PRESS KIT

September 2008

The first **zero emission** scientific research station

INTERNATIONAL POLAR FOUNDATION

princess elisabeth antarctica

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Princess Elisabeth Antarctica

LABORELEC

Electrabel GDF SUEZ

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by Gérard Mestrallet, GDF SUEZ Chief Executive Officer

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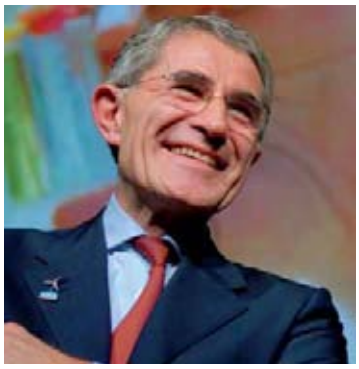
EDITORIAL

By Gérard Mestrallet
Chief Executive Officer of GDF SUEZ



Innovation and commitment

Fighting global warming, protecting resources and promoting sustainable development are the core challenges for the new century. They require the commitment and mobilisation of all of us. Through our leading activities, energy and the environment, the GDF SUEZ Group is at the heart of these issues. Our teams contribute daily to sustainable solutions to protect the Earth. That is their mission, of which they are rightfully proud. pride.

Global warming is one of today's most worrisome issues and requires deep changes in our behaviour. Through our support of scientific projects like the Antarctic polar station, we help to mobilise and raise the awareness of as many people as possible.

This commitment brings with it the Group's values and is based on a true partnership. Through a sponsorship of skills, we work together on the construction of the station in the fields of energy, water and waste treatment. Our Laborelec and Electrabel research teams are mobilising to provide know-how, innovation and the latest technologies for this fabulous project.

We are very proud to be a partner of the International Polar Foundation and to have the opportunity to contribute, along with Alain Hubert, to a wonderful human and technological adventure by designing the first zero-emission site.

This international project is also an occasion to showcase the commitment and expertise of Belgium, which has always been a pioneer in this field.

1 GDF SUEZ, a major partner for a unique and ambitious project

Electrabel's undertaking

In the context of the 2007-2008 International Polar Year, GDF SUEZ and Electrabel wished to join this project because they are convinced of the relevancy of polar research, the aim of which is to improve understanding of climate and the environment.
In this way, the GDF SUEZ Group and its subsidiaries highlight their dedication to the quest for innovative and wide-ranging solutions in support of sustainable development.

Via their activities, the GDF SUEZ Group and its subsidiaries are committed players to sustainable development.

GDF SUEZ: an involved partner

Via their activities, the GDF SUEZ Group and its subsidiaries are committed players to sustainable development and environmental protection. On that basis the Group has become involved in the polar research station that was designed and developed by the International Polar Foundation. The Group's support has brought financial backing as well as a significant technical contribution from the Laborelec subsidiary.
The Group committed itself, via the Grenelle Environment Roundtable, to be part of the transition to reduced-carbon energy production:

- by significantly increasing our capacity to generate power by renewable means (hydraulic, photovoltaic, wind power and biomass) in Europe, increasing to 18% our renewable energy capacity by 2009;
- by developing renewable thermal energy, both directly in buildings and via heat networks;
- by actively participating in applied research in CO_2 capture and storage projects and in research and development of 4th generation nuclear energy.

Around 40% of the Group's energy production capacity is slated to be "carbon-free".

Electrabel, a European supplier of tailored and global energy solutions

Electrabel is developing its range of energy products and services by taking advantage of synergy between natural gas and electricity. Every customer is offered quality local products and services via business subsidiaries and partnerships with local operators. Electrabel manages diversified generation facilities of more than 30,000 MW and conducts trading activities on all energy markets.

LABORELEC

Laborelec, the Group's energy research centre, offers skills sponsorship

Founded in 1962, Laborelec is the energy research centre of the GDF SUEZ Group. Located on the outskirts of Brussels, it specialises in facilities for energy production, distribution and consumption.

Its activities revolve around four priorities:

- the development of material, operations, maintenance and control of equipment.
- the quality of electricity generation and distribution
- environmental protection
- the rational use of energy

Laborelec is part of the Princess Elisabeth scientific polar station project via skills sponsorship in which it undertakes to provide all its expertise, know-how and enthusiasm to the International Polar Foundation (IPF).

The challenge: to achieve an autonomous, zero-emission station

Based on energy models conducted by the IPF and 3 E in preliminary studies, the working group, comprising IPF, Laborelec and Schneider Electric, developed systems for reliable low-and zero-emission autonomous electricity facilities. The task was formidable. Built on a granite base at 1,400 m altitude in a 1,500 m^2 uninhabited zone, far from any electricity grid, the station's construction was definitely a learning experience.

A life-sized test

Featuring wind turbines, photovoltaic panels, solar energy, computers, batteries, water treatment, bioreactors, pumps, ventilators, lighting, and more, the station's entire electricity installation, from generation to management, as well as its internal infrastructure, were all set up at Laborelec and tested over a period of four months, from the end of May to the beginning of September.

The many contributions of Laborelec researchers and technicians:

- optimisation of the (mini) electricity grid
  - management of the balance between electricity generation and consumption
  - management of power quality in the circuits, bearing in mind the problem of earthing the system (granite rock)
  - minimisation of electromagnetic disturbances
  - guaranteeing electricity safety
- interior and exterior lighting proposals
- optimisation of the water and waste treatment system with a view to achieving zero-emissions
- participation in the transmission of environmental data to Europe and remote control and management of the facility.

