

Renergi Pty Ltd: Energy from Waste through Pyrolysis Project

Lessons Learnt Report #2

COVER PAGE

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EXECUTIVE SUMMARY

Renergi Pty Ltd has developed a patented, award-winning pyrolysis technology, which is termed as “grinding pyrolysis” technology. The technical feasibility of this patented technology has previously been demonstrated with a 100 kg/hr demonstration plant funded by the ARENA and the WA state government.

The ultimate aim of this project is to design, build, commission and operate a pre-commercial demonstration plant in Collie, WA, to convert municipal solid wastes, other wastes and forestry/agricultural residue into three main commercial products – bio-oil, biochar and wood vinegar.

This project is carried out at the time of prolonged COVID-19 pandemic. Herein we report our lessons learnt so far that the COVID-19 pandemic is causing price increases of key supplies such as steel required by the project. The Consumer Price Index (CPI) is not necessarily an accurate measure of the increases in the price of such raw materials as steel. The COVID-19 pandemic has also caused major problems in global logistics. The combined impacts of raw material price increases and worsening logistics can threaten the financial feasibility of what has been a well-budgeted project. The COVID-19 pandemic has much more impacts than just the delay in local project activities.

KEY LEARNINGS

Lesson learnt No. 2: Financial impacts of the COVID-19 pandemic

Category: Commercial

Objective: During this project, in partnership with the Shire of Collie, WA, Renergi will design, build, commission and operate a pre-commercial demonstration pyrolysis plant in Collie. The success of this project will contribute to the transition of Collie from a coal-reliant economy to a renewable-reliant economy by developing a negative-emission bio-based circular economy.

Renergi's pyrolysis plant will have two types of feedstocks: wastes (e.g. municipal solid wastes) and forestry/agricultural residues. Renergi's plant will provide a sustainable waste management solution for the Shire of Collie whereby its municipal solid wastes will be processed into biochar and bio-oil for sale as commercial products. Renergi's plant will also convert other wastes or forestry/agricultural residue into biochar and bio-oil. Renergi's technology can potentially be replicated in many regional areas in Australia and other parts of the world to divert the wastes from landfills while avoiding large amounts of emissions.

The construction of a pre-commercial plant will require a large amount of capital items. Some plant components are off-the-shelf commercial products. Some plant items need to be specially designed and manufactured for this project. Obviously, it is vitally important for Renergi to secure these supplies on time and within budgets.

Detail: This project was planned in 2019 with a sound budget, including significant contingency fund. However, since the beginning of the COVID-19 pandemic, there have been drastic increases in the steel price. Below are some examples of recorded steel price increases in 2021:

- According to Trading Economics [1], the steel rebar futures increased from 3,400 CNY/t in April 2020 to a peak of nearly 6,000 in May 2021 or another peak of around 5,900 CNY/t in Oct 2021.
- According to Fortune [2], from March 2020 to July 2021, "steel prices are up a staggering 215%".

Because Renergi's plant will be made mainly of steel of various grades, the increases in the costs of materials to build Renergi's plant alone could increase the project costs by a few hundred thousand dollars.

The worsening global logistics and therefore the increases in the transportation costs have created another major impact to this project because the increased shipping costs will increase the raw material prices in Australia. Furthermore, Renergi has to import some equipment from overseas. According to ABC [3], "the cost of shipping a 40 foot container from Shanghai to Sydney on the spot market has doubled" during the pandemic. The high shipping costs may last for some time before we can see any drops [4].

It should be noted that the official CPI value [5] rose 3.0% over the period of twelve months to the September 2021 quarter. Obviously, the CPI is not necessarily a good guidance on project cost increases.

As a result of drastically increased costs, the financial viability of the project has become a serious concern. This issue has been resolved by Renergi and granting body putting more resources into the project.

Implications for future projects: The lessons learnt would include:

- In times as uncertain and difficult as the current COVID-19 pandemic, the budget for a major project should have significant contingency fund and commitment from the investors to put in more funds when/as necessary.
- The common CPI values are not necessarily an accurate measure of possible increases in project costs.

References

- [1] Trading Economics, <https://tradingeconomics.com/commodity/steel> (accessed 6 January 2022).
- [2] Fortune, <https://fortune.com/2021/07/08/steel-prices-2021-going-up-bubble/> (accessed 6 January 2022).
- [3] ABC, <https://www.abc.net.au/news/2021-06-10/prices-consumers-shipping-ports-trade/100203086> (accessed 6 January 2022).
- [4] ABC, <https://www.abc.net.au/news/rural/2021-10-14/sea-freight-costs-stabilising/100535856> (accessed 6 January 2022).
- [5] Australian Bureau of Statistics, <https://www.abs.gov.au/statistics/economy/price-indexes-and-inflation/consumer-price-index-australia/latest-release> (accessed 6 January 2022).