



Observations from the Arctic Energy Summit and Results from the Arctic Energy Action Team

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Good morning, my name is James Hemsath and I am the Senior Fellow for energy at the Institute of the North. This morning I will be providing a brief update from our AES Technology Conference and then I will be presenting on our upcoming activities

First, let me tell you about the ION. ION was created by former Alaskan Governor and Former Secretary of the Interior, Wally Hickel, to address issues important to the people of the Arctic, especially as it relates to areas of connectivity - telecommunications, aviation and marine transportation

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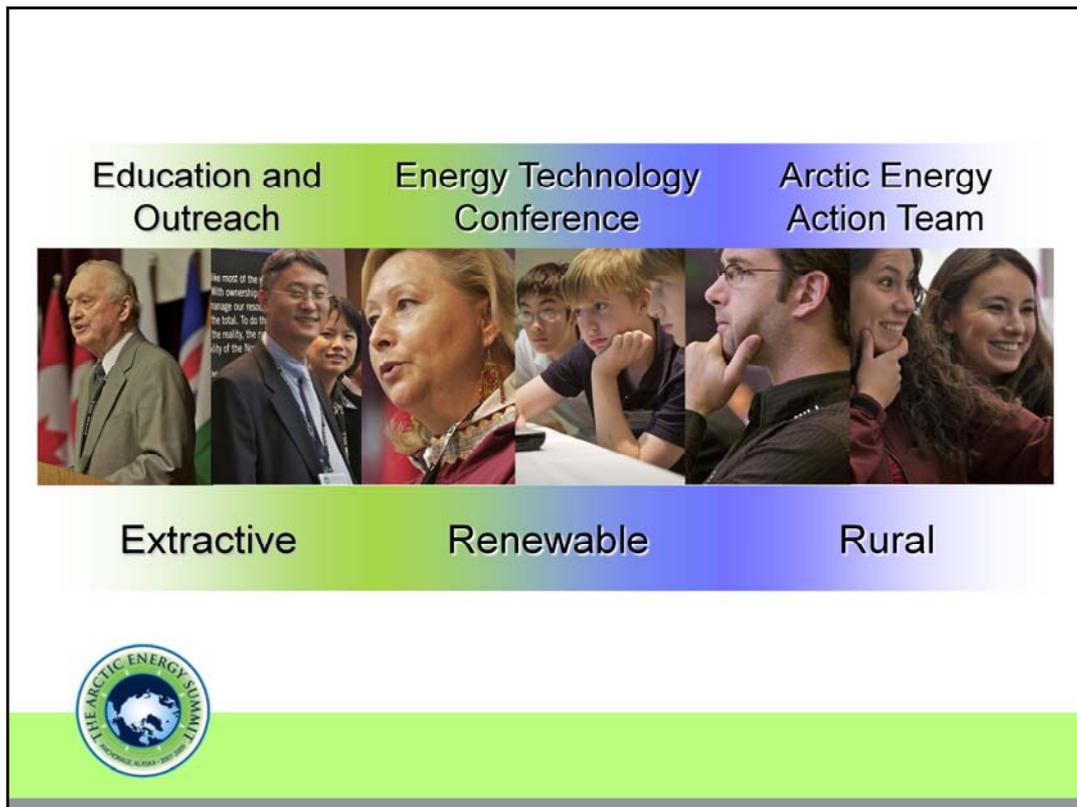


3 Years ago we started discussions looking at energy deployment and at the development of the arctic as an energy province. When we think about the arctic we use expressions such as last frontier, high north, edge of civilization. The impression is about conquering, taking and leaving. A Province implies investing, developing, building - taking ownership for the people of the north.

Our proposal to the IPY was to develop a summit to bring together the people of the arctic to discuss, share and develop a balanced approach to develop extractive, renewable and rural power all in a sustainable way supporting the vision of creating energy wealth while eliminating energy poverty.

