Eco-design

GRI Standards:

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

PLANET CARE

At Sanofi, the dedication to improving people's lives goes beyond innovations in healthcare. As a global organization, Sanofi also bears great responsibility in caring for the planet. Every day, Sanofi is minimizing the environmental impacts of its products and activities while strengthening its business resilience in the face of environmental changes.

Through the Planet Care program, Sanofi sets clear goals and is mobilizing employees, partners to join in taking action for the planet.

- ***Fight climate change****: build the road to net zero emissions by 2045 with an intermediate carbon neutrality trajectory for 2030, on a 1,5°C science based emission reduction trajectory*
- ***Limit our environmental footprint and aim for circular solutions*** *by optimizing the use/reuse of resources and reducing impact of emissions*
- ***Improve environmental profile of products by*** *delivering eco-innovative products and by fostering a sustainable use of medicines*
- ***Mobilize our people for environmental sustainability*** *by promoting an environmentally conscious culture in the workplace*
- ***Engage our suppliers in our environmental ambitions by*** *sourcing responsibly and leading by example*

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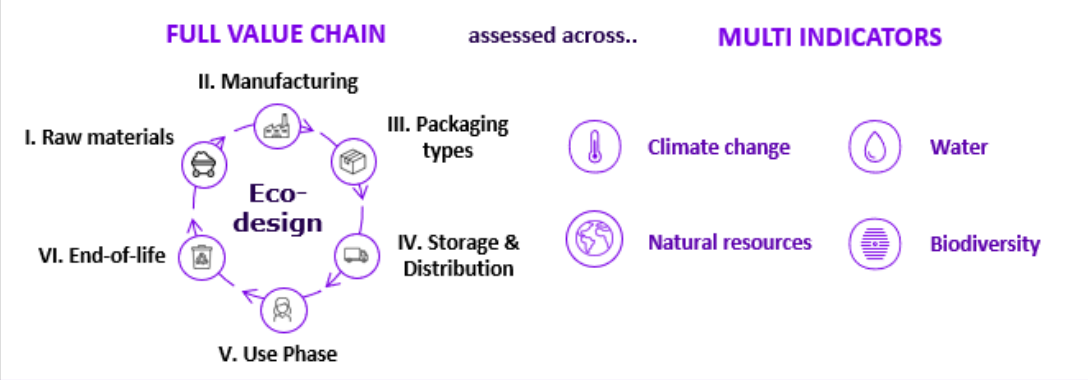
1. Our commitments to Eco-design

Eco-design is the cornerstone of our environmental sustainability strategy and one of our Corporate Social Responsibility flagships.
Eco-design is an approach that aims to improve our medicines' environmental performance by integrating environmental criteria into our product design and development. To reduce the overall product environmental impacts, we have a holistic approach which considers:

- All steps of the life cycle (Raw material extraction & transformation, Manufacturing, Packaging, Distribution, patient use phase, End of life treatment);
- Multi-criteria indicators (Climate change, water scarcity, resource depletion, … please see our full list below).



This science-based expertise allows us to evaluate potential environmental impacts and take action to provide eco-innovative products.

That is why Sanofi is committed to deliver the following:
- By 2025, 100% of our new products will follow an eco-design approach
- By 2027, 100% of our vaccines packaging will be blister-free
- By 2030, 100% of our top-20-selling products will follow an eco-design approach

Many projects are already implemented with this mindset, such as fostering a responsible consumption of raw materials, energy, or water for manufacturing activities, recycling solvents, including ecotoxicity concerns in our R&D pipeline, improving our supply chain sustainability, promoting responsible use & disposal of medicines by patients.

2. Performance

We measure the performance of our Eco-design activities using several indicators:

- # Life Cycle Assessments (LCAs) conducted yearly
- % New products undergoing eco-design approach

A robust Life cycle assessment (LCA) method in Sanofi

LCA is a standardized international method (ISO 14040 and 14044) for assessing the quantifiable effects on the environment of a service or product from the extraction of materials up to the end-of-life.

