



## **Annual General Meeting**

**Friday 30 November 2018**

### **Chairman's Address and Company Presentation**

Welcome Fellow Shareholders,

I'm pleased to be reporting to you after a significant year of development for our Company.

It's been a long road for the Company and you all, our shareholders, however we've made several important advances in the past year which will be touched on here and in the following presentation.

Notably, on 30 May we signed the MOU which set the direction for the largest ever research and development (R&D) collaboration between Australia and India.

And while the past year has entailed additional layers of process as we reach 'financial close', shareholders will recognise that to be successful in India requires a high level of on-the-ground engagement and disciplined diplomacy, in addition to patience with polite persistence.

India has been our most important objective and for that we make no apologies about the focus and concentration of resources we have directed to finalising this initiative. Delivering on our promised first deal is critical to all other initiatives going forward and sets the baseline for management's ability to

India is full of opportunity – growth rates of 8.5%, one of the largest populations in the world and the largest population of young people under 25, who are highly educated, speak fluent English and will become the middle-class consumers that will drive India to being a powerful consumer market to rival China.

Despite this, there are necessary reforms yet to take place, which still make it a complex place to do business as a foreign company. But this is changing, and we are seeing the effect of reforms like GST, and changes to insolvency and bankruptcy laws in India which evidence that the Government has the will to change and following suite are companies like NLC and NMDC showing great dedication towards global best practise in many areas of how they do business.

With that in mind, this year's strategic objectives have been guided by the following themes:

1. Evidence Adoption - Apply our technology to commercial projects
2. Secure Value - Improve our development and protection of our technology
3. Demonstrate Value - Reach operational revenues to underpin the economic sustainability of 1 & 2 above

Consistent with our 3-year strategic plan, our objectives cover:

1. Commercialisation
  - 1.1. Commercialise the Coldry technology
  - 1.2. Commercialise the Matmor technology
2. Innovation and Market Development
  - 2.1. Continual development and leverage of existing technologies

- 2.2. New and evolving technologies and markets
- 3. Corporate Capacity and Capabilities
  - 3.1. R&D program management & administration
  - 3.2. Capital, finance and resource management
  - 3.3. Communications, marketing and stakeholder engagement
  - 3.4. Governance, risk and compliance

This has manifested in the following key result areas:

1. Progressing our Indian project and making way for feasibility of new projects.
2. Improving large-scale R&D capability and processing efficiency at our Bacchus Marsh facility
3. Developing markets with near-term revenues for our products and projects
4. Restructuring the organisation and right-sizing roles and responsibilities
5. These key result areas (KRA's) and the relevant Key Performance Indicators (KPI's) of each staff member, give us the day to day focus as we embark on the challenge of meeting our strategic objectives.

### **India Project**

This world-first collaboration involves the joint development of our Coldry and Matmor technologies via a research and development (R&D) project in India to the value of ~AUD70M.

The objective of the project is to successfully deploy a pilot scale integrated Coldry-Matmor plant as a prelude to broader commercial rollout in India and globally.

Our partners in the project, NLC India Limited (NLCIL) and NMDC Limited (NMDC) are Indian government public sector undertakings (PSU's) with a combined market value of ~\$10 Bn.

NLCIL is India's lignite (brown coal) custodian, with an extensive mining and power generation portfolio.

NMDC is India's largest iron ore miner and the 10th largest iron ore miner in the world, producing over 35 million tonnes in 2017.

NLCIL and NMDC will each contribute 50% of the ~AUD30 million project capital cost in return for a 51% stake in the project entity.

As we stand today, with NLC board approval in hand, we await the NMDC board approval after which our India project is poised to proceed through to 'financial close' upon signing of the detailed Research Collaboration Agreement (RCA).

Following 'financial close' our partners, NLCIL and NMDC will release funding in parallel with ECT providing the Project Bond and the project will commence, ushering in the transition from project development, to project execution.

We all agree that delivering this project has been the most important objective for our Company, and the team has worked diligently to achieve this outcome.

### **Bacchus March High Volume Test Facility (HVTF)**

Our facility, located 50km northeast of Melbourne on the outskirts of the town of Bacchus Marsh, has been the focus of our fundamental and applied research and development for both Coldry and Matmor since 2006.

Its importance has continued to grow over the past year, with ongoing testing and improvement of our technologies. Our facility not only allows us to generate new knowledge, it also allows us to do so in an

environment where we have a high level of control and protection over the test work that leads to new discoveries and future value.

Our Coldry facility has been re-engineered to be productive and efficient enough to provide the closest approximation we can currently achieve at small scale, of a commercial application of Coldry, with the intention that the resultant product from our research and development activities is able to be sold as solid fuel into end-user demonstration projects and other commercial customers.

Progress with the Bacchus Marsh plant and the subsequent delivery of our R&D programs ensure that the intellectual property that we currently have under patent protection will be rigorously tested and continually improved.

Our technology suite features vertical and horizontal integration across our proprietary processes and equipment. This approach is intentional, allowing us to develop further intellectual property within the protective framework of our pre-existing technologies and know-how.

The Bacchus Marsh HVTF provides the essential infrastructure and apparatus to further develop and refine our intellectual property through on-going R&D as well as prepare for, and support, data collection and project specific designs for future demonstration and commercial projects.

Over time, our research has led to the accumulation of a more sophisticated and detailed understanding of underlying processes which has, in turn, led to new intellectual property, particularly around the Packed Bed Dryer (the 2012 Design for Tender program with engineering firm Arup).

More recently, the innovation process has led to new discoveries around the chemical reactions underpinning Matmor, resulting in two new technologies; HydroMOR and COHgen.

HydroMOR is the subject of an international patent application (PCT) lodged last November (2017), while fundamental research activity has commenced on our newest discovery, COHgen, with the aim of lodging a provisional patent in due course.

As we head into 2019, our HVTF continues to provide critical support to our R&D programs that will allow us to continue pursuing IP protection as we develop our technologies.

