflows which evidence the commercialisation of our technology suite.

To date, the Company has relied on equity and debt capital raisings, together with Government R&D rebate funding to advance development activities.

Over the past four years the Company worked to develop strategic relationships with technically and financially strong project partners in India, noting the supportive market dynamics in India for adoption of its technology suite and the capability to establish a global engineering and fabrication base.

While ECT continues to pursue project opportunities in India with NLC India Limited (NLCIL) and other strategic partners, timelines for the development of its technology suite have stretched, necessitating a change in strategy to ensure near term cashflows.

Over the past 8 months, ECT has been advancing a strategy aimed at developing near-term operational cash-flows in parallel to proposed projects in India, the Latrobe Valley and other regions. As a result of previously announced India project delays, the Company has accelerated these plans.

To deliver positive cashflows sufficient to continue the broader research, development and commercialisation objectives over and above basic operating expenses, the Company is adopting the following three-tiered approach.

Three-Tiered Approach

Tier	Description	Targeted Outcome	Targeted Benefit
Organic Growth	Bacchus Marsh plant; char, syngas and steam fuel production	\$3m EBITDA	Finance basic operational costs
Acquisition	Proposed acquisition targets where ECT technology can be leveraged for better value	\$3M+ EBITDA	Finance ongoing project and technology development
Structural	Corporate restructuring to improve market rating	>20x earnings multiples	Drive return to shareholders

Achieving Positive Cashflow

To achieve positive cashflow, the Company aims to maximise revenues from its existing facility at Bacchus Marsh in addition to ongoing market and application testing of Coldry products to underpin the offtake from larger capacity Coldry plants, including the proposed Latrobe Valley project which targets 200,000-300,000 tpa of Coldry production.

In achieving these near term cashflow objectives, the Company would expect improved financial market support and sentiment whilst also underpinning growth-oriented budgets for project development and further R&D.

Additionally, the Company believes there are significant upside opportunities for technology-leveraged business acquisitions. Through increased economies of scale, and supported by organic revenue growth, the Company aims to consolidate its market position through the acquisition of businesses with complementary processes, similar products and established earnings. These target businesses would be evaluated for synergies with ECT's existing suite of technologies and, where appropriate benefit from their deployment or integration post-acquisition, leveraging the existing business value.

Finally, in building earnings with the first two tiers, ECT is also considering corporate transactions and structures that optimise market ratings for our asset class. At the core of the Company's business model is the development of technology which beneficiates low-rank and waste resources. ECT's technology suite utilises a diverse set of waste feedstocks to produce higher value products with low to zero emissions profiles.

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At the core of the Company's business model is the development of technology which beneficiates low-rank and waste resources. ECT's technology suite utilises a diverse set of waste feedstocks to produce higher value products with low to zero emissions profiles. Aligned to this, ECT is able to position itself as an emerging "waste technology" business with its focus on growing organic earnings first and foremost.

Consistent with this approach, any subsequent acquisition would need to be earnings accretive to allow for financing options which align with shareholder return and any corporate transaction would target:

- 1) Improved access to inputs:
 - a) appropriate feedstocks (such as owning collections of waste plastics or glass), or;
 - b) relevant resources (such as Yallourn lignite via terminal upgrades), or:
- 2) Resource ownership, including:
 - a) above ground resources such as waste millscale and stored waste plastics, or
 - b) below ground resources, such as lignite.

The Company believes that this approach will allow the market to better categorise and rate its value according to an earnings multiple commensurate with its market peers.

This current corporate strategy aligns with ECT's 5-year stated purpose where we, *"bridge the gap between today's use of resources and tomorrow's zero emission future."*

Tier 1 - Organic Growth

The first tier of the strategy aims to leverage the Company's existing Coldry HVTF northwest of Melbourne to build upon the demand in the local market for solid fuel and char products.

Following the successful signing last year (9 August 2018) of a 5-year deal for the provision of fuel and steam services to a Victorian customer, the Company subsequently announced (12 April 2019) the launch of its steam and boiler package division.

This division offers turnkey solutions to industrial-scale steam and hot water users, encompassing the upgrade of existing equipment, installation of new equipment, new equipment financing, operations, maintenance and fuel supply with the unique proposition of offering significant savings to customers on their total cost of ownership.

The launch of this new business initiative was made following upgrades to the Company's Coldry HVTF which increased the testing capacity of the plant, making higher volumes of Coldry solid fuel available for sale.

In parallel, ECT has been assessing other markets for potential Coldry sales. This has led to consideration of the char market. Char serves two key markets; as a smokeless fuel (e.g. BBQ fuel) and as a carburiser, used in specialty metallurgical applications. A market analysis, covering steam fuel, char and syngas markets will be the subject of a further announcement over the coming days.

