ENVIRONMENTAL CLEAN TECHNOLOGIES LIMITED

India Project Update

Matmor Pilot Plant Basic Design Package Complete

23 March 2018: Environmental Clean Technologies Limited (ASX: ESI) (ECT or Company) is pleased to announce the completion of the 'basic design' for the Matmor component of its planned India project.

Key points:

- The Matmor technology is the world's first and only lignite-based primary iron making process, capable of replacing metallurgical coal and high-grade lump iron ore with lower-cost alternative raw materials due to its unique chemistry and furnace design.
- The completion of the basic design package allows the plant design to proceed to tender following the signing of the Master Project Agreement (MPA), financial close and completion of the Coldry basic design package, targeted for 30 June 2018.

The completion of the basic design package for the Matmor pilot plant is a significant milestone in the preparation for the Company's integrated Coldry demonstration and Matmor pilot plant project with NLC India Limited (NLCIL) and NMDC Limited (NMDC).

The aim of the project is to deliver a pilot scale demonstration of ECT's two leading technologies under development; 'Matmor' and 'Coldry'.

Matmor

Matmor is the world's first and only lignite-based primary iron making technology capable of replacing metallurgical coal and high-grade lump iron ore with lower-cost alternative raw materials thanks to its unique chemistry and furnace design.

Typically, lignite (also known as brown coal) can't be used in traditional metallurgical applications such as the blast furnace due to its high moisture and volatile matter content.

Matmor's breakthrough lies in its ability to remove the moisture (via the Coldry technology) and harnesses the natural chemistry of lignite via a unique process and furnace design built around a fundamentally different chemical pathway to that of a Blast Furnace.

The value proposition for Matmor is characterised by two distinct advantages:

1) Alternative raw material opportunity – liberating and monetising the 'above ground ore body' and decoupling from coking coal
2) Lower plant cost

There exists a vast 'above ground ore body' in the form of iron ore mine fines and slimes, and industrial wastes such as mill-scale and nickel refinery tailings.

Current processes can't utilise iron-rich fines and wastes without expensive pre-processing.

Matmor liberates this typically stranded, 'waste' resource in an efficient, cost-effective manner, while simultaneously decoupling steelmaking from relatively expensive coking coal.

The Matmor plant, incorporating Coldry as its front-end raw material preparation stage, is up to 40% less capital intensive than an equivalent capacity Blast Furnace or Coal-based DRI plant.

Relatively low operating temperatures reduce the capital cost of plant and smaller equipment sizes, when compared to existing steel production processes, result in reduced land area requirements.

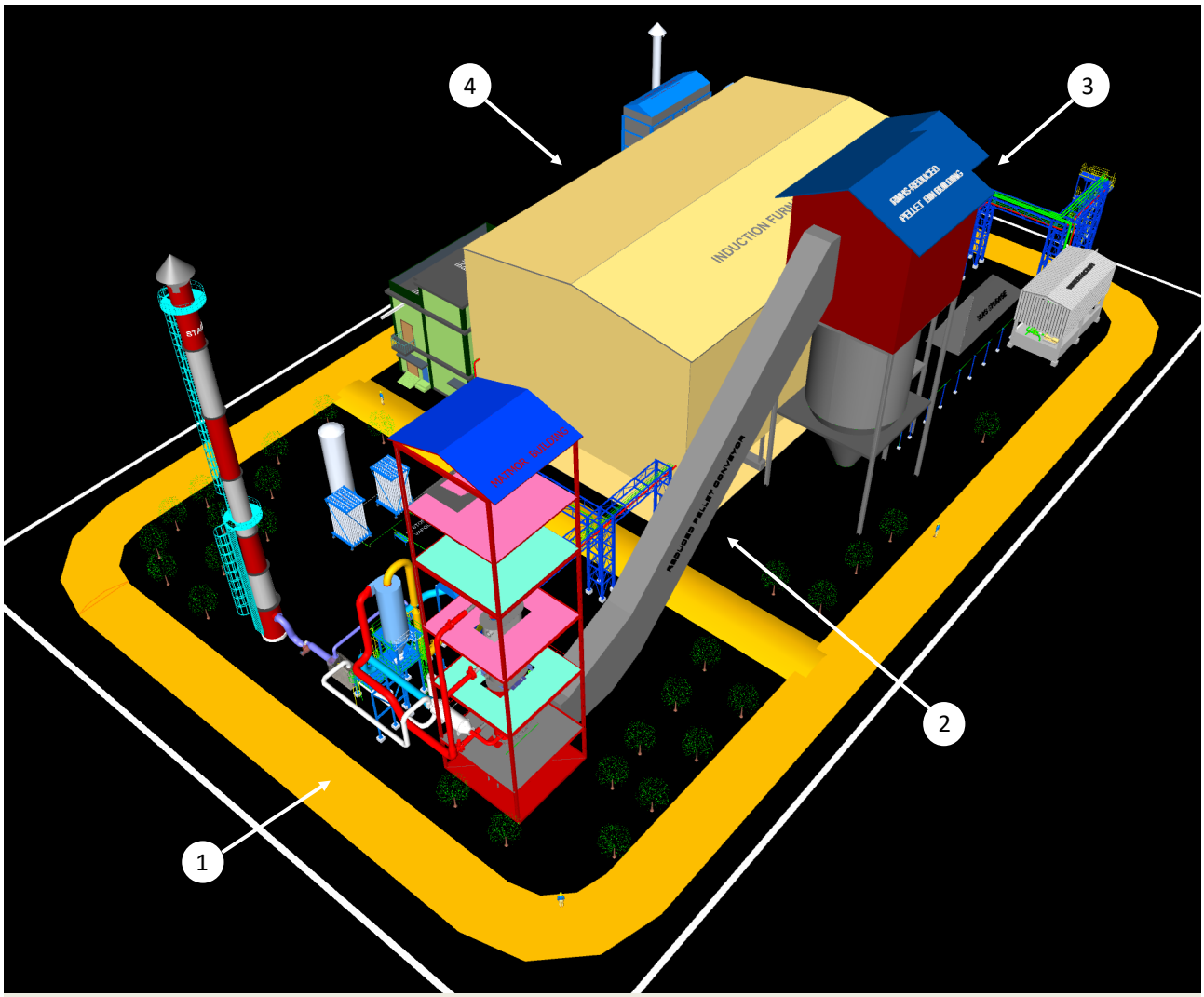
Matmor's efficient reaction kinetics result in lower reductant requirements when compared to Direct Reduced Iron (DRI) technologies.

