



Transporting Medicines and Vaccines

**GRI Standards:**

302-5, 305-5: Emissions

EXECUTIVE SUMMARY

In order to fulfil its public health mission and to ensure the delivery of medicines and vaccines to the market without interruption, Sanofi considers the supply chain and the delivery of medicines to be among the Company's most important responsibilities. Protecting patients' health is a priority challenge every day, as well as reducing the Company's impact on the environment and the guarantee of its products safety. Medicines, especially vaccines and insulins, are very sensitive products which require very strict rules in terms of temperature all along the supply chain, from production to distribution.

To address these multiple challenges regarding transportation, the Supply Chain Management team within Sanofi keeps an eye on reducing environmental impacts and the Company's direct and indirect greenhouse gas emissions, as well as ensuring sustainable medicine transportation. This means choosing seaways

instead of air transportation, developing railways transportation, optimizing truck, container and pallet occupancy, and promoting greens models such as using gas, biogas or electric vehicles whenever it is possible. Furthermore, Sanofi Supply Chain Management is investigating packaging optimization which leads to a reduction of our environmental footprint.

TABLE OF CONTENTS

<i>1. Background</i>	4
1.1 ORGANIZATION AND NETWORK	4
1.2 SEVERAL WAYS TO TRANSPORT OUR MEDICINES AND VACCINES..	4
<i>2. Action</i>	5
2.1 OVERSEA TRANSPORTATION: ENCOURAGING THE USE OF SEA TRANSPORTATION INSTEAD OF AIR TRANSPORTATION WHENEVER POSSIBLE	5
2.2 CHOOSING ALTERNATIVES TO ROAD TRANSPORTATION WHENEVER POSSIBLE	6
2.3 COMPLYING WITH PHARMACEUTICAL REGULATION	6
2.4 DEVELOP USE OF BIOGAS & LIQUEFIED NATURAL GAS (LNG) VEHICLES	6
2.5 RAIL TO CHINA	7
2.6 PACKAGING OPTIMIZATION PROJECTS	7
2.7 WORKING WITH FREIGHT FORWARDER ON SAF USE (SUSTAINABLE AVIATION FUEL)	8

1. Background

As a global healthcare leader fulfilling a public health mission, Sanofi considers the supply chain and the delivery of medicines to be among the Company's most important responsibilities.

Sanofi is committed to make every effort to ensure that the supply chain will continue to deliver medicines and vaccines to the market without interruption. Protecting patients' health is a priority challenge every day.

Distribution and transportation are the last part of the supply chain, which is dedicated to serving all patients worldwide. The supply chain's purpose is to deliver our products in close proximity to patients and to ensure a high standard of quality.

Distribution and transportation must be performed with an eye on reducing environmental impacts by controlling CO₂ emissions. Sanofi has made clear commitments to ensure a sustainable medicine transportation organization and to reduce the Company's direct and indirect greenhouse gas emissions.

1.1 ORGANIZATION AND NETWORK

The Transportation Department is part of the Supply Chain within Global Industrial Affairs. Sanofi's transportation strategy is to guarantee the continuous supply of drugs and vaccines to our patients without any disruption. This global strategy has been developed and implemented throughout the Company.

The Supply Chain Management team is responsible for enforcing various processes on all sites where the Company operates (more than 75 Sanofi plants and 100 distribution centers belonging to Sanofi or external partners), ensuring controlled processes as well as compliance with our continuous improvement policy.