At Sanofi LCA Methodology relies on ISO 14040/44 standards and provides a common basis for consistent, robust and quality-assured life cycle data, methods and assessments. These support consistent and reliable business and policy instruments related to products, natural resources, and waste management and their future implementation, such as eco-labelling, carbon foot printing, reporting and environmental responsible

procurement.

The environmental indicators considered for the LCA at Sanofi are from the EF 3.0 Methodology. It is a European method that is robust, commonly used and recommended by the Product Environmental Footprint. The European Commission has proposed the Product Environmental Footprint (PEF) as a common method for measuring environmental performance (Commission Recommendations 2013/179/EU). PEF is the life cycle assessment methodology recommended by the EU to quantify the environmental impacts of products (goods or services).
PEF has designed a list of 16 impact categories (below) which Sanofi is considering in its approach:

Impact category	Indicator
1. **Climate change**	Radiative forcing as Global Warming Potential (GWP100)
2. **Ozone depletion**	Ozone Depletion Potential (ODP)
3. **Human toxicity, cancer**	Comparative Toxic Unit for humans (CTUh)
4. **Human toxicity, non-cancer**	Comparative Toxic Unit for humans (CTUh)
5. **Particulate matter**	Impact on human health
6. **Ionizing radiation, human health**	Human exposure efficiency relative to U_{235}
7. **Photochemical ozone formation**	Tropospheric ozone concentration increase
8. **Acidification**	Accumulated Exceedance (AE)
9. **Eutrophication, terrestrial**	Accumulated Exceedance (AE)
10. **Eutrophication, freshwater**	Fraction of nutrients reaching freshwater end compartment (P)
11. **Eutrophication, marine**	Fraction of nutrients reaching marine end compartment (N)
12. **Ecotoxicity, freshwater**	Comparative Toxic Unit for ecosystems (CTUe)
13. **Land use**	Soil quality index (covering Biotic production, Erosion resistance, Mechanical filtration and Groundwater replenishment)
14. **Water use**	User deprivation potential (deprivation-weighted water consumption)
15. **Resource use, minerals and metals**	Abiotic resource depletion (ADP ultimate reserves)
16. **Resource use, fossils**	Abiotic resource depletion – fossil fuels (ADP-fossil)

Table 1– EU Product Environmental Footprint Environmental impact categories list

Key 2023 performance Proof points

1. Measurement: Within Sanofi, we completed 13 Environmental Life Cycle Assessments (LCA), including 6 in 2023 :
    - 2 top-marketed Products follow an Eco-design approach with Sanofi :
        - **Hexaxim vaccine**: this LCA was conducted to assess improvement levers executed by Sanofi since 2019 (reduction of water consumption, a change of energy mix from grid mix to renewable energies, producing part of heat with biogas, usage of a compact box as a new secondary packaging). **The new eco-designed Hexaxim has -17% impact on carbon emissions** & -19% on water scarcity vs. its 2019 version (cradle to grave study made with the syringe packaging, followed by a critical review conducted by an independent party).

- **Toujeo Insulin treatment**: this LCA enabled to highlight the change in the method of production of insulin glargine has an important impact on the full environmental footprint of this medicine. The new Eco-designed Toujeo (2023 version) has -12% impact on carbon emissions & -10% on water scarcity vs its 2022 version (cradle to grave study including the device, will be followed in 2024 by a critical review conducted by an independent party).
- **4 new medicines** (still under development phase) were also assessed with a LCA to identify their key environmental hotspot & respective improvement levers.

2. Packaging : We made 39% of our vaccines' packaging blister-free, and saved 300 tons of PVC
3. Digital: Accelerating the execution of LCA is key for our strategy, therefore we keep on investing in our internal Eco-design Digital intelligence (EDDi) tool to model, measure & simulate, monitor & optimize our medicines' environment profile aligned with European Commission Product Environmental Footprint (PEF) standards. In April 2024, we received the critical review certificate from Bureau Veritas, an independent verification body, that the EDDi tool is compliant with ISO 14040 & ISO 14044 . We are also exploring the use of AI and GenAI to boost data analytics and reports generation.

