office of energy security

Geothermal Discussion

CERTS 2009

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Jeff Haase

Energy Conservation Policy Goal

...achieve annual energy savings equal to *1.5 percent of annual retail energy sales* of electricity and natural gas directly through:

- energy conservation improvement programs; and
- rate design

and indirectly through:

- energy codes and appliance standards;
- programs designed to transform the market or change consumer behavior;
- energy savings resulting from efficiency improvements to the utility infrastructure and system;
- and other efforts to promote energy efficiency and energy conservation.

MN Geothermal Report

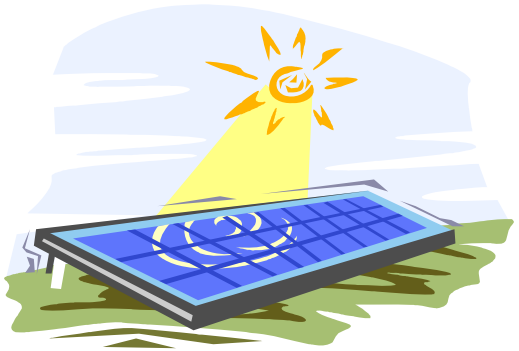
- Funded to develop a comparison to conventional systems:
  - natural gas and conventional AC
- The report evaluated:
  - Emissions
  - Economics
- Due to funding limitations the dataset for the report was modeled

Geothermal Challenges

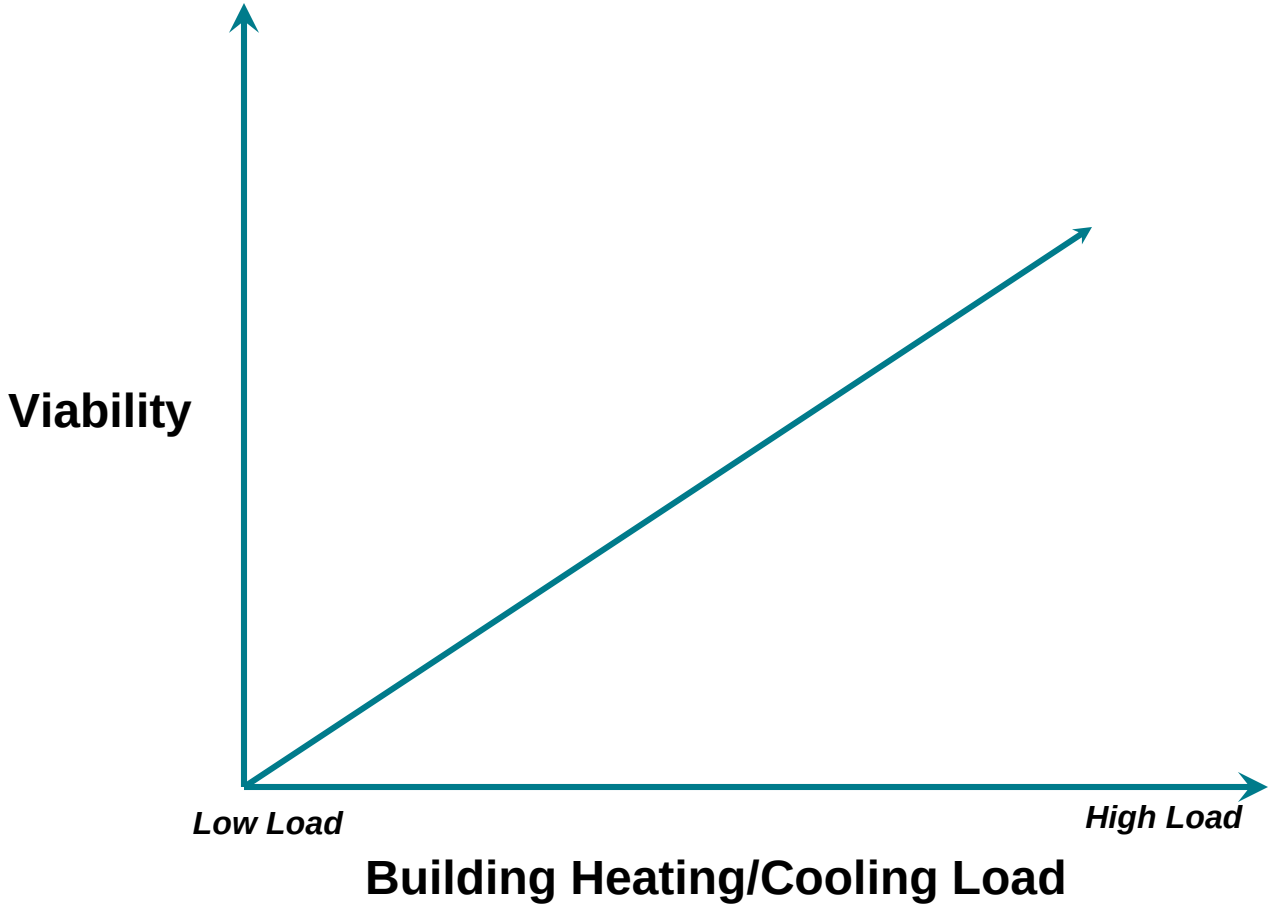
- High up-front costs associated with the well field
  - Other parts of the system are similar in cost to traditional equipment
  - Infrastructure investment that stays with the house
- Comparison to natural gas and air cooled AC
- Variability of well field installation

