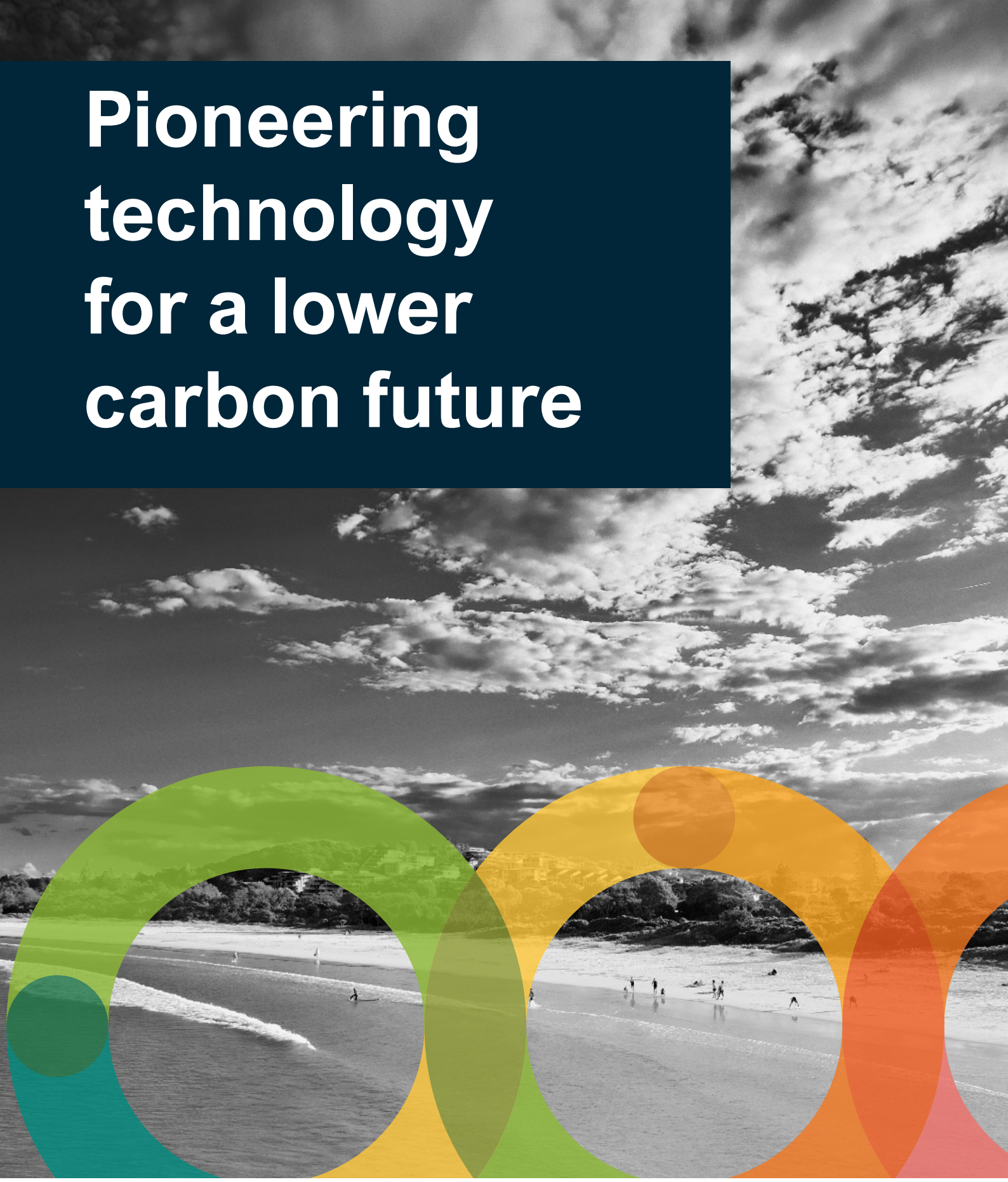
Pioneering technology for a lower carbon future



Licella™

Cat-HTR™

licella.com

Reducing waste, not natural resources

Licella are the global leader in hydrothermal liquefaction (HTL), the next-generation of advanced recycling.

Our patented Catalytic Hydrothermal Reactor (Cat-HTR™) technology platform reduces, recycles and recaptures carbon from a wide variety of recovered resources, both plastic and biomass feedstocks, across multiple markets.

Cat-HTR™

A LOWER CARBON FUTURE REQUIRES PIONEERING THINKING AND PIONEERING TECHNOLOGY.

