SmartWay®

Vision 2020

A New Era of Freight Sustainability

Letter from the Office Director

If evidence is needed to demonstrate that collaboration and innovation are an effective approach for addressing tough environmental issues, the U.S. Environmental Protection Agency's (EPA's) SmartWay program is an excellent case study. Through SmartWay, EPA and its partners have made significant gains in the efficiency of how our nation moves goods, helping address air quality challenges, improve public health and reduce freight's contribution to climate change.

When we launched SmartWay early in 2004, leaders from my office and others representing the transportation and freight industry knew the timing was right to take action. In developing SmartWay, our goal was to craft a strategy to reduce freight's escalating environmental impacts and provide the industry with tools that would also help mitigate the risks of rising energy costs and an emerging, new world economy.

The freight industry was rapidly growing and changing. Our economy was becoming increasingly global and more freight was moving faster and further. Though goods movement is key to the strength of our economy, these changes and growth in freight transportation have led to rising levels of greenhouse gases and air pollution.

Christopher Grundler
Director
Office of Transportation and Air Quality, U.S. EPA

With considerable input from our industry partners we built a solid business case for SmartWay that has evolved and continues to provide value-added benefits to our partners and the environment. We have continued the dialogue on the future of this dynamic industry. Freight activity continues to grow rapidly, both domestically and abroad. SmartWay already has served as a template and is being used to help jumpstart green freight initiatives all over the globe.

This report reflects what we've heard, and provides a vision for SmartWay as we move forward to the year 2020 and beyond. I am confident that through SmartWay, EPA and its partners will continue leading by example, helping to not only strengthen the sustainability of how supplies and products are delivered, but also the health of our economy and U.S. competitiveness.

Executive Summary

SmartWay Sets New Goals for Future of Freight Sustainability

As highlighted in *SmartWay Vision 2020* SmartWay partners have saved 6 billion gallons of fuel, lowered fuel costs by $20.6 billion and reduced carbon emissions by over 60 million metric tons since the program's inception. A partnership between the U.S. Environmental Protection Agency (EPA) and the freight industry, participation in SmartWay has grown from fewer than 20 partners when it was first announced in 2004, to more than 3,000 today.

In the coming decade, SmartWay partners will achieve even more emissions reductions and cost savings through strategies and technologies that will strengthen the efficiency of goods movement, both domestically and globally.

SmartWay partners are committed to sustainability and worked with EPA to create SmartWay using market-based incentives and technology solutions to ensure that the partnership would effectively address long-term trends, changes and challenges in the goods movement industry. Businesses and environmental organizations appreciate how SmartWay has helped raise awareness about freight's economic importance, underscore its prominence in the value chain, and make it clear that by optimizing the freight network companies can get closer to achieving their environmental goals.

Based on recent recommendations from the freight community, EPA is issuing *SmartWay Vision 2020*, a plan that outlines how SmartWay will keep pace with the evolution and future of the freight industry, based on four key principles:

Complete the transportation supply chain

Specifically, SmartWay is developing its carbon assessment and monitoring tools to cover all modes of freight transport, including truck, train, barge, air and marine. SmartWay tools currently assess emissions from truck, train and barge transport. By integrating air and marine, SmartWay will be in a better position to leverage national and international efforts to streamline freight data, amplify the program's reach and reduce freight emissions worldwide.

Sustainability reporting

Many SmartWay partners already are reporting emissions from freight transport in their sustainability reports. Interest in supply chain emissions is growing, and for many companies freight transport is an increasing source of emissions. SmartWay's carbon accounting tools use peer-reviewed methodologies and EPA standards to generate reliable freight performance data.

Global collaboration

SmartWay has served as a template for other countries and regions that are working to establish partnership-based programs to address freight emissions. In addition to those programs, SmartWay is committed to ongoing global efforts to align multimodal supply chain carbon accounting methodologies and tools that will lead to greater knowledge of freight's environmental impacts and strategies to reduce it.

Information sharing

In support of the goals that companies are setting to further reduce emissions and other impacts from moving goods, SmartWay will provide the industry with greater opportunities for information exchange, including webinars, education, peer review, speaking engagements, partner profiles, case studies and best practices guidance. As a public-private partnership SmartWay provides a neutral and credible platform.

For over a decade EPA's SmartWay partners have proven that lowering carbon emissions from goods movement significantly strengthens supply chain performance, and generates returns that positively affect the bottom line. At the same time, SmartWay partners have successfully elevated the value of efficient freight logistics and caught the attention of executives, investors and the public, among other constituents.

EPA is confident that the plans we've laid out in *SmartWay Vision 2020* will continue to lead the goods movement industry forward, resulting in further emission reductions, reduced fuel costs, greater energy independence and a stronger economy and healthier environment.

Acknowledgments

Chronicling SmartWay, where the program is today, and its future direction is no small task. Our *SmartWay Vision 2020* was developed with critical input from our partners, stakeholders and colleagues in the private sector, government, civil society and academia.

As we reflect on the progress we've made through SmartWay over the last 10 years and share our collective vision for the future, we would like to express our gratitude and sincerest thanks for the support provided by so many key stakeholders. Without them, SmartWay would not be what it is today, nor would our vision for the future be as inspiring or ambitious.

We would like to acknowledge our 15 charter partners who came together over 10 years ago to help develop, launch and champion SmartWay. Their leadership, ingenuity and commitment to freight sustainability led the way for the thousands of partners who followed. In addition to these business and industry leaders, we want to thank the American Trucking Associations and Business for Social Responsibility for their help in conceiving and launching SmartWay.

Numerous other SmartWay partners and affiliates have stepped up over the years to champion the program and lead the way for others.

Most recently, EPA convened a SmartWay Legacy Fleet Workgroup under the Mobile Sources Technical Review Subcommittee of the Clean Air Act Advisory Committee. This group of several dozen shippers, carriers, logistics firms, trade associations, academic experts, environmental and community groups worked over two years to study SmartWay and develop recommendations for enhancing, strengthening and growing the program. Their thoughtful ideas and recommendations were incorporated into our vision for SmartWay.

Thank you again to everyone who dedicated time, energy and expertise in contributing to our *SmartWay Vision 2020*.

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SmartWay Overview

In 2004, the U.S. Environmental Protection Agency (EPA) pioneered SmartWay to encourage greater efficiency and lower greenhouse gases and other harmful emissions from transportation supply chains.[1] In the years since, SmartWay and its partners have made significant progress toward these goals, leading businesses through a historic transition toward a new era of freight sustainability.

From the beginning, EPA and its partners worked through SmartWay to collaborate, to provide technical assistance and funding to seed investment in verified environmental and energy improvements, and to create tools to quantify freight emissions and their costs in the supply chain. Moving forward, EPA will continue to leverage SmartWay and help businesses and their transportation service providers find ways to more efficiently move goods in an increasingly energy-constrained, low-carbon world.

This overview section highlights transportation's importance to supply chain sustainability, key trends, and the environmental and social challenges the goods movement industry must meet to thrive. We'll also take a look at how industry, government agencies and the public are collaborating through SmartWay to make their supply chains leaner.

Photo courtesy of Port of Long Beach

The Importance of Goods Movement to Supply Chain Sustainability

Between 1990 and 2013, total U.S. freight greenhouse gas emissions from supply chain activities grew by over 50 percent.[2] In 2012, the U.S. freight and logistics industry moved more than 54 million tons of goods worth nearly $48 billion every day, which is more than 60 tons of freight per person per year.[3]

This much movement demands an extraordinary amount of energy, consuming over a billion barrels of oil and generating over 500 million metric tons of greenhouse gas emissions annually.[4]

Projections are that by 2025, as international commerce increases and supply chains become more global and complex, shipments of U.S. goods will grow another 23.5 percent,[5] and by 2040, a total of 45 percent.[6] As freight activity in the United States increases, projections are that during this same time frame, growth in greenhouse gas emissions from freight will exceed growth in greenhouse emissions from all other transportation activities, including passenger transportation.[7]

Over half of the world's oil production is used for transportation, and transportation is fueled almost entirely by oil. Global transportation, including cars, trucks, ships and planes, consumes more than 48 million barrels of oil per day and emits 10 billion tons of carbon dioxide per year—roughly 25 percent of all greenhouse gas emissions.[8]

These trends are compelling many corporations to more closely assess their shipping operations, and find opportunities to move goods using less fuel and with fewer emissions.

