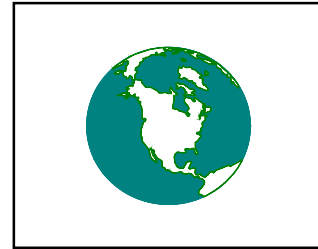


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EUROPE

1. New EU Environment Chief Promises Pollution Crackdown

The nominee to become European Union's new environment chief says he'll work to eradicate pollution by taking actions such as pushing for non-chemical alternatives to pesticides and taking measures to tackle microplastics. "I want to make pollution a thing of the past," said EU Commissioner-designate for environment and the oceans Virginijus Sinkevicius at a European Parliament confirmation hearing on October 3.

At 28, Sinkevicius would be the youngest-ever European commissioner. He is a member of Lithuania's center-left Farmers' and Green Union political party and would move into the commission role having been his country's economy and innovation minister since November 2017.

Commissioners are the top EU officials responsible for formulating and proposing laws, which are then decided on by the European Parliament and by EU countries represented in the Council of the EU. The new European Commission will take office November 1, subject to a confirmatory vote in the European Parliament, which will likely take place October 23.

Sinkevicius isn't a controversial choice. He has "huge potential" and his background as an innovation minister would be beneficial for EU environment policy, said Peter Liese, a German center-right veteran member of the European Parliament environment committee.

The new zero-pollution push would be built around updated policy plans on air quality, water quality and a non-toxic environment, said Sinkevicius, whose term in office would run until late 2024.

Specific proposals would seek to limit microplastics at their source by introducing new rules on textiles and tires; include new pharmaceutical substances in the list of those that must be monitored or limited in water; and allow only "friendly chemicals" in plastics to facilitate recycling, Sinkevicius said.

He added the EU's REACH law should be used "even more" to place limitations on use of harmful chemicals. That would mean that substances that are shown to be endocrine disruptors would be treated like substances that are classified as carcinogenic, mutagenic or toxic to reproduction, meaning their use in the EU is generally prohibited. So far, 43 chemicals have been made subject to authorization under REACH. As such, their use is banned in the EU unless a time-limited use for a specific process is granted.

In addition, limits on nitrous oxides and fine particles from combustion-engine vehicles would be tightened through an update to current car tailpipe standards, Sinkevicius said.

Protecting the variety of life on Earth would also be a priority. The October 2020 United Nations biodiversity summit in China will be "a critical opportunity to turn the tide" of biodiversity losses, Sinkevicius said.

He also said the EU should promote "ecological farming" that limits pesticide use, and that farmers should learn to live alongside large carnivores, such as wolves, and not "resort to the bullet."

2. France Found Guilty Of Breaching Europe's NO2 Rules

Europe's top court has ruled that France "systematically and persistently" breached EU limits for nitrogen dioxide across 12 urban areas including Paris, Marseille, Strasbourg, Nice and Toulouse.

Nitrogen dioxide, which is known to cause respiratory health problems, was the target of the decade-old Clean Air Directive. The law required member states to curb NO2 emissions to less than 40 micrograms per cubic meter by a deadline January of 2010. The European Commission said France had exceeded these limits well after the deadline.

France disputed the "systematic" accusation and claimed there were "structural difficulties" in meeting the EU law. In response, the court threw the book at France and called up article 23 of the directive, which states that measures must be taken to ensure that the exceedance time is kept "as short as possible". The European Court of Justice (ECJ) also said that it was "irrelevant" whether the breaches were by intent, neglect or structural difficulties.

The ruling was a clear win for the Commission, which took the case to the ECJ as the final step of its infringement process. It also sets the tone for a spate of other dirty air cases against member states such as Germany, UK, Italy and more recently Spain and Bulgaria, which are still pending a decision. Air pollution violations are now the leading cause for member state infringement, overtaking water in 2018.

Sophie Perroud, policy coordinator at HEAL, said, "today's verdict clearly shows that beating air pollution is in the hands of national governments. They are accountable for protecting people's health."

The European Environment Agency estimates that air pollution is responsible for over 400,000 premature deaths in Europe every year. (See story below.) Some 48,000 of them occur in France, according to the national official figures. Last summer, a citizen science report by HEAL detected high levels of nitrogen dioxide in children's classrooms across European cities, including Paris.

3. EEA Report Highlights Inadequate Pace Of European Action On Air Pollution

Nearly all of Europe's city dwellers remain exposed to air pollution in excess of World Health Organization limits, the European Environment Agency has said. It comes despite a wave of legal action and growing awareness of a public health crisis that has been dubbed the 'new tobacco'.

The latest edition of the EEA's annual report¹ – based on 2017 data from more than 4,000 monitoring stations across the EU, Balkans and Turkey – shows improvements in some areas. The data showed the lowest levels of NO2, produced in particular by diesel-fueled road traffic, since 2000, with 7% of the EU's urban population exposed to concentrations above the bloc's legal limit, which is identical to the WHO's air quality guideline for the pollutant.

But the picture was worse in the case of fine particulate matter (PM2.5), which is considered one of the more dangerous forms of air pollution. The EEA estimated this type of pollution caused 412,000 premature deaths in 2016, with 374,000 of them in EU countries.

¹ "Air Quality in Europe 2019"

"We do not see any big improvement, or worsening, year on year," EEA air quality expert Alberto Gonzalez Ortiz said. "It is PM2.5 that we should worry most about, and it is coming from domestic heating, industry and transport."

The study said 17 percent of EU urban populations have been exposed to particulate matter levels above the advised EU daily limit, and 44 percent were exposed to concentration exceeding the more stringent level set by the World Health Organization.

Concentrations above the EU annual limit for PM2.5 were recorded at 7% of reporting stations, but that figure rose to 69% when the WHO guidelines were applied. Only Estonia, Finland and Norway did not breach pollution levels deemed safe by the UN agency.

The European Parliament agreed in March that the EU should bring its own limits into line with the more stringent and regularly updated WHO air quality guidelines (AQGs).

"Air pollution is a global threat leading to large impacts on human health and ecosystems," the report states. "When it comes to Europe, air quality remains poor in many areas, despite reductions in emissions and ambient concentrations."

The Denmark-based European Environment Agency is the chief environmental arm of the European Union.

Reacting to the EEA report, however, the European Environmental Bureau noted EU governments continue to drag their feet over implementing and enforcing even the existing EU rules. Czechia, Greece, Hungary, Ireland, Italy, Latvia, Luxemburg, Malta, Romania and Slovakia have yet to deliver air pollution control plans required under the National Emissions Ceiling (NEC) Directive, the environmental umbrella group said.

"There's no secret about how to cut pollution: we need clean power and less wasted energy, greener and smarter transport, and sustainable production and consumption of food," said Margherita Tolotto, a policy officer with the group.

The environmental lawyers' group ClientEarth, which is supporting the campaign group Deutsche Umwelthilfe (DUH) in pollution-related legal cases at 40 locations across Germany, said the EEA report should "embarrass German leaders into action".

"German leaders at all levels are trying to fight the inevitable. We've seen all tactics in play, from lobbying the EU to loosen pollution limits, to appealing court rulings made to protect people," lawyer Ugo Taddei said.

Italy's environment minister Sergio Costa described the report as the latest ringing of the alarm bell over air pollution, noting it "unfortunately put Italy at the top of the list in Europe for deaths from nitrogen dioxide".

In late November, the European Commission is due to host a second pan-European Clean Air Forum in Bratislava, following up on a 2017 event that preceded a wave of EU legal action against national governments that has not lost momentum.

"Europe has now a unique opportunity to set an ambitious agenda that tackles the systemic causes of environmental pressures and air pollution," said EEA executive director Hans Bruyninckx.

“We are making progress but it’s time to speed up the changes in our energy, food and mobility systems to put us on a trajectory of sustainability and a healthy environment,” he added.

4. Air Pollution Is Now A ‘Health Emergency’, Head Of NHS England Warns

The head of NHS England has warned of a “health emergency” as new figures revealed hundreds more children and adults are suffering cardiac arrests, strokes or severe asthma attacks because of days of high air pollution. Stunted lung growth in children and links between pollution and lung cancer were also found by researchers who looked at nine cities across England.

Higher air pollution triggered each year an extra 124 cardiac arrests in people not already in hospital, 231 cases of stroke and 193 children and adults being admitted to hospital for asthma, the study found. The figures, from King’s College London and UK100, a group of 94 local government leaders, highlighted the “immediate, short-term and avoidable” impact of high air pollution, the experts said.

Government data has previously shown that pollution contributes to up to 36,000 deaths every year.

In London, days with worse pollution accounted for 87 extra cardiac arrests and 251 people being admitted to hospital for asthma or strokes, the research suggested.

In Birmingham, they were responsible for 12 more cardiac arrests and 53 children or adults being taken to hospital for asthma or a stroke.

Simon Stevens, chief executive of NHS England, said that it was clear that the climate emergency was in fact “also a health emergency” and that it meant the NHS needed to cut its own greenhouse gas emissions. “Since these avoidable deaths are happening now – not in 2025 or 2050 – together we need to act now,” he said. “For the NHS that is going to mean further comprehensive action building on the reduction of our carbon footprint of one-fifth in the past decade.

“So, our NHS energy use, supply chain, building adaptations and our transport will all need to change substantially.”

Polly Billington, director of UK100, added: “Local government needs additional powers and resources to address this public health crisis, alongside a timetable for when air pollution levels will meet World Health Organization guidelines.”

The research, which will be published in full in November, was released before an international clean air summit hosted by Sadiq Khan, the mayor of London, and UK100. The summit is expected to push the government to provide new powers and resources to local authorities to clean up the air alongside a timetable for implementing World Health Organization targets on one of the most dangerous forms of pollution.

Rita Issa, a GP in Tower Hamlets, east London, and member of Doctors for Extinction Rebellion, said the findings were “shocking but not surprising”.

“London has never met the legal limits on pollutants, which has been declared unlawful by the Supreme Court,” she said. “Air pollution hits our poorest communities the hardest.”

Other findings included that higher pollution days caused four more cardiac arrests, and 18 children or adults taken to hospital for asthma or strokes in Bristol, 16 children or adults being taken to hospital for asthma or strokes in Derby and four more cardiac arrests, and 24 children or adults taken to hospital for asthma or strokes in Liverpool.

In Manchester there were six more cardiac arrests and 28 children or adults were taken to hospital for asthma or strokes.

5. London's World-Famous Black Cabs Go Green With Launch Of A Fully Electric Vehicle

A fully electric version of London's iconic black cab was launched recently. The zero-emission vehicle, called the Dynamo Taxi, is based on the Nissan e-NV200 Evalia. It has a range of as much as 187 miles on a single charge, can carry a maximum of five passengers and is wheelchair accessible.

The Mayor of London, Sadiq Khan, said in a statement that working with cabbies – cab drivers – to go electric was a “key part of our plans to improve London's air quality.” “The Dynamo Taxi will accelerate the retirement of polluting diesel taxis from city streets across the U.K., improving air quality, helping to tackle the climate emergency and to create a green economy,” he added.

Along with red double decker buses and the Tube, black cabs are an iconic part of London's transport infrastructure. In recent years, efforts have been made to reduce their impact on the environment.

Since January 2018, taxis in London being licensed for the first time have had to be “zero emission capable.” Their carbon dioxide emissions must not be greater than 50 grams per kilometer and they need to have a minimum zero emission range of 30 miles.

The Dynamo Taxi is priced at £55,495 (\$71,461) although it is eligible for a £7,500 grant to reduce costs. It adds to London's sustainable transport options, joining the London EV Company's TX vehicle on city streets. Powered by a lithium-ion battery, the TX utilizes a petrol range extender.

Central London is now home to an Ultra Low Emissions Zone, or ULEZ. The ULEZ operates 24-hours a day, seven days a week. Vehicles which do not meet the ULEZ's emissions standards are required to pay a daily charge to drive in the zone. Taxis with a London license are exempt from the charge, although there is a 15-year age limit for the vehicles.

6. London's ULEZ Cuts NO2 Pollution By A Third

London's Ultra-Low Emission Zone (ULEZ) has seen nitrogen dioxide (NO₂) pollution cut by a third in the capital since its introduction in April 2019.

City Hall has published a report on the first six months of the zone, which shows it's delivering some promising outcomes in cutting air pollution. Quarterly averages reveal that levels of NO₂ on roadside monitors have fallen from 89 µg/m³ in January to March 2017 to 57 µg/m³ in July to September 2019, a reduction of 36%.

According to the report, there are now 13,500 fewer polluting cars being driven into central London every day, with 77% of all vehicles now in the zone meeting ULEZ emissions standards. This is higher than the 39% seen in February 2017 and the 61% in March 2019.

There was also a reduction in traffic flows in central London in May and September 2019 of between 3% and 9% when compared to 2018, which City Hall says indicates the wider benefits of the ULEZ in encouraging people to switch to walking, cycling or using public transport.

Fine particulate matter (PM2.5) has reduced only slightly, with the report saying that over 50% of London's PM2.5 emissions blow into the capital from outside sources. Earlier this month, Sadiq Khan joined over 30 other mayors from around the world to commit to reduce fine particulate matter (PM2.5) pollution in line with World Health Organization (WHO) guidelines by 2030 (See story below.).

The Mayor of London, Sadiq Khan, said: 'These figures prove without a doubt that ULEZ is exceeding expectations, reducing polluting vehicles and cleaning up our lethal air. I am determined to stop Londoners breathing air so filthy it is damaging our children's lungs and causing thousands of premature deaths. The ULEZ shows what we can achieve if we are brave enough to implement such ambitious policies.

'I now hope the government will match my ambition and amend their environment bill to ensure it has the legally binding WHO- recommended limits to be achieved by 2030 that we need to protect public health.'

The London Mayor plans to expand the zone's boundary in 2021 should he be re-elected next year.

Conservative Mayoral candidate Shaun Bailey has previously said he would set aside the money for the planned expansion of the ULEZ in 2021 to pay for 371 electric buses.

7. UK Air Is Cleaner But Challenges Remain

Take a deep breath. If you're a long-term UK-dweller the air in your lungs right now is almost certainly fresher than the air you inhaled forty years ago. Policy interventions in the UK have significantly improved air quality since the 1970s, according to a new study, and resulted in a halving of the number of deaths attributable to some of the most common air pollutants. But there are significant challenges associated with reducing secondary pollutants such as ozone; the study suggests where the UK needs to focus its clean-up act next.

Outdoor air pollution is estimated to kill 4.2 million people each year worldwide. In the UK around 30,000 deaths a year are attributed to air pollution. Long-term exposure to air pollution increases risk of cardiovascular and respiratory disease and lung cancer. Short-term exposure aggravates respiratory and cardiovascular illness and triggers asthma attacks. There is also emerging evidence of links between air pollution and diabetes, obesity, cognitive decline, dementia and adverse birth outcomes.

Like most other industrialized countries, the UK saw a rise in air pollution through much of the 20th Century, reflecting an increasing demand for energy and mobility, and a fall in air pollution in recent decades due to more stringent emissions standards. But how much impact did policy interventions really have?

Stefan Reis from the Centre for Ecology & Hydrology in Edinburgh and colleagues at the University of Edinburgh, University of Oxford and Institute of Occupational Medicine modelled

changes in key air pollutant concentrations — nitrogen dioxide, sulphur dioxide, fine particulate matter and ozone — and related health effects across the UK over the last 40 years.

In order to correct for the variability caused by meteorological factors, they used a fixed meteorological year for all simulations. This meant that the modelled changes in air pollutant concentrations and related health effects were solely a function of changes in emissions and reflected the impact of policy interventions such as phasing out specific fuels or substances, regulating use of particular chemicals, or developing cleaner and more efficient technologies.

Overall, the results show that the UK attributable mortality due to exposure to fine particulate matter declined by 56% and that due to nitrogen dioxide exposure dropped by 44%, while ozone attributable respiratory mortality increased by 17% over the same period (with a slight decrease between 2000 and 2010).

Analyzing the data more closely, it was clear that policy interventions and reductions in emissions were behind many of the trends. For sulphur dioxide and fine particulate matter, the researchers observed a consistent downward trend over the entire time period. Nitrogen dioxide was more complicated. Growth in vehicle numbers and miles travelled resulted in an increase in NO_x emissions between 1970 and 1990, but then more stringent vehicle emissions controls kicked in and emissions began to fall. “The further growth of vehicle numbers and mileage has been offset by individual vehicles emitting less,” says Reis.

Ozone concentrations showed a steady increase over the 40-year period; ironically some of the greatest increases have occurred in areas where NO_x emissions have decreased most. That’s because ozone is a secondary pollutant that forms from precursor pollutants including NO_x and non-methane volatile organic compounds (NMVOCs). The ratio of nitrogen dioxide to NMVOC determines how much ozone is produced.

“Too much nitrogen dioxide leads to destruction of ozone, so you will typically not find high ozone concentrations on or near busy roads, but rather some distance away from the main sources, where the atmosphere is more mixed,” says Reis, whose findings are published in *Environmental Research Letters* (ERL). “To reduce ozone further, consistent reductions of NO_x and NMVOC emissions will be essential, so the current focus on reducing road transport emissions and more general fossil fuel combustion is on the right track.” Ozone can also travel long distances and so it will be important to look at sources outside the UK.

Reis and his colleagues suggest that there needs to be a greater focus on reducing emissions in sectors that have so far escaped major scrutiny. These include agriculture, domestic wood and coal burners, shipping and non-road mobile machinery. The researchers also note that we need to better quantify the sources contributing to the pollution and focus on a truly integrated assessment of policies to avoid unintended consequences. For example, the promotion of biomass for domestic heating has helped to reduce our carbon footprint but has also led to local air pollution hotspots because most domestic appliances do not have filters and can emit large amounts of fine particulate matter.

“Integrated policies that look at air pollution, greenhouse gases and other sustainable development indicators are essential to ensure interventions are leading to overall improvements, rather than solving one problem by creating new ones,” says Reis.

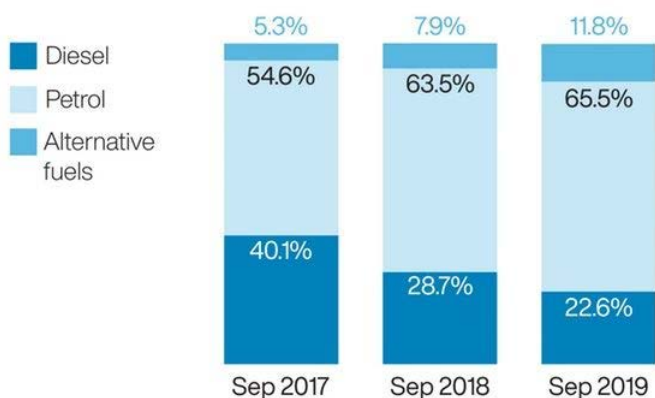
8. UK New Car Market Down 2.5% In 2019

Some 1.86 million new cars were registered between January and September compared with 1.91 million during the same period in 2018, the Society of Motor Manufacturers and Traders (SMMT) said, a decline of 2.5%.

The organization blamed fears over Brexit for holding potential buyers back from purchasing new cars.

Figures for last month alone show the market grew by 1.3% year-on-year, but this is compared with September 2018 when registrations were severely hit by new emissions regulations and a lack of testing capacity affecting supply.

Sales of new cars in UK, by type



PA graphic. Source: SMMT

Other major European markets performed much stronger last month, with growth in double digits.

SMMT chief executive Mike Hawes said: "September's modest growth belies the ongoing downward trend we've seen over the past 30 months.

"We expected to see a more significant increase in September, similar to those seen in France, Germany, Italy and Spain, given the negative effect WLTP (Worldwide Harmonized Light Vehicle Test Procedure) had on all European markets last year.

"Instead, consumer confidence is being undermined by political and economic uncertainty. We need to restore stability to the market which means avoiding a no-deal Brexit and, moreover, agreeing a future relationship with the EU that avoids tariffs and barriers that could increase prices and reduce buyer choice."

Sales of diesel models were down 20.6% during the first nine months of 2019, while demand for new petrol models was up 2.6%.

The market for battery electric cars is up by 122.1% but the plug-in hybrid sector is down by 29.2%. Government grants for new low-emission cars were slashed in October last year, meaning hybrid models are no longer eligible for the scheme. Motoring groups have warned that the decision will leave the UK struggling to meet targets to reduce vehicle emissions.

Karen Johnson, head of retail and wholesale at Barclays Corporate Banking, said: "The first increase in new car sales for some time will offer no relief, as the comparison with an extremely weak September 2018 was expected to be better than this.

"New fuel regulations lowered sales a year ago, and this time around it's hard to look beyond a lack of consumer confidence due to Brexit uncertainty as the primary reason for the pickup not materializing as hoped.

"We're also seeing increasing evidence of purchasers who would previously have looked to buy a new vehicle instead switching to the used car market."

Minister for the Future of Transport George Freeman said: “This Government is serious about driving the UK towards net zero emissions. That’s why we have announced major new funding for new EV charge points to make driving an electric car as convenient as a petrol or diesel car.”

9. Germany Set To Miss 2020 Climate Targets By At Least 5 Years

Germany is on course to miss its 2020 greenhouse gas reduction targets by at least five years, despite a new package of measures approved by the country’s ‘climate cabinet’ in September. While Germany had committed to reduce emissions by 40% on 1990 levels by next year, the government has long recognized that it will fail to do so. The country is on course to have reduced emissions by only 33.2%.

Research commissioned by Greenpeace Germany finds that new plans to introduce a carbon price for the transport and building sectors, which along with the energy sector are the main stumbling blocks to cutting emissions, “barely have any steering effect” on short-term emissions.

“The CO2 price should be introduced at a considerably higher rate and increase much more steeply,” says the report, which was carried out by the German Institute for Economic Research (DIW Berlin).

Even the power sector, generally recognized as easier to decarbonize than transport and buildings, is set to miss its emissions targets without additional policies, the report adds. It is currently on track to meet the 2020 goal by 2026, and to miss its 2030 goal by around 20m tons of CO2 equivalent.

“Urgent improvements are therefore necessary in all sectors, particularly in the power sector, in order to reach the climate goals and to slow down/avert the risk of a climate catastrophe,” reads the report.

Karsten Smid, the head of climate and energy at Greenpeace Germany, urged the government to put in place a much more rapid phaseout of coal power, along with more ambition in reducing emissions from buildings, transport and agriculture. He called for a “strong climate protection law with ambitious, binding sectoral targets”.

10. Member States Push Back On Changes To Shipping Emissions Data

EU ambassadors have objected to a European Commission proposal that ship cargo reports become voluntary instead of mandatory, on the grounds that cargo is important to emissions data.

