

Princess Elisabeth Antarctica Press Conference Program

10:30 am

Guest welcome

11:00 am

Opening speech by Alain Hubert, Chairman of the International Polar Foundation and Station Project Director

Speech by Sabine Laruelle, Minister of Belgian Science Policy

Film: "Explorer" - International Polar Foundation / Capa TV

Speech by Nighat Amin, Vice-President of the International Polar Foundation and Station Program Administrator

Speech by Johan Berte, Station Project Manager

Speech by Bruno Defrasnes, Manager of Sustainable Development for Electrabel, GDF SUEZ Group

Speech by Gilles Vermot-Desroches, Director of the Schneider Electric Foundation and of Sustainable Development

Closing speech by Alain Hubert

Question & Answer Session

12:00 - 1:00 pm

Tour of the station's mock-up with the possibility to do interviews, take photos & videos

Refreshments (drinks & finger food)

Press Release
International Polar Foundation
Bruxelles, le 16 October 2008

Princess Elisabeth Antarctica

First "Zero Emission" Research Station

On October 16th, 2008, the International Polar Foundation (IPF) will reveal the technical systems that will make the Princess Elisabeth station the very first "zero emission" research station ever constructed in Antarctica.

An international press conference will be held at 11 am at the Laborelec (Electrabel) premises in Brussels.

The completion of the first phase of construction during BELARE (Belgian Antarctic Research Expedition) 2007-08 was a major accomplishment, and a dream come true for Alain Hubert, Founding President of the IPF and Director of the Princess Elisabeth station project, as for every member of the team.

During the 2008 austral winter, the Princess Elisabeth station was left in hibernation; the same cannot be said of the BELARE team working from Brussels. From June to October 2008, a team of dedicated experts have been busy building and testing the energy management systems designed to make Princess Elisabeth Antarctica the very first "zero emission" research base. Inside a scaled mock-up of the station's technical core at Laborelec, Belgium, the core systems of the station were pre-assembled:

- firstly to check the installation of the systems inside the confined space;
- secondly, to provide a trial run for the construction crew and engineers from Schneider Electric and Electrabel, GDF SUEZ Group, who will later take care of re-assembling the systems in Antarctica; and
- thirdly, to measure the equipment energy loads and to test the energy management protocols.

Once tried and tested, the systems will be shipped to Antarctica via Antwerp in mid-November onboard the ice-class cargo ship MSCO Ivan Papanin. These sophisticated electronic systems will reach their final destination at Utsteinen, in Antarctica's Dronning Maud Land, around Christmas time.

From November 2008 to March 2009, the final phase of the Princess Elisabeth's construction will take place during this year's BELARE 2008-09 Expedition. During the expedition, all the functional systems of the station tested in Brussels (energy management, ventilation and waste water treatment) will be installed. The official inauguration of the station in Antarctica is planned for mid-February 2009, thus making the Princess Elisabeth station the only station to be completed within the International Polar Year 2007-09.

Even before the systems are fully integrated, several international research expeditions will use the Princess Elisabeth station as a base camp.

- In November and December 2008, a team of glaciologists lead by the Université Libre de Bruxelles (ULB) and comprised of scientists from the University of Aberystwyth and the University of Washington will study the mass loss/gain of the Antarctic ice sheet in light of recent climate change.
- In January and February 2009, microbiologists from the Université de Liège (ULg) and the Universiteit Gent (UGent) will explore the diversity of microorganisms in the Sør Rondane area with scientists from the Museum of Paris and the British Antarctic Survey.
- In January 2009, the Belgian Royal Meteorological Institute (IRM) will start collecting data around the station with an international team of scientists including a Russian and German.
- During this same period, geoscientists from the Japanese National Institute of Polar Research (NIPR) will conduct geological research around Utsteinen.

The Princess Elisabeth project has been in the making for five years and has included contributions from countless dedicated individuals and corporations. The originality of the project, which was conceived, designed and financed by the IPF through sponsorship, opens up new possibilities for the international community, and raises new standards for polar research. Beyond the financial sponsors and technical partners involved in constructing the station, further support was provided on the scientific level by the Inbev-Baillet Latour Fund.

Using specialised building design and materials, a passive heating system, an energy control system, energy efficient appliances, and sound insulation techniques, engineers from the IPF and its technical partners have managed to take a pioneering step forward in the domain of sustainable development. The station is also unique in that it is a joint public-private venture, carried out by the IPF and the Belgian federal Science Policy Office (Belspo).