3. More Actions

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

1. **Reducing raw material extraction & transformation**
2. Minimizing environmental impact of our manufacturing **production** process
3. Reducing our **packaging/devices** materials consumption
4. Implementing a sustainable **supply chain**
5. Promoting a sustainable **use** of medicines
6. Reducing **waste** & boosting circularity

Reducing raw material extraction & transformation

Based on the 13 products LCAs already performed, on very different platforms (bio/pharmaceuticals, vaccines), we could empirically observe the following: the **cradle-to-gate stages** (Raw material extraction & transformation, Manufacturing) of the medicines are key environmental drivers. Resulting to the conclusion that integrating Eco-design in R&D at the earliest stages of designing manufacturing processes is essential.

Reducing the use of virgin resources is one of our key levers with Sustainable procurement. It translates firstly into an approach of reducing the consumption of resources and materials, and then into reducing the environmental impacts of the materials used, focusing on renewable, bio-based materials, secondary raw materials and in all cases materials from certified and traceable sources.

Sanofi recognizes that sustainable sourcing is essential to reducing its overall impact. The principles of sustainable sourcing help preserve natural resources, reduce the environmental footprint, and protect and promote biodiversity on sites.

Solvent environmental profile selection

From the earliest stages of product development, teams are encouraged to use reagents and solvents with the least possible hazardous properties 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[1]," was published in November 2013 and made publicly available.

Optimizing solvent consumption

[1] 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.

Most of the energy, chemical reagent, and solvent reduction occurs during scale-up and 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 Company focuses on three areas:

1. reduce solvents quantities used in scale-up and industrial processes,
2. recycle solvents (when possible),
3. 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 2023, we reduced by -5% the quantity of solvent used & prevented 48.097 tons or 56% of our total quantities of solvent use in our industrial processes by on-site regeneration and reuse in a closed-loop approach.

Reference	2023	2022	2019 (baseline)	Change vs 2019 (%)
Solvents used (tons)	85.887	90.058	89.185	-4%
Percentage regenerated	56%	57%	57%	-2%

For more information, see in our Document Center: Circular economy & Waste Management factsheet

Change for greener reagents

Depending on the type of chemical conversion to be carried out, the choice of reagents is often limited to products that are toxic to human health and the environment, are not very safe to use and generate large amounts of waste. This is the case for oxidation reactions, reductions, fluorinations and formation of amides.

The best choices of reagents are studied during the process development stage thanks to an internal classification and quantification of our process raw materials (solvents, reagents etc.) according to their hazardous properties in which stoichiometries are optimized.

Promote catalytic transformations

Even if reagents generate less waste compared to solvents, it is our duty, as recommended by the 12 Principles of Green Chemistry, to implement as much as possible catalytic chemical or enzymatic transformations. For example, Palladium catalyzed Suzuki type C-C bond formation reactions are commonly used. In order not to impact the Cost Of Goods (COGs) and to minimize our environmental impact, the recycling of catalysts is studied and evaluated of new synthesis routes as the replacement of palladium by other metals (Cu, Fe,...). 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 exceptional production yields exceeding 90%, while concomitantly implementing scalable, environmentally sustainable, and cost-efficient methodologies.

We lead a long-term program collaboration with universities to improve the environmental impact of synthetic routes by replacing non-sustainable biocatalysts.

Systematic Process Mass Intensity

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 synthesis routes, evaluate critical parameters in terms of cost and environmental performances and to allow specific targeted process improvement. Various parameters are monitored from the earliest stages of product development to the industrial development phase. 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 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.

Benchmarking shows that pharmaceutical industries typically use about 100 kg of raw materials to produce 1 kg of active pharmaceutical ingredients. This 1% mass efficiency compares to about 20% for fine chemicals and 50% for bulk chemicals.

