# Achieving Greenhouse Gas Goals

## How Organizations Reduce Carbon Emissions

PRESCOUTER

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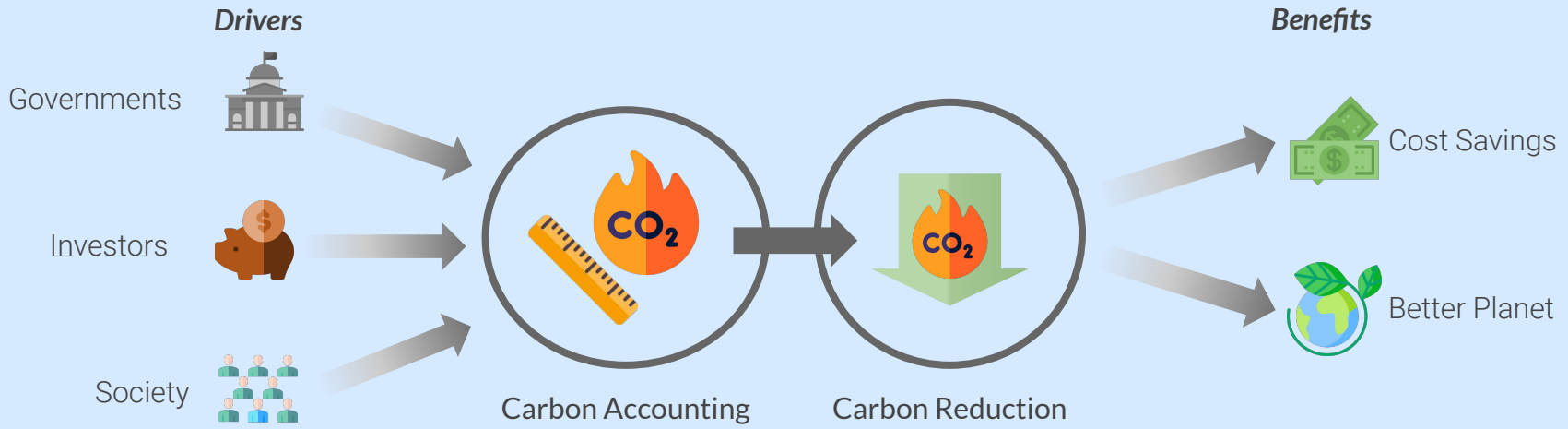
**This is not the decade for action; this is the year for action.** The once gentle nudges from governments, investors, and society are becoming painful taxes, investment blacklists, and consumer protests. To survive and thrive in the coming decade, companies can follow the steps we outline in this report to account for and reduce their carbon emissions.

