SDWG Progress Report to SAOs Syktyvkar, Komi Republic, Russian Federation 26-27 April, 2006.

2006

Sustainable Development Working Group (SDWG)

Arctic Energy Summit Proposal

In conjunction with the International Polar Year of 2007/2008, the Arctic Energy Office (AEO) of the National Energy Technology Laboratory, Department of Energy will sponsor and lead an Arctic Energy Summit on energy development and rural power as it relates to the arctic regions. The United States is inviting Arctic Council member states and Permanent Participants to join the U.S. as lead country in the Summit to begin in late 2006 through 2008. If approved, the U.S. would ask interested Arctic Council states and Permanent Participants to nominate a representative to serve on an international organizing committee and provide in-kind support for the Summit to the level each desire.

It is envisioned that the overall program management of the Arctic Energy Summit will be provided by the Arctic Energy Office of the U.S. Department of Energy's National Energy Technology Laboratory located in Fairbanks, Alaska, working through the Sustainable Development Working Group (SDWG). Understanding the impact energy development has on the environment, the program will be developed in collaboration with the Arctic Monitoring and Assessment Programme (AMAP), Protection of the Arctic Marine Environment (PAME), Conservation of Arctic Flora and Fauna (CAFF) and the Emergency, Prevention, Preparedness and Response (EPPR) working groups of the Arctic Council.

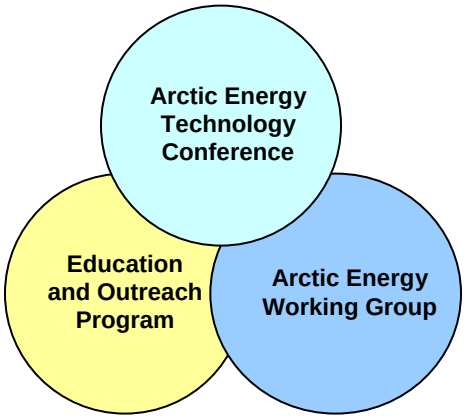
While the Arctic is home to more than 25% of the planet's unextracted oil and natural gas, much of the Arctic is a sparsely populated region with a fragile terrestrial and aquatic ecosystem. There are some 1,500 small communities in the Arctic beyond their national road and rail networks. Most of these communities rely upon diesel generation when they have a community power system. Energy supplies are primarily delivered by marine or riverine transportation but sometimes expensive delivery by air is necessary. Because of these challenges to small communities in the Arctic, it is hoped Permanent Participants will be involved in the planning, execution and participation in the Summit, as well.

The Arctic Energy Summit is being designed with a key element of the Arctic Council in mind: "Encourage dialogue among scientists, policy planners, Arctic residents and political level decision-makers," as it relates to energy development in rural power in the Arctic.

At the core of the proposed Summit will be a technology conference to be held in late fall of 2007 in Anchorage, Alaska. The focus of the proposed conference will be in three areas: 1) Extractive energy development (oil, gas, coal bed methane, methane gas hydrates, coal); 2) Rural and renewable power, especially in extreme remote areas; 3) Environmental, socio-economic and sustainability impacts of energy projects in the Arctic.

It is envisioned that leading up to the technology conference and following the Summit to its completion will be an international education and outreach effort with the goal of capturing the interest of the public and decision-makers, and attracting and developing the next generation of scientists, engineers and leaders. Special attention will be focused on the rural and remote areas of the Arctic.

The third area of the Summit is designed to begin at the Technology Conference and will be the organization and deployment of an Arctic Energy Working Group. The working group will be charged to develop a practical way forward on the implementation of key Arctic energy technology. It is envisioned that this working group will follow two areas, one on the development of an extractive energy source (such as the development of arctic coal) and the other on the implementation of a solution to a rural energy problem.



The Summit is envisaged with three distinct but overlapping components, at the center of which is the technology conference and exposition. As lead program manager for the Summit, the Institute of the North will be responsible for the development of key panelists and speakers, and the preparation and publication of the conference proceedings and outcomes, as well as the physical activities and media events. The University of Alaska will manage the coordination and overall call for papers and session chairs.

The second component is the education and outreach plan. Through the auspices of the Arctic Energy Technology Development Lab at the University of Alaska Fairbanks, proposals will be solicited and awarded for the development of the web site, creation of educational materials, and the managing of student research grants and contests. Working with the Alaska Geophysical Institute and the University's Geography department the framework for the Arctic Energy Atlas will be created and populated with energy resource information.

The third component is the creation of the Arctic Energy Working Group. An international advisory committee will be established in 2006 and will be tasked with identifying and recruiting members for the working group. Involved with this will be the development of a survey to determine key energy concerns in the Arctic that can be then refined into working group tasks. The managing of this activity and publishing of the working group report will by the Institute of the North guaranteeing consistency in the presentation of the final work products.

Funding for the Arctic Energy Summit will come from three major sources. The first underwriting will be through the Arctic Energy Office of the U.S. Department of Energy's National Energy Technology Laboratory. It is envisaged Arctic energy companies will provide the second revenue stream through industry sponsorships at the conference. The third revenue stream will be from participant fees. This combination of funds will cover all

education and outreach activities including web design, the Arctic Energy Atlas, development of Arctic energy curriculum, scholarships and academic contests. Total estimated costs for the Arctic Energy Summit are $US600,000 and cover all activities beginning in 2006 and ending with the presentation and publication of the final report of the Arctic Energy Working Group in December 2008.

