



SHARING, LEARNING, AND CO-CREATING TOWARD A SUSTAINABLE FREIGHT ECOSYSTEM

PROCEEDINGS OF THE INTERNATIONAL WORKSHOP ON GREEN FREIGHT INITIATIVES

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TABLE OF CONTENTS

Executive Summary	ii
Background	1
Objectives	1
Workshop structure	2
Workshop proceedings	2
Global trends, challenges, and opportunities for sustainable transportation	3
Regional context	4
Green freight initiatives.....	4
Green freight programs.....	4
Driver training	8
Technology verification programs	10
Freight assessments, research, and opportunities.....	11
Strategies and resources to foster green freight.....	13
Collaboration and exchange	13
Innovative green freight solutions	14
Green freight practices on the ground.....	15
Site visit	15
Key messages	16
Next steps	18
List of abbreviations and acronyms	19
Appendix	20
Agenda.....	20
List of attendees.....	22

EXECUTIVE SUMMARY

From November 18–20, 2019, 150 people from 10 countries gathered at the International Workshop on Green Freight Initiatives in Brasilia, Brazil, to discuss green freight initiatives in Latin America. The event, hosted by the Brazilian National Confederation of Transport (CNT) and the Social Transport Service and the National Apprenticeship Service of Transport (SEST SENAT), was co-organized and supported by the U.S. Environmental Protection Agency (EPA), Natural Resources Canada (NRCan), and the International Council on Clean Transportation (ICCT).

The two-and-a-half-day workshop convened professionals from the freight industry, government, academia, technical cooperation agencies, and nonprofit organizations. They sought to identify ways to develop, implement, expand, and align green freight programs throughout Latin America and to identify other innovative solutions to improve freight environmental performance.

During the first two days, speakers and attendees explored the relevance of the freight transport sector in the economy and its disproportionate contribution of greenhouse gas emissions and other local pollutants that affect human health and the climate. Representatives from different countries gave presentations about existing green freight programs and the context in which they have been implemented. Collaboration and exchange were emphasized as key elements for fostering green freight throughout Latin America. Driver training, capacity building, technology verification programs were also discussed by the participants, as was current research and trends. Additionally, some companies shared lessons learned from implementing their own innovative solutions. The workshop closed with an exciting and open discussion about the opportunities for green freight programs and initiatives in the region.

On the third day, participants visited one of the 153 SEST SENAT technical facilities, this one in Samambaia, southwest of Brasilia. There they learned about the driver training program adopted by CNT and SEST SENAT, which is based on NRCan's SmartDriver program. Participants also learned about other training courses and an electric bus pilot in Brasilia.

BACKGROUND

The Brazilian National Confederation of Transport (CNT) and the Social Transport Service and the National Apprenticeship Service of Transport (SEST SENAT) hosted the International Workshop on Green Freight Initiatives in Brasilia, Brazil, from November 18–20, 2019. The event was co-organized and supported by the U.S. Environmental Protection Agency (EPA), Natural Resources Canada (NRCan), and the International Council on Clean Transportation (ICCT).

A previously signed memorandum of understanding (MOU) between CNT, SENAT, NRCan, and ICCT served as the framework. The organizations agreed to collaborate to offer internationally certified driver training courses aimed at promoting energy efficiency in the Brazilian cargo and passenger road transportation sectors. The EPA's SmartWay program joined to support the development and expansion of these efforts and other green freight initiatives, and to make this international workshop a reality.

The event also drew upon work done in previous workshops in Latin America that focused on green freight programs and vehicle emissions control.¹ The purpose was to continue sharing experiences from around the world and from within Latin America.

OBJECTIVES

The workshop's goals were to facilitate discussion and the exchange of knowledge about green freight programs globally and regionally. Participants engaged with how to support the implementation of best practices regarding energy efficiency, including clean technology verification, driver training, benchmarking, and capacity building. Ultimately, this is to help freight carriers and companies reduce fuel consumption and the greenhouse gas (GHG) and local pollutant emissions associated with burning fuel, cut costs, and benefit the environment and societal wellbeing.

The two-and-a-half-day workshop convened 150 people from 10 countries—Brazil, Canada, the United States, Mexico, Argentina, Uruguay, Chile, Peru, Germany, and Portugal. Participants included representatives from the freight industry, government, academia, technical cooperation agencies, and nonprofit organizations. Their work focused on identifying ways to develop, implement, and expand green freight programs throughout Latin America. An additional focus was on identifying other innovative solutions that might improve freight environmental performance.

¹ See <https://theicct.org/events/latin-america-green-freight-workshop-june2017> and <https://theicct.org/events/south-american-summit-vehicle-emissions-control>

WORKSHOP STRUCTURE

On the first day, discussions focused on framing the challenge for greening the freight sector, showcasing current efforts, and exchanging best practices regarding program development and regional integration. On the second day, the workshop concentrated on driver training, capacity building for freight professionals, and innovative technologies for sustainable transport. The third day, a half day, was a site visit to one of the SEST SENAT units in the city of Samambaia, near Brasilia.



Participants during the first day of the workshop.

WORKSHOP PROCEEDINGS

The workshop presentations, agenda, and other materials are available on [the ICCT website](#) and on the SEST SENAT [workshop website](#). Additionally, live recordings of the workshop are available online ([Day 1](#) and [Day 2](#)).

