**Concrush – Closing the Loop – 15/9/2021**

**Background**

Concrush has operated in the recycling industry for over 20 years while located at Teralba, NSW. We are a “zero waste” industry. We repurpose 99.02% of the C & D waste we receive into valuable resource products including aggregates, sands and road base material.

We aim to become a low carbon manufacturer. We support the endeavours of Beyond Zero Emissions (BZE). Every dollar we spend in electrifying our operation improves air quality.

There are two hurdles to our Zero Emissions Plan which are:

1. The return on required capital to electrify our operation must be better than 5 years. Electrifying our operation is very expensive.
2. Available technology – we currently have no commercial access to battery powered or hydrogen powered mobile plant (30T excavators and 3.5m3 bucket sized loaders)

That said, we can adopt transition technologies or methods which make our products with lower embedded emissions. For example, we can measure and then reduce the amount of diesel burned for each tonne of product we manufacture using materials handling efficiency gains. We can also plan for the new technology (which is coming in 5-10 years time).

**Resource Recovery**

Concrush recycles C & D waste (demolished concrete, bricks, tiles, etc.) into suitable products (aggregate, road base etc.), for reuse in the civil construction industry. The current recycling rates for our industry are below:

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| --- | --- | --- |
| **Region** | **Recycling Rate, %** | **Tonnes Recycled PA** |
| Australia | 82% | 18.8 mtpa |
| NSW | 76% | 9.579 tpa |
| Lower Hunter | 85% | .780 tpa |

As can be seen from the table above the recycling rates in Lake Macquarie LGA of 85% represent a mature and established C & D recycling industry. (Figure excludes power station ash of 5 mtpa).

For every tonne of product made from C & D waste represents a 60% reduction in CO2 to the atmosphere when compared to virgin quarried materials.

**Hydrogen Fuel**

Concrush became aware of the first hydrogen fuel dispensing facility opened to the public operating in Fyshwick, Canberra in February 2020. During the site visit it became apparent how compact and basic the technology is for example, nelhydrogen.com have been making electrolisers for many years.

The Fyshwick “hydrogen fuel station” was built to service a small fleet of cars from Hyundai (Nexo).

From our initial enquiries Newcastle interested parties could build a “hydrogen producing” facility for about $10.0m in capital and produce about 60,000kg of hydrogen fuel per month. This is the starting size of a commercial model.

The issue appears not the technology to make hydrogen; but the technology and required customer base to use the hydrogen fuel produced.

Our calculations indicate that 25 customers (or hydrogen consumers) the size of Concrush would be required. This means a fleet of about 200 large machines (excavator, loaders, trucks, etc.) would need to be “hydrogen ready” to use the available fuel.

**Electrification**

Electrifying Concrush’s manufacturing process in lieu of burning diesel is desirable. The issues encountered with this strategy are:

1. High infrastructure cost. Thus, the “rate of return” is not commercially viable for a 5 year period (required timeframe for SMEs)
2. Access to competitive “green energy” supply price from Ausgrid and electrical retailers.
3. Poor flexibility in sizing electrical supply to facility and equipment. And subsequent cost to upgrade.
4. Available and commercial ready battery powered large mobile equipment (large excavation 30T and large loaders)

Our current assessment of the cost of various options is summarised below:

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| --- | --- | --- | --- | --- |
| **Option** | **CAPX Cost over 5 years** | **Consumption Cost** | **Total Cost 1-5 years** | **Total Cost 5+ years** |
| Ausgrid (400A) | $0.27c/kwh | $0.17c/kwh | $0.44c/kwh | $0.17c/kwh |
| Solar (9W) | $0.36c/kwh | Nil | $0.36c/kwh | Nil |
| Solar (440W) | $1.38/kwh | Nil | $1.38c/kwh | Nil |
| Diesel Generator (500kW)\* | $0.125c/kwh | $0.43c/kwh | $0.56/kwh | $0.56c/kwh |
|  |  |  |  |  |
| \* Diesel cost $1.40/litre |  |  |  |  |