HOT TOPIC
WASTE v LOW VALUE RESOURCES

'Waste' as a description is merging with 'low value resources'.

This is due to society becoming increasingly aware of the need to transition to a circular economy where recycling, upgrading and optimisation of resources is critical to a sustainable future.

Traditional waste is now viewed for its valuable feedstock potential to downstream processes (plastics to oil, glass to sand), just as lignite is viewed for its valuable chemical input to downstream processes (hydrogen, char, syngas, fertiliser etc).

ECT aims to capitalise on this transition consistent with our strategic vision.

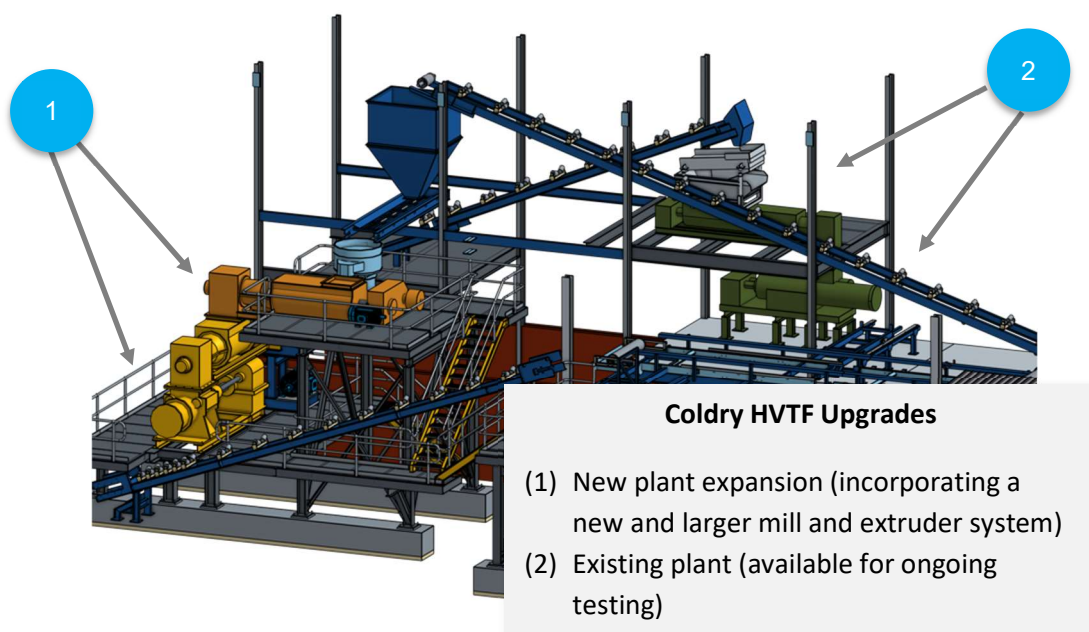
The next phase of development at the HVTF aims to increase capacity to 25,000 tonnes per annum, with the following sales and revenue targets:

Market	Description	Volume (Tonnes per annum)	Revenue Target (\$)
Steam & boiler systems	Support existing marketing & operations	~5,000	1,000,000
Char products	Vertical integration with char process	~10,000 char	5,000,000-6,000,000
Syngas	Derived from the char process	~10,000 (equivalent)	TBC
Total		~25,000	~6,000,000+

To deliver the above sales objective, the Company aims to execute the following key capital works:

#	Upgrade	Description
1	Raw lignite handling	Further upgrade of terminals 15 & 16 at Yallourn coal mine to underpin lignite supply
2	Feedstock preparation	Installation of milling & screening equipment to provide increased volume capacity
3	Primary processing	Installation of larger pug mill & extruder with 25,000 tpa capacity
4	Drying	Installation of larger conditioning belt to provide increased volume capacity and upgrades to packed bed dryer to improve efficiency
5	Char	Installation of rotary char kiln
6	Energy	Installation of syngas harvester for process heat requirements and other economic uses (e.g. co-generation of electricity)

Diagram: Upgrade #3 – Primary Processing



The draft timeline to deliver the upgrades and revenue is as follows:

Activity	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20
Char off-take agreement	■									
Project Planning & Design	■									
Financing	■									
Upgrades Stage 1	Char plant, feedstock handling & preparation									
Upgrades Stage 2		Boiler, Packed Bed Dryer								
Upgrades Stage 3			Pug Mill, Extruder, Conditioning Belt							
Automation						■	■			
Commissioning							■	■	■	
Full Production										■

Further details will be announced over the coming weeks as key elements of the project are finalised, including off-take partners, project design and implementation plan, refined revenue targets and project financing.

