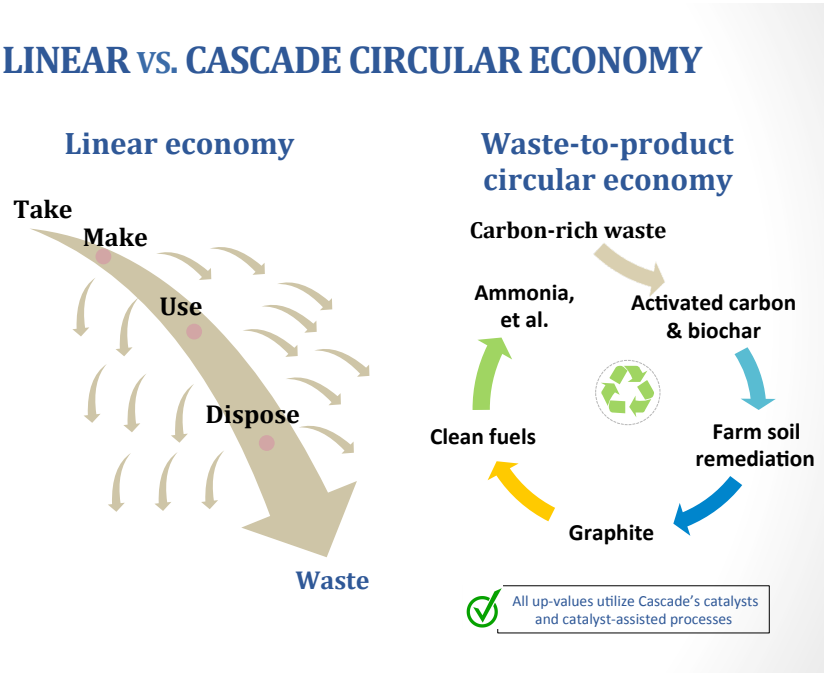
RETHINKING CARBON-RICH WASTE STREAMS IN BRITISH COLUMBIA WITH MARKET-DRIVEN, PROBLEM-SOLVING SOLUTIONS

Project Brief

Presented by: Cascade Catalysts, Inc. (Greater Vancouver): a Four Phase Plan for Implementing a Market-Driven Circular Economy to Convert Multiple Carbon-Based Waste Streams in BC and Canada into Critical Materials & Clean Energy Products



JUSTIFICATION, CONSIDERATIONS & CALLS TO ACTION: SUMMARY

In recent years in BC, there is increasing political and economic concern regarding the various waste streams directly attributable to human activity as well as the ever increasing environmental, social and public costs associated with them, including:

- Construction & demolition wood waste increasing at such a rapid rate as to significantly decrease the lifespan of area landfills unless aggressive and expensive landfill diversion policies are found and implemented,
- Forest waste from logging operations increasing the risk of wildfires—as does standing sawlogs charred from previous wildfires,
- Agricultural waste disposal adding significantly to atmospheric emissions when burned while being uneconomical to landfill or digest,
- Oxidized coal from mining operations containing little economic value in metallurgy and risking spontaneous combustion when piled in open storage,

- Municipal solid waste containing some economically recoverable recyclates save for the lion's share (as much as 70%) of this waste stream consisting primarily of organics & plastics, while
- Canada's tar sands hydrocarbon deposits offering the promise of marketable products however remaining comparably difficult to process and purify.

All of these waste streams are similar in that they are all primarily made up of a single common element—carbon. That's not a problem, that's actually a good thing.

In British Columbia, we have dealt with wood waste in the past as a low-cost resource to supply thirteen massive pulp production facilities (18 total facilities including paper production) near or somewhat near logging operations, however:

- pulp & paper market demand has been waning for decades commensurate with the ever ubiquitous digital economy, while
- hauling distances are continuously increasing, and
- more stringent regulations all combine to reduce the availability of fibre—even though the fibre theoretically exists with more than 300 million trees in the province.

Today, many of these massive pulp & paper facilities with abundant electrical feed, truck, rail & ship access with ample infrastructure are either dormant or headed toward dormancy risking significant and long term loss of jobs and revenue.

Previous efforts to recycle other carbon-rich waste streams have largely failed, especially in market terms. Burning or combusting carbon-rich waste streams represent their lowest value option in economic terms and are therefore unavoidably more expensive and increasingly troublesome.

The very root of this problem is that there has not been (1) an economically viable conversion technology for carbon-rich waste streams into higher-value, desirable products, nor (2) a common organizational strategy for processing carbon-rich waste streams that takes advantage of economies of scale that significantly reduce ancillary costs.

The implementation of this project positively addresses these and other important issues to the benefit of the forestry industry in product diversification, the goals of BC's Ministry of Forests in wildfire prevention and improving damaged and low value forests, the PPWC in maintaining good-paying union jobs in BC, the federal and provincial governments in helping reach Canada's net-zero goals, the involved municipal governments in the nearly complete reuse of increasingly problematic municipal solid waste & sludge, and First Nations people in improving resource stewardship and maintaining a defined value-chain for today's modern economy throughout the province.

PHASED OUTLINE

- PHASE I (6-9 months)
    - (a) C&D Wood Waste into Activated Carbon & Biochar
    - (b) Profitably recovering forest residue wood fibre & standing sawlogs waste for conversion to dimensional lumber logs, activated carbon & biochar;
- PHASE II (9-15 months)
    - Coal and coal waste/tar sands into activated carbon & biochar
    - Ag waste/biomass waste to activated carbon & biochar
    - Provide specialty activated carbon for remediation of farmland from pesticide, herbicide and other organic chemical residue in soil;
    - Provide specialty activated carbon for more effective treatment of municipal waste water & sludge;
    - Municipal Solid Waste (MSW) (organic portion) to activated carbon & biochar
- PHASE III (16-24 months)
    - Wood waste, coal waste, tar sands, hydrocarbon waste & MSW into pyrolytic graphite using catalyst-activated graphitization for use in EV batteries, semiconductors and other
- PHASE IV (24-36 months)
    - Direct, catalyst-activated depolymerisation of carbon-rich waste streams into hydrogen and/or ultra-clean transportation fuels

PHASE I(a): C&D Wood Waste into Activated Carbon & Biochar, commencing operations approx. 6 months after funding

PURPOSE: Profitably converting wood waste fibre from C&D operations in BC into activated carbon & biochar for sale in N. America in support of Canada's net-zero goals

BENEFITS:

- Maximize returns to shareholders;
- Can leverage absolute advantages over competitors in transportation costs and production efficiencies (make it cheaper);
- Continuous flow operations allow more throughput per day with a smaller production footprint, very low energy costs;
- Catalyst-assisted production significantly reduces production time, lowers operational temperatures and eliminates process pressure.

IMPLEMENTING AGENCY: