



# TECHNOLOGY CONFERENCE

ANCHORAGE, ALASKA • 15-18 OCTOBER 2007

— *An International Polar Year Event* —

## AGENDA

# PANEL SESSION OVERVIEW

## PANEL SESSION ONE

### Policy Experiences in Developing Energy Assets in the Arctic

Policy decisions, even more than technical capabilities, have a large influence on the selection of technology, projects, economics and funding as they relate to the development of energy projects. Policy determines energy security, land use, emissions, project economics, fuel prices and, in some cases, which communities survive and which communities do not. The development of the Arctic as an energy province versus an exploitable resource will be determined by development of a comprehensive, integrated energy policy. This panel is convened to open a dialogue to share past policy experiences - both positive and negative - among the Arctic communities. Discussion areas will include industry development, environmental concerns and collaborative Arctic policies.

## PANEL SESSION TWO

### Developing Human Resources for Arctic Energy Development

The development and operation of energy facilities in the Arctic will require simultaneous development of human resources in the Arctic, including provision of those skill sets necessary to bring the next generation of energy projects to fruition. Specific attention must be focused on the energy systems required for rural and remote communities. Achieving this new level of competency will require an entirely new curriculum addressing the breadth of Arctic energy including engineering, design, operations, maintenance, management, economics and all aspects of care of the environment. This panel is convened to open a dialogue to identify the key required skill sets and the kinds of curriculum necessary to meet those needs; and to examine new training paradigms, such as distance learning, to deliver those skills to the appropriate areas.

## PANEL SESSION THREE

### Development of Rural Energy in the Arctic

The Arctic is a region of tremendous energy wealth; however, rural Arctic communities are attempting to exist in spite of tremendous energy poverty. These communities - off the electrical grid, off the road system and populated by predominately indigenous people living a subsistence lifestyle - suffer crippling energy costs threatening their very existence. New approaches are needed to prevent the extinction of these communities and to moderate energy costs for electricity, heating and transportation, using both extractive and renewable energy sources. This panel will open a dialogue on the rural energy situation, to discuss modern technological approaches and energy sources, as well as approaches to energy efficiency necessary to create an effective rural energy paradigm.

## PANEL SESSION FOUR

### Shipping and Transportation Options for the Arctic

The ability for the Arctic to emerge as a global energy province will be both driven and constrained by transportation. Climate change, while potentially opening up new sea routes, is also changing the structure of seasonal river shipping, weakening existing road systems, affecting runways and shortening tundra travel. More open sea travel will necessitate increased air support (search and rescue). The basic logistics paradigm for the Arctic is changing, and shipping and transportation options will have to change as well. This panel is convened to open a dialogue on the opportunities and challenges that climate change and new shipping routes will present. The discussion will include the impacts on the entire transportation system (marine, ground and air) that extractive and renewable energy development will present.

# AGENDA MONDAY

Time	Event
0800-0900	Registration
0900-0930	Opening Ceremony and Introductory Comments Honorable Walter J. Hickel
0930-1020	Welcome - Alaska Governor Sarah Palin Welcome - U.S. Senator Lisa Murkowski
1020-1045	Daniel Sullivan Assistant Secretary, Bureau of Economic, Energy and Business Affairs U.S. Department of State
1045-1110	<b>B R E A K</b>
1110-1135	Dr. Evgeny Velikhov President Kurchatov Institute
1135-1200	Dr. Dan E. Arvizu Director, National Renewable Energy Laboratory U.S. Department of Energy
1200-1400	<b>L U N C H</b> Sponsored by Agrium Keynote Speaker Andrew Revkin New York Times (interactive video presentation)
1400-1430	His Excellency Ólafur Ragnar Grímsson President of Iceland
1430-1455	Patricia Cochran Chair, Inuit Circumpolar Council Chair, Indigenous Peoples Secretariat
1455-1520	Honourable Julian Evans British Consul General
1520-1545	<b>B R E A K</b>
1545-1610	Bud Fackrell Senior Vice President BP Exploration, Alaska
1610-1635	James Hemsath Senior Fellow – Energy Institute of the North
1830-1900	<b>RECEPTION</b> (no-host bar) 2nd floor balcony Anchorage Marriott Downtown
1900-2100	<b>OPENING BANQUET -</b> Grand Pacific Ballroom Anchorage Marriott Downtown Sponsored by the Government of Canada

The Arctic Energy Summit's Technology Conference, hosted by the U.S. Department of State and set for 15-18 October 2007 in Anchorage, Alaska, is the premier energy conference of the International Polar Year, focusing on the Arctic as an emerging energy province. For four days, energy experts from around the Far North, along with those from outside the Arctic region, will discuss, debate and collaborate on energy challenges and opportunities in the extractive and renewable fields, as well as tackling how to provide affordable energy to the Arctic remote communities.

