Foresight

ARCTIC 1 **Waste Heat**

July 2015 - June 2016

Challenge:

Identify technologies that can capture waste heat from Steam Assisted Gravity Drainage operations, which include the combustion of large quantities of natural gas to produce steam, and transform it into higher-value heat or electricity.

- **Challenge Sponsor:** COSIA
- **Challenge Facilitators:** Delphi Group and Tessellate
- **Budget:** $785,000
- **Finalist:** AMS Energy Corp

Semi-Finalists:

AMS Energy Corp.'s *SolHeat Pipe Heat Exchanger* featuring Thermosyphon Heat Pipe Technology:

- Originally used by NASA for space vessels
- Cost & performance benefits over traditional heat exchanger technologies.

HeatMatrix Group BV's *HeatMatrix exchanger:*

- Rigid matrix of connected polymer tubes yield highest heat transfer efficiency
- Modular structure allows scalability to any size

Environmental Benefits:

- Cumulative GHG reduction of 790,000 tonnes by 2030 if as few as 30 units are installed across the oil and gas industry and within other sectors (e.g. potash, pulp and paper)
- Reduction in fresh water required by the Oil Sands Mining industry of 3,150,000 m3/year by 2030

790,000 Tonnes
GHG reduced

3,150,000 M3/Year
Fresh water saved

Outcomes:

AMS' heat exchanger was installed on two separate Once Through Steam Generators in an in-situ production facility:

	First Installation	Second Installation
Fuel Reduction	**37,060** GJ/Year	**18,530** GJ/Year
Emissions Reduction	**2075** MT/Year	**1038** MT/Year
Cost	**$1.8M** (CAN)	**$1.1M** (CAN)
Payback	**9.32** Years	**11.39** Years

Conclusion:

The installation costs for retrofitting AMS Energy Corp's technology into current facilities were too high (10X the cost due to the additional space needed), so it was concluded the technology would be useful for new projects but not for retrofitting into existing facilities.