To start, the executive directors of the host organizations CNT and SEST SENAT made opening remarks and co-organizers ICCT, NRCAN, and EPA SmartWay delivered a welcome message; all emphasized the theme of the workshop, which was sharing countries' experiences, learning from best practices in Latin America, the United States, and Canada, and co-creating strategies, plans, and initiatives toward a sustainable freight sector. This opening session stressed that collaboration among agents of the freight system is key to overcoming the challenges of climate change, cleaning the air of our cities, reducing costs and inefficiencies, and improving competitiveness along supply chains. All of this is needed to reduce the environmental, energy, and health impacts of the transport sector and generate positive impacts on businesses and communities.



Panelists at the opening session from left to right: Luke Bond (NRCan), Nicole Goulart (SEST SENAT), Bruno Batista (CNT), Rachel Muncrief (ICCT), and Buddy Polovick (EPA SmartWay).

GLOBAL TRENDS, CHALLENGES, AND OPPORTUNITIES FOR SUSTAINABLE TRANSPORTATION

Prof. Alan McKinnon of Kuehne Logistics University in Hamburg, Germany, was the keynote speaker in this panel. He provided an excellent overview of the scientific data around climate change and clearly outlined the challenges ahead in decarbonizing the freight sector. Given the current rate of global emissions, national pledges are not enough to stay within approximately 1.5°C of warming; countries need to cut their carbon dioxide (CO₂) emissions by 50% from today's levels by 2030 and become carbon neutral by 2050. Prof. McKinnon discussed some of the key strategies for this, including electrifying logistics activities and decarbonizing electricity generation, improving asset utilization and vehicle operation, and utilizing information and communication technologies (ICT). Prof. McKinnon also shared the “10 C” approach, which contains 10 steps to decarbonize logistics.

Catalina Etcheverry, an initiative coordinator at the Secretariat of the Climate and Clean Air Coalition (CCAC), highlighted the importance of working on green freight due to its explosive growth—the volume of freight is expected to triple by 2050. She also mentioned freight's operational inefficiencies, high contribution to global transportation emissions, and how it is critical to reduce emissions of short-lived climate pollutants (SLCP) and all GHGs to stay within 1.5°C of warming. The CCAC is supporting these actions through its Heavy-Duty Vehicles Initiative, which seeks to reduce particulate matter and black carbon emissions by 90% by 2030, and the [Global Green Freight Action Plan](#), through which countries and organizations around the world have pledged to work on green freight programs.

Rachel Muncrief, deputy director of the ICCT, emphasized the need for efficiency improvements and electrification in the on-road sector to achieve climate goals. Methods of achieving this include efficiency standards, zero-emission vehicles (ZEV) and related infrastructure deployment, city-level policies supporting ZEV adoption in urban areas, and market-based measures such as green freight programs. She noted that

long-haul trucking is the most difficult segment to cost-effectively decarbonize, but the pathway for accomplishing this is emerging.

REGIONAL CONTEXT

Across Latin America there are common challenges to achieving sustainability within the transport and freight sectors. These challenges relate to technology, policy and regulations, finance, information and education, inefficiencies throughout supply chains, government capacity, and resources and infrastructure. These are not different from challenges in the rest of the world, but Latin America has a regional context of its own and it is important to consider its unique commercial interactions, integration of supply chains, and economic, political, and cultural history. For example, in the case of Brazil, the vehicle fleet grew by 81% in the last decade alone. In the heavy-duty vehicle sector, the average age of fleets run by independent owner-operators is 17 years, and although more than 60% of freight is transported by road, only 12% of Brazil's roads are paved.

GREEN FREIGHT INITIATIVES

The workshop gave an overview of initiatives. These include green freight programs that are at different stages of development, driver training, technology verification programs, freight assessments, and innovative freight solutions. They are led by government, industry, and academia.

Green freight programs

SmartWay is the longest-running green freight program in the world.² It is currently led by the United States and Canada. Mexico has been piloting SmartWay since 2018 and aims to harmonize to create a single North American program. SmartWay is a voluntary, market-based program that integrates shippers, logistics firms (3PL), and carriers, and it has been a reference for other programs.

² <https://www.epa.gov/smartway>



Green freight programs or initiatives in Latin America

Bruno Batista, executive director of CNT, described the structure of Programa Despoluir, which was launched in 2007 in Brazil and has had a national scope ever since.³ It supports transportation companies and independent drivers in adopting energy efficiency measures and provides training and other resources to help them improve competitiveness and comply with environmental regulations. Despoluir was recognized as one the “Big Push” programs for sustainability by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) in 2019. One component of Despoluir assesses the environmental performance of vehicles and helps companies implement strategies to reduce emissions and adopt cleaner technologies. The program has so far supported almost 25,000 companies and 27,000 independent truck drivers, and there are multiple resources available online including environmental bulletins,

³ <http://www.despoluir.org.br/>

technical publications, interviews, news, podcasts, cost-assessment calculation tools, and others.

Buddy Polovick, SmartWay international team lead at the EPA, shared some of the lessons learned from the SmartWay program and how it has evolved since inception in 2004. The SmartWay process starts with an assessment of the given freight sector to determine the needs, challenges, and opportunities; it then moves to focus on the areas where improvements would have the greatest impact. Engagement with industry throughout the process is critical, and this can be achieved through workshops and roundtables that build awareness and gather input from industry leaders. Overall, SmartWay is building capacity among a variety of stakeholders and seeking to design and implement a program that can be replicated to create global harmonization.

Companies have a strong motivation to measure and assess the performance of their vehicle fleets and operators, as improving performance reduces both costs and carbon emissions. Today's consumers are also more aware of sustainable practices and expect these from companies. SmartWay has emphasized development of tools to modernize practices and the use of telematics to help collect data that will inform both the industry and those crafting public policy. Overall, the key elements of SmartWay include performance benchmarking systems, quantification and reporting tools, knowledge-sharing platforms, technology verification, performance recognition, and a credible brand.