As one of the 228 approved IPY projects, the summit is also sanctioned by the eight-nation Arctic Council. At the request of the U.S. Department of State through the Arctic Council, Anchorage-based Institute of the North has been tasked to organize this critical dialogue.

The Arctic is home to more than 25% of the planet's undiscovered reserves of oil and natural gas. Yet, much of the Arctic region is remote, sparsely populated and harsh with fragile terrestrial and aquatic ecosystems. Any discussion of the Arctic and the polar regions would be remiss if there was no consideration of the extensive oil and gas development occurring in Alaska, the Russian Far East and Siberia, Canada and the Barents Sea, as well as the need for affordable energy in the remote rural areas within these regions. In addition, there appear to be many unique renewable energy resources within the Arctic, many of which are untapped.

The summit is comprised of three components. In addition to the technology conference, this two-year project includes:

- An educational outreach component designed to be implemented through a bilingual (English/Russian) Arctic energy website, [www.arcticenergysummit.org](http://www.arcticenergysummit.org). Upon securing adequate levels of funding, other educational activities may include: funding undergraduate and graduate research work in the areas of Arctic energy and power; a graduate level Arctic energy course; and the development of a web-based and interactive Arctic energy atlas that will include traditional extractive energy resources, as well as non-traditional renewable energy sources.
- The creation and recommendations of an international Arctic energy action team assigned to develop a roadmap for the enhancement of extractive energy recovery in the Arctic, the expanded use of renewable and hybrid energy sources and the deployment of economical and environmentally sensitive energy sources to rural Arctic communities.

The summit supports the IPY aim of utilizing the intellectual resources and scientific assets of Arctic nations to make major advances in polar knowledge and understanding, while creating a legacy of new or enhanced observational systems, facilities and infrastructure. Arguably, the most important legacies will be a new generation of polar scientists and engineers, as well as an exceptional level of interest and participation from polar residents, students, the general public and decision-makers worldwide.

