Eco-design

GRI Standards:

302-5: Energy
305-5: Emissions
306-2: Effluent and waste
301-1, 301-2: Materials

TABLE OF CONTENTS

1. Our approach to Eco-design

At Sanofi, we're integrating eco-design into our product development process, examining environmental impacts at each stage of the product life cycle. Eco-design is an approach that aims to improve our medicines & vaccines' environmental performance by minimizing their environmental impact over their value chain, but to also adapt our environmental profile to the complex climate and nature-related challenges we face.
Our 2 corporate objectives are:
- Since 2025, all our new medicines & vaccines adopt an Eco-design approach.
- By 2030, our 20 top-selling products adopt an Eco-design approach.

By leveraging environmental Life Cycle Assessments (LCA), as well as our science-based Eco-design Digital intelligence tool (EDDi), we assess and identify opportunities to reduce environmental impact of our products through their entire lifecycle — namely in terms of raw materials, manufacturing, device and packaging, including distribution, patient use and product end-of-life treatment.

Our Eco-design approach covers environmental multi-impact indicators the Eco-design approach is progressively becoming systemic at Sanofi in development & manufacturing activities, minimizing the environmental impact of our medicines & vaccines.

Figure 1 – Sanofi Eco-design approach illustration

A significant number of Eco-design projects are already implemented across Sanofi organization (see details section 3) with this mindset: minimizing use of resources use, energy, or water for manufacturing activities, including a proactive approach to minimize the potential impacts on ecosystems of medicines and vaccines in the environment.

2. Performance

At Sanofi, we monitor the environmental benefits and impact of the program with the execution of Eco-design improvement levers based on Environmental Life Cycle Assessment (LCA). This standardized tool is based on science-based international recommended methods[1] used to quantify and optimize the environmental profile of our medicines & vaccines over their lifecycle (cradle to grave): from the extraction of materials up to the product end-of-life treatment.

[1] European Commission – Joint Research Centre European Platform on Life Cycle Assessment (EPLCA).European Commission. Available at: https://eplca.jrc.ec.europa.eu. And British Standards Institution (2025): Pharmaceutical products – Product category rules for environmental life cycle assessments. Publicly Available Specification PAS 2090:2025.London, United Kingdom: https://knowledge.bsigroup.com/products/pharmaceutical-products-product-category-rules-for-life-cycle-assessments-specification.

At Sanofi, environmental LCA relies on:

- **Multi-criteria**: LCA considers a multiplicity of environmental indicators (Climate change, water use, resource depletion, etc.) to identify best environmental improvements.
- **ISO-compliant**: we follow specifications of LCA-related standards ISO 14040 & 14044.
- **Environmental Footprint (EF) method**: EU Commission has the most robust and comprehensive LCA methodology available that includes 16 environmental impact indicators.
- **Pharmaceutical products category rules (PCR):** Environmental life cycle assessments for pharmaceutical products, the PAS2090 standard published by British Standards Institute (BSI).

IMPACTS CATEGORIES	IMPACT CATEGORY INDICATOR
Climate change, total	Radiative forcing as global warming potential (GWP100)
Ozone depletion	Ozone Depletion Potential (ODP)
Human toxicity, cancer	Comparative Toxic Unit for humans (CTUh)
Human toxicity, noncancer	Comparative Toxic Unit for humans (CTUh)
Particulate matter	Impact on human health
Ionizing radiation, human health	Human exposure efficiency relative to U235
Photochemical ozone formation, human health	Tropospheric ozone concentration increase
Acidification	Accumulated Exceedance (AE)
Eutrophication, terrestrial	Accumulated Exceedance (AE)
Eutrophication, freshwater	Fraction of nutrients reaching freshwater end compartment (P)
Eutrophication, marine	Fraction of nutrients reaching marine end compartment (N)
Ecotoxicity, freshwater	Comparative Toxic Unit for ecosystems (CTUe)
Land use	Soil quality index24; Biotic production; Erosion resistance; Mechanical filtration; Groundwater replenishment
Water use	User deprivation potential (deprivation weighted water consumption)
Resource use, minerals and metals	Abiotic resource depletion (ADP ultimate reserves)
Resource use, fossils	Abiotic resource depletion – fossil fuels (ADP-fossil)