The upgrade program will also establish the final plant capacity which may exceed 35,000 tonnes per annum, thus giving potential upside to the economics of this plant as described above.

Preparations for Plant Upgrades

In preparation for the planned upgrades at the HVTF at Bacchus Marsh, the Company is pleased to announce the appointment of two additional Plant Operators Scott Vagala and Shane Willis. Both Operators have been undergoing training at the facility over the last 4 weeks and provide the Company with the ability to implement continuous operating shifts, whilst also managing the raw coal processing, finished product and maintenance programs to optimise plant uptime and through put.

ECT Chief Operating officer Jim Blackburn commented, “We have built a highly competent team to take on all aspects of current plant operations and preparation for the new upgrade program.

“Under the guidance of our Senior Plant Operator David Johnston, lead electrical and fabrication engineers Josh Doherty and Dan Hughes, and with strategic input from Senior Engineers Ashley Moore, Orion Coyle and David Wilson, we have conducted a comprehensive review of the site and are ready to take on the next stage of development. This work has been greatly rewarding for all of us in seeing the current potential of this site fully realised ahead of our focused program for greater volume throughput and product diversification to support the higher value market opportunities that we have been working to develop”.



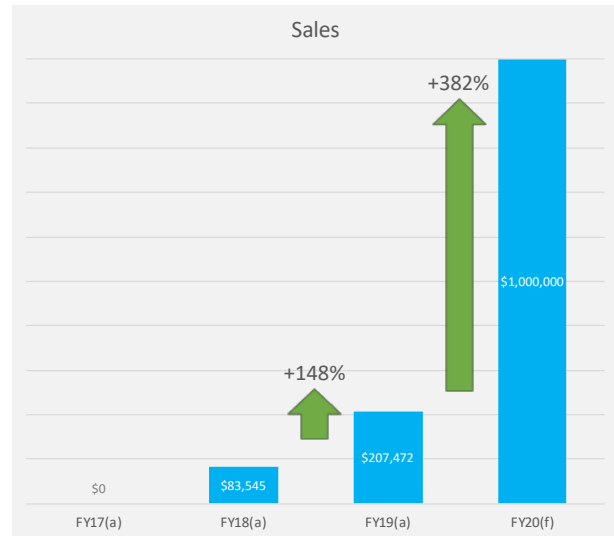
Raw coal stockpile



Financing the Corporate Strategy

In developing the current strategic plan, the board of ECT acknowledged that had the proposed India project proceeded as envisaged, the Company needed to improve short term operational cashflows.




ECT Chairman Glenn Fozard commented, “The development of our steam and boiler services business was the initial foray into establishing operational cashflows. Whilst we are happy with how we have progressed our value proposition, further sales will be underpinned by increasing trust in our service delivery and our brand recognition as we undertake customer quotations and tender responses. Therefore, it is evident that this business, whilst growing, will do so over a longer timeframe than first expected.



“Whilst ECT’s fuel sales from steam and boiler packages (chart, above) have grown significantly in percentage terms over the last three years on the back of a near fully developed marketing message (see table below), sales in FY20 will not be enough to meet the company’s 12 month revenue targets and plant capacity.

“If we add our targeted char sales of \$5M-\$6M to our forecasts, we enter a territory that justifies the additional upgrades at the HVTF.

“Entering the char market will also allow ECT to establish a dedicated off-take partner for the upgraded capacity of the plant as well as produce valuable syngas to offset boiler costs and open up further revenue options from the excess syngas fuel.

Steam and Boiler Marketing		
What are we selling?	An ‘over-the-fence’ steam delivery service which may also include a new boiler package. ECT manages the fuel and operations of the steam system (which may include multiple boiler types), delivering steam for a fixed price.	 January 2018
Who are we selling it to?	Any business that requires auxiliary steam systems for their business. Example: Abattoirs and meat processors, brick makers, wood drying kilns, milk & food processors etc	 June 2018
How do we sell it?	This is something we are currently refining as we undertake direct sales with potential customers, increasingly learning what is most effective including: <ul style="list-style-type: none"> • Fully financed boiler and steam packages • Sale and leaseback of existing steam systems • Total steam system packages including gas, biomass and other solid fuel supply agreements 	 Oct 2019

“We are aiming to underpin the remaining costs of the upgrades foremostly with loan finance against the equipment. Once we have finalised the off-take partners, upgrades program, budget and finance plan during the balance of September an outline will be provided, including an estimate of the financing mix and costs.