# AGENDA TUESDAY

Time	Room 1	Room 2	Room 3	Room 4	Room 5
0900-0930	Extractive - 01 Arctic Oil and Gas Activities: Effects and Potential Effects	Extractive - 13 Arctic Gas Hydrate Energy Assessment Studies	Renewable - 01 Geothermal Potential in the Arctic	Rural - 05 Interhemispheric Tunnel & Rail Group Proposal	Renewable - 07 Fish Oil as an Alternative Fuel for Conventional Combustors
0930-1000	Extractive - 02 Global and Alaskan Oil Demand and Supply	Extractive - 20 Alaska Gas Hydrate Research and Stratigraphic Test Preliminary Results	Renewable - 03 An Integrated Geoscience and Geothermal Exploration of Chena Hot Springs	Extractive - 24 Arctic Escape, Evacuation, and Rescue	Rural - 06 Heat Recovery from Diesel Exhaust for Alaskan Village Diesel Generators
1000-1030	Extractive - 03 Program of Centralized Power Supply in the Khanty-Mansiysk Region	Extractive - 15 Preliminary Results from the 2007 Wainwright, Alaska CBNG Drilling and Testing Program	Sustainable - 14 The Youth Movement: A Profile of the Alaska Youth for Environmental Action	Extractive - 16 Future Marine Transportation of Arctic Energy Resources	Sustainable - 28 A Diesel Generator Exhaust Design Approach for the South Pole Station
1030-1100	<b>B R E A K</b>				
1100-1130	Extractive - 04 Exploration Results in the Arctic Islands	Sustainable - 04 Energy Education for Secondary Schools	Renewable - 04 Renewable Energy Development in the Aleutian Pribilof Islands	Panel Session 4 Shipping and Transportation Options for the Arctic	Rural - 07 Load and Temperature Profiling for Diesel Electric Generators in Rural Alaska
1130-1200	Extractive - 05 Hydrocarbon Systems Basin Analyses - Bristol Bay	Sustainable - 05 Education Activities through the International Environmental Information Center	Renewable - 05 Economic Impacts of Climate Variability in the Arctic: The Case of Hydropower	Panel Session 4 Shipping and Transportation Options for the Arctic	Rural - 08 Wind-Diesel Systems for Isolated Arctic Communities
1200-1230	Extractive - 06 U.S. Geological Survey Circum-Arctic Resource Appraisal	Sustainable - 06 Sustainable Development Principles in Training of Oil and Gas Specialists a Russian View	Renewable - 08 Cold Climate Problems of a Micro-Hydroelectric Development	Panel Session 4 Shipping and Transportation Options for the Arctic	Renewable - 19 The VRB Flow Battery for Load Leveling for Wind Systems
1230-1400	<b>L U N C H</b>				
1400-1430	Extractive - 10 Experimental Investigation of Relic Gas Hydrates Formation in Frozen Sediments	Panel Session 2 Developing the Human Resources for Arctic Energy Development	Rural - 02 Integrated Village Energy Analysis Model	Panel Session 5 Environmental Concerns in Developing Energy Assets	Renewable - 12 Status of Wind-Diesel Applications in Arctic Climates
1430-1500	Extractive - 09 Methane Hydrate Resource Potential Associated with the Barrow Gas Fields	Panel Session 2 Developing the Human Resources for Arctic Energy Development	Rural -12 Analysis for Integrating Renewable Energy Sources into Village Power Systems	Panel Session 5 Environmental Concerns in Developing Energy Assets	Renewable - 10 Analysis of Deploying Photovoltaic Array in Remote Arctic Communities
1500-1530	Extractive - 11 Development of Methods for Hydrate Fields Exploitation	Panel Session 2 Developing the Human Resources for Arctic Energy Development	Rural - 04 A Systems Dynamic Approach to Model a Multimodal Energy System	Panel Session 5 Environmental Concerns in Developing Energy Assets	Renewable - 11 Renewable Energy and Waste Heat Utilization for Greenhouse Production
1530-1600	<b>B R E A K</b>				
1600-1630	Sustainable - 15 The Role the WL Project has in the Development of Arctic Energy Resources	Sustainable - 12 Sustainable Development through Geophysical and Traditional Knowledge	Panel Session 3 Developing of Rural Energy Resources	Extractive - 21 Training for Sustainability Life Cycles in Safety Instrumented Systems	Rural - 13 The Aurora Ice Museum Absorption Refrigeration System
1630-1700	Extractive - 26 Submarine Technologies for LNG and Global Energy Security Enhancement	Sustainable - 13 Ecosystem Habitat Mapping: Hydrocarbon Development in the Beaufort Sea	Panel Session 3 Developing of Rural Energy Resources	Sustainable - 24 A Sustainable Design Approach for the South Pole Station Modernization Project	Renewable - 17 Snow Cooling - Renewable Energy for Large Parts of the World
1700-1730	Extractive - 27 Global Energy Security and the Role of Russia	Sustainable - 08 Arctic Energy and Cumulative Effects: Growing Demands	Panel Session 3 Developing of Rural Energy Resources		Rural - 20 An Amalgamated Approach to Rural Generation: A Case Study in Sustainability
1900-2100	<b>Networking Banquet Alaska Ballroom, Hilton Anchorage</b>				