Aside from its scientific mission, the Princess Elisabeth station will be the main theme for an educational program coordinated by the IPF. "Class Zero Emission" will be launched this January 2009 in classrooms across Belgium. The initiative offers workshops about climate change through the station's "zero emission" objectives and polar science programs.

Princess Elisabeth Antarctica: history and project description

The International Polar Foundation (IPF) was commissioned by the Belgian government to conceive and carry out the Princess Elisabeth station project. The Belgian Federal Science Policy (Belspo) and the Belgian Federal Department of Defence are both active partners in this project.

Several previous BELARE expeditions were carried out to Antarctica. Here is a quick review:

- BELARE 2004: site topographical survey expedition and installation of an Automatic Weather Station (AWS) - Dec 2004
- BELARE 2005: logistics survey expedition to outline a secure landing point for the ship and a safe access route to an inland depot area - Nov 2005
- BELARE 2006: site preparation expedition with the offloading and transport of first equipment - Dec 2006 to Jan 2007
- BELARE 2007: Station Construction Expedition - Nov 2007 to March 2008

Once completed, the Princess Elisabeth station will be managed by a Polar Secretariat. The secretariat will be made up of a director, six representatives from the private sector selected by the IPF, and six from various Belgian government ministries: two from Belspo and one representative each from the Belgian Ministries of Foreign Affairs, Environment, Defence and Sustainable Development.

International Polar Foundation

The International Polar Foundation is a public utility foundation, which aims to promote polar research as a tool for raising public awareness and fostering understanding of the fundamental mechanics of our climate. The IPF also encourages the adoption of innovative solutions that will enable us to respond in a sustainable manner to the challenges associated with climate change.

Sites Internet

www.polarfoundation.org: IPF, objectives, structure, projects and creations.

www.educapoles.org: Educational tools and projects.

www.explorapoles.org: Polar expeditions and explorers.

www.sciencepoles.org: Polar sciences and publications in various polar disciplines.

www.antarcticstation.org: Official website of the "Princess Elisabeth" Antarctic station.

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First "Zero Emission" Scientific Research Platform

In 2004, the International Polar Foundation set out to design, build and finance the first "zero emission" research station in Antarctica. Four years later, with the help of the public and private sector, the station is on its way to meeting the ambitious objectives set in 2004.

A "Zero Emission" Station

Water Treatment Unit

Scientists at the Princess Elisabeth station will be among the first to recycle their used water. Inspired by technology developed for the space sector, the two bioreactors and two filtration units will allow the station to treat 100% of its water and reuse 75%!

After purification and neutralisation, the recycled water, although fit for human consumption, will be reused for other functions.

The station's water treatment unit will recycle both grey waters (from showers, sink, dishwasher, etc.) and black waters (from toilets and labs - if not chemically contaminated). Located in the center of the main building, the station's water treatment unit uses micro-organism digestion and aerobic decomposition to rid the water of its organic matter, and chemical treatments (active carbon and in-line pH correction by adding a base or acid) to remove non-decomposable components, such as heavy metals. The water is then subject to a final ultraviolet treatment in order to maintain a high level of purity.

Theoretically speaking, water can be recycled endlessly. At the Princess Elisabeth station, however, the water will be recycled a maximum of 5 times, depending on the number of people occupying the station. After treatment, part of the recycled water will be evacuated through a crevasse underneath the building.

Renewable energy

The Princess Elisabeth Antarctic research station is designed to operate on a combination of wind and solar power: two renewable, carbon-neutral technologies for producing electricity. While wind power will be used solely to supply the station with electricity, solar power will provide both electricity (photovoltaic solar panels) and hot water (thermal solar panels).

Nine 9-metre-high wind turbines will sit atop the Utsteinen mountain ridge to the north of the station (seven have already been mounted). They will generate a total of 54 kWh of electricity. Each turbine will consist of 3 blades, manufactured from extremely strong, yet flexible thermoplastic composite material. Directly connected to a direct-drive generator, the turbines will also have self-regulating rotors in order to be able to adapt to changes in wind intensity and direction.

In addition to the wind power, the station's photovoltaic solar panels will provide a total energy output of 50.6 kWh. Of the station's 408 photovoltaic solar panels, 120 (109.5 m²) will be attached to the walls and roof of the station and the remaining 288 panels (270 m²) will be positioned on top of the station's technical building. While most of them are positioned towards the north for maximum sun exposure (Antarctica being located in the southern hemisphere), some panels will also face in other directions in order to take advantage of the sun at different times of the day.