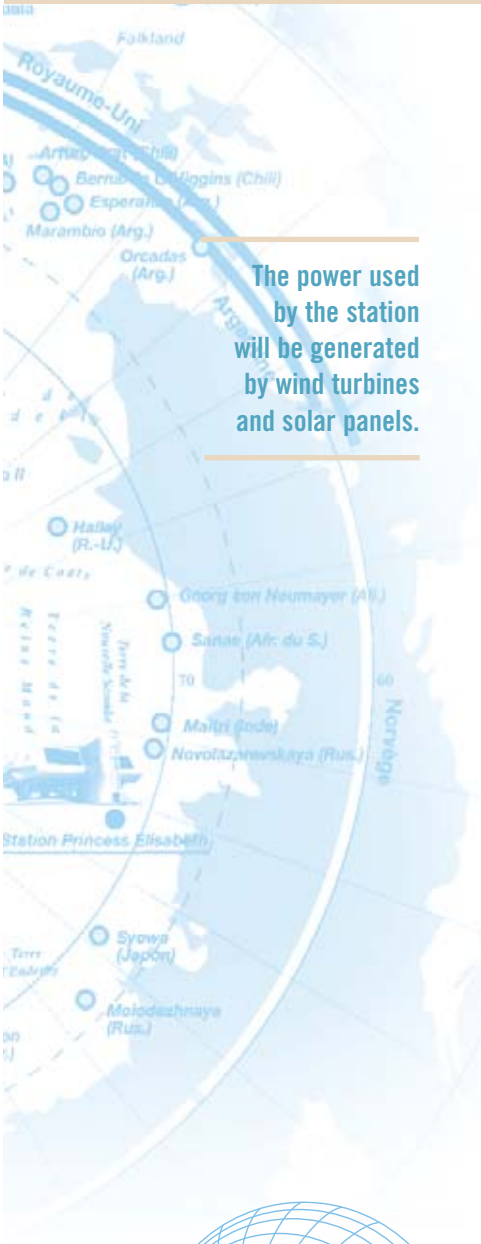
Once the equipment was thoroughly tested and made reliable at the Laborelec laboratories, it was disassembled, packed in containers and then shipped to the Antarctic. Six workers from the company will join the next BELARE expedition in the winter of 2008-2009, led by Alain Hubert to assemble and commission the entire station.

The big challenges for the station are to maximise production, ensure high reliability and guarantee longevity, as well as to limit energy consumption, minimise emissions and the environmental impact. The goal of making a success of the research station, to which Laborelec has contributed, is also at the heart of the company's daily concerns and the mission that it carries out in the service of its customers.

"The Laborelec teams are proud to have the chance to use their skills in energy efficiency and decentralised generation for this ambitious project and in that way help the IPF to build an exemplary polar base that will play a big role in the fight against climate change."

Bart Bosemans, director of Laborelec

2 The Princess Elisabeth zero-emission polar station: a unique and ambitious project



The power used by the station will be generated by wind turbines and solar panels.

Set up on an outcrop north of Utsteinen *nunatak* (an exposed, often rocky element of a ridge, not covered with ice or snow) in Dronning Maud Land (Queen Maud Land), the Princess Elisabeth polar station will be the first of its type. It is designed to operate exclusively on renewable energy and to reduce the size of its environmental footprint on the Antarctic, in keeping with the principles of the Antarctic Treaty.

The team of engineers, coordinated by Johan Berte, used an evolutionary model that includes ongoing adjustments to the station's design in light of results from simulations.

The power used by the station will be generated by wind turbines and solar panels. The energy efficiency of the design and the materials used, the passive heating system, the system for controlling energy and the use of low-energy consumption equipment all contribute to making this the most energy-saving Antarctic base ever built. As a sustainable development model, the Princess Elisabeth station has brought together know-how and technology from around the world and has raised the awareness of many. Johan Berte, project director and head construction engineer, and Alain Hubert, the project's director and chief engineer, asserted that, *"If it is possible to construct such a building in a region as cold and harsh as the Antarctic, it is possible to do it anywhere in the world."*

Unique in its material design, the Princess Elisabeth station is also original in its financing. Its construction is a project of the International Polar Foundation (IPF), which is financed by a group of private business sponsors, including the GDF SUEZ Group. The Belgian defence minister provided logistic support for the station's construction during the BELARE expeditions, while Belgium's federal scientific policy backed the scientific programmes. A new Polar Secretariat, a private-public partnership between the Belgian government and the IPF, will coordinate all the operational functions and will fund the operating and maintenance costs as well as the deployment of the scientific expeditions.

Individual donors may also make contributions.

INTERNATIONAL POLAR FOUNDATION

The International Polar Foundation

Created in 2002 by Alain Hubert and professors André Berger and Hugo Decleir, the Brussels-based IPF is a state-approved public utility foundation. Its mission is to promote polar research with the aim of raising the awareness of and informing the public about research conducted in the polar regions in order to gain understanding of the basic mechanisms of climate change. The IPF also encourages the application of innovative solutions for meeting climate change challenges in a sustainable way.

