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Micro not Macro

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ABSTRACT

The circular carbon economy is all about seeing the value in what we have previosuly discarded, and changing the way we think about efficiency. We have become very confused about the concept of economies of scale, believing that bigger is better, instead of understanding that bigger is only better in industrial terms it it introduces efficiency.

Renewables gain no advantage of scale. Hence, large scale applications of renewable energy technologies suffer from macro scale. They may have reached the point of lower cost at point of generation, but the economics suffer when being aggregated at macro scale.

Hydrocarbon energy is cheap, with a macro scale installed infrastructure, which makes it appear comparitively expensive for the developed world to transition and makes clean energy disadvantageous for the developing world.

If we only think of the problem in the macro scale paradigm we miss the many advantages of renewable technologies when deployed at micro scale. The modular small scale nature of the many proposed thermal and chemical technologies for the circular carbon economy lend themselves to micro scale opportunities.

Taking waste to energy as the example, rather than aggregating large volumes of waste for industrial processing, it is more efficient to deploy the processing technology to handle the waste locally, also creating local jobs. This has the additional advantage of making the products: renewable fuels, heat energy and by products such as biochar available locally. Each application creates the opportunity for a local renewable energy hub. This makes them ideally suited to regional geographies such as Australia, and of further interest to support indigenous forestry and regeneration.

Given solar and wind also gain no advantage of scale, the locally produced renewable fuels can be used to firm a local micro grid, opening the door to behind the meter renewable energy generation.

Another major cost that contributes to the poor economics of clean energy at scale is the EPC approach. These micro scale applications do not require EPC models, removing many of the obstacles to deploying digital technology to full advantage. Project costs are lower as a result, and if not more importantly, the chances of project success are increased by deploying virtual plants on a design one, build many basis in line with the manufacturing industries.

This presentation explores current projects to illustrate that these new micro scale technologies and opportunities are progressing beyond many proposed macro approaches because of different thinking.

KEY WORDS

Micro, Waste to Energy, Renewable Fuels, Behind the Meter, Pyrolysis, Refining

BIOGRAPHY

For the last 36 years, Howard has worked on process plant all over the world, from downstream petrochemicals and refining through midstream to upstream onshore and offshore, from roles as a technician to executive consultancy.

As his seniority increased, he became increasingly involved in technical readiness and technical due diligence assessments, informing corporate acquisitions and recently guiding start ups using new energy technology applications.

Howard is known for his book 'Simplicity from Complexity' and providing clarity where others struggle.

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