Methanol purification process A technology worth replicating

Fast facts

Technology: Methanol purification Replicability: Strong potential Capital cost investment: \$5 to 12 million Output: High purity methanol Hot water and condensates used as utilities

Advantages of the methanol purification project¹

Accessible technology

- Technology can be used in many Canadian kraft mills.
- The bio-methanol can be a platform chemical for producing new products.

New revenue stream

• The extracted methanol generates internal savings as well as a consistent revenue stream for a product outside traditional pulp and paper markets.

Environmental benefits

- The methanol is produced by diverting a waste stream to the purifier.
- Internally, methanol replaces purchased fossil fuels. It can also be used as a green alternative in other fossil fuel-based products.

How it Works – Methanol Purification System



Success story

In 2012, Alberta **Pacific-Forest Industries** installed a methanol purification system to produce 3,000 litres of methanol for internal use in pulp whitening operations or for external sale and use of green alternatives in solvents, antifreeze and fuels.

Designed and engineered by A.H. Lundberg Systems (AHL), this unique patented process produces high purity methanol from a facility's stripper off-gas or refinery sour water streams.



きょう 人名美国人 小山田 からの

Need funding?

Access the Canadian Business Network database of government grants, loans and financing options at **canadabusiness.ca/eng/program/search/** for opportunities in your region.



Technology maturity (high)

Has the technology been implemented on a commercial scale outside of Canada?

• The technology for the extraction of methanol from stripper off-gas, though new at this level of purity, has been commercialized by other equipment manufacturers in a less complex fashion to produce simple methanol fuel for internal combustion.

Ease of implementation (very high)

How easily can the technology be replicated, with regards to process complexity, capital costs or intellectual property issues?

- The process can easily be integrated into existing kraft mill processes and its operation does not require any additional human resources.
- Capital costs are relatively low given the payback, and the ownership of intellectual property rights rests with the suppliers. A.H. Lundberg (purification system) and FPInnovations (reverse osmosis system).

Potential for replicability (very high)

Are there multiple sites available with the potential to facilitate such a project?

 Steam stripping is carried out at all Canadian kraft mills, therefore the process could be replicated at any of these mills. Furthermore, the process could be used to remove methanol from sour water in oil refineries, thereby increasing its replicability potential to include the nearly 30 oil refineries currently in operation across Canada.

Market opportunities (low)

Is the relative market size targeted by this technology accessible?

• While large methanol markets do exist, it would be best to target local and domestic markets due to the relatively small quantities which would be produced by Canadian mills.

Is it suitable for you?

- The process requires electricity, cooling water and steam to operate. The electrical requirements are minimal, as they are limited to the operation of transfer pumps.
- ✓ This technology is available to every kraft mill in Canada that uses steam stripping to treat all or part of their foul condensate streams, thereby producing a non-condensable gas stream that needs to be managed.
- This technology would likewise be of value to oil refineries looking to extract higher-value products from their sour water streams.

Cat. No. F04-70/2016E-PDF (Online) ISBN 978-0-660-06500-7

Aussi disponible en français sous le titre :

For information regarding reproduction rights, contact Natural Resources Canada at nrcan.copyrightdroitdauteur.rncan@canada.ca.

© Her Majesty the Queen in Right of Canada, as represented by the Minister of Natural Resources, 2017

Socio-economic benefits (moderate)

Would the project lead to job creation opportunities, environmental benefits and the potential to transform the industry?

- Mill operators and lab technicians would develop new skill sets as a result of the implementation of this technology.
- Producing methanol from a waste stream would lead to many environmental benefits, as it would provide a green alternative to natural gas-based methanol products.
- This technology's transformational potential would be promising should many kraft mills and refineries invest and begin producing green methanol.

Replicability Radar Diagram



Disclaimer: This replication analysis is based on the technology implemented under the project funded by IFIT. The IFIT program does not endorse any specific technology provider and has produced this brief analysis for the benefit of those considering implementing this type of project.