SmartWay aims to become a North American partnership. Luke Bond, senior policy analyst at NRCAN, explained how Canada got involved with SmartWay. Canadian companies were already joining the U.S. version of the program because they wanted to access the materials, measure their performance, and benchmark against their peers. When SmartWay was expanded and became jointly administered by Canada and the United States in 2012, several changes had to be made to harmonize; these included translating tools into French, adjusting to the metric system, and making it one, single program so that companies in either country could obtain consistent results and have the same experience with the program. To date, approximately 500 carriers with a fleet of 47,000 trucks have registered with SmartWay in Canada, and this has generated average fuel savings of 4,000 liters per vehicle annually.



Luke Bond (NRCAN)

Another important component of SmartWay is the driver training program, SmartDriver, which was developed by NRCAN. It is a very comprehensive program with several training suites relative to different heavy-duty vehicle applications, including for on-road and forestry trucks, school buses, and city buses.

Mexico based its program, Transporte Limpio (*Clean Transport*), on SmartWay and is currently in the process of fully harmonizing with SmartWay's tools, methodologies, and logos.⁴ Mexico is an important leader in Latin America and full harmonization makes sense for companies in the region and their supply chains. Judith Trujillo, deputy director at the Secretary of Environment and Natural Resources in Mexico (SEMARNAT), shared that despite the lack of public resources assigned to the program, it has endured due to industry's interest and support. The experience of Mexico suggests that green freight programs can be successful strategies and that program harmonization will benefit North American supply chains.

Clara Sanguinetti, director of management and monitoring of projects and programs from Argentina's Ministry of Transport, and Fernando Lía, energy efficiency coordinator of transport from Argentina's Secretary of Energy, presented on the current green freight program led by the government. Argentina launched the full phase of its program, Transporte Inteligente (*Intelligent Transport*), at the end of 2019.⁵ It builds on the findings of the pilot phase where nine companies and more than 70 vehicles participated by implementing 12 energy efficiency measures. Average savings per fleet in the first phase were around 7%. The measures adopted most were eco-driving training and idling control, and these were followed by aerodynamics improvements and tire inflation. The return of investment period for these measures was, on average, six months. Additionally, as a result of the program, trailer skirts for semi-trucks will be manufactured in Argentina.

Cristina Victoriano, chief of transport at the Sustainable Energy Agency of Chile, shared lessons learned from the design and implementation of Giro Limpio (*Clean Shift*) and highlighted the importance of having a long-term plan for adopting energy efficiency.⁶ She pointed out that when fossil fuel prices were high in 2008, many energy efficiency policies were implemented, like scrappage programs, energy efficiency training, and others. But there was a need for a long-term plan to take full advantage of those opportunities.

Giro Limpio was developed by University Andrés Bello and is now being implemented by the Sustainable Energy Agency. Ms. Victoriano pointed out that one of the lessons from the program was to include larger companies. At an early stage the program focused on small companies, but these were not able to implement many energy efficiency strategies. Today, many large companies have joined the program—52 carrier companies with a fleet of 2,800 trucks that move 40 freight tons across Chile. Smaller companies can now learn from these experiences. The program has developed many resources that are available online, including 13 guideline documents for freight transport that discuss eco-driving, energy efficiency strategies, cost assessments, and other strategies.

Martin Tanco, director of the Center for Innovation in Industrial Organization (CINOI) at Montevideo University in Uruguay, laid out the results of the latest carrier sustainability survey and the main aspects of the Programa de Logística Sustentable Uruguay (*PLSU; Sustainable Logistics Program*).⁷ Mr. Tanco said there are great opportunities to increase the still low adoption of environmental best practices and monitoring,

4 <https://www.gob.mx/semarnat/acciones-y-programas/programa-transporte-limpio-190236>

5 www.transporteinteligente.gob.ar

6 <https://www.girolimpio.cl/>

7 http://fium.um.edu.uy/propuesta-academica/programa_de_logistica_sustentable_uruguay/

reporting, and verification systems (MRV). While it is mostly big companies taking the lead on sustainable practices, supporting smaller carriers is important, as well. Preventive maintenance, route optimization, speed control, fleet renewal, eco-driving, and driver training are some of the most adopted measures. Corporate image, cost savings, and environmental awareness are the main drivers behind the adoption of sustainable practices.

The PLSU was launched in fall 2019 and brings together representatives from the private sector, government, and academia to develop a sustainability roadmap. Similar to other programs, PLSU engages with training, best practices and ad hoc tools, branding, case studies and research including technology verification programs and strategies to increase awareness of sustainable practices. PLSU is collaborating with the Smart Freight Centre (SFC), Programa de Logística Verde Brasil-PLVB (*Brazilian Green Logistics Program*), and Andrés Bello University.



Regional Context of Green Freight in Latin America panel, from left to right: Fernando Lía (Secretary of Energy, Argentina), Clara Sanguinetti (Ministry of Transport, Argentina), Judith Trujillo (Secretary of Environment, Mexico), Damiana Serafini (moderator), Cristina Victoriano (Energy Efficiency Agency, Chile), and Martín Tanco (CINOI, Uruguay).

Driver training

Day 2 of the workshop included discussion of regional driving training experiences from Argentina, Brazil, and Perú.