Figure 2 - EU Product Environmental Footprint 16 midpoint indicators

<u>2025 Eco-design performance proof points</u>

1. **Strategy**: at Sanofi, aligned with our corporate Eco-design objective, we completed Environmental Life Cycle Assessments (LCA) that proof point the environmental optimization of our medicines and vaccines. We've already started seeing the results of Eco-design applications:
    - **60% of our top 20 selling products** follow an Eco-design approach with Sanofi:
        - For **DUPIXENT**[2], currently used by over one million patients worldwide, optimizing the active ingredient manufacturing process with our partner Regeneron has cut its carbon footprint by 53%, reduced water use by 62%, and minimized resource depletion by 30%. Considering 1 year of treatment for 1 million patients, this reduction-impact is equivalent to: 14M km driven.
        - We've also seen significant environmental improvements of **TOUJEO**[3]: we've cut its carbon footprint by 27%, reduced water use by 11%, and minimized resource depletion by 18%, thanks to improvements in manufacturing, packaging, and device production. Considering treatment of 1,000 patients for 5 years, the reduction is equivalent to 366K water bottles.
        - By optimizing the production and packaging of **HEXAXIM**[4], we've reduced its environmental footprint to cut carbon footprint by 17%, reduce water use by 19%,

[2] Based on an ISO-compliant LCA peer-reviewed by an independent panel, following ISO 14040 & 14044 standards. LCA Technical Summary report: [LINK]

[3] Based on an ISO-compliant LCA peer-reviewed by an independent panel, following ISO 14040 & 14044 standards. LCA Technical Summary report: [LINK]

[4] Based on an ISO-compliant LCA peer-reviewed by an independent panel, following ISO 14040 & 14044 standards. LCA Technical Summary report: [LINK]

and minimize resource depletion by 6%.

- **ALTUVIIIO** first-in-class, high sustained Factor VIII replacement therapy has a better environmental profile than Eloctate®, a treatment also approved for the treatment of Hemophilia A. We've cut its carbon footprint by 43%, reduced energy resource use (non-renewable) by 44%, and minimized air pollution (particulate matter formation) by 41%, thanks to improvements in manufacturing, packaging, and device production Considering 1 year treatment for 1,000 patient impact reduction is equivalent to 5.4M km flight.

  The following products are also following an Eco-design approach, gathering their environmental LCA and improvement levers identified addressed to their responsible experts: APIDRA, ASPART, LANTUS, LISPRO, SOLIQUA, BEYFORTUS, ELOCTATE and inactivated polio vaccines (IPV) .

- **100% new medicines** (under development phase, before their first submission, first indication, first geography) were also assessed with an environmental LCA study to identify their main environmental drivers and address their respective improvement levers.

2. **People:** since 2025, Eco-design responsibilities have been integrated into new job description and individual Sanofian performance goals to create accountability for key departments Research and Development (R&D), Manufacturing Science, Analytics and Technology (MSAT) and Global Device and Packaging Unit (GDPU).
3. **Investments**: Every year, we invest €3 million in transforming our employees' innovative ideas into concrete, impactful solutions. In 2025, Planet Care Challenge edition focuses on Eco-design by leveraging our network of expertise, disruptive mindset, and reach, we seek to amplify our impact while driving meaningful changes within the industry.
4. **Tool:** we keep on investing in our internal Eco-design Digital intelligence (EDDi) tool to model, measure & simulate, monitor & optimize our medicines' environment profile.
   - In April 2024, we received the certificate from Bureau Veritas, a world leader independent in certification services, attesting that Sanofi EDDi tool is compliant with ISO 14040 & ISO 14044.
   - In 2025, we integrated generative artificial intelligence (GenAI) for medicine and vaccine LCA execution acceleration to ensure Eco-design experts focus more on environmental improvement levers. To effectively collect & utilize accurate, comparable suppliers' environmental data, the Environmental & Procurement teams collaborated to establish supplier environmental data specifications checklist aligned with international standards: PAS2090 & GHG Protocol. This ensures clarity and compliance with the required environmental data formats.
   - Over the years, to implement Eco-design at the core Sanofi business ecosystem, we integrate Eco-design standards and process (HSE Eco-design management systems standard; Sustainable Packaging and Device standards, R&D product development stage gate deliverables, and in Manufacturability assessment tool to include Eco-design according to Sanofi industrial expectations Scientific and Technological Standards).
5. **Upskilling:** environmental knowledge and skills development of Sanofian is key for Eco-design approach integration and acceleration. To reach this objective Sanofi has developed and executed in 2024 an Eco-design transformation program with four levels according to target audience and learning objectives:
   - **Level 1:** global audience, Sanofi Eco-design approach objectives
   - **Level 2:** target audience, Sanofi Eco-design approach tools presentation
   - **Level 3:** target audience, Sanofi Eco-design approach tools application
   - **Level 4:** target audience, Sanofi Eco-design approach – LCA advance learning