Why a polar scientific research station?

It is now agreed that human activities contribute to climate change. The Antarctic is a unique and irreplaceable repository of the Earth's climate history. It is therefore indispensable that we investigate this past in order to find urgent solutions to today's problems. The issues at stake for the Princess Elisabeth station are significant. By providing scientists a facility equipped with the best technology, the research projects conducted there will help the world to understand climate change.

A word from Alain Hubert

"Climatology and Earth sciences are recent fields and the climate is the result of extremely complex phenomena. Antarctic glaciers, to cite just one example, constitute the memory of past climate conditions. Studying the past helps us to understand the present and prepare for the future. This is an indispensable tool for doing our best to contribute to nature, to estimate tolerance to the emission of greenhouse gases and, consequently, to produce the energy on which our well-being and comfort rely. Building the first base in the Antarctic consuming 100% renewable energy shows that Belgium has the know-how and the technology to do here what we did there under extreme conditions. This base will stimulate technology and initiatives in sustainable development.

"Our aim is to position this project toward the future and tomorrow's generation. Its name, Princess Elisabeth, is proof of that. The base will be an opportunity to stay in touch with a wide range of people, from companies to schools, in order to further public understanding of the climate change issues and solutions – those that are already available today and those that we will have to devise in future. Although I have always sought to conduct my expeditions in line with what my predecessors had done during their polar explorations, I am also very grateful to the scientific community for having discovered the absolute necessity to conduct scientific research at the poles.

"The Antarctic is a unique repository of world climate. Research there is essential and indispensable for understanding of the planet's climate and for seeking answers to the acute questions raised by global warming. Only science can point the way forward. Today, science is telling us we must review our ways of producing and using energy.

The analysis of Antarctic ice core samples confirms that air temperature is linked to the concentration in the atmosphere of greenhouse gas. This shows that CO_2, the main greenhouse gas present in the atmosphere, mainly comes from burning fossil fuels. This shows that only the reduction of greenhouse gases, in particular CO_2, can provide us with a response to global warming that is now underway."

Four years of preparation

In 2004, the Belgian government entrusted the International Polar Foundation with the design, construction and financing of new research platform in the Antarctic. In the same year, the first models of the future Princess Elisabeth station were made and an initial expedition, Belare 2004, was launched in December to choose the Antarctic station's construction site. An on-site topographical study was conducted and an automated weather station with a satellite data link was installed to collect precise weather data.

In November 2005, a second expedition, for logistic and study purposes, called Belare 2005, was undertaken to carry out maintenance of the automated weather station and to take additional topographical measurements and to gauge the thickness of the ice. Air and land reconnaissance was done to select the best site at Breid Bay for the future delivery of construction equipment and material, as well as to find the safest route to reach the site.

A third expedition, Belare 2006, was conducted during the 2006-2007 austral summer with the mission of preparing the site and checking the previously mapped-out land route. This expedition also received the first load of heavy transport equipment and material and then built and tested the first wind turbine designed to supply power to the station.

In the summer of 2007, the Princess Elisabeth station was assembled in Brussels at the Tour et Taxi site. The twofold goal was to check the construction procedure and make any adjustments to the station prior to the departure for the Antarctic, as well as to explain polar research to the public.

On 5 September 2007, the station was unveiled, with Crown Prince Philippe of Belgium, Honorary President of the International Polar Foundation, in attendance, along with 2,000 guests and 200 journalists. The event was a popular success. More than 35,000 visitors came to the site over four days and expressed support for the project's goals. On 10 September, the station was disassembled, packed in containers and sent to Antwerp, the port of departure to the Antarctic via Cape Town, South Africa.

On 5 September 2007, the station was inaugurated in the presence of Crown Prince Philippe of Belgium, Honorary President of the International Polar Foundation, and 2,000 guests and 200 journalists.

Johan Berte
Project head at IPF
and Base designer

Léon Duvivier
In charge of
the Sustainable Process
Technology product line

Bart Boesmans
Laborelec General Manager

Paul Lemmens
Former Laborelec
General Manager

(from left to right)

Two-phase construction

The first phase of the station's construction took place between November 2007 and March 2008. Over those four months, Alain Hubert and a team of technicians and specialists erected the station's building, built the garage and assembled seven of the eight wind turbines.

The Belare 2007-2008 mission was conducted over three phases:

• **November:** Alain Hubert and 24 other expedition members, who were the vanguard and arrived at the start of November, set up the base camp, sent back containers left behind the previous year, completed the construction of the garage and drilled, with considerable difficulty, the anchoring points for the station and the wind turbines.

• **Mid-December:** After 20 days, the good ship Ivan Papinin, sailing from Cape Town and transporting 120 containers of material as well as the rest of the team, cast anchor at Crown Bay, where the ice was more manageable than at the original destination of Breid Bay. The 120 containers were loaded onto sleds and carried to the base camp along a path previously marked out by Alain Hubert. Eighteen crossings, taking an average of 40 hours for each round trip at an average speed of 15 km per hour, were needed to transport the cargo to its destination. It was a very delicate, but successful, operation that came off without a hitch, thanks to the know-how and experience of Alain Hubert, the expedition's commander, and several experts in icy and mountainous environments. At the same time, the last of the wind turbines were erected on the rocky outcrop and the station's foundations and the garages were completed.