The dispute stems from a push to align data collection between the International Maritime Organization (IMO) and the EU’s monitoring, reporting, verification (MRV) regulation. Last February, the Commission put forward a proposal aligning the systems in order to streamline data collection and “cut red tape” for ship owners.

The sticking point is ‘cargo carried’, which can be used to compare a ship’s emissions versus its load – and thus show its carbon efficiency. Under the Commission’s proposal cargo reports would become voluntary.

However, the EU Council disagrees. In a meeting of the Committee of Permanent Representatives (COREPER), member states maintained that cargo rules should stay as they

are. "The maritime transport sector has to become more energy efficient and use less fuel to contribute to our climate goals," said Krista Mikkonen, Finland's environment and climate minister, who chaired the meeting.

Faig Abbasov, shipping policy officer at Transport & Environment welcomed the COREPER's decision. "Cargo-carried data is very important to understand the real-world performance of ships as opposed to their theoretical performance," he said. "Without it, we will not be able to see the difference between an empty ship and an efficient ship."

The EU's maritime sector makes up some 2-3% of total CO2 emissions and 13% of those in the transport sector – more than any member state's standalone contribution.

The EU's MRV regulation was introduced in 2015 as a way to monitor emissions across the union. Negotiations to harmonize it with the IMO's system are now due to start with the European Parliament.

Abbasov said keeping the cargo data was a "no brainer" but stressed the need for further climate goals. "Now we need to move beyond emissions reporting and require emissions reduction at the EU level."

International maritime shipping is the only transport mode not included in the EU's commitment to reduce greenhouse gas emissions. Frans Timmermans, the commissioner-designate for the EU Green Deal, has called for maritime CO2 cuts and for the sector to be included in the European emissions trading system.

11. Chinese Electric Buses Help Optimize Green Transportation In Finland

Since August this year, residents in the capital region of Finland have often encountered blue-and-white buses with a striking charging plug pattern on their sides running quietly, making almost zero noise. Looking carefully, one may spot the Chinese logos on the vehicles glass.

Being the first batch of pure electric buses in operation in Finland, the 33 buses produced by China's Zhengzhou Yutong Bus Co. Ltd have met the requirements of Finnish authorities, participants in a media visit held in Helsinki recently were told.

The buses were introduced to Finland by Pohjolan Liikenne, one of Finland's largest public transport operators.

"China is very advanced in the development and production of electric buses. Our partner Yutong is the world's largest manufacturer of electric buses," Heikki Alanko, managing director of Pohjolan Liikenne, told journalists.

"The battery of the electric bus produced by Yutong has good performance, large storage capacity and fast charging speed. According to our estimation, after full charge, it can support at least 200 kilometers of driving even under harsh conditions," said Alanko.

"Our drivers gave pretty good feedback on driving Yutong pure electric buses. The passengers also praised them for the comfort and low noise," Alanko said. "We are very satisfied."

According to Alanko, more than a year ago, the Helsinki Region Transportation Authority, which is responsible for maintaining the public transportation network of nine cities in the capital area,

tendered the first batch of pure electric buses. Yutong's products were selected by Pohjolan Liikenne, one of the bidders, for their outstanding quality, and finally got recognized by the government.

"The government and the Helsinki Regional Transportation Authority have strict control over the quality of public transport vehicles. Pure electric buses by Yutong met our requirements in terms of model size, comfort, energy consumption, safety and follow-up services," Johanna Nyberg, head of city traffic of Espoo in the Helsinki region, said.

Pure electric buses produced in China will also play an important role in helping Finland save energy, reduce emissions and promote green travel.

According to Nyberg, several cities in the Helsinki region, including Espoo, plan to increase the proportion of zero-carbon public transport to 30 percent within five years, and reach 100 percent zero-carbon emissions in public transport system by 2030.

Ma Kai, Nordic market project manager at Yutong, told Xinhua that in light of the long, cold and snowy winters in Finland, Pohjolan Liikenne was very concerned about the performance of the buses. Representatives of the Finnish bus operator "came to Harbin (the capital of Heilongjiang, China's northernmost province), which has a similar winter climate as Finland, for testing our products, and finally were convinced by the quality," said Ma.

Yutong is a Chinese bus manufacturer that has an excellent track record in the new energy bus industry. The publicity department of Yutong told Xinhua that as of July 2019, the company had sold 120,000 new energy buses worldwide, including more than 8,000 in Europe. In 2018, its large and medium-sized passenger vehicles had a global market share of 13 percent.

"The development of our new energy bus business is largely due to China's vigorous promotion of new energy vehicle research and development (R&D) and production in the past few years. The forward-looking policies have enabled us to touch the pulse of the industry, accumulate a wealth of experience and get our technical strength enhanced," Ma said.

12. Chinese Bus, Coach Manufacturer Receives Awards At Busworld Europe

Chinese bus, coach and self-driving car manufacturers have been reaping the awards and making great progress, according to the organizers of the ongoing Busworld Europe, a bus and coach exhibition which is running from October 18 to 23.

Twenty-one buses and coaches from manufacturers across the globe were tested and examined by a professional jury panel. And Chinese bus maker Yutong captured three out of the 10 honors available at the 25th Busworld Awards ceremony in Brussels.

- Yutong U12 was awarded for Bus Design in recognition for its European level design, as well as for its aesthetic balance in interiors and external appearance.
- The Design Coach award went to Yutong T13. The jury was impressed with its fine exterior and interior design, in particular the precision of the finishing and placement of the interiors, equipment and components.
- Yutong Ice12 won the prestigious award for Ecology. Its latest model uses many recyclable materials for the interiors, replacing plastic for metal products, while

outperforming other electric vehicles with lower emissions.

The 2019 edition of Busworld is turning into the biggest edition yet, drawing 510 exhibitors from 39 countries at Brussels Expo, including 75 bus makers, covering almost all the major bus and coach manufacturers in the world.

This year China ranks among top 3 participating countries at Busworld, with 54 companies present, including Yutong, CRRC Electric, King Long, BYD and Higer.

Of the other Chinese companies present, King Long Buses, a Chinese bus manufacturer headquartered in Xiamen, southeast China's Fujian province, unveiled its latest model "Apollo 2.0", a high automation of level 4 autonomous driving, after only one-year of commercial operation.

San Bus King 2.0, which boasts state-of-art technologies developed by CRRC Electric and is assembled in Hungary, was another highlight of this year's exhibition. The new bus is set to usher in a brand new era for the public transportation market in Hungary and Europe at large.

As an affiliate of the world's largest rail transit equipment supplier, CRRC.EV is a leading innovator in bullet train technology. CRRC Times Electric Vehicle Co. officially released this year its second generation San Bus King 2.0, equipped with intelligent batteries and 360 intelligent driving system. The new bus is set to usher in a brand new era for the public transportation market in Hungary and the rest of Europe.

13. EU Net Zero Goal Scares Eastern And Central Europe

Key business and government decision makers in central and eastern Europe are "afraid" of the European Commission's plan for the EU to go carbon neutral by 2050, with the region's large automotive sector the focus of particular concern.

The EU's climate narrative is "scary", said Daniel Křetínský, chairman of the board of EPH, a Czech-based utility that has been buying up coal and gas plants across Europe. He was speaking at the Globsec Tatra Summit 2019, held in Slovakia from 11 to 13 October.

Carbon neutrality has to be discussed in the context of maintaining the region's competitiveness, Křetínský emphasized. He said he could not understand why some in Europe want to phase out gas plants running at 46% efficiency when coal plants from the 1920s were still running in Russia.

The Czech billionaire said the EU should focus more on those industries where it is a leader - such as chemicals and car making - rather than on those where it isn't. "A superfund for digitalization to create a new [European] Google? We will never succeed!" he said, accusing the EU of an "ideological" approach.

Johan Van Overtveldt, the Belgian right-of-center MEP who chairs the European Parliament's budget committee, said climate policy was a source of uncertainty that is holding back investment in Europe.

Slovakia's Central Bank governor Peter Kažimír said central banks could play a "pioneering" and "catalytic" role in climate action, but green investments so far have not had a good enough credit rating.

The transition to electromobility championed by the EU executive is causing major concern in Central and Eastern Europe's automotive sector. It is a critical part of the region's economy - Slovakia is the world's biggest carmaker on a per capita basis.

In future, cars will be "electric, automated, shared and connected", Slovakia's finance minister Ladislav Kamenický recognized. Electric vehicles need 5-10 times fewer parts than the classic internal combustion engine and assembly is much easier too. "We are really afraid," he said.

There are embryonic attempts in the region to enter the electromobility value chain, such as the Slovakian company InoBat, which has teamed up with a US firm to build a €100-million battery production line in Slovakia.

Poland's finance minister said his country was interested in electric vehicles because it would be "easier" to become a producer of these than to "catch up" with the existing market. Poland is the second biggest producer of automotive parts and components in Europe.

The main problem remains the lack of a business case for clean transport. Central and eastern Europe leaders also suggested that the EU should ban older cars, for example Euro 3 or 4 standard models, from the internal market and label them as waste.

The average car in the east of the EU is 15 years old. With the rise of diesel bans in the west, the EU is in danger of seeing an "internal carbon leak" to the east of the bloc, they warned.

14. IEA And European Industry Anticipate Surge In Solar Power Deployment

Solar power is primed for "spectacular growth" over the coming five years, while European firms expect to see the highest ever deployment of the technology next year as governments rush to meet their 2020 renewable energy targets.

Installations of solar panels on homes, commercial buildings and industrial facilities are set to provide 60% of an anticipated 1.2 gigawatts of renewable electricity capacity deployed globally between now and 2024, according to a new IEA report.

"Renewables are already the world's second largest source of electricity, but their deployment still needs to accelerate if we are to achieve long-term climate, air quality and energy access goals," said Fatih Birol, director of the Paris-based intergovernmental body.

The deployment over five years of renewable power infrastructure equivalent to the total current electricity generation capacity of the US will help increase the share of green power in the global mix from 26% to 30%, the report predicts.

The number of domestic rooftop solar systems worldwide is set to double to some 100m by 2024, with Belgium, the Netherlands and Austria expected to be in the top five in terms of market demand in that year, alongside Australia and California.

However, the IEA expects to see the bulk of growth, around three quarters of new installations, in industrial and commercial facilities that can take advantage of economies of scale.

"As costs continue to fall, we have a growing incentive to ramp up the deployment of solar PV," said Dr Birol. The cost of generating electricity from distributed solar PV systems is already below retail electricity prices in most countries," Birol said.

The IEA expects the cost of solar PV technology to further decline by between 15% and 35% over the coming five years.

Although the agency sees China leading worldwide growth, with close to half of global deployment, the European solar industry has also entered a new growth phase, according to Walburga Hemetsberger, CEO of SolarPower Europe.

The Brussels based industry body expects to see 20.4 GW of capacity deployed across Europe in 2019, rising to 24.1 GW next year, exceeding the previous annual record set in 2011, Walburga said.

“One of the key reasons for this strong solar demand is the upcoming EU 2020 targets, where many member states are opting for low-cost solar to meet their targets,” Walburga said.

The industry representative also noted the effect of the EU's recently adopted 'clean energy package', which includes a 32% target for the share of renewable energy in European consumption by 2030 but said its impact will depend on the final form taken by National Energy and Climate Plans.

15. Volvo's First Electric Car Kicks Off a Plan to Cut Emissions

When Volvo decided a decade ago that it wanted to make a push on safety, the automaker created a plan to eliminate deaths and serious injuries in its vehicles by 2020. Though it admitted earlier this year that the company wouldn't get there, today's Volvos offer a bevy of innovative safety systems. They work to mitigate injuries when cars go off the road, issue distracted driving alerts, and even watch for moose. Now the Swedish automaker (owned by China's Geely) is setting its sights on another ambitious goal—the carbon footprint.

By 2025, Volvo aims to reduce its emissions by 40 percent, targeting manufacturing processes, operations, and even the shipping of new vehicles from its factories. The cars themselves will play a part too. Recently, in Los Angeles, Volvo showed off its first all-electric car, a battery-powered version of its XC40 small SUV, dubbed the XC40 Recharge. The automaker has also reportedly announced plans to electrify the XC90 SUV by 2022.

Volvo bids to become fully climate neutral by 2040, it said in a statement.

The company aims to reach the 2025 targets through a string of measures, including generating 50% of global sales from fully electric cars and having a 25% share of recycled plastics in new vehicles by that time, both of which have been previously announced. The rest of its cars will be hybrids, as Volvo plans to offer some form of electrification in all its models. The Recharge name will apply to all models that are either fully electric or have plug-in capability. Consumers who purchase a plug-in hybrid Volvo will also get a year of free charging, in the form of a refund for the average electricity costs in their region.

It is also aiming for a 25% cut in carbon dioxide emissions related to its global supply chain and its overall operations, including manufacturing and logistics, by 2025.

“Stopping movement is not the answer to solve the climate issue,” says Volvo CTO Henrik Green. “We want to offer people the freedom to move in a sustainable way. You cannot and will not solve

the climate problem by gradually improving petrol and diesel engines. Pure electric cars running on and built using renewable energy are the only cars that can really do it.”

The XC40 Recharge uses two 150 kW motors, one on each axle, and a 78 kWh battery pack that’s embedded in the floor. The system will produce 408 hp and an estimated 442 pound-feet of torque, sending the small SUV from 0 to 60 mph in 4.9 seconds. At a 150 kW DC fast-charger, the car should reach 80 percent charge in under 40 minutes. Range won’t be known until the EPA tests the car, but Volvo estimates it will reach 248 miles under the European WLTP testing schemes, which typically translates to about a 200-mile range in the US, Volvo said. The company plans to begin sales next year starting at about \$50,000, after government incentives.

Green says the company would pay close attention to sourcing batteries, including ensuring that they can be recycled—though he didn’t indicate if it had a plan in place to actively reclaim the batteries at the end of their lives. He also mentions that Volvo worked overtime to ensure that the new vehicle would be as safe or safer as other Volvos, even though it had to redesign the safety system in the absence of a front-mounted engine and it had to protect the battery pack beneath the floor.

There are slight cosmetic differences between the gasoline-powered XC40 and the new EV variant—there’s a smooth cover in place of the grille, and a few other tweaks to distinguish it. But the interior experience promises to be a significant upgrade. Volvo promises an infotainment system with an interface “as good as a mobile phone” thanks to a collaboration with Google. The system will use natural-language voice commands that the company promises will “work every time you use it,” and it will use artificial intelligence to learn driver preferences and hone its interactions over time. The car will also stay generally fresher via over-the-air updates, much like Tesla does with its cars.

Germany’s Daimler said earlier this year it aimed to have a carbon neutral new car fleet by 2039, while Volkswagen targets carbon neutrality by 2050.

16. Mercedes-Benz Faces New Emissions Recall of Older Vans

Daimler may have to recall 260,000 Mercedes-Benz Sprinter vehicles after German motor vehicle authority KBA warned the luxury carmaker that the transporter vans may contain illegal engine management software, Bild am Sonntag reported.

The latest KBA actions came after Daimler agreed to pay a fine of 870 million euros at the end of September when it admitted a breach of supervisory duties which resulted in emissions violations.

German weekly Bild am Sonntag, without citing sources, said it was now likely that the car and truck maker needed to begin a recall for 260,000 Sprinter vans, since Daimler had been called to a hearing. Daimler confirmed that KBA had demanded a hearing related to its Sprinter vans. Daimler further said the vans in question belonged to a previous generation of vehicles which have been out of production since 2016.

KBA has been made aware that the software found in the vans was also being used in other vehicle variants, Daimler said, adding that it had completed a review of its fleet.

“KBA has now also initiated a hearing procedure. Daimler has presented the functionality to KBA in May 2018 and thereafter explained it in detail in further meetings since summer 2018. We continue to fully cooperate with KBA,” a spokesman said.

In June, Daimler issued a profit warning and announced an increase of legal provisions by a high three-digit million euros amount, to cover various ongoing governmental proceedings and measures relating to diesel vehicles.

17. Denmark Calls For EU Strategy To Phase Out Diesel And Petrol Cars From 2030

Denmark, backed by 10 other European Union countries, has called for a strategy to phase out diesel and petrol cars, including allowing the ban of sales at member state-level by 2030 to combat climate change. Denmark made the proposal during a meeting of EU environment ministers in Luxembourg.

The 2050 goals are part of Ursula van der Leyen's plans, the new president of the European Commission, to make Europe the first climate neutral continent by 2050. The Danish delegation argued that to achieve this the transport sector needs to decrease their emissions, which is the only sector that currently is increasing its emissions.

The EU aims to cut carbon emissions in the bloc by 40 percent by 2030 while its executive, the Commission, plans to reduce them to zero by 2050 to help stop global warming.

Denmark made headlines in October 2018 when its government announced that it would ban the sale of all new fossil fuel-powered cars by 2030 but it subsequently scrapped the idea because this would have breached EU rules.

Danish Climate and Energy Minister Dan Jorgensen said proposing to allow individual member states to ban sales on new diesel and petrol cars will hopefully put pressure on the Commission to propose a complete phasing out of fossil fuel-powered vehicles in the bloc in the coming decades.

Jorgensen also said if the EU could not agree on a union-wide ban, it would be good if at least individual countries were allowed to implement such a measure.

"Plan A would be to make it a European ban," he said.

Lithuania, Latvia, Slovenia, Bulgaria and several other countries however suggested that more must be done to stop the "carbon leakage" of selling second-hand autos from western Europe to the eastern region.

Jorgensen said it was important to communicate the bloc's long-term policy directions to carmakers. He said Denmark's next step was to set up an alliance with the 10 member states that support its strategy to phase out diesel and petrol cars and the possibility to prohibit the sale of them in individual member states.

"Then I think others will follow," he said.

18. Ireland Budget 2020: New Emissions Tax On New Cars And Used Imports

A new tax based on a vehicle's nitrogen oxide (NOx) emissions will be applied to new car purchases and used imports from January 1st, replacing the current 1 per cent diesel surcharge.

The Republic of Ireland budget move comes alongside an increase in diesel and petrol prices due to an increase in carbon tax of €6 per ton. It's likely to add 2 cents to a liter of diesel and 1.7 cent on petrol. It's the first step in the Government's plan that will ultimately bring the charge from €20 per ton of carbon to €80 in 2030.

By the time the repeated increases have hit, the price of a 60-litre fill of petrol will have risen €13.76, while diesel will be up €15.72, including VAT.

In terms of the new NOx tax, the first 60mg/km of NOx emissions from new cars is to be charged at a rate of €5 per mg. With average NOx emissions from new cars at 43mg/km, it means in many cases, and for the majority of new diesel models, the charge will barely be enough to directly replace the existing 1 per cent Vehicle Registration Tax (VRT) on diesel engine cars.

Above 60mg/km of NOx, the charge increases to €15 per mg, and above 81mg/km it jumps to €25.

According to a spokesperson for the Department of Finance: "For a typical new diesel car with NOx emissions of 43mg/km, the surcharge element of the VRT charge will be €215. Likewise, for a new petrol with typical NOx of 23mg/km, the surcharge will be €115. Levels of NOx emissions tend to be much higher among older cars, particularly diesels, which were not subject to more stringent Euro standard thresholds.

"As such, for an older diesel with 80mg/km NOx, the surcharge added to the regular VRT will be €600. The impact will be less severe on petrol cars, as petrol engines are typically associated with less NOx. For an older petrol with, for example, NOx of 40mg/km, the surcharge will be €200.

"This NOx surcharge is based on the polluter-pays principle and will link the amount charged to the milligrams of NOx emitted. It is introduced in light of public health and environmental concerns. Pollutants such as nitrogen oxide, sulphur oxides and particulate matter impact air quality, particularly in high population density urban areas. The surcharge acknowledges the detrimental effect continued exposure to these emissions has on the air that we breathe and on the wider environment."

For the best-selling current new diesel models, the average charge under the new NOx tax will be broadly similar to the cost of the outgoing levy. For example, a Volkswagen Golf 1.6 TDI, with NOx emissions of 35mg/km will be charged €175 under the new tax. The outgoing diesel surcharge added about €174 to the price of the same car.

For new petrol and hybrid-engine models, it will represent a slight increase in price, as they had hitherto not been subject to the 1 per cent levy. The lowest-emitting cars, in terms of NOx, will obviously get off the lightest. A Toyota Corolla Hybrid, for example, has NOx emissions of just 3mg/km and so buyers next year will pay an extra €15 thanks to the NOx tax.

For other petrol engine cars, the charge will be higher, but still small enough against the backdrop of overall increasing prices in the car market. A Hyundai Kona crossover, fitted with a 1.0-litre turbo petrol engine, will be charged a mere €80.

Of all cars that benefit most from these changes to the tax system, it's those electric cars that do the best. These emit nothing at the point of use – no carbon dioxide, no NOx – so for now fully electric vehicles will continue to enjoy the lowest possible tax charges.

Minister for Finance Paschal Donohoe also announced an extra €3 million for the roll-out of on-street recharging points in 2020, including communal charging points for apartment blocks and at designated taxi ranks. He said the move would double the number of local authority on-street charging points installed.

In addition, he allocated €8 million to maintain grants for those purchasing electric cars. He also extended the tax relief available on hybrid and plug-in hybrids for 2020. He also extended the tax relief available on hybrid and plug-in hybrids for 2020, and the Benefit-in-Kind zero tax rate on electric vehicles to 2022.

Using the NOx tax as a deterrent to those seeking to import a used diesel car from the UK could well prove effective. For example, a 2013 Volkswagen Golf 1.6 TDI (and the Golf is currently the most popular imported car) has NOx emissions of 118mg/km. That would incur a NOx tax charge of €1,510. Given that a 2013 Golf would currently be charged only €1,500 or so in terms of VRT when it's imported, that may well prove a significant barrier to second-hand car shopping in the UK.

With other models, though, the impact will be minimal. For example, a BMW 520d executive saloon from 2015 (again, a hugely popular car among those importing from the UK) has rated NOx emissions of just 17mg/km, so would only be charged €85 in NOx tax. Equally, an Audi A6 2.0 TDI diesel saloon, also from 2015, has NOx emissions of 55mg/km, so while it will be a little more expensive, the total charge will amount to just €275.

NORTH AMERICA

19. The Trump Political War Against California Heats Up

DOJ Targets California's GHG Link To Quebec

The Trump administration is intensifying its political war with California, suing the state in federal court over the state's years-old decision to tie its greenhouse gas cap-and-trade program with Quebec's, which the administration charges tramples on the president's exclusive power to conduct foreign policy and regulate international commerce.

