ENVIRONMENTAL CLEAN TECHNOLOGIES LIMITED

Shareholder Update – Local Activity

23 March 2021: Environmental Clean Technologies Limited (ASX: ECT) (ECT or Company) is pleased to provide the following general update on Company activities.

Overview:

- Status Update – Coldry Upgrade Project
- Yallourn power station closure opportunity
- COHgen – enabling lower cost, low or zero emission hydrogen production from brown coal
- Capital management update
- Coldry Upgrade Project – activity overview
- Coldry Upgrade Project – background

Status Update – Coldry Small-scale Commercial Demonstration

In recent announcements (24 December 2020, 15 January 2021) the Company provided updates on the progress of its Coldry upgrade project, aimed at enabling the small-scale commercial demonstration of its unique, low-cost, zero-emission brown coal drying technology in Victoria, Australia.

Chairman, Glenn Fozard commented, "We're pleased to report that overall progress on Phase 1 continues, despite several shipping delays and some severe weather events shifting the timelines of certain activities. At present, we anticipate completion of construction during May, ahead of commissioning and testing throughout May and June."

Chief Engineer, Mr Ashley Moore added, "We've safely and successfully installed the main components of our primary processing train, namely the mixer, mill and extruder (see photo, right), following the completion of the required structural supports and clearing out the building's prior equipment.

Photo above: mixer, mill and extruder being installed

"In addition, we've disassembled the internal walls of our existing packed bed dryer (PBD), ready to install the newly fabricated walls, starting the last week of March. The new walls feature design and positioning changes driven by the accumulated operational experience with the prior Coldry pilot plant. These changes are aimed at further improving drying efficiency, increasing throughput and decreasing the cost of production."

ECT Chairman Glenn Fozard added, "Although frustrated by the shipping delays, we have managed to limit the impact on the schedule.

"Successful completion of this small-scale commercial demonstration plant is part of our broader commercialisation strategy, which involves the further potential scale-up of our

Coldry process in Victoria's Latrobe Valley, supporting the higher value, lower emission utilisation of lignite via a range of downstream applications, including solid fuel, liquid fuel, specialty chemicals and hydrogen production."

Previously, the Company outlined the status of its Coldry upgrade project, noting:

- ✓ The completion of the site layout and basic design
- ✓ Site preparation works commenced
- ✓ Process tender packages issued
- ✓ Clearing of interior of existing building ahead of plant installation
- ✓ Design of support structures
- ✓ Construction of shelters for coverage of coal supply, incorporating workshop & laboratory facilities

In addition, the Company has completed:

- ✓ Installation of mixer, mill and extruder with support structures
- ✓ Removal of all PBD walls in preparation for installation of new design
- ✓ Fabrication of all support and safety structures
- ✓ Electrical switch room upgrades and installation of cable trays
- ✓ Laboratory and workshop electricals in preparation for genset install

The Company also provided an outline of the targeted project timeline (next page), updated to reflect the impact of COVID-19 and weather on procurement of plant components, and noting the following next steps:

Description	Status
Equipment procurement (tender, fabrication, shipping, delivery)	80% complete
New motor control centre & control room (system automation & diagnostics)	50% complete
Preparation of the existing building ahead of the installation of new equipment	85% complete
Conditioning system design, fabrication, installation and testing	40% complete
Electrical and process control, instrumentation and cabling (design & selection, fabrication & installation, field wiring & terminations)	30% complete
Commissioning of mixer, mill and extruder	Scheduled for April
Completion of workshop & laboratory facilities	80% complete
Structure & platforms – fabrication	Complete
Structure & platforms – installation	30% complete
Packed bed dryer – upgrade; removal works, reconfiguration of internal designs	50% complete
Heat system upgrades	50% complete
Commissioning preparation, dry runs & first operations	Pending

