ENVIRONMENTAL CLEAN TECHNOLOGIES LIMITED

Shareholder Update

Boiler trials and Coldry logistics and sales agreement

Wednesday 1 November 2017: Environmental Clean Technologies Limited (ASX:ESI) (ECT or Company) is pleased to provide the following update on its research, development and commercialisation activities in Victoria.

Key points

- Major end-user boiler trial completed with AKD Softwoods
- Outcomes support research and local market development objectives
- Logistics & sales agreement signed with logistics firm, Jebsens

Boiler trials completed

The Company previously announced (21 July 2017) research and development (R&D) trial activities with a large consumer of solid fuel in southwestern Victoria as part of its broader Coldry commercialisation strategy.

This activity, pursued with AKD Softwoods in Colac, is now complete, having delivered valuable outcomes.

Coldry Commercialisation Strategy

Through FY2017 and into the first quarter of FY2018, ECT has continued to develop its strategy for offering a cost-effective solid fuel (i.e. Coldry pellets) for use in steam and hot water boiler systems across Victoria, and potentially to markets interstate and overseas.

The cost-effectiveness of the Company's solid fuel sits in contrast to the rising costs and falling security of supply of other energy sources, including:

- Natural gas $10-$20 Gj
- LPG $17-$50 Gj
- Biomass $9-$25 Gj

Coldry solid fuel pellets using lignite sourced from the Yallourn open-cut mine, have a distinct cost advantage against all the above options.

ECT Chairman, Glenn Fozard commented, "This advantage is not surprising given the readily available abundance of lignite inside the pre-existing infrastructure. Economies of scale already exist in the natural resource and the relatively low-cost means of extraction.

"The rapidly changing face of Victoria's fuel supply mix, resulting in increased reliance on higher-priced gas, will continue to place pressure on local industries reliant on reasonably priced fuel inputs to remain competitive. Without a choice of fuel that helps maintain Victorian industry's competitive advantage, the state may continue to see an accelerated contraction of important sectors such as manufacturing, food processing and other energy-intensive employers.

"Our proposition for commercialisation, therefore, remains clear and concise.

"And while these market opportunities are a clear signal for commercialisation, on their own they don't make a commercial ready proposition certain. As such, we continue to improve this certainty through effective R&D programming to test and refine variables expected at a larger scale, under a continuous processing environment. This is consistent with our commercialisation strategy where a broad range of demand factors result in market 'Pull' as we 'Push' with R&D programs that increase technology options (see diagram, top of next page).

Commercialisation Pathway

ECT's commercialisation strategy is a core part of its business model. Revenue is the goal.

- Commercialisation is the process that converts ideas, research, or prototypes into viable products and production systems.
- Commercialisation relies on the creation of effective manufacturing, supply chain and implementation strategies.
- Research, development and commercialisation require significant investment before revenue is realised.
- Our commercialisation strategy also includes marketing and sales systems, which will seek to drive the transition from research investment to revenue generation.

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"Our goal in Victoria is to deliver a zero-emissions gateway fuel plant. We believe this will help 'future-proof' Victoria's energy prices while establishing a scalable access point for the improved utilisation of Victoria's brown coal reserves, including high efficiency, low emission (HELE) power stations, hydrogen production and fertiliser production, to name but a few."

Over this last 12 months, the Company has set its strategy, which comprises three targeted programs aimed at testing our alternative solid fuel, produced using our Coldry technology, under commercial conditions. These programs include:

- 800-tonne boiler trial – AKD Softwoods, Colac
- Drying simulation trial program – ECT Bacchus Marsh
- 3000-tonne continuous production trial program – strategic partner collaboration

800-tonne Boiler trial – AKD Softwoods, Colac

With planning taking place through May and early June 2017, ECT undertook an extensive trial of Coldry solid fuel produced at the Bacchus Marsh High Volume Test Facility (HVTF) in a 4.2MW (thermal) fluidised bed steam boiler system located in Colac, Western Victoria.

This trial was undertaken in parallel with the stage 2 upgrades at the HVTF, which targeted improvements to storage, drying efficiency, inventory and logistics management and product handling.

After three months, the trial has now been completed and the data processed, ahead of moving into the next phase of a drying simulation program at Bacchus Marsh. The boiler trial, conducted in collaboration with industry partners, AKD, Mecrus, Calleja Transport and Geelong Boiler Systems, assessed all points of the commercial supply chain in producing, transporting and combusting Coldry solid fuel pellets.

Outcomes and learnings from the trials include the following.

Product specification is critical to efficient performance outcomes

- The trial tested product with a range of specifications, including two different sources of raw material, several moisture content profiles and variations in pellet format.
- This test scope provided valuable performance data, defining and refining appropriate product specification parameters relative to the specific boiler type, and informing the development of specifications for other systems (now the subject of further testing).
- Optimised Coldry performed better than briquettes, and the end user experience with appropriate specification Coldry was positive, reinforcing the business case for ongoing local market development. Importantly, the requirements of many smaller utility boilers may require some support systems to be adapted to achieve similar positive performance, though this is another aspect of key learnings developed during the trials.

Logistics and inventory management are critical elements of a solid fuel business

- The trials provided a basis for significant improvements in supply chain management, product handling and infeed control processes to achieve suitable operations with a new material
- In particular, ECT acknowledges the opportunity to partner with additional third-party logistics providers that have existing access to, and relationships with, solid fuel market customers.