Vinicius Ladeira, deputy director of SEST SENAT, explained that CNT's National Program on Energy Efficiency is based on two pillars—education and technology. As a result, CNT, SENAT, ICCT, and NRCan signed an MOU to share international experiences and adapt Canada's SmartDriver and FleetSmart programs to the Brazilian context. Achieving this adaptation required a thorough analysis of the Brazilian context to be able to adjust and create new content for videos and manuals. Additionally, CNT and SEST SENAT acquired 123 driving simulators to complement driver training, and an app was created to support data collection and monitor fuel consumption, CO₂ emissions, and freight activity. Drivers receive an international certification after completing and passing the training, and that provides an additional incentive to participate. The results of the program are remarkable. Three courses are fully developed (truck driver, bus driver, and fuel management), and more than 6,700 people have participated; some participants have indicated, through an online survey, that they achieved average fuel savings of 24% by implementing some key strategies like regular maintenance, operating the vehicle within weight limits, route planning, eco-driving,

and constant training. Luke Bond noted previously that Canada's SmartDriver program has led to fuel savings of 11% annually. Next, the National Program on Energy Efficiency will expand to include more courses, technology verification programs, and future technologies that focus on electric and autonomous vehicles.



Driver Training and Capacity Building in Latin America panel, from left to right: Julio Velázquez (FADEEAC, Argentina), Nicole Goulart (SEST SENAT), Vinícius Ladeira (SEST SENAT), Orlando Dávila (Ministry of Transport, Peru) and Alejandro Robson (FADEEAC, Argentina)

Alejandro Robson, general manager from La Fundación Profesional para el Transporte (FPT), technical branch of the Argentinian Federation of Road Freight Transportation Companies (FADEEAC), and Julio Velázquez, manager of FADEEAC, presented their driving training program in Argentina. FPT's mission is to work on research, development, and technology. It currently offers training on the mandatory courses required to obtain a truck driver's license and has also developed other courses for professional truck drivers. FPT has been working on the development of driving simulator software with a local university in Argentina to improve driver training based on the driving patterns and performance of truck drivers affiliated to Rango Verde (*Green Range*), the green freight program implemented by FADEEAC. Software users will have the option to choose from eight different truck configurations and various cargo options, and it will be installed in FPT's 45 driving simulators. The project is about 75% complete and is expected to be finalized by the middle of 2020. The main objective is to track the driving patterns of truck drivers through telematics and create an ad hoc training with the simulation software; it is intended to help drivers address their main

mistakes. Julio Velázquez highlighted the great opportunities that exist with telematics and big data to improve operations efficiency and truck-driver training.

Orlando Dávila, economic analyst of the Ministry of Transport and Communications (MTC) in Peru, talked about the National Training Program on Efficient Driving. Peru ratified the Paris Agreement and incorporated within it some actions related to freight transportation. This national program responds to one specific mitigation policy in Peru's nationally determined contribution: mandatory eco-driving training for professional drivers of trucks and buses as part of the truck driver licensing process. The program aims to increase the competitiveness of the transport sector and promote energy efficiency, road safety, and sustainability. To implement this measure, MTC has developed, with the support of GIZ Peru, an eco-driving manual for trainers and drivers. They also received input from trucking associations, NGOs, and related stakeholders. In 2019, a pilot program was conducted to explore the design and implementation of the driver training tools and the program. The pilot included collaboration with the Volvo Driver Academy to train participants by using driving simulators and real driving environments in different routes in northern, central, and southern Lima. That pilot actively sought the participation of women, who still represent a very low percentage of drivers in the workforce. The preliminary results showed a 7% reduction in fuel consumption and the long-term goal is to train 10% of all professional drivers every year.

Technology verification programs

There are many opportunities to reduce emissions in the freight sector by adopting new technologies—engine, aerodynamics, telematics, etc.—but not all companies are willing to take the risk of investing in these technologies. This is why technology verification programs are so important.

Buddy Polovick shared the experience of SmartWay and how technology verification programs have helped fleets assess the fuel-savings claims of market technologies; select appropriate technologies; carry out third-party testing; and accelerate the adoption of proven technologies. These also encourage technical innovation and technology transfer to achieve real emission reductions. The verification process includes technology and application review, and testing is conducted by the manufacturer according to specific protocols and durability requirements. In the United States, some emission control devices are verified by the EPA, including selective catalytic reduction (SCR) systems, diesel particulate filters (DPF), and diesel oxidation catalysts (DOC). The only fuel-saving devices verified by SmartWay are aerodynamic devices, idle reduction systems, and low rolling resistance tires. The SmartWay website has a variety of online resources to support the development of programs in other countries, build capacity in the public sector, and advance the adoption of fuel-saving technologies.⁸ These resources are available in English, Portuguese, Spanish, Chinese (Mandarin), and French.

Julio Villalobos, executive director of the Transportation and Logistics Center at Andrés Bello University in Chile, highlighted the importance of information and data when considering alternatives to reduce fuel consumption and emissions from the transport sector. Chile has developed its own test protocol (NCh3331) based on international protocols (SAE J-1321) to assess vehicle technologies, and there is a high level of acceptance and interest from the transport community. Some of the testing results

⁸ www.epa.gov/verified-diesel-tech/clean-diesel-technology

under the protocol have found that aerodynamics has an impact of 12%–15% on fuel consumption and a return of investment period of 7–11 months with a relevant reduction in emissions.

In Argentina, the HDV-E Arg working group of the Argentine Institute of Normalization and Certification (IRAM) supports technology verification by piloting and developing technical norms like IRAM 10290 (SAE J-1321). During the summer of 2019, fuel consumption and coast down (SAE J-2263) pilot tests were carried out with the support of FADEEAC, EPA, ICCT, logistics companies, truck manufacturers, and technology providers. The pilot helped to support the capacity building in the region for vehicle testing in Latin America and the use of VECTO software.⁹ Julio Vassallo from the Ministry of Environment emphasized that these pilot tests will support the development on energy efficiency regulations for on-road HDVs in Argentina. The country will also seek regional harmonization through COPANT and share experiences within the Transportation Task Group (TTG) of the G20.¹⁰



Regional Experiences on Technology Testing and Verification panel, from left to right: Julio Villalobos (Andrés Bello University, Chile), Bruno Batista (CNT), Buddy Polovick (EPA SmartWay), and Julio Vassallo (Ministry of Environment, Argentina).