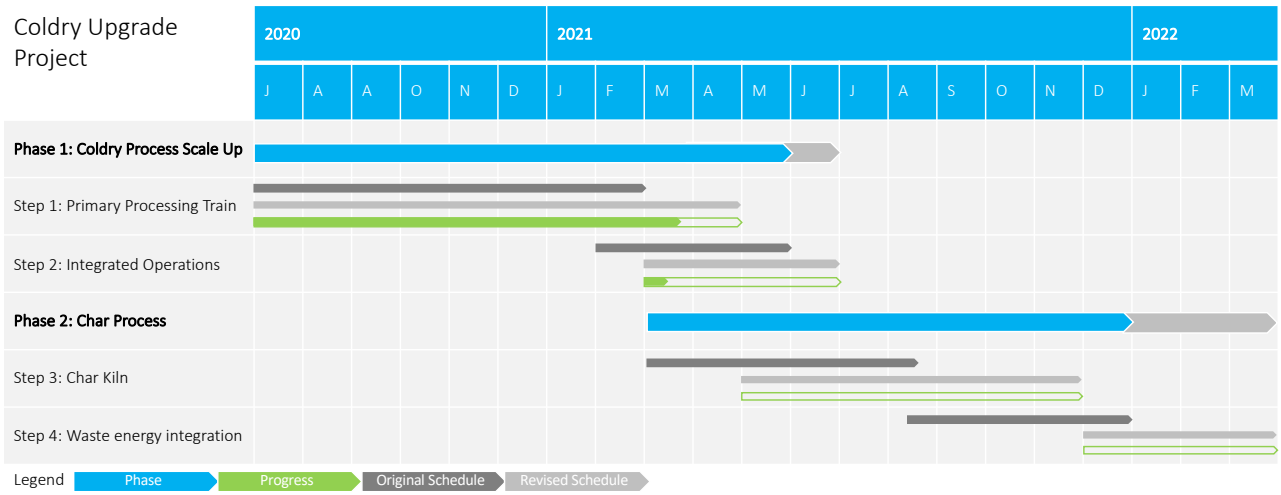
COVID Impacts

The below Gantt chart shows the current status of the project.

Chief Engineer, Ashley Moore noted, “COVID-19 continues to have impacts on shipping and procurement lead times. These impacts are shown in the revised schedule.

“While Phase 1 has experienced some delays it is currently on track for delivery during June. We have reviewed Phase 2 to include provision for ongoing supply chain uncertainties, revising our target from December 2021 to March 2022.

“We will continue to monitor supply chain impacts and update our guidance on the schedule accordingly.”



Pages 7 through 12 provide further details and photos of activity over the past 3 months, including:

- Installation of mixer, mill & extruder
- Packed Bed Dryer upgrade
- Structure & platforms
- Build of Raw Coal Storage, Workshop and Laboratory
- Preparation of the existing building
- Heat system upgrades
- New electrical & process control room (system automation & diagnostics)
- Conditioning system fabrication, installation and testing

Coldry Primary Processing Train
Foreground: mixer, mill and extruder.
Background: Cable trays installed ready for Motor Control Centre to be installed.

ECT poised to demonstrate 'gateway' solution to future use of brown coal

The announcement by EnergyAustralia on 10 March 2021 that it would close the Yallourn power station in mid-2028 highlights the importance of Coldry as the 'gateway' solution for the future of Victoria's brown coal resource.

Importantly, the closure does not affect the immediate Coldry project at Bacchus Marsh nor the ability to source lignite from the Yallourn mine for that project.

The closure does however raise the importance of Coldry as the 'gateway' solution for the future use of the resource and presents the current Coldry project, scheduled for commissioning in coming months, as the only meaningful scale demonstration of an alternative to power generation, for the low-emission application for the Latrobe Valley's abundant, world-class coal resource.

ECT holds the view that unless a viable alternative use for lignite, other than high-emission power generation, is validated in the near term, the brown coal resource is at risk of being stranded, with billions of dollars of future economic activity possibly lost to the region. In this context, the Company believes that the success of the Coldry project at Bacchus Marsh can shine a light on that viable pathway for the future low emission use of the brown coal resource.

The Company looks forward to providing further information on this opportunity in future updates.

Hydrogen production (COHGen) – next stage commercialisation

Recently, the Company has received a great deal of interest from the investment market and shareholders about the progress of its highly prospective COHgen technology and is currently developing a strategy and associated budget for progression to the next stage of commercialisation.

COHGen leverages the Company's Coldry and HydroMOR processes to deliver a unique method for producing hydrogen from brown coal.