California's 2013 agreement with Quebec "undermine[s] the ability of the federal government as a whole, and the president in particular, to speak for the United States with one voice on a variety of complex and sensitive subjects of foreign policy," the Justice Department (DOJ) argues in its October 23 complaint in *United States v. State of California, et al.* which was filed in the U.S. District Court for the Eastern District of California.

The suit is just the latest front in a wide-ranging battle between the administration and California over environmental issues, including a drawn-out dispute over the administration's plan to roll back vehicle GHG rules. However, the animosity has extended to EPA allegations that the state is falling down on its enforcement of air and water laws -- charges that critics paint as political.

Specifically, the administration urges the court to find the six-year-old agreement between the state and Canadian province to be unconstitutional. It seeks an order blocking continued operation of the deal, as well as a separate agreement with the Western Climate Initiative (WCI) and California's regulations that allow for formal connections to international cap-and-trade programs.

The lawsuit does not appear to target the remainder of California's rules that enforce the cap-and-trade program on in-state emitters.

Under the agreement, California and Quebec operate separate cap-and-trade programs requiring major GHG emitters to secure allowances representing their emissions, with the pool of available allowances decreasing over time to reduce overall emissions. However, the state and province jointly operate quarterly allowance auctions, and agree to accept credits issued by either jurisdiction for compliance. Supporters of the program say this helps to keep costs in check by expanding the potential number of emission-reduction efforts.

But the administration argues that by crafting an agreement with an international partner, California violated the Constitution's bar on states entering into treaties and its prohibition on joining a foreign "compact" without approval from Congress.

"The power to enter into such agreements is reserved to the federal government, which must be able to speak with one voice in the area of U.S. foreign policy," Assistant Attorney General Jeffrey Bossert Clark, of the Justice Department's Environment and Natural Resources Division, said in a news release. "California's unlawful cap-and-trade agreement with Quebec undermines the President's ability to negotiate competitive agreements with other nations, as the president sees fit."

DOJ also argues that the agreement interferes with the federal government's international climate policy and imposes a "substantial and undue burden on foreign commerce."

The complaint notes that President Donald Trump has pledged to leave the United Nations Paris Agreement by November 2020, and that the California-Quebec agreement and several more recent deals pushed by California "interfere" with the federal government's foreign policy on GHGs.

It also cites a 2006 quote from then-Gov. Arnold Schwarzenegger (R) likening California to a "nation-state" because of its large population and economy.

"According to California, the state is a party to 72 active bilateral and multilateral 'agreements' with national and subnational foreign and domestic governments relating to environmental policy," DOJ's complaint says. "Additionally, California states that the purpose of these agreements is 'to strengthen the global response to the threat of climate change and to promote a healthy and prosperous future for all citizens.'"

California and supporters of the cap-and-trade program are harshly criticizing DOJ's lawsuit -- which continues weeks of attacks from the administration against California on environmental issues including claims of lax state enforcement of federal air and water laws and a final rule preempting the state from issuing auto GHG rules.

"The White House is yet again continuing its political vendetta against California, our climate policies and the health of our communities," Gov. Gavin Newsom (D) said in an October 23 statement. He added that the state's cap-and-trade program is a model around the world, and that the lawsuit shows the administration has "its head in the sand when it comes to climate change."

The Western Climate Initiative targeted by the Justice Department caps greenhouse gas emissions but allows power plants, factories and other industrial facilities to buy permits to release

them. A similar regional cap-and-trade program is designed to curb emissions in New York, Massachusetts and other Northeast U.S. states but, unlike the California plan, it does not include international partners.

President Donald Trump and California officials have been sparring for years, though the battles have intensified recently over the state's efforts to rein in greenhouse gas emissions from automobiles. California has emerged as a leading legal antagonist of the Trump's efforts to ease environmental regulations, with the state having filed dozens of suits challenging administration policy actions.

D.C. Circuit Rejects Auto GHG 'Finding' Case But Sets High Bar For Rule Suit

A federal appeals court has rejected for lack of jurisdiction a suit filed by states and environmentalists over EPA's 2018 finding that Obama-era auto climate rules are not "appropriate," ruling that it is not a final agency action. But the decision sets a potentially high bar for EPA to justify its pending rollback of the rules once that is litigated.

A three-judge U.S. Court of Appeals for the District of Columbia Circuit panel, in a unanimous October 25 opinion finds that EPA's determination -- which sparked its forthcoming rollback of the Obama standards -- does not have direct legal consequences because it is akin to granting a petition to reconsider a rule rather than definitively committing the agency to a change in standards.

"The Revised Determination does not determine rights or obligations or establish legal consequences within the meaning of the Bennett test's second prong," the opinion says, quoting the 1997 Supreme Court case *Bennett v. Spear* that outlines a test for determining when agency actions are final and therefore reviewable by courts.

The court's opinion adds: "The Revised Determination did not itself effect any change in the emissions standards that were established by the 2012 final rule for model year 2022--2025 vehicles. EPA has made clear that those 'standards will remain in effect unless and until EPA changes them by rulemaking.'"

The ruling effectively ends the first round of litigation over the Trump administration's auto GHG rule rollback, essentially maintaining the status quo for both the administration and opponents of the rollback, who have pledged to launch a vigorous challenge of that rule once it goes final later this year.

Even so, the D.C. Circuit opinion also contains an apparent warning for EPA about its rollback plan, with the judges noting that the agency has "not erased" the voluminous technical record that supported the Obama administration's January 2017 conclusion that it should retain the rules. Trump officials scrapped that finding with their revised determination issued in April 2018.

"By withdrawing the Original Determination and initiating a rulemaking, EPA has not erased the Draft Technical Assessment Report, Technical Support Document, or any of the other prior evidence it collected," the court says. It adds: "Of course, if EPA ultimately changes the 2012 standards, it will need to provide a 'reasoned explanation' for why it is 'disregarding facts and circumstances that underlay or were engendered by the' 2022--2025 model year standards when they were set in 2012 and the additional record developed during the original mid-term evaluation process."

The court's opinion notes that Obama officials developed a 1,217-page draft technical assessment of the MY22-25 standards, and that the 2017 determination ran 268 pages and was accompanied by a 719-page technical support document.

It also notes that the far-shorter 2018 determination concluded the 2012 standards were "not appropriate," but "its analysis of the individual [factors for reviewing the rules] was less definitive."

The judges stress that the 2018 determination "created only the possibility that there may be a change" in EPA's auto GHG standards, concluding the current rules are "not appropriate" because they "may be too stringent." They say that attorneys for California and other states acknowledged during September 6 oral argument that EPA's finding does not bind the agency to relax the standards -- even though all sides say this is a highly likely outcome. Similarly, "EPA has taken the position that the Revised Determination 'does not dictate the outcome of further rulemaking.'"

The administration has since finalized a related plan to revoke a Clean Air Act waiver that allows California to set its own auto standards—a decision that has launched a separate set of litigation.

The EPA and the Department of Transportation are also working on a new set of less stringent emissions targets for automakers to follow, which is expected to trigger an even bigger legal battle.

"The fight for clean car standards is far from over," California Attorney General Xavier Becerra, who led the state coalition against the EPA's move, said in a statement after the ruling. "We will continue moving forward, for the sake of protecting public health."

"Today's judicial ruling that the Trump administration must address the rigorous facts showing the feasibility and extensive benefits of our nation's clean cars standards establishes an insurmountable burden for Trump's factually flawed attack on these climate and clean air safeguards," said Martha Roberts, Senior Attorney, Environmental Defense Fund.

The Court emphasized that "[t]he Original Determination has been withdrawn, but the evidence supporting it stands. If EPA's rulemaking results in changes to the existing 2012 standards, it will be required to provide a reasoned explanation and cannot ignore prior factual findings and the supporting record evidence contradicting the new policy."

The Court specifically cited and relied upon portions of the oral argument in which counsel for EPA acknowledged that the agency's obligation to justify any departures from the existing standards and its extensive underlying record is wholly unaffected by the 2018 Revised Determination. Instead, the 2017 Determination endorsing the existing standards remains the most recent final agency action for purposes of judicial review of "any future final action."

The opinion highlighted the extensive record supporting the existing Clean Car Standards, including EPA's findings, as part of a "1,217-page Draft Technical Assessment Report," that "[a] wider range of technologies exist[s] for manufacturers to use to meet the MY 2022–2025 standards, and at costs that are similar or lower, than those projected" when the standards were established in 2012.

The Alliance of Automobile Manufacturers, a group of major automakers that intervened in the case, praised the ruling, saying it ensured that the federal government could revisit standards as needed. "The Auto Alliance, as an intervening party to this case, is appreciative that the DC Circuit dismissed the lawsuit that would have prevented DOT and EPA from ensuring that future auto

fuel economy and greenhouse gas standards were based on updated, more current information—which is what was agreed upon by the federal government and other stakeholders when the 2012 rulemaking was finalized,” the group said in a statement.

Experts Claim Attack On California Auto GHG Rules Legally Vulnerable

Environmental law experts are underscoring multiple legal obstacles the Trump administration faces when defending its rule preempting California’s vehicle greenhouse gas and zero emissions vehicle (ZEV) rules, including statutory history and EPA’s unprecedented withdrawal of permission for the programs years after approving them.

The critiques surface in venues such as a recent webinar sponsored by several major law schools, and two prepublication papers authored by Greg Dotson, a longtime aide to former Rep. Henry Waxman (D-CA) and now a University of Oregon law professor.

The criticisms echo arguments that are likely to surface or have already arisen in wide-ranging litigation over the Trump administration’s vehicle policies.

“There are multiple ways for EPA to lose this case,” New York University’s Institute for Policy Integrity (IPI) policy director Jack Lienke said during the September 25 webinar, focusing initially on EPA’s unprecedented decision to retroactively withdraw a Clean Air Act waiver of federal preemption for the California programs, finding the state has not met the conditions to receive such a waiver.

“It could lose this case because [courts] find it doesn’t have revocation authority, full stop,” he said, citing the IPI’s prior arguments that EPA has no authority to repeal such a waiver once issued. Or, courts could find the agency can withdraw such a waiver but that it hasn’t cited “permissible grounds” to do so, Lienke added.

Further, courts could determine the agency might have grounds in theory to revoke the waiver, but that “it hasn’t developed the record necessary to support the findings.”

EPA has argued that it has “inherent authority” to revoke the waivers it previously has issued for California.

The waiver revocation was issued jointly with a National Highway Traffic Safety Administration (NHTSA) rule finding California’s programs are preempted by the Energy Policy and Conservation Act (EPCA) bar on rules by states or localities that are “related to” fuel economy.

But Lienke cited at least three reasons why courts are likely to take a skeptical view of EPA’s inherent authority claims, including the almost seven years that have elapsed since the agency’s January 2013 approval of the waiver for California’s vehicle GHG and ZEV programs.

Case law requires such reversals to happen within a “reasonable period of time,” he said, and courts also take into account “reliance interests” of state and other parties, including California’s reliance on the programs to meet GHG and air quality goals. In addition, California has unique reliance interests as a sovereign state government using emissions programs to protect the health of its citizens, he added.

Julia Stein, of the University of California-Los Angeles School of Law, added on the webinar that the preemption rule upends 50 years of precedent under which EPA has never revoked an air act waiver for California.

She also noted that EPA's waiver revocation relies on "splitting apart" the state's clean air programs by considering them separately, calling this a "departure from past agency practice" of considering the state's programs as a whole.

The administration's final preemption rule attempts to hedge against the reliance claims referenced by Lienke and others in part by citing recent California actions -- including its voluntary agreement with four automakers on GHG standards with stringency between the Trump administration's proposal to freeze Obama-era standards and the current program -- as evidence the state is no longer reliant on its current program.

Lienke calls such arguments "absurd . . . It is as if your landlord has threatened to turn off your heat and you said that is illegal . . . but also you order some blankets on Amazon. And then your landlord said you definitely don't need heat because you have all those blankets."

He also noted that the final rule narrowed the administration's legal arguments in defense of the waiver revocation, omitting claims that the California's programs are not feasible for automakers. Observers attribute that change to the fact that the administration has completed its attack on the waiver but has not yet finished its regulation rolling back federal requirements -- including the justification for regulatory breaks for automakers.

Dotson during the webinar referenced his two recent papers that delve into the Trump administration's claims, which focus on the proposed rather than final version of the administration's waiver decision, though the final rule largely reaffirms the administration's proposed arguments.

The first paper cites numerous alleged flaws in the administration's preemption arguments -- including the lack of a limiting principle to prevent NHTSA's EPCA interpretation from derailing numerous state and local laws on subjects such as anti-idling rules, speed limits and gasoline taxes -- which may all theoretically be "related to" fuel economy and thus preempted.

NHTSA also implemented EPCA "for more than [25] years without raising a possibility that EPCA preempted state emission standards," the paper says, noting that NHTSA has repeatedly factored emissions standards into its fuel economy standards despite such impacts amounting to as "much as 28 percent in specific vehicles." The agencies provide "no basis for distinguishing these previous 'appropriate' actions [factoring emissions standards into fuel economy rules] from today's efforts to reduce emissions that they deem preempted."

Dotson's second paper focuses on both legislative and statutory history over the past several decades, arguing the "best reading of the law is that Congress has preserved -- not encroached upon -- California's authority to regulate greenhouse gas emissions from cars and trucks."

Among the elements of that history is language in the 1990 Clean Air Act amendments that specifically recognized and endorsed the California ZEV mandate, Dotson notes, with the law going so far as to direct states to emulate elements of that program when implementing clean vehicle programs. "It would be quite odd to have Congress say, 'Sure, we preempted [California] in 1975 [via EPCA], but now we are going to allow their programs to run in parallel and in fact build off of that,'" he said during the webinar.

Dotson also argues that the Trump administration fundamentally misinterprets the Energy Independence & Security Act of 2007 to claim that Congress at that time had a chance to scuttle EPCA's preemption of state programs related to fuel economy but did not. Dotson says this interpretation ignores both the legislative and statutory history of the 2007 law, which shows Congress opposed limiting California's authority, including a savings clause in the statute that says nothing in the bill limits authority under any other provision of law.

Dotson notes that this language was being enacted as the Supreme Court ratified EPA's authority to regulate GHGs in the landmark *Massachusetts v. EPA* ruling. In addition, Congress at the time rejected multiple efforts to rein in EPA or state GHG programs, and two federal courts in California and Vermont found -- in *Central Valley Chrysler Jeep Inc. vs Goldstone and Green Mountain Chrysler Plymouth Dodge Jeep. v. Crombie* -- that EPCA does not preempt state vehicle GHG programs.

Dotson also quotes the late Justice Antonin Scalia to argue that that even under a "textualist" interpretation of statutes, favored by Scalia and many conservative jurists, NHTSA's interpretation that EPA preempts state vehicle GHG programs "falls short."

"Scalia has said that the role of a judge is '[t]o interpret all provisions, to the extent the language will bear it, so as to reconcile each section of a statute with the others, and yesterday's laws with today's,'" he said. In that vein, Dotson argues the Supreme Court has made clear that EPA regulates air pollution, and Congress has "always sought to uphold California's unique authorities" to curb pollution.

EPA Rejects Claim Of California ZEV Rules Offering Air Quality Benefit

The Trump administration, as part of its final revocation of California's authority for its vehicle greenhouse gas and zero emissions vehicle (ZEV) programs, is rejecting claims from the programs' supporters that the ZEV rules in particular improve local air quality, citing the state's declarations appearing to downplay the rules' benefits.

However, defenders of the state programs argue the administration is distorting the state's prior remarks, and that the ZEV program can have important air benefits over the near and long term.

The dispute could figure prominently in broader litigation over California's authority, after EPA concluded the state's GHG programs are not justified by "compelling and extraordinary conditions" under the Clean Air Act (CAA), and the National Highway Traffic Safety Administration (NHTSA) determined they are also preempted by the Energy Policy and Conservation Act's (EPCA) bar on state programs "related to" fuel economy.

But the Trump administration's final rule targets the ZEV program as "inextricably linked" to California's vehicle GHG strategies -- efforts it claims are preempted by EPCA, as well as unjustified under the CAA because California does not face unique threats from climate change.

That position means Trump officials must also argue the ZEV program in isolation is unnecessary to improve California's infamous local air quality problems -- the issue long identified as a major factor in concluding that the state faces "compelling and extraordinary" circumstances that warrant auto rule preemption waivers.

Specifically, the EPA quotes language from the California Air Resources Board's (CARB) 2013 request for a waiver noting that there is "no criteria emissions benefit" from including the ZEV proposal -- "in terms of vehicle (tank-to-wheel or TTW) emissions," because of a the state's third phase of low-emission vehicle (LEV) standards.

"The LEV III criteria pollutant fleet standard is responsible for those emission reductions in the fleet; the fleet would become cleaner regardless of the ZEV regulation because manufacturers would adjust their compliance response to the standard by making less polluting conventional vehicles," the agencies argue in one part of the rule directly quoting California's waiver request.

But initial litigation by nearly two dozen states targeting NHTSA's EPCA preemption rule shows every indication they will vigorously dispute that the ZEV rules are irrelevant to air quality.

The complaint filed in federal district court calls both the GHG and ZEV rules "fundamental to State Plaintiffs' efforts to protect public health and welfare," citing the status of passenger vehicles and other mobile sources as California's largest source of both smog-forming nitrogen oxides and greenhouse gases, "which exacerbate pollution as they warm the climate."

It also calls the ZEV standards a "necessary part" of the California's efforts to attain national ambient air quality standards (NAAQS), noting that EPA in 2016 approved California's state implementation plan (SIP) for air quality that included the ZEV rule, and the state also relies on ZEV to help demonstrate conformity with the Clean Air Act for purposes of transportation funding. "For similar reasons, other section 177 states have the GHG standards, and the ZEV standards, or both, approved into their state implementation plans."

EPA and NHTSA respond to these claims in their final rule in part by arguing the ZEV rule is preempted by EPCA, whatever its benefits for air quality.

And the agencies also claim -- in line with the argument that the ZEV sales mandate does not help air quality -- that the ZEV program is instead "inextricably interconnected" with California's GHG strategy, and that the GHG provisions were not included in the state's 2016 SIP.

"California's [comments] do not rebuff the Agency's views that the ZEV standards . . . are inextricably connected with the design and purpose of California's overall GHG reduction strategy" -- rules the administration claims are preempted under EPCA and the CAA.

But one supporter of California's vehicle programs says that the administration's claims are flawed because they rely on a distortion of "one sentence" in CARB's waiver request -- limited to a narrow "tank to wheel emissions" analysis and the interaction of the ZEV rules with the LEV provisions allowing compliance credits for ZEVs -- to broadly argue ZEVs do not benefit air quality.

"The reason you see this sentence come up [repeatedly in the final preemption rule] is it is the only thing [the agencies] have" to downplay the air quality concerns with revoking the ZEV program, the source told reporters.

Specifically, the reference to a "tank to wheels" analysis does not address air pollution from the "well to tank," meaning it does not include upstream emissions benefits of ZEVs in reducing refining and distribution emissions from conventional gas-powered vehicles, the source says.

In addition, the administration's air quality discussion ignores factors including: emissions controls on conventional, non-ZEV vehicles deteriorate over time while those for electric vehicles do not;

increased deployment of ZEVs reduces pollution hotspots near highways now brimming with conventional vehicles; and the ZEV program speeds a shift away from fossil fuel-powered vehicles that results in major air quality benefits over the long term.

More broadly, this source references as “absurd” language in the preemption rule stating that the ZEV rule -- or another similar program related to fuel economy -- would be preempted by EPCA regardless of any air quality benefits.

“A state has no authority to adopt a requirement that falls within the scope of EPCA preemption,” the final preemption rule states. “This is true even if adopting the unlawfully enacted requirement would assist the state in coming into compliance with the NAAQS.”

Trump Administration Asks Court to Throw Out Clean Cars Cases

Federal lawyers are pushing to derail legal challenges from Democrat-led states and environmental groups that oppose the Trump administration’s recent decision to block California from setting its own standards for auto emissions.

In a new legal filing, the Justice Department urged the U.S. District Court for the District of Columbia to dismiss these lawsuits from a coalition of states and environmentalists taking aim at the Department of Transportation’s role in stripping California of its authority to set clean car standards.

In a joint action in August, the Environmental Protection Agency revoked California’s waiver, and DOT’s National Highway Traffic Safety Administration issued a related rule that said the state’s emissions standards are preempted by federal law because they affect fuel economy, an area under NHTSA’s jurisdiction.

The two district court lawsuits target NHTSA’s preemption rule. Separate litigation over the EPA’s revocation of the California waiver is expected in the U.S. Court of Appeals for the District of Columbia Circuit, which oversees major Clean Air Act litigation.

But the Justice Department says NHTSA’s regulation is intertwined with the EPA’s action, and must also be litigated in the D.C. Circuit. “EPA’s interrelated final action is only reviewable in the United States Court of Appeals for the D.C. Circuit and one of the Interest Group Plaintiffs has already filed a petition for judicial review in that court,” the October 15 motion says. “Thus, for both jurisdictional reasons and judicial economy, these cases belong in the D.C. Circuit.”

DOJ is asking the court to dismiss the cases or transfer them to the D.C. Circuit to be combined with future lawsuits that zero in on the EPA’s waiver decision.

General Motors Sides With Trump in Emissions Fight, Splitting the Industry

Breaking with some of their biggest rivals, General Motors, Fiat Chrysler and Toyota said they were intervening on the side of the Trump administration in an escalating battle with California over fuel economy standards for automobiles.

Their decision pits them against leading competitors, including Honda and Ford, who this year reached a deal to follow California’s stricter rules. It represents the latest twist in one of the Trump administration’s most consequential rollbacks of regulations designed to fight climate change. It

has also opened a rift among the world's biggest automakers — the very industrial giants that the Trump administration maintains it was trying to help with regulatory relief.

The automakers siding with the administration, led by the industry group the Association of Global Automakers, say that the federal government, not California, has the ultimate authority to set fuel economy standards for passenger cars and trucks. John Bozzella, chief executive of the automakers association, said the group still hoped for a middle ground. "We can still reach an agreement that is supported by all the parties," Mr. Bozzella said.

Still, the auto industry has "historically taken the position that fuel economy is the sole purview of the federal government," he said, "though it doesn't have to come to that."

The legal fight between the Trump administration and California over auto pollution rules has swelled into a battle over states' rights and climate change that is likely to only be resolved once it reaches the Supreme Court. Its resolution could have repercussions affecting pollution regulations across the United States, as well as states' rights to set their own environmental laws and the future contours of the auto industry.

