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# *Stakeholders' perspectives on barriers to remote wind-diesel power plants in Canada*

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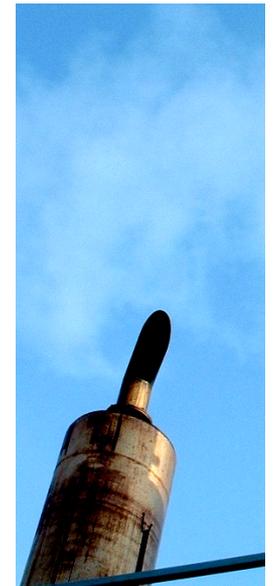
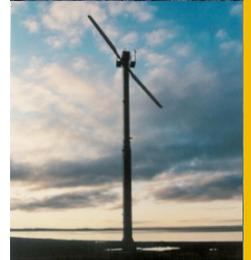
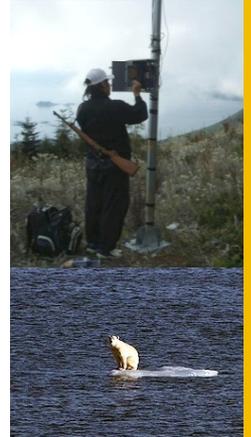
# Purpose of research

- What are the barriers in the Canadian context?
  - *What is Alaska doing that we aren't?*
- Are there differences in perception amongst the different stakeholders?
- Understanding the barriers and the perceptions can help design policy to overcome them



# Methodology

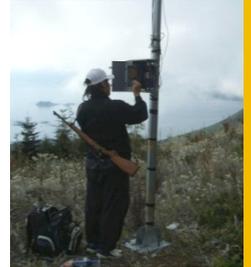
- Survey of stakeholders
  - Key questions:
    - Rank key barriers
    - Recommend incentive to overcome barriers
    - Is wind-diesel ready for the Arctic?
- Stakeholder categories:
  - Wind Energy Manufacturers
  - Researchers
  - Developers
  - Government employees
  - Utility employees



# Methodology 2

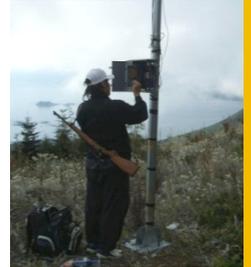
- Survey results collected since October 2006
  - High response rate within the small industry

	Manufacturers	Researchers	Utility Employees	Project Developers	Government Employees	Total
Persons approached	10	11	10	11	11	53
Responses	7	11	7	9	8	42
Response Success	70%	100%	70%	82%	73%	79%
Percent of Respondents	17%	26%	17%	21%	19%	100%



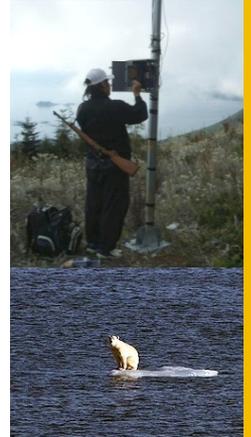
# Results 1 – Highest Ranked Barriers

	Manufacturer	Researcher	Utility	Developer	Government	Average
Capital costs	2	1	3	1	1	<b>1</b>
Operation and maintenance costs	5	2	2	2	3	<b>2</b>
Perceived technical risks	1	4	5	2	2	<b>3</b>
Access to equipment/labour	5	3	3	5	4	<b>4</b>
Technology maturity	8	7	1	6	5	<b>5</b>
Market failures	7	5	6	6	6	6
Awareness amongst utilities	2	6	10	8	7	7
Awareness amongst communities	4	9	8	9	7	8
Regulatory barriers	10	8	9	4	11	9



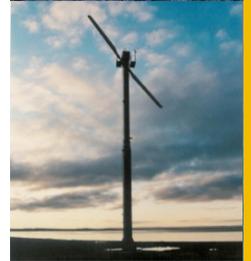
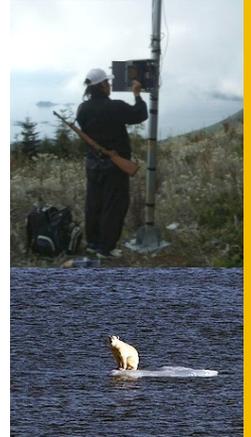
# Discussion - Costs