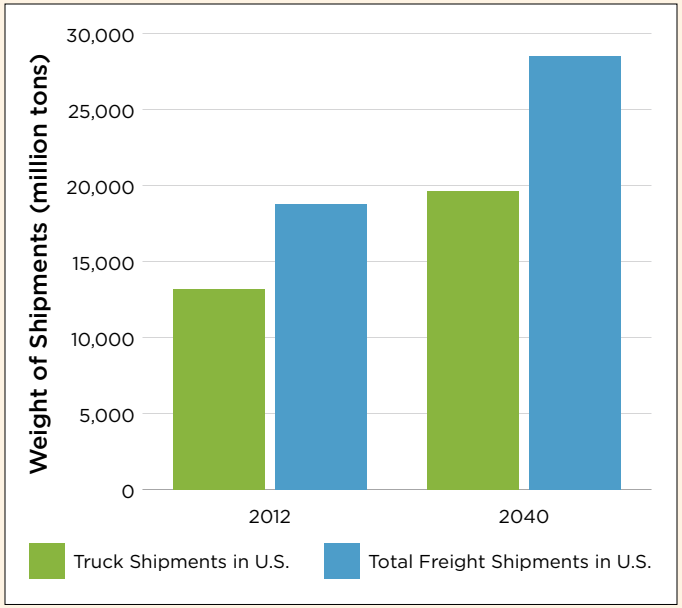
EPA's SmartWay program is integral to these efforts, providing a comprehensive and well-recognized system for tracking, documenting and sharing information about freight emissions and fuel use across the supply chain. The program also is used to help identify and select greener modes, carriers and operational strategies that can improve shipping efficiency and lower costs.

SmartWay partners and other industry leaders realize that carbon is a leading indicator of efficiency, and that their transportation and logistics operations represent significant opportunities for both carbon reductions and energy savings. For personal and household goods manufacturers that manage extensive global supply chains, shipping can account for over 10 percent of their carbon emissions in the value chain.[9] For retailers and companies that move heavy commercial goods and industrial products, emissions from goods movement and logistics can account for more than one-half of their supply chain carbon footprint.[10]

More and more, these companies are joining SmartWay and using the program to help identify opportunities for improving how they source and transport goods and supplies. By tracking and reporting emissions from goods movement, companies also are well-positioned to respond to growing public and shareholder interest in how supply chains and product transport contribute to climate change. Carbon reporting also gives companies a chance to monitor their progress, and show their commitment to responsible business practices and sustainable growth.

Increasingly, through SmartWay, business leaders recognize the importance of freight transport to supply chain performance, and to demonstrate that supply chain, financial and environmental performance all go hand in hand.

Figure 1. U.S. Freight and Truck Shipments Projected Growth 2012–2040



The U.S. Department of Transportation projects that over the next 25 years, freight shipments by truck will grow more than 40 percent. During this time total freight shipments are expected to increase 45 percent. At this rate of growth, even with the introduction of new fuel and emissions standards for freight equipment, the *2015 Annual Energy Outlook* forecasts that greenhouse gas emissions and energy consumption from goods movement will increase at a faster rate than all other sources of greenhouse gas emissions in the transportation industry. Within transportation, heavy-duty trucks are the fastest-growing contributor to emissions.

Environmental and Social Costs of Freight

While there is broad agreement that growth in global trade has a net positive effect on the world economy, there's a growing recognition of transportation's contribution to climate change, and other negative impacts that freight movement has on the environment and public health. These concerns are especially prevalent in communities located near ports, highway corridors, distribution centers, rail yards and other shipping centers.

Carbon emissions are a direct result of the amount and type of fuel burned, and are widely used today as a common metric in sustainability reporting to monitor a company's progress in improving efficiency and reducing greenhouse gas emissions. Volatile fuel prices and the rising cost of shipping, as well as current and future regulatory standards that would limit carbon emissions and increase freight efficiency, are another focal point of discussion in the business community.

In addition to carbon and other greenhouse gases, the heavy-duty trucks, cargo handling and similar equipment used to move freight are a source of diesel exhaust, which contains a broad range of toxic chemicals. EPA classifies diesel exhaust as a likely human carcinogen. Diesel exhaust also is a primary source of particulate matter and nitrogen dioxide, both of which are regulated by EPA as "criteria air pollutants," due to their human health and environmental impacts.

Exposure to fine particulate matter, including black carbon and other air toxics present in diesel exhaust, is harmful to human health, ecosystems and visibility. Health effects include respiratory and cardiovascular problems, such as asthma, decreased lung function and low birth weight, as well as premature death.[11] Nitrogen dioxide contributes to the formation of fine particle pollution and ground-level ozone, and is linked to a number of adverse effects on the respiratory system as well.

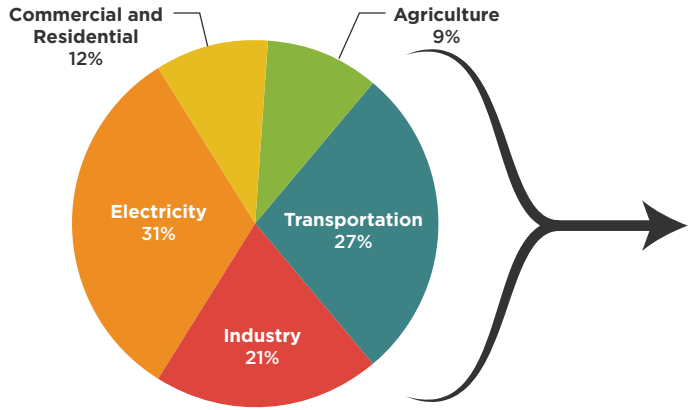
People living in communities located near large freight transport facilities are especially vulnerable to the health effects posed by diesel emissions.

In the United States, it's estimated that more than 13 million people, including 3.5 million children, live near marine ports and rail yards.[12] As trade increases, these freight hubs are expected to expand, both in the United States and in other countries.

Recent studies, including a comprehensive research report from the Health Effects Institute, show that substantial reductions in both the emissions and health effects associated with exposure to diesel exhaust are possible.[13] In fact, the United States and other nations have recently adopted standards for heavy-duty vehicles that will significantly reduce emissions and public health impacts of exposure. However, because diesel engines can operate for decades, millions of older, dirtier engines are still in use today. That's why public and private investment in clean diesel technologies, including truck replacements and retrofits, are needed to improve air quality and protect public health. Operational strategies, such as reduced idling and access improvements, also are important to achieving emission reductions and reduced risks.

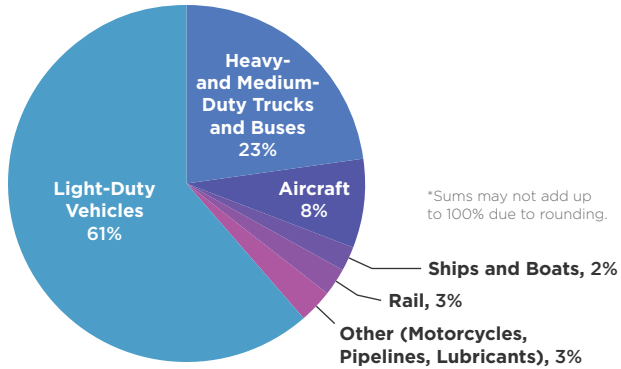
EPA and its SmartWay partners have been at the forefront of these efforts and share goals that will continue to support and develop incentives to reduce freight emissions.

Figure 2. 2013 Total U.S. Greenhouse Gas Emissions by Economic Sector



EPA's *2013 Greenhouse Gas Emissions Inventory* shows that greenhouse gas emissions from transportation accounted for nearly 30 percent of all U.S. greenhouse gas emissions, making transportation the second largest contributor to greenhouse gas emissions, after the electricity sector.

2013 U.S. Greenhouse Gas Emissions Transportation Sources*



Within transportation, passenger cars are currently the largest source of emissions and heavy-duty vehicles are the second largest source. Transportation has been the fastest-growing source of greenhouse gas emissions since 1990, and heavy-duty vehicles have been the largest, fastest-growing contributor to that growth.


US EPA Designated
SmartWay

SmartWay: Making a Difference Today

Over 3,000 organizations representing all facets of the transportation and freight industry participate in SmartWay today.[14] SmartWay partners are leaders, driving change across business supply chains. They integrate best practices and measure their progress using metrics and methods established by SmartWay and widely accepted by industry. SmartWay partners set clear goals for reducing the environmental impacts and costs of transportation, which also contributes to more resilient supply chains.

SmartWay supports those goals. The program's quantification tools are developed in consultation with industry experts and peer-reviewed, providing a sound basis for establishing emission reduction goals and benchmarking performance. Partners are recognized for their progress and given opportunities to collaborate, share ideas and strategies, and work together for a sustainable transportation future.

In this section of *SmartWay Vision 2020*, we cover the progress that EPA and its partners have made and the principal elements that contribute to the program's technical vigor, progress and success.

The Power of Partnership

Whether it's a trucker picking up food products from a distribution center to bring to the local grocer, a rail car transporting raw materials to a manufacturing facility, or the U.S. Postal Service delivering mail, it's likely you will find a SmartWay partner making the shipment. A diverse group of partners is central to SmartWay's success, including truck, rail and barge carriers, and the retailers, manufacturers and logistics managers that rely on them to ship their products and supplies. Industry groups; non-governmental organizations; and international, state and local agencies also participate as SmartWay affiliates.

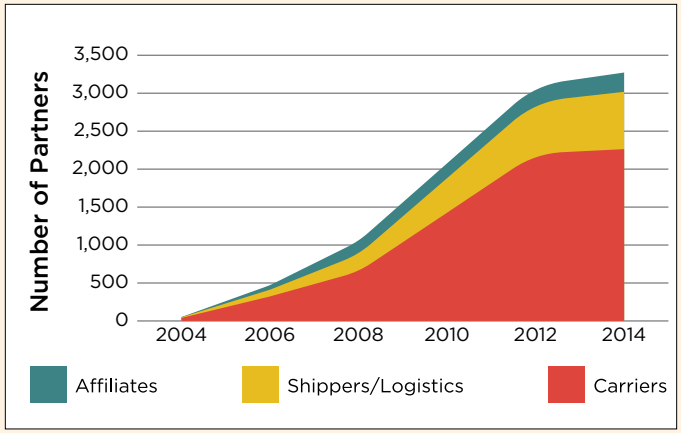
The United States Postal Service (USPS) and United Parcel Service (UPS) are SmartWay partners committed to green freight. Patrick Donahoe, USPS Postmaster General from 2010 to 2015, and D. Scott Davis, Chairman and Former UPS Chief Executive Officer, also collaborated to create Blue and Brown Make Green, an innovative program to achieve their shared goals for excellent customer service, lower costs and a reduced carbon footprint of package delivery.

When EPA first brought these businesses and affiliates together and launched SmartWay in 2004, it created a unique and unprecedented platform for addressing the environmental and social impacts of freight movement at the national level. Though this platform has evolved over time, the program rests on key components: a strong ongoing public-private collaboration, brand recognition and technology assessment.

Collaboration is at the heart of SmartWay and through the partnership EPA encourages its partners to leverage existing business-to-business relationships up and down the supply chain. To help achieve that goal, EPA draws on its technical expertise and input from its partners to provide a single integrated approach for companies to track fuel use and emissions from freight activities.

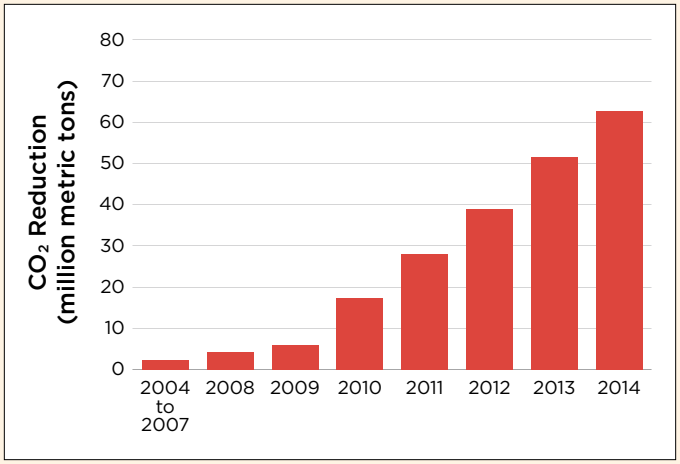
Ten Years of Environmental Progress

Figure 3. Growth in SmartWay Partnership, 2004–2014



When EPA first launched SmartWay in 2004, 15 companies joined the partnership with a shared goal to reduce freight emissions and improve transportation efficiency across the supply chain. The partnership grew quickly, and today includes over 3,000 partners, including all major rail companies, many Fortune 500 shipper companies, inland barge operators and an increasingly diverse group of large and small truck carriers.

Figure 4. SmartWay's Reduction in Carbon Dioxide Emissions, 2004–2014



Since 2004, SmartWay partners have reduced more than 60 million metric tons of greenhouse gas emissions, saving more than 144 million barrels of oil and over $20 billion in fuel costs. At the same time, partners have significantly reduced other harmful air pollutants, including over one million tons of nitrogen oxides and 43,000 tons of particulate matter.

SmartWay's suite of carbon accounting tools meets the data needs of today's business community, and facilitates communications among shippers, their logistics managers and carriers. EPA designed these tools to make data transfer and reporting simple, providing users with a value-added service for their customers.

For example, many SmartWay shipper partners cite their progress in SmartWay in their corporate sustainability reports. This is a highly effective way to respond to shareholder and public interest in how companies are demonstrating corporate responsibility by shrinking their carbon footprints. They can also use SmartWay data to

set performance goals for business units and suppliers to further improve the sustainability of their supply chains.

Similarly, SmartWay freight carriers are integrating sustainability into their brands, and they can highlight their SmartWay performance as a way to communicate their commitment to customers and improve their bottom line. SmartWay logistics partners find the program adds value in servicing their clients. They use SmartWay data to assist their customers in understanding how optimizing their freight operations with technology and operational improvements strengthens their supply chain.

SmartWay enables companies to move toward a balanced realization of their environmental, social and economic objectives. The partnership offers a streamlined and transparent method to track emissions and show their progress toward achieving commitments. Through the program, partners can check the return on their investments and benchmark their performance. Developed for and with businesses, SmartWay is a win-win solution for understanding the role of freight movement efficiency in supply chain sustainability.

> *SmartWay provides a framework that enables us to evaluate, measure and reduce the environmental impact of our transportation operations in a comprehensive and strategic way. Specifically, SmartWay has helped us reduce fuel usage and greenhouse gas emissions, and improve our operational efficiency.*
>
> **— Kevin J. Igli, Senior Vice President and Chief EHS Officer, Tyson Foods[15]**

Affiliates Key to Achieving SmartWay Clean Air Goals

SmartWay affiliates are a diverse group of more than 200 organizations with a shared commitment to clean freight, healthy air and a strong economy. Affiliates encourage members and customers to join SmartWay and move freight more efficiently. SmartWay affiliates include trade associations, truck dealerships, environmental groups, and truck rental and leasing companies, among others.