In what was widely seen as a retaliatory move, the Justice Department subsequently opened an antitrust inquiry into the four automakers on the grounds that their agreement with California could potentially limit consumer choice, according to people familiar with the matter at the time the inquiry was opened.

In a statement, Honda distanced itself from Global Automakers' intervention. "Honda is not a participant in this litigation," said Marcos Frommer, a Honda spokesman, "and is not contributing any funds supporting our trade association's activity in this area." Honda has already locked in vehicle greenhouse gas standards through model year 2026 based on the stricter standards agreed on with California, Mr. Frommer said.

Mary D. Nichols, chairwoman of the California Air Resources Board, which sets the state's clean air standards, criticized the move. "We are disappointed in the Association of Global Automakers for hiding behind the Trump administration's skirts and its assault on public health," she said. California, she said, would "keep working with those automakers committed to a framework that delivers cleaner vehicles that benefit consumers and the environment."

Ann Carlson, co-director of the Emmett Institute on Climate Change and the Environment at the University of California Los Angeles, said the Trump administration had been clear from the outset that it was not interested in tightening the standards. "If you're intervening on the side of the Trump administration to limit California's authority, you're siding with much less stringent standards," she said. "I don't think you can have it both ways."

The move "emboldens an administration that has already rejected any sort of settlement with California," she added.

Senator Tom Carper of Delaware, the top Democrat on the Senate Environment and Public Works Committee, said the move by General Motors, Toyota and the other automakers was "not in the long-term best interest of these companies—really, it's just the opposite."

"To say I'm disappointed is an understatement," he said, "especially given the number of times these companies have told me personally that they wish to avoid costly litigation and regulatory uncertainty."

New Study: Rollback of California Car Rules Will Cause Emissions to Spike

Revoking California's Clean Air Act waiver would let greenhouse gas emissions soar and electric vehicle sales plummet, new research shows. The analysis by the economic consulting firm Rhodium Group examined the climate impact of the Trump administration's planned rollback of Obama-era clean car standards.

The rollback has two main components. It would freeze fuel economy standards at 2020 levels through 2026, allowing cars to travel much shorter distances on one tank of gas, and would revoke California's Clean Air Act waiver for greenhouse gases, which lets the state set tougher emissions rules than those of the federal government.

If the administration pursues only the first component, an additional 493 million to 684 million metric tons of carbon dioxide will enter the atmosphere, the research found. But if the administration pursues both components as planned, CO₂ emissions will soar by an additional 1,055 million to 1,317 million metric tons.

The analysis found a similar effect on sales of zero-emission vehicles, including plug-in hybrid and battery-electric models.

If the administration freezes only fuel economy standards, there will be 6 million to 7 million fewer ZEVs on the road. But if the administration freezes the standards and revokes California's Clean Air Act waiver, ZEV sales will plummet by 12 million to 14 million.

Emily Wimberger, a climate economist at Rhodium Group and lead author of the research, said the findings show the "outsized impact" of the California waiver. "The difference between the California waiver being revoked and the waiver remaining in place is pretty large," said Wimberger, a former chief economist at the California Air Resources Board.

Ultimately, the findings highlight the importance of the California waiver to meeting global temperature targets. "When we're thinking about trying to reach long-term climate targets, the California waiver really does change the trajectory of where we're going and really could put us off track to get below 1.5 degrees Celsius," according to Wimberger.

Wimberger also noted that the average life span of a vehicle is 12 years, so if ZEV sales plateau now, future generations will feel the effects. "Because vehicles have a 12-year life expectancy, every ZEV that's not put on the road now means we're going to continue to rely on petroleum-based vehicles far into the future," she said.

Study: California's Deal with Automakers Will Lessen Impact

After months of negotiations with the Trump administration over its proposed rollback of Corporate Average Fuel Economy (CAFE) standards, California has struck out on its own. In a new agreement with California, four of the world's largest automakers voluntarily agreed to implement annual fuel economy improvements across their entire fleets. Together these automakers, Ford, Honda, BMW and Volkswagen, account for about 30% of new cars and light trucks sold in the US. The Rhodium Group modelled the impact of the new deal on average fuel economy, US oil consumption and greenhouse gas (GHG) emissions, and found it fares modestly better than the EPA's proposed freeze of CAFE standards at 2020 levels. The deal could offer regulatory certainty for additional automakers looking to lock in their long-term product plans after months of

uncertainty. If more companies sign on, the impact of the California deal could rival those of the Obama-era standards, and greatly weaken the Trump administration's hand.

In the new deal, California and the four manufacturers agree on a 3.7% average annual increase in fuel economy from 2022 to 2026. About a percentage point lower than the gains expected under the Obama standards, this puts the automakers on track to achieve the fleetwide fuel economy anticipated in 2025 under the original rules one year later. The four participating automakers can offset about a quarter of this improvement by incorporating cleaner technologies in vehicle design or by selling electric vehicles (EVs). Credits for EVs established under the Obama-era rules and schedule to phase down by 2021 would extend through 2026 under California's deal.

While some have criticized the terms as offering too many loopholes to automakers, others see the deal as a much-needed compromise after months of tense deliberations. The voluntary actions could meaningfully offset the impacts of a nationwide freeze.

To put the California deal in context, Rhodium first revisited its estimated impact of the proposed CAFE rollback under a series of oil price scenarios. This time around, it considered impacts under a range of likely oil prices consistent with its Taking Stock 2019 projections. The analysis captures, in 2018 dollars, a wide range of potential oil prices—from today's prices of around \$50 a barrel West Texas Intermediate Crude Oil Prices (WTI) to the past decade's high of nearly \$100 a barrel.

Under Obama-era standards, today's 34 miles per gallon (mpg) fleetwide fuel economy for new vehicles rises to 45 to 46 mpg in 2025, depending on oil prices. Fuel economy reaches 49 to 50 mpg by 2030. If standards are frozen at 2020 levels, fuel economy hits 37 to 39 mpg by 2025 and 39 to 43 mpg by 2030. In all cases, standards continue to grow at a slower pace past 2030 as electric vehicle adoption increases².

To see how the California deal compares, Rhodium assumed that the four automakers meet fuel economy improvements mandated by the California deal, and that the extended EV credits apply. The remaining companies adhere to Trump's proposed lower standards. In this split market, we estimate that fleetwide average rises to 39 to 41 mpg in 2025, and 42 to 45 mpg by 2030.

Because CAFE standards only impact new cars, the knock-on effects of rolling back CAFE standards are slow to start. But the impacts grow over time as more cars are sold under the weaker rules. In 2025, freezing CAFE standards increases US oil consumption between 221,000 and 285,000 barrels per day, relative to the effect of Obama-era standards. Assuming no change in post-2025 standards, this could rise to as much as 899,000 barrels per day by 2035. The California deal would dampen this rise in oil demand by about 30%, compared to Obama's plans, with consumption growing to 438,000 to 631,000 barrels per day by 2035.

California has called their deal an olive branch to the administration and sees the plan as a blueprint for a national standard. Regardless of whether the federal government ultimately changes course, California's Governor Gavin Newsom is "very confident" that other companies will sign on to the voluntary agreement. We estimate that the deal, as it stands today, could reduce emissions by 184 to 266 million metric tons (MMTs) cumulatively from 2021 to 2035 relative to Trump's pending rollback. If all automakers who sell in the US market were to join, cumulative reductions would jump to 557 to 807 MMT over the same timeframe. This would put the expanded deal on par with reductions we would expect to see if Obama-era rules were re-instated.

² Using the central electric vehicle battery cost assumptions in "Taking Stock 2019", by Hannah Pitt, Kate Larsen, Hannah Kulus, Shashank Mohan, John Larsen, Whitney Herndon, Trevor Houser, Rhodium Group, July 2019

California has already spent months embroiled in back-room negotiations and litigation, and the fight over Trump's pending rollbacks of CAFE and other policies is far from over. If it scales, California's deal with automakers points to a potential new way to sustain momentum on clean transportation that cuts the Trump administration out of the equation. Beyond improving fuel economy, California aims to scale up electric vehicle penetration and is currently considering banning internal combustion engines entirely at some point in the future. The state has just proven it has sizable leverage to push policy forward. Automakers, looking for regulatory certainty and policy support for their growing electric vehicle investments, may prove a willing partner according to Rhodium.

EPA Chief Hints Vehicle CO2 Limits Will Tighten

The Trump administration's chief environmental regulator said recently that final U.S. vehicle fuel economy standards due out later this year could be more restrictive than current rules enacted by the Obama administration because they will eliminate certain loopholes.

"In some of the out years, we're actually more restrictive on CO2 emissions than the Obama proposal was" because the proposed Trump administration rules will eliminate "off ramps" that make it easier for automakers to comply, Environmental Protection Agency Administrator Andrew Wheeler told reporters after a speech to the Detroit Economic Club.

Wheeler said the final proposal will not be look "exactly like" the original one announced in August 2018 to freeze fuel efficiency standards at 2020 levels through 2026. He declined to offer more details. Work is continuing on revisions to the vehicle efficiency and emissions standards, which are overseen by EPA and the Department of Transportation, he said.

The Trump administration's earlier proposal called for freezing the average vehicle fuel efficiency target at 37 mpg. Wheeler said he is hopeful California regulators will have a different view when they see the administration's final proposal.

Only three automakers complied with U.S. fuel efficiency standards in 2017, Wheeler noted, saying the Obama rules "are not based on reality."

Wheeler used the speech to the Detroit Economic Club to defend the administration's environmental record. The decision to scrap the Obama fuel economy targets and strip California of its authority to set its own standards for vehicle CO2 emissions are aimed at making new vehicles less expensive, and encourage consumers to buy newer, safer vehicles, Wheeler said.

On a separate point, Wheeler said the EPA is prepared to enact new regulations to curtail smog and plans to set new standards next year for nitrogen oxide emissions from heavy trucks.

Automakers are pushing ahead with plans to invest billions in new electric vehicles. General Motors Co, for example, has proposed spending \$3 billion to convert a Detroit assembly plant to build electric trucks and vans.

Wheeler was critical of electric vehicles and electric vehicle subsidies. He told the Detroit audience regulations that effectively mandate electric vehicle sales will result in automakers raising prices for sport utility vehicles and trucks so they can sell electric cars at lower prices.

California should focus on limiting smog-forming pollutants, and still has the power to do so, Wheeler said. “California has the worst air quality in the United States,” Wheeler said. “We hope the state will focus on these issues ... rather than trying to set fuel economy standards for the nation.”

20. California Will Miss Emissions Goals Without Drastic Action, Study Warns

California is a national leader in cutting greenhouse gas emissions, but it is well short of meeting its climate goals for the next decade and won't reach them for at least 30 years unless drastic action is taken, according to a recent study of the state's green economy.

The 11th California Green Innovation Index found the state would have to reduce carbon dioxide from cars and factories by an average of 4.51% every year to meet the goal set by SB32, which requires car and factory emissions to be 40% below 1990 levels by 2030 and 80% lower by 2050.

The only state or country to ever accomplish a reduction that large was France, when it switched its power system to nuclear in 1974 in response to a worldwide oil shortage, climate experts said. California has been reducing carbon emissions by an average of about 1.15% a year.

“California has made tremendous gains cutting pollution without detrimental economic impacts ... but this year's index serves as a wake-up call,” said Noel Perry, founder of Next 10, a San Francisco nonprofit research group that focuses on the economy and the environment. “We're going to need major policy breakthroughs and deep structural changes if we're going to deliver the much-steeper emissions reductions required in the years ahead.”

The state's emissions record has been stellar so far — at least in comparison to the rest of the country, according to the report, co-authored by Next 10 and the consulting firm Beacon Economics. Greenhouse gas emissions have been cut more than 25% since 1990 while gross domestic product (GDP) per capita has increased 41%.

California, which has the second-lowest rate of energy-related carbon emissions per capita in the nation after New York, met its self-imposed 2020 emissions reduction goals four years early. The year 2017 marked the first time more of the state's power came from renewable sources like wind and solar than from fossil fuels.

But the early success may be deceiving, according to the study. Since 2000, it said, the electrical grid has been the only economic sector that has had continuous declines in greenhouse gas emissions.

Industry, housing and transportation recorded reductions of less than 5%, but the commercial sector, which includes all businesses not involved in manufacturing or transport, increased emissions 64% in the 17 years following the turn of the century.

Meanwhile, vehicle emissions hit a record high in 2017, accounting for 41% of the state's total. That's because car ownership rates and vehicle miles traveled were at an all-time high that year

People are also buying more SUVs, pickup trucks and minivans than in the past. Such low-efficiency vehicles made up 57.3% of new-vehicle registrations in 2018 compared with 39.3% five years earlier.

If nothing changes, California won't meet its 2030 emissions goals until 2061 and won't meet its 2050 target for at least 100 years, according to the report.

David Clegern, a spokesman for the California Air Resources Board, said Gov. Gavin Newsom signed an executive order last month to funnel billions of dollars into making transportation systems cleaner.

"We recognize that achieving the target of a 40% reduction by 2030 is an ambitious goal for California," according to Clegern. "It is clear that achieving the state's ambitious goals will require continued legislative and funding support."

Clegern said the agency has a "cost-effective, technologically feasible path to achieve our 2030 target, which requires reductions much like those called for in the Next 10 study," but, he added, "we need to make sure the policies and necessary transformations identified in it are actually happening."

California has already seen a dramatic increase in temperatures since the 1980s. The snowpack in the Sierra has been in a continual decline, decreasing by 9% since 1906, according to a report by the California Environmental Protection Agency. The largest glaciers in the Sierra have shrunk by an average of about 70%, and marine heat waves have increased, according to several reports.

The result of all this change has been an alarming increase in weather-related calamities. The five largest wildfire years since 1950 have all occurred since 2006, and the past two years saw the deadliest and most destructive wildfires in state history.

Although the report is sobering, the study's authors said there is hope. Electric-vehicle use is at an all-time high, and solar and wind are now cost competitive with fossil fuels.

California's leadership role in the development of clean fuels and sustainable energy has largely driven the market in the rest of the country. This innovative spirit, in defiance of the political trends in Washington, D.C., puts the state at the forefront of a new economic model that could, if handled properly, make clean energy the standard throughout the world, the authors said.

21. California Plans Nation's First Electric Truck Mandates

California air regulators want to force a wave of cleaner trucks onto the road by requiring that half of all medium and heavy trucks sales be for zero-emission vehicles by 2030.

If adopted by the California Air Resources Board, the regulation would be the first of its kind in the nation. It would set graduated goals for certain truck classes weighing more than 8,501 pounds to meet zero-emission goals beginning in 2024. The rule primarily affects stop-and-go, day route trucks—including delivery, bucket, garbage, and single-axle trucks—that head back to home bases at the end of the day.

By 2030, 50% of certain truck and chassis sales of medium and heavy trucks would have to be zero-emission, as would 15% of all other truck sales, according to the proposed regulation.

CARB released the proposed regulation October 22 and a comment period on the proposal opened October 25. The first board hearing on the proposed rule will be held in December, with a final vote expected in mid-2020, CARB spokesman Dave Clegern said.

State officials say the rule is the latest step to reduce emissions from the transportation sector, which contributes 41% of greenhouse gas pollutants, the largest source in the state. In 2017, transportation emissions increased by 1%, according to a state inventory.

The regulation is an attempt to get larger manufacturers with more established supply chains or ability to innovate on board while reducing pollution, said Tony Brasil, chief of CARB's Transportation and Clean Technology Branch.

"The primary goal is to get the manufacturers to build the trucks," Brasil said. "This is just the next step in our efforts" to electrify the heavy duty sector. Several manufacturers and fleet operators have pledged to increase zero-emission truck use in the coming years, and Brasil said new models are in the pipeline.

"The rule does not mandate that anyone purchase these vehicles," said Tim Blubaugh, executive vice president of the Truck and Engine Manufacturers Association, a trade association that represents worldwide manufacturers of medium- and heavy-duty trucks. "Zero-electric vehicles are often more expensive, they present operational challenges, and need charging infrastructure in place."

Some work will be required, Brasil said, but as more zero-emission vehicles come online, charging ability will increase and prices should decrease. "The technology exists, but the infrastructure will have to be installed," Brasil said.

The proposed regulation is expected to save \$4.9 billion in truck transportation costs from 2020 to 2040, mostly from fuel savings, the state said.

A coalition of environmental, labor, and advocacy groups also say the plan doesn't go far enough to protect residents and the environment from harmful pollutants.

Advocates like the Coalition for Clean Air, Earthjustice, and the International Brotherhood of Electrical Workers for San Diego and Imperial counties say the state's goals amount to only 4% of trucks on the road and that CARB should aim higher. "This rule can create some type of monumental change," said Andrea Vidaurre, a policy analyst with the Center for Community Action and Environmental Justice. "We are concerned that they are being incredibly unambitious."

In some truck and freight corridors, as many as 500 trucks per hour pass by homes. Those areas, which some call "diesel death zones," don't often have the lobbying money or political weight to force change, said Angelo Logan, campaign director for the Moving Forward Network, a national environmental justice group based at Occidental College that focuses on freight issues.

The coalition wants all classes of trucks, including pickups, to have some zero-emission requirements by 2024. Under the proposal, pickups would be excluded until the 2027 model year. "We're really disappointed that they're not using this as an opportunity," Vidaurre said. "It feels like another marginalization for us."

CARB's proposed rule also requires fleet owners with more than 100 trucks to report about their operations. That information could be used to set more stringent goals in the future, Brasil said. "If we can accelerate, we will."

22. States Eye Adopting CARB Truck NOx Standards Due To EPA Rule Delay

Several East Coast states say they might adopt the California Air Resources Board's (CARB) planned low-nitrogen oxide (NOx) standards for heavy-duty trucks starting in model year 2024-26, given uncertainty over the effectiveness of EPA's plan to adopt new national standards starting in MY27.

The states' declarations may ramp up pressure on EPA and truck engine manufacturers to reach a compromise with CARB on one set of national standards to avoid a patchwork of emissions regulations. But truck makers are continuing to raise numerous concerns with CARB's proposed regulations, charging they are too stringent and costly.

"The Northeast definitely needs strong and timely interstate NOx control for the vehicles, and absent such a federal program the Northeast states will look to the CARB standards to get reductions from the sector," said Coralie Cooper, deputy director of Northeast States for Coordinated Air Use Management (NESCAUM), during a September 26 CARB staff workshop in Diamond Bar, CA.

Jim Clyne, director of the bureau of mobile sources with New York State Department of Environmental Conservation, said that if EPA does not adopt a "timely and acceptable program," the state will "work with California as they develop their omnibus NOx regulations, and we will consider -- if there's not a federal alternative -- adopting them in New York state."

Similar sentiments were made during the CARB workshop by representatives of Connecticut, Oregon and Colorado, as well as the National Association of Clean Air Agencies. They all expressed concerns that without effective truck NOx regulations, regions will not be able to meet EPA's national ambient air quality standards.

NESCAUM's Cooper told reporters that while states interested in adopting CARB's low-NOx standards "would likely try to move quickly," regulatory lead-time requirements may result in the standards taking effect "a little later in states outside of California."

Under Section 177 of the Clean Air Act, other states can adopt California's vehicle emissions standards after California has received a waiver of federal preemption for its rules.

The Trump administration recently revoked California's waiver to implement its greenhouse gas emission standards for light-duty vehicles as well as its zero-emission vehicle sales mandate. But administration officials have said the move is not intended to affect California rules addressing conventional pollutants such as NOx.

In response to a stakeholder question about the need for a waiver to implement the new low-NOx engine standards, a CARB staffer said during the workshop: "To the extent required, we will apply for a waiver. And I can't really speculate on the timing for when exactly we'll do that, or when we might hear back from EPA."

Meanwhile, truck manufacturing companies are continuing to raise numerous concerns with CARB's proposed regulations, arguing they are too stringent and will result in exorbitant prices for new trucks.

While manufacturers want a 50-state program to be able to most efficiently develop and build products, they're "seeing the light at the end of the tunnel dimming quickly," says a source familiar

with the issue. “EPA is not moving quickly enough to establish a new 50-state rule and California is in the driver's seat with something that's unworkable.”

As a result, manufacturers may have no choice but to build a certain portion of their fleet to meet California's forthcoming, strict standards for MY24-26 and build the remainder to meet weaker federal standards in the rest of the country, the source says.

However, if other states adopt CARB's rules, the industry faces an even more daunting challenge.

Representatives of truck makers Navistar and Volvo Group during the workshop expressed frustration over CARB's proposal, as well as testing being done by Southwest Research Institute (SRI) on the feasibility of certain emission-reduction technologies under different driving modes.

Truck makers have been trying to persuade CARB to agree to a less stringent voluntary standard that industry representatives drafted earlier this year, but CARB staff have said that proposal falls far short of what's necessary to reduce NOx emissions to help meet air quality standards.

CARB staff during the workshop briefly discussed the potential of offering their own voluntary standard -- an option that may become part of the broader “omnibus” package of new regulations for medium- and heavy-duty diesel engines.

In addition to new low-NOx emissions standards for various sizes of trucks, the package includes new provisions for in-use compliance testing, a “low-load” certification cycle, useful life and warranties, as well as on-board diagnostic (OBD), durability demonstration and credits.

CARB plans to initially adopt the new regulations in April. However, the finalization of the rulemaking likely would not occur until several months after that, due to expected post-meeting “15-day” changes. In addition, the proposal may be altered as a result of SRI's final engine testing results that are due in March.

EPA, meanwhile, is scheduled to release a notice of proposed rulemaking “later in 2020” for its “Cleaner Trucks Initiative” featuring tighter NOx standards beginning in MY27, according to CARB.

The specific emissions standards CARB staff is now proposing are slightly more stringent than limits board officials floated in January. They include a NOx limit of 0.05 grams per brake horsepower-hour (g/bhp-hr) for MY24-26 vehicles and 0.015-0.030 g/bhp-hr limit for MY27 and subsequent vehicles. The MY27 limit is slightly more stringent than the previous proposal, which had an upper limit of 0.035 g/bhp-hr.

In addition, CARB is proposing a particulate matter standard of 0.005 g/bhp-hr for MY24 and subsequent engines.

Regarding the potential voluntary standard for manufacturers to meet for MY24-26, CARB staff's presentation notes that it “may propose a voluntary option for manufacturers: Certify to a less stringent standard in California in exchange for committing to certify cleaner trucks nationwide.”

But CARB staff declined to identify what the emission limits may be under such a voluntary option.

“It's a little premature to actually throw out a number,” said Mike Carter, assistant chief of CARB's mobile source control division, during the workshop. “We've been, however, in lengthy

discussions with our colleagues from EPA, and we've talked to the industry. We're going through those negotiations on a potential voluntary option.

