Gas Alternatives:

Stage 2 analysis and greenhouses

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Prepared by Dr. Heather McDiarmid & Kent Elson

McDIARMID Climate Consulting

Elson Advocacy

Overview

- Gas heating is not the most cost-effective option – heat pumps can lower homeowner energy bills by $12,000 over the equipment lifetime

- Alternatives exist to reduce some or all gas needs in greenhouses

No savings from gas

- Enbridge says customers save $226 million with gas (over 20 yrs)
- Problems with analysis:
  - Does not account for equipment efficiencies
  - Assumes electric resistance heating over electric heat pumps
    - Heat pumps are the most efficient and cost-effective option
  - Ignores some variable fuel costs and fixed charges

No savings from gas

- My analysis – Part I
- I revised Enbridge's spreadsheet:
  - Accounted for equipment efficiency
  - Compared to best alternative option – heat pumps
  - Included all variable costs*
- Result: **customers will lose $48 million with gas** (over 20 years)

*The NPV is negative $24 million if variable gas distribution costs are removed.

No savings from gas

- My analysis – Part II
- Total cost impact – gas vs. heat pumps for houses
  - Upfront costs, variable costs, gas fixed costs, cooling, heating
- Result: **$12,000 lower lifetime energy bills** with heat pumps on avg.
  - $5,200 NPV total savings (20 yrs)
  - Still cost-effective even if gas prices drop by >95%

No savings from gas

- Analysis was conservative:
  - Panhandle region is warmer: results in greater efficiency than modelled
  - New construction likely have lower up-front installation costs
  - Ground source heat pumps are even more efficient and cost-effective
  - Federal grants not accounted for
  - No carbon price increases assumed after 2030

Alternatives for greenhouses

- Alternatives exist to replace some or all gas in greenhouses
  - Biomass (incl. combined heat & power)
  - Efficiency
  - Heat pumps
  - Ground-air heat transfer systems
  - Combinations of heating approaches