The Princess Elisabeth station will also be equipped with 24 m² of thermal solar panels. Like the photovoltaic panels, the thermal panels are orientated towards the north to make optimal use of sunlight. A first series of solar panels (18 m²), located on the station's roof, will generate heat for the water used in the kitchen, bathroom and water treatment unit. The remaining 6 m² of solar panels, located on top of the garages, will provide enough heat to melt the snow (source of drinking water). Heat will also be stored in hot water.

A Passive Building

The Princess Elisabeth station is conceived to take full advantage of currently available passive building techniques. The station's outer "skin," insulation, shape, orientation and window disposition allow a comfortable ambient temperature to be maintained inside the building with little energy input.

While the geometry of the station's windows allows the station to benefit advantageously both from solar passive and active gain, the station's thermal insulation minimizes any heat loss through the station's walls and floor. Each one of the side panels that makes up the walls of the station are made up of 7 consecutive layers, totalling 60 cm in thickness.

In addition to the station's good insulation, the building's envelope is lined with a waterproofing material, EPDM, a synthetic rubber lining membrane that prevents air leaks. However, by creating an air-tight building, the fouled air is no longer evacuated. To address this problem, a sophisticated ventilation system will be installed to maintain adequate inside air quality levels.

Princess Elisabeth station will also be equipped with 3 high efficiency ventilation units capable of recovering both heat and humidity, two major factors of comfort in the cold and dry climate of Antarctica. Two systems will service the inside living quarters, and another, the station's technical core. The ventilation system will work on two fronts:

- transports both foul and fresh air using ducts, outlets and fire dampers; and
- ventilates the rooms using the energy recovery system, ventilators and regulation device.

Intelligent Systems

In order to make a "zero emission" station, the station's electrical systems had to be designed to be as energy-efficient as possible. All station systems are thus integrated and piloted by an intelligent central unit. This configuration ensures that working and living conditions inside the station are optimised with minimal resource consumption. This centralised control of interdependent systems also allows for remote monitoring during the winter.

Energy management of the station will consist of maintaining the equilibrium of the entire network between the energy produced by the solar panels and wind turbines, and the energy used in the station. Based on a certain amount of instructions that are programmed into the central unit by the station's users, priority will be given to some systems over others (those related to human safety always taking priority) and, depending on the time of day, to some locations over others (e.g. kitchen around mealtimes).

A battery grid consisting of four double valve-regulated lead acid (VRLA) battery packs, with a total capacity of 8,000 Ampere-hours, will help store and release energy produced by the wind turbines and solar panels as needed.

BELARE 2008-09 Expedition

BELARE 2008-09 (Belgian Antarctic Research Expedition), the last building expedition of the Princess Elisabeth Antarctic station, will set out mid-November and come home at the end of the International Polar Year, in March 2009. The mission of BELARE 2008-09 will be to integrate the station's interior systems (ventilation unit, water treatment unit, systems control and batteries). This expedition will ensure the station's systems start up successfully.

This year's team will amount to a total of 70 people spread over the entire season. A small team is scheduled to leave the second week of November with Alain Hubert to set up the base camp and assess the premises. Other team members will arrive gradually to tackle preparatory work inside the station, before the actual equipment is integrated.

Preparatory work will continue until the arrival of the first containers on board the Ivan Papanin ice-class ship around Christmas time. The ship will also carry additional team members in charge of unloading containers and transporting them inland to the station. At this time, the construction team will start the mechanical integration of the station's technical core and electric wiring, install the solar panels, and start all of the wind turbines. This ongoing mechanical and electric work will take place in parallel inside and outside the station.

In January, the engineers will begin sub-system testing at the station. Software testing and final integration tests are planned in February, just before the on site inauguration of the station and the start up of its systems and commands.

A Platform for International Science Collaboration

From November 2008, the Princess Elisabeth station will provide the necessary services and facilities to efficiently support international scientific research in the Sør Rondane area.