"The thing to keep in mind is California does not have the authority to establish standards on a nationwide basis -- that's why it's a 'voluntary' kind of a thing," he said. "But one of the options, for example, when we go to the board next year with our proposal, we could propose a 50-state option if you will. So, manufacturers can certify . . . and be valid and able to sell nationwide."

However, there are "a lot of nuances to work out, in terms of enforceability, that kind of a thing, and how it could be worked," Carter added. "And I really can't -- I don't want to go into the details, because it would take forever to go through them, first of all. And they're all preliminary at this point. But I can assure you we're working on that; we're trying to make it work. We recognize that it's in everybody's best interest if a national program is in place early, because that's where the benefits will come from, especially in California because of the [vehicle miles traveled] from out-of-state trucks."

23. Diesel Engine Maker Plans for Separate Federal, California Air Limits

Leading U.S. engine maker Cummins Inc. is developing a range of diesel engine technologies to meet what it expects to be separate limits for ozone-forming pollution, a company official said October 23.

As noted above, the Environmental Protection Agency is aiming to issue a notice of proposed rulemaking in 2020 to limit ozone-forming nitrogen oxides from heavy-duty diesel engines to an unspecified level nationally in 2027, while California is planning to make its own proposal to go into effect starting in MY 2024.

Under the Clean Air Act, EPA and California are required to give engine manufacturers four years lead time to make engines compliant with new standards.

Some truck engine manufacturers are not waiting to see whether the federal government and California will collaborate on a single uniform standard, especially because the Trump administration is engaged in a public spat with California over compliance with the nation's air and water laws.

"Depending on where California goes with its proposal, the technology that we are developing will be different for the 49 states," Wayne Eckerle, Cummins' vice president for research and technology, said after a House Energy and Commerce subcommittee hearing.

The engine manufacturer representatives testifying said they would prefer that the EPA and California Air Resources Board collaborate on crafting a single standard for nitrogen oxides, as they did in drawing up greenhouse gas emissions cuts from heavy duty trucks that takes effect in 2021.

"National-level emissions policy and regulation is important because a patchwork system across states could result in a proliferation of technologies that is unsustainable and inefficient for business and customers," Eckerle said.

Timothy Blubaugh, executive vice president of the Truck and Engine Manufacturers Association, said air pollution from heavy duty trucks has been reduced by 99% from those built 30 years ago

“because the target emission regulations were aligned nationwide and provided the regulatory certainty needed for a level competitive playing field.”

Both Eckerle and Blubaugh testified at the House Energy and Commerce Subcommittee on Environment and Climate Change hearing that examined approaches for “decarbonizing” the transportation sector, which is the largest source of greenhouse gas emissions in the nation.

24. EPA’s ‘Secret Science’ Plan Divides Advisers; Some Want More In Depth Study

The EPA’s science advisers delivered a mixed bag of responses about the agency’s idea of a “tiered” approach to handling individuals’ private health information. The September 30 report from the Science Advisory Board to Administrator Andrew Wheeler formalizes the board’s thinking and will be used to guide the Environmental Protection Agency’s next steps. It also confirms the board couldn’t reach consensus, mirroring comments made in an August 27 advisory board meeting about the issue.

Historically, the SAB has mostly achieved consensus, or near consensus, in its reports, said former SAB chair Deborah Swackhamer. The lack of a common stance limits the efficacy of the board’s response, she said.

The debate centers over how the EPA uses scientific research that isn’t or can’t be made public, known as the “secret science” rule. Under the proposed tiered approach, the EPA would use different strategies for handling individuals’ data based on varying disclosure risks.

In one strong rebuke, board member Stephen Hamburg, chief scientist at the Environmental Defense Fund, wrote that because EPA has provided so little information about how it might apply the tiered approach, he assumes the agency wants to “avoid providing clarity about the rule and its implications.”

Joseph Gardella, a chemistry professor at the University of Buffalo, wrote that the EPA’s broader rulemaking “could lead to de facto attempts to engineer particular outcomes by arbitrarily eliminating studies from consideration.”

Some studies have also shown that the EPA’s bid to protect individual privacy won’t be as effective as the agency thinks, wrote Deborah Hall Bennett, professor of environmental and occupational health at the University of California, Davis.

“This is not a consensus report, it is a compilation of comments with no attempt to provide clear, thoughtful advice to the administrator,” said Swackhamer, a professor emerita of science, technology, and public policy at the University of Minnesota.

“There was a single phone teleconference to provide an opportunity for the SAB members to hear from each other, but no follow-up on doing a more in-depth consultation,” according to Swackhamer. “So not only was there insufficient discussion, but the charge questions required some expertise in the tiered approach used by other agencies. Those members without expertise in this could not provide informed comments.”

In a 2015 study, researchers were able to match 43% of the people named in news stories to their medical records using the Lexis-Nexis database, Bennett wrote.

The EPA unveiled its Strengthening Transparency in Regulatory Science proposal (RIN:2080-AA14) in April 2018, also known as the “secret science” rule. Blocking the use of scientific research that isn’t or can’t be made public would represent a sharp break from the EPA’s decades-old approach to regulatory science. Critics have said the proposal is a bid to sideline the science that the EPA uses in regulations because the agency wouldn’t be able to rely on epidemiological studies, which often use private medical information.

The EPA will issue a supplemental proposal on its rulemaking early next year, rather than coming forward with a final rule this year, Wheeler told reporters September 19.

The shift is happening because the rule was deemed significant enough to warrant additional public comment, Wheeler said during testimony before the House Science, Space, and Technology Committee.

But several of the EPA’s 22 science advisers who submitted written remarks also said the tiered approach is a reasonable path forward.

Some of the strongest comments in support came from board member Richard A. Williams, a retired former director of social sciences at the Food and Drug Administration. In Williams’ view, EPA staff scientists are just as capable of driving decisions with biased results as political officials are of interfering in the science. Staff scientists can even “choose like-minded people to do funded research confident that they will arrive at the correct outcome,” Williams cautioned. “EPA is a political agency and the decisions are, of necessity, political.”

John Graham, a professor and former dean at the O’Neill School of Public and Environmental Affairs at Indiana University, said the public is entitled to access the information government agencies use to support their regulations. Graham also suggested that the EPA reach out to scientists to earn their acceptance. “The scientific community is not accustomed to mission-oriented federal agencies making detailed requests for access to their work products,” he wrote.

Several members of the Science Advisory Board (SAB) expressed their dismay in the consultation report at the limited charge they were given on the proposed rule. Some continued to question the process that EPA employed to gather input from SAB on the proposal, where the agency sought individual responses from SAB members through a “consultation” process rather than seeking a consensus report developed over multiple meetings of the SAB.

“To directly reply to the charge questions put before us could be construed as the SAB having been consulted and then providing input on the proposed Science and Transparency rule, when in fact we have not been consulted on the core matters surrounding this proposed rule,” SAB member Mark Wiesner, a professor of civil and environmental engineering at Duke University, writes in the consultation report SAB released.

“Moreover, the process we are being asked to participate in represents a departure from the traditional practice of producing a consensus SAB statement. The proposed rule would limit the scientific information that EPA would be allowed to take into consideration in the regulatory process with potentially harmful implications for public health.”

Only half of SAB members responded to EPA’s two, narrow charge questions. SAB Chairman Michael Honeycutt was among those who did not submit a response.

Other SAB members in their responses urged EPA to allow SAB to undertake a broader review. SAB voted to undertake a broader look independently at its last meeting in June, but it is unclear how far the advisors will be able to advance such a review without EPA cooperation.

Thomas Parkerton, an SAB member and a distinguished environmental scientist with ExxonMobil Biomedical Sciences, writes of “the broad implications of the proposed rule on EPA’s foundational policies related to the use of science in rulemaking and policy development and the essential need for a formal, deliberate review by relevant experts to logically inform a final regulation.”

Parkerton adds that “consultation process” under which SAB members provided their own comments to the agency on its narrow charge “is both limited in scope and in the relevant expertise that is available via the Chartered SAB members for addressing the broad science challenges posed. Therefore, I would urge that the Administrator give serious consideration to a more transparent evaluation of the science challenges that underpin the proposed rule by either constituting a dedicated SAB panel or supporting a focused National Academy of Sciences study.”

Former EPA Administrator Scott Pruitt issued the proposed rule in 2017 after a legislative model, pushed by former House science committee Chairman Lamar Smith (R-TX), failed to advance in the Senate. But critics, including SAB, have raised particular concerns about the rule limiting EPA’s access to studies involving human health effects and trade secret information.

Several SAB members suggested EPA re-write the rule -- as Wheeler told the House Science Committee recently that staff is doing -- to give SAB a role in determining when, once implemented, to exempt studies from the proposed rule. The existing proposal gives the administrator wide exemption authority, a feature which garnered concerns of potential political interference from many critics.

25. Former CASAC Experts Criticize NAAQS Review; Recommend Tighter PM Standards

Former members of EPA’s disbanded Clean Air Scientific Advisory Committee (CASAC) expert particulate matter panel are warning the agency that its accelerated process for reviewing ambient air limits “puts the cart before the horse” by requiring staff to suggest policy decisions on the standards before resolving major scientific questions.

Members of the panel, which agency chief Andrew Wheeler terminated as part of his push to speed the reviews, have formed an independent group unaffiliated with EPA that is seen as a “shadow” CASAC. Known as the Independent Particulate Matter Review Panel (IPMRP), the group held a meeting October 10 in Arlington, VA, to discuss the agency’s review of its particulate matter (PM) national ambient air quality standards (NAAQS). The nonprofit Union of Concerned Scientists offered to defray airfare and lodging costs, although some members paid their own way.

CASAC has already acknowledged that they don’t have the expertise to conduct the review but the Independent Panel does. The Panel has more than double the experts of CASAC, and importantly, it has multiple experts in each of the necessary scientific disciplines critical to ensure a comprehensive, robust review of the science supporting the standards.

The group debated the agency’s draft “policy assessment” (PA) document that gives EPA options to revise PM standards or leave them unchanged. The agency most recently updated the fine

particulate matter (PM_{2.5}) NAAQS in 2012, setting it at 12 micrograms per cubic meter (ug/m³), which is more stringent than the prior PM_{2.5} standard of 15 ug/m³ established in 1997.

The official seven-member CASAC plans to hold its review of the PA on October 22, and the Clean Air Act only requires that EPA consider CASAC's advice, so it can ignore what IPRMP says.

The independent panel is made up of 20 mostly academic scientists who were initially selected and vetted by the Obama administration's EPA to counsel CASAC. But Wheeler—who wants to complete a review of air quality standards of fine airborne particle pollution and ground-level ozone by the end of 2020—dismissed them last October, saying they took too long to deliberate.

Wheeler last month appointed a dozen ad hoc scientific consultants, which will respond to CASAC questions in writing—but not hold public meetings.

Christopher Frey, a North Carolina State University civil and environmental engineering professor who is chairing the informal panel, questioned the ad hoc group's expertise, noting that it lacks an epidemiologist who can analyze the latest studies and speak to the health effects of air pollution.

Frey said he hopes the EPA will take his panel's comments seriously, especially as it has the expertise in reviewing air quality standards that the agency advisers appear to lack.

"EPA is committed to scientific integrity and transparency," the agency said in response to questions. "EPA has the utmost confidence in its career scientists and the members on its science advisory boards and panels. EPA routinely takes comments from the public and outside organizations, including those not employed or associated with EPA, and will continue to take into consideration those comments that meet our scientific standards."

The agency's condensed PM review is due to conclude in late 2020, putting EPA on a very tight schedule. In response, EPA has streamlined the review process to eliminate certain steps and consolidate others, with less consultation of CASAC. One consequence is that EPA has issued its draft PA before finalizing its draft integrated science assessment (ISA), the document that synthesizes policy-relevant science on the health risks of PM. EPA has further folded its risk and exposure assessment, seeking to quantify those risks, into the PA document.

"There is no question there is a lack of regard for science under this EPA leadership," said Frey, who chaired the EPA panel between 2012 and 2015. "I don't think scientific review should be sacrificed to meeting deadlines."

IPMRP member Ron Wyzga, a specialist in air quality and health effects at the industry-funded Electric Power Research Institute (EPRI), said at the October 10 meeting that EPA's approach "puts the cart before the horse" by leaving purely scientific issues unresolved before moving to the policy implications of the science, including how to set the NAAQS.

Given that the official CASAC extensively criticized the draft ISA for overstating the effects of PM, among other failings, the final version could render the draft PA "moot," Wyzga said. Nor will there be another opportunity for CASAC to review another draft of the ISA, or PA, members of the independent panel noted.

Jeremy Sarnat, an IPRMP member and environmental health professor at Emory University, said “the sequence of this is not logical at all.”

Lianne Sheppard, an environmental sciences professor at the University of Washington, said that EPA’s draft PA is deficient because it fails to mention any of the process changes brought about by the Trump administration, with general agreement from other panelists in the room on the need for a full description in the PA.

North Carolina State University professor of environmental engineering Chris Frey, chair of the IPMRP, suggested documenting the many changes the Trump EPA has made to the NAAQS review process as part of the independent panel’s eventual public comments to EPA and CASAC. “I don’t think the science review should be sacrificed just for the sake of expediency,” he said, noting that the panel “can push back” on the process issues.

“The process is a problem,” agreed John Balmes, a professor of medicine and environmental health at the University of California.

EPA in 2018 scrapped the 20-member PM expert panel and recently replaced it with a 12-member “pool” of consultants that will provide advice to the seven-member CASAC, on written request by CASAC members for the ongoing reviews of both ozone NAAQS and PM standards.

The chartered CASAC, which has changed its entire membership under the current administration, itself requested help with the reviews after admitting it lacked the range of expertise required.

Meanwhile, the independent panelists in their written comments on the draft PA offered qualified support for EPA’s staff’s conclusion that EPA should tighten the existing NAAQS for PM_{2.5}, which is the type thought responsible for many adverse health effects.

The PA suggests that the latest data on the health impacts of PM_{2.5} exposure justify tightening the “primary,” or health-based NAAQS down to a level above 8 ug/m³. The PA says that EPA need not, however, consider tightening the existing secondary, or welfare-based standards for PM_{2.5} that are 15 ug/m³ annually, and 35 ug/m³ over 24 hours.

Several IPRMP panelists including Balmes, Wyzga, Michigan State University toxicologist Jack Harkema and Patrick Kinney, an environmental health scientist with the Boston University School of Public Health, expressed general agreement with EPA staff’s conclusion that a tightening of the primary NAAQS is necessary.

The standards of greatest interest are the primary PM_{2.5} standards. These are the standards for particulate matter less than 2.5 micrometers (fine particulate matter) that are designed to protect public health. The panel supported the preliminary conclusions of a Draft EPA Policy Assessment that the current standards aren’t requisite to protect public health.

The letter cited new and consistent epidemiological findings, supported by human and animal studies and other studies with natural experiments, as providing “clear and compelling scientific evidence” for tighter standards. Since the last particulate matter review, several new large-scale epidemiological studies provide powerful evidence that particulate matter is causing adverse health outcomes (such as early death, heart attacks, and respiratory stress) at locations and during time periods with concentrations at or below the level of the current standards.

They write, "New and compelling evidence that health effects are occurring in areas that already meet or are well below the current standards." Notably, this evidence cuts across different locations with different study populations, different study designs, and different statistical approaches.

Given the weight of the evidence from new studies across scientific disciplines and consistent with the decision-making process that EPA and its science advisers have used for many years, the panel recommends a particulate matter standard between 8 µg/m³ and 10 µg/m³ for the annual PM_{2.5} standard (compared to the current standard of 12 µg/m³) and between 25 µg/m³ and 30 µg/m³ for the 24-hour standard (compared to the current standard of 35 µg/m³) to protect public health. These ranges are tighter than those recommended in EPA's Draft Policy Assessment.

The Independent Panel rejected a potential argument for maintaining the current primary PM_{2.5} standards. The Draft Policy Assessment offered up an alternative rationale that might be used if the agency were to reject the draft assessment's recommendation to strengthen the standards and maintain the current standards. This alternative rationale explains that such a move would require the administrator to be arbitrarily selective in choosing which new studies to accept and which to toss and to disregard new epidemiologic evidence showing effects at lower levels.

The panel roundly rejected this justification, noting that, "Arguments offered in the draft Policy Assessment for retaining the current standards are not scientifically justified and are specious." This is important because if the administrator fails to strengthen the standards, he'll have to explain (both in court and in the court of public opinion) why he feels such a decision is science-based, as required under the Clean Air Act. And one proposed argument he could use has just been debunked by this expert Panel.

While the Independent Panel critiqued some details of the EPA's Draft Policy Assessment, the panel agreed that the draft science and policy assessments were cohesive and robust and the panel commended the "good faith effort" involved in the policy assessment. Specifically, the panel affirmed the use of EPA's causality framework used in the Integrated Science Assessment they reviewed last year and the Policy Assessment's new use of a hybrid modeling technique that allows for better assessment of risk from particulate matter exposure across the country especially in rural areas.

This diverges from what the seven-member CASAC has said and done around the EPA's assessment of the science and policy. In December, they concluded that the agency's draft science assessment was not a scientific document and CASAC Chair Dr. Tony Cox has been critical of the agency's causality framework that has been developed with dozens of experts over more than a decade. This view is not shared by the scientific community, and now, not shared by the Independent Panel either.

The Independent Panel decided other particulate standards were also inadequate. On PM₁₀, particulate matter less than 10 micrometers, the panel recommended revising this standard downward given that the PM_{2.5} component would also be tightened and noted several research and monitoring areas that need further work. On the secondary standards, i.e. the standards designed to protect welfare effects, such as visibility, the panel concluded that the standards should be tightened in order to be more protective.

The Independent Panel's deliberations demands for further research, and unanswered questions highlight how broken the EPA process is. In a normal review cycle, the panel would have had the

opportunity to talk with agency scientists directly. The EPA staff would then have considered their comments and revised the Integrated Science Assessment in response to the committee and panel's suggestions. But because the administrator disbanded the panel and abbreviated the process, there was no opportunity for such dialogue and refinement of the agency's science assessment before policy decisions were discussed. The panel had to make do with what was available to them and CASAC does too.

26. Divided CASAC Spars On PM Review But Leans Toward Retaining NAAQS

Over the advice of agency staff, a majority of EPA's Clean Air Scientific Advisory Committee (CASAC) appears ready to recommend that officials retain existing particulate matter (PM) standards, but some members are questioning how to interpret the latest data and whether they can or should complete their review by the agency's tight deadline.

Four members of the seven-member panel said they supported retaining the current standard, while two backed staff's recommendation to tighten it.

In addition, a deep divide on procedural issues emerged at the meeting, with those same two panelists urging a halt to CASAC's review of the PM standards -- which would risk pushing completion of the review past the Trump administration's goal of finalizing a decision by late 2020 on whether to retain or change the standards.

As such, a consensus recommendation from CASAC to EPA chief Andrew Wheeler on whether the agency should retain, tighten or weaken its PM standards is unlikely.

"I think we need to call a halt to this. We need to stop," because "the review process is so dysfunctional," argued Mark Frampton, the committee's only research scientist, who added that EPA has "enough evidence" to show its current standard is "not protective."

But current CASAC Chairman Tony Cox, an industry consultant noted for his skeptical view of the health risks of PM_{2.5}, urged the independent panel to justify its decision to use the "weight of evidence" approach to the scientific risks of the pollutant, instead of what he said is a more rigorous approach to establishing causation of health harms.

IPMRP Chairman Chris Frey said on an October 22 call that the weight of evidence approach is "well vetted" and that Cox was "aggressively self-promoting" inappropriate methods of establishing causation between PM exposure and disease by "cherry-picking" studies and "gerrymandering" CASAC's agenda.

Cox retorted that he "care[s] mainly about empirical evidence."

Meanwhile, EPA's separate effort to review its 2015 ozone NAAQS is at a much earlier step in the process, with the agency in late September issuing its review of relevant scientific data that will inform the broader review:

EPA staff's integrated science assessment (ISA) of the latest data on ozone air pollution finds weaker evidence of a link between ozone exposure and public health harm but sees stronger evidence of the pollutant's environmental damage, mixed findings that could complicate the agency's ongoing review of its ozone ambient air standard.

The agency had hoped to release its draft PA for the ozone standard in October, but that has not yet been released. CASAC was slated to review these documents in November or December, with final versions due in “early spring.” EPA hoped to issue a final rule on whether to retain or change the standard by “winter 2020/2021.”

Yet both the procedural and substantive issues that are currently facing EPA on the PM NAAQS review likely will resurface in the ozone review -- raising questions about whether the agency can complete either review by the end of next year.

27. Perciasepe: Federal Policy Vital To Deploying Climate Technology

Former EPA Deputy Administrator Bob Perciasepe says emerging technologies could solve climate change and other environmental issues but deploying them at the necessary scale will require government policy, investment, and leadership that is lacking under the Trump administration.

Perciasepe, currently president of the non-profit Center for Climate and Energy Solutions (C2ES), delivered a keynote address to the inaugural GreenTech Conference on October 3, following the October 2 opening speech by former EPA Administrator William K. Reilly that called for the United States to reclaim “planetary leadership” amid worsening global crises.

Perciasepe said the Trump administration’s threat to withdraw from the Paris climate agreement, though not slated to take effect until late 2020, has nevertheless contributed to a lack of global leadership for the deal. When 195 nations supported the Paris climate agreement, they followed the United States, China, the European Union, and India as a leadership working group, which now is no longer functional. In effect, he said, the G20 group of economic powers is now the G19 because while other nations are putting forward implementing agreements, the United States “doesn’t want to talk about it.”

The Trump administration’s pending rollbacks of Obama-era climate and emissions rules add to that trend, Perciasepe continued. The rollbacks are “a big deal” in themselves, but “the bigger deal” is the signal the administration’s actions send to the rest of the world about “whether we’re serious or not,” he said.

But regardless of government rollbacks, “businesses are generally going to ignore some of these rollbacks,” Perciasepe said. He noted the growth of voluntary sustainability programs like net-zero emissions goals at power companies and initiatives by automakers to build fuel-efficient vehicles -- including the deal between four companies and California to meet state-crafted standards despite the Trump administration loosening federal targets.

Nevertheless, he said, atmospheric carbon dioxide levels have soared and will require drastic action in order to avoid catastrophic warming. “We’re facing daunting constraints here,” he added.

The key challenge is how to get innovative technologies deployed at the large scale necessary, Perciasepe said. “There’s a desperate reality” that unless all of the innovations being created can be deployed, “they can’t help” solve the problems, he said.

