

# A BRIDGE TO A LOWER CARBON FUTURE



**“The Wonder from Down Under”**

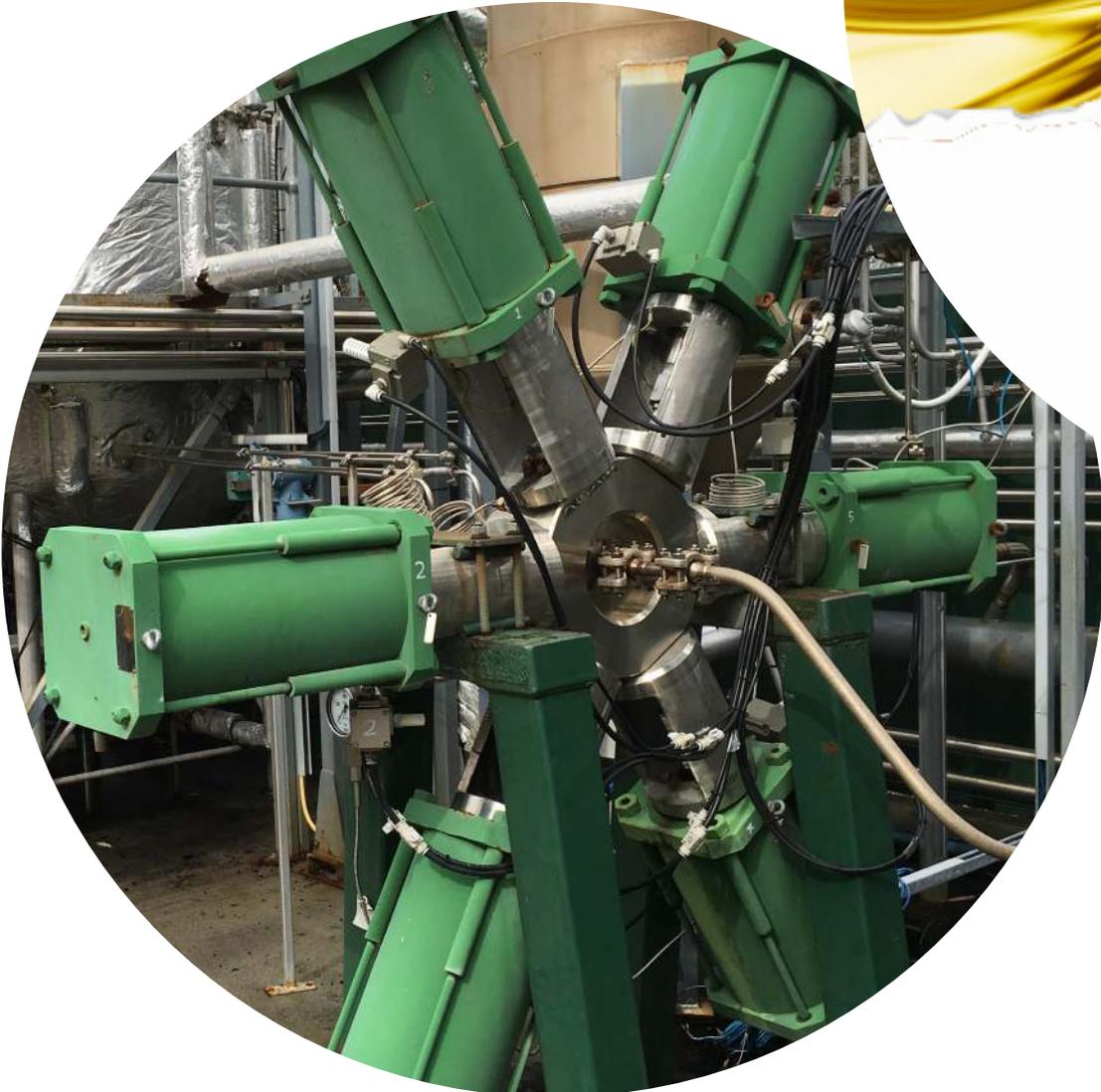
– Jim Lane, Biofuels Digest

**“Canfor did a worldwide inventory of the technologies available  
and Licella stood out”**

– Martin Pudlas, Vice President Pulp and Paper, Canfor

**“Biomasters of the universe”**

– EPPM, the magazine for Europe’s plastic processors.



# ABOUT US

**Licella™ is the global leader in hydrothermal upgrading.**

Our proprietary hydrothermal upgrading platform, the Cat-HTR™ (Catalytic Hydrothermal Reactor), has been extensively tested at the world's first large scale continuous-flow pilot plant, converting biomass residues, End of Life Plastic, non-edible biomass, used lubrication oil and lignite into a stable biocrude or synthetic crude oil.