Penske is a SmartWay affiliate, logistics and carrier partner that takes an active role introducing SmartWay and supporting customers that participate in the partnership. For example, Penske offers customers the option to lease SmartWay tractors and trailers; helps complete their SmartWay carbon accounting tools and generates reports to help benchmark and monitor environmental progress.

Penske estimates that since 2011 its 'SmartWay' customers have improved their fuel economy by nearly 10 percent, while reducing particulate emissions and NO_x emissions by almost 90 percent and two-thirds, respectively. According to Penske, SmartWay's sustainability goals are part of its 'DNA' and the company is committed to working with its customers to achieve those goals: improved fleet efficiency, better environmental performance, reduced fuel use and lower costs.

The SmartWay Brand

The SmartWay brand is a recognized symbol of cleaner, more efficient transportation. Since its introduction ten years ago, the brand has:

- Helped achieve significant emissions reductions from goods movement.
- Raised awareness about the need to improve transportation sustainability.
- Motivated carriers, logistics managers and their customers to improve how they move goods, products and supplies, resulting in less fuel use, reduced costs and fewer emissions.
- Helped improve the freight industry's image among consumers and the driving public.
- Contributed to a steady growth in the number of companies and affiliates pursuing and delivering on environmental excellence through their participation in SmartWay.

Today, EPA, its partners, and SmartWay affiliates use the SmartWay mark to communicate our shared commitment to reducing transportation-related emissions. Each SmartWay mark is designed for a specific purpose in symbolizing clean transportation:

- EPA uses the basic SmartWay mark to educate and promote the partnership to industry, consumers and others.[16]

- The **SmartWay Partner Getting There With Cleaner Air** mark demonstrates and communicates an organization's participation in SmartWay and commitment to freight sustainability.

- The **SmartWay Proud Supporter** mark helps SmartWay affiliates educate their members and customers about SmartWay and encourage these companies to join the program.

- **SmartWay Designated** product marks are available to vehicle manufacturers to label eligible tractors and trailers at the point of sale. Truck operators also can display the SmartWay Designated mark on their vehicles to show their investment in clean and green equipment.

- Additionally, EPA offers the **SmartWay Certified** vehicle mark to enable consumers to identify the cleanest, most efficient passenger vehicles.

The use of each of these marks signifies a partnership between government, businesses and consumers united by a shared goal to protect our environment and improve air quality for future generations.[17]

SmartWay Brand Builds Awareness Around the Importance of Green Freight

Before SmartWay, the shipping industry didn't have a way to identify goods moved with reduced environmental impacts. Today, the SmartWay brand is well known as a symbol of green freight, and according to industry surveys, SmartWay and its partners are widely recognized for their leadership in moving goods using less fuel, more efficiently and with a reduced carbon footprint.

SmartWay built this awareness by introducing the SmartWay brand to create a greater appreciation for the benefits of greener freight. The SmartWay brand differentiates the delivery services of SmartWay partners and establishes credibility and customer trust. "Product on Wheels," SmartWay's first public service campaign, stood out for its innovation, using non-traditional images carried on wheels to deliver everyday products like fruit, cameras and shoes to convey the fact that fuel savings, clean freight and lower costs go hand in hand.[18]

SmartWay continues to promote the brand and encourages freight carriers, shippers and logistics providers participating in SmartWay to use it as a tool for identifying green freight. The SmartWay brand sends a clear signal to suppliers, customers and the broader public about a company's environmental commitment.

EPA SmartWay Technology Assessment Center

In the decades leading up to SmartWay, average fuel economy for combination trucks remained fairly constant, at 5 to 6 miles per gallon.[19] Despite the emerging availability of fuel-efficient equipment technologies, large truck carriers and independent owner-operators were reluctant to make technology investments without verification of benefits and a return on this investment.

Before SmartWay, it was hard for even sophisticated trucking fleets to sort through claims made about fuel-saving devices and equipment, or to understand how these devices might perform in their own freight operations.

Through SmartWay, EPA developed an objective, credible and transparent verification program that has served to demonstrate the effectiveness of various emissions control equipment and technologies. The program includes the development of testing protocols, equipment and vehicle demonstration tests, verification performance thresholds, and other data used in agency air programs and subject to scientific peer review.

Most recently, the program established specifications for aerodynamic equipment devices (trailer skirts, front and rear fairings, under-trailer devices) and low-rolling-resistance tires that trucking fleets can use for calculating fuel savings for SmartWay and SmartWay Elite dry van and refrigerated trailers.

By verifying the efficacy of truck equipment, such as idle control devices, aerodynamic fairings and low-rolling-resistance tires, and supporting market-based incentives to spur early adoption, SmartWay has served as a catalyst in advancing freight efficiency and as "proof of concept" for EPA's recent greenhouse gas and fuel efficiency standards for medium and heavy duty trucks. Specifically, the performance-based standards for Class 8 tractors used in the Heavy-Duty National program were informed by vehicle specifications developed through SmartWay.

Going forward, SmartWay's technology program will continue to spur innovation and encourage the adoption of cleaner, more efficient technologies that support and strengthen our nation's hard-working truck owners, drivers and trucking fleets.

SmartWay Vision 2020: A New Era of Sustainability

SmartWay and its partners have played a critical role in elevating the importance of efficiency and sustainability in the transportation supply chain. In the coming decade, EPA will continue this strong collaboration to develop and position the partnership so that it effectively meets the needs of its partners and the business community at large.

SmartWay Vision 2020 is the outcome of that collaboration, including input from many of our partners, and a specially convened federal advisory committee, the Clean Air Act Advisory Committee (CAAAC). In 2014, a panel of experts from a CAAAC workgroup issued a series of recommendations that EPA has shared with its SmartWay partners, many of which are included in this document.

These recommendations, in conjunction with the Agency's broader mission and goals, helped EPA create this vision that will enable SmartWay to continue driving down emissions, energy consumption and costs well into the next decade. EPA is pleased to share this vision here.

Advancing Sustainability Goals in the Transportation Supply Chain

Completing the Supply Chain

Companies serious about leaning their operations while reducing emissions are looking closely at the environmental performance of the carriers they hire, the transportation modes used to move their goods, and their overall goods distribution networks.

To give a fuller picture of freight's impact on the supply chain, both to and from the United States, SmartWay is developing tools so that emissions from all modes of freight transport can be tracked. SmartWay's existing toolset currently covers trucking, rail and, most recently, barge transport.

SmartWay carrier partners submit annual data about their freight activities—whether truck, rail, or barge carriers, or carriers that operate more than one mode of freight transportation ("multi-modal carriers").[20] SmartWay tools convert those data into reports on emissions and efficiency performance. Partners can use these reports to benchmark and chart their progress. There are also tools for third- and fourth-party logistics companies (3PLs and 4PLs) that handle freight on behalf of shippers. Through an interface with SmartWay's carrier and logistics tools, shippers can generate summary reports of their carriers' emissions data (truck, rail and barge), which gives any business a reliable and quantitative measurement of its transportation carbon footprint across its supply chain.[21]

In our increasingly global economy, many SmartWay shippers operate overseas and/or use air and maritime freight. SmartWay is planning to introduce quantification tools to assess and track emissions from air and ocean shippers. These additions will complement the existing suite of partner tools to

Barge: SmartWay's Newest Carrier Category

According to the U.S. DOT Maritime Administration, barge navigation serves 87 percent of all major U.S. cities and accounts for 79 percent of all domestic waterborne freight.[22] While many factors determine choice of mode, including scheduling, routes, and a need to change mode during transport, barge carriers are the most efficient among the modes SmartWay currently covers. Adding this mode in the 2014 data year allows SmartWay to characterize and understand a broader landscape of mode choice, and the resulting opportunities and outcomes of these choices.

provide a "one-stop shop," enabling shippers to assess the complete picture of greenhouse gas emissions associated with goods movement across all modes.