PIONEERING TECHNOLOGY

Our patented Cat-HTR™ platform enables a circular economy for recovered resources. We have the patented and world-leading technology to unlock the value from what others consider waste. Diverting a wide variety of biomass and plastic from landfill or burning, and creating valuable new products in the process.

PIONEERING THINKING

Where others see waste, we see valuable resources. By re-shaping our thinking around carbon, we can work with nature's carbon cycle and unlock value from waste, while reducing our reliance on fossil resources. The possibilities for more sustainable products are endless and the resources are all around us, hiding in plain sight.

The way we use carbon is unsustainable

Licella offer low carbon solutions that help achieve decarbonisation and reduce the reliance on fossil resources.

ENABLING A GLOBAL CIRCULAR ECONOMY IS CRUCIAL FOR A LOWER CARBON FUTURE.

- Each day, the world consumes around 100 million barrels of fossil oil, yet creating oil takes nature millions of years.[1]
- Every day, huge quantities of biomass is burned or buried, creating significant GHG emissions and wasting potential carbon resources.
- Human-related activities contribute six billion tonnes of carbon emissions annually.
- If no action is taken, CO_2 in the atmosphere will double by 2100.[2]
- According to McKinsey & Company data published this year, “Change is too slow to reach the 1.5°C Pathway”[3]
- Even if this 1.5°C target is met, the costs to the global economy relating to climate change are projected to reach USD 54 trillion by 2100.[4]
- A transition to renewable energy can only address 55% of global emissions. The remaining 45% comes from producing the products we use every day.[4]

1. U.S. Energy Information Administration (EIA). (2021) Independent Statistics & Analysis.
2. Intergovernmental Panel on Climate Change (IPCC). (2014). Synthesis report.
3. McKinsey & Company. (2021). Global Energy Perspective.
4. Ellen Macarthur Foundation. (2019). Completing the picture - How the circular economy tackles climate change

Our Business Model

WE PARTNER WITH OTHER INDUSTRY LEADERS WHO SHARE OUR VISION FOR A LOWER CARBON FUTURE.

Our flexible business model allows us to commercialise our Cat-HTR™ technology alongside our strategic partners.

These partnerships are built upon a foundation of collaboration, extensive due diligence and a shared vision for a more sustainable future.

Our world-class technical and commercial teams include Cat-HTR™ Inventors, Dr Len Humphreys (CEO) and Prof Thomas Maschmeyer (Key Technology Consultant), winner of the 2021 Prime Minister's Prize for Innovation in Science and the 2018 CSIRO Eureka Prize for Leadership in Science.

Our Cat-HTR™ technology is at the core of our partners advanced recycling processes.

The first commercial plant to utilise Cat-HTR™ has commenced construction by ReNew ELP in the UK. The technology risk for the plant has been underwritten by AXA.

ReNew ELP is part of Mura Technology, our global partner for post-consumer plastic outside of ANZ.

KBR and Dow are supporting Mura's global roll out.

Arbios Biotech is our joint venture with integrated forestry company, Canfor Inc, in the renewable market. Arbios will commercialise our Cat-HTR™ technology for post-consumer biomass in North America, South America and Europe.

Arbios has a global alliance with Shell Catalysts & Technologies.

These Global offtake agreements are accelerating the commercial roll-out of our Cat-HTR™ technology commercial.

We retain the rights to commercialise our Cat-HTR™ platform for plastic and tyres in Australia and New Zealand.