With over AU\$75M invested already in the Cat-HTR™ platform, it is now commercial-ready and we are working with our strategic partners to build the world's first commercial-scale hydrothermal upgrading plants.

**Licella's biocrude is renewable, stable, miscible and non-corrosive.**

Licella's biocrude is capable of being blended within a conventional refinery to produce drop-in biofuels and valuable biochemicals.

Licella's Cat-HTR™ platform can be fully integrated within our partners existing infrastructure, to provide a brand new revenue stream to industries such as pulp and paper and Resource Recovery.

By doing so, we are helping to provide a high value proposition for our partners low value residues, diverting End of Life Plastic and other residues from landfill and the natural environment and reducing our reliance on virgin fossil crude.

**By doing so, Licella's Cat-HTR platform is providing a bridge to a lower carbon future.**

# OUR TECHNOLOGY

Licella's patented Catalytic Hydrothermal Reactor (Cat-HTR™) converts a wide range of low-cost feedstocks, waste and biomass residues into high-value products, without needing to dry feedstock prior to processing.

The Cat-HTR™ platform has been extensively tested, and conservatively scaled up over the past ten years to its current large pilot plant on the NSW Central Coast, Australia.

## 1 FEEDSTOCK + CATALYST + WATER



**WATER:** The Cat-HTR™ process is a net producer of water, which has been treated to remove impurities and is then either recycled or released.