- Costs identified as most significant barriers almost universally
  - Capital
  - O & M
- All stakeholder groups ranked within **the top 5**
  - Capital costs
  - O & M costs
  - The perception of technical risk
  - Access to local equipment/labour

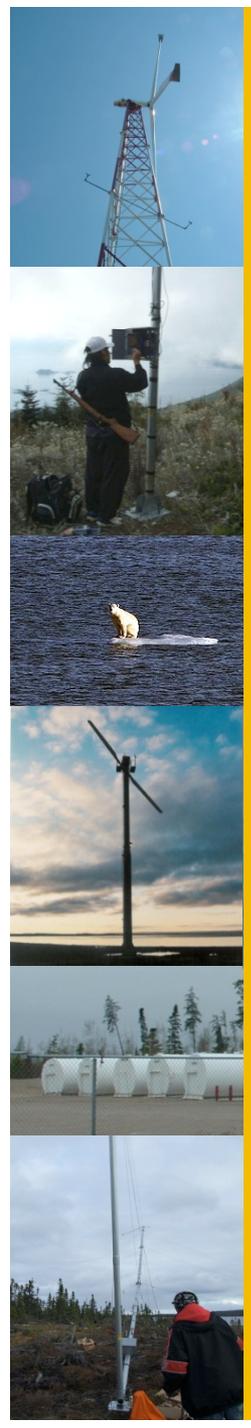
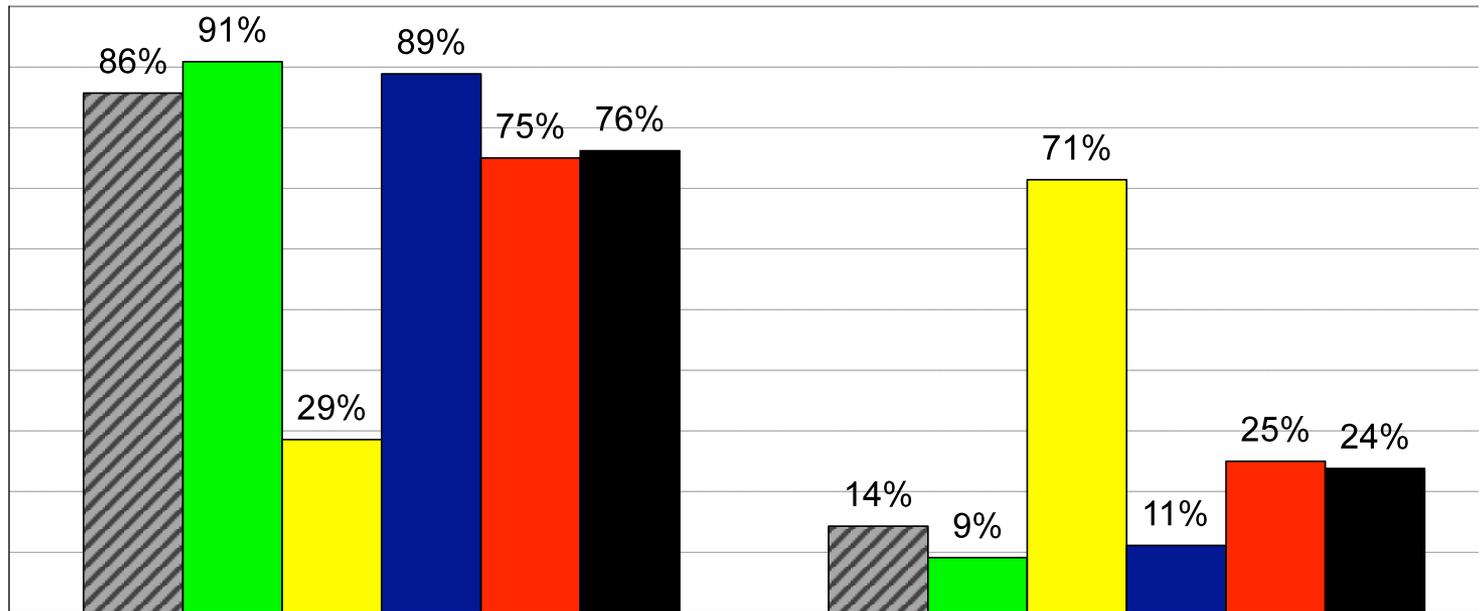