By the end of 2025 5,001 Sanofi employees had been trained across various Eco-design learning levels. Complementing these core programs, dedicated webinars were organized to deepen expertise on key environmental topics, including product environmental claims, plastic pollution, and packaging and device recyclability.

3. Actions

Along our medicines' value chain, we are actively working to reduce their environmental impacts by:

1. **Reducing our impact resources & optimizing** our manufacturing facilities
2. Reducing our **packaging/devices** materials consumption
3. Implementing actions in our **supply chain**
4. Promoting proper **use** of medicines
5. Reducing **waste** & boosting circularity

A. Reducing our impact on resources & optimizing our manufacturing facilities

Based on the great variety of various products LCAs already performed since 2016, on very different types of medicines and vaccines (synthetics, biopharmaceutical and vaccines), we can observe that **Drug substance (DS), packaging and device manufacturing** (including in scope raw material extraction & transformation up to final finish medicine) are Sanofi's product environmental drivers. Leading to the conclusion that integrating Eco-design approach in R&D at the earliest stages of designing manufacturing processes is essential.

Reducing the use of resources combined with responsible procurement is one of our key levers to minimize the environmental profile of our medicines and vaccines. It translates firstly into an approach of reducing the consumption of resources and materials, and then selecting sustainable resource, focusing on renewable materials, secondary raw materials and in all cases materials from traceable sources. Sustainable sourcing is essential to preserve natural resources, reduce the environmental footprint, and protect and promote biodiversity on sites.

Optimizing solvent consumption and selection

Most of the energy, chemical reagent, and solvent use reduction occurs during manufacturing, rather than during the drug-research phase. Even after an active pharmaceutical ingredient is in the production phase, industrial development teams continue to optimize chemical and biochemical processes whenever possible. Solvents used in the production processes are either purchased ("consumed" quantities) or recycled at Sanofi sites or at partner company sites.
To decrease the use of non-renewable raw materials, the Sanofi focuses on three areas:
reduce solvents quantities used in scale-up and industrial processes,
recycle solvents (when possible),
incinerate solvents with energy recovery.

Sanofi initiated a solvent management plan in 2015 to improve solvent reporting. Thanks to this action plan, we have continually optimized quantities of solvent use. In 2025, 58% of solvents were regenerated and reintroduced into the industrial process. This avoided generating the same amount of waste. In 2 Sanofi French sites based in Ambares and Tours, we created a take-back loop with the pallets of our packaging supplier, saving 2078 pallets in Ambares in 2023 vs 2022 and 2780 pallets in Tours on 1st semester of 2024 vs same period of 2023.
For more information, see our: Circular economy & Waste Management factsheet

From the earliest stages of product development, teams are encouraged to use the best reagents and solvents for human health and the environment. To help teams make decisions, Sanofi has developed an internal guide on the appropriate use of solvents for the design of drug-manufacturing processes: *Sanofi's solvent selection guide: a step toward more sustainable processes*[5] was published in November 2013 and made publicly available. An update of this guide was performed in 2025 to better assess latest Environmental; Health and Safety concerns regards solvent usage.

[5] Prat, D., Pardigon, O., Flemming, H., Letestu, S., Ducandas, V., Isnard, P., Guntrum, E., Senac, T., Ruisseau, S., Cruciani, P. and Hosek, P. (2013). "Sanofi's solvent selection guide: a step toward more sustainable processes," in Organic Process Research and Development, 17(12), pp.1517-152. http://pubs.acs.org/doi/abs/10.1021/op4002565. The guide was a success based on its 15,408 views (reference date: March 24, 2022). An update of Sanofi's solvent guide was performed in January 2021.