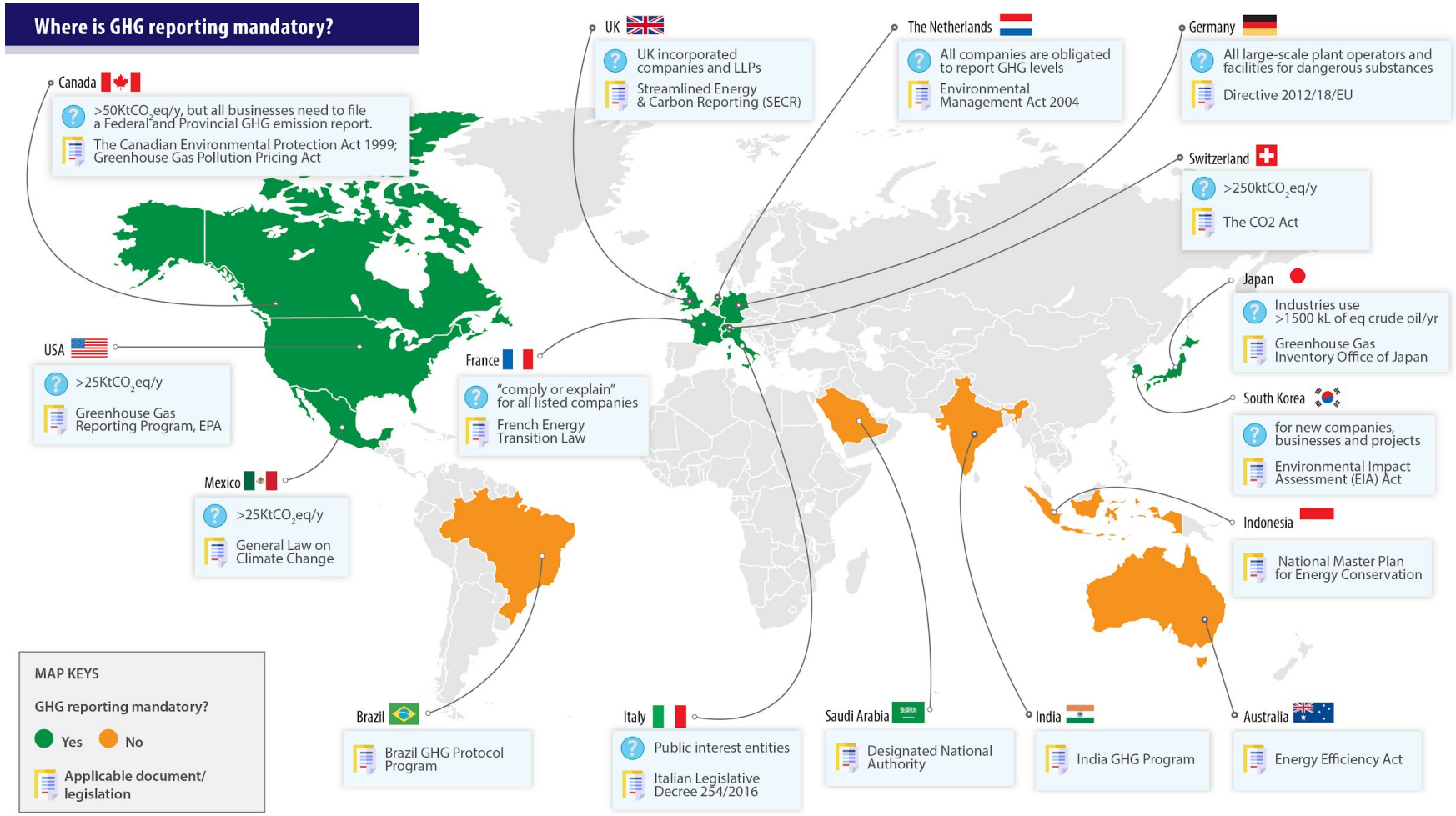
Becoming carbon neutral or achieving net-zero emissions is not an easy task. It certainly cannot be achieved overnight. Nevertheless, there is increasing evidence that companies embarking on this path are finding greater profitability while making the planet better.



# Governments are increasing carbon reporting requirements for organizations.

While the earliest carbon reporting regulations date back to 2003 in the European Union and 2004 in Canada, many of the top 20 countries by GDP have now implemented reporting requirements.

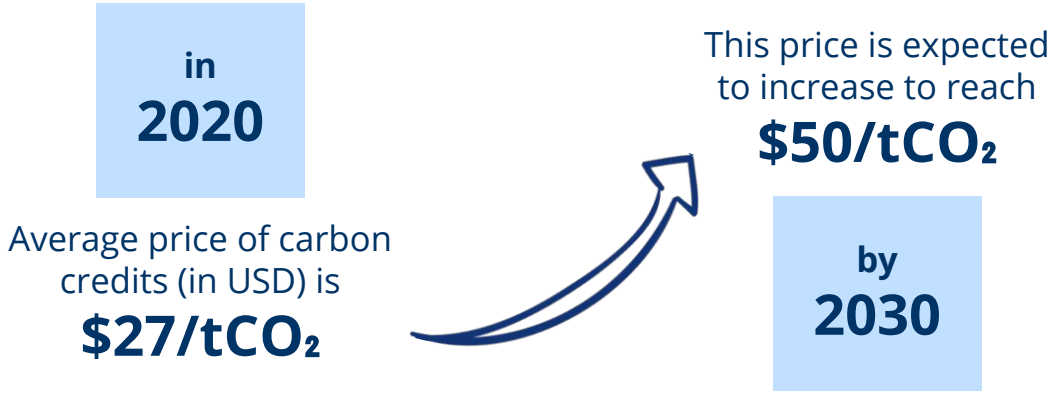
These reporting requirements have typically targeted industries with the greatest emissions but are expected to expand to wider groups of companies over the coming decade.