# Discussion - Technology

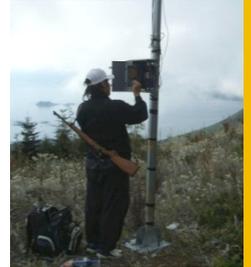
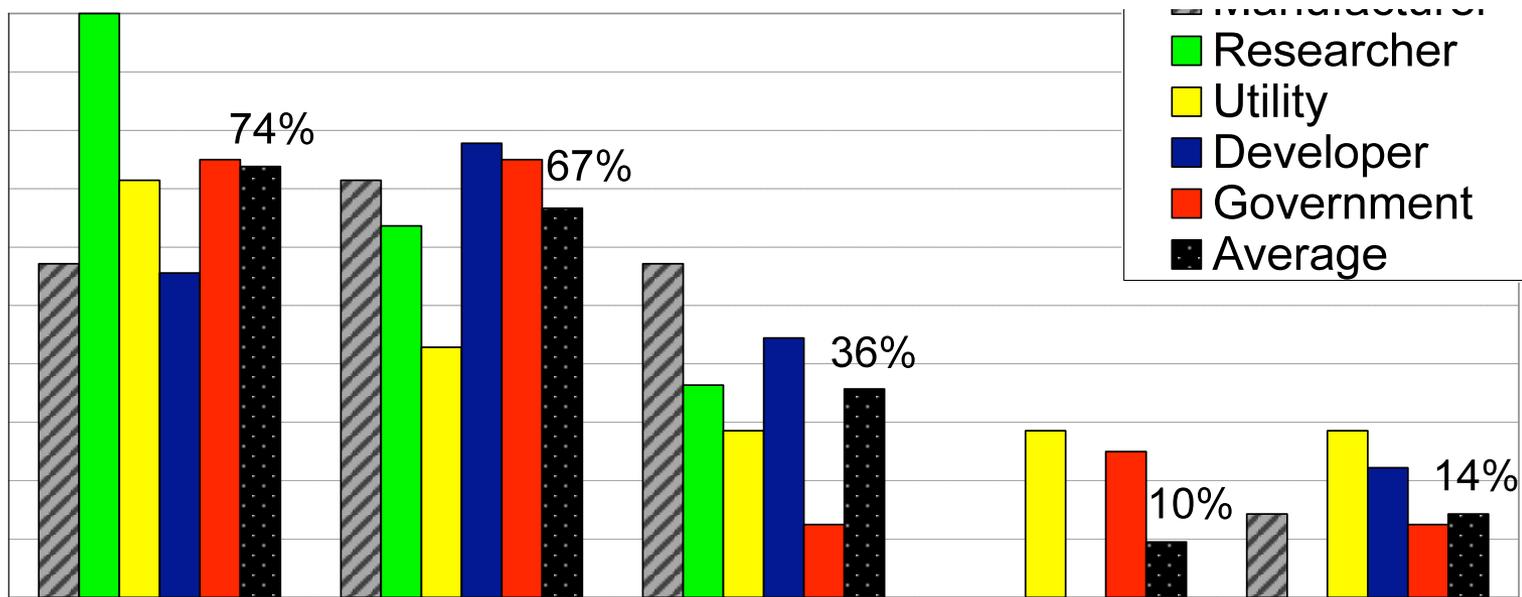
- Only utility and government employees ranked technical maturity among top 5 barriers
  - Utilities: #1
  - Gov't: #5
- Apprehensiveness particularly evident when asked directly if wind technology is ready for remote applications



# Is wind-diesel ready for Arctic?



# Incentive Recommendations



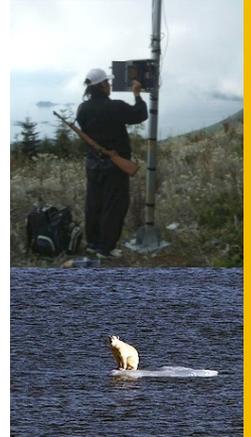
# Overcoming barriers

- A vicious cycle of technology comfort and project implementation
  - (or lack thereof)
- Strategic projects need to be developed first
  - Production incentives aim to ensure that projects are operated and maintained over the long term
- Capital costs are a significant barrier to small communities
- Need a long-term, stable signal to foster development



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