While private initiatives are helpful for that goal, he said, “what we ultimately need is a national policy or suite of policies.” For instance, he continued, power companies have said voluntary net-zero programs can achieve as much as 70% of international greenhouse gas reduction goals, but government regulation will be essential to the remaining 30% or more.

“What we see is this continued leadership in the business realm, but what we don’t have is the policy to help accelerate and get it all deployed,” he said.

While no such suite has taken shape so far, Perciasepe said broad support for a Green New Deal and bipartisan interest in Congress in some sort of climate legislation are promising signs for the future.

Along the same lines, he said, “drivers for implementation” are a top priority in C2ES’ work but they have found that deploying advanced technology without government support is “more complicated than we think.”

Perciasepe listed tax incentives, federal research funding and infrastructure investment for electric cars as examples of technology drivers that only government can put in place, with a price on carbon as “the icing on the cake” to drive both more innovation and more deployment of the advanced technologies.

28. EPA Must Tackle Air Pollution From Upwind Power Plants, States Say

The EPA’s refusal to tackle power plant releases of ozone-forming pollution makes no sense to downwind Eastern states where some of that dirty air ends up. In an October 8 letter, a coalition of these states and environmental groups told the U.S. Court of Appeals for the District of Columbia Circuit that their case against the EPA is supported by the same court’s October 1 decision in a related case.

That case, *New York v. EPA*, vacated the EPA’s reading of the Clean Air Act’s “Good Neighbor” provision in a 2018 regulation. The provision says the EPA must require upwind states like Ohio and Pennsylvania to control pollution that is causing downwind states to violate federal ozone limits.

The court in *New York v. EPA* essentially scrapped the regulation, known as the Close-Out Rule, which said air quality modeling showed these states would meet the 2008 ozone standards by 2023, meaning EPA intervention was unnecessary.

The EPA had used the Close-Out Rule as the reason to deny petitions filed by individual states to get it to force upwind states to tackle power plant pollution. Denial of these petitions prompted Delaware, Maryland, New Jersey, and New York City to sue the EPA in the same court last year.

“New York unambiguously reaffirms that the Good Neighbor Provision requires elimination of upwind impacts by the downwind state’s actual attainment deadline” to meet federal ozone standards, the coalition of states and environmental groups, led by Delaware, wrote in the letter.

The ruling shows “the inappropriateness of EPA’s reliance on the Close-Out Rule’s conclusion that further reductions of ozone precursors are unnecessary because downwind states purportedly will attain the 2008 standard by 2023,” the letter said.

The letter came after EPA notified the court that the October 1 ruling didn’t apply to these individual lawsuits from downwind states, which are now consolidated into one case.

The EPA is contending that the Close-Out Rule dealt with the downwind states' inability to meet the 2008 ozone standards of 75 parts per billion, while the states' petitions dealt with the 2015 limits of 70 parts per billion.

Specifically, "the Court held that, barring special circumstances, EPA should have required upwind states to eliminate Good Neighbor violations of the 2008 ozone standard by 2021," Justice Department attorney Samara M. Spence told the court October 3.

The states in their letter countered that "it is immaterial that New York concerns the 2008 rather than the 2015 ozone standard." They cited Delaware as an example of a state that must meet the 2008 or 2015 ozone limits by 2021, while the EPA's air quality modeling shows it won't be in compliance until 2023.

Inability to meet the deadline results in a requirement to add pollution controls and could mean the loss of federal highway funding.

29. Study: US Air Pollution Deaths Increased By 9,700 A Year From 2016 To 2018

Air pollution is killing more people during the Trump administration than it was under President Obama. Air pollution was responsible for 9,700 more deaths in 2018 than it was in 2016, according to a new paper³ by economists at Carnegie Mellon.

The researchers, Karen Clay and Nicholas Muller, argue that some of the increase is due to non-regulatory factors, like an increase in wildfires and economic growth. But they note a decline in Clean Air Act enforcement under Donald Trump that could be responsible as well.

The Trump administration has so far rolled back 24 different regulations and accords related to air pollution, according to a New York Times analysis, including rules around air pollution from refineries, industrial pollution of 189 different substances, and regulation of "haze" in national parks.

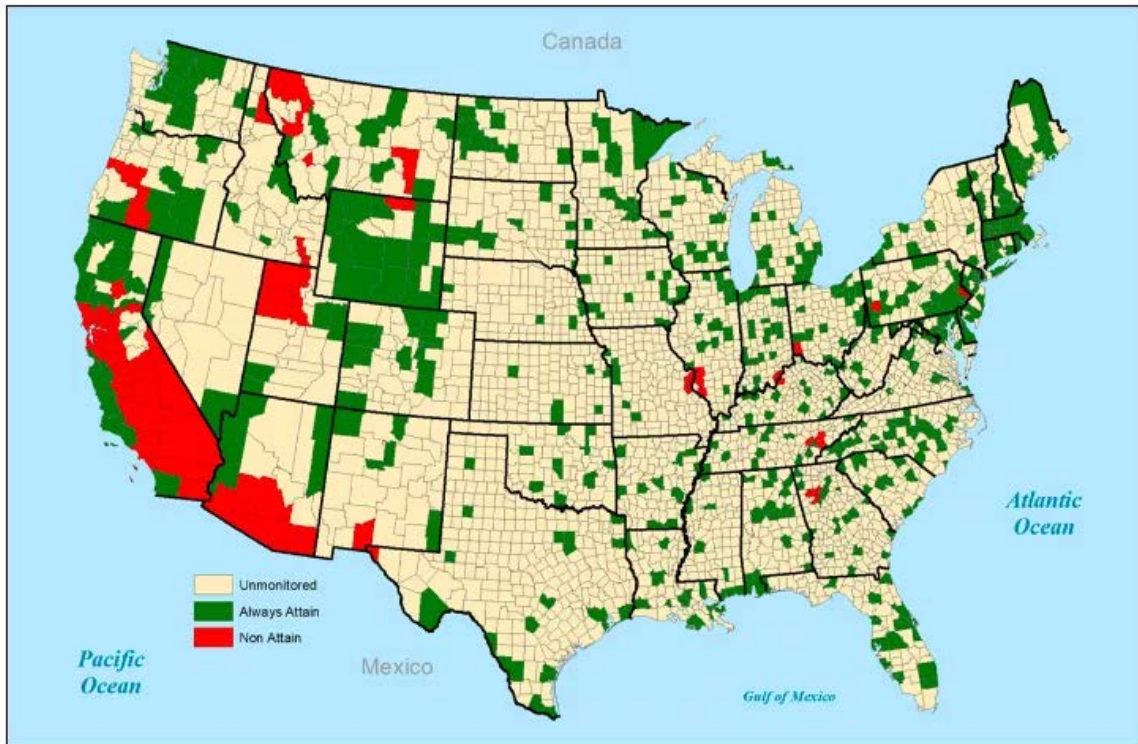
But the specific kind of pollution addressed in the new study is what experts call PM2.5: microscopic particles 2.5 micrometers or less wide (a small fraction of the diameter of a human hair) arising from human industry, including coal mining and burning, gasoline combustion, construction dust, etc.

PM2.5 can kill people in a number of ways: by causing "heart disease and stroke, lung cancer, chronic lung disease, and respiratory infections," to name a few listed in a recent report from the Health Effects Institute and the Global Burden of Disease project. That report estimates that PM2.5 killed about 4.1 million people in 2016 alone through those mechanisms.

In the paper, Clay and Muller analyze monitoring data collected daily as part of the Environmental Protection Agency's Air Quality System in 653 US counties. Because the collections were daily, that dataset is quite rich: 1.8 million different readings from 2009 to 2018. Overall, that dataset shows that from 2009 to 2016, PM2.5 pollution declined by 24.2 percent. This was a fairly steady decline, too: After holding mostly still from 2009 to 2011, pollution declined noticeably each year from 2011 through 2016.

³ "Recent Increases in Air Pollution: Evidence and Implications for Mortality", Karen Clay, Nicholas Z. Muller, National Bureau of Economic Research Working Paper No. 26381, October 2019

Figure 1: Map Showing Counties with at Least One Monitor



Notes: The map shows counties that had at least one PM_{2.5} monitor during 2009-2018.

Counties with air pollution monitors used in the study. Clay and Muller 2019

But between 2016 and 2018, PM_{2.5} pollution rebounded, growing by 5.5 percent.

The rise in PM_{2.5} increased the number of premature deaths of adults over age 30 by about 9,700 from 2016 to 2018, with 80% of the premature deaths occurring among the elderly and 20% of the premature deaths among adults ages 30 to 64, the study found. These calculations use the same methods used by the EPA to relate fine particulate matter to mortality. The damages of \$89 billion are calculated by multiplying deaths by the EPA's value of a statistical life. Increases in PM_{2.5} in the air were especially pronounced in California, with 43% of the rise in deaths nationally from 2016 to 2018 occurring in the state.

The researchers present evidence on three possible causes for the national increase:

- Changes in economic activity: Increased use of natural gas in households and industries, and growth in the number of miles travelled by fossil fuel-powered vehicles likely contributed to the rise in PM_{2.5} in certain counties, while decreases in coal-fired power drove declines in other areas.
- Increases in wildfires: In parts of the West and Midwest, rising numbers of wildfires during the period studied were associated with increases in fine particulate matter. California experienced numerous wildfires during this period, with the most deadly--the Camp Fire--taking place in November 2018.

- Decreases in enforcement of the Clean Air Act: Enforcement of this law may influence compliance by firms, and the study found that the most frequent type of enforcement of the Clean Air Act fell from 2009 to 2016 and continued to fall from 2016 to 2018.

"This research demonstrates that recent increases in fine particulate matter have appreciable effects on risks of premature mortality," explains Nicholas Muller, associate professor of economics, engineering, and public policy at Carnegie Mellon University's Tepper School of Business, who coauthored the study. "These increases are worrisome and should persuade policymakers to take the necessary steps to maintain limits on air pollution."

30. U.S. EPA Settles With Six Companies Over California Trucking Rules

The U.S. Environmental Protection Agency (EPA) announced recent settlements with six companies totaling over \$450,000 in penalties for violating the California Air Resources Board's (CARB) Truck and Bus Regulation and Drayage Truck Regulation. The companies either failed to install particulate filters on their own heavy-duty diesel trucks, failed to verify that trucks they hired for use in California complied with the state rules, or failed to maintain required records. As part of one of the settlements, \$90,000 will be spent on an air filtration system at one or more schools in the South Coast Air Basin.

"Heavy-duty trucks can emit drastically higher levels of pollution when not equipped with required emissions controls," said EPA Pacific Southwest Regional Administrator Mike Stoker. "Transport companies must comply with California's rule to improve air quality and protect adjacent communities from breathing these toxic pollutants."

Diesel emissions from trucks are one of the state's largest sources of fine particle pollution, or soot, which is linked to a variety of health issues, including asthma, impaired lung development in children, and cardiovascular effects in adults. About 625,000 trucks are registered outside of the state but operate in California and are subject to the rule. Many of these vehicles are older models and emit high amounts of particulate matter and nitrogen oxides.

The announcement highlights separate administrative settlement agreements with the following companies:

- The Coca-Cola Company failed to verify that 63 of the carriers it hired in California from 2015 to 2017 complied with the Truck and Bus rule. In addition, the company dispatched drayage trucks that did not meet emission standards and failed to verify that their contracted truck owners were registered with the CARB's Drayage Truck Registry. The company, headquartered in Atlanta, Georgia, agreed to pay a \$145,000 penalty.
- Mercer Transportation Company Inc. failed to verify that their contracted truck owners were registered with the CARB's Drayage Truck Registry and failed to maintain records. The company, headquartered in Louisville, Kentucky, failed to comply with CARB's regulation governing drayage moves destined to or from California ports from 2015 to 2017. Mercer Transportation Company agreed to pay a \$46,787 civil penalty.
- Liquid Transport LLC and Liquid Transport Corp. operated heavy-duty diesel trucks in California from 2014 to 2017 without the required diesel particulate filters. The companies also failed to verify that 122 of the carriers it hired to transport goods in California complied with the Truck and Bus rule. In addition, the firms owned and

dispatched 22 drayage trucks that did not meet emission standards and were not registered with CARB's Drayage Truck Registry. The companies, headquartered in Indianapolis, Indiana, agreed to pay a \$150,000 penalty.

- Dean Foods Company operated 14 heavy-duty diesel trucks from 2014 to 2017 without the required diesel particulate filters and failed to maintain records for 40 vehicles. The company, headquartered in Dallas, Texas, agreed to pay a \$30,000 civil penalty and will spend \$90,000 on a supplemental environmental project to install an air filtration system to reduce harmful air pollutants in classrooms in one or more schools in the South Coast Air Basin, which includes Orange County and parts of Los Angeles, Riverside and San Bernardino counties.
- D&E Transport LLC operated 26 heavy-duty diesel trucks in California from 2014 to 2017 without the required diesel particulate filters. The company also failed to verify that 104 of the carriers it hired to transport goods in California complied with the Truck and Bus rule. The company, headquartered in Clearwater, Minnesota, agreed to pay a \$55,000 civil penalty.
- Flat Creek Transportation LLC operated 24 heavy-duty diesel trucks in California from 2014 to 2018 without the required diesel particulate filters and failed to maintain records for 63 vehicles. The company, headquartered in Kinston, Alabama, agreed to pay a \$71,250 penalty.

The California Truck and Bus Regulation has been an essential part of the state's federally enforceable plan to attain cleaner air since 2012. The rule requires trucking companies to upgrade vehicles they own to meet specific NOx and particulate matter performance standards and to verify compliance of vehicles they hire or dispatch. Heavy-duty diesel trucks in California must meet 2010 engine emissions standards or use diesel particulate filters that can reduce the emissions of diesel particulates by 85% or more.

The California Drayage Truck Regulation was also adopted into federal Clean Air Act plan requirements in 2012 and applies to owners and operators of drayage trucks operating in California, motor carriers that dispatch such vehicles, marine or port terminals, and intermodal rail yards. In particular, the Drayage Truck Regulation requires owners and operators of drayage trucks operating in California to meet specific emissions standards and register such trucks with the Drayage Truck Registry administered by the California Air Resources Board.

31. Trump Officials Agree on Plan to Boost Ethanol, Biodiesel

The Trump administration has reportedly agreed to a new plan for boosting renewable fuels and offsetting waivers exempting oil refineries from mandates to use them. The tentative agreement, which follows weeks of negotiations, would allow the Environmental Protection Agency to offset those waivers in response to criticism from industry advocates and Midwestern politicians that the exemptions have hurt demand for corn-based ethanol and soybean-based biodiesel.

Under the deal, the EPA would factor recent waivers into new annual biofuel quotas, by adjusting the targets to reflect a three-year rolling average of exemptions. White House officials also rejected a bid by oil industry allies to prevent spikes in the prices of biofuel compliance credits refiners use to prove they have fulfilled the targets.

The agreement reflects a deal pitched by farm-state senators to the president earlier this month.

“The Trump administration has overseen year-over-year increases in domestic fuel ethanol production, to the highest level in history, and the United States exported a record volume of ethanol in 2018 for the second consecutive year,” the EPA said. “The president will always seek to engage with stakeholders to achieve wins for the agriculture and energy sectors.”

The deal could still unravel as administration officials work to translate broad commitments into formal regulations. There is a narrow window for the administration to codify the changes, as the EPA is legally required to finalize 2020 biofuel-blending quotas by November 30.

Biofuel producers and supporters have warned the White House of potential political repercussions in Iowa and other politically important swing states. Iowa helped send Donald Trump to the White House in 2016, after he pledged to support ethanol.

Oil industry advocates have cautioned the administration that a lopsided deal could be just as risky, alienating some Rust Belt voters without fully satisfying biofuel interests.

“Politically, with the ethanol industry, too much is never enough,” said Scott Segal, a lobbyist with Bracewell LLP who represents refiners. “The administration really has no assurance that agribusiness won’t demand more and more, just as they always have.”

The president and top administration officials have spent weeks trying to develop a plan for advancing biofuel and appeasing agricultural interests, without alienating oil companies. Both constituencies helped him win the election in 2016.

32. US To Develop Hydrogen Fuel Cell Disaster Relief Vehicle To Serve Emergencies

The hydrogen fuel cell is a thing of interest for the US government and its agencies. Following US Army collaboration with General Motors on the Chevy Colorado ZH2 fuel cell pickup, it appears there's more interest around the alternative powertrain.

Recently, the US Department of Energy and the US Army revealed a new collaborative effort to develop a purpose-built disaster relief vehicle with a fuel cell powertrain. While fuel cells offer their own benefits in the form of zero emissions, the Army and DoE underscored a few other important points.

Fuel cells can provide a source of power, heat and even water for up to 72 hours. In the middle of a disaster zone, such benefits could revolutionize the way emergency crews and first responders tackle a situation. The US pointed to recent California wildfires and Hurricane Dorian's aftermath in the Bahamas as two examples where this kind of vehicle would serve well.

While the collaborative effort is new, the DoE has focused on hydrogen fuel cells longer. The department previously rolled out its H2@Scale Initiative, which focuses on creating reliable and affordable hydrogen production, transport and storage. Hydrogen powers fuel cells, which in turn creates electricity like an electric car. The added benefits as a power station of sorts come with the territory, which the Army was very interested in to improve situations in the battlefield. Fuel cells also produce a faint heat signature, which can make the vehicles far less detectable during more covert operations compared to an internal-combustion engine.

While no photos of specific details of the truck were provided, the fuel cell emergency vehicle does have an appropriate name: H2Rescue. The Army Corps of Engineers along with various

partners will begin issuing a requests for proposals this fall before work starts getting underway. GM's Silent Utility Rover Universal Superstructure (SURUS), was debuted as a potential fuel cell platform of the future. Perhaps GM will take another crack at a fuel cell emergency vehicle.

Following engineering and development, H2Rescue will go through a feasibility study. The DoE and Army also plan for a joint demonstration to make sure and showcase how an emissions-free emergency vehicle isn't only eco-conscious, but better suits those who work in the field.

33. Ports Of Long Beach, L.A. Unveil New Zero-Emission Vehicles

The ports of Long Beach and Los Angeles will soon deploy new zero-emissions vehicles at some of their terminals, as they continue testing technology that will help them become more eco-friendly, officials at the twin port complex announced separately on October 2. Both ports have made it their goal to fully transition from diesel-powered to zero-emission cargo-handling equipment by 2030.

The Port of Long Beach unveiled a new battery-electric yard tractor during an evening ceremony at the Civic Center. That tractor — the term for the vehicle portion of tractor-trailer big rigs that commonly roam freeways — will carry cargo containers from the Long Beach Container Terminal, in Pier E, to the rail yard. It is one of five vehicles the port will deploy over the next month for a two-year testing period, thanks to a \$5.3 million grant from the California Air Resources Board, officials said.

Pier E will also have a fuel-cell yard tractor. The other vehicles, according to port officials, are battery-electric top handlers, which look like a mix between a forklift and a crane; the top handlers will place them onto tractors. Pier E will get one top handler and Pier J will get two.

Officials will determine the long-term future of the vehicles after the testing period, which will include accessing how long the batteries last and how much power they have, said Long Beach port spokesman Lee Peterson.

The Port of Los Angeles, meanwhile, announced that it will begin a one-year demonstration of two battery-electric top handlers as well. The two zero-emission vehicles are prototypes that cost \$1.8 million each, said a port spokesman.

The two pre-commercial battery-electric top handlers were designed and built in the US by Taylor Machine Works Inc, the largest supplier of top handlers at the port.

Port of Los Angeles' executive director Gene Seroka said: "Today shows we are making good on our pledge to do the hard work of advancing commercially feasible solutions to meet our goal of transitioning all cargo handling equipment to zero emissions by 2030.

"We're excited to power up these battery-electric top handlers and test them under the real-world conditions of a working container terminal."

The top handlers run on a one-megawatt battery designed to operate for up to 18 hours between charges and each machine has a data logger for tracking hours of operation, charging frequency, energy usage and other performance indicators.

The data collection process also involves obtaining feedback from all demonstration participants, including the drivers and mechanics who will operate and maintain the top handlers. Workers will be able to provide input on the maneuverability, noise level and safety of the equipment.

The battery-electric top handlers are a key component of the port's US\$7.7m Everport Advanced Cargo Handling Demonstration Project. The California Energy Commission (CEC) is supporting the large-scale zero-emissions technology project with a US\$4.5m sustainability grant.

Energy commissioner Patty Monahan said: "The CEC is proud to be working with forward-thinking partners like the Port of Los Angeles to accelerate the adoption of innovative and sustainable freight technologies.

"Projects like this are critical to showcasing zero-emission equipment that can make the state's freight industry more efficient and competitive, while helping clean California's air."

The Everport demonstration is one of 16 projects in which the port is either the lead agency or a participant working with multiple partners to test near-zero emissions engines, emissions control technology and alternative fueling and charging stations.

In addition to the battery-electronic top handlers, the projects include testing hybrid natural gas and fully battery-electric fuel cell heavy-duty trucks; battery-electric forklifts, yard tractors and rubber-tired gantry cranes.

Los Angeles' Mayor Eric Garcetti, who was present at the demonstration, said: "Every Angeleno deserves to know that future generations will inherit a sustainable city and a livable planet – and that our air, water and natural resources will be protected and preserved."

34. Hyundai Plans to Reveal Heavy-Duty Fuel Cell Truck

Hyundai Motor Co. plans to reveal its concept for a hydrogen-powered fuel cell electric truck at this year's North American Commercial Vehicle Show in Atlanta. Hyundai named the truck the HDC-6 NEPTUNE in honor of the Roman god of the seas, Neptune. It also symbolizes the hydrogen-powered natural elements of the sea – the largest potential source of hydrogen fuel on Earth, the company said.

The automaker joins a handful of other companies looking to commercialize fuel cell heavy-duty trucks. The biggest name is Toyota Motor Corp. The Japanese automaker is working with truck manufacturer Kenworth Truck Co. on a project that will begin service soon. The goal is to develop green cargo-hauling trucks that can replace diesel big rigs and reduce pollution at the ports of Los Angeles and Long Beach, California.

Nikola Motor Co., a Phoenix-based startup, also is developing a hydrogen fuel cell heavy-duty truck. Nikola plans two trucking industry innovations. First is its high-volume, long-distance fuel-cell electric heavy-duty truck models. It also will market the vehicles at an "all-in" lease rate that includes fuel, service and maintenance with the truck. It's planning a 2022 launch for the truck.

Hyundai, which already has a fuel cell passenger car, said its fuel cell truck supports the company's environmental vision.

