

The increase in carbon dioxide (CO₂) emissions is one of the greatest challenges facing life on our planet.

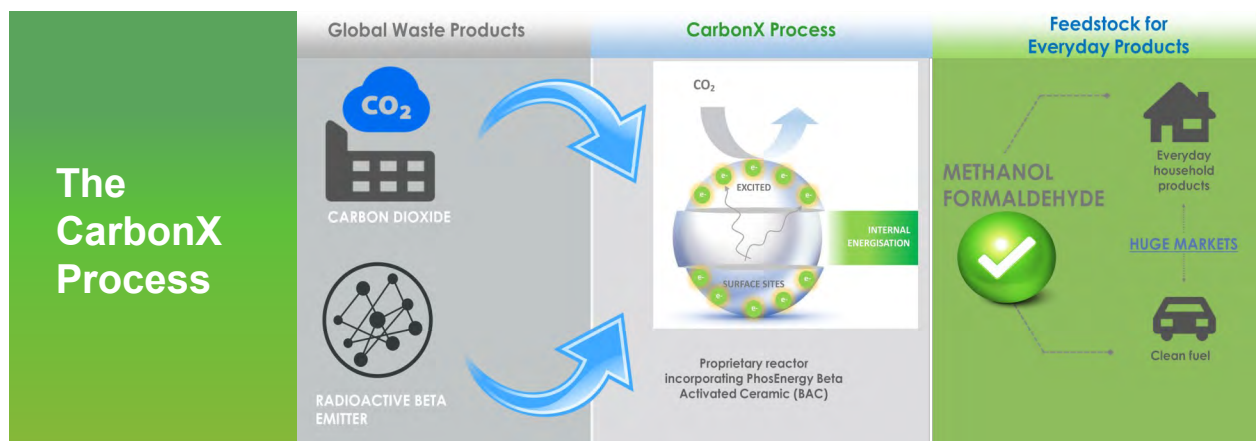
PhosEnergy's CarbonX Process is a ground breaking technology, which has the potential to profitably convert CO₂ to methanol and other commercial products.

Our Approach

PhosEnergy is using its proven process development capability and expertise in the fields of chemical engineering and radio-chemistry to develop Beta Activated Ceramic "BAC" capable of converting CO₂ to methanol and a range other chemicals.

How CarbonX Works

- Beta-emitters (radioactive isotopes that emit high energy electrons) are integrated into the crystal structure of ceramic semi-conductors to form the above mentioned BAC.
- The integrated Beta-emitters energise multiple BAC particles, creating electrons on their surface .
- When aqueous CO₂ is combined with the BAC particles, the transfer of electrons from the surface of the BAC particles to the adjacent CO₂ molecules, causes the CO₂ to become unstable.
- The destabilized CO₂ combines with hydrogen in the aqueous solution (H₂O), producing methanol (CH₃OH) and other valuable chemicals.
- The production of methanol is continuous and does not require external energy to drive the conversion reaction.



The Benefits

- The CarbonX process does not require an external energy source.
- The CarbonX process is modular and readily scalable.
- The CarbonX process does not create by product emissions of CO₂.
- The CarbonX process uses two waste products, namely nuclear waste and CO₂ to produce a high demand product (methanol).

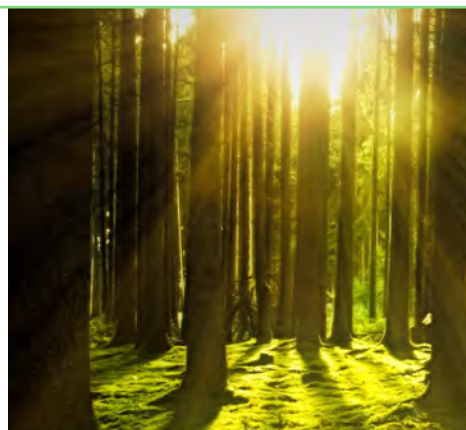


How Are We Different?

The science of CO₂ utilisation to produce methanol is well understood. So how are we different? Previous approaches have used low powered UV light, electrical power or high pressure and heat to energise the reaction. PhosEnergy utilises beta emitters to provide a reliable driving force for the reaction.

Our Advantage

- Proven capability of developing complex chemical processes and delivering step changes to industry.
- Primary inputs are waste products.
- Broad patent portfolio.
- Strong relationships with local and international research Laboratories.
- Simple process design.
- Highly supportive shareholders / investors.
- Technology licencing agreements.



Proof of Concept

The CarbonX Process was demonstrated in a proof of concept (POC) experiment in 2018 conducted at the University of South Australia. The POC demonstrated successful conversion of CO₂ in solution to methanol confirming the ability of beta emitters to catalyse these types of reactions.

How Will We Do It?

Phos's technical team, led by Dr. Julian Kelly is now working to rapidly progress development. Dr Kelly is a chemical physicist / materials scientist and has worked in nuclear technology roles for over twenty years including as a nuclear technology analyst for ANSTO in Sydney and Vienna.

Through Dr Kelly's network PhosEnergy have partnered with highly credentialed laboratories, which have purpose built facilities and experience in handling radioactive material (Beta-emitters) and ceramic semiconductors.

An Australian Provisional Patent application was lodged in December 2018 with a clearly mapped out pathway to commercialisation.

PhosEnergy recently completed a successful capital raise of ~\$800,000, with funds now being utilised to advance the technology's potential on a commercial scale.

Potential Sources of Revenue

- Carbon Credits for CO₂ emission reductions.
- Supply of proprietary plant, equipment and expertise to convert CO₂ to Methanol.
- Toll treatment of CO₂ streams.
- Technology licencing agreements.

Corporate Snapshot

A proven and highly credentialed board and management team

Major Shareholders

Tim Goyder (Director)	16.3%
DevEx Resources	8.9%
Calm Holdings	4.1%
Top 20	~52.4%

Board & Management

Tony Kiernan	Non-Executive Chairman
Bryn Jones	Managing Director
Tim Goyder	Non-Executive Director
Tim Wise	Director
Dr Julian Kelly	Chief Scientist