

CASE STUDY

# WarmtelinQ project uses residual heat to power the Dutch energy transition




In partnership with

gasunie

isoplus®

 BOREALIS

بروج  
Borouge 



**“As an energy network operator, we at Gasunie take our role in enabling the transition to a zero-emission energy system very seriously. By turning residual heat into warmth for homes and businesses, the WarmtelinQ project is making a meaningful contribution to realizing our climate goals while also mitigating energy-security risks.”**

Gasunie

## Background

The European Commission’s Fit for 55 climate package aims to reduce greenhouse gas emissions in the EU by 55% by 2030 (compared to a 1990 baseline). For the Netherlands, this requires lowering the country’s own emissions by 49 million tons, a massive 52% reduction compared to 1990.

As one measure to achieve this ambition, the Dutch Climate Agreement stipulates that by 2050, the heating systems of all buildings in the Netherlands must be powered by more sustainable energy sources like pre-insulated district heating networks. Reaching this goal has become even more urgent since the start of the war in Ukraine, as EU countries rush to wean themselves off cheap Russian natural gas.

## Challenge

An enormous amount of residual heat is produced by industries operating in the Port of Rotterdam, the largest seaport in Europe. Excess heat which would otherwise be wasted, or warm the natural waters and other surrounding environments, could be put to good use in a district heating system for neighboring cities. This would be cost-effective and more sustainable than natural gas. It would also lower emissions and reduce the country's dependence on gas. Yet given the distance from the Port of Rotterdam to urban areas requiring heat, it is essential to use a pipe material that can minimize heat loss.

## Solution

**Gasunie**, the state-owned Dutch utility and the Netherlands' energy network operator, is pivoting towards more sustainable energy solutions. Its lighthouse project **WarmtelinQ** is currently the largest long-distance, underground district heating project of its kind in Europe. WarmtelinQ entails the installation of a long pipeline originating in the Port of Rotterdam, with completion of the main pipeline due 2025 (23 km) and its extension by mid-2027 (46 km).

Once completed, WarmtelinQ will supply heat to around 120,000 urban households in the province of South-Holland. It will reduce the Netherlands' CO<sub>2</sub>-eq emissions by 2 to 3 million metric tons per year, thus making up approximately 5% of the total emission reductions required to meet its EU climate goals. Even the logistics related to construction works are designed to reduce emissions, with pipe being transported by rail freight from the ISOPLUS factory in Austria to Rotterdam. The prefabricated pipeline components are assembled and welded on site before insulating the seams and laying the pipe. For the main heat transport, two pipes, each with an outer diameter of around 90 cm, are being installed in parallel.



Photo: Courtesy of ISOLPLUS



# The benefits of BorSafe HE3490-LS in district heating



District heating (sometimes called “heat networks”) uses a system of insulated pipes to transport heat in the form of high-temperature (up to around 120°C) water from a central station, where it is generated, to end users such as households and commercial enterprises. A district heating pipe network is composed of inner steel pipes and outer polyethylene (PE) casing pipes. The inner steel pipe, which is insulated by a polyurethane foam layer, distributes pressurized hot water in a circulation system. The external PE casing pipe, according to the European Standard EN 253, must withstand various mechanical and environmental stresses: ground contact; scratches and notches occurring during transport and installation; and elements found in the surrounding environment, such as salts, minerals, and industrial residues. Thus the outer PE pipes must exhibit excellent water & air tightness as well as mechanical and chemical resistance.

Pipes for the WarmtelinQ project are being supplied by Borealis customer ISOPLUS, a leading supplier of pre-insulated piping systems. The casing pipes are made of BorSafe™ HE3490-LS, a bimodal PE compound based on our advanced Borstar® technology. Over nearly two decades, this pre-compounded PE100 material has established a successful track record in many pipe end uses, including water and gas distribution; industrial applications and projects like sea outfall pipes, desalination, geothermal, power plants – and district heating.

Compared to the use of natural resin with masterbatch addition, the BorSafe HE3490-LS produces pipes with improved consistency and mechanical performance thanks to its excellent carbon black and stabilizer dispersion, and its stable extrudability. BorSafe HE3490-LS ensures excellent long-term thermal stability and UV resistance. It also shows good resistance to slow crack growth thanks to its molecular structure.

What is more, the sustainability of pipes made using BorSafe HE3490-LS may be further enhanced when opting to use a grade from our Borneables™ portfolio of circular polyolefins. Made from second-generation renewable feedstock, Borneables grades are International Sustainability and Carbon Certification (ISCC PLUS) certified according to the mass balance method. This means that our customers can track and quantify the effective renewable feedstock used at each step in the manufacturing process. The same high application quality can be achieved – with no need for additional certification or approval steps.

**“At every step of the way, the WarmtelinQ project shows how district heating systems can play a substantial role in enhancing the sustainability of our energy infrastructure. The use of BorSafe HE3490-LS ensures minimal heat loss over many kilometers of pipe. Its operators can count on consistent performance over decades. Using residual heat from the Port of Rotterdam that might otherwise be wasted is the smart way to accelerate the energy transition. We hope that this project has many imitators so that we may achieve our ambitious climate goals in Europe, and beyond. Together with our partners, we are enabling life’s essentials.”**

**John Webster**

Global Commercial Director Infrastructure, Borealis

**“Our customers rely on us to supply pipes with robustness, long service life, and proper insulation so as to minimize heat loss from networks over time – because low heat loss translates into lower CO<sub>2</sub> emissions. We trust and rely on Borealis to deliver the innovative compounds we need to provide consistently high quality to our own customers for ambitious clean-energy projects like WarmtelinQ.”**

**Gregor Wegerer**

Managing director, ISOPLUS Austria

## Borealis and Borouge polyolefin infrastructure solutions for pipes and fittings are enabling life’s essentials

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Borealis is one of the world’s leading providers of advanced and sustainable polyolefin solutions. In Europe, Borealis is also an innovative leader in polyolefins recycling and a major producer of base chemicals. We leverage our polymer expertise and decades of experience to offer value-adding, innovative and circular material solutions for key industries such as consumer products, energy, healthcare, infrastructure and mobility.

With operations in over 120 countries and head offices in Vienna, Austria, Borealis employs around 6,000 people. In 2022, we generated a net profit of EUR 2.1 billion. OMV, the Austria-based international oil and gas company, owns 75% of our shares. The Abu Dhabi National Oil Company (ADNOC), based in the United Arab Emirates (UAE), owns the remaining 25%.

In re-inventing essentials for sustainable living, we build on our commitment to safety, our people, innovation and technology, and performance excellence. We are accelerating the transformation to a circular economy of polyolefins and expanding our geographical footprint to better serve our customers around the globe. Our operations are augmented by two important joint ventures: Borouge (with ADNOC, headquartered in the UAE), and Baystar™ (with TotalEnergies, based in the US).

[borealisgroup.com](https://borealisgroup.com) | [borealiseverminds.com](https://borealiseverminds.com)

### Borealis AG

Trabrennstr. 6-8, 1020 Vienna, Austria  
Tel +43 1 22 400 000 - Fax +43 1 22 400 333  
[borealisgroup.com](https://borealisgroup.com)

**Borouge Pte Ltd** Sales and Marketing Head Office  
1 George Street 18-01, Singapore 049145  
[borouge.com](https://borouge.com)

