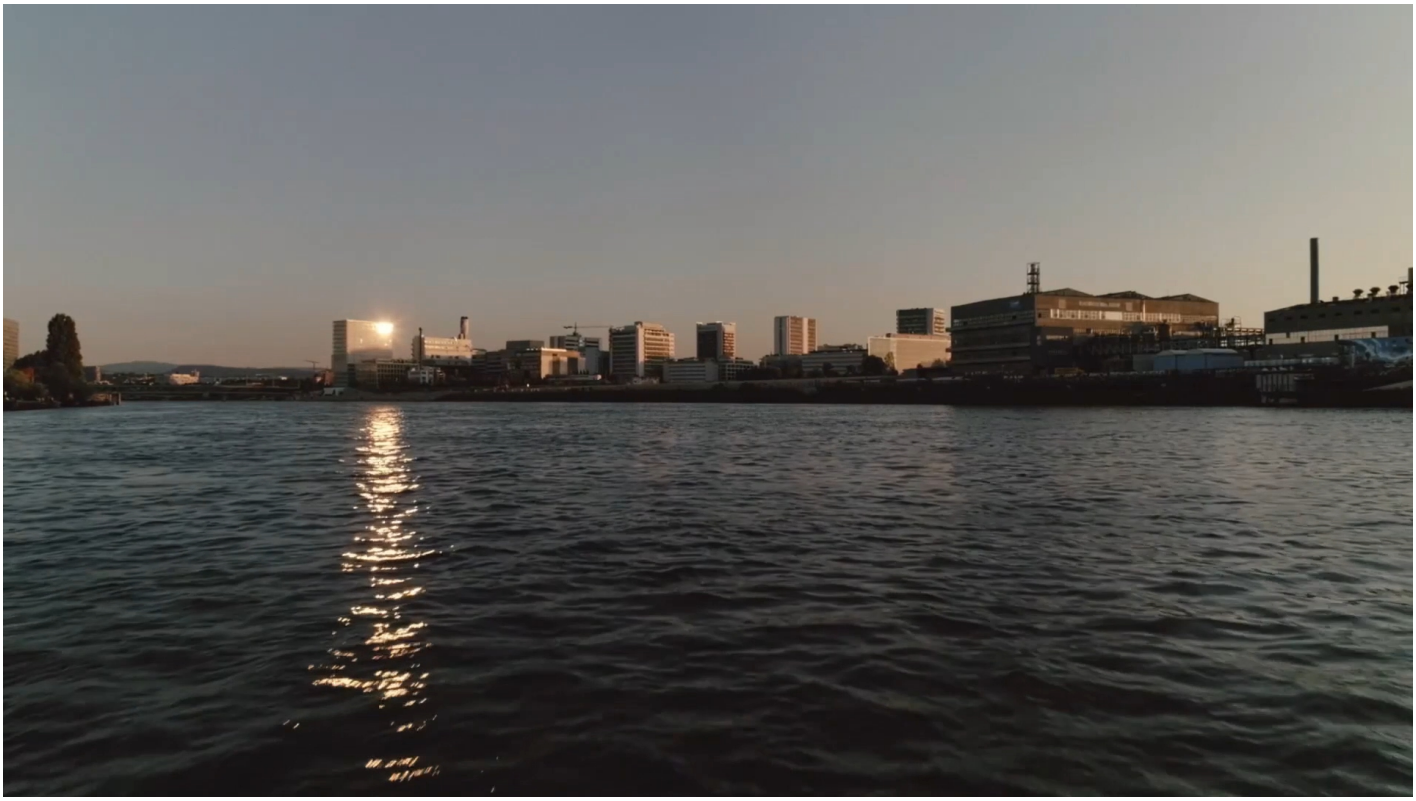
Nature - Water



Health and water are closely interconnected. For Novartis, responsible water management means using water efficiently and safely throughout the lifecycle of our products, including in our supply chain, and avoiding potential risks related to pharmaceuticals reaching the natural environment. We aim to be a water steward wherever we operate, working to achieve water sustainability and helping ensure sufficient and safe water.

We endorse the CEO Water Mandate and are committed to advancing water stewardship.

