## Imagine Scotland and Energy Majors spearheading global initiatives to contain and adapt to climate change

Initiatives delivering:

- (1) Low-cost dispatchable renewable energy powering electricity supergrids with near zero transmission losses.
- (2) Non-polluting production of hydrogen and by-products from existing oil & gas assets.
- (3) Towards a case for oil & gas majors to finance, build and operate the production of renewable energy powering electricity supergrids for Europe, Africa, and Asia.

The key to the first is harnessing advances in using renewable energy to produce ammonia. A <u>breakthrough technology</u> that extracts hydrogen from ammonia economically boosts the value of ammonia as a carrier of hydrogen. In effect a battery supporting hydrogen fuel-cell production of dispatchable electricity. Scotland currently leads in meeting its electricity needs from wind energy. It has the wind, wave and tidal resources to meet without pollution the electricity needs for the whole of Europe.

The second initiative proposes the application of existing technologies and non-polluting production processes to extract hydrogen and a wide range of industrial by-products from oil. Hydrogen for electricity for the grid or in the production of the by-products. This is complemented by a promising carbon neutral technology to extract hydrogen from natural gas that is being commercialised by the <u>Hazer Group</u>, a listed Australian company. Using iron ore as a catalyst, the process also produces graphite for industrial uses, including electric vehicle batteries. Hazer are also well advanced in the production of graphene from graphite. Using graphene to achieve low-cost superconductivity in the transmission of electricity would be a game changer. Australian-China commercial partnership is manufacturing high voltage direct current (HVDC) and <u>Ultra-HVDC cables</u>.

This confluence of technological advancements underpins the feasibility of establishing low-cost dispatchable renewable energy powering electricity supergrids with near zero transmission losses. A concept plan to achieve this outcome is provided in the paper "Cairncross Speculation - Scotland as the Renewable Energy Hub for Europe". This in turn could underpin the development of a case for oil & gas majors to finance, build and operate the production of renewable energy powering electricity supergrids for Europe, Africa, and Asia.

Other initiatives outlined include:

- (4) Accelerated cultivation of seaweed <u>using CO2 directly captured from air</u> on a massive scale in conjunction with massive arrays of floating windfarms underpinning the production of: (a) vegan food products for global markets; and (b) biodegradable plastics.
- (5) Consideration of adapting an Australian technology to convert <u>plastic waste to biofuel</u> to operate on ships designed to collect ocean-borne plastic waste and remain indefinitely at sea powered by the biofuel.
- (6) Building hydrogen fuelled ships for seaweed cultivation and harvesting and processing ocean-borne plastic waste.

These initiatives and many others covered in Cairncross Speculation make a compelling case to direct the massive investment in the exploration of fossil fuels into accelerating their realisation. The additional accelerant of globally accepted carbon pricing would deem such exploration economically unsustainable.