Freight assessments, research, and opportunities

Throughout the workshop, the importance of doing an initial assessment of a given freight sector to understand its particular challenges and opportunities was highlighted. This knowledge can also illuminate promising new areas for research.

Luke Bond shared the details of a brand-new program from NRCan that focuses on green freight assessments and supports companies in evaluating their freight operations and performance to identify key opportunities for improvement.¹¹ This program covers the development of the initial freight assessment. Additionally, in some cases it could provide some funding for the implementation phase, after strategies

⁹ Vehicle Energy Consumption Calculation Tool of the European Commission for heavy-duty vehicle CO₂ certification.

¹⁰ COPANT is the Pan-American Commission of Technical Norms that integrates all ISO chapters in America. For more on the TTG, see here: <https://theicct.org/events/2019-meeting-g20-transport-task-group>.

¹¹ <https://www.nrcan.gc.ca/energy-efficiency/energy-efficiency-transportation/greening-freight-programs/green-freight-assessment-program/20893>

have been identified that have the potential to reduce fuel consumption and mitigate implementation barriers.

John Koupal from the Eastern Research Group (ERG) presented the initial findings of the Chile freight assessment, supported by the EPA. The study followed the freight assessment blueprint template developed by the ICCT, which outlines the relevant information needed to understand the freight sector. This includes data about the truck market, trends and operations, and the main drivers that lead to implementing fuel-saving technologies; it also helps identify opportunities to reduce fuel consumption and emissions.¹² ERG conducted a survey and interviews as part of the study, and the survey resources are available for interested stakeholders to use in other countries' freight assessments. As is the case for many other countries, one of the main challenges in the Chile study was obtaining a representative sample to account for the large number of small carriers. The report of the Chile freight assessment will be finalized in late April 2020.

Leticia Pineda, a researcher from the ICCT, highlighted the importance of analyses using real industry data and shared the results of a recent study of a supply chain from China to the United States. Strategies considered for improving energy and environmental performance of that supply chain related to logistics, mode switch, and clean technologies. The results show that current adopted "green" practices generated reductions of 23%–27% in particulate matter (PM), nitrogen oxides, and CO₂ emissions compared to the baseline. Moreover, reductions could be increased through additional measures that include more advanced truck technology, electrification, and mode switch, and this could lead to 67%–81% reductions of the same pollutants. Ms. Pineda highlighted that there's no one-size-fits-all approach and operational and vehicle technologies are necessary to achieve the largest potential reductions. Collaboration among stakeholders is also key, but sometimes companies are reluctant to share information or best practices. This study shows that real-world data analysis can inform others without compromising sensitive data.

Finally, Joshua Silverblatt, SmartWay international coordinator from the EPA, gave a presentation about transportation megatrends and efficiency opportunities that also offered some ideas about what freight transportation could look like in 2050. Some megatrends that enable the creation of seamless transportation networks involve automation and digitalization, e.g., telematics, e-commerce, machine learning, and supergrid logistics. Energy efficiency opportunities can be created through the use of alternative fuels (electricity, hydrogen, and biofuels), enhanced equipment (aerodynamics, lightweighting, engine efficiency, low rolling resistance tires), and operations (automation, vehicle to everything [V2X], big data and logistics, and mode switch). Solutions should be tailored to the given situation. For example, electricity appears to be more suitable as power for smaller vehicles and those that travel shorter distances, whereas for larger vehicles and those that travel longer distances, low-carbon biofuels are more appropriate.

¹² https://theicct.org/sites/default/files/publications/Freight-Assessment-Blueprint_ICCT_white-paper_14032017_vF.pdf



Current Research and Trends panel, from left to right: Leticia Pineda (ICCT), Julio Villalobos (Andrés Bello University, Chile), Josh Silverblatt (U.S. EPA SmartWay), and John Koupal (ERG).

STRATEGIES AND RESOURCES TO FOSTER GREEN FREIGHT

Collaboration and exchange

This panel, facilitated by Camila Gramkow of ECLAC, brought together experts from different initiatives focused on creating alliances and exchanging experiences to support the decarbonization of the transport sector.

The Transport Decarbonisation Alliance (TDA), represented on the panel by Nuno Miguel Pinto, was launched in 2018 to bring together countries, cities, and companies, which are the major drivers of low-carbon mobility. These are known as the 3C's—countries, cities (regions), and companies. TDA's 74 members, which represent more than 170,000 freight vehicles, have publicly committed to work together toward decarbonization and exchange information on best practices, challenges, and solutions in the realm of ZEVs.

Cristiano Façanha presented an overview of CALSTART's Drive to Zero. The program was launched in September 2019 to support the deployment of ZEVs and focuses on applications where technology is or will be available in the near-term. These opportunities need to be supported by an ecosystem that incorporates public policy, incentives, infrastructure, and pilot programs. When seeking to consolidate the opportunities and expand them in other markets and regions, collaboration is key.

Marcus Regis described GIZ's PROMOB-e program, which aims for electromobility in Brazil. This cooperation between Germany and Brazil seeks to engage with industry, government, and civil society to create a national platform for electromobility. This platform will help to develop public policy, articulate norms and regulations, and develop business models and pilot projects.