### **Developing markets for our products and projects**

Supported by our ongoing R&D effort, and consistent with our commercialisation strategy, ECT continued a period of establishing operational revenues to underpin the feasibility of our technology suite.

Last year we began developing markets that have near-term potential for generating operational revenues.

Over this period, in tandem with the upgrade programs at the HVTF, we developed a pipeline of sales leads, culminating in our announcement during July of a \$1.3 million five-year deal to provide a turnkey solution for 'steam services' for a Victorian customer.

The deal includes the end-to-end delivery of steam including ongoing operation and maintenance. Importantly, it will run on Coldry solid fuel produced from our HVTF at Bacchus Marsh.

We're currently engaged with several other existing and potential customers to develop a similar solution and anticipate that over the coming year, we will continue to develop local opportunities, improve our operational capabilities and establish contracts for the supply of solid fuel pellets and turnkey boiler and steam solutions.

Building on our endeavours in the local market for utility-scale heat applications, the economic landscape in Victoria has become increasingly conducive to larger scale deployment of our Coldry technology, justifying further exploration of the broader market.

Last year (September 2017) we commenced the early stages of a feasibility study for a commercial scale, zero emissions, solid fuel pellet (Coldry) demonstration plant in the Latrobe Valley. We partnered with the owners of Yallourn mine and power station, Energy Australia, narrowing down the site options and identifying integration requirements. This led to a compelling business case, providing a clear path for increased capacity beyond our HVTF.

Progress on this feasibility study was suspended whilst we dedicated resources to completing the India deal but as was announced on the 28th of November, we have restarted the next stage of feasibility. If a project were to proceed on the basis of this feasibility, it would become the largest, most environmentally friendly, economical gateway to upgraded brown coal in Australia and with the current State Government policy statement of the "Future Use of Brown Coal", ECT is in a good position to test Coldry's application on our local market.

A Coldry plant in the Latrobe Valley would aim to not only improve energy affordability and reliability to businesses threatened by rising electricity and natural gas costs, but also help realise the potential of brown coal in Australia for prospects such as High- Efficiency Low Emissions (HELE) power plants, low emission hydrogen production, fertiliser production and other downstream chemical conversion methods.

As we approach 'financial close' for our India project and advance local market opportunities we look forward to continuing all these efforts through 2019 and on behalf of the board of directors, executive and staff, we thank you, our shareholders for your continued, invaluable support.

**For further information, contact:**

*Glenn Fozard – Chairman      info@ectltd.com.au*

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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<sub>2</sub> 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.

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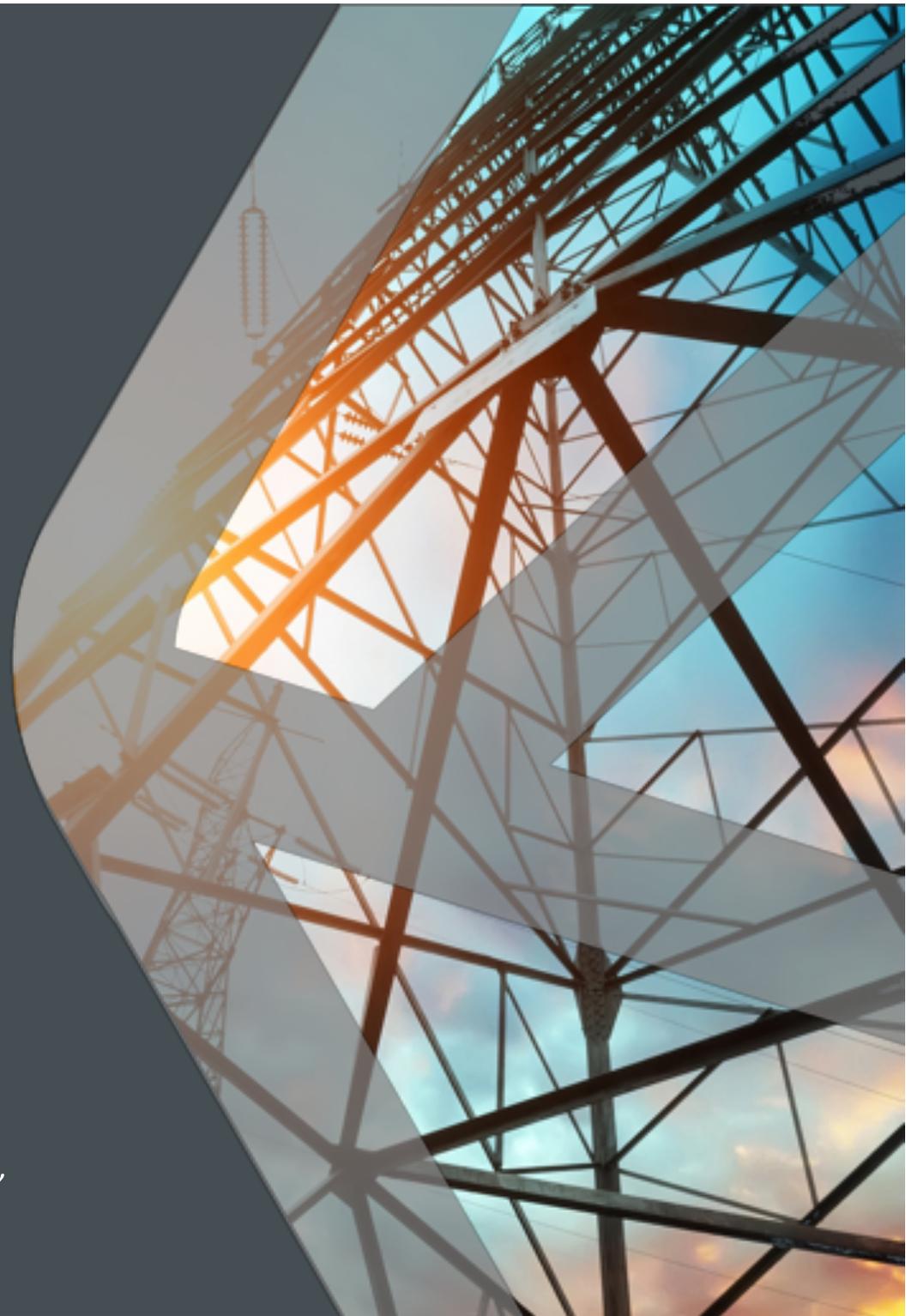
ENVIRONMENTAL CLEAN  
TECHNOLOGIES LIMITED