• **January:** The construction of the station got underway in January. Cranes, carpenters, bulldozers and workers got down to work. The metal infrastructure and the wooden superstructure were assembled, followed by the flooring, the lateral modules, the tower, the roof and the insulation. The 40-person team managed to assemble the entire station one week ahead of schedule.

The second phase of construction will take place during the next expedition, from November 2008 to March 2009. At that time, the station's operational systems, energy and waste water treatment, will be installed.

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International cooperation

The Antarctic is the planet's largest cold source is managed by 46 countries, accounting for 2/3 of humankind. The project was conducted with the cooperation of several signatory countries of the Antarctic Treaty, such as Japan, Sweden, Germany and Norway, each of whom contributed logistic know-how and techniques.

The total estimated cost of the project amounts to €12.7 million.

Once built, the station will be run by a polar secretariat comprising a director, five private-sector representatives appointed by the IPF and five representatives from different Belgian ministries, two of whom from BELSPO (the Belgian federal scientific policy), as well as a seconded representative each from the Belgian foreign and defence ministries. The station may at that point host scientists from around the world. BELSPO will define the scientific programme and will select the scientific teams that will spend time at the station. The total cost of the project is €12.7 million. In 2006, BELSPO was allocated an additional budget by the Council of Ministers of €1 million euros per year for 2008 and 2009 to pay for the station's management and upkeep as well as another €500,000 per year for deploying research programmes.

What is **the Antarctic Treaty?**

The Antarctic Treaty, which entered into force in 1961, defines the 6th continent as a natural reserve devoted to science and peace. In 1998, the 6-year Madrid Protocol reinforced the Treaty by banning all mining activities. The Protocol, attached to the Treaty, concerns the impact of certain activities on the environment, the conservation of Antarctic flora and fauna, the elimination and management of waste, the prevention of marine pollution, the management of specially protected zones and responsibility in the event of environmental emergencies.

110 years after the first **Belgian Antarctic expedition**

Belgium already has a long history of scientific exploration and research in the Antarctic. In 1898-99, the expedition of the Belgian Adrien de Gerlache, aboard the Belgica, was the first to spend a winter in the Antarctic. Sixty years later, during the International Year of Geophysics, Gaston, the pioneer's son, erected the first Belgian Antarctic station, the Roi Baudouin Base. Inaugurated on 12 November 1957, it was abandoned ten years later because of a lack of funds. The International Polar Year, 2007-2008, offers a golden opportunity to inaugurate the new Princess Elisabeth scientific polar station, marking Belgium's deep commitment to combating climate change.

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An educational **programme**

The research undertaken at the station will be continuously tracked by an educational programme that will explain the range of polar research and stimulate interest of future generations. The programme will give a high profile to polar research and will explain the role of polar regions in climate change.

The missions: from microbiology **to meteorology, including glaciology**

In general, research at the Princess Elisabeth station will be conducted in the fields of meteorology, microbiology, geophysics, seismology, geomagnetism and glaciology.

Although already operational since the completion of BELARE 2008, the station will be fully underway in March 2009. The first scientific expedition is expected to start in November 2008 and will be headed by Dr Frank Pattyn, a glaciologist at the University of Brussels. The expedition's goal will be to study the losses and gains in mass of the Antarctic glaciers under the effect of climate change. The second expedition will get underway in January 2009 and will last two months. A team of microbiologists led by Dr Annick Wilmotte will explore microorganisms populating the rocky crevasses and gravel in the region of Utsteinen.

3 The northeast Antarctic

The station is at an altitude of 1,400 m on an outcrop north of Utsteinen Nunatak in Dronning Maud Land (Queen Maud Land), 71°, 57' S 23°, 20' E. In other words, it is located in the northeast of the Antarctic, which extends over 14 million km^2, twice the size of the United States.

The station was built on a granite outcrop surrounded by expanses of snow, not far from the former Roi Baudouin station, in a region free of logistic and scientific infrastructure. It is located 190 km from the coast and 500 km from the nearest station.