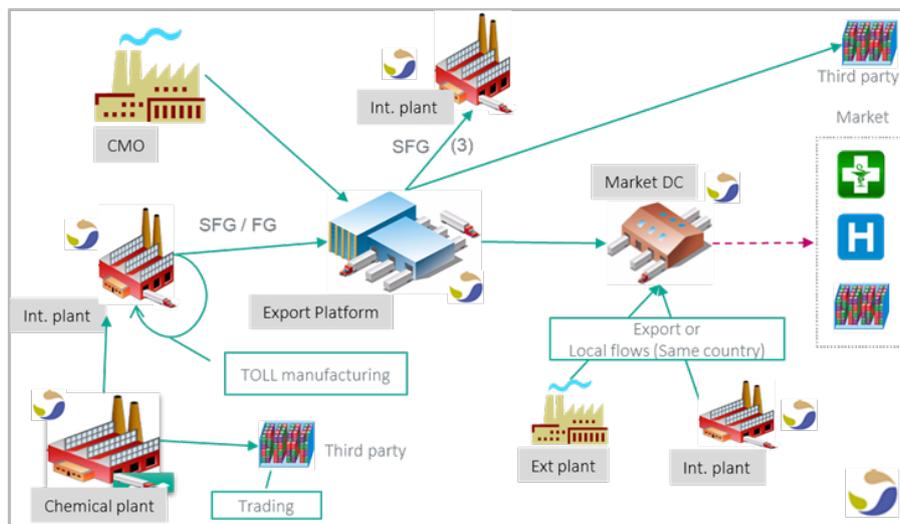


Figure 1- Our distribution organization

1.2 SEVERAL WAYS TO TRANSPORT OUR MEDICINES AND VACCINES

- delivery of products between our plants - we deliver products between our chemistry plants and pharmaceuticals plants in the most optimized way, determined according to location;
- delivery to our distribution centers - our products are consolidated and exported from our export hub to our local distribution centers. Pallet optimization and truck occupancy are key parameters to improve

the transportation of our goods. This organization enables massification associated with cost competitiveness and a sustainable strategy.

- delivery to our customers - this includes wholesalers, hospitals and pharmacies.
- delivery in cities (the last kilometer); and
- Sanofi asks all his partners to develop sustainable solutions such as:
 - > alternative fuels for trucking (gas, truck electrical...);
 - > use of ferries or River Boats, rail; and
 - > reusable cold chain packaging.

2. Action

- choose sea instead of air transportation when it's possible;
- increase the level of occupancy for truck and sea containers;
- develop railway transportation;
- consolidate flows and mutualize transport to reduce the number of trucks on the road;
- promote green models of transportation with all forwarders;
- optimize our packaging to reduce the environmental footprint; and
- working with freight forwarder on SAF use (Sustainable Aviation Fuel).

2.1 OVERSEA TRANSPORTATION: ENCOURAGING THE USE OF SEA TRANSPORTATION INSTEAD OF AIR TRANSPORTATION WHENEVER POSSIBLE

Sea transportation is 30 times less polluting than air transportation. That is the reason why Sanofi chooses as much as possible to use sea transportation for its medicines instead of air shipments.



Figure 2 - Percentage of sea transportation used by Sanofi from 2018 to 2021 for medicines shipments (oversea transportation)



As such, sea transportation for destinations outside Europe went from 78% in 2011 to 85% in 2021. This ratio remains flat, small variations may be observed due to geopolitical context, or evolution of the products portfolio.

Moreover, new regulation for sea transportation (IMO 2020) will also contribute to decrease CO₂ emissions and environmental impact. In this context, shipping lines companies are investing in the construction of new greener ships.

Below is an example of the new biggest LNG power ship on the seas since December 2020.



2.2 CHOOSING ALTERNATIVES TO ROAD TRANSPORTATION WHENEVER POSSIBLE

In Europe, regular flows are switched from road to rail transportation, for example from Riells (Spain) to Frankfurt (Germany).

Some projects are currently developed, such as reaching some countries from France and Germany with intermodal modes (road, rail & short sea).

2.3 COMPLYING WITH PHARMACEUTICAL REGULATION

In order to guarantee the quality of distributed medicines and vaccines, transportation has to respect very strict rules, especially in terms of temperature. In 2013, the EU implemented new Good Distribution Practices (GDP) to protect medicinal products.

The appropriate temperature must be maintained during the transportation of medicines, regardless of external conditions.

Vaccines and insulin are extremely sensitive. To respect the cold chain during the transport of these products, the temperature must be maintained between 2 and 8 °C.

2.4 DEVELOP USE OF BIOGAS & LIQUEFIED NATURAL GAS (LNG) VEHICLES

NGV shuttles between Croissy and CDG

In accordance with the Group's Environmental roadmap and the commitment of the supply chain to reduce CO₂ emissions linked to transportation, the Export platform at Croissy recently set up NGV (Natural Gas Vehicle) shuttles between the site and Paris Roissy Charles de Gaulle airport.

But the adventure does not stop there! The goal is to run 100% of our carriers on this journey using NGV (80% to date) and then generalize the use of bio NGV to reduce further our CO₂ emissions. These actions allow us to reduce our CO₂ emissions by around 90% on this route.

Biogas & Liquefied natural gas development

News more ecological transport solutions are developing, and we wish to take part in these evolutions.

We mainly use sea shipment from our sites to reduce CO2 emissions, but pre-carriage and post-carriage are done by road. To continue to improve our CO2 impact, we are working with our freights forwarders to use new technologies.