# AGM

## Presentation

Friday 30 November 2018

*“Bridging the gap between today’s use of  
resources and tomorrow’s zero-emissions future”*



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This presentation contains "forward looking statements" which involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of ECT, industry results or general economic conditions, to be materially different from any future results, performance or achievements expressed or implied by such forward looking statements. In particular, certain forward looking statements contained in this material reflect the current expectations of management of the Company regarding among other things: (i) our future growth, results of operations, performance and business prospects and opportunities; (ii) expectations regarding the size of the market and installed capacity of our Coldry and Matmor plants; (iii) expectations regarding market prices and costs; and (iv) expectations regarding market trends in relation to certain relevant commodities, including benchmark thermal coal and metallurgical coal prices and foreign currency exchange rates.

Forward looking statements are only predictions and are not guarantees of performance. Wherever possible, words such as "may," "would," "could," "will," "anticipate," "believe," "plan," "expect," "intend," "estimate," "aim," "endeavour" and similar expressions have been used to identify these forward looking statements. These statements reflect the Corporation's current expectations regarding future events and operating performance, and speak only as of the date of this material. Forward looking statements involve significant known and unknown risks, uncertainties, assumptions and other factors that could cause our actual results, performance or achievements to be materially different from any future trends, results, performance or achievements that may be expressed or implied by the forward looking statements, including, without limitation, changes in commodity prices and costs of materials, changes in interest and currency exchange rates, inaccurate geological and coal quality assumptions (including with respect to size, physical and chemical characteristics, and recoverability of reserves and resources), unanticipated operational difficulties (including failure of plant, equipment or processes to operate in accordance with specifications or expectations, cost escalation, unavailability of materials and equipment, delays in the receipt of government and other required approvals, and environmental matters), political risk and social unrest, and changes in general economic conditions or conditions in the financial markets or the world coal, iron and steel industries.

The materiality of these risks and uncertainties may increase correspondingly as a forward looking statement speaks to expectations further in time. Although the forward looking statements contained in this material are based upon what the Company believes to be reasonable assumptions, the Company cannot assure investors that actual results will be consistent with these forward looking statements. These forward looking statements are made as of the date of this material and are expressly qualified in their entirety by this cautionary statement. We do not intend, and do not assume any obligation, to update or revise these forward looking statements, unless otherwise required by law. Prospective purchasers are cautioned not to place undue reliance on forward looking statements. This presentation is for information purposes only and does not constitute an offer to sell or a solicitation to buy the securities referred to herein.



## Section 1

### Domestic Activity

- Organisational Structure
- Revenue Model
- Bacchus Marsh
- Latrobe Valley
- Capital Management

