



## Coldry pilot plant upgrade adds commercial capability

**Friday, 4 February 2011:**

### Key Points:

- Coldry pilot plant upgrade with JC Steele complete
- Significantly lower cost of production provides commercial capability
- Large test sample program to commence

Environmental Clean Technologies Limited (ASX:ESI) is pleased to announce the collaborative upgrade of its Coldry pilot plant with JC Steele has concluded successfully.

Following the installation process of the past few months a detailed commissioning program over the past week has achieved steady-state production.

In addition to the new extruder kit (announced 19 Oct 2010) supplied and installed by JC Steele, the boiler unit responsible for producing the low-grade heat for the Coldry pilot plant was replaced, providing increased production capacity with lower cost heat.

This upgrade will enable the following:

- Higher production capacity – 20,000 tonne per year maximum
- Faster turnaround of large test samples
- Improved product quality
- Refinement of operational parameters to fine-tune the commercial scale design

### Benefits of the upgrade:

With its reliance on relatively expensive bottled gas to generate the low-grade heat for the process, the Coldry pilot plant was never initially designed to operate on a commercial basis. It has always been a proof-of-concept, R&D facility with a relatively high cost of production.

With the increased capacity provided by the new extruder and the decreased operating cost due to a more efficient heat source, ECT is able to reassess the plant's ability to become 'cash generative'.

ECT Chief Executive, Kos Galtos said the opportunity to generate sales from a commercial plant could help off-set the production cost of large sample quantities destined for both the domestic and global market.

"We have a clearly targeted sales process which leads to the need for larger scale testing of Coldry product in target power stations. We are now at the point where various parties are ready to commence these large scale test burns requiring several hundred tonnes each," Mr Galtos said.

"Our trips to China late last year stimulated a great deal of interest. Large scale testing of Coldry product by potential consumers is the next step in our sales approach" he said.

The Company expects to produce several thousand tonnes of Coldry in coming months to meet the needs of domestic testing by power stations in addition to companies in China.

A study undertaken to ascertain the sales potential for Coldry in the local Victorian market based on the new, lower cost of production has been completed with leads being pursued.

### Large Sample Production

Several thousand tonnes of Coldry will be commercially produced in coming months from both Maddingley and Latrobe Valley brown coal for use in large scale testing in local and Chinese power stations.

## Parameter Optimisation

During sample production further data will be collected on the performance of the JC Steele equipment for refinement of the commercial scale design. This will feed in to the Victorian Coldry project.

## Upgrade Overview

### Mixer & Extruder

The original equipment, while able to demonstrate proof-of-concept and produce R&D outcomes, differs from the type of equipment identified by our engineers Arup as ideal for scale-up in the commercial plant design.

The commercial plant design incorporates the JC Steele 'Model 90' extruder to achieve the 150,000 tpa dry output per module. The pilot plant upgrade therefore involved the installation of a smaller scale version of the '90 Model' - the '25 Model' JC Steele Extruder and mixer.

The new mixer achieves a faster and more pronounced attritioning of the coal compared to the previous unit. Attritioning of the coal releases moisture while the shearing of the coal faces opens new reactive coal surfaces triggering the exothermic chemical reaction – phenolic polymerisation - responsible for the dramatic change from wet brown coal to a drier, densified black coal equivalent.

The mixer transitions the plasticised coal to a vacuum chamber where entrained air is removed as it progresses through to extrusion. This has the effect of producing a denser, smoother extrudate, which delivers a harder, more durable pellet.

The extruder incorporates two offset augers to further shear then push the plasticised, de-aerated coal through a die designed to act on the coal to achieve a smooth surface, promoting less fines generation during drying and handling.

The extruded pellets are warm and 'steaming' as they are delivered to the conditioning belt. This heat is the result of the chemical reaction taking place within the coal.

Throughput of the new extruder is significantly increased allowing large test batches of several hundred tonnes to be processed in days instead of weeks, resulting in lower cost of production.

### Vacuum pump & boiler

The vacuum pump works with the extruder unit to remove entrained air from the plasticised coal mix prior to extrusion, significantly increasing pellet density and durability, two important factors when handling and transporting bulk quantities by allowing greater bulk density and lower fines generation. This feature was not present on our previous extruder.

The commercial plant design utilises waste heat transfer from the co-located power station, resulting in 'free' energy for the evaporation of moisture. The pilot plant has no such waste heat source.



Therefore the boiler unit is required to provide the low-grade (45°C) heat to facilitate the evaporative removal of moisture expressed by the Coldry pellets as they pass through the packed bed dryer following extrusion.

The new boiler is significantly more efficient than the old boiler, providing for lower operating cost.

### Plant Tour

A plant tour is scheduled for the month of April, on a date to be confirmed in a later announcement.

### **For Further Information Contact:**

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### **About ECT**

ECT is in the business of commercialising and selling disruptive, leading-edge technologies that have game-changing potential within the energy and resources sector that are capable of delivering environmental and commercial benefits.

We are focused on advancing a portfolio of such technologies that have attractive market potential. This potential is largely informed by global markets that exhibit significant potential for growth and enable us to secure sustainable profits through licensing royalties or other commercial mechanisms.

### **About Coldry**

When applied to lignite and some sub-bituminous coals, the mechanically simple Coldry process produces a black coal equivalent (BCE) in the form of pellets that are stable, easily stored, can be transported and which can be of equal or better energy value than many black coals, whilst significantly reducing CO2 emissions.

### **About Matmor**

The Matmor process is positioned to revolutionise primary iron making thanks to the design of our simple, low cost, low emission, patented Matmor retort using cheaper, alternative raw materials.

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