# Beyond reporting, governments will likely use carbon taxes to drive organizations to meet carbon emission targets.

Globally, 40 countries already use carbon pricing, with 64 initiatives implemented or scheduled for implementation.

Carbon credits could cost 85% more in 2030 than they do today. The price of carbon credits has seen an increase in the past few years, with high variability today, ranging from as low as US$1/tCO₂ to a maximum of US$139/tCO₂ but averaging around US$27/tCO₂. Forecasts place it up to US$50/tCO₂ in 2030, even as some countries are already setting targets >$100/tCO2 (e.g., Canada)




Relying on carbon credits will represent paying
**85% more**
for those same emissions by 2030

which translates to an extra
**USD 800 Billion**
to the total $CO_2$ emissions **ten years from today**.

The price of carbon credits is going up, and paying them can only be a short-term solution. Relying on carbon credits alone is not a sustainable long-term solution.

# Investors are increasingly using environmental impact to evaluate companies.

During the COVID-19 pandemic, emphasis on climate change became an even greater focus among investors, who piled into the stocks of sustainable companies. This drove up the values of companies like Tesla and doubled the money invested in sustainability-oriented mutual funds.

**What is important about 2050?** As pension fund holders whose funds mature beyond 2050 become the majority, concern is increasing about the impact of climate change on companies in these investment portfolios. Fund holders are also concerned with how these companies are aiming to reduce their contributions toward climate change.

TCFD, championed by **Michael Bloomberg**, provides provides a standard for voluntary and consistent climate-related financial risk disclosures in mainstream company filings. In November 2020, the UK announced that climate risk reporting aligned with TCFD will become mandatory for large companies and financial institutions.

**Christopher Hohn**, a billionaire hedge fund manager, is financing a campaign to force at least 100 of the companies in the S&P 500 stock index to publish their carbon emission reduction plans and put them up for a shareholder vote.

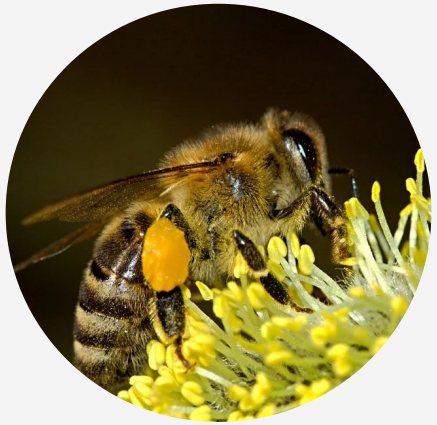
BlackRock is arguably the world's most powerful investor, controlling nearly $9 trillion in investments. BlackRock chief **Laurence D. Fink** is calling on all companies "to disclose a plan for how their business model will be compatible with a net-zero economy". BlackRock plans to adjust its investment process for its actively managed funds, scrutinizing and flagging companies for climate risk.

# WHAT DOES A 3% INCREASE IN TEMPERATURE MEAN?

All arctic summer ice will be gone, and higher temperatures will also exacerbate rapid polar melting, causing further havoc in the climate system.

All coral reefs will die & the associated global tourism industry will dwindle.

Global food production & availability will be at high risk.



>30 % of the insect population will die, therefore destabilizing much of the required biodiversity that protects our agriculture systems.

# Organizations are also facing increasing societal pressure.

## Protests

Inspired by Swedish schoolgirl Greta Thunberg, over 4 million people, many of them school children, participated in a climate strike in September 2019 to demand action by political leaders to prevent climate change. Smaller scale protests are now a regular occurrence across the globe. Fridays For Future reports that 79,000 strikes across 7,800 cities have taken place since early 2019.