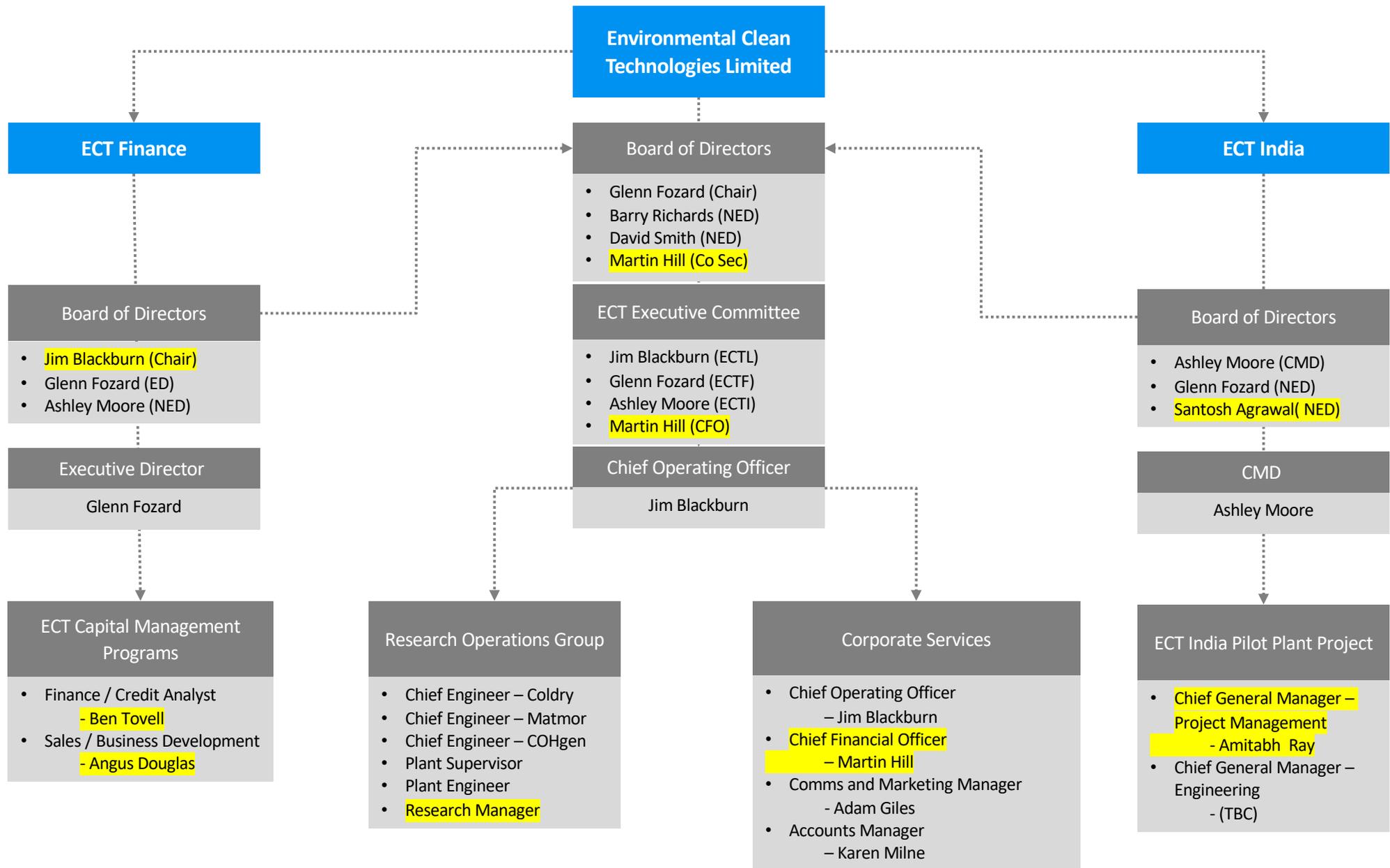


## Section 2

### India Activity

- Project Engineering Update
- Commercial Terms
- Research Collaboration Agreement
- Pathway ahead

# Organisational Structure



## Summary of Revenue Mechanisms

- Direct sales of product:
  - e.g. Coldry fuel sales into the domestic multi-feedstock boiler market)
- ECT's share of licensing fees and/or royalties from the India SPV
  - 49% ECT, 25.5% NLCIL, 25.5% NMDC
- Project development fees
  - Project engineering
  - Project management
- Original Equipment Manufacture (OEM)
  - Fees for access to supply of proprietary plant and equipment
- Investment returns
  - Enhanced balance sheet structure and access to capital, ECT to consider direct investment in operating plants.

## Coldry Capacity Targets

Stage of Development	Capacity	Status
Theoretical models	NA	Achieved
Lab Scale	<10kg, batch	Achieved
Test Scale	~5 tonne, batch process	Achieved
Pilot Scale	15,000-35,000 tpa, continuous, simulated waste heat	Pending
Commercial scale	600,000 tpa +	Target
Industrial scale	1.8M tpa +	Target

## Matmor Capacity Targets

Stage of Development	Capacity	Status
Theoretical models	NA	Achieved
Lab Scale	<10kg, batch	Achieved
Test Scale	~40kg/h, semi-continuous	Achieved
Pilot Scale	~1 tph, continuous (India Project)	Pending
Commercial demonstration	India Plant 1 (500 ktpa, billet steel basis)	Target
Commercial scale	India Plant 2 (2.0 mtpa)	Target
Industrial scale	India Plant 3, Global Plant 4, Global Plant 5 (6.0 mtpa)	Target

## High Volume Test Facility – Site development and Upgrades

- Stage 1 and Stage 2 expansion completed FY2018
- Site footprint increased by 35% to provide for program expansion (product handling, storage and equipment testing)
- Enhanced R&D capability
  - Significant investment in testing and monitoring equipment and additional R&D program management resources
  - Review and restructure of core R&D programs in line with Coldry and Matmor advanced findings and overseas rulings
- OHS&E improvements
  - Safety signage, lighting, CCTV, security fencing, training and management process improvement
- Automation enhancements
  - Digital Control interface and data capture (PLC System) upgrades and integration
- Maintenance improvements
  - Maintenance schedules updated to match increase operating scale
- Technology scale-up testing & de-risking program
  - Coldry:
    - Pilot plant operating model scale increase from 5,000 to 15,000 tpa capacity (35,000 tpa target)
    - Enhanced drying temperature and pellet conditioning testing
    - Additive trials for and infrastructure upgrades
  - Matmor – Test plant refurbishment
    - Ability to produce larger test samples for R&D trials in end applications
    - Enhanced feedstock supply capability to support Matmor Test Plant validation process

## High Volume Test Facility Stage 3 & 4 Expansion

### Stage 3: Dec 2018 – April 2019

- Target Capacity Up to 25,000 tpa
- Budget ~\$1.15-1.25m
- Status: Procurement & Construction

### Stage 4: April 2019 – July 2019

- Target Capacity Up to 35,000 tpa
- Budget ~\$1.0m
- Status: Planning



## Strategic partnerships:

- Calleja Group – site & transport (Maddingley)
- EnergyAustralia – coal supply and Project site partner (Yallourn)
- HiTech (QLD) and John Thompson Boilers – boiler package equipment supplier and installation
- Jepsens – 3rd party logistics
- Mecrus – steam package operations and maintenance

## Market development activity:

- |   |                |
|---|----------------|
| • 800 tonne trial at AKD Softwoods              | Completed      |
| • Gippsland Abattoir trial program              | Completed      |
| • Tasmania food processor trial program         | Completed      |
| • Victorian food processor trial program        | Completed      |
| • First steam boiler package client (Gippsland) | Ongoing supply |
| • First fuel supply client (Tasmania)           | Ongoing supply |

## Markets

### Small to medium volume:

- Consumers who need affordable utility grade heat to run their business.
- Timber, dairy and agriculture.
- Many switched to gas when the Morwell briquette plant closed, but with the increasing gas price, they need an alternative.
- Coldry is an ideal substitute and is more cost-effective than importing black coal from NSW or Queensland.

### Large volume:

- Large consumers such as Loy Yang power station which need an affordable fuel to restart their boilers after a shutdown.