Innovative green freight solutions

Miguel Martin, a representative of telematics company DriveUp, presented an overview of how big data and the internet of things (IoT) are improving driver training and fleet management in ways that deliver not just safety benefits but also energy-efficiency gains. DriveUp's approach is to focus on eco-driving, safety, and maintenance, and the firm collects data, analyzes it, trains the drivers, and then tracks driver performance in terms of key performance indicators. Mr. Martin emphasized that eco-driving and driver training requires top-down organizational vision. DriveUp has seen fuel consumption savings of 16% with the use of driver training and telematics, but companies and fleet owners have to be convinced that these measures are delivering results. To do this requires a reliable methodology and the support of telematics systems that can prove results.

FADEEAC members make up more than 90% of the on-road freight sector in Argentina. Fuel costs are 40% of the total operational costs for long-haul trucks and 20% for short distances. Luciano Milito mentioned that FADEEAC is exploring the use of biodiesel because it can be used in conventional trucks without major adjustments to the vehicle, costs less than regular diesel, and Argentina has a large production capacity, as it is one of the main producers of soy in the world. FADEEAC will carry out a pilot test in the first half of 2020 to evaluate the performance of trucks using B100 biodiesel and regular diesel under different route conditions. Moreover, in partnership with DriveUp, FADEEAC has been using telematics to analyze the operations of different trucks and routes; this is to determine the most representative drive cycles and match them with the appropriate vehicle technology.

Jens Giersdorf mentioned that within the PROMB-e program, GIZ is also working on electrification of the last mile of transport. The program has supported Brazil's federal government by helping with training, development of best practices documents, and conducting pilot projects and case studies. In particular, a pilot project involving the Brazilian postal service will test cargo bikes in São Paulo and electric bikes in Paraná from 2019 to 2020. They have also released a study analyzing the potential of electric scooters in Brazil, including for use in parcel and food delivery.



Innovative Green Freight Solutions panel, from left to right: Nicolás Granchelli, Luciano Milito, and Julio Velázquez (FADEEAC, Argentina), Rachel Muncrief (ICCT), Miguel Martin (DriveUp, Argentina), and Jens Giersdorf (GIZ, Brazil).

Green freight practices on the ground

Representatives of three companies shared their experiences with sustainability initiatives and each highlighted that these practices support their competitiveness in the market.

- » Gustavo Amaral from Tora Transporte, a Brazilian a logistics company, discussed a multimodal—truck and rail—route between Rio de Janeiro and São Paulo. The use of both modes allows for more cargo consolidation; the first and last mile are integrated by truck, and on the long-haul portion, rail is used.
- » Elias Alves da Silva from VIX Logística SA Grupo Águia Branca, a company that provides logistics services and transports both passengers and freight, shared the company’s sustainability practices, including for its vehicle fleet. Some of these are optimization of vehicle maintenance, eco-driving, aerodynamic technologies, quantification of emissions, and the use of alternative vehicles.
- » Franco Leonardi from LZ Energia offered solutions to improve fuel efficiency by using hydrogen. LZ has generated emissions reductions of 50% of carbon monoxide, 65% of PM, and 48% of hydrocarbons, a 5% improvement in fuel economy, and a 50% reduction in the use of diesel exhaust fluid (DEF/Arla).

SITE VISIT

On the third day of the workshop, some participants visited one of SEST SENAT’s technical facilities in Samambaia, southwest of Brasilia. The participants were able to explore the facility and learn about the different services offered to the affiliated drivers and their families (i.e., medical, recreational, training, etc.). Participants visited the classroom where driver trainings, which are based off of NRCan’s SmartDriver program, take place, and some were able to try the driving simulator. Participants also learned about an electric bus pilot program in Brasilia. They were able to talk with the bus driver about the technical characteristics of the bus and the overall experience of the pilot.



Participants of the workshop at the site visit

KEY MESSAGES

The last panel of the second day of the workshop, moderated by Damiana Serafini, environmental consultant, elaborated on the challenges and opportunities of the freight sector in Latin America. Several earlier panels had already mentioned some of these challenges, and they are summarized below along with other key messages and opportunities:

- » Lack of harmonization. There are numerous green freight programs throughout Latin America—in Mexico, Brazil, Chile, Argentina, and Uruguay. These are at different stages of development and have different areas of focus, methodologies, and approaches. Several countries have multiple programs with overlapping stakeholder groups. Programs are being led by the government, industry, academia, or some combination of these. There is value in having different initiatives because we all learn from different approaches and the innovative ideas generated, as these address common challenges. At the same time, however, having different methodologies and verification protocols and different country standards and policies are barriers to pursuing seamless and sustainable supply chains and freight networks. Business and industry, particularly multinationals, need to minimize reporting burdens and can do this by relying on common benchmarking and reporting methodologies that help them with carbon reduction efforts and efficiency strategies. Thus, achieving harmonization and mutual recognition among programs—nationally, regionally, and globally—is a long-term goal.
- » Expansion of green freight programs. Green freight programs deliver real benefits for business, society, and the environment. Though not all programs develop or start in the same way, leveraging the experience of other programs can help existing programs to grow and expand to other countries while striving for alignment and harmonization. The context of the country, its industry, and its economy are relevant to the design and implementation of green freight programs, but there are great opportunities to expand these programs to other Latin American countries. Doing so would support the integration of supply chains and the sustainability of the freight sector.
- » MRV systems. Monitoring, reporting, and verification systems are critical to assess the impact of sustainable practices and support the sustainability goals of the public and private sectors. This is also true of freight assessments, as these help to understand the specific sector or baseline and identify key opportunities. The use of internationally adopted methodologies like the Global Logistics Emissions Council (GLEC) framework is highly recommended.
- » Sustainable practices support competitiveness. As recognized in previous workshops, there is a strong business case, generally accepted by the private sector, for improving the energy efficiency of the freight sector. Reducing fuel consumption and emissions reduces operating costs and increases competitiveness. Corporate, social, and environmental responsibility and the value customers place on sustainable practices are important for companies. When the public and private sector work together on these efforts, they enhance a country's energy security and foster more sustainable economic development.
- » Support small companies or carriers. The majority of the freight carriers and companies in most countries are small or owner-operators, and this is also the case