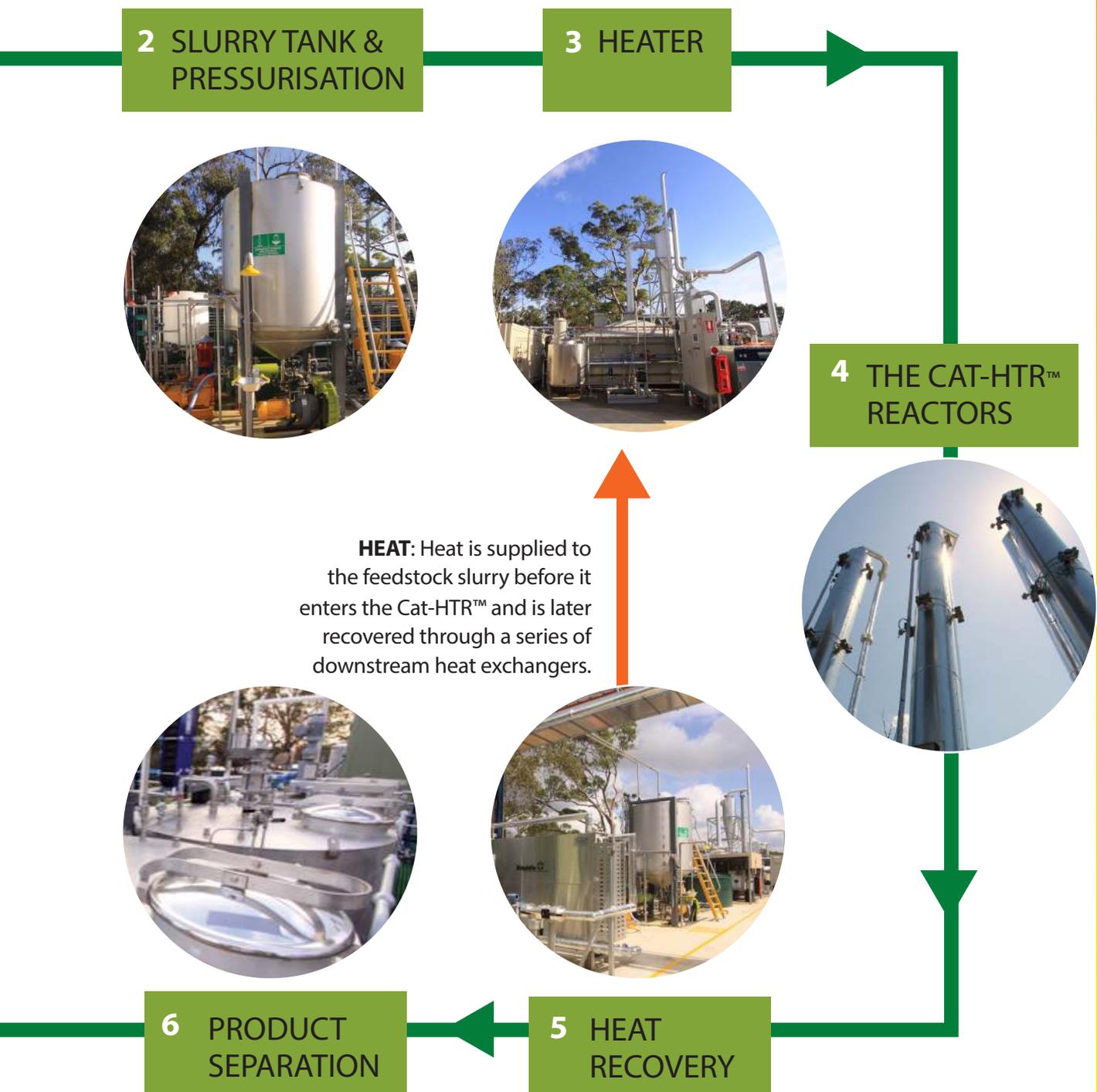
## 8 FINISHED PRODUCTS

## 7 END PRODUCT: BIOCRUDE/ PLASTICRUDE

## Licella's Feedstock Strategy Saves Cost and Reduces our Carbon Footprint

Licella™ is able to process numerous low-cost products, waste and biomass residues and strategically targets feedstocks that are already aggregated. By doing so, we avoid significant aggregation and transportation costs, and also reduce our carbon footprint.

In addition to enormous cost savings, Licella™ is helping to divert these feedstocks, such as biomass residues, from non-environmentally friendly disposal, such as burning, further reducing greenhouse gas emissions. By using End of Life Plastic, Licella™ is helping to reduce the burden of plastics on landfill and our oceans.



# OUR PARTNERS

Together with our partners, Licella™ is planning to build the world's first commercial-scale hydrothermal upgrading plants.

On the lignite side of the business, IER has long-term partnerships to develop our Syncrude and MRC products.



Canfor Pulp is a Canadian (TSX) listed leading global supplier of pulp and paper products.

Licella™ has formed a joint venture with Canfor Pulp to integrate our Cat-HTR™ platform into their Prince George (Canada) mill.



Cat-HTR Plastics, a wholly owned subsidiary of Licella™, has formed a joint venture with Armstrong Chemicals, a subsidiary of Armstrong Energy (UK). The JV will build the world's first commercial-scale hydrothermal upgrading plants for End of Life Plastic to chemicals and will come on line in 2019.



iQ Renew has been established via a partnership between Licella and Stop Waste, an Australian recycling company and owner of Material Recovery Facilities (MRFs) and secondary processing plants for resource recovery. iQ Renew will own the exclusive Australian rights to the Cat-HTR for End of Life Plastic.



Idemitsu Kosan Co.,Ltd, Global Japanese petroleum company, is working with IER toward optimising the Syncrude and MRC products for the global market.

# OUR PROJECTS

## Pulp and Paper

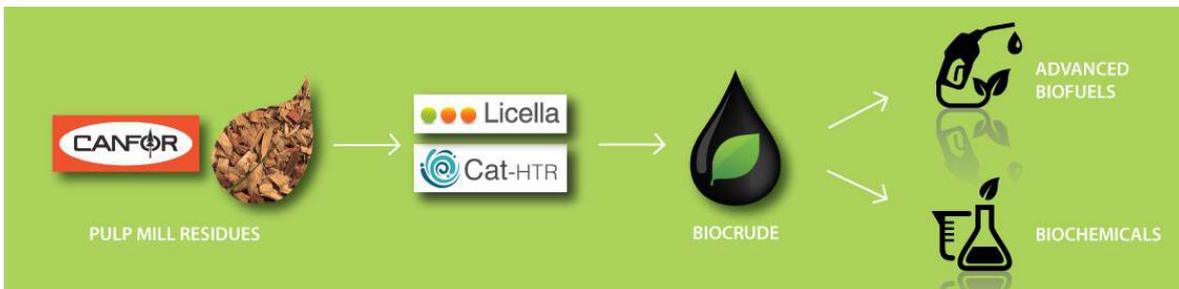
Creating renewable crude at a comparable price to conventional crude, having a >80% carbon intensity reduction

Alongside Canfor Pulp we are working towards the integration of the Cat-HTR™ platform into kraft and mechanical pulp mills, offering a new solution for the stressed pulp and paper industry. By economically converting residues (waste streams) from the kraft pulping processes into biocrude, we can give pulp companies a brand new revenue stream, and reduce waste in the process.

The formation of the JV follows successful trials at Licella's pilot plants.

Our initial commercial plant is planned for Canfor Pulp's Prince George pulp mill. Once complete it will produce 500,000 bbl/annum of biocrude, making it one of the largest 2nd generation bio-refineries in the world.

The JV will then offer this Cat-HTR™ solution to kraft and mechanical pulp mills globally.