### High-value downstream products like:

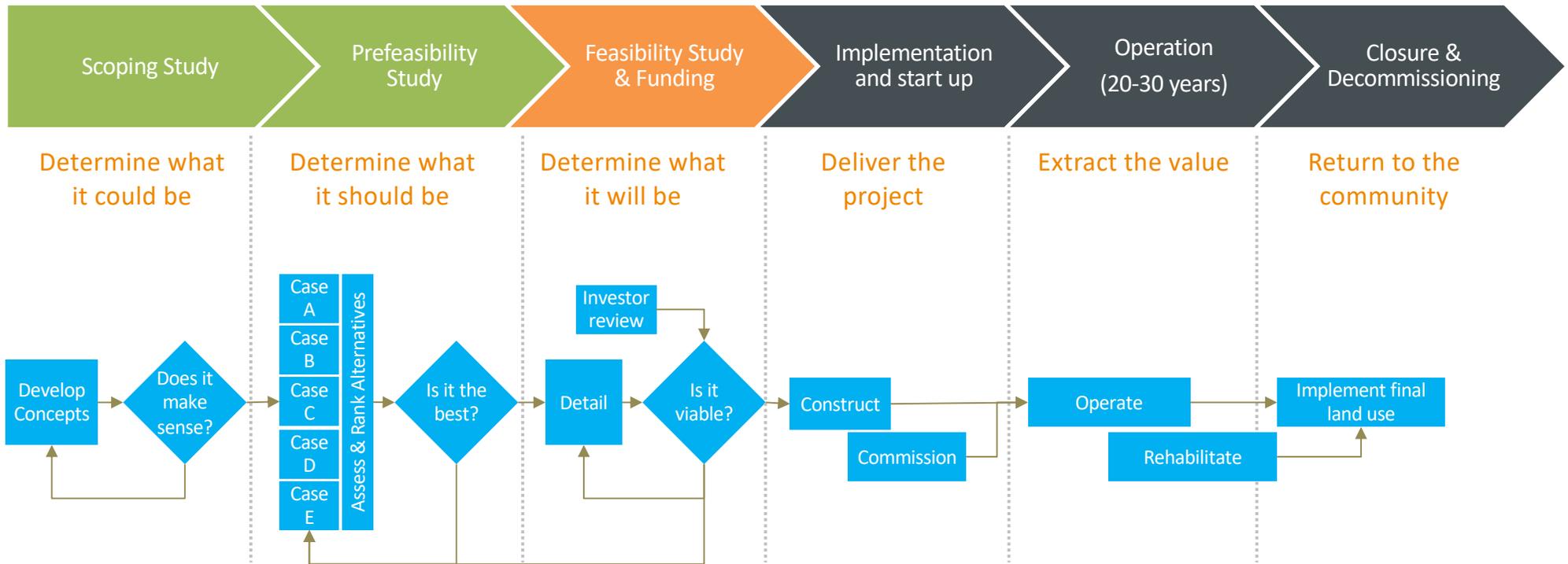
- PCI coal (the type used to generate heat in blast furnaces),
- Activated carbon (which has applications in water and air cleaning, food & beverage, medical and pharmaceutical industries), and;
- Hydrogen production.

## Coldry large-scale demonstration plant

- Capacity - up to 600,000 tonnes per annum
- Feed material for high value conversion process
- Pre-Feasibility program completed:
  - Scoping study and selection phase
  - Economic Modelling
  - Market Study
- Feasibility program commenced:
  - Logistics and transport planning
  - Product specification testing for export grade
  - Site specific planning



## Project Pathway



## R&D Tax incentive

- Positive ruling received for the Coldry project in India
- Matmor 'Advance Finding and Overseas Ruling' application submitted and under review, results expected Q3 FY18.
- Allows financing of 43.5% of the eligible R&D expenditure, estimated to be approx. A\$10 million