Key benefits of the COHgen process include:

- Lower CO_2 emissions than conventional brown coal gasification
- Lower carbon capture and storage cost, due to lower CO_2 emissions
- Higher hydrogen yield per tonne of coal than conventional brown coal gasification
- Lower estimated cost than conventional brown coal, renewable and natural gas-based hydrogen production routes
- Utilises an abundant, affordable, environmentally friendly catalyst that can be used multiple times.

ECT's Research Manager, Dr Vivek Ravishankar commented, "One of the significant ways to economically achieve net zero carbon emissions for brown coal-based hydrogen production is through the development of innovative technologies like COHgen that create novel ways to produce hydrogen that also channels the residual carbon into valuable by-products.

"COHgen's ability to achieve lower CO_2 emissions than conventional brown coal-based hydrogen production methods is due to most of the carbon in the coal being captured and stored in solid form within the process. We believe technologies, such as COHgen, can help unlock the future low emission use of brown coal, supporting energy security whilst maintaining reliability and affordability."

Further details on the COHgen development strategy will be announced in due course.

Capital Management Update

The Company provided an update on 18 June 2020 following the initial COVID-19 lockdown period, noting the budget for the full implementation of the upgrade project had increased by ~$1.2 million and the timeline for the commissioning of Phase 1 had been pushed back to April 2021.

Currently, the project is on track to conclude construction of Phase 1 early May, followed by commissioning during the balance of May and June.

The Company further noted in its 18 June 2020 update that it anticipated that the increased cost would be financed by a number of non-dilutive solutions, including project and equipment finance, government grants, R&D tax initiatives and reduced or deferred capital expenditure.

At present, these solutions are expected to deliver the funding required to complete Phase 1.

Entering Phase 2, which involves the addition of the char kiln and associated integration components budgeted at ~$1.9M, the need to source further funding solutions is anticipated. The Company is exploring a range of options with preference given to non-dilutive options including:

- Increased R&D loan limits
- Government grant and funding programs
- Project contributions from strategic and technology partners
- Alternative debt funding solutions

There is also equity based funding potential via the listed options and existing Equity Lending Facility (ELF), although the outcome of these will be heavily influenced by share price:

- ECTOE options – Strike of 0.3c – fully diluted cash = $7.32 million
- ELF 2021 – Strike of 0.1c – fully diluted cash = $2.05 million

R&D loan

The Company has finalised the conditions precedent to start the drawdown of its new R&D loan facility with a $1.2 million limit.

We are looking forward to working further with specialist lender, RnD Funding, for ongoing financing solutions over the coming months in support of completing the funding for Phase 2.

Insurance proceeds

The Company received the final insurance payment of $593,000, in January 2021.

Government grants and funding

There are a range of government grants and programs designed to support innovation across several key industry sectors, including minerals, manufacturing and energy exports.

Where the Company's technologies meet the criteria of these programs, applications will be submitted in support of attracting funding or support for their development or commercialisation.

Driving this effort is ECT's recently appointed non-executive director, the Hon. Neil O'Keefe MHR, who brings extensive government relations experience as a former Federal Member of Parliament.

To date, ECT has been building the momentum of credibility within government funding programs with the Company previously announcing participation in the following programs:

- Future Energy Exports Cooperative Research Centre (FEnEx CRC):
    - FEnEx CRC is helping focus and drive hydrogen research efforts across industry and academia
    - Government policy supports a technology-neutral approach, providing clear price and emission targets for industry:
        - H2 (hydrogen) under $2 per kilogram by 2030
        - CO_2 emissions per kilogram of 'clean' H2 must be at least 60% less than the 'benchmark' threshold emissions of 10.9kg CO_2 per kg of hydrogen
    - Two hydrogen production pathways will receive support:
        - Electrochemical – splitting water using an electrolyser powered by electricity
        - Thermochemical – splitting hydrocarbons derived from natural gas, coal or oil, combined with carbon capture and storage (CCS)
    - ECT will support the advancement of CCS hydrogen through the development of its two highly prospective technologies:
        - COHgen – a unique and novel process for the low-cost production of hydrogen from lignite as an alternative to the gasification-steam reforming process
        - Coldry – the world's only low temperature, low-pressure lignite drying process which also features a net-zero carbon footprint, providing a cost-effective drying solution for both the COHgen process and the standard gasification-steam reforming hydrogen production process
- Innovation Connections: HydroMOR grant
    - The Company has attracted support for the ongoing research and development of its HydroMOR technology.
    - ECT, in partnership with CSIRO, has been awarded a $50,000 grant from the Commonwealth Government Department of Industry, Science, Energy and Resources toward a $100,000 project aimed at profiling the performance of the Company's HydroMOR technology across a range of feedstocks.
    - HydroMOR, which stands for 'hydrogen metal oxide reduction', is the Company's lignite-based, hydrogen-driven, low-emission primary iron making process which enables the utilisation of alternative low grade and waste resources, improving the economic and environmental outcomes of primary iron production.
    - HydroMOR utilises the Coldry process as its front-end drying and material agglomeration stage.
    - Contracts have been executed and the activities are being led by ECT's Research Manager, Dr Vivek Ravisankar.