IPY approved our proposal in March 2006 and the Arctic Council sanctioned the project later that year.

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We looked at the Arctic energy system as having 2 energy sources - extractive and renewable and 2 methods of deployment - external and internal. So our Extractive CHANGE sources - oil, gas, coal, natural gas from coal seams, methane hydrates - all have an external component for the creation of wealth and all have an internal use for the people of the north. Likewise our renewable CHANGE energy sources - wind, geothermal, hydro and biomass have internal and external applications.

And we focused on a very specific internal need CHANGE Rural Energy.

CHANGE The summit will be accomplished through the implementation of 3 activities - the first an Education and Outreach program which currently consists of our website and Synergy Newsletter. If funding allows we will also have an graduate level class in Arctic Energy and an Arctic Energy Atlas.

CHANGE The Technology Conference our Technology Transfer vehicle and CHANGE our Arctic Energy Action Team.

One might also consider that possible theme for next years Arctic Frontiers might lie in a Renewable theme and a Rural Energy theme.

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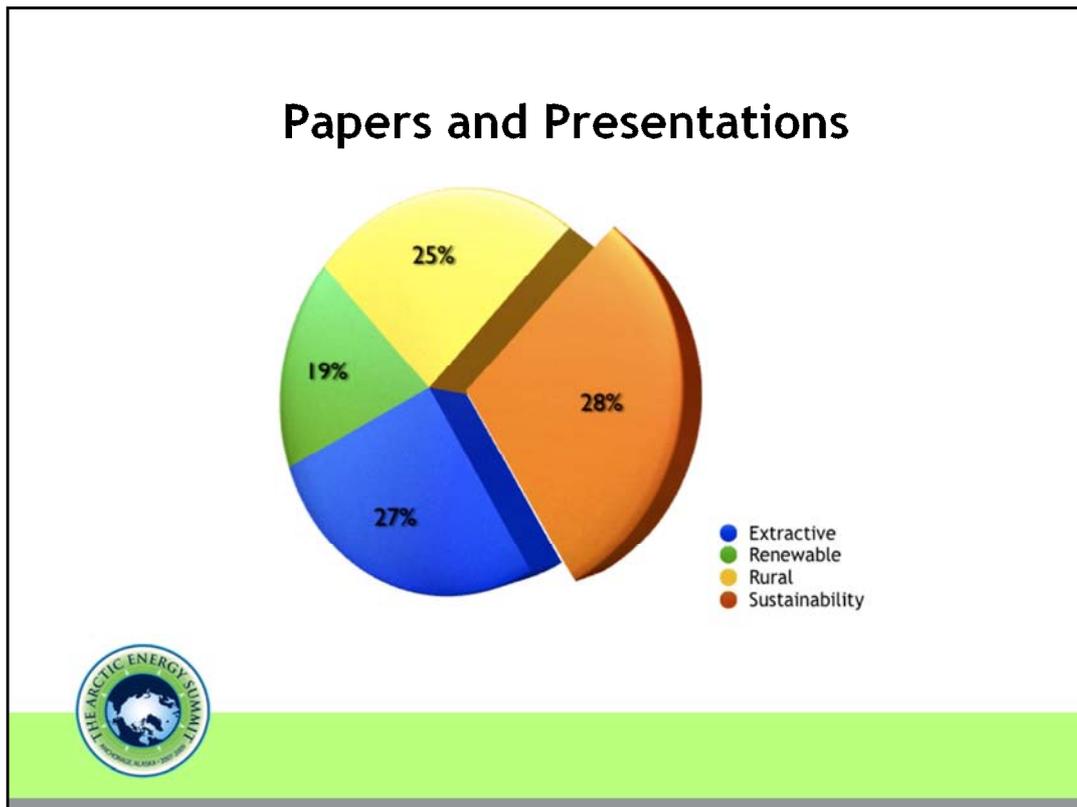
Our technology conference was held this past fall with over 300 people from 14 nations participating. The conference consisted of a series of plenary speakers
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including President Grimmonson of Iceland,
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Technical papers and panels sessions all with the
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goal of the development of the arctic as an energy province for the people of the Arctic .