in Latin America. Small operators often have limited resources and limited flexibility in their operations, and these bring additional challenges in seeking to adopt sustainable practices. Also there is fierce competition in the freight sector and margins are very thin. Financial resources may be limited, which can make it difficult to invest new technologies, and overall uncertainty about the impacts of adopting different practices reduces the likelihood that smaller companies will adopt them. Large companies can play a key role by adopting practices like testing vehicle technologies and sharing their experiences with smaller companies or carriers.

- » Limited public resources and capacity. Across many of the experiences with green freight programs shared, common denominators were limited resources and limited government capacity for oversight and management. Despite these limitations, green freight initiatives have endured due to the tireless efforts of government officials and the support of industry because these programs are delivering results. In some countries, industry is taking the lead to develop a green freight program. Ideally both the public and private sectors, and academia and NGOs, can work together toward a single green freight program or harmonization of existing ones. The reality of limited resources further emphasizes the need to align and harmonize efforts so that countries can benefit from established programs, methodologies, and frameworks like the Global Green Freight Action Plan, SmartWay, GLEC, and other global efforts.
- » Collaboration is key. Countries, companies, and cities need to find ways to collaborate, not just by sharing best practices and success stories, but also by explaining the lessons learned from those experiences. There is a need to create better collaboration mechanisms and networks to connect stakeholders with resources, build capacity, and develop private-public partnerships. Green freight programs and workshops like this support this exchange, but at the sub-regional level, other tri- or bilateral initiatives are also important. This is especially so when there are relevant commercial interactions or when companies have a presence in various countries. In some cases, companies are reluctant to share the details of their operations, but there are ways to share data without compromising sensitive information.
- » Supply chains approach. There is a tendency to think about freight systems within the bounds of specific countries, but we need to think more in terms of supply chains. The benefits of improving the environmental and energy performance of supply chains extend beyond the borders of any given country. It is important to consider how countries are connected and how they can work and advance together, particularly in regional economies like Latin America. This workshop was mainly about on-road transportation, but a few experiences of multimodal supply chains highlighted the importance of discussing the opportunities of multimodal integration and mode shift.
- » Megatrends. Online shopping, information and communication technologies, IoT, alternative technologies, automation and digitalization, and many other megatrends are reshaping the future of the freight sector. Telematics has been beneficial for tracking operations and routes and improving the efficiency of supply chains; however, we have to follow closely the applications of these technologies and research around these trends, which will greatly impact our lives.
- » Big data and data management. Massive amounts of data are being collected. It is necessary to have sufficient infrastructure to store, process, and analyze this data,

and also to develop data management protocols to ensure the privacy of sensitive data, define the owners of the data, and establish terms for data-sharing consent.

- » Humans are a crucial piece: Several panels discussed driver training programs, the adoption of new and cleaner vehicle technologies, and the use of telematics to track driving patterns and vehicle performance, and they all highlighted the importance of the humans engaged with the supply chain. Professionalization of the freight sector is key to advancing to more sustainable practices and this could be achieved by providing truck drivers with a variety of resources. Such resources might include training and learning tools, tips for improving physical and mental health, career path guidance, and recognition of them as key agents in the freight ecosystem.

NEXT STEPS

Latin America is a unique, vibrant, and evolving region that has already taken many steps toward improving the efficiency of its freight sector. Still, there is a need to increase the level of collaboration and communication among countries, and this could lead to regional harmonization of green freight programs, emissions quantification methodologies, and environmental standards. Ideally, a third-party NGO or other stakeholder group could coordinate more regular collaboration throughout the region to advance these efforts. This would be especially beneficial since there is currently no overarching body in the region to do this work. Additional workshops, pilots, training, research, technology demonstrations, technology verification, data and information sharing, education, and related efforts are warranted.

This workshop continued the discussion around opportunities to overcome the sustainability challenges in Latin America's freight sector, and it needs to continue. The institutions that organized this workshop will continue to collaborate to support green freight initiatives in the region and to create mechanisms to share information and resources. The globalgreenfreight.org website, which includes the Global Green Freight Action Plan, will continue to serve as a one-stop shop for green freight resources. The institutions also intend to utilize other communications tools such as webinars and newsletters, and others are invited to collaborate on these.