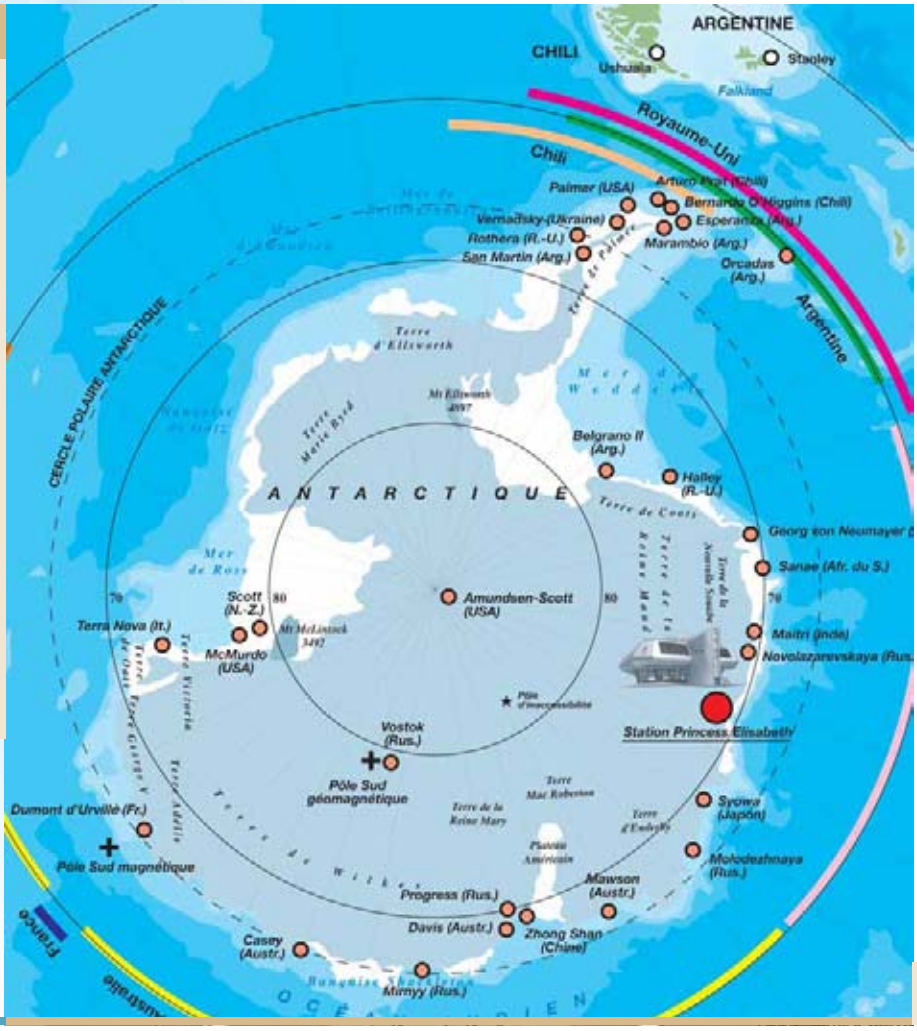
The station was built on a granite outcrop surrounded by expanses of snow, not far from the former Roi Baudouin station, in a region free of logistic and scientific infrastructure. It is 190 km from the coast and 500 km from the nearest station. The site's configuration is ideal, in a flat snow-free area, with good stability for installing the wind turbines facing the dominant winds. The surrounding snow is a precious source of water for the station's inhabitants.

Its location is also strategic in that it provides a wide range of research sites along the Sør Rondane mountain chain, the Antarctic plateau, glaciers and the coast.

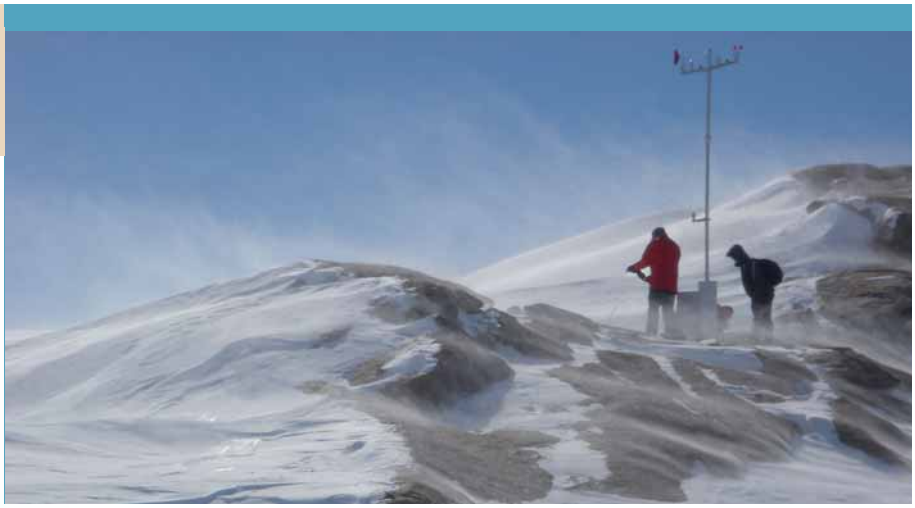
The station's systems were optimised to accommodate 12 persons. However, it will be possible to house up to 20 people at the base. Initially, the station will only be open during the austral summer, from November to March. But later on it may be transformed into a winter station, depending on demand.

Weather conditions

- **Air temperature:** -50ºC to -5ºC
- **Dominant katabatic winds**
- **Dominant wind direction:** from the southeast
- **Average monthly wind speed:** 20 km/hour
- **Maximum wind speed:** 125 km/hour
- **Monthly maximum speed of gusts:** 250 km/hour
- **Average atmospheric pressure:** 830 hPa
- **Number of days of 24 hour daylight:** 100 of the 120 days of the austral summer



The station's energy needs are barely 20% of those of a comparable Antarctic station.



Sun and wind will provide the station with the energy it needs.

Energy independence

The station's inhabitable area is 490 m^2, while the technical installations of the garages extend over approximately 1,000 m^2. On the main floor a kitchen, a bathroom, a laboratory a common living area, bedrooms, control and water treatment units, offices, storage area, etc. are fitted out.

A garage and technical installations, where vehicles (snowmobiles, tractors, etc.) and other equipment are kept, were built in an area 1,050 m^2 in size below the base, under the snow covering the outcrop.