Identified opportunity for product enhancements through targeted research and development

- The trial program highlighted specific opportunities for additional, targeted research to enhance the performance of the Coldry product including:
    - Potential additives for composite pellet production
    - Temperature and air speed conditions for pellet conditioning
    - Temperature and air speed conditions for pellet drying
    - Bulk handling and containerised storage methods

Support for the commercialisation pathway and test product sales

- The positive outcomes of the trial program directly support and reinforce the current feasibility study (announcement 4 September 2017) for a demonstration-scale Coldry plant in the Latrobe Valley to provide a solid fuel alternative to high-priced gas.
- 'In-specification' test product produced from ongoing R&D activities will continue to be available to consumers.
- There exists the potential to repurpose the HVTF, following completion of the R&D program, to dedicated consumer production ahead of the demo-scale plant start.

As mentioned, the data generated via the trial with AKD has proved highly valuable, both in what it has confirmed and in highlighting remaining challenges.

In this respect, and as can be anticipated in a commercialisation program of this scale, the trial presented several key learning opportunities, which provided important feedback to the research team and have driven a number of fundamental changes to the Coldry development program including:

1. Coal Feedstock:
    a. The trial identified the requirement to switch feedstock coal from Maddingley (Bacchus Marsh) to Yallourn (Latrobe Valley) to deliver solid fuel with lower sulphur and ash.
    b. In the first instance, this change required sourcing of coal and associated transport and logistics management from the Latrobe Valley to the HVTF in Bacchus Marsh.
    c. This change necessitated the reprogramming of production metrics at Bacchus Marsh across the entire processing line, extending the trial program by 3 weeks.

2. Product Variability:

   The completion of stage 2 upgrades to the HVTF has provided some significant changes to plant operations, which in turn provided unexpected challenges under high volume production. These included:

   i. Higher system output created inventory management challenges
   ii. Improved Packed Bed Dryer efficiency lead to instances of over-drying of the pellets.
   iii. Switching of feedstock coal and subsequent different coal chemistry affected moisture content and drying profile during processing
   iv. Improved insulation and air leak repairs increased both the temperature and air speed profile within the drying system, contributing to instances of over-drying of the product.

Having settled the Latrobe Valley logistics arrangements and progressed the next stage of drying simulation trials, the majority of these issues have been addressed.

Notwithstanding the R&D nature of this project, the Company generated $162,000 in revenues from the project.

Jim Blackburn, ECT Chief Operating Officer and executive sponsor of the R&D trial commented, "The trial was an important next step in commercialising Coldry. We had previously shown success in small boiler systems and to take on a system with substantial daily consumption volumes, allowed us to test our operational capability as well as the technical capability of Coldry."

"We will now incorporate our substantial learnings from this trial into the next phase of our strategy. The interim aim here is to provide a sound basis for stage 3 upgrades at the High-Volume Test Facility and deliver a facility readily able to support ongoing large trials and sales of Coldry pellets."

One of the key outcomes of the AKD trial was to identify areas of improvement and efficiencies within the logistics chain as well as support further sales and distribution of our Coldry product.

Next Coldry Trial Program – 3000 tonnes

Upon completion of the Drying Simulation Program at Bacchus Marsh, ECT intends to undertake a trial of Coldry solid fuel pellets which will incorporate the benefits of the improvements realised through prior trials and R&D programs.

In addition to its R&D focus, the next trial intends to support the identification and development of contracts for off-take to help underpin the feasibility of the Latrobe Valley Coldry project as well as other commercial sales.

Given the synergies between the Latrobe Valley project and the 3000-tonne trial, the Company has prioritised site selection and market analysis within the feasibility plan. Early determination of a site partner, which will also drive coal feedstock selection, is important to ensure the greatest alignment between the next trial program and the feasibility study for the Latrobe Valley Coldry project.

Further updates will be provided as they become available.

Logistics, Yard Management and Sales Agreement - Jebsens

ECT is pleased to announce it has entered an agreement with Jebsens, for logistics and yard management at its Bacchus Marsh High-Volume Test Facility.

Jebsens are well experienced with the logistical challenges presented by the storage and transport of solid fuel having been the logistics manager for IEPL (the "Morwell Briquette Factory").

The agreement will see Jebsens manage the logistics chain, including yard management, at Bacchus Marsh and into other plants that are built across Victoria, including the Latrobe Valley Coldry project currently under feasibility.

Jebsens also has strong existing relationships with solid fuel users in Victoria and Tasmania. As a result, ECT has agreed to offer them an exclusive sales services and distribution agreement for the capacity of Bacchus Marsh as well as a further 100,000 tonnes.

Jebsens' role will be to originate and support sales leads, utilising their extensive network of relationships with end users.

The agreement allows ECT to develop sales leads ahead of incurring the costs of the yard management and third-party logistics services. These obligations will only come into effect if the business case is approved by ECT's Board, with sales being a major influence on the approval.

ECT Chairman, Glenn Fozard commented "As a key outcome of the recently completed trial program, we are delighted to add Jebsens to our list of strategic partners. With their knowledge of key markets and customers for this type of fuel, we have been able to establish an agreement which provides both the critical logistics management services, and access to Jebsens' customer relationships. This underpins our Coldry commercialisation strategy in providing potential sales for the full future capacity of the Bacchus Marsh facility (up to 35,000 tonnes per annum) as well as scope for a further 100,000 tonnes per annum from the Latrobe Valley plant, which is currently the subject of feasibility planning."

"Having an experienced logistics expert who also supports sales of Coldry solid fuel will now allow ECT to focus on technical improvements of the product and operational rigour in running the plant."

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 CO_2 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:ESI)	ECT Finance	ECT India	India Project	Aust. Project	R&D	HVTF	Business Develop.	Sales