GSHP & Solar PV

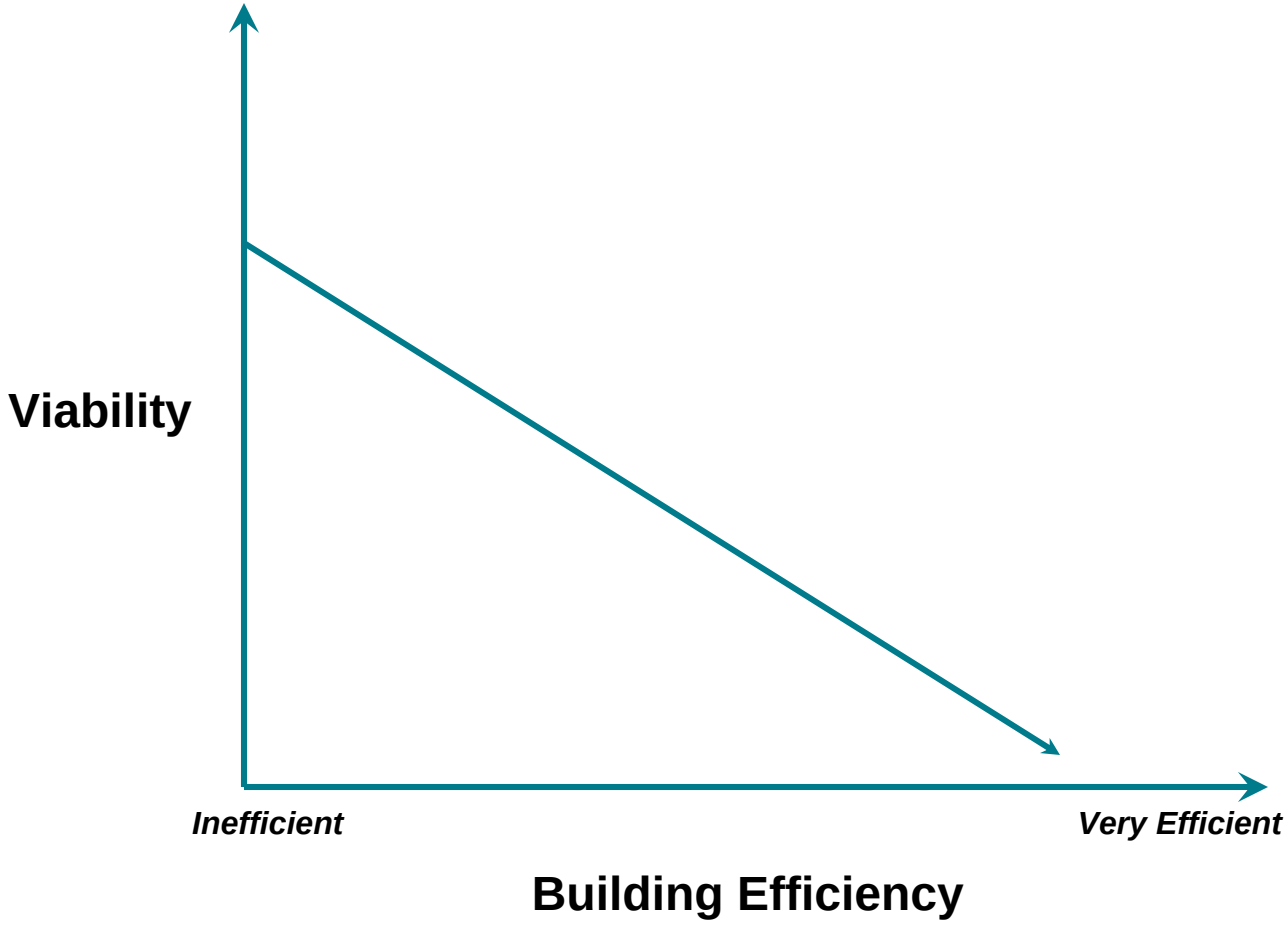
- In some respects the challenges of these two technologies are similar
  - High up front cost
  - Site specific installation
  - Technology advocates
  - Low operating costs



GSHP Viability with Building load



GSHP Viability with Building Efficiency



Energy savings goals

25 X 25

Regional emissions will continue to decrease with increased renewable energy on the system

Energy System Changes

- More renewables are expected to make up utility generation portfolios.
- Wind has characteristics that are synergistic with GSHP.
- The high EERs that GSHP can deliver in the summer months help to offset very expensive power.

When should you take a closer look?

- Electric space heating
- High heating/cooling load
- Cheap well field install
  - Land for horizontal installation
  - Pond or lake loop installation
- Favorable utility rates
  - Space heating, GSHP or Dual Fuel
- Aversion to combustion sources

Other considerations

- Efficiency, efficiency, efficiency
- It's all about cost
  - The well field
- Quality installation
- Long term financing
- Tax credits

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Thank You!

Jeff Haase
jeffrey.haase@state.mn.us
651.297.5648