"We have cemented the fuel cell technology leadership position in the passenger vehicle sector with the world's first commercially produced fuel cell EV and the second generation fuel cell EV, the NEXO," said Edward Lee, who heads Hyundai's commercial vehicle business division.

“Fuel cell electric trucks can resolve the environmental equations of widely used commercial vehicles and our commitment to create a decarbonized society,” Lee said.

ASIA PACIFIC

35. India Bets Big On Electric Vehicles In Push For Green Transport

With the availability of a number of other electric vehicles, the consumers in India now have a wide range of choice to adopt environment-friendly transportation mode. The electrification of two-wheelers and buses in India has already picked up pace, but the country also wants to become a major market for electric cars by 2030. The target is to have 30 per cent of all cars on the road to be EVs.

Driven by an urge to cut pollution in the cities, enhance national fuel security, and making the country a major global manufacturing hub for electric vehicles, the country has announced several incentives this year to boost the EV sector, ranging from tax cuts to allowing sale of electricity as "service" for charging of electric vehicles in a bid to attract investments into charging infrastructure.

Close on the heels of the Union Budget providing tax relief for buying electric vehicles (EVs), the GST Council in its 36th meeting in July cut the tax on EVs from 12 per cent to 5 per cent effective from August 1.

The Council also slashed the rate for EV chargers from 18 per cent to 5 per cent making electric vehicles affordable for the buyers.

While the share of electric vehicles out of total annual vehicle sales in the country is less than one per cent, the incentives announced this year have drawn the attention of major car-makers of the world to the potential of the Indian EV market.

In July, when the Indian auto industry reported one of the worst decline in sales of passenger-vehicles, top players like Tata Motors, Mahindra, Maruti Suzuki and Hyundai revealed their plans for new EV models.

What is more, the upscale e-tron SUV, the first electric vehicle from the German car-maker Audi, has been unveiled in India. The company plans to launch the vehicle in the last quarter of the year. While the company has not yet revealed the price, speculations are rife that it could cost around Rs 1.2 crore⁴, on-road.

Mahindra, the biggest electric car seller in India, terms its eVerito "India's first electric sedan".

South Korean automaker Hyundai in July launched its first electric SUV, KONA electric, in India. Launched at a price of Rs 25.30 lakh⁵, the car promises a driving range of 452 Kilometers in full charge. The price of the vehicle came down to Rs 23,71,858 after the reduced GST rate became applicable from August 1.

Chinese automaker SAIC Motor Corporation Limited's subsidiary MG Motor is also preparing for the launch of electric compact SUV -- ZS in India next year.

⁴ 1 crore equals 10 million

⁵ 1 lakh equals 100,000

With the availability of a number of other electric vehicles, the consumers in India now have a wide range of choice to adopt an environment-friendly transportation mode.

Also, to make electric vehicles affordable to consumers, the Union Budget this year said that the government will provide an additional income tax deduction of Rs 1.5 lakh on the interest paid on loans taken to purchase electric vehicles. This amounts to a benefit of around Rs 2.5 lakh over the loan period to the taxpayers who take loans to purchase electric vehicle.

Noting that it may not be unrealistic to visualize one of the Indian cities emerging as the "Detroit of EVs" in the future, the Economic Survey 2018-19 stated that "appropriate policy measures are needed to lower the overall lifetime ownership costs of EVs and make them an attractive alternative to conventional vehicles for all consumers".

Citing the Ministry of Environment, Forest & Climate Change (2018), the Survey said that in India, the transport sector is the second largest contributor to carbon dioxide emissions after the industrial sector.

Road transport accounts for around 90 per cent of the total emissions in the transport sector in India. Given the large import dependence of the country for petroleum products, it is imperative that there should be a shift of focus to alternative fuels to support our mobility in a sustainable manner, it added.

Citing NITI Aayog, the Survey further notes that, in India, electric two-wheelers have been the major part of EV sales with sales of around 54,800 in 2018.

"In India, the limited availability of charging infrastructure seems to be a major impediment to increased adoption of EVs," the survey added.

Under the National Electric Mobility Mission Plan (NEMMP) 2020, there is an ambitious target to achieve six to seven million sales of hybrid and electric vehicles by the year 2020.

36. Historic Fall In India Vehicles Sales Enters 11th Month

Despite a 135 basis point interest rate cut since February and a number of measures announced by the Central government, including a sharp corporate tax cut, domestic vehicle sales plummeted for the 11th straight month in September.

Society of Indian Automobile Manufacturers (SIAM) data released recently showed that total commercial vehicle sales — a proxy for the economy's commercial health — steeply fell by 39 per cent to 58,419 units in September.

Rating agency ICRA had, earlier this month, said its outlook on the domestic commercial vehicle sector was negative, considering the sharp correction in vehicle sales amid slowing economic growth, overcapacity and tight financing environment.

Signs that the customers were still away from showrooms was clearly visible in passenger vehicles sales data, which witnessed a decline of 23.69 per cent to 223,317 units this September.

Passenger cars sales witnessed de-growth of 33.4 per cent to 131,281 units. In August, sales were down 41 per cent.

SIAM President, Rajan Wadhera, however, told reporters that the festive season retail sales that are monitored on a regular basis is “good” but avoided giving any sales forecast. “The Navaratri sale has also been good and if we compare it to the sales from last year, the sale has been nearly 10-12 per cent better,” he said.

Wadhera stressed that owing to number of government steps and ongoing festive season, the consumer sentiments have improved. Consumer confidence, the Reserve Bank of India showed, dipped to six-year low in September.

Besides, two-wheeler sales – often tracked to analyze the rural markets health – were also down 22.09 per cent.

Three-wheeler sales declined by 6.66 percent in April-September 2019 over the same period last year. Within three-wheelers, passenger carrier sales registered a de-growth of 6.37 percent and that of goods carriers declined by 7.98 percent in April-September 2019 over April-September 2018.

In the two-wheeler segment, sales registered a de-growth of 16.18 percent in April-September 2019 over April-September 2018 while in the segment, scooters, motorcycles and mopeds declined by 16.94 per cent, 15.24 per cent and 25.33 per cent, respectively, in April-September 2019 over the comparable period last year.

Overall domestic automobile sales fell 22.41 per cent in September 2019. In August, the sales data had showed that overall sectoral offtake in the domestic market had plunged 23.55 per cent.

This level of downturn was witnessed only once earlier, in December 2000, when the de-growth was registered at 21.81 per cent. The available data series commences from 1997-98.

However, exports across categories inched-up by 0.68 per cent to 417,232 units from 414,428 units shipped-out during September 2018.

The sales decline has forced several auto makers to announce production cuts and slash workforce in order to cut losses.

Automobile production declined by 18.29 per cent in September to 2,406,640 units across segments and categories.

“There is a small element of positive performance, if one were to look at the volume growth, on a sequential basis across segments and this is coming out of some new introductions and discounts offered. But this is nowhere near the volumes seen in the previous year,” according to Grant Thornton India LLP Partner Sridhar V.

Based on the sales report filed by the automakers, ETAuto estimates that the overall industry declined by 25.6 percent (approx.) in September 2019.

37. Automakers Are Gearing Up For The BS-6 Transition

From offering huge discounts aimed at bringing down the inventory levels of BS-4 vehicles to creating awareness among consumers on the benefits of new technology, automakers are pulling all stops to ensure that they are ready to roll out BS-6 vehicles come April 1, 2020.

Contrary to the previous transition in emission norms from BS-3 to BS-4, wherein automakers were caught napping and had to liquidate their stock within a matter of a few days before the deadline, this time, automakers are not only better positioned to make the transition to BS-6 norms well within the stipulated deadline, but are also not expecting a fire sale of the BS-4 models.

BusinessLine spoke to automakers to understand how they are gearing up for this transition to BS-6 norms, which has also been identified by most automakers as one of the major reasons for the subdued customer demand in the face of one of the worst slowdowns to beleaguer the automotive industry in recent times.

Back in 2017, just a few days before the deadline for the transition to BS-4 norms, the Supreme Court banned the sale and registration of BS-3 vehicles, leaving automakers staring at a stock of around 8.2 lakh BS-3 vehicles, as it was earlier understood that they will just have to cease the manufacture of new BS-3 vehicles post the deadline, and that they can sell their existing BS-3 stock even after the BS-4 deadline.

In line with the BS-6 transition, Maruti Suzuki, the country's largest carmaker, introduced its first BS-6 compliant model in April 2019, and has already sold 2 lakh BS-6 compliant petrol vehicles, with eight of its 16 models being BS-6 compliant now. It has already stopped production of BS-4 cars for these eight models in which BS-6 models have been introduced, said Shashank Srivastava, Executive Director, Marketing & Sales, Maruti Suzuki India Limited. For the rest of the models, the decision to cease BS-4 production will be taken keeping in mind the inventory levels, he added.

Srivastava said that Maruti has a "very balanced inventory" of BS-4 vehicles and that it doesn't seem like there will be a fire sale.

"The current discounts are at an all-time high and we don't think it will go beyond this level. Also, the production plan of most of the companies are aligned to BS-6 implementation and soon the BS-4 stocks will finish without prompting any fire sale." affirmed Rajesh Goel, Senior Vice President & Director, Sales and Marketing, Honda Cars India.

Suraj Ghosh, Principal Analyst, Powertrain & Compliance Forecasts, IHS Markit, said that most OEMs would be clearing their inventories by February or March, and that there wouldn't be a fire sale in its actual sense. "If there's ever a sales period with heavy discounts, then it's going to be this quarter, particularly the last month," he added.

Ashish Modani, Vice-President and Co-Head, Corporate Ratings, ICRA, also said that the discounts are already high and that the likelihood of any fire sale – which is almost non-existent – will be specific to a particular OEM or dealership. From an industry point of view, the industry is much better prepared this time, compared to the BS-3 to BS-4 transition, he said.

In order to boost consumer sentiments at a time like this, Maruti has undertaken efforts like promotional offers of up to 1 lakh, price cuts to share the benefit from the corporate tax cut, easier finance availability by approaching banks for attractive finance schemes and an enhanced reach in sales and services through the launch of Mobile NEXA Terminal.

Honda Cars is also providing offers under 'The Great Honda Fest', which is helping it maintain sales of its BS-4 vehicles, said Goel. Honda Cars has also tied up with multiple banks and financial institutions to offer up to 100 percent on-road financing, low EMI packages and long-tenure loans

to make the purchase process more attractive. “We are confident about clearing our BS-4 stock well in time before BS-6 implementation...We will do a sequential changeover to BS-6 from Q4 of FY19-20,” said Goel.

Additionally, taking into consideration the apprehensions beleaguering customers post the announcement about the discontinuation of smaller diesel vehicles, Maruti has rolled out a 5-year, 1-lakh km warranty on its four diesel powered cars, namely Dzire, S-Cross, Swift and Vitara Brezza. Customers’ confusion about the continuance of Vitara Brezza and S-Cross – which are currently available in diesel only – made them hold back their purchases, and Maruti plans to introduce petrol variants of these two models in the coming months, said Srivastava.

Goel said that the market has definitely moved towards petrol in many segments and that Honda Cars will also be aligning its production mix in line with the market demand. Honda Cars is planning to continue with its diesel models post the BS-6 implementation, he added.

In order to salve customers’ apprehensions about the BS-6 transition, Srivastava said that Maruti has also created extensive training modules for its front line teams and dealer sales executives on doubts related to the transition, as they are the ones interacting with customers on a day-to-day basis.

Hyundai, on the other hand, is offering petrol BS-6 engines with its Grand i10 NIOS and New 2017 ELANTRA. “We will be fully ready before the BS-6 implementation from April 2020...We have optimum levels of inventory for BS-4 and BS-6 cars,” said Puneet Anand, Sr. GM & Group Head - Marketing, Hyundai Motor India. It has also rolled out a Mega Festival Campaign, offering “smart deals on wheels, big benefits and assured early deliveries” on some of its brands in a bid to boost sentiments during the festive season.

At Toyota Kirloskar Motors Ltd, in the light of its challenges with Innova and Fortuner where the price hike is going to be severe post the transition, and is currently being discussed at Toyota, the company is trying to educate customers about the price hike and provide them with solutions in both BS-4 and BS-6, as per their needs, to help them make an informed decision, said N. Raja, Deputy Managing Director, TKM.

“Toyota production is based on a ‘pull system’ which helps us regulate how much is required by when and how, thereby regulating production basis the market demand. Therefore, we would monitor such elements so as to ensure no BS-4 vehicle stock beyond March 31, 2020,” said Raja.

Raja added that since customer preferences will vary depending on whether the purchase is made for personal or fleet use, and price forms an important aspect for fleet customers, the company’s biggest challenge will be to predict such customer-specific demand accurately.

At Mahindra & Mahindra Ltd, it is taking efforts to educate customers on the BS-6 technology, said a Mahindra spokesperson. “All our marketing efforts will be to promote our differentiated value proposition of clean emissions and fuel efficiency with thrilling performance of our vehicles,” the spokesperson stated, adding that currently, it is up to the customers to take advantage of the existing price levels which are inclusive of festive offers to buy BS-4 diesel vehicles.

“At Mahindra, we are planning a smooth transition, with a ramp-down for BS-4 and ramp-up of BS-6 in such a way that the overlap will be minimal. In case of rare overlaps, customers will have the option to choose between BS-4 and BS-6 vehicles and will get price benefits on BS-4 vehicles. Since we cannot switch overnight from selling BS-4 to BS-6, we will start selling BS-6 vehicles

and tone down BS-4 vehicles in a phased manner. For BS-6 diesel vehicles, availability of BS-6 fuel is crucial,” the spokesperson added.

A Volkswagen spokesperson said that the company is currently evaluating the market and is aligned with the Indian government’s vision. “Volkswagen carlines will be compliant well within the time period. To this effect, our on-ground sales and service consultants are well-trained to provide required advice and support to our customers,” the spokesperson said.

Honda Cars’ Goel said that from a customer’s perspective, it is the best time now to make a car purchase since the discounts are at an “all-time high”.

“The same car in BS-6 version will be more expensive and without these discounts. Even if one considers the resale value of a BS-6 car versus a BS-4 car, the current upfront discounts on buying cars now make the total cost of ownership more favorable for BS-4 cars,” said Goel.

Any undue confusion among customers about the viability of BS-4 vehicles has also been clarified by the government when it reiterated that all BS-4 vehicles registered till March 31, 2020 will continue to be operational for the entire period of registration, and this also means that there should not be any hesitance in buying BS-4 vehicles, Goel pointed out.

The demand is better than what it was a few months back because customers have understood that this is the best time to buy cars, added Goel. Since the festive period is ongoing now, it remains to be seen how the demand progresses in later months, he said.

38. Maruti Suzuki Sells Over 2 Lakh BS VI-Compliant Vehicles

Automobile Maruti Suzuki India has reported that it has sold over 2 lakh BS-VI compliant vehicles in six months. The company had launched its BS-VI range with Alto 800 and Baleno in April 2019, a year before the government stipulated timeline of April 2020.

At present, the complete range of Maruti Suzuki BS-VI compliant petrol models includes Alto 800, Baleno, WagonR (1.2 L), Swift, Dzire, Ertiga and the recently launched XL6 and S-Presso.

“The BS-VI compliant petrol vehicles will lead to a substantial reduction of nearly 25 per cent in nitrogen oxide (NOx) emissions,” the company said in a statement, adding that the BS-VI compliant petrol vehicles can run on BS-IV petrol also.

“The BS-VI petrol cars from Maruti Suzuki have been extensively tested with BS-IV fuel and there is no operational concern,” it said.

“In spite of higher exports, the total sales declined 17 per cent YoY to 10,911 units from 13,078 units a year ago,” said the statement.

39. IOC Bets On Hydrogen Fuel Cells

This element powered our first internal combustion engines, took us to the moon and back, and was discovered before fossil fuels. Yet, it has taken nearly 200 years for this clean energy source to even be considered for the roads. Now, as the world stares at an energy crisis and grapples with climate change, hydrogen is also on the table as a green alternative to fossil fuels.

“Hydrogen has never enjoyed so much international and cross-sectoral interest, even in the face of impressive recent progress in other low-carbon energy technologies, such as batteries and renewables,” says a recent report by the International Energy Agency (IEA). It is just as well. Thanks to commitments made by governments around the world to reduce their net emissions by 2050, sectors whose requirements can be met by electricity are in the glare. These include aviation, shipping, and long-distance road transport. “How do you electrify heavy-duty vehicles like buses and trucks and also ships and aircraft through lithium-ion batteries?” asks S.S.V. Ramakumar, director, R&D, Indian Oil Corporation (IOC). The answer, he believes as does the IEA, lies with hydrogen-based fuel cells.

Ramakumar explains that since hydrogen eliminates all disadvantages of lithium-ion batteries, it could be the “ultimate green mobility option for India”. What he is referring to isn’t just “range anxiety”—the apprehension about the distance travelled by an electric vehicle in one charge—but also the high cost of batteries, the challenges of setting up pan-India charging infrastructure, and a disposal mechanism for these cells. Plus, it’s not clear whether lithium-ion batteries will be as efficient in a tropical country like India, as elsewhere.

There’s a reason why hydrogen wasn’t considered an alternative to fossil fuels. In fact in 2009, then U.S. secretary of energy Steven Chu cut funding for hydrogen-based fuel cells citing four reasons: One, hydrogen is highly inflammable and difficult to store; two, it was costly to produce; three, infrastructure to distribute hydrogen had to be built; and four, the fuel cell wasn’t as durable, low-cost, and powerful as the internal combustion engine.

A lot has changed since. Hydrogen now competes with lithium-ion batteries as a fuel for the future. Consider this: Once charged, a car with a 5-kg hydrogen cylinder can cover 550-600 km, compared to 80-100 km on a lithium-ion battery. Refueling takes three-five minutes, akin to that for a compressed natural gas (CNG)-fueled car, while a battery may take hours to charge. Hydrogen’s energy content, too, is higher than that of fossil fuels. Also, the materials used in hydrogen cells can be recycled, unlike batteries. These factors make it a correct fit for medium or heavy vehicles. No wonder Airbus CEO Guillaume Faury says he’s seen a “growing willingness to explore the potential of hydrogen as a possible aviation fuel”.

Globally, the adoption of hydrogen as a fuel has been rising. According to the IEA, 11,000 hydrogen-powered cars are on the road, with 20,000 fork-lift trucks at warehouses. Countries taking the lead in such vehicles include the U.S., Japan, Denmark, Germany, China, France, and South Korea. Carmakers such as Toyota, Hyundai, and Honda sell hydrogen-powered cars which are two-three times more fuel efficient than their petrol counterparts. “Hydrogen is the technology of the future—available today,” says Charles Freese, who heads General Motors’ fuel cells business.

While India is still debating the right technology for the future, it makes sense to look at the bigger picture “like providing a clean environment rather than focusing on the right technology”, says IOC chairman Sanjiv Singh. Some options are being explored. Pilots of hydrogen-powered vehicles are on and India is on course to have buses that run on hydrogen-spiked fuel soon.

While it’s still early days for hydrogen in India, industry leaders such as Toyota Tsusho Corp. chairman Jun Karube and shipbuilder Mitsubishi Heavy Industries’ president and CEO Seiji Izumisawa believe using hydrogen as fuel would help create a cleaner, energy-efficient future.

Fuel cells have distinct advantages over lithium-ion batteries. A small 5-kg hydrogen tank attached to the fuel cell occupies a much smaller area than a series of batteries that power a

vehicle. It is also much lighter because aluminum, used in fuel cells, is one-fourth the weight of lithium, ensuring higher mileage. With 55% efficiency, fuel cells are better than conventional vehicle engines which run at 25% efficiency. This means that not only does a fuel cell fit in an automobile, it is also more efficient than a conventional engine.

A recent KPMG report says that during the second phase of electrification of transport, fuel-cell-based electric vehicles “can come in as a complementing technology” to lithium-ion battery-powered ones. For India, which pays massive sums for crude oil imports, it should play a bigger part. And compared to lithium-ion batteries, fuel cells seem the better option because India lacks the raw materials—lithium and cobalt—and the processes to manufacture lithium-ion batteries. That’s not all. “If lithium-ion batteries continue to be charged through electricity produced from coal and other fossil fuels, it will only mean shifting environmental pollution from cities to the place of generation or from the roads to the power plants,” says Singh.

On the other hand, hydrogen is found in abundance in nature. Also, methane, a refinery by-product, is a rich source of hydrogen. But in view of India’s green goals, IOC, the biggest producer and consumer of methane in the country, proposes to produce it from renewable sources. “We can easily do so by splitting steam [the gaseous form of water] into hydrogen and oxygen by using electricity generated from solar panels and from bio-methanisation of agricultural waste or by converting bio-waste to biogas,” says Ramakumar. The bio-methanisation process that IOC has developed is a game changer, contends Singh. It is tailor-made for India as there is “no dearth of agricultural waste in the country or the right technology to produce biogas”, he says.

Under the petroleum and natural gas ministry’s Sustainable Alternative Towards Affordable Transportation scheme, public sector oil refiners are helping private entrepreneurs set up bio-methanisation plants, with an assurance to pick up all the compressed bio-gas they produce at a fixed price for perpetuity. Nearly 230 such expressions of interest have been issued so far. But what makes the R&D team at IOC optimistic about its success is the fact that they have identified, developed, and patented certain microbes that will yield the maximum amount of methane from organic biomass. “Through our two-stage digestive process and using our own patented microbes, we are able to recover nearly 85% of methane from agricultural waste, while traditional players are recovering only 65%- 70% methane,” says Ramakumar. It is only a matter of time before the purification level reaches 95% methane making it as good a fuel as CNG.

Singh, the driving force in all such innovations at the sprawling R&D center in Faridabad, says his company is ready to go into production. In fact, IOC has already put in its bid for the Ministry of New and Renewable Energy’s recent expression of interest calling organizations to run four indigenously developed hydrogen fuel cell-powered buses as a pilot project. These buses will first ply on Delhi’s roads and then in the National Capital Region for five years.

The 25-seater buses will not only help the government gather data on the fuel’s efficiency and emissions, but also its commercial viability and the possible techno-economic hurdles. It will also help the government set rules and procedures regarding regulation, standardization, and the safety of the entire hydrogen value chain all the way from its production to transportation to integration with the electrical system or the computer in the bus.

Ramakumar says his company has the necessary expertise to run these buses safely. “We have already run Tata buses on our R&D campus using hydrogen fuel cell technology developed by Ballard Power, a technology company that was spun off from the U.S.-based General Electric,” he says.