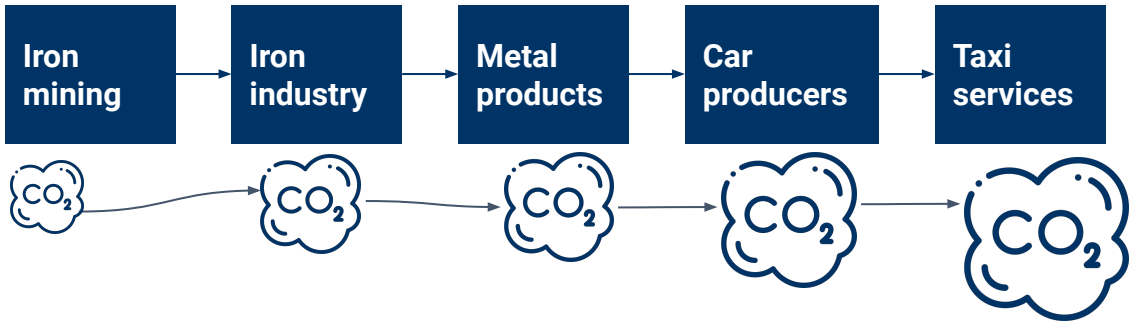

*San Francisco Youth Climate Strike - March 15, 2019*
*Image: WikiCommons*

## Changing Customer Preferences

Between 2013 and 2018, products marketed as sustainable grew 5.6 times faster than those that were not, with Unilever claiming that its "sustainable living" brands now deliver 70% of its turnover growth. As customers modify their preferences to reduce their own emissions, these changes could boost or erode demand for all types of products.