“Loan-funded financing to complete the upgrades budget will be given priority over other funding options for the project which we estimate total project costs to not exceed \$2.5M

“Directing our resources and financing into completing the HVTF upgrades to support sales contracts for the full plant capacity is the most effective way to reach our \$3M earnings target, for our first strategic tier, within 12 months.

“It’s important for shareholders to recognise that we are aiming to reach significant operational earnings via this upgrade pathway whilst also improving the feasibility of our larger facility, currently being planned, for the Latrobe Valley. As such, we expect the char product off-take partner will also contract output from the larger plant, benefitting from the lower cost of production provided by economies of scale.”

Tier 2 & 3 - Acquisition & Structural Growth

ECT is currently engaging with potential acquisition targets that meet its requirements, being:

- 1) Existing and established earnings
- 2) Processes or plant which would benefit from the application of one or more of ECT’s existing technologies

Additionally, ECT is in formal but incomplete discussions with companies capable of realising its goals for a listed market re-rating, with a focus on:

- 1) Earnings accretion
- 2) Resource or feedstock access

Pursuant to Listing Rule 3.1A these engagements constitute incomplete proposals or negotiations at present and are exempt from disclosure until such time as a transaction is complete or that the progress of negotiations meets the disclosure requirements.

Further updates will be provided to the market regarding these potential acquisitions as further details are finalised.

Project & Technology Development

Whilst the upgrades at the Company’s HVTF plant will be the main priority (Tier 1) over the coming six months, project & technology development and R&D activities will be advanced as time and resources permit.

ECT Chief Engineer Ashley Moore noted that “ECT’s engineering and technical team in Australia and India will be working to deliver on the mix of projects for our Coldry HVTF expansion project, as well as the continuing advancement of ECT’s suite of technologies. The India team will play a particularly important role in sourcing competitively priced equipment, such as the rotary kiln system, to support the expansion project.”

Latrobe Valley – Integrated Coldry CDP Project

Given the close association of HVTF upgrades with the Latrobe Valley project (the “LV project”) feasibility, outside the priority of the three strategic tiers, the engineering and executive teams will continue to drive

forward with this initiative over the next six months. This is reinforced by the upgrade activities for the HVTF including further upgrades of terminals 15 and 16 at Yallourn Power Station's outfeed conveyor and lignite loading facility.

Next steps for the LV project include:

- **Basic engineering design – Coldry scope and quote:**

The combined Australian and India-based engineering team have completed the scope and quoting process for the Coldry basic engineering program in concert with a network of domestic and international engineering design firms. The Company is pleased with the support and response to the design basis for the LV project and believe the range of firms engaged represent not only good value but industry-leading expertise for our first commercial-scale project.

- **CDP-WTE engineering review program and integration pathway analysis:**

Having onboarded the CDP engineering program over the past 3 months, engineering personnel have been focused on a deep analysis of potential integration pathways with existing Coldry technology, focused on the significant potential for Coldry to supply the stable baseload feedstock for the production of diesel and other valuable hydrocarbon products. The team has been evaluating the full process chain including raw material handling and preparation, core process engineering and opportunities for further development of catalysts and additional output product processing.

- **Targeted short-term CDP-WTE R&D program:**

The ongoing evaluation of the proposed integration pathway between the CDP-WTE and Coldry technologies has provided the Company with some key additional R&D objectives which will support the required basic engineering design process. In this way the teams can target key process steps, and mirror to an extent the R&D program that has been conducted by CDP-WTE for the timber and plastic waste streams over the past 4 years. This narrow focus will allow the timeframe and budgets for any additional R&D activities to remain tightly managed.

- **Revised basic engineering design package for integrated Coldry/CDP-WTE plant:**

The outcome of the technical evaluation and targeted R&D activities will be to then add the CDP-WTE technology element to the scope and budget for the encompassing Integration basic engineering design program. With both technologies advanced to this stage of preparation, the project will move forward as a single design, construction and commissioning program, under a project-specific Special Purpose Vehicle (SPV) and future external capital raising program, supporting both waste-to-energy (including lignite to diesel) and other higher value Coldry applications (char, solid fuels, etc) through proposed market offtake agreements.

CDP-WTE – Alternative Project Opportunities

The Company recently announced the completion of the acquisition of the CDP Waste-to-Energy (WTE) technology and is pursuing two specific objectives:

- 1) LV project: integration of the CDP-WTE technology with the Coldry process, and;
- 2) New project development: exploring the existing and new opportunities for commercial deployment of external CDP-WTE projects utilising wood fibre and plastic waste streams.

As previously announced, a key feature of the acquisition of the CDP Group was the previous project development work undertaken on a number of prospective standalone projects, positioning the CDP-WTE

technology to progress to commercial demonstration. ECT has continued to explore these opportunities with a range of interested parties to quantify and qualify the commercial potential.

