

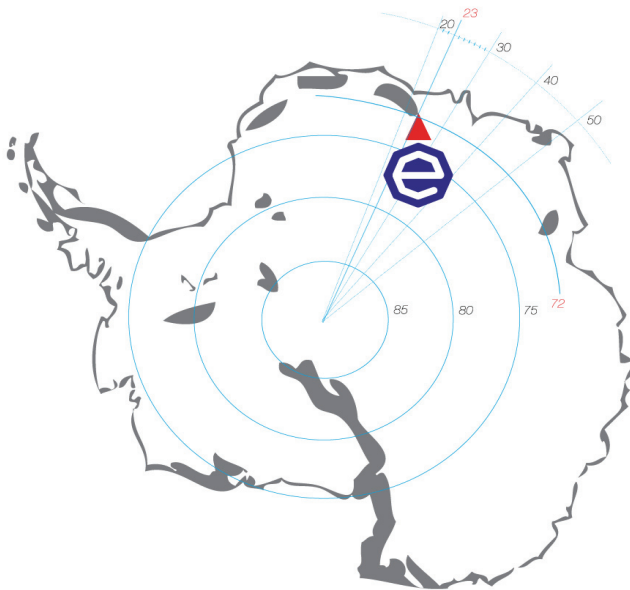
## TECHNICAL SHEET

### STATION

- Summer station open from November to February (austral summer)
- Maximum Capacity: 20 people
- Expected lifespan: 25 years minimum
- Total usable space inside the station: 495 m<sup>2</sup>
- Outside scientific facilities: 105 m<sup>2</sup>
- Garages: 875 m<sup>2</sup>

### LOCATION

- Position: 71°57' South and 23°20' East on the North Ridge of Utsteinen nunatak in the Dronning Maud Land, East Antarctica
- Distance to coast: 190 km
- Distance to nearest base: 500 km
- Research opportunities: Sør Rondane Mountains, glaciers, coast and the Antarctic Plateau



### METEOROLOGICAL CONDITIONS

- Air Temperature: -50 °C to -5 °C
- Dominant katabatic winds
- Prevailing wind direction: Southeast
- Monthly average wind speed: 20 km/h
- Monthly maximum wind speed: 125 km/h
- Monthly maximum gust speed: 250 km/h

- Average atmospheric pressure: 830 hPa
- Precipitation: accumulation depending primarily on snowdrift
- 24-Hour daylight: 100 days out of 120 during austral summer season

## THE STATION'S INSULATING WALLS

The walls will have 9 layers consisting of:

- 1.5 mm layer of stainless steel
- 5 mm of foam with closed cells
- 3 mm EPDM silicone sealing layer
- 42 mm of lamellate wood
- 400 mm of low density polystyrene doped with graphite (main insulating layer)
- 74 mm of lamellate wood
- Kraft paper
- Aluminium vapour barrier to keep in moisture
- Woollen felt layer (inspired by Mongolian yurts) stuck to the aluminium layer with Velcro

The windows will consist of:

- Double-glazed glass with special heat mirror film in the void between the panes, with three layers of glass glued together instead of one facing towards the exterior
- A 400 mm layer of air in the centre
- Double-glazed glass with special heat mirror film in the void between the panes

## MEETING THE ENERGY NEEDS OF THE STATION

Total demand for the four summer months: 7000 kWh/month

Total demand for the eight winter months: 2000 kWh/month

Total yearly demand: 54 MWh

Total surface area of the station and garage: +/- 1500 m<sup>2</sup>

Average annual consumption per m<sup>2</sup>: 51 kWh/m<sup>2</sup>/year

- Solar energy
  - thermal heating: 22 m<sup>2</sup> of solar thermal panels
  - solar energy: 109.5 m<sup>2</sup> of photovoltaic solar panels on the outside of the station and 270 m<sup>2</sup> on the rocks next to the station – total output: 50.6 kWh (up to 800 W/m<sup>2</sup> of solar radiation)
- Wind energy: 8 wind turbines producing 6 kWh each; total output: 48 kWh
- Non-renewable energy: 2 diesel generators (for use in emergency situations); total output: 44 kWh

## WATER TREATMENT FOR THE STATION

75% of the water used will be recycled and used a second time

- Water treatment in several stages: anaerobic reactor, filtration, aerobic bio-reactor, active carbon, chlorination unit, and finally a regeneration system using UV treatment for conservation of drinking water inside the tank.
- After treatment, used water will be disposed of in a rimaye (crevice between ice and a rock)