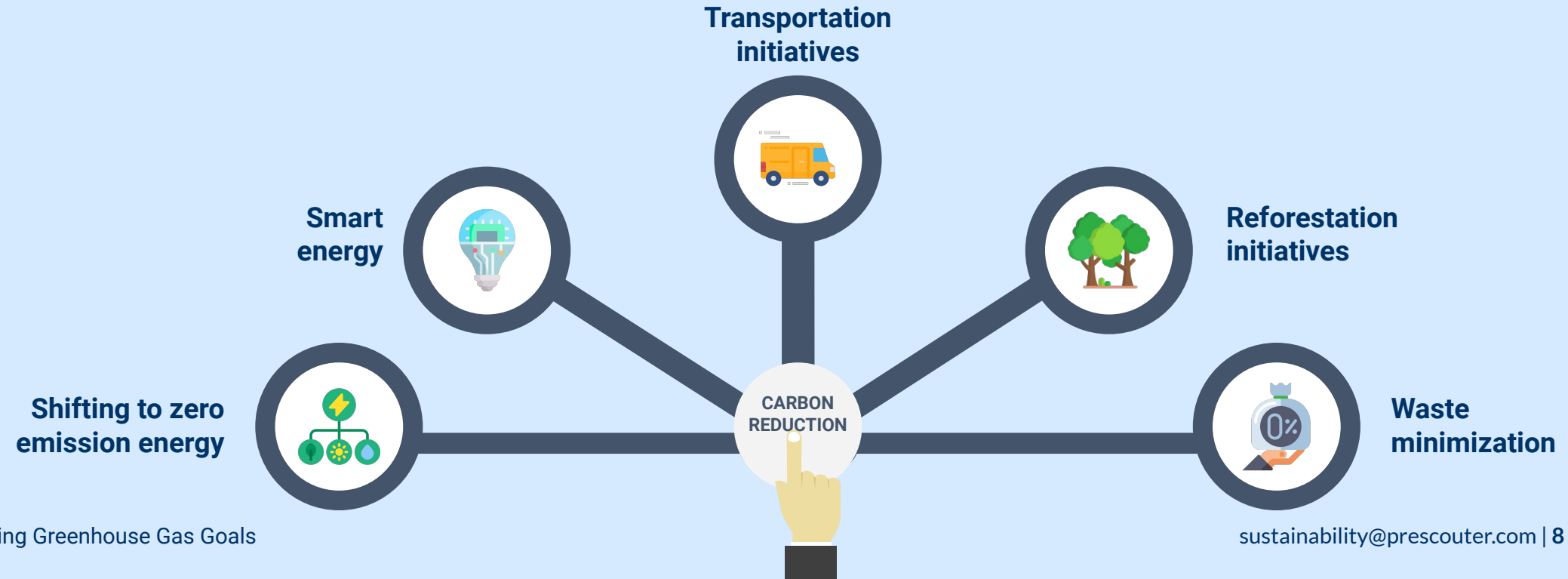
### The Reconfiguring Supply Chain

As consumers move to more sustainable products and services, companies will look at shifting their entire supply chain to reduce their emissions from their supply chain. This example is for logistics services.




## **Carbon Reduction** - *Finding what works for your business.*

The carbon management strategy that best suits each company is highly dependent on the type of service and/or product a company offers. However, there are five broad carbon reduction strategies that have shown results for the early leaders in carbon reduction. Companies should test and experiment with these - and other - strategies until they find approaches that work best for achieving their carbon reduction goals.



# Shifting to zero emission energy

Renewable energy can provide a 90% reduction in energy-related GHG emissions. Coupled with improved energy efficiency, renewables can significantly bring down energy costs/expenditures.

Solar and wind power are currently the least expensive green energy alternatives and the "lower-hanging fruit" when it comes to shifting to non-emitting energy.

Emerging technologies in those spaces involve **multi-rotor wind turbines** (with higher efficiency than conventional turbines) and **solar glass and solar cladding** construction materials (which provide an incentive for users concerned about balancing aesthetics and functionality).

**Solar rooftop installations** represent one strategy many companies have adopted. Examples include Target, Walmart, IKEA, Kimco, and General Motors.

**Wind farms** are another investment to provide a green source of energy. Advances in turbine technologies are improving the output and lifetime of parts. IKEA Canada purchased two wind farms in 2013 and 2017 that account for 4X more than the total energy they use across Canada.

**The solar-wind alliance:** Relying on both these sources is the most sound strategy to cover most, if not all, energy requirements. Walmart is collaborating with Schneider Electric for more than 8GW of wind & solar power.

**Get started by:**

1. Identifying local renewable energy providers
2. Vetting each solution for suitability and cost. You'll also need to reach out for a quote.
3. Comparing each solution, keeping in mind ROI and make a choice.

**PreScouter has helped dozens of clients make this shift. It certainly isn't a one-size-fits-all type of solution. Shoot us an email and let's discuss what's best for your business.**

# Shifting to zero emission energy

Multi-rotor turbines produce 2% more electricity than conventional turbines. Image Source: Power Technology.

Installation of Mitrex Solar Cladding Building Materials. Image source: Mitrex.

# Smart energy

Artificial intelligence (AI) has the potential of reducing global GHG emissions by **4% by 2030**.

However, the **combination of AI and the Internet of Things (IoT)**, being dubbed as AIoT, is bringing enhanced capabilities for better energy management. Such capabilities include curbing energy waste, increasing energy production and improving an organization's overall energy infrastructure.


**EXTRA READING**

Tapping into AI has never been easier with the advent of 3rd wave AI. Enjoy this free resource that shows how companies are tapping into the benefits of 3rd wave AI today.

A Marriott hotel in Halifax, Nova Scotia, installed an AI solution for **HVAC energy efficiency** in June 2020. Five months later, Marriott reported a 24.5% reduction in natural gas consumption and 3% for electricity.