Promote catalytic transformations

We strive to implement catalytic chemical or enzymatic transformations. For example, Palladium catalyzed Suzuki type C-C bond formation reactions are commonly used. To minimize our environmental impact, catalysts recycling is evaluated for new synthesis routes as the replacement of palladium by other metals (Cu, Fe etc.). More recently, based on work published in the literature, the application of different reagents for catalytic amidation on our products has been successfully tested. In 2023 we launched studies in collaboration with Boston College to identify replacements for rare earth metal catalysts used in a coupling reaction commonly found in our synthetics API manufacturing routes with an earth abundant option. Since 2023, We have launched a post-doctoral project aimed to establish a robust and versatile biocatalytic amidation platform. The primary objective is to achieve production yields exceeding 90%, while concomitantly implementing scalable, more sustainable, and cost-efficient methodologies.
We lead a long-term collaboration program with universities to improve the environmental impact of synthetic routes by replacing non-environmentally sustainable biocatalysts.

Systematic Process Mass Intensity (PMI)

Complementary to LCA tool, our R&D teams use a process performance analysis tool for all its projects to guide chemists in the selection of synthetic routes, evaluate critical parameters in terms of cost and environmental performances and to identify process improvement targets. Various parameters are monitored from early stages of product throughout its industrialization. Product mass intensity (PMI), solvent & water indexes and reagents' scoring are tracked from R&D synthetic pathways to the production of active pharmaceutical ingredients (APIs) in our plants. Energy & safety work-up efficiency are also part of the monitoring to deliver a more sustainable and optimized drug manufacturing process at launch.

For more information on our overall Sustainable Procurement Strategy, aligned with the UN Global Compact, see in our Document Center the Sustainable Procurement factsheet.

Minimizing environmental impact of our manufacturing process
Medicines are often produced using large amounts of resources to obtain small amounts of active ingredients, which corresponds to low mass efficiency. Sanofi has intensified its efforts at the development process level to implement:

- **Enhanced Technologies:** by shifting from the usage of rare metals catalysis to biocatalysis, the expected positive gains are to design benign chemicals, prevent and reduce accidents, promote use of renewable feedstocks and reduce undesirable derivatives.
    - **Actions example:** we are using innovative technologies to improve our synthesis routes; (1) Replacement of chemical route (3 steps) by enzymatic (Ketoreductase enzyme, 1 step) for the synthesis of a key chiral building block allowed reduction of PMI (~-25%) and undesired solvent. Implementation at 2 * 30 kg (Clinical batch) demonstrated the robustness of the process. (2) Replacement of chemical route (4 steps) by combining light-driven and enzyme-driven (Ketoreductase enzyme) reactions for the synthesis of a key chiral building block (2 steps) delivered a greener, more efficient process: Reduced solvent use, No transition metals (Pd-free), Widely available starting materials, High yield (~70%), PMI reduced 13-fold. Implementation at 16 kg (photochemical step) and 80g (enzymatical step) demonstrated the robustness of the process.

- **Hybrid Manufacturing:** combination of small-footprint batch operations with continuous manufacturing. Hybrid manufacturing delivers Eco-design goals through process intensification. By reducing the commercial size of reactors, the efficiency of mass and heat transfer is observed. Further intensification of the processes is achieved by applying continuous manufacturing. Typical benefits include higher robustness, better selectivity resulting in a better impurity profile which simplifies the downstream processing. Holistically, hybrid manufacturing decreases the safety risks, raw material and energy use while allowing them to operate under greener conditions.
    - **Actions example**: we can optimize by nearly 30% on PMI metrics by reducing the consumption of raw materials through increase in yield and quality, which has a direct impact on medicine environmental profiles.

- **Biotechnologies:** require fewer chemical steps thanks to processes based on fermentation with micro-organisms for the synthesis of active molecules. As fermentation processes have other environmental impacts (mainly biological chemical oxygen demand – COD - load to wastewater treatment), comparative environmental life-cycle assessments (LCA) are performed to make the best decision on the most optimized environmental technology.

  Actions example: To execute Eco-design approach our biological and vaccines products portfolio, we are using a tailor-made enzyme: a new highly selective trypsin variant for insulin production increased final yield by 50% on the industrial scale. For each batch, environmental savings are: 2000 m3 purified water, 22 tons of raw materials, and 61 tons kgC02eq.