# AGENDA WEDNESDAY

Time	Room 1	Room 2	Room 3	Room 4	Room 5
0900-0930	Extractive - 07 Low-sulfur Coals of Arctic Alaska: A Vast Undeveloped Energy Resource	<b>HIGHLIGHTS OF THE ALASKA RURAL ENERGY CONFERENCE</b>  Renewable - 02 Overview of Geothermal Prospects in Alaska	Renewable - 18 Climate and Renewable Energy in Nordic Countries	Sustainable - 19 Energy Development in the Arctic: A Fine Balance?	Sustainable - 01 Above-Ground Issues Affecting Energy Development in the Arctic
0930-1000	Extractive - 08 Creation of Technology for Utilization and Recovery of Coal Seam Methane	Renewable-14 Renewable Energy and Energy Planning in NW Alaska	Rural - 17 PolarPower.Org – Sharing Knowledge About Power Systems for Polar Regions	Sustainable - 20 Social Impacts of Energy Sustainability in Kivalina	Sustainable - 02 Defining "Energy Security" in the Arctic Context
1000-1030	Extractive - 19 Impact of High Volatile Content on Coal Grind Size and Combustion in Power Plants	Renewable - 16 Tidal Energy Projects in Alaska	Rural - 18 Ivotuk: An Autonomous Power and Communications System on Alaska's North Slope	Sustainable - 22 The Nordic Network for Sustainable Energy Systems in Isolated Locations	Extractive - 12 What if High North Energy Exploitation Fails? An Analysis of What Can Go Wrong
1030-1100	<b>B R E A K</b>				
1100-1130	Extractive - 23 Exploration Potential for Natural Gas in Cook Inlet and the Brooks Range of Alaska	Rural - 21 Energy in Community Planning	Sustainable - 07 Aerospace Information Management	Sustainable - 21 Community Energy Planning in NWT	Panel Session 8 Energy Security - The Arctic's Role in Global Security
1130-1200	Extractive - 22 Experience in Mastering the Oil and Gas Potential in Khanty-Mansiysk	Rural - 22 Alaska/British Columbia Intertie	Sustainable - 16 Climate Monitoring in the Arctic: Benefits for Science and Industry	Sustainable - 23 A Toolkit for Community Energy Planning in Northern Canadian Communities	Panel Session 8 Energy Security - The Arctic's Role in Global Security
1200-1230	Extractive - 25 Facilitating the Development of the Alaska Gasline through the Office of Federal Coordinator	Rural - 23 Integrated Systems Approach for Wood Energy in Alaska Rural Villages	Sustainable - 27 Arctic Soils Monitoring, Oil Spill Bioremediation, Remote Sensing Technologies	Renewable - 15 Impacts of RETScreen in Canadian Northern and Remote Communities	Panel Session 8 Energy Security - The Arctic's Role in Global Security
1230-1400	<b>L U N C H</b>				
1400-1430	Panel Session 1 Policy Experiences in Developing Energy Assets in the Arctic	Rural - 10 Pre-payment Utility Meters: Greater Conservation and Efficiency in Rural Alaska Villages	Sustainable - 18 Estimating the Value of Alaska Public Infrastructure at Risk to Climate Change	Sustainable - 25 Inupiat Traditional Knowledge and Energy Development Decisions	Renewable - 09 Relevance of Hydrogen Technology for the development of small stable energy grids
1430-1500	Panel Session 1 Policy Experiences in Developing Energy Assets in the Arctic	Rural - 11 Advanced Residential Energy Technologies for Harsh Northern Climate	Sustainable - 17 Disturbance to Vegetation Resulting from Different Ice Road Construction Methods	Sustainable - 09 Norway's Integrated Management Plan	Rural - 25 Fuel Cells and Hydrogen for Rural Alaska: A Reality Check
1500-1530	Panel Session 1 Policy Experiences in Developing Energy Assets in the Arctic	Rural - 09 Hybrid Micro Energy Project - A Comprehensive Year-Round Approach to Powering the Arctic	Rural - 19 Alaska Military's Arctic Energy Challenges at Remote Sites	Sustainable - 03 Alaska Energy Board: Lessons from the Denali Commission and the 2002 UN Global Summit	Rural - 24 Energy Alternatives in the Yukon River Watershed
1530-1600	<b>B R E A K</b>				
1600-1630	Rural - 01 Power Engineering of Russia's North-East	Renewable - 13 Foundation Design of Wind Towers in Southwestern Alaska	Panel Session 6 Infrastructure and the Impact of Climate Change	Panel Session 7 Impacts of Energy Development on the Peoples of the North	Extractive - 17 Oil Spill Management in Ice Conditions in the Baltic Sea
1630-1700	Rural - 03 Renewable Power in Rural Alaska: Improved Opportunities for Economic Deployment	Rural - 14 Economic Wind Power Development in Rural Alaska	Panel Session 6 Infrastructure and the Impact of Climate Change	Panel Session 7 Impacts of Energy Development on the Peoples of the North	Sustainable - 10 Oil Spill Response in Cold and Ice Conditions in Baltic Sea States
1700-1730	Rural - 16 Optimization of Local Generation Unit's Fuel Balance, Sakha Republic	Renewable - 06 Fire Island and Renewable Energy for Alaska	Panel Session 6 Infrastructure and the Impact of Climate Change	Panel Session 7 Impacts of Energy Development on the Peoples of the North	Sustainable - 11 Extending Oil Spill Rates from the Gulf of Mexico to the Beaufort and Chukchi Seas
1900-2100	<b>Robert O. Anderson Sustainable Arctic Award Dinner</b> Discovery Ballroom, Hotel Captain Cook				