2025

Reduce water consumption in our own operations by half[1] and have no water quality impacts from manufacturing effluents (from own manufacturing sites and high-risk suppliers[2])[3]

2030

Have no water quality impacts from manufacturing effluents (from own manufacturing sites, labs and all suppliers[4])[3] and implement water use reduction for own and supplier sites based in water-stressed basins[5]

Responsible use

We recognize that water is a valuable resource which needs to be used responsibly particularly in regions of the world where water is scarce. Water recycling and practices of water savings are therefore a priority for our operations. We closely monitor all water streams into and out of our sites, which helps ensure effective

management of water resources and costs. Sites are encouraged to use water from underground or surface sources for cooling because this can save energy in areas where water is abundant. However, we take care to do this in a sustainable way and without impact to the environment.

Access to water is crucial during drug production both as a solvent in the production process, as well as for cleaning and cooling processes. The resulting wastewater also needs to be effectively treated in order to avoid potential risks, including drug substances, reaching the natural environment. We are installing new technologies at our production sites to use water efficiently and safely. For example, in Singapore, recycling solutions have been implemented to enable production in water-stressed areas.

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Water quality

An emerging concern on water quality is the prevention of pharmaceuticals entering the aquatic environment. The majority of pharmaceuticals in the environment are a result of excretions from patients being treated with the medicines and improper disposal of unused or expired medicine. Relatively small quantities can come from drug manufacturing effluents and R&D facilities. We actively manage pharmaceutical discharges, including antibiotics, from our own and our supplier production sites. For example, at our manufacturing site in Targu Mures, Romania, we have built a new wastewater treatment plant, equipped with the latest carbon-filter technology to better purify water from active pharmaceutical ingredients.

Making medicines environmentally sustainable

Pharmaceuticals are highly active in small amounts – which is beneficial for patients, but potentially harmful for the environment. Novartis is working across its pipeline to foresee and prevent the unintended impact of drugs. All new products undergo a regulatory assessment for potential long-term environmental risks and our legacy products run through a targeted assessment to prioritize pharmaceuticals for further environmental testing.

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Dissolving a toxic tradition

Organic solvents are as natural to chemistry as the ubiquitous test tubes. But the fossil origin of some widely used solvents, which are also used in drug development, are a threat to the environment. Special soap-like substances that can work like nanomachines might dissolve part of this toxic problem and help chemistry become more natural.

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Collective action

Novartis participated successfully in the iPiE project (Intelligence-led Assessment of Pharmaceuticals in the Environment), funded by the Innovative Medicines Initiative (IMI). The IMI is a public-private partnership between pharmaceutical companies, the European Commission and the European Federation of Pharmaceutical Industries and Associations (EFPIA). This project developed a framework to identify the potential risk of pharmaceuticals to the natural environment and methods to prioritize legacy pharmaceuticals for targeted environmental risk assessment. Following the success of iPiE, Novartis joined IMI-PREMIER, a 6-year project with the IMI, focused on evaluating and mitigating risk of medicines in the environment. The PREMIER (Prioritisation and Risk Evaluation of Medicines in the EnviRonment) project aims to deliver an innovative framework for characterizing the environmental risks of active pharmaceutical ingredients (APIs), which can ultimately be used to explore and promote greener drug design.

In India, we are working with local partners and communities in the State of Telangana to implement an innovative watershed project that aims to be a sustainable solution for the industry, while also having a positive impact on society in general. In addition, as an active member of the Pharmaceutical Supply Chain Initiative, we are supporting the State of Telangana's efforts to revitalize the Musi River, a vital water source to

the Hyderabad area which has been impacted by poor wastewater management.

For further information, please see:

- Novartis position on Pharmaceuticals in the Environment (PDF 0.2 MB)
- EFPIA work on Pharmaceuticals in the Environment
- iPiE- Intelligent Assessment of Pharmaceuticals in the Environment
- Prioritization and Risk Evaluation of Medicine In the EnviRonment (PREMIER)
- Disposal of Medicines in Europe

1. Target water consumption includes water discharged via treatment and water lost through evaporation or other destinations
2. The scope includes high risk suppliers of active pharmaceutical ingredients, including drug substance and drug product. Scope is aligned with the scope of ESO (External Supply Operations) Vendor Segmentation Process and includes strategic (long term relationship) and selected tactical (key technology provider) ESO suppliers. In addition, high risk suppliers also include antibiotic suppliers
3. Assessment based on water maturity ladder for internal/external suppliers with Level 1 (training, legal compliance), Level 2 (quantification and risk assessment) and Level 3 (PEC/PNEC<1); PEC: Predicted Environmental Concentrations, PNEC: Predicted No Impact Concentrations
4. The scope includes all suppliers of active pharmaceutical ingredients, including drug substance and drug product
5. Basin-specific targets will be established for sites in own operations and upstream suppliers

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