



Epichem enters partnership to develop waste into fuels technology

- Biomass/feedstock oxidative process uses oxygen and water at high temperature and pressure to break down input materials and form useful end products
- New disruptive technology is a novel invention from US-based Australian Ken Anderson, Founder and Chief Technology Officer of Thermaquatica
- Perren will seek government grants and other funding

1 September 2020 – Perth, Australia: Epichem Pty Ltd, wholly owned subsidiary of PharmAust Limited (ASX:PAA), has entered into a partnership agreement with Obsidian Minerals Pty Ltd to establish Perren Pty Ltd to develop a novel and disruptive waste to fuels technology using oxidative non catalytic dissolution.

Perren will endeavour to develop and commercialise the biomass/feedstock oxidative process that can turn waste into fuels. The technology is a world-first because of its potential to turn a wide range of waste and biomass feedstock into valuable fuels, fine chemicals, agricultural growth stimulants and ethanol.

The benchtop flow reactor will be carbon neutral, environmentally sustainable and uses oxygen and water at high temperature and pressure to break down input materials and form useful end products.

The process has the potential to convert:

- Plastics into renewable fuels and useful chemicals
- Coal into diesel, agricultural biostimulants, diesel and fine chemicals
- Rubber tyres into liquid fuels and valuable chemical products
- Trees into cellulosic ethanol and fine chemicals
- Leftover stock or crops into liquid fuel
- Agricultural waste into cellulosic ethanol and agricultural biostimulants.

The technology used in the flow reactor could also be used to enhance the process of carbon storage in soils. It may also have application in the minerals recovery sector.

“There are many things this process may be able to convert. We are excited to learn more of its capabilities and applications,” said Epichem CEO Colin La Galia. “The technology could make a significant contribution in our local capacity to deal with waste and produce diesel, liquid fuels, biofuels, liquid fertilisers and biostimulants.”

The technology is a novel invention by US-based Australian Mr Ken Anderson, Founder and Chief Technology Officer of Thermaquatica Inc. It is under a research licence agreement and patented and IP protected.

“The flow reactor has the potential to help with the problem of what to do with the waste produced in WA. The flow reactor may help WA’s focus on sovereign capability to produce our own ethanol for our PPE requirements in Australia including the manufacture of hand sanitiser. It can be scaled up for a range of industry partners and create employment opportunities in WA and Australia moving forward.”

“We are seeking government grants and funding support and investment to create the benchtop flow reactor.”

Colin La Galia has been appointed as the inaugural CEO of Perren. Epichem and Obsidian will each own 50% of Perren.

Epichem CEO Colin La Galia said, "Epichem welcomes the opportunity to work in partnership with Obsidian and share our technology, science and chemistry capability and expertise to provide novel and disruptive technologies to our customers, support relevant industries, contribute to the economy and have a positive impact on the environment."

Obsidian Director Keith Whitehouse said, "we are excited to work with Epichem in delivering an innovative technology that has potential to deliver major benefits across a range of industries."

Chairman Roger Aston stated, "We see this as a low cost but high potential initiative in a very scalable and disruptive business that may have multiple uses and customers."

Key Material Terms of the Heads of Agreement:

- Perren is an incorporated joint venture between Epichem Pty Ltd and Obsidian Minerals Pty Ltd for the investigation and development of the Oxidative Hydrothermal Dissolution (OHD) chemical process
- The HOA shall continue for a period of 2 years from 25 August 2020
- The parties intend to agree a formal Subscription and Shareholders' Agreement within 90 days
- Epichem and Obsidian will each own 50% of Perren
- The Purpose of the Agreement
 - a. to cooperate in the development of a benchtop OHD unit;
 - b. to use the benchtop unit to investigate the use of the OHD process to process various feedstocks to generate commercially useful chemical compounds or to transform feedstocks in such a way that they are amenable to further processing into useful materials, substances, chemical compounds etc;
 - c. to investigate the commercial opportunities which arise from the results of tests by the development of scaled up OHD units to production at scales from Production Demonstration through Pilot Plant to Commercial Production;
 - d. to apply to various funding bodies including but not limited to the Western Australian and Commonwealth governments for funding to advance these aims;
 - e. to receive funding from the shareholders and or other investors to further these aims and;
 - f. to aim to execute the Subscription and Shareholders' Agreement and generally carry out the work necessary to achieve the objectives set out above and any further activities as deemed appropriate by the Board.

This announcement is authorised by the Board

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About PharmAust (PAA):

PAA is a clinical-stage company developing targeted cancer therapeutics for humans and animals. The company specialises in repurposing marketed drugs lowering the risks and costs of development. PAA's subsidiary, Epichem, is a successful contract medicinal and synthetic chemistry and material science company.

PAA's lead drug candidate is monepantel (MPL), a novel, potent and safe inhibitor of the mTOR pathway – a key driver of cancer. MPL has been evaluated in Phase 1 clinical trials in humans and dogs; was well tolerated and produced a significant reduction in key prognostic biomarkers. PAA is positioned to commercialise MPL for treatment of human and veterinary cancers as it advances the drug in Phase 2 clinical trials.

About Epichem:

Epichem is a wholly owned subsidiary of the ASX listed company PharmAust Limited. Located in Technology Park, Western Australia, Epichem has been delivering products and services in synthetic and medicinal chemistry to the global drug discovery and pharmaceutical industries in over 40 countries worldwide for over 16 years. Epichem has newly constructed purpose-built, state-of-the-art laboratories and has world class equipment and expertise in synthetic and medicinal chemistry to support drug discovery projects, and for the cost-effective synthesis of drug analogue libraries and intermediates. It also has a rapidly growing catalogue of pharmaceutical reference standards.

Epichem is the recent winner of the WA Industry Export Award 2019 for International Health.

More information at www.epichem.com.au