LIST OF ABBREVIATIONS AND ACRONYMS

3PL	Third party logistics firms
CCAC	Climate and Clean Air Coalition
CNT	National Confederation of Transport, Brazil
CO₂	Carbon dioxide
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
EPA	U.S. Environmental Protection Agency
ERG	Eastern Research Group
FADEEAC	Argentinian Federation of Road Freight Transportation Companies
GHG	Greenhouse gas
GLEC	Global Logistics Emissions Council
ICCT	International Council on Clean Transportation
ICT	Information and communication technologies
MTC	Ministry of Transport and Communications, Peru
NRCan	Natural Resources Canada
SEMARNAT	Secretary of Environment and Natural Resources, Mexico
SEST SENAT	Social Transport Service and the National Apprenticeship Service of Transport
SLCP	Short-lived climate pollutants
ZEV	Zero-emission vehicles

APPENDIX

AGENDA

DAY 1 - Monday, November 18, 2019

8:30 - 9:00	Reception and Welcome Coffee
9:00 - 9:30	Opening <ul style="list-style-type: none"> • Bruno Batista and Nicole Goulart, Brazil National Confederation of Transport (CNT), Social Service of Transport and National Apprenticeship Service of Transport (SEST SENAT) • Rachel Muncrief, International Council on Clean Transportation (ICCT) • Luke Bond, Natural Resources Canada (NRCan) • Buddy Polovick, The United States Environmental Protection Agency SmartWay (U.S. EPA SmartWay)
9:30 - 10:45	Global Trends, Challenges and Opportunities for Sustainable Transportation Moderator: Erica Marcos, CNT <ul style="list-style-type: none"> • Alan McKinnon, Kühne Logistics University (virtual presentation) • Catalina Etcheverry, Climate and Clean Air Coalition (CCAC) • Rachel Muncrief, ICCT
10:45 - 1:15	Coffee - break
11:15 - 12:00	The Brazilian Transportation Scenario and Despoluir <ul style="list-style-type: none"> • Nicole Goulart, SEST SENAT • Bruno Batista, CNT
12:00 - 12:45	North American Green Freight Programs Overview <ul style="list-style-type: none"> • Buddy Polovick, US EPA SmartWay • Luke Bond, NRCan
12:45 - 14:00	Lunch
14:00 - 14:30	Sustainable Transportation in Brazil <ul style="list-style-type: none"> • Vander Costa - President, CNT / SEST SENAT
14:30 - 16:15	Regional Context of Green Freight in Latin America Moderator: Damiana Serafini, US EPA SmartWay/Eastern Research Group (ERG) <ul style="list-style-type: none"> • Mexico: Judith Trujillo, Secretary of Environment (SEMARNAT) • Argentina: Clara Sanguinetti, Ministry of Transport and Fernando Lia, Secretary of Energy • Chile: Cristina Victoriano, Sustainable Energy Agency • Uruguay: Martin Tanco, Montevideo University
16:15 - 17:00	Sharing of Green Freight Practices on the Ground Moderator: Regina Cavini, United Nations Environment Program (UNEP) <ul style="list-style-type: none"> • Gustavo Amaral, Tora Transporte • Elias Alves da Silva, Vix Logística SA Grupo Águia Branca • Franco Leonardi, LZ Energia
17:00 - 17:20	Coffee - break
17:20 - 18:20	How collaboration and exchange can foster green freight? Moderator: Camila Gramkow, Economic Commission for Latin America and the Caribbean (ECLAC) <ul style="list-style-type: none"> • Nuno Miguel Pereira Pinto, Transport Decarbonization Alliance (TDA) • Cristiano Façanha, CALSTART (virtual presentation) • Marcus Regis, GIZ
18:20 - 18:30	Wrap up of the day

DAY 2 – Tuesday, November 19, 2019

8:30 - 10:00	<p>Driver Training and Capacity Building in Latin America Moderator: Nicole Goulart, SEST SENAT</p> <ul style="list-style-type: none"> • Brazil: Vinícius Ladeira, SEST SENAT • Argentina: Julio Velázquez, Argentinian Federation of Road Freight Transportation Companies (FADEEAC) • Peru: Orlando Dávila, Ministry of Transport and Communications
10:00 - 10:30	Coffee – break
10:30 - 11:30	<p>Regional Experiences on Technology Testing and Verification Moderator: Bruno Batista, CNT</p> <ul style="list-style-type: none"> • USA: Buddy Polovick, U.S. EPA SmartWay • Chile: Julio Villalobos, Transportation and Logistics Center in Andres Bello University • Argentina: Julio Vassallo, Ministry of Environment
11:30 - 12:45	<p>Current Research and Trends Moderator: Julio Villalobos, Transportation and Logistics Center in Andres Bello University</p> <ul style="list-style-type: none"> • Josh Silverblatt, U.S. EPA SmartWay • Leticia Pineda, ICCT • John Koupal, ERG
12:45 - 14:00	Lunch
14:00 - 15:45	<p>Innovative Green Freight Solutions Moderator: Rachel Muncrief, ICCT</p> <ul style="list-style-type: none"> • Miguel Martin, DriveUp • Julio Velázquez, FADEEAC • Jens Giersdorf, GIZ
15:45 - 16:15	Coffee – break
16:15 - 17:30	<p>What’s next? Moderator: Damiana Serafini, US EPA SmartWay / ERG</p> <ul style="list-style-type: none"> • Brazil: Liane de Moura Fernandes Costa, Ministry of Infrastructure • Brazil: Higor de Oliveira Guerra, Ministry of Regional Development • Argentina: Clara Sanguinetti, Ministry of Transport • Argentina: Fernando Lia, Ministry of Energy • Chile: Cristina Victoriano, Sustainable Energy Agency • Mexico: Judith Trujillo, Secretary of Environment • Uruguay: Martin Tanco, Montevideo University • Peru: Orlando Dávila, Ministry of Transport and Communications
17:30 - 17:45	<p>Final Remarks</p> <ul style="list-style-type: none"> • Bruno Batista, CNT • Nicole Goulart, SEST SENAT
17:45 - 20:00	Reception

DAY 3 – Wednesday, November 20, 2019

9:00 - 12:00	<p>Technical Visit to SEST SENAT Unit</p> <ul style="list-style-type: none"> • Viação Piracicabana: Angeoneide Henrique Alves
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