Implementation of new in vitro methods for vaccine and vaccines intermediates testing

The removal and replacement of *in vivo* assays for vaccines testing via strong scientific and technical expertise and successful advocacy towards regulators and pharmacopoeias (including Chinese pharmacopoeias) to ensure new assays acceptability. Key major environmental and animal welfare facts include:

- no longer use of suckling mice, mice, guinea pig, rabbit to test our new cell banks and viral seeds manufactured in raw material of animal origin free processes
- Progression on removal of in vivo assays for tetanus, pertussis, and diphtheria vaccine potency testing
- Implementation of recombinant reagent for bacterial endotoxin testing in replacement of reagent coming from Horseshoe crab (LAL reagent)
- Suppression on the rabbit pyrogens test and its replacement by new in vitro Monocyte Activation Test
- Implementation of in vitro alternative for generation of specific monoclonal antibodies and ligands for vaccine antigens characterization (no more use of mice for immunization and generation of specific antibodies)
- Global reduction of about 50 % of animal testing since 2020

For more information on our overall Energy and Water programs, aligned with the UN Global Compact, see in our Document Center the Climate change & water factsheet(s).

B. Reducing our packaging / devices materials environmental impact

Packaging is crucial to ensure the quality and integrity of these products throughout the distribution chain, and pharmaceutical companies use many types of packaging for the medicines and vaccines they sell. It also contains important information for the proper use of medicines, precautions, and regulatory information. In each country, specific regulations govern packaging - for example, for the collection and recycling of packaging materials, marking and identification systems, and acceptable concentration levels of certain heavy metals in packaging (e.g. Europe, Directive 94/62/EU).

Since 2020, Sanofi has been applying an Eco-design method to packaging & devices, starting with Life Cycle Assessment (LCA) to check technical modification options influence of various environmental indicators. Furthermore in 2023 Sanofi performed an environmental assessment of its global packaging & device portfolio, the objective was to identify key environmental drivers to prioritize and build its packaging and device environmental strategy.

Since 2023, Sanofi reinitiated a systematic analysis of its product packaging size, to bring further continuous improvement in the "Reduce" aspect, with 2 major expected benefits: **Reduction of packaging material overall weight and reduction of logistics impacts**. The scope of this initiative, processes as a continuous improvement approach, is global and consists in addition numerous small changes which at the end will represent approx. 5% reduction of packaging material and logistic consumption.

Key 2025 environmental packaging and device environmental initiatives

Plastics focus:

A PVC-free initiative has been started in 2022 to reduce the use and remove, when possible, PVC use for secondary & tertiary packaging . Removing PVC from blisters packaging to be replaced by PET, PP, PE, cardboard or paper is under study with some providers. Feasibility assessments and pilot trials are currently ongoing to build the knowledge base needed to define a comprehensive industrial-scale transition plan, by 2030 for the medicines presenting the lowest level of barriers (stability).

In 2025, 61.5% of our syringe's vaccines are blister-free. We aim to reach 100% by 2030 by mobilizing significant investments, internal resources as well as end-user practice change management.

Eco-design and circular economy approach are applied to Pre-Filled Safety Syringe (PFS-S) with shift to with mono material approach for all plastic from PET / PETG with 50% chemically recycled content.

Paper & Cardboard

Efforts to reduce paper waste by either optimizing the size of the leaflets or removing the printed leaflets from our boxes are continuous.

Eco-leaflet program: Paper and Cardboard used for packaging can contribute to deforestation as timber products. In 2022, Sanofi launched a major workstream to optimize the size of the Product Information Leaflet, with no compromise on the content and readability with the objective of reducing paper consumption. Therefore leaflet reduction is a good opportunity for all products where paperless is not possible in the near future.

Due to high volume and huge leaflet sizes, insulin businesses was a perfect product group to show potential. It was demonstrated that by replacing it with smaller and thinner leaflet through smaller fonts, optimized layouts, and improved content arrangement leading to better environmental profile can be achieved. The Eco-Leaflet implementation is ongoing at Sanofi; almost half of the leaflets in scope are addressed. For the brands: TOUJEO, ASPART and LISPRO (EU) are in implementation phase. Leaflet for brands: APIDRA & LANTUS in Submission. Potential to roll these improvements out to solid forms in General Medicines and Vaccines global business units (GBUs) is currently under investigation.