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The papers and presentations were grouped roughly into our technology areas.

27% focused on the development of extractive energy

19% focused on renewable energy

25% looked at rural power issues, and

28% focused on a variety of sustainability issues

including the environment, education, planning and traditional knowledge

Overall the presentations covered a wide variety of topics from a wide variety of nations. Topics included energy security, integrateing renewable energy sources into village power systems, geothermal applications, methane hydrates, CBM, coal, wind and tidal
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Panel Sessions

- ▶ Technology alone will not result in development
- ▶ Success will be determined by how well eight sustainability factors are addressed
- ▶ Panel sessions were convened at the conference to allow for discussion and sharing of experiences in these eight areas
- ▶ To allow for the Arctic to be developed as an Energy Province the following areas must be integrated into any strategic plan



Understanding that technology is not the only driver in the implementation of an energy source, we also wanted to initiate dialogues in what we considered 8 key sustainability factors that must be considered in the development of any successful energy project in the arctic

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Sustainability Factors

- ▶ Policy
- ▶ Human Resources
- ▶ Rural Energy
- ▶ Shipping and Transportation
- ▶ Environment
- ▶ Infrastructure
- ▶ Impacts on the People of the North
- ▶ Security



These panels were populated by subject matter experts from a variety of viewpoints, a variety of countries and representatives of the indigenous people of the north.

Specifically we looked at:

These panels formed the nucleus of discussion that would lead to the Arctic Energy Action Team

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Arctic Energy Action Team Mission

- ▶ Cooperatively develop an international vision of the North through a broad coalition of energy, technology, and policy experts and stakeholders
- ▶ Formulate strategy and identify enabling technologies for:
 - Enhancement of extractive and renewable energy recovery
 - Deployment of economical and environmentally sensitive energy sources to rural Arctic communities
 - Development of the Arctic as an Energy Province



When the Energy Summit was developed our goal was to have a deliverable that would allow any Arctic organization, community or business to take action to bring focus to the development of energy in the north

At the conclusion of the conference 50 individuals convened the first energy action team meeting with the mission of:

And to specifically accomplish these goals

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Arctic Energy Action Team Goals

- ▶ Identify technology needs for the three challenge areas
- ▶ Develop a technology roadmap for the development and demonstration of the enabling technologies
- ▶ Identify barriers that can be eliminated by cooperative action, with commitments at local, regional, national and international levels
- ▶ Report to the Arctic Council and International Polar Year in early 2009



Our end product will be the development of a technology roadmap for the next 20 years, a strategic business plan that will address the economics of the technology in the context of our our functional areas, and a series of future scenarios that that those business plans will fit in.

There are an infinite number of energy issues that need to be discussed, but focusing on the 3 broad energy issues of the conference we will be concentrating on:

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Communication

- ▶ Virtual team
- ▶ Broken down by challenges and eight sustainability factors
- ▶ Minimum physical meetings
- ▶ Maximum use of Internet, email, web meetings
- ▶ Google Groups as primary vehicle for communication



The Action Team is a virtual team with minimum physical meetings using the web to reach across multiple time zones to work together in an innovative way.

Google Group was chosen for flexibility and ease of registration.

Postings are by topic and work activity

The Arctic Energy Website will be used to store large documents

An invitation for the team explaining our challenges and inviting your participation is available on the table outside the door

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The largest challenge for the Action Team will be task management, we are relying heavily on individual contribution and individual responsibility.

The most effective way to manage this is still developing and your help will be needed.