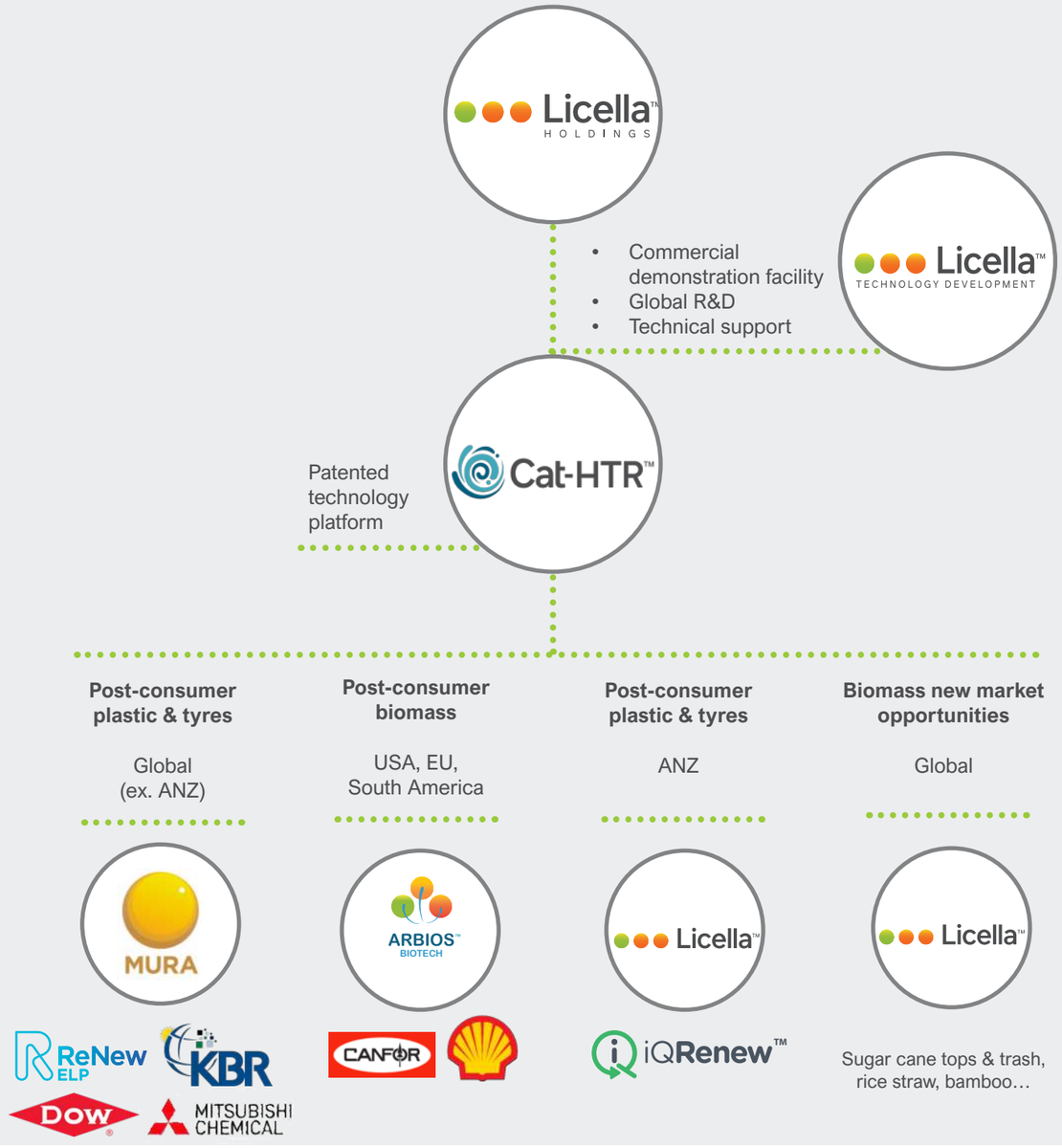
Our ANZ team are well advanced commercially, with a feasibility study underway with major project partners, including iQ Renew, Nestle, LyondellBasell and Coles, to determine the first ANZ commercial plant site.

"… the 'Catalytic Hydrothermal Reactor' – an **innovative Australian designed technology** that converts end of life plastics into waxes, diesel and new plastics. These innovations show us **a truly circular economy is not only possible but is achievable**."

SCOTT MORRISON, AUSTRALIAN PRIME MINISTER

Our Commercial Partners

OUR BUSINESS STRUCTURE ALLOWS US TO COMMERCIALISE OUR PATENTED TECHNOLOGY PLATFORM ALONGSIDE OUR STRATEGIC PARTNERSHIPS.



Our Technology

OUR AWARD-WINNING AND INNOVATIVE AUSTRALIAN TECHNOLOGY CREATES HIGH VALUE PRODUCTS FROM WASTES, WHILE REDUCING OUR RELIANCE ON FOSSIL RESOURCES.

Hydrothermal Liquefaction (HTL) uses water under pressure and at high temperature to chemically transform solid carbon-based material into oil.

HTL is the next-generation of advanced recycling (also know as chemical recycling). It is a depolymerisation process for natural polymers (biomass) and man-made polymers (plastic).

We have spent over 13 years developing our commercial-ready Cat-HTR™ (Catalytic Hydrothermal Reactor) platform. With over AU$100M invested, it is the most advanced HTL technology in the world.

Our first Cat-HTR™ Pilot Plant was commissioned in 2007, with three successful reactor scale ups.