ePI program- Leaflet Dematerialization: Starting in 2024, a cross-functional team from M&S, Regulatory, and Digital has developed a global ePI deployment program, promoting electronic Product Information (ePI) to all our stakeholders. Transitioning from printed to digital patient information improves the experience for patients and healthcare professionals by providing quicker access to updated information and more easily readable data, while also reducing our environmental footprint. The transition to ePI-paperless solutions was successfully implemented in Japan, Australia, New Zealand, Singapore markets from 2022, followed by Malaysia and Taiwan in 2024. The years 2024-25 marked a significant milestone with numerous Health Authority ePI pilots emerging worldwide and new regulations enabling paper leaflet removal. More than 10 countries have launched pilots including paper removal (most European countries, countries in Latin America & Asia such as Brazil, South Korea). Over the same period, some countries have also implemented new regulations to enable paper leaflet removal from specific categories of products (e.g., Switzerland for the products administered by health care professionals, Thailand for injectables, excluding vaccines and self-administered injectables). Sanofi actively participates by proposing eligible products, advancing toward digitalization and contributing to paper waste reduction.

eSASL: Some tactical changes are also being driven forward, notably the replacement of the physical Sanofi Security Label (SaSL) with a 100% digital authentication solution. The eSaSL is a key pillar of our industrial product protection strategy to combat falsification and illicit trafficking of our products.

Beyond its security benefits, the eSaSL solution delivers a meaningful environmental impact: by eliminating the physical label, it reduces transportation needs and saves raw materials, directly contributing to Sanofi's Eco-design packaging commitments and broader more sustainability goals.

Building on its 2021 foundation and driven by strong Vaccines expansion in 2025, this solution is now live across multiple sites: Ambarès (France), Hangzhou (China), Lüleburgaz (Turkey), Scoppito (Italy), Swiftwater (USA), Val de Reuil (France), Le Trait (France), Adimmune (Taiwan), Biovac (South Africa), Nipro (Japan) and Cuautitlan (Mexico).

Implementation continues at Vaccines sites such as Toronto, further extending the reach of this dual-purpose solution — protecting patients while reducing our environmental footprint.

Medical devices

Sanofi conducted intensive LCA studies on medical application devices, such as diabetes pens and autoinjectors. Thanks to these environmental assessments, and by applying the Eco-design approach, new devices are in development to reduce the weight, assembly complexity, and the number of materials which in aggregate result in a significant reduction in the overall environmental impact. TouStar TOUJEO® illustrate our Eco-design commitment as first-in-class reusable pen won the Eco-design award at Pharmapack as well as the Good Design award 2022:

TouStar is the first reusable injection pen for a concentrated insulin, designed with a dedicated replaceable cartridge system.

Transportation packaging

Since 2018, a special effort has been made with three of our main CMOs (Contract Manufacturing Organizations): the optimization of pallet patterns and transportation efficiency (truck loading optimization with pallets double stacking) delivered significant reduction of transportation environmental impact: a reduction of **370 pallets (on a total of 4,500)** and 72 trucks avoided (on a total of 148) per year.

C. Implementing more sustainable actions in supply chain

As part of Sanofi's Eco-design approach, our transportation strategy is to guarantee the continuous supply of medicines and vaccines to our patients without any disruption. To minimize its environmental footprint, Sanofi's Transportation Department has already engaged actions with the following approaches:

- Choose sea instead of air freight for long distances.
- Choose road instead of air freight for short or medium distances.
- Increase the level of occupancy for truck and sea containers.
- Develop railway transportation from Europe to China for pharma products (15/25°C & Injectables products) and within Europe.
    - Qualification in December 2024 the possibility to use Rail Shipment from France to China during all year for our 15/25°C products
- Consolidate flows and mutualize transport to reduce the number of trucks on the road.
- Develop new modes of transport as mix mode of air & sea to deliver Oceania & Asia markets.
- Look for new sea shipment solutions (hybrid vessel or sailing boat)
- Implementation of pre carriage with EV Trucks for sea shipments from Val-de-Reuil distribution center.
- Implementation of pre carriage with B100 trucks for sea shipments from Croissy distribution center with different freight forwarders
- Implementation of LNG trucks in China
- Use of B7 diesel trucks in UK (7% biodiesel)
- Explore usage of electrical trucks for deliveries within UAE
- Develop LCL (less than container load) solution with other pharmaceuticals companies.
- Increase the recycling & re-use of our temperature dataloggers.
- Increase the level of occupancy for truck and sea containers.