Developing and producing drugs this way is financially inefficient and environmentally unsustainable. As an alternative, since 2019, Sanofi has intensified its efforts at the development process level to implement:

- **Biocatalysis:** by shifting from the usage of rare metals catalysis, the expected positive gains are to design benign chemicals, prevent and reduce accidents, promote use of renewable feedstocks and reduce undesirable derivatives.
    - **Actions example:** inspired by nature and biomimicry, we are using innovative technologies to improve our synthesis routes; 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.

- **Hybrid Manufacturing:** combination of small-footprint batch operations with continuous manufacturing. By reducing the commercial size reactors, the efficiency of mass and heat transfer is observed. Further intensification of the processes is achieved by applying of continuous manufacturing. Typical benefits include higher robustness, better impurity profile which simplifies the downstream processing. Holistically, hybrid manufacturing decreases the safety risks, raw material and energy use while allowing to operate under greener conditions.
    - **Actions example**: we can optimize by nearly 30% on most sustainability metrics (PMI, energy, greenhouse gas) by reducing solvent quantities usage, increasing 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 eco-design our insulin 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 m^3 purified water, 22 tons of raw materials, and 61 tons CO_2e.

Reducing our packaging / devices materials environmental impact

Since 2020, Sanofi has been applying an **eco-design method to packaging & devices,** starting with some life cycle assessment (LCA) to check whether the technical modification options are beneficial for several environmental indicators.

In 2023, Sanofi performed an environmental assessment of its global Packaging & Device portfolio, the objective was to identify environmental key driver to prioritize and build its packaging and device environmental strategy for finished goods. Key learnings are the following:

- Packaging & Device environmental footprint is driven by raw materials production & transformation processes.
- Packaging and Devices impact representativeness per materials:
    - Glass represents 40%,
    - Plastics 25%,
    - Cardboard & Paper 15% ,
    - Devices (Plastics + metals) 15%
    - Metals (Aluminum foils) 5%.

In 2023, Sanofi established an Eco-design **Standard** for packaging & devices to assist in the development or modification of a package & device to reduce its environmental impact.

A continuous improvement effort plan has been in place for Primary, Secondary & Tertiary packaging for the last 10 years and continues to deliver.

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. In Europe, Directive 94/62/EU is an example. Because packaging requires the use of raw materials, Sanofi has organized initiatives to reduce the environmental impact of packaging globally while considering current regulatory constraints.

Such sustainable initiatives include programs to reduce packaging size and weight, to shift to recycled or recyclable materials with a circular economy perceptive, to develop ways to reduce the environmental impact through the whole value chain of Sanofi's products.

In 2023, Sanofi reinitiated a systematic analysis of its product packaging size, to bring further continuous improvement in the "Reduce" aspect of sustainability, 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.

Glass

We want to work with our providers to reduce the environmental impact of our glass-based packaging. Several options can be envisioned.

Plastics

The less the better, to preserve our oceans and avoid landfilling.

PVC-free initiative started in 2022 to get rid of PVC for secondary (on-going) & tertiary (done) packaging **by 2030**. Removing PVC from primary packaging (blisters to be replaced by PET, PP, PE, cardbox or paper) is under study with some providers and will be in place by 2030 for the medicines presenting the lowest level of barriers (stability).

Some primary packaging, mainly glass used for ampoules, vials, and syringes, are packed in plastic blisters or trays before being inserted in a carton box with a leaflet. Replacing plastic trays with full carton trays for secondary packaging or replacing PVC by alternate recyclable material for primary packaging are ongoing projects. In 2023, 39% of our vaccines are blister-free. Reaching 100% by 2027 will mobilize significant investments, internal resources as well as end-user practice change management.

Paper & Carton

Origin of paper & carton is an important environmental criterion, for this reason we are doing our best to source paper and carton with FSC/PEFC certifications.

Focus on the leaflet

We try to reduce the amount of paper used (reduction in grammage, dimensions, etc.). In 2022, Sanofi opened a major workstream to optimize the size of the **Patient Information Leaflet**, with no compromise on the content and readability but with the objective to reduce paper consumption.