Our Technology Development division operates the largest continuous flow HTL Plant in the world in Somersby, NSW, Australia.

Compared to pyrolysis and gasification, our HTL process is more efficient, flexible, delivers more value and has a lower carbon footprint (due to the lower reaction temperatures).

Our renewable biocrude is far superior to pyrolysis oil, and our process for biomass produces a significantly higher yield of oil.

For plastic, Cat-HTR™ can process all polymer types together, including multilayer packaging – a major advantage over pyrolysis.

Competitive Advantages

OUR PIONEERING CAT-HTR™ TECHNOLOGY DELIVERS HIGHER VALUE AND LOWER EMISSIONS THAN OTHER ADVANCED RECYCLING APPROACHES.

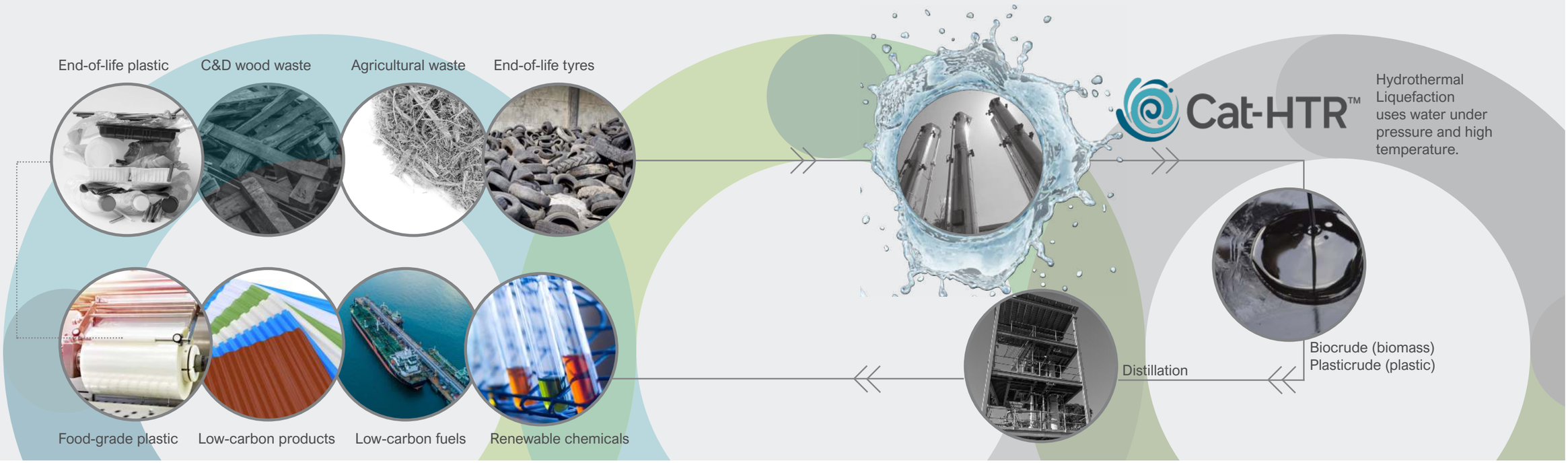
Our Cat-HTR™ platform has a lower carbon footprint than pyrolysis and gasification, due to its lower reaction temperatures. We use a low cost catalyst and there is no need to add external hydrogen, further reducing the cost and complexity of commercial plants.

BIOMASS

- Uses water as the “agent of change” – no need to dry the biomass prior to processing, significantly reducing cost and the plant complexity.
- Our biocrude is suitable to drop-in to conventional refinery infrastructure.
- Our biocrude is double the energy density of pyrolysis oil.
- It is more stable and less corrosive than pyrolysis oil, making it blendable and transportable.
- Proven to process a wide range of biomass wastes and residues.

PLASTIC

- Uses water to control the conversion of plastics to oil, resulting in a higher yield and no harmful by-products, such as dioxins. The oil is very low in other contaminants, such as ash.
- Can process any and all types of plastic, including soft plastic and multilayer packaging.
- No need to sort plastic by type, can process degraded and contaminated plastic.
- Delivers double the value and half the emissions of Waste to Energy (incineration of plastic).
- A true circular solution for plastic - by taking the plastic back to oil, all new plastic produced through advanced recycling can be food-grade.



End-of-Life Plastic

ENABLING A CIRCULAR ECONOMY FOR ALL PLASTIC, CAT-HTR™ IS UNIQUE AMONG PLASTIC TO OIL TECHNOLOGIES.