By providing a fully integrated suite of assessment tools capable of measuring transportation emissions from across the supply chain, SmartWay will support partner efforts to strengthen the sustainability of their complete freight operations. These tools will provide valuable data that companies can use to make decisions for adjusting the volume, distance, mode, technologies and other strategies to improve the performance and efficiency of their shipping operations throughout their supply chains. In addition, as an indicator of energy consumption, SmartWay's tracking tools are useful for identifying fuel use and costs directly associated with transportation—both meaningful measurements to design and shape high-performing global supply chains.

As SmartWay moves forward to enhance and expand business' capability to assess all freight modes, we collaborate with our partners, industry experts and other stakeholders. This enables us to stay informed of market drivers and fill gaps that will help strengthen the industry and equip it to stay one step ahead of the next challenge. The following two sections provide a preview of these enhancements to the program's modal assessment capability.

Air Freight

Working with SmartWay partners, EPA air quality modelers, the International Civil Aviation Organization, and other experts and stakeholders, EPA expects to add air cargo to its SmartWay suite of freight tracking tools in 2015.

The air cargo market consists of a few dominant air freight carriers and several smaller ones. Some air carriers already participate in SmartWay because they also operate trucking fleets. They support development of a tool that would allow integration of the air freight sector into SmartWay as a benefit to shippers by providing a more comprehensive view of their supply chain impacts.

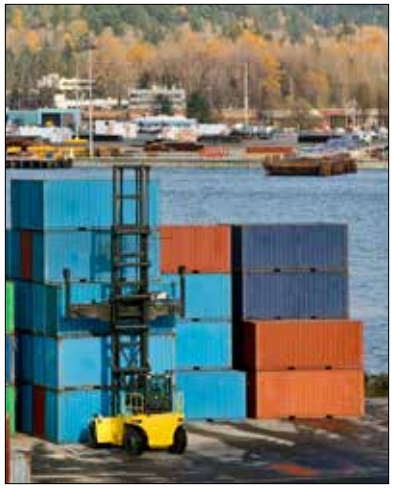
Additionally, public interest in aviation-related emissions is strong and many commercial and freight air carriers are beginning to provide information on the carbon dioxide emissions associated with air travel, including individual passenger travel and freight/parcel shipments.

Between 1993 and 2013, revenue cargo ton-miles by air carriers more than tripled, from 9 billion to 33 billion ton-miles.[23]

The SmartWay air tool will use data that are already being collected for other reasons by the Federal Aviation Administration and other agencies. This will minimize added reporting requirements while helping air carriers more fully realize the value of these data in carbon accounting and in demonstrating a commitment to sustainability and transparency. In addition to carbon dioxide emissions, the tool will provide information on emissions of particulate matter and oxides of nitrogen.

The air component will be fully integrated into the full suite of SmartWay's carbon accounting system, specifically the shipper, logistics and multi-modal tools. With the addition of air freight emissions, SmartWay moves one step closer to covering the entire freight supply chain.

Ocean Freight



The addition of ocean freight modes in SmartWay is critical to give businesses and the public a comprehensive picture of the carbon and other air emissions costs of moving goods. The increase in international trade over the past decade has placed a premium on ocean freight in the supply chain for many companies, large and small.

As a step in this direction, EPA will identify opportunities for reciprocity and data sharing that will enable us to further streamline and enhance the value of SmartWay's tools with the inclusion of ocean shipping. One challenge is the complexity of this sector. Segmentation and performance differences exist by vessel type and structure, cargo, and scope of operations, among others.

Nearly 80 percent of international trade relies on ocean-going vessels and container ships.[24]

Nonetheless, emission reductions and energy efficiency are a priority for ocean carriers across the board. Several organizations and government agencies have developed data sets, protocols and emission

factors to assess marine emissions from ocean-going vessels and container ships. Some have established methodologies and initiatives to measure and address energy use and emissions. Building on these efforts and SmartWay's successful collaboration with other business sectors, EPA plans to increase its engagement with the ocean transportation industry, to build a better understanding of how to account for shipping's carbon footprint. This will include exploring existing environmental and carbon assessment approaches, as well as the need for additional or enhanced methods or tools that would support ocean carriers and shippers in measuring and comparing the impacts of various goods movement choices, such as near-sourcing, mode shifts and other operational strategies. As with other sectors, our plan is to collaborate with industry, scientists and other experts to develop a SmartWay tool that will best meet the maritime sector's needs for monitoring and establishing carbon inventories and roll this out within the next two years.

Addressing Other Pollutants

In addition to measuring carbon emissions across all modes, SmartWay is researching tool improvements that will give partners emissions data on other pollutants that contribute to climate change, starting with black carbon.

Black carbon is a component of fine particulate matter. Short-term and long-term exposures to fine particulate matter are associated with a broad range of human health impacts. Recent research shows that in addition to causing serious health effects, black carbon is a major contributor to climate change.[25]

Black carbon influences climate by directly absorbing light, reducing the reflectivity of snow and ice through deposition, and interacting with clouds. Black carbon is called a "short-lived climate forcer," because it lasts in the atmosphere for only days to weeks after being emitted. However, black carbon is the most strongly light-absorbing component of particulate matter and can absorb a million times more energy than carbon dioxide per unit of mass in the atmosphere. When black carbon is released to the atmosphere, its warming effect is more immediate and powerful than that of carbon dioxide or several other greenhouse gases. Consequently, targeted strategies to reduce black carbon emissions can be expected to provide climate benefits within the next several decades.

Diesel-powered vehicles and equipment, including heavy-duty trucks used to move goods, are a significant source of black carbon in the United States and elsewhere. In the future, EPA—in collaboration with other experts in the scientific community—will refine its methodologies and tools to incorporate black carbon, so that SmartWay partners can track and monitor their progress in reducing it.

Reaching Consumers and the Public

As critical as the issues of globalization, trade growth and technology advancement are to business' bottom lines, EPA and its SmartWay partners also recognize the value of an informed public and smart consumers.

Surveys show consumers increasingly taking an interest in the story behind the products they buy, asking companies to disclose not only social, labor and manufacturing practices across their supplier and production networks, but also the amount of carbon dioxide that was emitted producing and distributing these products. In a recent study of online shoppers, respondents indicated that they would be willing to pay more or wait longer for goods ordered over the Internet if they were given a sustainable delivery option.[26]

SmartWay will continue seeking innovative opportunities to educate the public on the economic and environmental importance of transportation and how it contributes to our quality of life. We will do this by extending the ways in which we engage and broaden the public's knowledge and understanding of goods movement, and highlight the efforts SmartWay partners are making to reduce the environmental impacts of transportation.

SmartWay is already an active participant in online and social media. Going forward, we will step up these efforts and strengthen our support of affiliates and partners who are reaching their members, customers and suppliers through their own Web channels, direct marketing, loyalty programs or other innovative outreach methods. We will work with them to create messages that communicate the importance of freight to the economy, our quality of life and the environment. We will coordinate with our partners in creative ways that resonate with stakeholders. This can include public service announcements, communication about their SmartWay participation and results, development of curricula or other educational material, featured articles in trade media and newsletters, blog posts and other social media outreach.

Sustainability Reporting

As part of their sustainability goals, many companies are beginning to routinely monitor carbon emissions and establish an inventory or overall "carbon footprint," used to help identify strategies for reducing climate impacts. For guidance in preparing inventories, companies look to existing protocols for help in measuring their greenhouse gas emissions.