In parallel, the processes and tools to develop Digitalized Patient Information are being prepared so that Sanofi is ready to further reduce or remove the physical Patient Information (PI) feature still making available all relevant information to the patient or health care professional for an optimal use of the products. Switch to ePI was done in Japan, Australia, and Singapore markets in 2022. Global target is to have ePI for all our medicines, first keeping paper leaflet, then, once the local Health Authorities are ready, replacing paper leaflet by ePI.

Some tactical changes are also initiated like replacement of the Sanofi Security Label (SaSL) by a dematerialized Authentication feature (called eSaSL). It reduces transport and saves material associated to the label. Ambares-FR, Hangzhou-CN, Lüleburgaz-TR, Compiegne-FR, Scoppito-IT plants have started production with e-SaSL.

Metal

We try to reduce the amount of ALU (high CO_2 emission) or use recycled and/or recyclable material. There are developments at supplier level, but they are still in the development stage.

Wooden pallets (Tertiary 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) on a yearly basis.

Medical devices

While optimization and simplification of packaging such as blisters and boxes are part of the continuous improvement approach, specific studies are being conducted on other packaging-related factors.

Sanofi conducted intensive LCA studies on medical application devices, such as diabetes pens. Thanks to these 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.

Eco-design for new devices: TouStar Toujeo® 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.

Implementing a sustainable supply chain

As part of Sanofi's eco-design approach, our transportation strategy is to guarantee the continuous supply of drugs 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:

1. Choose sea instead of air freight for long distance.
2. Choose road instead of air freight for short or medium distance.
3. Increase the level of occupancy for truck and sea containers.
4. Develop railway transportation from Europe to China for pharma products (15/25°C & Injectables products) and within Europe.
5. Consolidate flows and mutualize transport to reduce the number of trucks on the road.
6. Develop new mode of transport as mix mode air & sea to deliver Oceania & Asia markets.
7. Look for new sea shipment solutions (hybrid vessel or sailing boat)
8. Develop alternatives solutions on pre carriage for sea shipments (electric trucks, river…)
9. Develop LCL (less than container load) solution with other pharmaceuticals companies.
10. Increase the recycling & re-use of our temperatures dataloggers.
11. Increase the level of occupancy for truck and sea containers.

Promoting a sustainable use of medicines

At Sanofi, we promote the **sustainable 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. To date over 600,000kgs of unwanted medicines have avoided landfill thanks to this campaign).

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

Reducing waste & boosting circularity

*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.

Concerned about its extended responsibility as a producer, Sanofi has launched several take-back programs for used medical devices. Focus is to collect the diabetes pens 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 May 2024, the following programs are in place:

- Denmark, RETURPEN: Industry collaboration with Novo Nordisk, Eli Lilly, Merck, 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.

Contributing to extra-company initiatives

Pharma LCA consortium & SMI (Sustainable Markets Initiative)

Enable pharmaceutical companies & their stakeholders to make informed choices about product development and patient care.

A consortium of eight Pharma companies (Astra Zeneca, GSK, Johnson & Johnson, Novo Nordisk, Pfizer, Roche, Sanofi & Takeda) has been set up to facilitate a universal approach to assess the environmental impact of pharmaceutical products.

IHI – 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, sterilisation / decontamination...) to make pharmaceutical manufacturing more sustainable. The project would also help on developing new methods to assess sustainability of innovation manufacturing processes at different stage of development.

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 green chemistry through Communication at major congresses

- 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)
- Northeastern Section of the American Chemical Society Process Chemistry Symposium, October 27, 2022, Burke Chan, Brenda, "How Process Chemistry is Delivering on Sanofi's Eco-design Mission"
- Northeastern Regional Meeting of the American Chemical Society, June 16, 2023, Burke Chan, Brenda "Integrating Sustainability, Eco-design and Manufacturing for Atuzabrutinib with Sanofi's KPPI Tools"
- American Chemical Society Green Chemistry and Engineering Conference, June 5, 2024, Ichiishi, Naoko, "Efficient Development Approach for Continuous Flow Development of Acyl Hydrazide Formation"