The Summit will be convened during the International Polar Year for the purposes of discussion and sharing of information, technology and approaches in those energy areas of common interest between the Arctic nations. A formal proposal (Active ID # 299, http://www.ipy.org/development/eoi/proposal-details.php?id=299) is on file with the IPY office. If approved by the Arctic Council as an official project and accepted by the IPY, it could be considered a contribution to the International Polar Year from the Arctic Council.

The format of the technology conference is envisioned to include presentations of papers from international authors on significant research, panel discussions on major areas of concern, a poster session of new technology and an industry exposition of products and services, all consistent with the functional areas of interest of the conference. Common energy concerns for the Arctic regions can be summarized in the following three functional areas: extractive energy development, rural power needs, and environmental, socio-economic and sustainability impacts.

Extractive energy development, while generally a commercial activity is of significant interest to the energy and security needs of the Arctic nations. The Arctic environment presents special needs and concerns where research into new approaches to development and sources of hydrocarbons will have significant impact in meeting the nations' and world's energy needs. Examples of technical areas include tundra travel, ice roads, natural gas from coal seams, and gas hydrates. In addition, this topic/section would also be a host to such areas as climate change and its impact in the Arctic on construction, travel and the development of oil and gas fields. Included in this discussion could be the development of clean fossil energy such as CO2 sequestration and the local impact that activity might have on localized warming trends.

Rural and extreme remote power needs are a key interest to Arctic nations, especially as they relate to the replacement of traditional fuel sources and lowering the cost of expensive electricity generation. Quality of life in these rural villages is dictated by the cost and availability of electricity. Possible topical areas of research and presentation include economics of a stand-alone nuclear reactor; natural gas from coal bed methane for village power; remote sensing to allow for optimization of diesel generation; alternate energy sources including fuel cells, wind and wind-diesel combinations; and hydro power from both tidal and river current sources. Non-technical areas for discussion should include cultural and sociological impacts and sustainability of new technologies in rural villages.

The Arctic is an extremely sensitive environment. It is easily disturbed and takes many years to recover from an incident. These incidents include damage of tundra from human traffic, disturbance of wildlife, or from oil spills – both onshore and offshore. The continued development of oil, gas and coal in the Arctic will be limited by the ability of industry to minimize damage, respond to events such as an oil spill and remediate the area to bring it

back to its original condition. Possible areas of presentation in this functional area include broken ice oil recovery, impact of gravel pads on the water table, remote sensing, and the evaluation of the impact on localized warming including the impact on permafrost as well as the tundra.

A major component of the IPY mission is education and outreach; and an area addressed in this Summit through a variety of activities and programs. Central to this program will be the development of an Arctic energy website, a bilingual (Russian/English) outreach tool that will not only be used for purposes of promoting and managing the technology conference, but will also include educational features, energy news, reference information (including an Arctic Energy Atlas) and "live feeds" from the technology conference. To support this effort a Summit "brand" has been developed that is easily recognized and provides a common identifier for all material that would be part of the outreach program. This material includes the bilingual website discussed above, brochures, and newsletters appropriate for all levels of outreach: elementary – university educational institutes, local governments, villages, etc.

Additionally the Summit is expected to include the funding of high school and university research in the areas of Arctic energy and rural power. At the public school level, the Arctic Energy Summit would work with the State of Alaska to establish a model promoting high school science fair projects in 2007 and 2008 as they relate to Arctic energy themes and remote power challenges through an award or scholarship. Additionally, an essay contest is envisaged to address the policy and social studies issues related to Arctic energy. With assistance and financial support from Arctic Council member nations, high school programs can be initiated in other countries, as interest warrants. At the undergraduate, graduate and post-graduate levels, research grants of varying amounts will be awarded to students at appropriate institutions located throughout the Arctic on topics relevant to the Summit's theme. Grant winners will be required to present their findings at the technology conference.

To support teacher education and professional development, a program/curriculum will be developed at the "500" level on Arctic energy. This program will not only address the technical aspects of energy production, but will address economic issues, environmental issues and socio-economic impacts of energy development. This program will be offered through the University of Alaska and the University of the Arctic; delivery formats are still being considered but include distance learning, traditional semester on-site class and a seminar format.

The capstone of the education and outreach program will be the development of an Arctic Energy Atlas. The atlas will help define the Arctic's emerging role as a key energy province. It will identify not only traditional extractive energy resources, but non-traditional renewable energy sources as well. By overlaying energy resources, energy needs, and population centers on the geography of the Arctic nations it is anticipated that this atlas will be a key document for decision and policy makers. It is envisioned that the atlas will be web-based and interactive in nature. The Arctic Energy Atlas will support the education and outreach component (including being a key "text" for teacher and professional development programs), the technical conference and the Arctic energy working group.

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The third area of the Arctic Energy Summit is the creation and deployment of an Arctic Energy Working Group (AEWG). The working group 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. An international advisory committee will be established in 2006 to identify and recruit experts for the working group. Additionally, during early 2007, topics for the working group will be developed. The working group will create a roadmap for the enhancement of extractive energy recovery and the deployment of economical and environmentally sensitive energy sources to rural arctic communities.

Members of the working group will be invited to attend the 2007 conference and to participate in side organizational meetings and panel sessions at the conference. During the next year following the 2007 conference, the working group will develop a roadmap identifying a way forward on the implementation of selected technologies. The report will be made available for publication in English and Russian. Presentations on the work of the group will be announced at an AES working group conference to be held in Anchorage, during the fall of 2008.

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