

# Towards a Sustainable Fuel Transportation Industry

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## Abstract

*This article reflects on the importance of working on inter-institutional links to generate a public-private relationship plan in order to raise awareness about continuous improvement processes with a direct impact on environmental safety and sustainability, making this the guiding principle in the transportation of fuels and hazardous cargoes.*

The Transportation Environmental Safety Area (ASAT) of the Transportation Safety Board (JST) interviewed the General Manager of the Mar del Plata operations base, Mr. Gerardo Valderrey, from Copparoni SA, a company founded more than sixty years ago, dedicated to the logistics and national and international transportation of liquid fuel and general cargo. It is the first national private company to be recognized by the JST in terms of safety and environmental management. Currently, it has a fleet of more than one hundred units and operational offices in Mendoza, Mar del Plata, Comodoro Rivadavia, and Chile. It is an active member of the Corporate Social Responsibility Chamber.

#### **What is the company's approach to sustainability?**

The company's approach is marked by a strong commitment to social responsibility and a comprehensive environmental safety strategy. For this purpose, the company has established strict compliance with environmental regulations and standards, the implementation of cutting-edge technologies and equipment to minimize risks, and the adoption of measures to prevent spills and leaks of pollutants.

#### **What were the main changes the company had to face due to this shift in vision?**

We initially intensified the preventive and corrective maintenance programs for vehicles and equipment as well as the design, development, and implementation of contingency plans in case of environmental incidents. We created training and learning processes for the team to address change management. In this regard, we received great support from our client YPF, partly because we must meet strict requirements to be distributors for this company. On the other hand, we invested in cleaner and more efficient technologies, such as compressed natural gas (CNG) propulsion, instead of relying solely on diesel propulsion.

#### **Could you elaborate further on this choice of CNG propulsion?**

Currently, this is a priority and one of the measures to reduce greenhouse gas (GHG) emissions. Decreasing environmental impact is a challenge and an opportunity for improvement. Transitioning to CNG is an investment that entails a significantly higher cost. Additionally, by making it 10% heavier, the amount of product that can be transported is limited. CNG trucks have lower autonomy, ranging between 400 and 420 km under optimal conditions, as the refueling capacity is affected by various factors. For instance, during the summer season, the autonomy decreases significantly because the storage tanks reach higher temperatures, resulting in internal pressure that exceeds normal levels. This counteracts the pressure at CNG dispensers (which also supply private vehicles), making it impossible for

the tanks to be filled to 100%. This leads to an increase in the frequency of refueling.

#### **What is the main barrier to CNG operations that you perceive?**

The supply lines are insufficient and not adequately prepared to service this type of unit in terms of infrastructure and the capacity of the dispensers. Despite this, we continue to choose and invest in this line of vehicles based on a short and medium-term strategy, driven by their low level of pollution.

***“Reducing the environmental impact is a challenge and an opportunity for improvement. Switching the fleet to CNG is an investment that comes at a much higher cost.”***



#### **What do you foresee for the future of CNG propulsion?**

For the coming years, it is ensured that the continued demand for this line of vehicles will enable the manufacturer to improve performance and encourage service providers to make the necessary investments to operate more efficiently. As a result of this policy, since late 2022, there has been an initiative to transform the road corridors frequently used into what are called "green routes." Pilot tests began on Provincial Route 2, and subsequently, other routes such as Provincial Routes 11, 63, 74, 29, among others, were added, expanding the service network.

#### **About GHG and pollution, have you implemented any other changes?**

Yes. Among the changes implemented to reduce pollution is the use of vehicles with more efficient technologies. The company has a two-year plan for renewing its fleet to Euro 5 standards. Seventy percent of the fleet has been renewed, and it is expected to reach 100% by the end of 2025. In terms of performance, these units have a greater refueling capacity and five times the autonomy compared to CNG vehicles. They utilize an automotive urea solution that acts as a reducing agent for nitrogen oxide emissions. As part of this program, starting in 2020, the new semi-trailers acquired are scalable (52.5 tons), which, as of the beginning of this year, make up 34% of the fleet. An aggressive tank transformation plan has been implemented, increasing the capacity by 25% (from 36 m<sup>3</sup> to 45 m<sup>3</sup>). The units allow for the transportation of a greater quantity of product while making fewer trips. By reducing the number of units in transit, the likelihood of accidents is diminished. In this line of efficiency, as a primary reference for

scalability, a bi-train has been incorporated, capable of transporting 37% more product compared to the scaled units. Copparoni SA is the only company in the country authorized by YPF to operate a bi-train throughout the province of Buenos Aires. In daily operations, it is ideal for supplying wholesalers along road corridors with ample turning radii that allow for its access and circulation, which minimizes risks and has a direct impact on safety.