Sun and wind provide the station with the energy it needs. Photovoltaic solar panels, 109.5 m^2 in size, will cover the roof and the exterior walls of the structure. Some 270 m^2 of panels will also be installed on the rocky surface adjacent to the station. All the panels together will generate 50.6 kWh (up to 800 W/m^2 of solar irradiation). In addition, nine wind turbines will be installed on the rocky outcrop to the north of the station that will each generate 6 kWh of power. All of them together will generate 48 kWh of energy.

Since the amount of renewable energy is limited by the storage capacity of the batteries, they must be used efficiently. The station's design was conceived for minimum energy consumption. An energy control and monitoring system as well as high-energy yield devices will be used in order to keep consumption down.

The station will be heated by a passive solar heating system combined with cogeneration, by recycling thermal radiation emitted by the station's energy core, i.e. computers, lighting and even humans. The station will need no heating during the austral summer. Significant insulation in the walls will prevent any heat loss and will keep the average ambient temperature at between 18 and 20°C.

All of the plumbing, ventilation, bioreactors and the main storage batteries will be installed on the main floor.

Snow will be the main source of water and will be collected and melted in a huge tank located in the centre of the station. Grey and black water will be treated and recycled via bioreactors.

Specifications

The station's design, the result of aerodynamic and energy studies, was the task of the IPF, with Johan Berte (project head), Nighat Amin (administrator) and Alain Hubert (project director and chief engineer).

The material and technology used adhere to the principles of eco-construction in order to reduce the base's environmental footprint.

The station's shell:

- 1.5 mm of stainless steel
- 5 mm of closed-cell foam
- 3 mm layer of EPDM (silicone) waterproofing
- 42 mm of spruce core plywood
- 400 mm of graphite-filled low-density expanded polystyrene (the main insulation layer)
- 74 mm of spruce core plywood
- A layer of Kraft paper
- A sheet of aluminium waterproofing
- Wool felt inspired by Mongolian yurts (fixed to the preceding layer by Velcro)

Windows (exterior and interior):

- an initial double-glazing with heat filter (film) in the centre vacuum space with 3 layers of glass fixed on the exterior.
- A 400 mm layer of air
- A second double glazing with insulating film in the centre vacuum space

Treatment of waste water

Seventy-five percent of waste water will be reused. Treatment will be done in several stages: anaerobic reactor, filtration, aerobic bioreactor, activated charcoal and a chlorination unit. A built-in regeneration system in the recycled water tank will use UV rays to keep the water at drinking quality. After treatment, the water will be drained into a rimaye (a crevasse between the ice and rock).

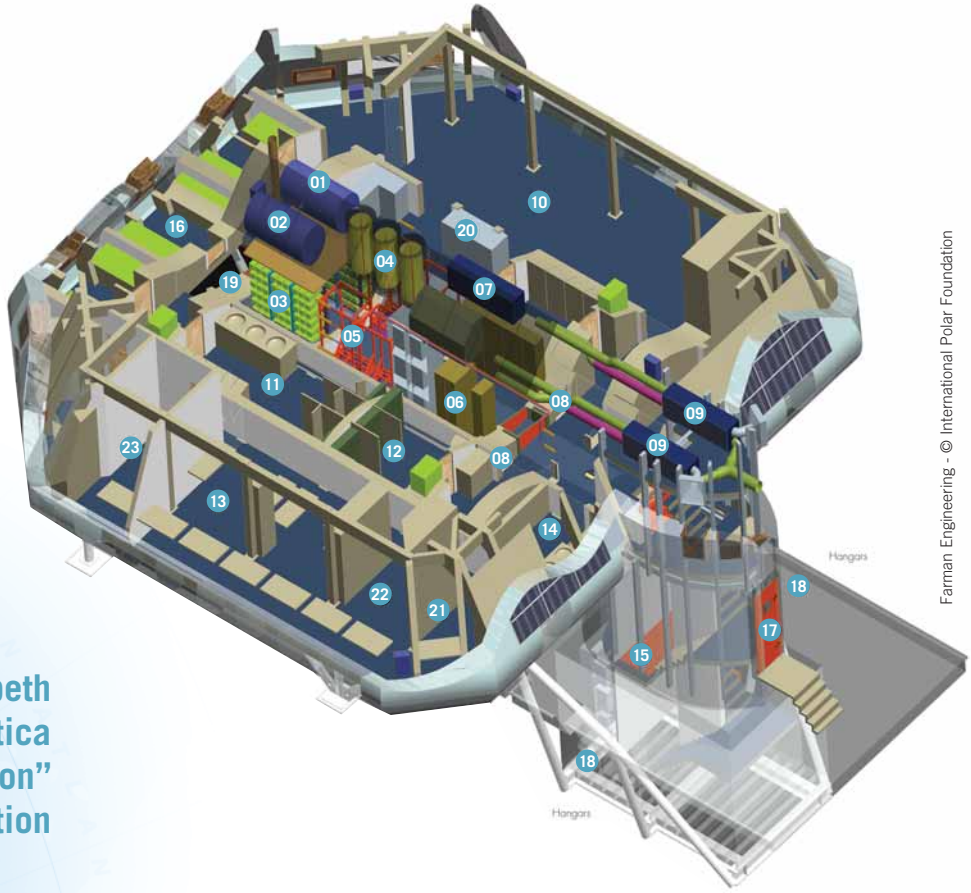
The station's energy demand and production