Until recently, the focus of protocol organizations has been to require companies to report carbon inventories from activities under their direct control, such as their manufacturing operations, characterized as "Scope 1" emissions, and the direct production or purchase of energy, or "Scope 2" emissions.[27]

Though these direct emissions may contribute to a large part of a company's carbon footprint, indirect carbon emissions—from sources upstream and downstream in the supply chain—are often an even greater part of the total footprint, depending on its business.[28] Indirect or "Scope 3" emissions consist of a broad range of activities, including transportation.[29]

EPA is actively working with several large, global protocol organizations, including the Global Reporting Initiative[30] and the Carbon Disclosure Project,[31] to integrate SmartWay carbon data into their guidelines and standards for purposes of specifying emissions from goods movement across the supply chain. Because SmartWay carbon data are generated with scientifically based methods using EPA emission factors, these data provide consistent and comparable metrics for freight emissions across all industry sectors. Further, SmartWay also provides a template for collaboration along the supply chain, encouraging shippers to collaborate with their freight carriers and establish shared efficiency goals.

> *Our success in measuring, and then shaving, energy demand and resultant Scope 1 and Scope 2 emissions associated with our brick and mortar operations has allowed us to apply the same productivity lens to reducing Scope 3 tailpipe emissions from vehicles that transport our finished goods and our employees. Our SmartWay Transport Partnership is the most well established of our Scope 3 emissions and reduction initiatives and has stimulated parallel efforts around the globe.*
>
> **— Deborah Patterson, Vice President Environment, Health and Safety Stanley Black & Decker[32]**

Strengthening the Brand

The SmartWay brand is well known within the business community, and many of our partners are leveraging the brand's reputation in the consumer arena. Going forward, SmartWay will seek opportunities to use its brand to heighten consumer interest in sustainable transportation.

For example, an innovative packaging pilot has allowed several electronics manufacturers to use the SmartWay partner mark to identify products transported by select, high-performing SmartWay partners. We intend to expand this initiative so more of our partners can take advantage of it.

Many carrier partners already display the SmartWay Designated mark on freight trucks and trailers that meet performance criteria developed by SmartWay. Meanwhile, automobile manufacturers can display the SmartWay Certified mark to identify passenger cars and trucks that emit less greenhouse gas and smog-forming tailpipe emissions. We will work to expand the use of the logo by encouraging more manufacturers to achieve the required performance levels and display the logo on their vehicles.

Why Is This Car Smiling?

EPA's SmartWay certification program for cars makes choosing the most environmentally friendly vehicle easy. To save fuel, money and the environment, car buyers can just look for the SmartWay Certified mark, which identifies the 20 percent lowest-emitting passenger vehicles in every class, from small cars to vans and SUVs. Each model year, EPA rates new passenger vehicles for greenhouse gas and smog-forming emissions on scales of 1 to 10. To earn the SmartWay designation, a vehicle must receive a combined score from both scales that is much better than the average vehicle in its class. EPA highlights this list of SmartWay Certified vehicles in its Green Vehicle Guide at www.epa.gov/greenvehicle/. The guide also offers helpful tips and suggestions for the driving public on how to cut down on driving expenses by saving fuel.

Education

Supply chain management has become a critical business discipline, affecting an organization's corporate strategy and bottom line. In response, universities and business schools throughout the United States now offer degrees and certificates in supply chain management.

A number of universities are integrating SmartWay into their curricula, across a range of academic disciplines and research projects. Some courses examine the importance of partnerships, sustainability and performance metrics in driving business and environmental change. Others look specifically at supply chain management and the economics of improving efficiency in transportation, warehousing and logistics management. The federal government, one of the world's largest "shippers," incorporates SmartWay in its own procurement and transportation management training courses.

EPA plans to continue its positive influence with educators and researchers on sustainable business strategies and practices. We will seek additional opportunities to introduce SmartWay and the partnership's approach toward strengthening supply chain performance through ongoing collaboration with students, teachers, education administrators, nonprofit organizations and the federal community.

Communities

Neighborhoods near busy highways, marine and rail terminals, airports, and other freight centers are disproportionately impacted by emissions, noise, congestion and other effects. In these areas, EPA and SmartWay are identifying actions we can take to support freight facilities in improving communication and integration with community needs and goals, and in reducing greenhouse gases and other harmful air emissions. For example, EPA is exploring ways to collaborate with states, local agencies and communities near busy transportation corridors where SmartWay's environmental goals can help contribute to regional, state and local air quality plans.

Facilitating Collaboration on a Global Stage

Applying SmartWay Approaches Globally

As a leader and early pioneer in the freight sustainability movement, SmartWay is invited to engage with a broad range of national and global initiatives. Due to the maturity and success of SmartWay, EPA is in a good position to share its technical expertise for furthering these initiatives, regardless of their stage of development, including:

- Partnership building and development
- Branding and recognition
- Technology verification support
- Performance benchmarking and measurement tools

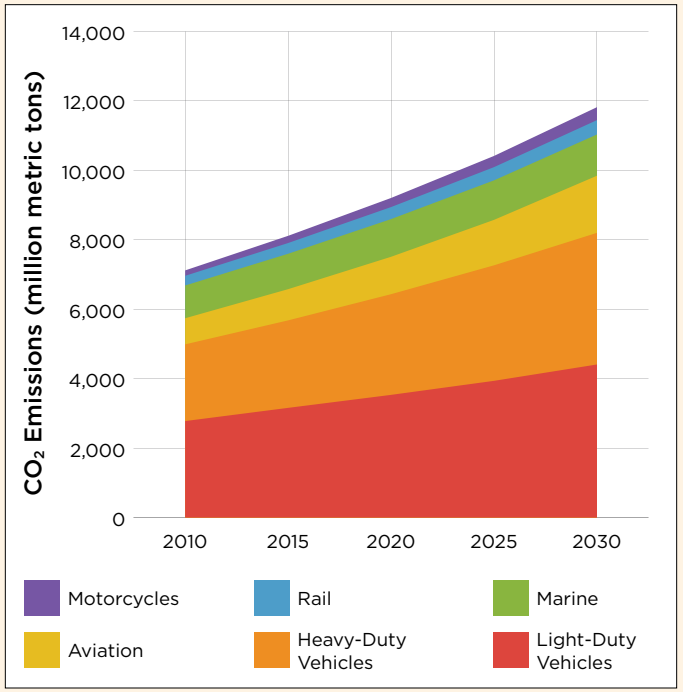
In addition to the environmental benefits, this interaction has a positive effect for U.S. businesses that are sourcing from, or selling to, these global markets.

For example, China—our nation's second-largest trading partner—and the United States recently formed a bilateral Climate Change Working Group to address climate emissions through a broad range of initiatives including the China Green Freight Initiative (CGFI).[33] Under this initiative, EPA is collaborating with China's Ministry of Transport, Ministry of Environmental Protection and other agencies to foster the development of more sustainable supply chains, using SmartWay as a model. EPA helped lay the groundwork for this collaboration a few years earlier, when China conducted a pilot "Green Truck Demonstration" in Guangzhou, China, working with EPA and using combinations of SmartWay verified technologies. The success of the pilot prompted China to implement a larger green freight demonstration pilot in the Guangdong Province, with funding assistance from the World Bank, and again supported by SmartWay.[34] The success of these pilots led the United States and China to incorporate green freight as part of the Climate Change Working Group's bilateral climate strategy. SmartWay—its program design, partnership model, carbon accounting tools and technologies—is integral to this effort. EPA will continue to support this effort and contribute to its success. As part of a CGFI expert group, we will offer technical and policy recommendations to assist with further program development. EPA also intends to continue its participation in an annual summit sponsored by China Green Freight, where stakeholders representing both programs share information and exchange ideas on program developments and related interests.