Activity: January - March

Installation of mixer, mill & extruder

Status: 90% Complete

Overview:

Following the completion of the support structure activity, the mixer, mill and extruder were installed, ready for cabling.



Above: Extruder being lifted on to its structural support.



Above: positioning and fastening of the extruder, followed by installation of mill and mill support structure.



Above: installation of mixer structural support beams above the mill and extruder.


Above: Mixer being placed into position on structural supports.

Packed Bed Dryer Upgrade

Previous status: Pending

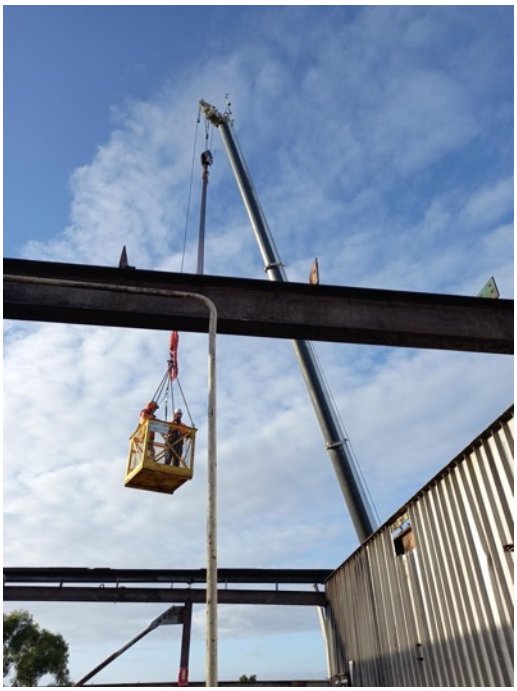
Current status: 50% complete

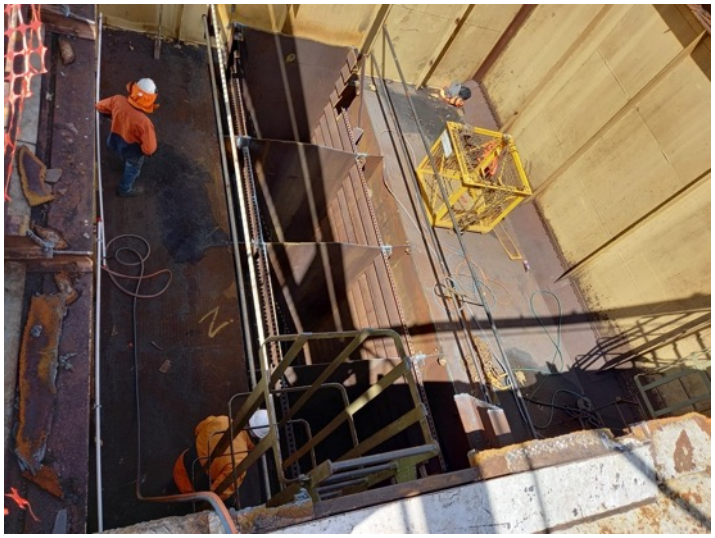
Overview:

- Removal of internal walls and preparation for new installations (complete)
- Installation of revised wall, inlet & floor design, aimed at further improving drying efficiency

The upgrade of the packed bed dryer involves the replacement of the internal walls, with an improved design, building upon learnings from the previous pilot plant.

Aimed at further improved drying efficiency, the updated design is expected to deliver increased throughput and decreased cost of production, supporting the higher capacity of the new primary processing train.