Total demand during the 4 summer months: 7,000 kWh/month
Total demand, 8 winter months: 2,000 kWh/month
Total annual demand: 54 MWh
Annual average consumption per m²: 51 kWh/year

- **Solar energy**
  - heating: 22 m² of thermal solar panels
  - electricity: 109.5 m² of photovoltaic panels on the station and 270 m² on the ground – Output 50.6 kWh (up to 800 W/m² of solar irradiation)
- **Wind energy:** 9 wind turbines, 6 kWh each; output 48 kWh
- **Non-renewable electricity:** two 44 kWh emergency diesel generators

Interior plan (excluding hangars and technical installations)

Total surface area: 440 m²



Farman Engineering - © International Polar Foundation

Princess Elisabeth Antarctica "zero-emission" station

01 Fresh water tank (melted snow): 1,500 litres
02 Recycled water tank: 1,500 litres
03 Batteries: 6,000 Ah
04 Hot water tanks (heated by thermal solar panels): 3 x 500 litres
05 Bioreactor modules (treatment by bacteria, filtration, pumps, valves, regeneration system): 1,500 treated litres per day
06 Electronic control system (command and management software)
07 Ventilation of the technical core: max. 600 m³/hour
08 Two modules, each with a washing machine and dryer
09 Ventilation modules in the living areas: max. 600 m³/hour
10 Living area: approximately 75 m²
11 Bathroom: 3 showers and 3 sinks
12 Toilets: 3
13 Offices for visitors: approximately 40 m²
14 Laboratories
15 Access tower with waste water tank (grey and black water)
16 Bedrooms (5 bedrooms with 2-4 beds)
17 Emergency exits
18 Access to the hangars (not detailed, 1,000 m²)
19 Storage units with built-in acoustic and thermal barriers
20 Kitchens
21 Doctor's office
22 Office of the base director
23 Bedroom of the base director

5 A portrait of Alain Hubert

The longest crossing ever carried out of the Antarctic on foot and on skis using traction kites: 3,924 km in 99 days, fully autonomously.

“ Alain Hubert, through his struggles and exemplary life, shows us that beyond fatalism and everyday indifference there is another path, the one that will lead us to the changes of tomorrow. ”

Bruno Coppens, Belgian humorist, La Libre essentiale

Civil engineer, businessman, mountain guide, accomplished athlete, lecturer, unrelenting explorer of the poles, Unicef goodwill ambassador, co-founder of the International Polar Foundation and father of three children, Alain Hubert’s achievements are enough to make one’s head spin. Where does he find the energy to wear so many hats and take on so many projects successfully? *“I was 15 in 1968. The events of the time gave us enormous confidence in our ability to change the world or at least to take part in shaping it, to build it and live according to our ideals of openness and solidarity… I forged my life in that way,”* he explained in his calm but firm voice.

As a teenager, he was interested in art and discovered a passion for mountains, wide-open spaces and sports. Although an open-minded dreamer, he was level-headed. With his civil engineering diploma in hand, he started a cooperative woodworking company in the Belgian Ardennes. His small company left him time to explore the world and the Himalayan summits before exploring the poles, first the North and then the South Pole. In 1997-1998, he completed the longest crossing ever of the Antarctic on foot, on skis and traction kites: 3,924 km in 99 days, fully autonomously. *“That was when I discovered the world of polar science. I was fascinated! I thought it was astonishing to see science serving a purpose. It was fundamental polar research, with the well-known ice core samples, that enabled us to discover the relationship between temperature and the concentration of CO_2. It was essential to our understanding of the universe. And thanks to chemistry, we were able to discover that the famous carbon dioxide we produce in excess comes from fossil fuels and limestone.”*

Enthralled at first sight by the splendid polar landscapes, he returned time again to explore these vast expanses of ice. Over the course of his expeditions, he was entrusted with scientific missions and became one of the most experienced explorers of the poles. In 1998, for the centenary of the first winter spent in the Antarctica, he co-organised the exhibition “The last continent– the Antarctic, the past, the present and the future” at the Cinquantenaire Museum in Brussels. The event was a big success and attracted 350,000 visitors over the eight months the exhibition was open. Contacted by Professor André Berger and convinced that the public and the authorities should be made aware of the ecological and economic issues of global warming, Alain Hubert suggested a year later the creation of the International Polar Foundation, a sort of bridge between

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science and society. The Foundation was created in 2002, while the Antarctic scientific station project was launched in 2004. *"If we want things to change, we must set an example. The citizens and business circles have enormous power over policy. I think we must show the way, encourage people to understand what our priorities are. I have children so I have the courage to believe in the survival of the human species. Maybe it's utopian, but that's how it is. Environmental problems are at the core of our future on an everyday basis. That is where we must render the world of politics responsible by combining our energy,"* he asserted.

"If we want things to change, we must set an example. The citizens and business circles have enormous power over policy. I think we must show the way, push people to understand what our priorities are."

Since then, every year Alain Hubert has undertaken Antarctic expeditions in order to create the scientific station, at the same time that he remains active in other areas. In 2007, he completed the first crossing of the Arctic between Siberia and Greenland via the North Pole in 106 days, accompanied by his team mate Dixie Dansercoer. They covered 1,650 km at -60ºC, in an environment that every year is becoming more dangerous because of the melting ice.

