

Cooling of unique arctic biodiversity vault begins

Work on cooling an underground vault that will preserve seeds of vital food crops from around the world for up to 1,000 years has begun in an arctic archipelago off Norway.

Refrigeration units Friday began pumping cold air deep into a mountain on the Svalbard archipelago that lies midway between Norway and the North Pole so as to speed up the opening of the fail-safe repository of vital crops.

The start of the refrigeration process, which will bring down the vault's temperature from its current minus 5 degrees Celsius to minus 18 degrees Celsius, coincided with the beginning of the three-month 'polar night' when there is 24 hours of darkness.

The cooling process is expected to take two months, and the vault is to be officially opened Feb 26 next year.

'It's very satisfying to see the vault evolve from a bold concept to an impressive facility that has everything we need to protect crop biodiversity,' said Terje Riis-Johansen, Norway's minister of agriculture and food.

'The seed vault is the perfect place for keeping seeds safe for centuries,' said Cary Fowler, executive director of the Rome-based Global Crop Diversity Trust, which has partnered with Norway and the Nordic Gene Bank on building the vault.

'At these temperatures, seeds for important crops like wheat, barley and peas can last for up to 1,000 years.'

The vault, which can hold up to 4.5 million seed samples, will eventually house virtually every variety of almost every important food crop in the world.

It is a hedge against disaster so that food production can be restarted anywhere on the planet should it be threatened by a regional or global catastrophe.

'We ran a lot of computer simulations to determine the optimum approach and believe we have found a very effective and especially energy efficient way to establish reliably cool conditions inside the vault,' said project manager Magnus Bredeli Tveiten.

'We believe the design of the facility will ensure that the seeds will stay well-preserved even if such forces as global warming raise temperatures outside the facility.'

Engineers are essentially using rock as a 'cold store,' he said, an approach that has become popular on the Norwegian mainland as a way to establish energy efficient refrigeration systems.

To do this, workers recently brought in a temporary 30 kilowatt refrigeration system from the mainland. They are using it to establish a minus 18 degree temperature approximately 10 meters deep into the sandstone surrounding the vault.

The vault lies at the end of a 120-meter tunnel blasted in a mountain near the town of Longyearbyen

on the island of Spitsbergen.

As engineers move quickly to complete the mechanics of the operation, Tveiten said Norwegian officials also are advancing rapidly to ensure that the vault's aesthetic features are as impressive as its technical qualities.

A large metallic sculpture by Norwegian artist Dyveke Sanne stands near the entrance of the vault, making it visible from miles around.

The installation utilises highly polished sheet metal on the roof and front of the entrance portal to serve as reflectors that will sparkle in the Arctic 'midnight sun' of the summer months. It will make use of fibre-optics for lighting during the long Arctic winters.

'We really want this facility to inspire, to stand out as a highly visible monument to the often obscure but very important mission of conserving humanity's agriculture heritage,' said Terje Riis-Johansen

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