Shell and Microsoft have formed an alliance to help meet carbon goals. One aspect of this alliance is to continue working together on AI. As of Sept. 2020, Shell has announced the deployment of 47 AI-powered proprietary applications across its businesses. Technologies such as Real-Time Production Optimization have already shown potential to reduce CO2 emissions in Shell's liquefied natural gas (LNG) operations.

mCloud employs IoT sensors to bring data from connected assets into the cloud, where AI and analytics are applied to maximize their performance through the Company's AssetCare solution. This solution is ideal for curbing energy usage in older buildings, where implementing a complete HVAC system update is not cost effective. Chinese-based Heiwado Shopping Center deployed AssetCare and reported 25% savings in HVAC energy usage and an 8% net reduction in energy use overall.

# Transportation initiatives

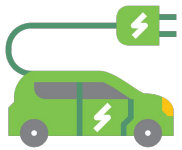
16.2% of energy consumption comes from transport leading to GHG emissions. Constant and rigorous initiatives are being taken, including direct support for electric vehicles (EVs), installation of more charging stations for EVs, hydrogen fuel cell technology, and minimizing travel.

If applied in the transport of goods, AI can enable more accurate traffic prediction, autonomous vehicles, and real-time journey planning. If you'd like to learn more about how to shift toward more sustainable supply chains, contact us here for a free consultation.

**Clean diesel fleet:** Meijer lowered its carbon footprint by 60% by using a selective catalytic reduction technology in the exhaust engine of its trucks to eliminate nitrogen oxide emissions.

**Minimizing travel:** Nike resorted to shipping via ocean, thereby eliminating 14,000 truck journeys per year.

**Fuel cell electric vehicles:** Toyota and Hino USA are jointly developing a Class 8 fuel cell electric truck. These hydrogen-powered trucks will offer heavy-duty capabilities and clean emissions. The first demo vehicle is expected in mid 2021.

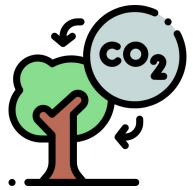


**Fleet electrification:** Many companies are already working on electrifying part or all of their fleet. Walmart intends to electrify 20% of its fleet by 2022 & run its entire on alternate power by 2028. GoFor plans to electrify its California fleet, followed by expansion across North America, with a goal of electrifying half of its fleet by 2025. Curbtender partnered with XL Fleet to electrify Curbtender's refuse trucks.

# Reforestation initiatives

In order to offset the carbon footprint in cases where emissions are impossible to reduce, companies have resorted to achieve zero carbon by expanding and **supporting forest policies**.

According to Ecosystem Marketplace, “offsets from tree-planting projects increased 342% from less than 2 metric tons of carbon dioxide equivalent (MtCO2e) in 2016 to 8.4 MtCO2e in 2018 and were distributed around the world.”




A single hectare of mature trees absorbs approximately 6.4 tonnes of CO2 per year

Approximately equal to the amount produced by driving a midsize car with an average fuel efficiency rating of 7.5L per 100 km more than 30,000 km

ENDURA

Sports apparel brand Endura set plans to plant over **one million trees annually** to completely offset their carbon footprint by 2024. Hence, through reforestation only, Endura aims to become a carbon-negative company.

Volkswagen is investing in reforestation and aims to **protect and restore 2.47M acres** of endangered forests in the tropics and subtropics.

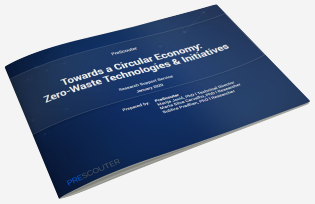
Lundin Energy

Lundn Energy will invest about $35M to plant **over 8M trees** across 11,000 hectares between 2021 and 2025, capturing about **2.6 million tonnes of CO2**.

# Waste minimization

Companies are moving toward incorporating **LED lightning** systems, reducing excess **water usage**, minimizing waste, and developing or using more **bio-based alternatives** in their products.

Better energy efficiency can easily be achieved by switching to LED or CFL lighting. In 2017, over 1 billion LED and CFL lights were installed in the United States –—> saving 142 million tons of CO2 emissions per year, at a cost of about $7 per ton of avoided CO2[2].




**EXTRA READING**

What promising and innovative zero-waste technologies and initiatives are fueling a more circular economy? In this Intelligence Brief, PreScouter looks at 10 companies offering a zero-waste technology or initiative, with the greater focus being on those directed toward plastics.