Coldry

Coldry is a unique, zero-emission, lignite (brown coal) upgrading technology capable of producing a solid fuel for use in power generation, industrial thermal applications and as a feedstock to higher-value downstream applications such as coal to liquids, gas, fertiliser, chemicals, chars, activated carbon, hydrogen and steelmaking via the Matmor technology. Coldry solid fuel is significantly less CO_2 intensive than lignite.

Matmor Pilot Plant – Basic Design

The following image shows the layout of the Matmor pilot plant:



(1) Matmor Retort & ancillary plant: two tonnes per hour metal output (Coldry plant not shown); (2) Reduced pellet transition conveyor; (3) Reduced pellet storage silo; (4) Melting & casting.

The India project builds on the fundamental and applied research and development (R&D) conducted by the Company at its Australian test facility north west of Melbourne and seeks to scale up the Matmor technology from its current capacity of ~40kg per hour to ~2 tonnes per hour, ahead of a subsequent scale up to a commercial module.

ECT India Chairman and Managing Director Mr Ashley Moore commented, "We've worked with one of India's leading pyro-metallurgical engineers, MN Dastur, to deliver this design package and look forward to moving to tender following the signing of our Master Project Agreement, completion of funding arrangements and conclusion of the associated Coldry basic design package".

"The basic design package for the Coldry component of the project is also nearing completion. Largely derived from the work previously performed by Melbourne-based engineering firm Arup, it includes changes that cater for the input of multiple raw materials (iron ore and lignite) and integration with the Matmor technology platform."

Next Steps

The parties have spent the past several years developing the business relationships, funding and corporate/legal structure for the Project. As per recent announcements, the parties are poised to sign the Master Project Agreement (MPA) following completion of respective Board and Government approvals.

The MPA provides the framework for the broad commercial arrangements needed to execute the R&D project, including funding, technical development, engineering, construction, commissioning and operational R&D activities. Detailed agreements covering these matters will be negotiated after the MPA is signed. The MPA also clearly articulates the intent for the Intellectual Property generated in this R&D work to be utilised to underpin commercial projects, and sets the value sharing structure between the parties from the resulting projects.

The parties have jointly set the target to sign the MPA and achieve financial close by 30 June 2018.

BACKGROUND

Why Matmor? Why India?

The Challenge:

India's growth plans highlight complex challenges in the acquisition of suitable and sufficient raw materials to support its steel industry.

While domestic iron ore supplies could largely support national targets, India's domestic mines produce soft ore, which generate large quantities of fine material (small particle size) which are unsuited to blast furnace operations without expensive processing and upgrading.

Additionally, India's domestic coking coal supplies are virtually non-existent, and the rising cost of imported coking coal is driving the national security need to develop technologies that can mitigate the need to import coking coal.

Ministry of Steel Secretary, Ms Aruna Sharma recently stated, "We have to adopt a new technology to reduce use of coking coal in steel making as India and most of the Asian countries - minus China - do not have much coking coal reserves".