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Extractive Energy Challenge

- ▶ *The Development of Arctic Coal*
- ▶ Large amounts of high quality coal exist in the Arctic (25% of known world reserves) subject to the constraints of the High North; sensitive environment, permafrost, long supply chains and severe weather
- ▶ Benefit both an export economy as well as meet local needs



The development of Arctic Coal

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Arctic Coal

- ▶ Prevent adverse effects of the use of coal that might impact the fragile Arctic environment
- ▶ Technologies all relate to the transformation of Arctic coal into a useful energy product
- ▶ Preprocessing, in situ gasification, coal-to-liquids, coal gasification



Looked at key issues of use and determined that in this development of this asset assuring that remote use would not impact the environment

That lead us to discuss the development of arctic coal in terms of transformations

Technologies we are looking at then include ...

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Renewable Energy Challenge

- ▶ *The Development of Tidal Generation*
- ▶ What technology or approach currently under development would best fit the Arctic environment
- ▶ What carryover will tidal technology play in other open water (wave) technology or in-river hydro
- ▶ Are there barriers (such as tidal ice) that would prevent this renewable resource from being used



The development of tidal generation in arctic conditions

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Tidal Generation

- ▶ Examine those technologies that might be more robust in ice conditions
- ▶ Technologies appear to be limited to axial flow turbines and bottom-tethered turbines



In reviewing the development of tidal generation, arctic conditions were not discussed.

In Alaska, specifically in the Cook Inlet – ice is a very big deal

Therefore we focused on tidal generation technologies that were inherently ice robust and looked at technologies that could be deployed below the ice.

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Rural Energy Challenge

- ▶ *The Development of **Alternative Transportation Fuels***
- ▶ One third of energy usage in a rural community is in transportation fuels
- ▶ High costs of these fuels significantly impact rural subsistence lifestyles and the viability of these communities



In examining energy patterns in rural Alaska and in other rural arctic areas the distribution of energy load was equally spread between power generation, space heating and transportation fuels.

This balance in itself provides for some unique opportunities for developing energy solutions as the opportunities for multigenerational applications goes up.

However the quickly increasing costs of transportation fuels is creating a crisis at the subsistence level and threatening the very existence of our rural communities drove our decision to focus on transportation fuels as our key energy challenge

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Alternative Transportation Fuels

- ▶ The cost to transport fuels significantly increases the cost to the user
- ▶ Find technologies that eliminate or minimize the penalty involved in getting transportation fuel to the communities
- ▶ Improving efficiencies, batteries, natural gas, propane, locally produced synthetic fuels



The problem with replacing existing transportation fuels is that they are so simple to handle and distribute, you can carry gasoline in a bucket, but it's much more difficult to carry hydrogen in a bucket.

Further compounding this problem is that not only the fuel costs going up but the cost of transporting those fuels over long distances is going up as equally fast. A gallon of gasoline in Barrow was selling for \$10/gallon, compared to \$4/gallon in Anchorage – Transportation is trending at 60% of the cost.

Therefore we want to find technologies that can shorten or eliminate that transportation link – something that could be done locally as well as reducing consumption or eliminating consumption

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Next Steps

- ▶ Review by AEAT and development of technology roadmaps
- ▶ Determination of level of maturity of each technology and risk to development
- ▶ Development of eight sustainability factors as they relate to implementation of the energy technology
- ▶ Prepare draft report - October timeframe



Our timeline is short - part of the remit of the IPY is an intense focused effort in a short time, our project is no different.

As mentioned individual and group collaboration and self management is absolutely critical to maintaining this timeline.

All of our efforts are focused at delivering a report to the Arctic Council in January 2009, with the presentation to the Arctic Council in April

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We have the opportunity to make a *change* in how the Arctic is viewed and to create a new energy vision of the North for the *people of the North*.

With vision, energy and action we can lead this change and make a *difference*.



I want to thank you for this opportunity to brief you on this effort and of course to encourage your participation in the Action Team.

We believe that that the Action Team will put a voice and face to the energy in the Arctic and help shape our culture rather than having it imposed.

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