Looking further across the developing world, SmartWay is playing an increasingly active role in the development of a Global Green Freight Action Plan, an initiative launched by the United Nations Environment Programme's Climate and Clean Air Coalition (CCAC).[35] The plan is an outgrowth of CCAC's work to address short-lived climate forcers, including a project to reduce black carbon and greenhouse gases from heavy-duty vehicles and engines, especially in emerging regions. Under that project, EPA is sharing best practices and lessons learned through SmartWay. This includes development of a workbook intended as a "how to" manual for any region or country that is looking to adopt SmartWay's approaches in areas such as partnership development, technology verification, branding and recognition, and other program fundamentals.[36] The workbook is currently available in five languages: English, Spanish, Mandarin, French and Portuguese. EPA will continue to support CCAC's development of complementary training tools that draw from the SmartWay experience: a trainer guide to help educators teach the lessons in the SmartWay green freight workbook; companion slides that summarize the workbook content, to use as a visual aid in teaching this material; and a guide to help countries and regions establish credible technology verification programs, based on SmartWay's technology verification model. EPA will continue supporting broader global technical and capacity building efforts by participating in future CCAC activities that may include regional train-the-trainer workshops to share SmartWay tools and approaches.

EPA and SmartWay are also providing guidance in South America, where efforts are underway to assess the prospects for developing a regional green freight effort. EPA is contributing to efforts in São Paulo, Brazil, where discussions center on developing support for a growing green freight effort in South America. Working with local experts and development organizations, EPA will advise on how to approach the design, development and implementation for a broader regional effort that could launch from Brazil. This work may include regional workshops and technology pilots in key countries such as Brazil, Chile and Mexico.

Figure 5. Growth in Global Carbon Dioxide Emissions by Transportation Mode



This chart reflects projected growth in global carbon emissions between 2010 and 2030 based on an analysis of tank-to-wheel vehicle emissions and fuel use developed by the International Council on Clean Transportation. International policies and standards, including U.S. vehicle standards adopted in 2014, have helped to slow this rate of growth. Increases in vehicle miles traveled, however, will result in higher future CO_2 levels. EPA works with several global organizations to support adoption of SmartWay's best practices in freight management with a goal to reduce transport emissions, now and in the future.

Similarly, in Europe, SmartWay helped lay the foundation for Green Freight Europe,[37] an initiative aimed at providing a single platform for shippers and carriers to assess, validate and benchmark the environmental performance of transport operations. A consortium of U.S. businesses with EU operations formed to pilot tools and methods modeled on SmartWay. EPA will extend its collaboration with this consortium by sharing best practices and promoting green freight efforts with a growing group of global shippers and carriers.

EPA is also coordinating with experts from academia, industry and nongovernmental organizations that have formed a "Global Logistics Emissions Council" with the future goal of creating a framework of environmental metrics covering freight movements throughout the world.[38] As with EPA's other global efforts, the goal isn't to replicate SmartWay everywhere, but rather to advance more aligned approaches that can complement one another. This avoids a patchwork of competing and potentially confusing efforts, which contributes to each program's environmental success while supporting U.S. businesses that buy and sell to the global market.

Promoting North American Supply Chain Efficiency

With SmartWay as a template, both Canada and Mexico have reached out to engage, collaborate and build public-private partnerships with stakeholders that

are based on a mutual understanding of the goods movement and supply chain issues in their respective nations.

In 2012, EPA and Natural Resources Canada formed an agreement to expand SmartWay into Canada as one seamless cross-border program.[39] Over the next few years, Canada developed its freight partnership using SmartWay's program design, including a shared set of standard quantification tools and methodologies, a common program name, and a consistent approach to performance benchmarking. Looking to the future, the two nations plan to further collaborate and harmonize efforts to reduce transportation emissions. For example, working together, EPA and Natural Resources Canada created e-learning short courses for professional truck drivers. The SmartDriver tools help drivers understand the relationship between their driving behavior and fuel consumption, and how simple technology choices can contribute to improved fuel efficiency. The majority of the strategies demonstrated in the training courses can be applied by trucking fleet operators of any size, from large fleets whose drivers access the newest vehicles, to smaller businesses that operate older or pre-owned trucks. And going forward, as SmartWay expands to cover all modes within the goods movement supply chain, the two nations will continue to collaborate on effective ways to reach out to stakeholders across modes and across borders.

EPA is also collaborating with the United States' third largest trading partner, Mexico, to improve supply chain efficiency across North America. In 2011, using SmartWay "generation one" tools and methods, the Mexican government launched its Transporte Limpio ("Clean Transportation") program.[40] The program now includes over 100 companies, including many U.S.-based SmartWay businesses. EPA and its counterpart, Mexico's Secretariat of Environment and Natural Resources, plan to continue working together to further enhance and grow Transporte Limpio while exploring ways to more closely integrate Transporte Limpio with SmartWay in the United States and Canada. These efforts will ensure that businesses—regardless of location—can reap the benefits of a more comprehensive and consistent North American strategy to transform the freight marketplace and prepare it for the future.

Informing the Marketplace

For years SmartWay has served as a credible and reliable information source, helping the industry achieve efficiency gains that may not otherwise have been possible. As an industry resource, we've effectively helped bridge the knowledge gap between freight professionals, technology providers and manufacturers across the board.

Looking ahead, we anticipate that the demand for our expertise and service will only increase. To meet the growing information needs of our partners and the larger domestic and global freight community, SmartWay will continue serving as a convener of information and data.

We will do so by leveraging our connections with leading EPA climatologists and environmental scientists, other government agencies, and their research arms. Working with our partners, we will also access experts from their organizations, trade associations, nonprofit organizations, academia and others. For example, SmartWay and the ENERGY STAR® program recently collaborated on an effort to help warehousing and distribution centers improve efficiency and cut costs by providing tools to assess energy and emissions from both their facilities and shipping operations.

Driving Best Practices in Freight Data Management

Reducing carbon emissions using strategies to improve fuel efficiency requires an understanding of the carbon accounting process, an essential step for carbon management. Using SmartWay's tools enables partners to assess and benchmark performance, and to integrate the results into their Global Reporting Initiative, Carbon Disclosure Project and other reporting efforts.

Going forward, EPA intends to continue to train and educate SmartWay partners in the most effective processes and data requirements to create robust annual environmental performance assessments in their freight operations. SmartWay will continue to build communication tools and approaches that help logistics and sustainability experts integrate this environmental and efficiency information into corporate-wide planning. For example, SmartWay has incorporated interactive, instructional aids into many of its tools, providing real-time assistance to streamline data reporting and reduce errors.

And, to ensure consistent and reliable data across the supply chain industry, SmartWay will continue to drive best practices in data collection, data management and safeguards to ensure data accuracy and consistency. For example, in 2013 we published a guidance document on best practices, *SmartWay Transport Partnership: Driving Data Integrity in Transportation*

Supply Chains.[41] We plan to update this guidance as the program expands to cover more modes.

In addition to this guidance, SmartWay will host webinars, workshops or other opportunities to convene experts in the field, inviting them to share innovative strategies and best practices that leading-edge organizations use to improve freight efficiencies—and their bottom line. Businesses adopting these strategies, such as mode diversification, also have the added benefit of improving the resiliency of their supply chains. SmartWay will encourage partners and other businesses to use these tools to influence the practices of suppliers and others engaged in their supply chain network. In this manner, efficiencies can be gained and best practices adopted across the entire supply chain—outbound and inbound, direct and indirect, domestic and international.

Technology Verification

Over the past decade, technologies have made unprecedented impacts on improving supply chain freight efficiency. Fleets are adopting sophisticated logistical tools, improvements in containerization and real-time monitoring to control the flow of goods. At the same time, the SmartWay Technology Program has verified numerous innovative technologies which fleets are adopting because of their quick return on investment.

