

CASE STUDY

Gothenburg is reducing the carbon footprint of its infrastructure projects

Water pipe renovation project installs pipes made of the Bornewables™ using the no-dig pipe bursting method



HALLINGPLAST



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Challenge

The city of Gothenburg, Sweden, is growing faster than most parts of the country. Several major infrastructure projects are underway to accommodate expansion, including an underground extension to the existing railway system, a major overhaul of its tramway network, installation of a new sewage system, and replacement of drinking water pipes. As eager as the city is to encourage growth, it wants to do so in a sustainable way. To this end, it has set ambitious goals to reduce CO₂ emissions in its infrastructure projects by 90% by the year 2030 (from a 2020 baseline). This means that the city must now identify those projects with the greatest potential to reduce CO₂ emissions, heeding all aspects of the respective project: from the type of materials selected and their performance, to installation methods and processes.

Solution

Gothenburg's water and wastewater services department initiated a water pipe renovation project that aims to lower CO₂ emissions at every step in the process. Ageing cast iron pipes will be replaced with robust PE100-RC pipes made using high purity BorSafe™ Bn HE3490-LS-HW-90, a grade from the Borealis Bornewables™ portfolio of circular polyolefin products manufactured with renewable feedstocks. The Bornewables offer the same material performance as virgin polyolefins, yet are decoupled from fossil-based feedstocks.

“It is gratifying to have progressive partners, like the municipality of Gothenburg and Hallingplast, who share our dedication to making infrastructure projects more sustainable. Ensuring the purity and quality of water pipe systems is paramount, but it is an enormous bonus for all stakeholders to be able to achieve this while at the same time reducing the overall environmental footprint of the project. This is what we at Borealis mean by re-inventing essentials for sustainable living.”

John Webster
Global Commercial Director Infrastructure, Borealis

Project parameters

Because the PE100-RC resin classification enables the use of no-dig installations, pipes will be laid using the pipe bursting method of trenchless repair. This installation process is not only faster, but also requires less ground excavation, emits less pollution, and generally results in less noise and disturbance for urban inhabitants. The city will be working closely with project supplier Hallingplast, one of the largest and most innovative pipe producers in Norway, to assess the ultimate environmental footprint of this pressure pipe system project. One aspect involves determining whether backfill can be used in an even more efficient way in order to further lower the environmental footprint of major infrastructure projects.

PROJECT DESCRIPTION

Replacement of ageing cast iron pipes (DN 150) by PE100-RC pipes (D180, SDR11, length of 12 m)

TOTAL PIPE LAYING LENGTH

408 m

MATERIAL APPLIED

BorSafe Bn HE3490-LS-HW-90



“I am very thankful for the opportunity to have this joint case study conducted along with Hallingplast and Borealis on renewable-based PE100-RC pipe and the trenchless installation technique. It nicely complements another recent exercise in which we evaluated the open-trench installation of renewable-based PP sewage pipe under challenging soft clay ground conditions. It was a real eye-opener to see the impact of backfill handling, in this case how skilled installation enables the highest possible use of recovered mass as backfill. The professional team involved did an excellent job.”

Fredrik Johansson
Göteborg Stad kretslopp och vatten

Result

The water pipe renovation project in Gothenburg employs a winning combination of a durable, reliable and more circular pipe material solution in tandem with more environmentally friendly installation methods.

The high purity drinking water grade BorSafe Bn HE3490-LS-HW-90 boasts outstanding resistance to slow crack growth, and is ideal for use in no-dig installation methods. The "90" in its name refers to the 90% renewable content, which is allocated to this grade via mass balance. Like all grades in the Bornewables portfolio, it is ISCC PLUS certified according to the mass balance chain of custody model that enables renewable content to be tracked, traced and verified through the entire value chain.



“Partners like Borealis are a pleasure to work with because they can assure the sustainability of the materials – from feedstock to final product. Because Borealis Bornewables grades may be used as drop-in solutions with no compromise on material quality or process efficiency, Hallingplast can guarantee our customers quality, reliability, and greater circularity.”

Martin Andersson
 Sales Director, Hallingplast AB

Borealis and Borouge infrastructure solutions are enabling life's essentials

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Borealis is one of the world's leading providers of advanced and circular polyolefin solutions and a European market leader in base chemicals, fertilizers and the mechanical recycling of plastics. We leverage our polymers expertise and decades of experience to offer value adding, innovative and circular material solutions for key industries. In re-inventing for more sustainable living, we build on our commitment to safety, our people and excellence as we accelerate the transformation to a circular economy and expand our geographical footprint.

With head offices in Vienna, Austria, Borealis employs 6,900 employees and operates in over 120 countries. In 2021, Borealis generated total sales and other income of EUR 10,153 million and a net profit of EUR 1,396 million. OMV, the Austria-based international oil and gas company, owns 75% of Borealis, while the remaining 25% is owned by a holding company of the Abu-Dhabi based Mubadala. We supply services and products to customers around the globe through Borealis and two important joint ventures: Borouge (with the Abu Dhabi National Oil Company, or ADNOC, based in UAE); and Baystar™ (with TotalEnergies, based in the US).

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Borealis AG
 Trabrennstr. 6-8, 1020 Vienna, Austria
 Tel +43 1 22 400 000 • Fax +43 1 22 400 333
borealisgroup.com

Borouge Pte Ltd Sales and Marketing Head Office
 1 George Street 18-01, Singapore 049145
borouge.com