From November to December 2008, Professors Frank Pattyn and Jean Louis-Tison from the Université Libre de Bruxelles (ULB) will lead the first international scientific expedition at the station, and carry out an investigation of the Gunnestadbreen Glacier hinge zone where the continent meets the ice shelf. The research team will include researchers from the ULB, the University of Washington (USA), and the University of Aberystwyth (UK). They will concentrate on glacial grounding lines within the context of a much larger project focusing on Antarctic subglacial processes, the IPY project SALE (Subglacial Antarctic Lake Environment).

During this same period, geologists from the Japanese National Institute of Polar Research (NIPR) will study the geology of the region around Utsteinen. This follows up their visit to Utsteinen in 2008. It is planned to be the first visit of several over the next few years.

A second international research expedition will follow at the station, from January to February 2009. Microbiologists from the Université de Liège (ULg) and the Universiteit Gent (UGent) will explore the diversity of microorganisms in the Sør Rondane area with scientists from the Natural History Museum in Paris, and the British Antarctic Survey.

A third group from the Royal Observatory of Belgium will place monitoring devices around the site in February 2009, and will be able to access data remotely from Brussels. More information about the instruments to be installed will be available shortly.

Further international science collaborations are planned over the 2008-09 austral summer with the Laboratoire de Glaciologie et Géophysique de l'Environnement (LGGE) in the field of glaciology. Alain Hubert will set out to install beacons between the station and the coast, which will make it possible to gather snow accumulation data and ice sheet movements.

Other countries and scientific institutes have also showed significant interest in the Princess Elisabeth station. Participatory discussions have already been launched with the Swiss Ecole Polytechnique Fédérale de Lausanne (EPFL) and other research programs in Luxembourg, Holland, China and the United States. A significant number of requests from all over the world to either participate in Belgian-coordinated research at the station, or to deploy foreign research programmes in the Utsteinen area have been received.

Management: Polar Secretariat

Once the construction is completed, the operational and scientific management of the station will be the responsibility of the Polar Secretariat, a private/public partnership between the IPF and the Belgian Government (including the Belgian Federal Science Policy Office, BELSPO).

The Commission of the Belgian Chamber of Representatives has passed a bill establishing the Polar Secretariat, which will serve as a basis for drawing up the royal decree and the bill's content.

The Polar Secretariat is recognized as an independently-managed government service, made up of a council composed of a parity of members between the public and private sectors and placed under the supervision of a director. The council will have twelve representatives, six from the private sector and six from the public sector. The six private sector representatives will be designated by IPF, while the six representatives from the public sector will include two from BELSPO, and one representative each from the Belgian Ministries of Foreign Affairs, Environment, Sustainable Development and Defence.

Aside from managing the base, the Polar Secretariat will also be responsible for promoting scientific findings related to research carried out there.

International Polar Year 2007-09 Legacy

The International Polar Year 2007-09 (IPY) is a joint effort of the international polar science community to highlight the important contribution of polar research. As the only research station completed during the IPY, the Princess Elisabeth station represents a major IPY legacy of international significance.

Since its very conception, the ambitious nature of the project has guaranteed worldwide notoriety. Besides raising interest within the international scientific community for future research, the Princess Elisabeth station has also sparked strong public support and media attention.

Conceived to be the first "zero emission" polar research station, this exemplary project is a first in many respects: It establishes a new reference for scientific research facilities and raises new standards within the Antarctic community. The advance design methodology, the balance of new and proven technologies installed in the station, the intelligent integration to achieve the "zero emission" target, the private sector involvement in the financing, and the private/public partnership for future operations, are all innovative aspects which open up new possibilities for designing polar research stations in the future.

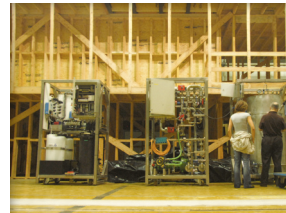
The Princess Elisabeth station attests that there is growing public interest in projects carrying a message of sustainable development, especially in terms of energy management. By addressing matters of public concern, this project thus sets new goals for the international community. The conception of a "zero emission" building capable of standing up to the extreme conditions of the Antarctic goes to show that similar techniques can also be deployed in more temperate areas of the world.

Press Pictures

Amongst others, here are some of the high resolution pictures available online for download at the following URL: <http://press.polarfoundation.org/>. Please contact the IPF for access codes. Detailed legends and copyrights for each photo are available on the website.

BELARE 08-09

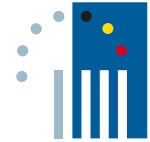
Interior systems



BELARE 07-08

Sunset over Princess
Elisabeth Station





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