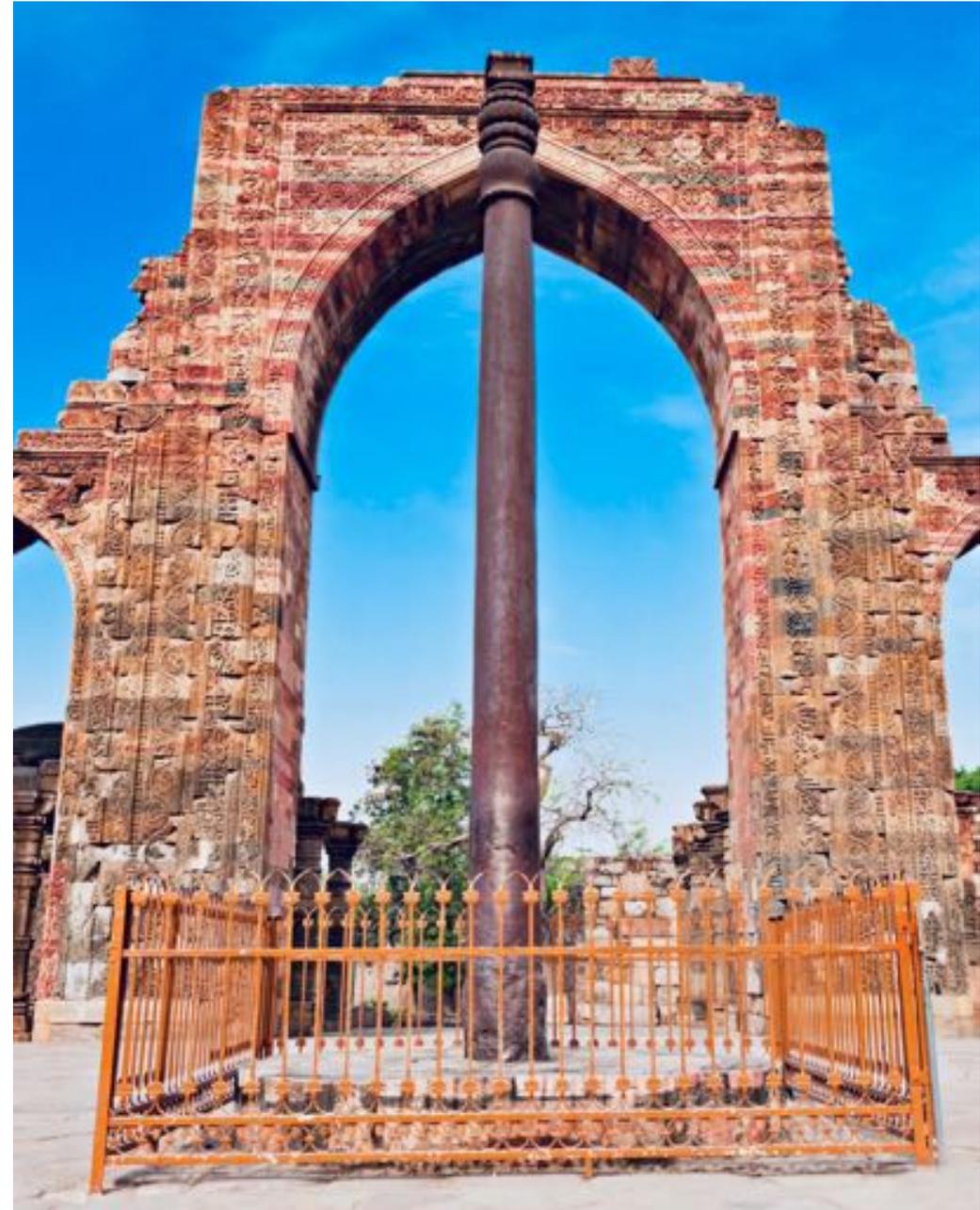
## Equity Lending Facility

- Successful establishment of over \$14 million in loans
- Supported raise of ~\$4.04 million cash via options conversion
- Generated >\$1M in cash repayments to ECT

## Section 2: India Activity

### Overview

- Project Engineering Update
- Commercial terms
- Research Collaboration Agreement
- Project Pathway



# Project Location – Tamil Nadu – Neyveli



- Process Flow Diagram
  - Block diagram
  - Materials balance
  - Reaction modelling / Energy balance
- Equipment Selection
  - Options analysis & selection
  - Specification development
- Electrical Systems
  - Power consumption analysis
  - Transformers & Distribution
  - Single line diagram
- Piping & Instrumentation Diagram
  - Process control assessment
  - Instrumentation identification
  - Process automation review
  - Shutdown & trip management
- Site Layout
  - Building identification
  - Process layout
  - 3D arrangement
- Schedule
  - Program overview
  - Detailed design assessment
  - Construction assessment
  - Capital expense estimate
  - 'Long lead' identification
  - Engineering discipline review by area

