

Applications of Clean Power Generation Technologies

This project evaluated various cleaner, renewable, and innovative options for power generation for a mining operation with a target of reducing the environmental impact of mine operations while considering the economics of new technologies. Technologies reviewed and assessed included:

- Combined Heat and Power (CHP) Cogeneration facilities (available today), and
- Small Modular Reactors (SMRs) (available in the coming 5 years pending regulations).

Lastly a broad investigation into upcoming technologies including renewables (solar/wind) and the state of art over the next 5 years was profiled. These technologies represent alternatives to the power grid which may offer a method to address the increasing need for more economically and environmentally sustainable means of power generation for use by mines across Saskatchewan.

Findings from the research is that any technology can be applicable to any mining operation, with the following considerations:

- Either SMR, Geothermal or a Combined Heat and Power System will be required as a base power option for any operation. Their evaluation rates SMRs and CHP higher than geothermal based on the criteria and information available from IPPs.
- Operations with no significant requirement for process heat and heavy reliance on fossil fuels— recommendation is to use SMRs as base power for the most impact. Geothermal can be used if the site is in southern SK. SMRs can be combined with solar or wind power for peak loads to increase the social acceptability.
- Operations with requirement for process heat – SMRs are recommended over CHP as they are more efficient and environmentally friendly. However, if timelines for development are a constraint (the project needs to be developed and operational before 2025), CHP is the next recommended option.

Report - Applications of Clean
Power Generation Technologies
for Saskatchewan Minerals

Proponent: March Consulting

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IMII & Industry Contribution: \$65,000

March Consulting: \$20,000