# AGENDA THURSDAY

Time	Event
0800-0830	Mead Treadwell Chair U.S. Arctic Research Commission
0830-0900	George Canelos Federal Co-Chair Denali Commission
0900-1000	Keynote Address U.S. Senator Ted Stevens
1000-1030	David Keane Vice President, Policy and Corporate Affairs BG North America, Caribbean and Global LNG
1030-1100	<b>B R E A K</b>
1100-1130	Rick Fox Manager, Alaska Asset Shell Exploration and Production Company
1130-1230	Arctic Energy Action Team James Hemsath Senior Fellow – Energy Institute of the North
1230-1300	<b>Close of Technology Conference</b> Ben Ellis Managing Director Institute of the North

## ARCTIC ENERGY ACTION TEAM

*“... leaving a legacy and creating a path forward ...”*

An Arctic energy action team will be convened at the technology conference with the purpose of cooperatively developing an international vision and programmatic way forward on common problems related to the development and deployment of energy in the Arctic.

Potential members of the team may include energy experts from the eight Arctic nations: producers, investors, consumers, educators, economists, landowners and governments; as well as experts in the fields of transportation, supply security and climate change. By engaging this variety of expertise, the action team will have the advantage of seeing the entire energy system as it reviews and recommends a technology approach to the development of an Arctic energy system.

The action team will be charged with exploring challenges and opportunities in the areas of Arctic:

- extractive energy,
- renewable and hybrid energy sources, and
- the deployment of economical and environmentally sensitive energy sources to rural Arctic communities.



# PANEL SESSION OVERVIEW

## PANEL SESSION FIVE

### **Environmental Concerns in Developing Arctic Energy Assets**

The Arctic and its associated cryosphere are home to some of the world's most fragile environments. First and foremost in any energy development endeavor is the requirement to do no harm to the environment. This includes air and water quality, impacts on permafrost and wildlife issues as detailed in any permitting activity, as well as attention to the carbon footprint. Increased offshore exploration and the potential for increased shipping will continue to emphasize the need for improved spill response and for an understanding of the impact these increases will have on fisheries. Renewable energy (battery storage, geothermal impacts, hydro turbines and wind turbines) also presents a variety of environmental challenges that will require a new generation of solutions. This panel is convened to open a dialogue on the environmental challenges and opportunities that will be faced in the continued development of the Arctic's energy assets.

## PANEL SESSION SIX

### **Infrastructure and the Impact of Climate Change**

As the Arctic continues its long cycle of warming, the infrastructure developed and built in a colder environment will be impacted. This will include roads, harbors, bridges, foundations, transmission lines, pipelines and airstrips, as well as ice roads and rivers (a traditional Arctic thoroughfare). The damage will be concentrated in places where permafrost thaws, flooding increases and coastal erosion worsens. At a time where the development of the Arctic as an energy province is essential to global and energy security and when energy costs are rising in rural Arctic communities, the infrastructure necessary for these projects is under attack. This panel is convened to open a dialogue on the various impacts – opportunities and challenges – of climate change on Arctic infrastructure, especially as it relates to the development and deployment of energy resources.

## PANEL SESSION SEVEN

### **Impacts of Energy Development on the People of the North**

The development of energy projects in the far north have had and will have significant impact on the people of the north, specifically those native or indigenous peoples living a subsistence lifestyle in remote communities. Energy development will have both positive and negative impacts on a community. Extractive development could bring wealth and jobs but impact a subsistence lifestyle. High energy costs drain community resources but the development of new lower cost energy facilities could require a differently trained workforce for operation and maintenance. This panel is convened to open a dialogue on the various impacts – opportunities and challenges – energy development will bring to the people of the north.

## PANEL SESSION EIGHT

### **Energy Security – The Arctic's Role in Global Security**

The development of the Arctic's energy resource potential has an impact on how the world defines energy security. Different and changing shipping and transportation routes, new geopolitical boundaries (as evidenced by this summer's North Pole activities), transnational indigenous organizations, technological advancements, new wealth, sensitive environments - all will have an impact on defining global and energy security. This panel is convened to open a dialogue on the changing face of energy security and the role played by the emergence of the Arctic as an energy province. Discussion areas include energy development (both extractive and renewable), Arctic infrastructure, new political participants and climate change.

# SPONSORS

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