The Solution:

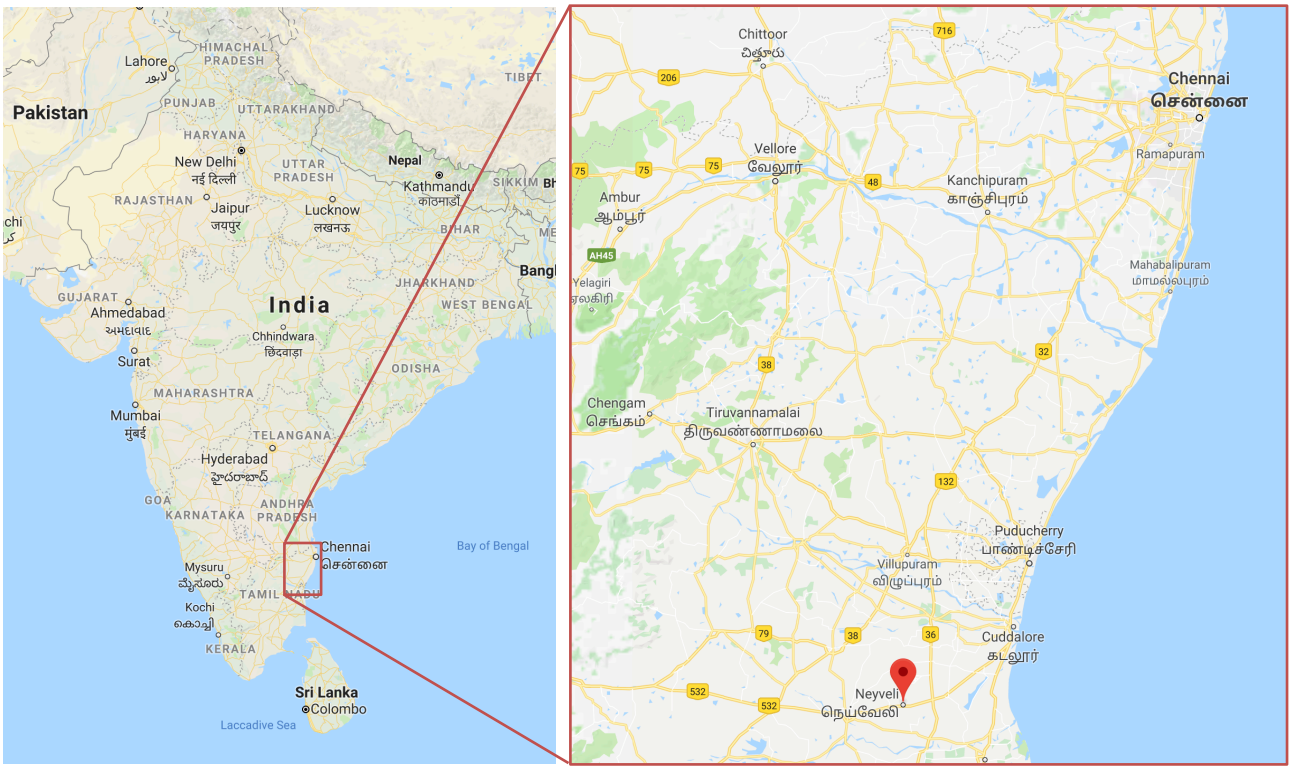
This project enables the Company to demonstrate its Coldry and Matmor technologies and deliver value to India by enabling the transformation of India's lignite and low-grade iron ore resources into feedstocks that will support national growth objectives.

For NLCIL & NMDC, the project represents the ability to transform low rank natural resources into higher value products that will support national growth objectives for energy and steelmaking as well as participate in future royalty sharing from income derived from the global deployment of ECT's technologies.

Upon successful completion of the R&D phase, the MPA provides the basis for the subsequent commercial deployment of the technologies, which may entail significant future investment. For example, the scope within our techno-economic feasibility (TEF) study (8 August 2016) was for a Matmor plant with a capacity of 500,000 tonnes per annum of finished steel billet, with an estimated capital investment of around A$300 million.

About the Project

The parties have agreed (subject to signing of the MPA) to the collaborative development of ECT's patented technologies, commencing with an integrated Coldry-Matmor pilot scale demonstration plant to be deployed in India within an existing NLCIL mine and power station complex located southwest of Chennai, the capital of Tamil Nadu State.



This is the largest R&D project ever undertaken by either NLCIL or NMDC and their first with an Australian company.

About the Parties

- ECT's project partners, NLCIL and NMDC, are 'Public Sector Undertakings' under the Ministries of Coal and Steel, respectively with a combined market value of ~A$11 billion.
- NLCIL is the largest integrated brown coal miner and electricity generator in India with current projects driving expansion into both traditional black coal power and renewable power generation nationwide.
- Their expansion target entails development of power generation capacity from the current level of 2,750 MW (e.g. similar size to the combined Loy Yang A & Loy Yang B system in Victoria, Australia) to 20,000 MW by 2025, highlighting the substantial role they will play in supporting India's growth objectives. For context, the capacity of Australia's National Electricity Market (NEM) is ~44,000 MW.
- NMDC is India's largest iron ore miner, with significant exposure across a number of other commodities. On track to achieve their short-term goal of 50 million tonnes per annum (MTPA) mining capacity in the iron ore sector, NMDC have commenced a program of vertical integration through the construction of a 3 MTPA integrated steel plant. For context, the entirety of Australia's Steel industry is ~6 MTPA.

The project, which features an integrated Coldry plant as the front-end raw material preparation stage, consists of an initial research and development (R&D) phase with an estimated Capex budget of ~A$35 million, to be located at NLCIL's existing mine and power station complex in Neyveli.

For further information, contact:

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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