100% electric :

First Maritime Container Haul with an All-Electric Vehicle between SANOFI Val De Reuil Site and the Port of Le Havre

June 7, 2024, marks a significant step in sustainable transport for Sanofi. For the first time, a maritime container was hauled between our Val de Reuil site and the port of Le Havre using an all-electric vehicle. This journey was completed with the first electric truck available since mid-May 2024. The truck used for this operation is a Volvo FH 4x2 electric vehicle, with a range of about 300 km. This innovative truck significantly reduces CO2 emissions compared to traditional vehicles. For the same 96 km journey, CO2 emissions were reduced to 0.017 tons, compared to 0.114 tons for a diesel truck.

Specifications:

- Autonomy: Approximately 300 km.
- Motorization: 3 electric motors, total power of 490 kW (666 hp).
- Battery: 6 batteries with a total gross energy capacity of 540 kWh.

This first journey is just a step in our path towards more sustainable logistics. With this truck, we can reduce our CO2 emissions by 85% per year, which is a reduction of 0.097 tons of CO2 per delivery, contributing to our sustainability goals and reducing our carbon footprint. We will continue to explore and adopt innovative technologies to reduce our environmental impact and promote transport that respects our planet.

Figure 3 – Sanofi First Electric Maritime container Haul

D. Promoting proper use of medicines

At Sanofi, we promote the **proper use of medicines**, with 2 measures, at country level:

- First, disease **prevention** through vaccines, diabetes pre-treatment promotion and precision prescriptions which support the avoidance of waste.
- Second, **awareness** campaigns on the right way to use medicines. (eg: Australia return unwanted medicines initiative in partnership with local authorities to raise awareness on proper medicine use and disposal.

Opportunities and examples of sustainable use of medicines are presented in the "Pharmaceuticals in the environment" factsheet in our Document Center.

E. Reducing waste & boosting circular economy

*This chapter is focused on Packaging & Devices waste in the **post-consumer use phase**.*
Operational waste are mentioned in the "Waste & circularity" factsheet in our Document Center.
Pharmaceutical substances in the environment are mentioned in the "Pharmaceuticals in the environment" factsheet in our Document Center.

In the US, an initiative to utilize a bio-based cold chain transportation packaging solution to limit the environmental impact on the quality of soil as the main waste treatment for this geography is landfill.

In 2024: 98% of Sanofi 1.4M shippers were biodegradable. From them, 20% are with biobased BIOFFEX material which will degrade in less than 2 years or less than 2 months in industrial composting. The remaining 78% is now made of EVG, EverGreen polystyrene which will degrade in 4 years in landfill.

Concerned about its extended responsibility as a producer, Sanofi has launched several take-back programs for used medical devices. Focus is to collect pen injectors after patient use as they are made of plastic, glass, and metals. Then, we make sure that the collected pens are given a new life rather than ending up as waste. As of March 2026, the following programs are in place:

- **Denmark, RETURPEN**: Industry collaboration with Novo Nordisk, Eli Lilly, Merck, GSK, UCB, Novartis and Sanofi using pharmacies countywide for the drop-off.
- **France, RECYPEN**: Industry collaboration with Sanofi, Eli Lilly, and DASTRI using pharmacies in four pilot regions: Auvergne-Rhône-Alpes, Grand Est, Hauts-de-France and Occitanie.
- **UK, RePen**: Countrywide envelope system using postal services for sending used pens back.
- **Other take-back systems for diabetes pens are in place in Asia**: Vietnam, Philippines, Singapore, and Thailand.

F. Collaboration for greater environmental impact

At Sanofi, we know more progress is only possible through the collective power of our people and partners, united to take meaningful actions in a way that creates a positive ripple effect throughout communities. Here are some Global Eco-design approach initiatives in which Sanofi is an active member:

- **Pharma LCA consortium & SMI (Sustainable Markets Initiative):** Sanofi is leading the Pharma LCA Consortium that gathers global pharmaceutical companies that have come together via the Pharmaceutical Environment Group (PEG) - with the CEOs sponsorship of the Sustainable Markets Initiative (SMI) Health Task Force. Jointly, we've published PAS 2090:2025, the world's first global standard for measuring the environmental impact of pharmaceutical products. The LCA consortium is also assessing the opportunity to develop a PAS 2090-compliant Life Cycle Inventory (LCI) database tailored to the pharmaceutical sector, and an LCA tool expected by November 2026 to support PAS 2090:2025 implementation.
- **PharmEco project: Initiative for Health Innovation (IHI**) is a European Union public-private partnership that funds research and innovation in the health sector. In this frame, Sanofi will contribute to the PharmEco project which is dedicated to support development of innovative solutions (synthetic and biological production, sterilization / decontamination...) to minimize pharmaceutical manufacturing impact. The project would also help with developing new methods to assess more sustainable innovation manufacturing processes at different stage of development.
- **NIIMBLE – National Institute for Innovation in Manufacturing Biopharmaceuticals** is a public-private partnership focused on advancing biopharmaceutical manufacturing, solving industry challenges, and developing the skilled workforce to meet industry's needs. The dedicated Sustainability Workstream explore how to achieve more sustainable manufacturing by incorporating the lessening of environmental impact as a design criterion across all areas of bioprocess manufacturing, including raw material sourcing, manufacturing technology R&D, process and facility design, manufacturing operations and waste recycling; also support the development of circular economies for raw materials and consumables using an end-to-end perspective.
- **American Green Chemistry Institute:** Sanofi is a member of the ACS GCI Pharmaceutical Roundtable which is the leading organization dedicated to catalyzing the integration of green chemistry and engineering in the pharmaceutical industry. Established in 2005 by the American Chemical Society's Green Chemistry Institute, the Roundtable's activities are driven by the shared belief that green chemistry and engineering is imperative for business and environmental sustainability.

Key focus areas include:

- Medicinal chemistry
- Biopharma
- Analytical chemistry
- Continuous Manufacturing
- Greener Peptides & Oligos
- Chemistry in Water
- Biocatalysis

Promoting Environmental sustainability in scientific publication and conferences

- ACS GCI Oct 2025, Addressing Sanofi's Eco-design Ambition through Biocatalysis
- Pacifichem, 2025, Addressing Sanofi's Eco-design Ambition through Biocatalysis
- Federation of International Chemical Societies, 2025, Addressing Sanofi's Eco-design Ambition through Biocatalysis
- Biocat: Accelerating the implementation of biocatalysis in pharmaceutical research and development portfolio Comptes Rendus Chimie, 2025, 28, 507–520. Rabion, A.; Panigada, D.; Roy, S.; Bigot, A.; Tedrow, J. S.
- Butyl Imidates: Highly Stable and Isolable Synthetic Intermediates (Use of butanol in imidate synthesis to reduce PMI). Journal of Organic Chemistry, 2025, 90(5), 1905–1911. Davis, C. R.; Ichiishi, N.; Burke, B. J.; Tedrow, J. S.
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- Biotrans 2025 Basel, june 29th-july 3rd 2025 Title: Biochemical approaches to enantiomerically pure substituted hydroxy-furane and hydroxy-cyclobutane derivatives: the power of KRED
- Biotrans 2023 is the most important scientific conference (650 attendees expected from 35 countries) dealing with biocatalysis over the world. Title: Accelerating the implementation of Biocatalysis in API synthesis: Contribution to Sanofi eco-design commitment
- Green Chemistry Conference GRC Barcelona, July24-29, 2022. Title : "Journeys in Eco-designed Chemistry for Process Development" awareness of the sustainable chemistry to students during courses: Aix-Marseille University, Montpellier chemistry school (ENSCM)
- American Chemical Society Green Chemistry and Engineering Conference, June 5, 2024, Ichiishi, Naoko, "Efficient Development Approach for Continuous Flow Development of Acyl Hydrazide Formation"
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- September 2024: A3P Switzerland congress in Laussane, "rFC implementation Strategy and endotoxin roadmap Sanofi vaccine " Thierry Bonnevay
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- July 2024: IABS Webinar in collaboration with Humane Society International "Global availability of critical reagents for biologicals testing Case Study: DTaP monoclonal antibodies" Emmanuelle Coppens
- June 2024: IABS – DCVMN Regulatory WG WS, "High-Throughput Sequencing for Adventitious Virus Detection to Substitute in Vivo Test : Sanofi Vaccine's Experience" Carine Logvinoff
- March 2024: Humane Society of the United States, webinar on Transition to non-animal-based vaccine batch release testing, " Human Rabies Vaccines, Switching from in vivo to in vitro potency testing" Patrice Riou