# Fly-through of 3D layout – Integrated Pilot Plant

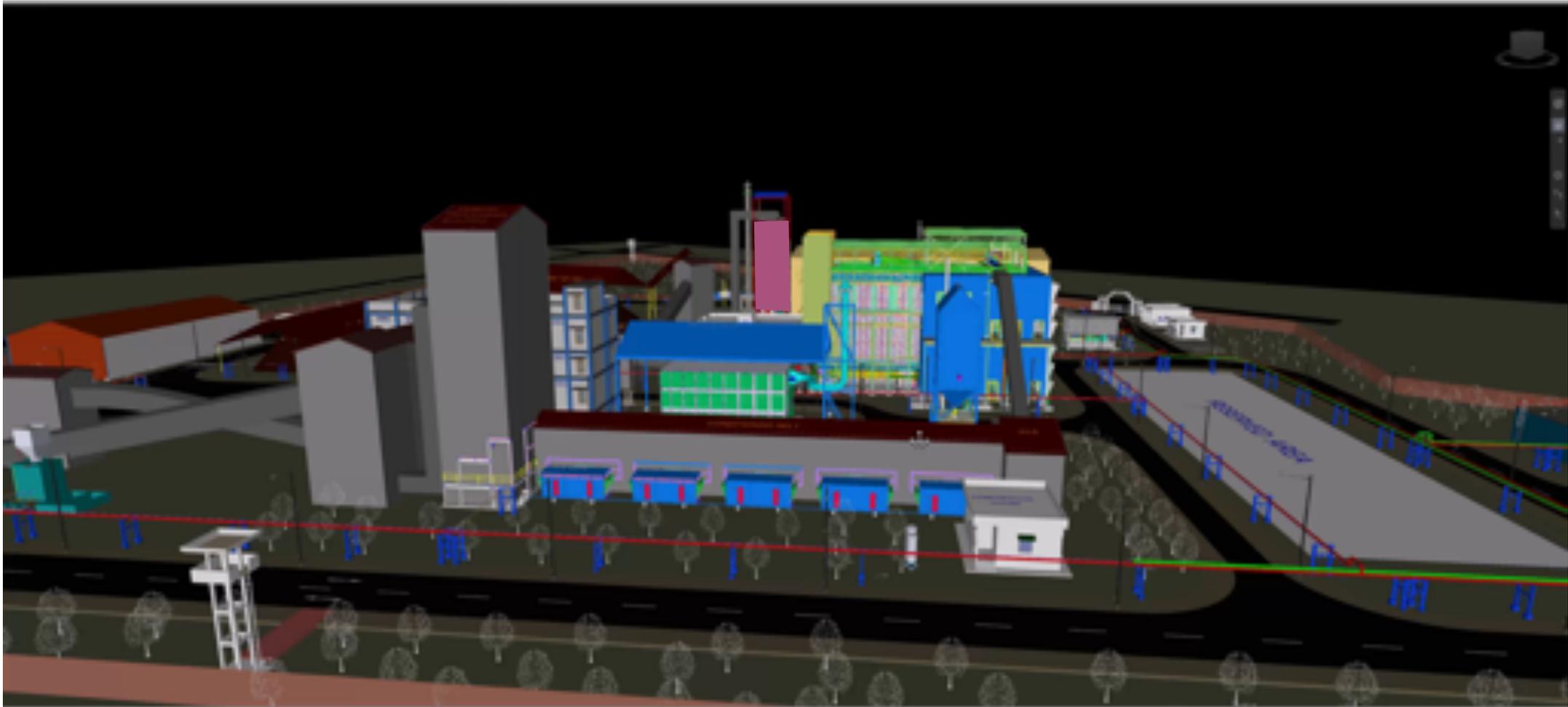


Raw material stockpiles  
Crushing & handling

Primary Processing Building  
Shift hoppers, milling & extruding

Conditioning Belt  
Conditioning fan boxes

# Fly-through of 3D layout – Integrated Pilot Plant

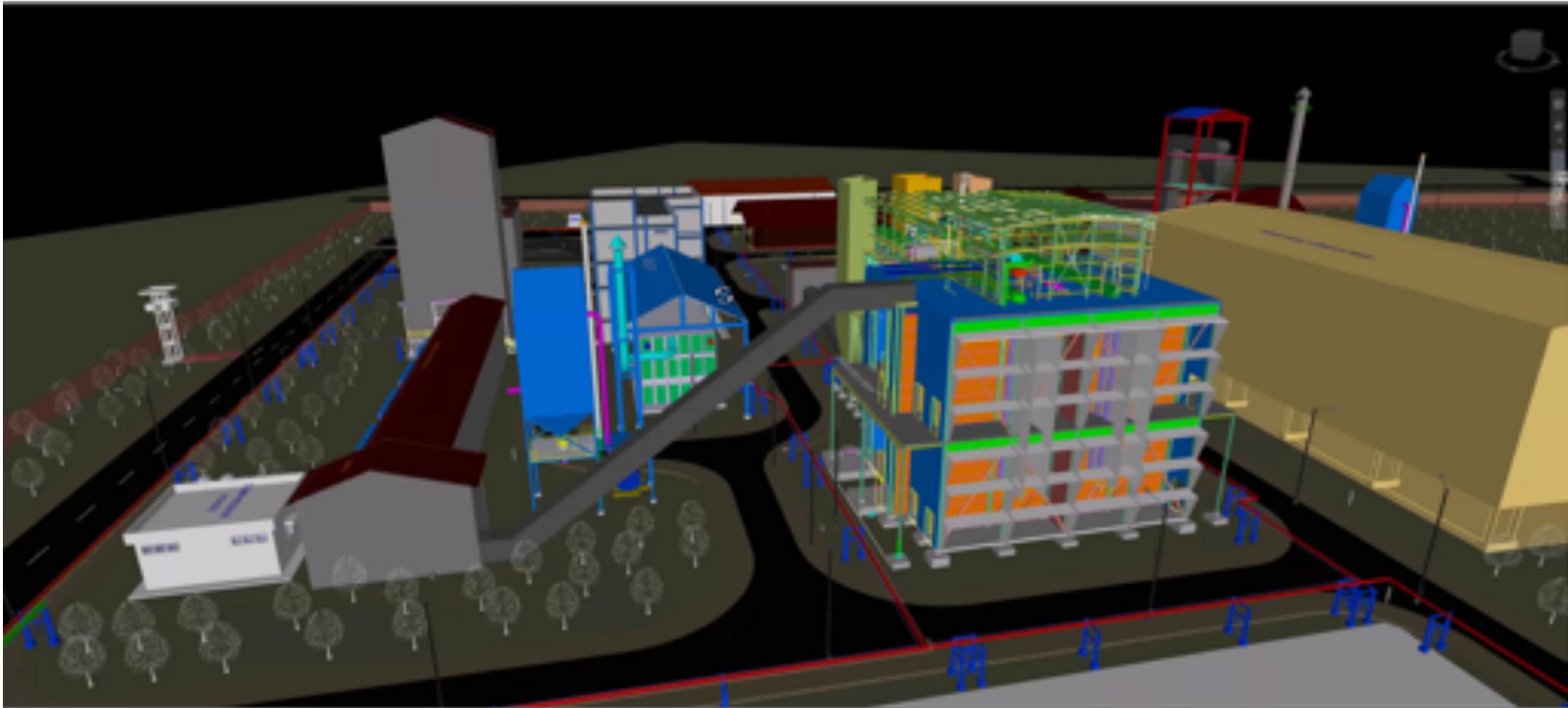


Control room & MCC  
Aux heating systems  
Incoming HV

Packed Bed Dryer  
PBD Fan boxes & heat exchangers

Moist pellet distribution conveyors  
PBD exhaust stacks

# Fly-through of 3D layout – Integrated Pilot Plant

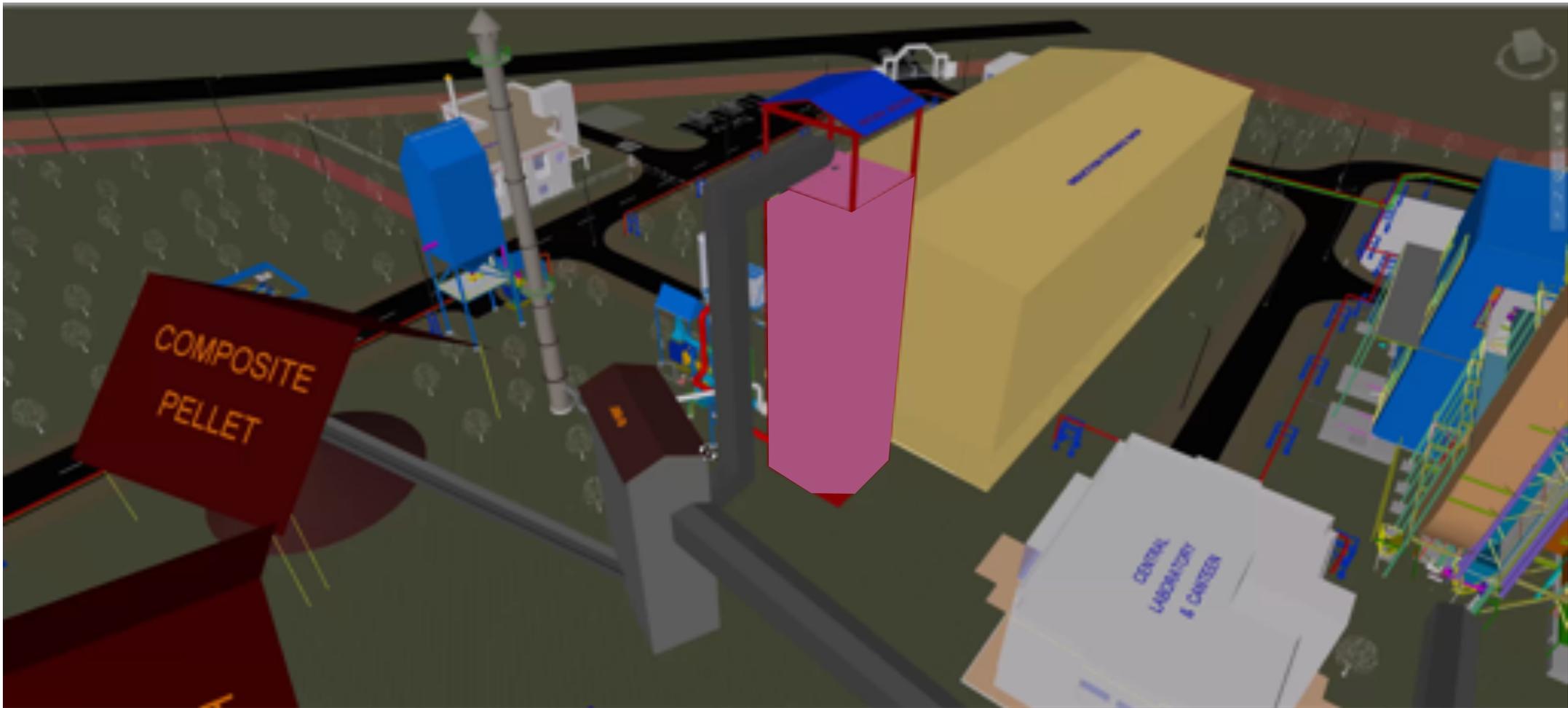


PBD discharge conveyors  
Pellet conveyors to retort & stockpile

Lab & lunchroom

Matmor retort  
Melt shop (Induction furnace)

# Fly-through of 3D layout – Integrated Pilot Plant



Retort  
Offgas combustor  
Offgas heat exchanger

Exhaust stack

Nitrogen system  
MCC

# Benefits vs Other Ironmaking Processes

Decoupling from traditional raw materials strengthens a business' resistance to inherent price volatility

TEF Study basis:  
2015/6 average RM costs & Sales prices

	Traditional	Indian Alt	ECT
	BF - BOF	CB DRI - EAF	C/M - EAF
	Blast Furnace - Basic Oxygen Furnace	DRI Kiln – EAF	Coldry / Matmor - EAF + Power Generation
Case / Scenario	Base Case	Base Case	Mid Case
CAPEX (Index)	100%	90%	64%
OPEX (Index)	100%	123%	103%
SALES (Index)	100%	108%	103%
ROI (index)	100%	70%	160%

Inherent strength – Lower Capex, plus ability to use lower cost raw materials:

- Coking coal (~\$US 85 FOB)
- Non-coking coal (~\$55 FOB)

TEF model updated using  
2018 Sep RM costs & Sales prices

	Traditional	Indian Alt	ECT
	BF - BOF	CB DRI - EAF	C/M - EAF
	Blast Furnace - Basic Oxygen Furnace	DRI Kiln – EAF	Coldry / Matmor - EAF + Power Generation
Case / Scenario	Base Case	Base Case	Mid Case
CAPEX (Index)	100%	90%	64%
OPEX (Index)	100%	106%	86%
SALES (Index)	100%	109%	104%
ROI (index)	100%	130%	250%

2018 current pricing:

- Coking coal >100% increase
- Non-coking coal >25% increase
- Lignite flat pricing
- Fe Ore fines ~flat
- Steel >30% increase

## Commercial terms:

- Research and development collaboration (R&D collaboration) -unincorporated association governed by the terms of the RCA
- The participating interests in the R&D collaboration (and subsequent SPV)
  - NLCIL: 25.5%
  - NMDC: 25.5%
  - ECT: 49%