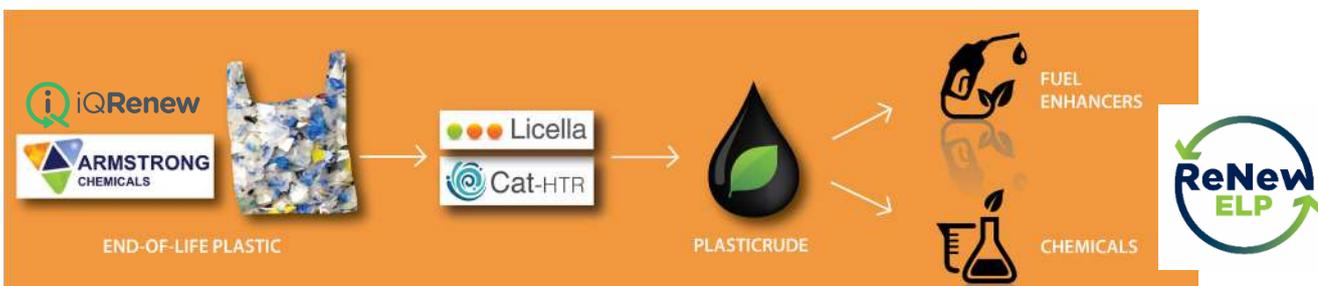
## End-of-Life Plastic (ELP)

A new solution for ELP, diverting plastic from landfill and our oceans

With Armstrong Chemicals in the UK we are building the world's first commercial-scale hydrothermal upgrading plant, the project formed is ReNew ELP. This initial plant will have an annual capacity of 20,000t feedstock and the site has been approved in Wilton, UK.

Following a series of successful trials at Licella's pilot plant, the commercial-scale Cat-HTR™ plant will convert ELP, otherwise sent to landfill, to valuable chemicals.

In many countries a significant charge is levied upon companies to dispose of ELP, which up until now was not economically viable to recycle. The JV will earn a license fee and royalties from the projects, with plans for a global roll out.



**Australia** - Licella™ retain the rights to commercialise and license the Cat-HTR™ platform for ELP within Australia and was recently awarded a grant from the Australian Government. iQ Renew has been established to combine, for the first time globally, physical and chemical recycling (the Cat-HTR platform). By investing in secondary processing, iQ Renew will become the second largest Australian recycler - with a unique local value proposition to create new products from recyclables, minimise material sent to landfill and hence maximise the value of resource recovery.

# OUR PEOPLE

Licella™ is led by a highly experienced and skilled senior leadership team, including co-founders and co-inventors of the Cat-HTR™ technology Dr Len Humphreys (CEO) and Prof Thomas Maschmeyer.



**Dr Len Humphreys, CEO**

Len was instrumental in the conception and development of IER's Cat-HTR process, and is the inventor of a number of patents central to the technology. Len is a Chartered Chemist and is the former MD of several conventional and renewable energy and IT companies.



**Mr Larry Ciccarelli, Chairman**

Larry is a Director of Karr Securities, a private investment firm, where he has worked since co-founding in 1989. Larry is also the Chairman of Karmin Exploration, a TSX-listed mining and exploration company with an interest in one of Brazil's largest undeveloped zinc projects.



**Mr Gordon Ewart, CFO**

Gordon qualified as a Chartered Accountant in 1996. Between 1990-2000, Gordon worked for KPMG, where he specialised in conventional and renewable energy. Prior to joining IER in 2009, Gordon developed biofuel and renewable energy projects in the UK.



**Prof Thomas Maschmeyer, Technology Consultant**

Thomas is an inventor of the Cat-HTR and a company co-founder. He is Professor of Chemistry at the Uni of Sydney and serves as Founding Director of the Australian Institute of Nanoscale Science and Tech. He authored 240+ publications, cited 6000+ times, including 22 patents.



**Dr William Rowlands, Chief Scientist**

William is an experienced industrial scientist with expertise in the area of high-temperature reactions, colloid science and catalysis. William completed a BSc. (Chemistry) in 1984 and a PhD in 1989. He is the author of 14 peer-reviewed papers and several patents.



**Mr Steve Rogers, Business Development Manager**

Steve has spent most of the last twenty years establishing and developing new technology companies. Steve spent 10 years at IBM. Steve joined Licella in 2008 and has since been involved in all areas of the business globally.



**Dr Adriana Downie, Business Development Manager**

Adriana has worked in private, engineering, start-up companies, on the commercialisation of bioenergy technologies for the past 12 years. She has been a Senior Fellow at the University of Melbourne and published more than 15 peer reviewed papers and book chapters.



**Mr Rob Downie, Product Manager Cat-HTR**

Robert, a Chartered Engineer, was the MD of BEST Energies Australia, before it was taken over by IER. He has commercial and engineering experience across various low carbon technologies, including biomass gasification, pyrolysis, biomass hydrolysis and direct coal liquefaction.



**Mr Calla Pieters, General Manager, Engineering**

Calla has 26 years of experience in R&D, Plant Operations, Design, Project Management and Technology Development in South Africa and Australia. Calla holds formal qualifications/degrees in Analytical Chemistry, Chemical Engineering and Pulp & Paper Technology.