Turning to his projects, Alain Hubert is also working at the same time on the creation of the Polaris Climate Change Observatory, a climate change interpretation centre, installed at the Foundation's headquarters. The Observatory's main objective is to turn Brussels and the *Tour et Taxi* site into a key instrument for scientific and educational goals, a unique force for the sustainable development of our economic and society in the broadest sense.

"We must dream of a world we long to build."

Alain Hubert has the pioneering spirit. The word *impossible* is not part of his vocabulary. Utopian? He does not deny it. For him, being utopian is even indispensable. "We must dream of a world we long to build," he asserted.

Alain Hubert's publications

L'enfer blanc, les premiers belges au Pôle Nord
by Alain Hybert and Didier Goetghebuer, Editions Labor

Cent jours pour l'Antarctique
by Alain Hubert and Dixie Dansecoer, Editions Labor

Deux pôles : un rêve
by Alain Hubert, Editions Arthaud

La décision : entre passion et raison
by Jean Mossoux and Alain Hybert, Edition De Boeck

Highlights

- Born in Schaerbeek, Belgium, in 1953.
- Civil engineering studies at the Louvain Catholic University in 1977.
- Numerous mountain expeditions in the Himalayas (including five attempts on Mount Everest), Patagonia, Antarctic and Alaska between 1983 and 2004. In 1999 an ascent of Everest was interrupted at 8,850 meters.
- 11 expeditions in the Arctic and Antarctic, including:
  - Geographic North Pole with Didier Goetghebuer. They were the first Belgians to reach the North Pole, on foot and on skis, covering more than 760 km, autonomously, over the Arctic Ocean, 1994.
  - World-record crossing of the Antarctic continent, with Dixie Dansercoer, 3924 km in 99 days in autonomy, Antarctica, 1997-1998; the longest crossing ever made on foot and skis, using innovative new power kites.
  - Queen Maud Land, Antarctica - first ever ascent of the south summit of Holtanna (Orvins Mountains) and a dozen of other rock peaks. International expedition, 1999-2000 and 2000-2001.
  - The Arctic, Compaq Pole II, attempt at the longest crossing (over 2400 km) of the Arctic Ocean, in autonomy with Dixie Dansercoer, spring 2002. The expedition was forced to abandon because of poor ice conditions.
  - The Arctic Arc - first ever Siberia-Greenland crossing via the North Pole - 106 days on the ice, 4,300 km together with Dixie Dansercoer, Arctic Ocean, 2007.
- Creation of the International Polar Foundation, 2002.
- Assembly of the Princess Elisabeth Station in the Antarctic, from November 2007 to March 2008.
- First recipient of the "Climate Change" prize awarded by the Prince Albert II de Monaco Foundation in February 2008.

www.polarfoundation.org

6 The Princess Elisabeth timeline

July 2004 to April 2005	Preliminary analysis and design.
May 2005 to February 2006	Final design.
June 2006 to May 2007	Detailed design.
20 December 2006	Signing of the partnership contract between Electrabel/GDF SUEZ and the IPF.
July 2006 to June 2007	Manufacture of the polar station.
June 2007 to August 2007	Assembly and tests.
5 September 2007	Inauguration of the life-sized station at the *Tour et Taxi* site in Brussels with an exhibition open to the public (350,000 visitors).
October 2007 to November 2007	Preparation of the site at Utstenein with exploration, drilling, measurement and installation of wind turbines. Transfer of the disassembled station to Cape Town, South Africa.
December 2007	Transfer of the disassembled station to the Utstenein camp to the Antarctic.
January 2008 to February 2008	Assembly of infrastructure of the base at the South Pole.
March 2008	Completion of assembly and closure of the base for the winter.
November 2008 to February 2009	Opening of the station and first scientific expedition of the new Princess Elisabeth research station.
February 2009	Official inauguration of the base.

7 Contacts

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Photos: IPF Laborelec / Map by R. Weyl

princess elisabeth antarctica

Electrabel GDF SUEZ

INTERNATIONAL POLAR FOUNDATION

princess elisabeth antarctica

The first **zero emission** scientific station

A project led by Alain Hubert

A committed explorer

- co-founder of the International Polar Foundation
- civil engineer
- mountain guide
- lecturer
- Unicef goodwill ambassador

Weather conditions

- **Air temperature:** -50°C to -5°C
- **Dominant katabatic winds**
- **Dominant wind direction:** southeast
- **Average monthly wind speed:** 20 km/hour
- **Maximum wind speed:** 125 km/hour
- **Monthly maximum speed of gusts:** 250 km/hour
- **Average atmospheric pressure:** 830 hPa
- **Number of days of 24 hour daylight:** 100 of the 120 days of the austral summer

The station is designed to function only on renewable energy in order to limit its environmental footprint. Its goals are to further understandi ng of climate change and to devise innovative solutions for preserving the environment.

The GDF SUEZ Group, via Electrabel and its research centre, Laborelec, contributes its technical expertise and skills to optimising the electricity supply, the water and waste treatment systems and to ensuring the remote management of the facilities during the winter period.

GDF SUEZ offers the International Polar Foundation its expertise in the fields of energy, water and waste management for the construction of the Princess Elisabeth station, the first zero-emission scientific station.

LABORELEC

2007-2008
International Polar Year

Electrabel
GDF SUEZ