Above: dismantling the packed bed dryer for removal of the internal walls.

Structure and platforms - installation

Previous status: Design complete, fabrication underway, installation scheduled

Current status: fabrication complete, installation 30% complete

Overview:

Fabrication and installation of equipment support structures.






Above: structural supports fabricated, ready for installation and painting.

Build of Raw Coal Storage, Workshop and Laboratory

Previous status: 80% Complete

Current status: Structural installation complete, awaiting power connection to workshop and laboratory

Overview:

- Relocation of existing work shelter and construction of new, double-stacked enclosed raw coal storage
- Customised 40ft containers to act as a new undercover workshop and clean laboratory
- Electrical installation of lighting, power points complete (photo, below right)
- Power supply connection pending

Above: laboratory and workshop

Preparation of the existing building ahead of the installation of new equipment

Status: 85% Complete

Overview:

- Removal of asbestos cladding (complete)
- Removal and storage of HydroMOR equipment (complete)
- Isolation and removal of electrical cabling (complete)
- Removal and relocation of old silos (complete)
- Erection of internal divider wall (complete)

Still to be completed:

- Floor preparation & certification
- Sub-floor management of sump water and load support (in progress)
- Roof reinstatement (pending installation of packed bed dryer upgrades)
- Building cladding reinstatement (pending completion of construction activities)

Installation of a permanent partition wall to replace the temporary fencing that previously separated the plant area from the neighbouring tenant, mounting of cable trays, ready for the installation of the motor control room (MCC).

Heat system upgrades

Previous status: 50% Completed – on schedule

Current status: In progress, not critical path

Overview:

Significant upgrades have been planned for the existing hot water system to optimise operation—upgrades target reliability, capacity and control system integration.

Holding tanks, centrifuge and other equipment have been completed and await plumbing and electricals to complete installation.

The heating system simulates 'waste' heat for demonstration purposes initially, facilitating the commissioning of the Coldry process train, which will then transition to a backup role following the installation of the syngas-fired boiler system included as part of the Phase 2 char process train.

Photo: Centrifuge and holding tanks positioned, ready for electrical connection

New electrical & process control room (system automation & diagnostics)

Previous status: In progress and on schedule

Current status: 30% complete

Overview: Designs and specifications complete, including main circuit breakers, power management and individual drive control systems. Motor control centre (MCC) is being fabricated, and the building which will house the equipment is also in process of fabrication and installation. Once the MCC panels are ready, installation is then "bolt in", followed by a period of cabling and termination works.

Conditioning system fabrication, installation and testing

Previous status: Delayed (due to shipping delays on the belting)

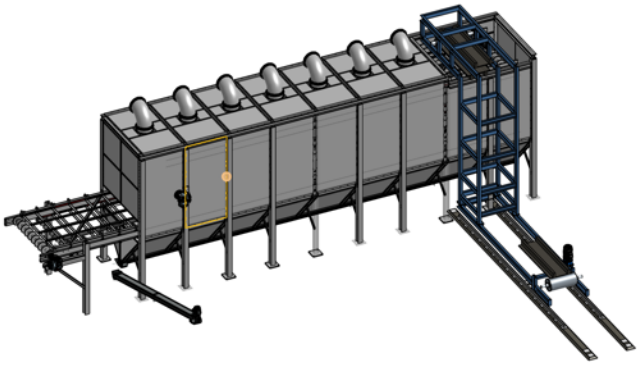
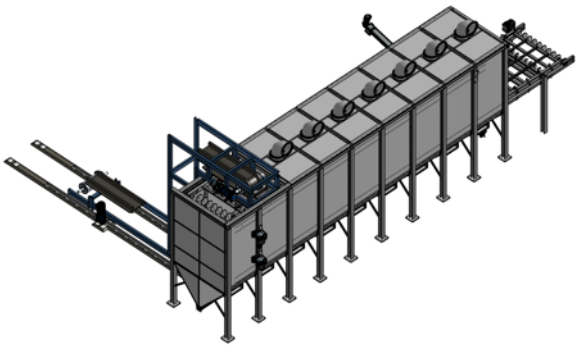
Current status: 40% complete

Overview: Design, sourcing and selection of the belting system - a vital component of the conditioning system - was completed on schedule; however, shipping delays have impacted the program.