The Company has a clear strategy to develop the CDP-WTE technology for deployment globally, as both an integrated Coldry-enabled plant such as proposed for the Latrobe Valley and as a standalone WTE application using other waste feedstocks such as timber and plastic waste.

The Company is close to finalising a licensing and route-to-market structure to support these commercial projects and will announce additional detail as these processes are concluded and terms become binding.

COHgen – Hydrogen Industry Development

COHGen development has continued with the assessment of test data from Monash University, Newcastle University and specialist laboratory service providers aimed at characterising the hydrogen yield potential and profile of lignite through application of the COHgen technology.

The Company has completed phase one of the COHgen R&D program and has set out a further 3 phase program inclusive of patent application and proposed strategic partner involvement. The broad structure for future development of the COHgen technology includes:

- **Phase 2 – Expanded R&D program focused on:**
 - Process chemistry determination
 - Catalyst selection and catalyst manufacturing process development
 - By-product characterisation and application development
 - Generate test vessel to move from batch operations at bench scale to testing that is semi-continuous in nature
 - Patent application process
- **Phase 3 - COHgen test (scale) plant – Bacchus Marsh:**
 - Verification at scale of semi-continuous hydrogen production from COHgen plant
 - Process design for raw materials, formulations, process algorithms
 - Scope of basis of design formulation for pilot / commercial demonstration plant
 - Early verification of economic model (CAPEX and OPEX cost factors) for pilot scale / commercial demonstration plant
- **Phase 4 - COHgen pilot scale / commercial demonstration plant:**
 - Investment / corporate / legal structure
 - Basic engineering design program
 - Detailed engineering design program
 - Project implementation

As a key objective stemming from the continuing development of COHgen, ECT will adopt a collaborative approach to advance COHgen commercialisation. To this end the Company has commenced discussions with potential strategic partners whom have broader interests aligned with hydrogen production, storage, distribution and consumption. Considering the stage of development and potential scale of commercial deployment, ECT believes it would be prudent to engage in a joint venture structure early in the technology development lifecycle and has based plans for funding, intellectual property (IP) development and commercialisation on this approach.

India Project Activities

The Company's Coldry technology provides the gateway solution to all of the subsequent ECT technology portfolio. In addition, it provides its own unique standalone solution as direct feedstock for a range of energy-intensive systems.

This is of particular relevance to the Company's continuing activities in India.

As previously stated, Coldry offers a cost-effective solution for significantly lower CO₂ intensity than as-mined lignite. This coupled with India's commitment under the Paris Climate Agreement to reducing its CO₂ intensity will continue to drive the Company's interest in developing its technology portfolio in the region. Specifically, the Company's Coldry testing will focus on the higher value utility steam and heat market, the waste-to-energy (WTE) market and downstream processes such as HydroMOR, hydrogen, char and fertiliser production, all of which have strong prospects as part of our portfolio of technologies in India.

Having formally concluded the previous MOU, the Company has now entered into discussion with both government and private companies who have expressed interest in both pilot plant and commercial projects.

Importantly, the Company is clear on a desired structure for any new partnerships in India, both in terms of likely commercial structures (funding, IP, resources supply, etc) and timeframe.

ECT Chairman Glenn Fozard commented, "The ECT board has made a number of very clear and positive decisions with regard to our continued presence in India. These have been made in light of the current high pace of domestic opportunities as well as the inherent value in our relationships and networks in India. We believe that the current in-country resources, led by P. Selvakumar can and will deliver quantified and implementable opportunities whilst allowing the Australian executive team to focus on near term cashflows and corporate transactions domestically."

The Company looks forward to providing further updates and requests the current trading halt be lifted effective immediately.

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 HydroMOR

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

HydroMOR is a simple, low cost, low emission, hydrogen-driven technology which enables the use of 'low value' feedstocks to produce primary iron.

About COHgen

The COHgen process has the potential to deliver a lower cost, lower emission method for hydrogen production from brown coal.

COHgen is currently advancing through fundamental laboratory development to inform its patent application ahead of scale up and commercialisation.

About CDP-WTE

The catalytic depolymerisation-based waste-to-energy process converts 'low-value' resources into higher-value diesel and other valuable by-products.

CDP-WTE can be deployed as a standalone solution or integrated with the Coldry process to deliver higher-value, lower-emission energy solutions to lignite resource owners.

Areas covered in this announcement:

ECT (ASX:ECT)	ECT Finance	ECT India	India Project	Aust. Projects	R&D	HVTF	Business Develop	Sales
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