- A special purpose vehicle (SPV) will be established
  - the earlier of:
    - Final Project Completion,
    - any registrable project IP
  - as mutually agreed between the parties
- Establishment of the SPV,
  - all project IP and assets transferred and assigned to the SPV,
  - SPV will become a party to the RCA.
- Project Control Committee (PCC):
  - NLCIL – 2 representatives
  - NMDC – 2 representatives
  - ECT – 3 representatives

## Commercial terms:

- NLCIL:
  - Fund 50% capital expenditure (~INR75 Crore or ~AUD15M)
  - Fund 25.5% operating expenditure (~INR6.9 Crore or ~AUD1.4M)
  - Fund 25.5% of any additional budget (CAPEX & OPEX)
- NMDC
  - Fund 50% capital expenditure (~INR75 Crore or ~AUD15M)
  - Fund 25.5% operating expenditure (~INR6.9 Crore or ~AUD1.4M)
  - Fund 25.5% of any additional budget (CAPEX & OPEX)
- ECT:
  - Fund 49% operating expenditure (~INR13.2 Crore or ~AUD2.6M) (CP- Coldry Australia, PCC, Board Approvals)
  - Fund 49% of any additional budget (CAPEX & OPEX)
  - Project bond of ~AUD3.5M or 10% of the PCC approved capital budget,
  - Master Technology License:
    - Exclusive royalty-free global licence during R&D phase
    - Transition to a commercial license when SPV created
    - SPV to issue sub-license - Global Royalty Share Structure
    - Pre-existing IP – remains owned wholly by ECT
    - Project IP – owned by the R&D collaboration/SPV
    - New IP (in the future) – owned in proportion to funding contributions
  - Commercial Technology License (Australia):
    - ECT will retain the right to license its pre-existing Coldry IP, in Australia
    - All royalty income shared through SPV

## Research Collaboration Agreement:

- Commercial Terms
- Master License
- Services Agreements
  - NLCIL
  - NMDC
  - ECT
- Legal / Compliance terms and conditions

# India Activity: Project Pathway

- Tripartite Agreement Completed
- Techno-Economic Feasibility study Completed
- External Legal / Financial Due Diligence (1) Completed
- Memorandum of Understanding Completed
- Basic Engineering Report (Dastur) Completed
- External Legal / Financial Due Diligence (1) Completed
- NLCIL Board Approvals Completed
- NMDC Board Approvals Pending
- Presentation to Government (MOC, MOS) Planning
- Signing Ceremony Planning
- Financial Close Planning



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Thank you.