Following shipping delays, all components are now on-site, and the fabrication of the conditioning unit is underway. Completion is scheduled for April.

Photos:


Above: the conditioning belt, an integral component of the proprietary conditioning system, has been fabricated and shipped. Arrival on site was early January 2021.

Above: Conditioning system, designed to surface-dry the extruded lignite pellets prior to delivery to the packed bed dryer

Next Steps

- New motor & process control room (system automation & diagnostics)
- Conditioning system fabrication, installation and testing
- Completion of workshop & laboratory facilities
- Electrical and process instrumentation and cabling
- Structure & platforms – installation & painting
- Packed bed dryer – installation of new internal walls
- Equipment cabling
- Instrumentation installation
- Commissioning preparation, dry runs & first operations

Background Information

About the Coldry Upgrade Project

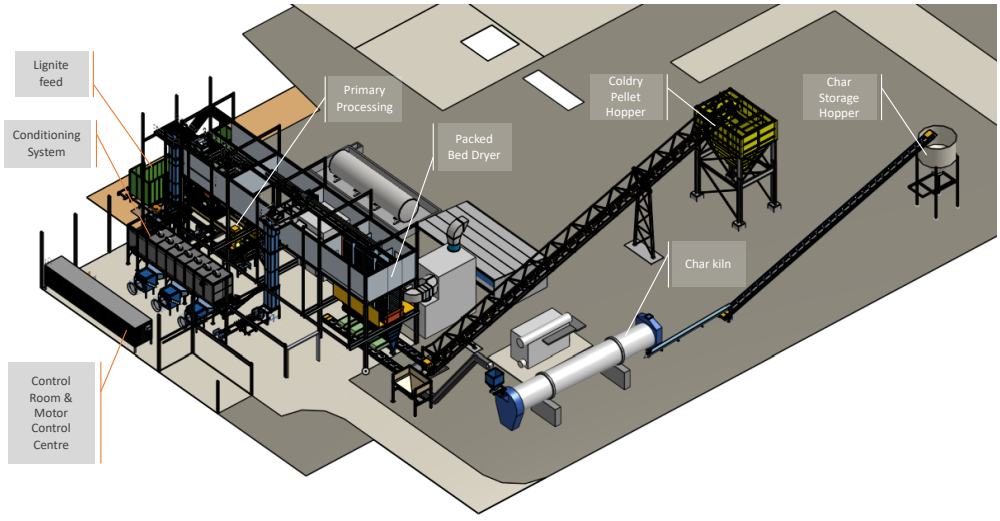
Enabling a modern, low-emission char manufacturing process

The Coldry upgrade project is poised to modernise lignite-based char manufacturing, allowing both the (natural gas-equivalent emission) production of char and paving the way for net zero-emission production of solid fuel (Coldry pellets).

Comprised of the scale-up the Company's Coldry process and the addition of new char plant and equipment, the Coldry upgrade project entered the construction phase in late October 2020 (see announcement 21 October 2020).

These project activities are focused on the delivery of two key objectives:

- **Engineering Scale-Up** - Advancing Coldry technical development via an engineering scale-up featuring an increase in throughput (up to ~3.5x current capacity) and reducing the plant's physical footprint by approximately half (compared to the previous Coldry pilot facility).
    - **Aiming to:**
        - Reduce scale-up risk for a future large-scale commercial demonstration plant (350,000 tpa+)
        - Refine commercial-scale plant design
        - Generate sufficient design and operational data to support bankable feasibility study and planning for the commercial-scale plant
- **Commercial Demonstration –** Small-scale commercial demonstration of the Coldry process integrated with a downstream application (char manufacture).
    - **Aiming to:**
        - Deliver up to $2.5 million a year of operating project cashflow from target revenues of approximately $6 million
        - Demonstrate Coldry as a gateway to higher-value downstream applications
        - Demonstrate Coldry as a net zero-emission drying technology and enabler of low-emissions downstream applications (natural gas equivalent or less)
        - Support continued development of **HydroMOR** (low emission steel making) and **COHgen** (low emission hydrogen production).