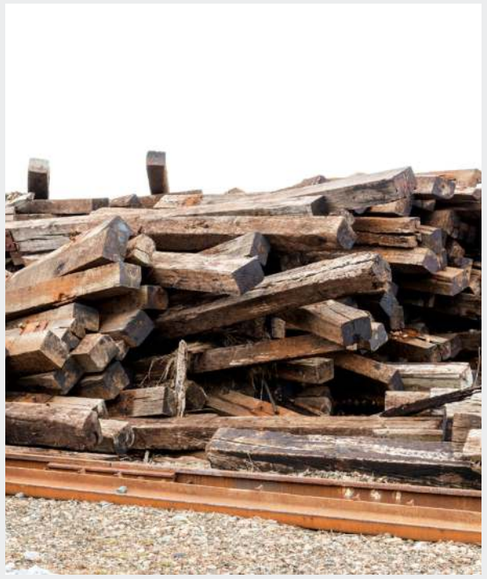
- For plastics, recycling 1 tonne could reduce emissions by 1.1–3.0 tonnes of CO_2 compared to producing the same tonne of plastics from virgin fossil feedstock.[1]
- Our Cat-HTR™ platform is the next-generation of advanced recycling.
- It creates double the value and half the emissions of Waste to Energy (incineration of plastic for energy).
- Our Cat-HTR™ hydrothermal liquefaction process uses supercritical water to control the conversion of plastic to oil.
- The result is a higher yield of oil, a more efficient and scalable process and no harmful by-products.
- Mechanical recycling focuses on rigid plastic (mostly PET & HDPE) and can be done 2-3 times before plastic degrades. Plastic must also be sorted by type.
- Advanced recycling complements mechanical recycling, helping to close the plastics loop for the ~90% of plastics that go to landfill globally.
- Our Cat-HTR™ platform can recycle any and all types of plastic without needing to sorting them by type - a huge advantage over other advanced recycling processes.
- It is a circular economy solution for difficult to recycle plastic such as soft plastic and multilayer packaging.
- Our Commercial Demonstration Plant in NSW, Australia, has successfully completed a demonstration with refiner Viva Energy, polymer manufacturer LyondellBasell and Nestle, that used our Cat-HTR™ process within the existing plastics supply chain to produce new food-grade soft plastics from recycled content.

Cat-HTR™

Global (Ex. ANZ): MURA

ANZ: Licella

1. Ellen MacArthur Foundation. (2016). The new plastics economy: rethinking the future of plastics.



Biomass Waste

THE TOTAL ACCESSIBLE MARKET FOR BIOMASS “WASTE” IS ENORMOUS.
WE OFFER A HIGH VALUE, LOW EMISSIONS ALTERNATIVE TO BURNING OR BURYING.

- Globally biomass wastes and residues available for bioeconomy are greater than the annual energy consumption of the US.[1]
- 38-45% of the total available supply is agricultural waste and biomass residues.[2]
- Black carbon from burning agricultural waste is the second biggest contributor to global warming and the largest source of dioxin emissions in Australia.[2]
- 92 million tonnes of crop residue are burned in India every year.[3]
- Diverting 50% of India’s crop residue from burning would result in the avoidance of 38 thousand tonnes of Black Carbon, 268 thousand tonnes of Methane (CH_4) and 73 million tonnes of CO_2, equal to a GHG reduction of 17 million cars off the road for a year.[4]
- Queensland is one of the biggest sugar cane producers in the world, with waste and residues available every year totaling 5.7 million tonnes of tops & trash residue alone.[5]
- Utilising sugar cane residues (tops and trash plus bagasse) as a feedstock for Cat-HTR™ plants creates significant emissions offsets and a new stream of revenue for growers.
- Landfill-destined feedstocks further reduce GHG emissions, particularly methane.

Cat-HTR™

Post-Consumer Biomass	New Market Opportunities
USA, South America, EU	Global
Global alliance with Shell Catalysts & Technologies.	Sugar cane tops & trash, rice straw, bamboo…

ARBIOS™ BIOTECH

Licella™

1. The International Renewable Energy Agency (IRENA). (2030). Global Bioenergy Supply and Demand Projections for the Year 2030.
2. NSW Dept. Planning, Industry & Environment. (2020). Guidance Note – Air Quality Toolkit.
3. FAOSTAT. (2019). Crop Residue Burning in India.
4. Akagi et al. (2011). Emission Factors for Open and Domestic Biomass Burning.
5. QLD Government. (2021). Open Data Portal.

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