**Do you monitor the environmental impact of the operations?**

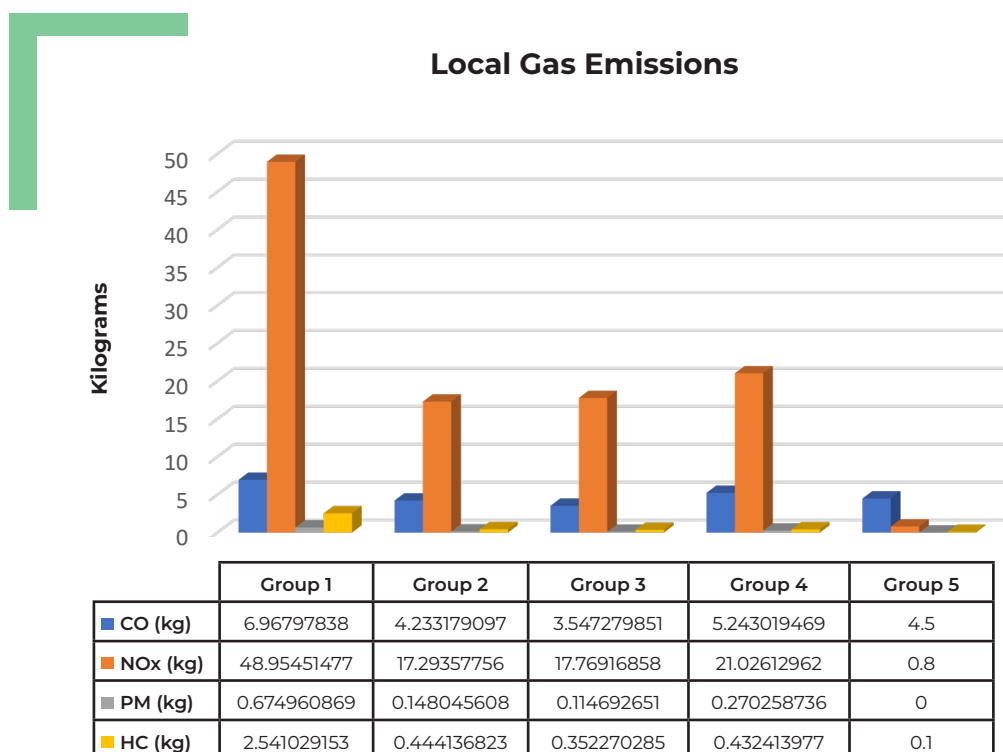
Yes. Indicators are implemented and managed within an environmental and legal risk matrix. As from 2023, as part of the comprehensive environmental safety policy, work began on detecting the carbon footprint. With the support of Leaf Sustainable Innovation, software is utilized to recognize the environmental impact produced by the company. The plan consists of identifying the sources of emissions and their extent, with the primary source being direct emissions: transportation. Carbon dioxide emissions and other greenhouse gases produced by combustion are shown. Based on the daily control of diesel consumption and kilometers traveled that the company records, it is possible to quantify the types of emissions per tractor unit. This would then allow for evaluating performance and making comparisons regarding the types of units, size, and design of the route sheets. Additionally, the software provides

a comprehensive view of all potential emission generators from different sectors of the company. Local air pollutants that affect people's health (not classified as greenhouse gases) include CO (carbon monoxide), NOx (nitrogen oxides), PM (particulate matter), and HC (unburned hydrocarbons). For this purpose, the units were grouped according to their specifications (Euro 3 diesel, Euro 5 diesel, and Euro 6 CNG) and the type of tank they tow, comparing their performance on a route equivalent to 9,000 kilometers traveled within the same road corridors, primarily consisting of Provincial Route 2 and Provincial Route 11 in the province of Buenos Aires.

**What is the impact of a CNG-powered truck versus a diesel-powered truck?**

It is easy to see that the impact of a CNG-powered truck is significantly lower compared to diesel-powered units. Unlike diesel units, CNG trucks do not record particulate matter (PM) emissions. In relation to nitrogen oxides, they are 600% more environmentally friendly than Euro 3 units and 200% more sustainable than Euro 5 units. In fact, a truck that does not use urea in its combustion has an average impact four times greater than a Euro 5 truck. Renewing the fleet with current technologies would reduce, within current possibilities, the impact of transportation services. A culture of transparency and accountability within the organization is essential, involving the commitment of all parties in pursuit of safety, trust, and quality of work.

Chart 1. Local gas emissions





**What is the role of human capital in this process of change?**

Human capital plays a key role in this process of change to adopt more environmentally friendly behaviors. Time is dedicated to developing awareness and professionalization programs for all staff, covering topics such as good environmental practices, proper handling of hazardous materials, emergency response techniques, and respect for diversity and inclusion in the workplace. In this sense, as part of sustainability policies, ensuring the well-being of workers is essential. For drivers, finding a balance between work and personal life is a key aspect of work organization. Therefore, dynamics have been created to allow drivers to have rest days without affecting transportation service, aiming to achieve maximum quality, efficiency, and safety while respecting drivers' rest periods. Additionally, promoting adequate sleep hours reduces the likelihood of incidents.

**Can the performance of human capital be measured in this process of change?**

Yes, it can. The break-even ratio is 1.25. This is influenced by several factors: the average number of vacation leaves, the historical data of leaves due to non-work-related illnesses, leaves under occupational risk insurance (ART) as well as the service demands depending on the time of year.

**If you could name a short-term goal, what would it be?**

The goal is to evolve in order to responsibly and professionally address the challenges of transporting hazardous and general cargo by land. This involves learning sustainable practices, collaboratively developing improvement mechanisms, and managing accurate risk indicators. These are the objectives pursued to contribute to an environmentally friendly future. Social responsibility is the indispensable key to the profitability and trust of companies. We have been working together with JST ASAT for two years on the implementation of an indicator matrix and monitoring indicators as well as on developing training programs and coordinating simulations.