> 100 % Vegetable & biodegradable fuel > 66 % reduction in CO2 Emissions



> Liquefied natural gas > 20% reduction in CO2 Emissions

2.5 RAIL TO CHINA



Sanofi Global Supply Chain and China team have launched a project in 2018 which consists in implementing a new mode of shipment between Europe and China to transport our pharmaceutical products under controlled temperatures: Rail transportation. China is Sanofi's second market, currently delivered by air and by sea. The target is to secure this strategic market by implementing a third transportation solution in line with our environmental roadmap, with a better transit time compared to sea and a better control on

temperatures and costs compared to air shipments. Tests were first carried out without products to verify the feasibility of this operation; a last test was carried out at the end of 2019 with products.

We started to use in routine mode rail shipment from our Croissy DC (France) to Hangzhou (China) since April 2020.

Unfortunately, during 2021, we couldn't use rail shipment to deliver Chinese market due to Covid restrictions, but we hope that in 2022 we could increase our rail shipment use.

2.6 PACKAGING OPTIMIZATION PROJECTS

Cold chain packaging - Bioffex

Sanofi ships 2m small parcel shipment of cold chain products domestically using shipping containers comprised of Expanded Polystyrene (EPS).

In August of 2021, after 2 years of testing and studies our North America (NA) Packaging team finalized their study to replace EPS, which is harmful to our waste treatment with a 100% biobased solution that is biodegradable known as **Bioffex™**.

What is bioffex?

- Made from 100% bio-based, renewable resources. Harvest 100% bio-based material from renewable resources like corn and sugar cane to create PLA.
- Sustainable and less resource intensive manufacturing process
- Thermal and mechanical performance equivalent to EPS
- End of life story that leaves nothing behind but a positive impact*

**Based on current data and projections. Actual performance may vary.*

Bioffex™ is a 100% sustainable solution for shipping temperature-controlled products. It mimics the performance of expanded polystyrene, however, is 100% sustainable from conception to molding of the coolers.

The Extruded Poly Lactic Acid (xpla) is manufactured from corn and sugar into beads that are pressurized into molds to create our Sanofi custom cooler designs that were designed in-house by the NA Supply Chain Package Engineering. Once the container is delivered to our customers, they can send to an industrial landfill that will degrade the shipper in less than 4 weeks, or it can be sent to a landfill and breakdown in less than 2 years vs. traditional EPS that takes 400 years to breakdown, as well as leaving zero toxicity and microplastics when broken down.

Bioffex™ will reduce water usage by ~60k gallons, remove 1K cars off the road, and reduce landfill space by 2M+ cubic feet or the height of 2,528 Eiffel Towers stacked end to end annually.

The team has a staggered approach for implementation, as it takes time to design and qualify each shipping solution to ensure product efficacy upon delivery to customers. The team has set a goal of 2024 for full implementation.

Cold Chain packaging – Thermal Blankets

Shipping already requires a lot of logistics and coordination but add on the requirement to regulate temperatures on sensitive items and shipping items becomes even more complicated. Together with our key suppliers we have started to re-use some cold chain packaging, such as Thermal Blankets.



What is a Thermal Blanket?

Thermal blankets allow to reduce the risks of temperatures excursions for pharmaceuticals products during waiting time on tarmac before or after flights. It is designed to protect pallet from the sun's rays and to prevent the temperature increase on our products.

In the past these blankets were destroyed after arrival at destination. Thanks to this initiative they will be re-used now.

2.7 WORKING WITH FREIGHT FORWARDER ON SAF USE (SUSTAINABLE AVIATION FUEL)

Since last year Sustainable Aviation Fuel (SAF) is become a new solution to reduce CO2 emissions for air shipments.



What is SAF?

SAF stands for sustainable aviation fuel. It's produced from sustainable feedstocks and is very similar in its chemistry to traditional fossil jet fuel. Using SAF results in a reduction in carbon emissions compared to the traditional jet fuel it replaces over the lifecycle of the fuel. Some typical feedstocks used are cooking oil and other non-palm waste oils from animals or plants; solid waste from homes and businesses, such as packaging, paper, textiles, and food scraps that would otherwise go to landfill or incineration. Other potential sources include forestry waste, such as waste

wood, and energy crops, including fast growing plants and algae.

SAF gives an impressive reduction of up to **80% in carbon emissions** over the lifecycle of the fuel compared to traditional jet fuel it replaces, depending on the sustainable feedstock used, production method and the supply chain to the airport.

To follow this new alternative, we are working with all our airfreight forwarders to be able to obtain a financial simulation of the impact of SAF use on our air shipments for the future years.

For more information about our CO₂ emissions, see in our [Document Center](#):

- *Carbon Footprint (Scopes 1, 2 & 3) Factsheet*
- *Sanofi's Risks and Opportunities Related to Climate Change Factsheet*