Above: layout design of the small-scale Coldry commercial demonstration plant currently under construction

Project Sequence

The project is divided into two phases:

Phase 1 – Coldry process scale-up:

- Design, construction, installation and individual commissioning of each key stage of the process, including primary processing train, conditioning system and drying system
- Integration of the plant and equipment across each key stage of the process to establish continuous, steady-state operations

Phase 2 – Char process integration:

- Design, procurement, installation and individual commissioning of the char kiln
- Integration of the char kiln with the Coldry process to establish continuous, steady-state operations and waste energy utilisation for drying

By phasing the project in this manner, the Company seeks to mitigate the unpredictable risks associated with the impact of COVID-19, and the well-understood risks related to the scale-up and commercialisation of new technologies. As such, expenditure is limited to the amount needed to reduce each phase's risk before proceeding to the next phase with increased technical and financial confidence.

About Char

The Company has identified the high-value char market as the ideal candidate application for the small-scale commercial demonstration of its unique Coldry technology.

Char is a well-established product in the Australian market as a barbecue fuel and metals reductant.

Char is also used to make 'activated carbon' products for use in filtration applications.

What is char?

Simply, char is 'partially burned' biomass produced using a process called 'pyrolysis'.

That biomass is typically wood or coal.

The key is to heat the raw material in the absence of oxygen, avoid combustion, remove most of the moisture and 'volatile' components, and leave the remaining carbon in place.

The result is an active carbon material, which is useful in several applications.

The volatile matter is turned in to 'gas' along with residual moisture, forming a "synthesis gas", or syn-gas that can be used to provide heat.

Waste energy from the char kiln will be harnessed and utilised to provide the drying energy for the Coldry process.

Modernising the old char manufacturing process for lignite-based coal

Char made from lignite, also known as brown coal, is well established.

Unlike char made from black coal, lignite-based char requires drying first.

Drying is easy. Drying efficiently, cost-effectively and with net zero-emissions, however, has proved elusive until now.

The dominant lignite drying method has been steam tube drying, which involves high heat and high pressure. Unfortunately, coal is burned to generate the steam needed to dry the coal, resulting in increased CO_2 emissions.

Coldry can achieve low temperature, low pressure, low cost drying through a unique combination of:

1. Brown coal densification (BCD)
2. Waste heat utilisation

BCD is a physical and chemical phenomenon exhibited by a range of high-moisture coals that results in the expulsion of moisture and densification of the remaining coal solids.

The Coldry technology process involves several process stages:

1. Mechanical Shearing: The majority of the physically trapped moisture is released via destruction of the porous structure of the coal, which is achieved via mechanical shearing, resulting in a coal slurry of suitable consistency for extrusion.
2. Extrusion: The slurry is extruded to produce pellets of optimal dimension for subsequent drying.
3. Drying: Ideally, waste energy from a co-located power station (or another low-grade 'waste' energy source) is utilised to cost-effectively evaporate the mobilised water within the pellets, delivering a finished product with less than 15% moisture.

The Coldry process has impressive benefits in comparison to the traditional drying processes, including;

- No direct gaseous emissions (including CO_2, NO_x, and SO_x);
- Significant energy uplift compared to the raw lignite (8MJ/kg > 22MJ/kg);
- Thermally stable finished product, with reduced spontaneous combustion profile;
- Where commercially desirable, there is also the option to harvest evaporated moisture.

By converting high moisture, low calorific value lignite from a low-value material with limited usage opportunities into a high energy, low moisture, transportable solid fuel, Coldry opens up new markets and a wide range of applications. It also reduces the CO_2 emissions intensity associated with utilisation, enabling greater sustainability of outcomes.

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 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

Coldry is the gateway enabler of higher-value applications for low-rank coals.

Low-rank coals are a rich source of valuable hydrocarbons. Still, they suffer from high moisture content that must be reduced to enable higher-value upgrading and conversion to solid fuels, liquid or gaseous hydrocarbons.

Drying is easy. However, drying efficiently and cost-effectively has been the challenge. Coldry meets this challenge through a combination of 'brown coal densification' and waste heat utilisation, delivering the world's first low temperature, low pressure, low cost, zero CO_2 emissions drying process.

About HydroMOR

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

HydroMOR is a simple, low cost, low emission, hydrogen-driven technology that enables '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 intended to form the basis for a 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	Aust. Projects	R&D	HVTF	Business Develop.	Sales