Technology improvements will continue to be a major influence in furthering efficiency. EPA's first heavy-duty greenhouse gas regulations have stimulated tractor and engine manufacturers to adopt and integrate more technologies to reduce emissions. These efficiency improvements are being recognized by SmartWay partners who are buying new trucks in record numbers.

The SmartWay program will continue to evaluate and highlight technology opportunities. Through research and peer-reviewed technical papers, the SmartWay Technology Program is working with industry to improve the understanding, confidence and performance in fuel saving technologies. SmartWay Designated Tractors and Trailers have been and will continue to be convenient methods of recognizing top performance in the trucking industry.

Operational Strategies

While equipment technologies can help improve day-to-day operations in supply chain transportation, technology is not the only answer. Our partners are integrating a range of strategies, often combining multiple technology solutions with advanced logistics and sophisticated supply chain modeling tools.

To support our partners, SmartWay analyzes and shares information on the emissions, performance benefits and cost savings of these operational practices including route optimization, driver training programs, increased intermodal utilization, collaboration, packaging efficiencies and load optimization to remove miles or weight.

For example, studies have shown a strong link between driver behavior and a truck's fuel economy and emissions. Through our partnership with the American Trucking Associations (ATA), SmartWay reaches out and joins ATA in its annual Truck Driver Appreciation program. We recognize smart driving practices and promote efficiency gains that drivers can achieve through minor improvements in how they drive. Through EPA's agreement with Natural Resources Canada, SmartWay has made available a suite of online SmartDriver training modules aimed at teaching drivers to maximize freight efficiency and use advanced technology systems to improve logistics and reduce emissions.[42]

Besides advocating for smart driving behaviors to save fuel, cut costs and reduce emissions, SmartWay will continue to inform the shipping community about a variety of innovative sustainable operational strategies that businesses can incorporate into their shipping operations. In the future, as new operational strategies emerge, SmartWay will evaluate, publish and highlight case studies, partner data and other information to quantify the benefits of these strategies. These can include near-shoring, low-carbon fuels and equipment and route-sharing. As EPA extends SmartWay's reach internationally by its leadership role in global green freight efforts, SmartWay also will encourage opportunities to promote more low-investment, high-return operational strategies, including in emerging nations that supply U.S. businesses.

Helping Small Businesses Thrive

An overwhelming majority of truck carriers are small fleets, including independent owner-operators. About 25 percent of SmartWay carriers are fleets with no more than 20 trucks.[43] SmartWay has committed time and resources to provide small independent owner-operators with technical advice and support, access to funds, and recognition for their efforts to operate their trucks more efficiently.

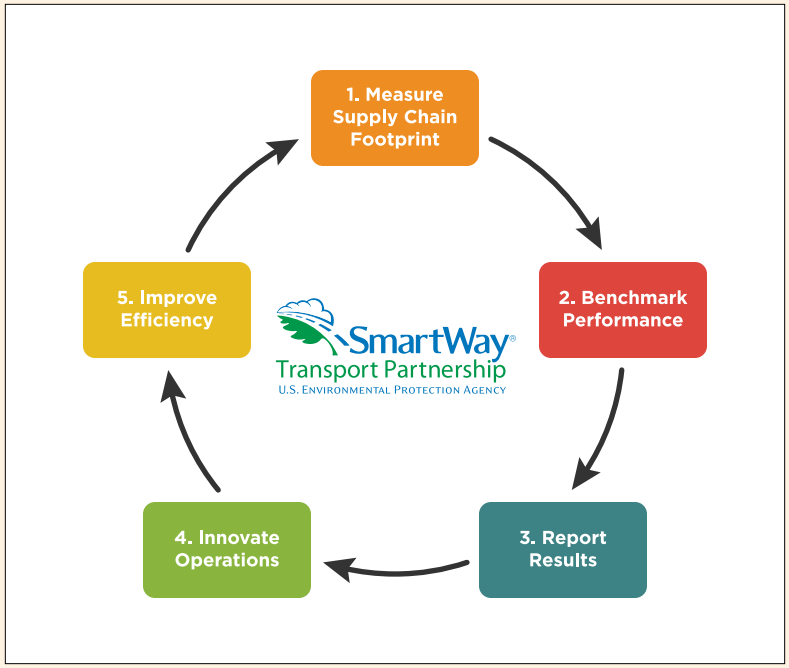
Going forward, SmartWay plans to streamline and develop tools and mobile device applications that will make it easier for small businesses to participate in SmartWay and meet the challenges of our changing industry. This will help further the benefits of SmartWay in communities, as many intra- and inter-city deliveries are handled by smaller, independently owned and operated companies.

Performance Benchmarking

Performance benchmarking is a SmartWay hallmark, and the partnership is committed to offering effective, up-to-date performance indicators and metrics. We will continue to encourage SmartWay partners to analyze their operations and submit data on an ongoing, annual basis to foster continuous improvement within companies and across the freight transport industry.

These data enable companies operating in the same business sector to benchmark and compare their performance while preserving anonymity, helping to foster a healthy competition.

Figure 6. SmartWay Best Practices Performance Benchmarking



To benchmark performance for freight transport, a SmartWay partner:

1. Measures its transportation footprint using SmartWay's peer-reviewed tools.
2. Uses SmartWay data outputs to assess its freight performance, compare the result to performance in previous years, and benchmark against SmartWay peers.
3. Reports results internally and externally to customers and shareholders.
4. Identifies and selects strategies and options for improving freight operations.
5. Implements technology and operational innovations.

Beyond the 2020 Horizon: Achieving a Shared Vision for the Future of Freight

Growing public concern and the increasingly damaging effects of climate change, unstable energy costs and globalization will continue to significantly affect the transportation industry into and well beyond 2020. EPA and its SmartWay partners are committed to meeting the challenges and seizing opportunities that the future holds. Working together through SmartWay, we will succeed in developing a more sustainable and high-performing freight sector.

Achieving a Shared Vision

Today, scientists and other experts from around the world have compiled comprehensive information on the harmful impacts of increased greenhouse gases and other air pollutants on human health and well-being, and on the delicate balance of our planet's biosphere and climate. This rise in greenhouse and other climate-forcing air pollutants is closely tied to the rapid increase in global industry and commerce as nations build and expand their economies to raise the standard of living for their citizens.

Yet, as SmartWay demonstrates, prosperity and sustainability are highly compatible. As we enter a period of rapid expansion of trade across national boundaries, EPA and its SmartWay partners are lending considerable expertise, knowledge and capability to improve sustainability in goods movement, which in turn reduces business costs and supports a vibrant economy.

This effort is especially important as individual consumers, investors, academics and others are making day-to-day decisions on what goods to purchase, which businesses to support, which technologies to research or adopt, and where to invest hard-earned resources. We are basing these decisions not only on our current circumstances, but on a deepening awareness of how we are affecting the world in which we'll live tomorrow, and the world that we are leaving for future generations.

The transparency and comprehensiveness of data that SmartWay provides; the methodologies and awareness it brings forward that accelerate adoption of cleaner, lower-carbon technologies and operations; the incentives it offers that drive the market mechanisms involved in goods movement to operate more efficiently—all of these contribute positively to the world in which we live and that our children's children will inherit.

In addition to the need to cut carbon emissions, there is an emerging awareness of our need to plan for transportation systems that are better adapted to handle the changes

brought about by climate change. Higher temperatures, erosion, flooding, wildfires, extreme weather events and other impacts can place more stress on our freight infrastructure and cause closures or disruptions of goods movement routes. By increasing the efficiency of today's transportation supply chains, sharing data and information, and raising awareness about the benefits of intermodal and multi-route options, SmartWay can also contribute toward planning more resilient freight transportation networks.

Collectively, SmartWay and its partners are making a difference today and taking steps to plan for tomorrow. These actions will contribute toward achieving our vision for a sustainable freight future in the 2020 decade and beyond.

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