MAN Diesel & Turbo

TMEIC

SIGMA THERMAL

**Waste heat recovery systems** (such as those provided by GE, MAN Diesel and Turbo, Tmeic, and Sigma Thermal) are usually used by industries to recover the heat lost from exhaust stacks of installations such as furnaces, kilns, or generators. The waste heat is often captured and converted to electric power in a generator, thereby improving the efficiency of the overall system, reducing emissions, and cutting costs.

Walmart

ZERO WASTE BULK

Many companies are aiming to partner with **packaging** companies that source sustainably and support recycling. For example, Walmart (as part of its sustainability hub) aims to achieve 100% recyclable packaging by 2025. Some grocery companies are also switching to more sustainable ways of selling their products by completely eliminating standard packaging. An example is Zero Waste Bulk store - a store for local, organic, and sustainable groceries in Waterloo, Ontario.

Climate change is the biggest existential challenge of our times that can potentially disrupt business as usual scenarios. Climate change related catastrophes costed the US economy $240 billion in 2018.

Early adopters will find that holistic carbon management makes business sense too for their profit & loss statement.

So, going forward climate-related financial disclosures from businesses will be scrutinized by investment firms.

**Get in touch with PreScouter today to see how we can help you achieve your GHG goals in the easiest and most profitable way possible.**

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# Authors


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Christian leads projects in the Natural Resources and Energy vertical by bringing solutions that align with our clients' sustainability, efficiency and financial goals. He ensures PreScouter clients receive the latest insights into any disruptive or groundbreaking technology within Carbon Capture & Utilization, Waste Management, Biofuel Developments, O&G, Mining, Renewable Energy generation and storage, among others.

## Baishakhi Sengupta

PreScouter Sustainability Expert

Baishakhi has two decades worth of in-depth technical experience in undertaking Carbon Footprints, designing bespoke carbon management systems that drive the right KPIs for businesses to achieve decarbonisation. Baishakhi has worked across many sectors, received a number of awards for her work and is widely known in the industry for her expertise in sustainability.

## Shruti Biyani

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Shruti is currently a Ph.D. candidate in Chemistry at Purdue University. She is a synthetic organic chemist by training. She has collaborated on diverse research areas including analytical chemistry, machine learning, reaction optimization, and technology-based new lab development.

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Srilakshmi is a researcher with broad interests in green energy, life cycle assessment, circular economy, sustainable energy and renewables. She has a double masters degree from the Royal Institute of Technology, Sweden and Instituto Superior Técnico, Portugal (InnoEnergy program on sustainable energy systems). She has also worked as a research engineer with the Center for Study of Science Technology and Policy, India, on solar energy projects.

## Jorge Hurtado

PreScouter Researcher

Jorge has a broad interest in sustainability and development issues that can generate positive changes in the lives of local communities. He is also involved in communicating science to specialized and general audiences, and still diverges most of his efforts to work with indigenous communities and volunteers to teach kids the importance of keeping in touch with nature.

# About PreScouter

## PRESCOUTER PROVIDES CUSTOMIZED SUSTAINABILITY AND ENVIRONMENTAL CONSULTING

### Carbon Accounting

- Scope 1,2, and 3 emissions inventory mapping
- GHG emissions calculations
- Life-cycle assessments
- Mass, energy and carbon flows
- Material tracing/transparency
- Regulations and policy framework

### Carbon Reduction

- Develop heat maps to pinpoint highest emission sources
- Scoping suitable technologies for emission reduction
- Draw out briefing on what a Netzero aspiration would mean for the business
- Supplier search/assessment

### Long-Term Carbon Management

- Identify process flow analysis that helps crystallise long term carbon management program
- This should dovetail with client overall business plan and drive process efficiencies
- Water/energy/resource management

**500+**
CLIENTS WORLDWIDE

**4,000+**
RESEARCH REPORTS CREATED

**150,000+**
HOURS OF RESEARCH COMPLETED FOR CLIENTS

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