“The Wonder from Down Under”
– Jim Lane, Biofuels Digest

“Biomasters of the universe”
– EPPM, the magazine for Europe’s plastic processors.
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 fuels and chemicals.

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, incineration 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

The Global Leaders in Hydrothermal Upgrading

Our patented Catalytic Hydrothermal Reactor (Cat-HTR™) converts a wide range of low-cost feedstocks, wastes and residues into high-value products. The synthetic oil produced is chemically equivalent to conventional crude oil.

Over the past 10 years the Cat-HTR™ platform has been extensively tested, and conservatively scaled up on the NSW Central Coast, Australia. The quality of the products is unchanged over three different scales of pilot plants. The Cat-HTR™ platform is now commercial ready.

Licella’s Feedstock Strategy Saves Cost and Reduces our Carbon Footprint

Licella strategically target feedstocks that are already aggregated. By doing so, we avoid significant transportation costs and reduce our carbon footprint. By utilising wastes and residues, we are helping to divert them from landfill, incineration or other non-environmentally friendly disposal.
COMPETITIVE STRENGTHS

Cat-HTR Oil Advantages

- Suitable to drop-in to conventional crude oil infrastructure
- Stable
- Double the energy density (vs. pyrolysis oil)
- Less corrosive than pyrolysis oil
- Miscible
- Transportable

Cat-HTR Process Advantages

- Continuous flow process
- Lower carbon footprint due to a lower reaction temperatures (vs pyrolysis and gasification)
- Low cost catalyst used
- No need to add external hydrogen – significantly reduces plant cost and complexity
- No drying of biomass feedstock required
- Tolerant to mixed feeds and high ash feeds
- Reactions easily controlled
One of the first companies to combine physical & chemical recycling

iQ Renew was formed by Licella and has since merged with Australian recycler Stop Waste, a developer of Material Recovery Facilities (MRFs). As a result iQ Renew will be the first Australian company to offer physical and chemical recycling - covering a greater percentage of resources and extracting more value from resource recovery.

iQ Renew will deploy the Cat-HTR for End-of-Life Plastic in Australia, alongside expanding its physical recycling operations - a truly circular solution for plastic. iQ Renew will be uniquely positioned to recycle almost 100% of plastics.

Advanced Biofuels from Construction & Demolition Wood Waste

iQ Renew Wood Waste will offer the Cat-HTR solution to the commercial and industrial construction and demolition sectors, as a solution for wood waste. Currently the market is limited for recovered wood from demolition but a large amount of feedstock exists suitable for chemical conversion into biocrude by the Cat-HTR platform.

Global Plastic Production
1950-2015 in million metric tones (Mt)

- Discarded: 4900, 79%
- Incinerated: 800, 12%
- Recycled: 600, 9%

79% of all plastic ever produced has been discarded in landfill or the natural environment.

If current trends continue, by 2050 there will be more plastic in the ocean than fish.
Pioneering a global solution to divert plastic from landfill and our oceans

Today only a minority of plastic waste can be recycled. The rest ends up in landfill, incineration or the ocean at great environmental cost. Fossil oil then needs to be extracted to make new plastics at great cost.

Our Cat-HTR platform can recycle all plastic back into the oil it came from. Meaning, everything that can be made from fossil oil can be made from waste plastic. A truly circular solution to the problem of plastic. Helping the environment, reducing GHG emissions, and creating value at the same time.

Mura is our global joint venture with Armstrong Energy in the UK, commercialising the Cat-HTR platform for End-of-Life Plastic (ELP) and End-of-Life Tyres.

Mura’s first licensee, Renew ELP, are building the world’s first commercial-scale hydrothermal upgrading plant in Wilton, in the North East of the UK. This initial plant will have an annual capacity of 20,000t of ELP feedstock.

Following a series of successful trials at Licella’s pilot plant, the commercial 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.

Neste Partnership

Neste, the world’s leading producer of renewable diesel, ReNew ELP, and Licella have joined forces in a development project to explore the potential of using mixed waste plastic as a raw material for fuels, chemicals, and new plastics.

The collaboration is one of the steps towards Neste’s goal to introduce liquefied waste plastic as a future raw material to fossil refining, with a target to process annually more than one million ton of waste plastic by 2030.

“This cooperation can accelerate the needed development and commercialization of waste plastic based products”

Matti Lehmus, Executive VP, Oil Products
Canfor Pulp is a Canadian (TSX) listed leading global supplier of pulp and paper products. Licella has formed a global joint venture with Canfor Pulp, Centrex, to commercialise the Cat-HTR platform for biomass.

By economically converting biomass residues from the kraft pulping processes into biocrude, Centrex will revolutionise the industry globally by offering pulp and paper companies a brand new revenue stream, and reduce wastes in the process.

Centrex’s initial commercial plant will be fully integrated into Canfor’s Prince George mill in Canada and will produce 500,000 bbl/annum of biocrude, making it one of the largest 2nd generation bio-refineries in the world.

Centrex will offer the Cat-HTR solution to kraft and mechanical pulp mills globally, creating new global pathways to advanced biofuels production, to fulfill the impending renewable fuel mandates, particularly in the US and EU markets.

**REDII - Renewable Energy Directive II**

**EU: 0.5% of transport fuels must be advanced biofuels by 2021, increasing to 3.5% in 2030**

Currently EU oil refiners annual production capacity is 7000 million tonnes (4.2 billion barrels).

- 0.5% = 126 million barrels of advanced biofuels by 2021
- 3.5% = 882 million barrels by 2030

This would require 882 commercial-scale Cat-HTR biocrude plants by 2030 in the EU alone.