To make hydrogen fuel cells a success, the company has entered into a tripartite arrangement with two other partners. One is the Bengaluru-based Indian Institute of Science (IISc), a premier research institution, and the other a leading electric bus integrator, whose name IOC refuses to disclose. The IOC research team will customize the fuel cell to operate on the fuel that is produced in the country, and the integrator's role will be to align the electronic control management system of the car with the fuel cell. The proof of concept of hydrogen production, developed jointly by IOC and IISc, has already been established and is currently at demonstration level.

Customizing fuel cells is important because they require pure hydrogen to function, which comes with a cost. For instance, 1 kg of 99.9% pure hydrogen costs around ₹550-600, while that with a purity of 99.99% is around ₹800 and the one with 99.999% purity will cost ₹1,100. "If we can use 99.9% pure hydrogen for our fuel cells, not only will it bring down the cost of fuel cells but also help in its mass adoption," says Ramakumar.

In fact, costs have been the biggest obstacle in the mass adoption of fuel cells. The idea is to bring down the delivered cost of hydrogen-based fuel cells below the current \$14 a kg for fossil fuels to \$3 per kg for renewable energy. That is the gap that needs to be bridged. Ramakumar argues that internal studies have shown that bringing down the price is eminently possible once bio-methanisation takes off. Being a chemicals company means IOC has the expertise to produce, handle, transport, and even dispense the highly inflammable hydrogen at its petrol stations.

While the technology matures further, trust Indian innovation to find a middle path—hydrogen-spiked CNG (H-CNG), which IOC has come up with. By blending 18% hydrogen in CNG, vehicles will not only reduce carbon dioxide and hydrocarbon emissions by 70%, but also increase efficiency by 5%. More importantly, vehicles with the older Bharat Stage IV (BS IV) engines will have emissions similar to those of a BS VI engine. According to the Environment Pollution (Prevention and Control) Authority, the fuel cost would rise by only 75p per km over conventional CNG.

There are two ways to bring H-CNG to petrol stations. One is to blend it at a distant location and then bring it to the stations; the other is to mix it at the station—which is cheaper. IOC's R&D team has patented a chemical process by which it can produce hydrogen in a reactor, which can then be connected to the main CNG pipe at the service station. "This technology will not only enable us to bring down costs by nearly one-third, but also increase efficiency by 5%," says Ramakumar.

Taking note of these developments, the Supreme Court has asked India's biggest refiner to study the feasibility of H-CNG buses. As part of a pilot, IOC will run 50 public buses on H-CNG in Delhi for six months and provide data such as the performance of the engine in terms of fuel efficiency and the load it can take and then compare it with ordinary CNG-powered vehicles. Trials will begin from November.

The R&D team at IOC is not just confident of the success of H-CNG but also of hydrogen fuel cells, which they believe is the technology for the future.

40. China and India's Intertwined Regarding Electric Vehicles

With India planning to replace a significant portion of its conventional internal combustion engine fleet by electric vehicles in the next decade, particularly to reduce pollution and also to create jobs through manufacturing of such vehicles, China may continue to play a huge role in realization of that dream.

Currently, China is the biggest market for electric vehicles and it also controls the supply of a major chunk of the key raw materials needed for making the battery used in these vehicles. This is particularly because electric vehicles continue to use lithium-ion batteries which consists of lithium-ion cells that use metals like lithium, nickel, cobalt and manganese. With purchase of mines in countries like Bolivia, Chile, Australia and Congo, China has emerged as a key supplier of these metals.

According to the "Global EV Outlook 2019" report brought out by International Energy Agency (IEA), the global electric car fleet exceeded 5.1 million in 2018, up two million from the previous year and almost doubling the number of new electric car sales.

China remains the world's largest electric car market, followed by Europe and the US, while Norway is the global leader in terms of electric car market share.

By the end of 2018, electric two/three-wheelers on the road exceeded 300 million and the vast majority of them are in China. With sales in the tens of millions per year, the Chinese market for electric two-wheelers is hundreds of times larger than anywhere else in the world.

In 2018, more than 460, 000 electric buses were on the world's road, almost 100, 000 more than in 2017.

But these dynamics could dramatically change in the next decade due to India's push for electric vehicles. Some automakers estimate that the demand for electric vehicles, especially in the two-wheeler segment, may surpass the demand in China.

In fact, Chinese automaker SAIC Motor Corporation Limited's subsidiary MG Motor has been busy preparing for the launch of electric compact SUV -- ZS -- slated for next year. The ZS will be one of the first locally-produced global EVs in India. However, its battery will be imported from Chinese battery manufacturer and technology company CATL.

MG Motor India will depend on its Group's globally successful strategy of bulk purchase of batteries from CATL, which is one of the world's largest producers of lithium-ion batteries. Nonetheless, depending on demand, the company may consider assembling battery packages in India in association with CATL.

"We might consider assembling CATL battery packages in India. But everything depends on demand. We have a global tie-up with CATL," Rajeev Chaba, President & Managing Director, MG Motor India, told IANS earlier this month.

The compact SUV ZS EV will have a full-sized boot and room for five. In order to create a hype, the company plans to deploy a limited number of ZS EV in India, even before the car's official launch.

As per plans, the company will deploy a limited number of ZS EV units for giving select customers a unique experience ahead of launch. Furthermore, the automaker's fast-charging infrastructure at limited locations is expected to be in place by October. MG Motor India has made an investment of Rs 2,200 crore at its plant and has installed an all-new assembly line.

China's leading electric vehicle company, Sunra, earlier this year expressed interest in setting up a factory in the country as it sees India emerging as the world's biggest market for electric bikes in the next four to five years.

It is expected that once the proper public infrastructure for electric vehicles is in place, more and more global giants in this segment, including those from China, will make a beeline for grabbing a pie of the Indian EV market.

41. China's New-Vehicle Market Downturn Extends; EV Sales Slip For 3rd Straight Month

China's new-vehicle market has contracted for the 15th straight month, with sales declining 5.2 percent from a year earlier to 2.27 million in September, as the nation's weakening economy continues to weigh on light vehicle demand.

Last month, new light-vehicle deliveries slipped 6.3 percent to around 1.93 million, according to the China Association of Automobile Manufacturers. Weak light-vehicle demand wiped out mild gains in sales of new commercial vehicles. In the month, deliveries of new commercial vehicles, including buses and trucks, gained 1.9 percent to around 340,000.

For the first nine months, new-vehicle sales in China dropped 10 percent from a year earlier to approach 18.4 million. In the period, new light-vehicle deliveries fell 12 percent to roughly 15.25 million while new commercial-vehicle sales dipped 3.4 percent to 3.12 million.

Demand for electrified vehicles slumped for the third straight month, after Beijing completed a new round of subsidy cuts for EVs and plug-in hybrids on June 25 with the goal to phase out the subsidy program by the end of 2020.

Last month, aggregate sales of full-electric vehicles and plug-in hybrids plunged 34 percent to approximately 80,000. The number includes some 63,000 EVs and around 17,000 plug-in hybrids.

For the first three quarters, total sales of electrified vehicles in China still jumped 21 percent to roughly 872,000. The tally includes some 692,000 EVs, 179,000 plug-in hybrids and 1,251 fuel cell vehicles.

42. Premier Li Keqiang Signals Coal Comeback

Premier Li has signaled what could be a significant comeback of coal to the center of China's energy policy. In a biennial speech delivered to the country's National Energy Commission on 11 October, Li highlighted the need to further develop coal technologies, naming "clean coal" and coalbed methane as focus areas.

The third such speech, it is seen as providing signals on the government's priorities for the development of China's energy sector. This year's address comes at a critical moment when government departments are preparing to draft the next Five Year Plan, the blueprint for the country's economic development.

This year's speech contrasts sharply with the top-line message from Li's 2016 address to the commission, in which he stated that China must "hasten the fundamental transition of energy supply and consumption, in order to support green and sustainable development."

With energy security an increasing concern, Li also placed greater emphasis than in 2016 on the need to expand the domestic extraction of oil and gas – which will mean more fracking – alongside the need to secure more international cooperation deals on oil and gas, demand for which, despite slowing this year, is still growing in double figures.

China should also “develop renewable energy sources such as hydro, wind and solar, and improve grid integration,” Li said. But energy outlet EKnower points out that, importantly, the word “accelerate” was missing from Li’s comments for the first time.

Lastly, Li made a short but notable comment that the country should “explore the commercial pathways of hydrogen,” a signal for companies to keep investing in this emerging sector.

43. Beijing Set To End Subsidies For Fuel Cell Vehicles Next Year

The Chinese government plans to phase out subsidies for all electrified vehicles -- including fuel cell vehicles -- by the end of 2021, China’s ministry of finance said. The ministry revealed the policy decision in an open letter addressed to SAIC Motor Corp. Chairman Chen Hong, who proposed that subsidies for fuel cell vehicles be extended beyond 2021 at the annual meeting of the National People’s Congress, China’s legislature, in March.

While reaffirming its plan to wind down subsidies for full electric vehicles and plug-in hybrids by the end of 2021, Beijing was previously vague on what to do with subsidies for fuel cell vehicles.

The current subsidy policies have resulted in “addiction” to subsidies among “some” fuel cell vehicle manufacturers, which has made it difficult for these companies to compete globally, the ministry noted in the letter posted on its website, without identifying the automakers.

While phasing out the subsidies, the central government will encourage provincial governments to provide incentives for construction of battery charging facilities for electric vehicles and hydrogen stations for fuel cell vehicles, the ministry added.

The Chinese government started subsidizing sales of EVs, plug-in hybrids and fuel cell vehicles in 2019. Under the current subsidy program for fuel cell vehicles, passenger vehicles qualify for 200,000 yuan (\$28,369) in subsidies; vans and light trucks are eligible for a subsidy of 300,000 yuan while buses and heavy-duty trucks can obtain 500,000 in subsidy.

In the first three quarters of this year, 1,251 fuel cell vehicles of various kinds were sold in China, 7.6 times the tally for the same period last year, according to the China Association of Automobile Manufacturers.

44. Chinese Cities PM2.5 Level Down Over 40% Since 2013

Recently, China’s top environmental watchdog discussed air quality developments in the country at a press conference, noting significant improvement in major cities throughout the country. Li Ganjie, minister of ecology and environment, said that 74 Chinese cities saw their average concentration of PM2.5 (fine particulate matter 2.5 microns or less in width) drop by 41.7% since 2013, according to China Daily. That same year, a new air monitoring standard was adopted by Chinese cities.

Aside from a drop in PM2.5, the average density of sulfur dioxide found in cities above prefecture-level also declined by 60%, falling to 14 micrograms per cubic meter.

While Li mentioned that China's air quality has improved rather fast, saying "It's hard to find a precedent in the international community," polluting emissions "remain high." Last year, one study showed that vehicle emissions had replaced coal as Beijing's top source of PM2.5. And the capital city isn't alone, as SCMP reported in 2017 that China has over 300 million vehicles, along with 10 of the world's 25 most congested cities.

Li also claimed that air quality in China is sensitive to changing meteorological conditions, which can have a significant impact if pollutant discharge is not reduced. The minister acknowledged that "the situation remains really not that optimistic" and "even grim," according to China Daily.

However, the fight against air pollution must go on. In May, Global Times reported that a domestically developed smog-monitoring laser radar system was deployed in densely-populated areas in the Yangtze River Delta, Pearl River Delta, Sichuan province and Chongqing. The smog laser is expected to help analyze the causes of pollution to create new strategies to tackle the pressing environmental issue.

45. Thailand Launches Crackdown On Emissions To Cut Smog

Transportation officials announced that they will strictly enforce vehicle emissions limits to tackle the unhealthy smog that's put the capital back among the world's most-polluted cities.

Vehicles will need to pass a smog-check when renewing registration and gross polluters tagged with paint, Land Transport Department director-general Chirute Visalachitra announced, among measures to crack down on vehicle exhaust, the primary contributor to the smog problem.

The seven measures also include establishing check-up points in the streets nationwide, but concentrated in Bangkok, to smog check private and commercial vehicle exhaust as well as launching a tip line for people to report gross polluters.

Vehicles found to have excessive exhaust will be fined THB5,000 (US\$170). They may also be spray-painted with the words "cannot use" on the windshield as well as receive an official warning to get emissions-tested.

Chirute added that in the past 12 months, the department checked over 120,000 cars and found about 3,500 had excessive vehicle exhaust.

46. Jakarta Citizens Sue Government Over Air Pollution

Shortly after Leona Wirawan moved to Indonesia's capital, Jakarta, in 2016 to study environmental law, she began to run out of breath. The shift from her home on the lush tropical island of Bali to the dusty, congested streets of a 10-million-strong megacity sparked a rapid comeback of her childhood asthma.

"I know that if I walk around without wearing a face mask then I'll have a relapse," she said, which, for a student is an expensive business – setting her back \$100 for a supply of just twenty good quality masks.

But Ms. Wirawan, 22, is reluctant to admit her problem to her family. "I'm worried my parents will ask me to go back home," she said.

When she graduates in a year, she will face the dilemma of whether to risk her health for her career prospects by staying in the capital, where she believes toxic smog is the cause of her multiple ear, nose and throat problems.

But for now, Ms. Wirawan, has decided to stay and fight for change by joining a group of 31 other activists, environmentalists, business people and civil servants who have come together to sue the Indonesian government to take action over the filthy air.

Long before the raging forest fires, caused by illegal land clearances in Sumatra and Kalimantan, made global headlines for spreading a toxic smog across Southeast Asia, Jakarta's citizens were already choking.

In June, the metropolis had the worst air quality in the world, according to AirVisual, an air quality monitoring app which measures "AQI", based on five pollutants – particulate matter (PM), sulphur dioxide, carbon monoxide, nitrogen dioxide, and ozone.

In 2017, the US Embassy's air monitoring stations recorded just 26 days where the air quality could be deemed "good," reported Australia's Lowy Institute. Research from the University of Chicago shows that Jakarta's air quality is now so bad that it is cutting 2.3 years off the average resident's lifespan, the Institute added.

While Greenpeace estimates that at least 7,390 city dwellers die early every year due to high levels of PM2.5- tiny pieces of particulate matter that increase the risk of heart disease, stroke, pulmonary disease, and acute lower respiratory disease.

The basis of the lawsuit is not to sue the government for money but simply to force the authorities to take more action to clean up the city's air, explained Ayu Eza Tiara, a lawyer from the Jakarta Legal Institute, which is handling the case. The action was based on human rights and environmental law and had been filed against the president, ministries of environment, home affairs and health, and against the three governors of Jakarta and neighboring West Java and Banten, she said.

"People have the right to have a healthy environment," argued Ms. Tiara. "We are very confident because we are not suing for money, we are suing for policy."

The case would be fought using evidence from air pollution studies, including World Health Organization resources, and witness statements from those suffering from toxic air, she said.

The plaintiffs all believed they were the victims of air pollution, said Ms. Tiara. "Some feel that because of unhealthy air they get sick easily and their kids have lung problems. Their health quality is going down, and they get easy to get tired."

Among them is Veronica Michelle, 43, who fears for the health of her six-year-old daughter, Misha, who suffers from a severe dusty allergy that causes painful skin infections.

Other parents were worried about high rates of asthma and Rhinitis allergies that caused nosebleeds, she said.

The lack of decent public transport or even pavements to walk on was a big problem for young families, Ms. Michelle added, as was waste being openly burned in residential areas.

The legal case is still in its initial phase and court proceedings will begin in early December if there is no settlement agreed beforehand.

In September, in a bid to reduce traffic congestion, the Jakarta provincial government enforced a license plate traffic policy that restricts cars with number plates ending with an odd number to travelling on odd-numbered dates and vice versa for plates ending with even numbers.

A senior environment ministry official would not comment on the lawsuit, but said the authorities were already working on multiple solutions to tackle air pollution and urged citizens to also play their role.

Fajri Fadhillah, a lawyer at the Indonesian Centre for Environmental Law, one of the organizations behind the legal case, said that a response from the Jakarta government alone was not enough.

“We want evidence-based air quality control in Jakarta province but in addition to that the Jakarta government needs to work together to coordinate with the West Java and Banten regional governments,” he said. “The effort to control Jakarta air pollution cannot be enough without considering the neighboring sources.”

He added: “If nothing is done, I think the sensitive groups will be the most harmed by the air quality. We begin with the children – many have asthma and a problem with their skin.

Pregnant mothers will be harmed and we won’t know the effect of the chronic diseases if the health agency is not gathering the data. There is a strong causal relationship between air quality and premature deaths.”

47. Air Quality App Attacked In Vietnam Amid Heavy Hanoi Smog Temporarily Unavailable

Independent online air quality index monitor AirVisual said recently that it is under “coordinated attack” to discredit the company after its data showed Hanoi has at times recently topped its list of 90 major cities which suffer from air pollution.

Air pollution in Hanoi and other major cities in Vietnam has hit its worst-ever levels, with the government’s Environment Administration warning people to limit outdoor activities.

Pollution could become a key political issue in the Southeast Asian country, where protests have been held against the degradation of the environment.

“AirVisual has received abusive and threatening messages posted on Facebook and on the Apple App Store and Google Play Store,” it said in a statement. “Consequently, the AirVisual apps and Facebook page are currently no longer accessible in Vietnam,” it said.

AirVisual had been among the most downloaded apps in Vietnam and was at one point recently the most-downloaded app on Apple Inc’s App Store before it was removed.

The attack came after Vietnamese Facebook user Vu Khac Ngoc, an online chemistry teacher with almost 350,000 followers on the website, said in a lengthy post that AirVisual was manipulating its data in order to sell air purifiers made by its parent company, IQair.

Ngoc did not offer any evidence to back up his claims, but the post - which said the AirVisual ranking would harm tourism to Vietnam and urged people to leave negative reviews of the app - quickly received thousands of shares and likes.

AirVisual said it is working with Apple, Google and Facebook to confirm that it has been unfairly attacked, and to make the AirVisual apps available again in Vietnam.

AirVisual said its data has helped raise awareness of air quality issues in Vietnam, but this also made it the target of a campaign to discredit the company.

The government blamed the pollution on low rain levels and farmers burning rice crop remnants after the harvest to prepare for new plantings. Coal is also widely used for power generation in the country.

Vietnamese Prime Minister Nguyen Xuan Phuc called on authorities in Hanoi and Ho Chi Minh City, Vietnam's main economic hub, to do more to address air pollution problems.

After a short time AirVisual said its air quality monitoring app is available for download again.

A spokesman for the company told Reuters it had "temporarily interrupted" new downloads of the app following the criticism but has now made it available again. "Efforts to suppress open and free air pollution data, rather than address the emission sources that have created the problem, are misguided and have negative health and environmental implications," AirVisual said in a statement.

"While the attacks have decreased, they are still ongoing. We are closely monitoring the situation and aim to continue to provide a stable service".

Pollution could become a source of political tension in Vietnam, where protests against the degradation of the environment have occurred in recent years.

Air pollution in Hanoi and other major cities in the Southeast Asian country has hit hazardous levels recently, with the government's Environment Administration last week warning people to limit outdoor activity.

48. Ministers At Hydrogen Meeting Set Ambitious Target For Green Transport

Energy ministers and officials from more than 30 countries agreed recently to aim to introduce hydrogen-powered systems for 10 million vehicles, planes and ships around the world in the next decade to curb greenhouse gas emissions. While the target set in the second Hydrogen Energy Ministerial Meeting in Tokyo is nonbinding, countries are expected to promote private investment in developing technologies and to lower costs to boost hydrogen-powered transport and hydrogen stations.

The chair's summary called for "10 million hydrogen powered systems" in different modes of transport and "10 thousand hydrogen refueling stations" in 10 years as indicative, nonmandatory and collective goals to help incentivize and mobilize the private sector and investment community.

"We must work toward (using hydrogen) globally in order to prevent the acceleration of global warming," said Japanese industry minister Isshu Sugawara, who chaired the meeting.

The number of fuel cell vehicles in the world has hovered at tens of thousands, while that of hydrogen stations remains in the hundreds, according to the Japanese industry ministry.

FCVs are powered by electricity generated by a chemical reaction between hydrogen and oxygen and do not emit carbon dioxide.

There has been growing public interest in renewable energy sources in Japan, particularly after the major nuclear accident at the Fukushima Daiichi power plant in 2011, the worst since the 1986 Chernobyl disaster.

The Japanese government has been supporting research and development as well as the introduction of necessary infrastructure in the field, hoping to generate and store hydrogen created through renewable sources, such as solar power, and reduce the country's dependence on fossil fuel imports.

The country hosted the first hydrogen ministerial meeting in Tokyo last year, with around 20 countries participating.

LATIN AMERICA

49. BYD Launches First Electric Bus Corridor In Latin America

China's leading electric vehicle maker, BYD, launched Latin America's first electric bus corridor recently in the Chilean capital of Santiago, in partnership with local operators Enel X and Metbus.

This move consolidates Chile as the region's leader in electric mobility, with a total fleet of 285 operational pure electric buses from BYD. Chile now has 386 such vehicles, and Santiago has the world's biggest operator of a pure electric bus fleet outside China.

"We are taking this great leap forward and into the future," said Chilean President Sebastián Piñera, after traveling on a BYD electric bus from Ñuñoa to the new electric terminal in Peñalolén. "This new public transportation system will allow us to improve the quality of life of all inhabitants."

Tamara Berríos, Country Manager of BYD Chile, said: "The current 285 BYD pure electric buses operating in Santiago are reducing emissions equivalent to more than 9,400 conventional cars.

"BYD is proud to contribute its technology towards the first 100% electric bus corridor in Latin America. We hope to continue building our dreams of a cleaner city with our sustainable transport solutions."

The BYD electric buses are emissions-free and cost-effective, being 70% cheaper to operate than conventional diesel buses. Their operational cost per kilometer is about \$0.1, compared to about \$0.4 per kilometer. They come with large-capacity batteries that provide a range of 250 km and take only five hours to be fully charged.

A BYD press release said the Santiago buses offer greater comfort and greater security, with wide seats, low flooring, Wi-Fi, air conditioning and USB chargers.

Serving one of the main routes of the city's transit system, the new fleet will benefit about 660,000 people across nine communities.

They are recharged at electric terminals located in the Peñalolén and Maipú districts.

The project includes the use of 40 bus stops for the new corridor, all the stops will include LED lighting, information screens, USB chargers, bicycle parking, and more.

As the city prepares for the upcoming Santiago Climate Change Conference, this first pure electric corridor is a tangible and far-reaching effort to the cause of environmental protection. According to Santiago's environmental plan, 50% of the city's fleet will become pure electric in the near future.

BYD pure electric buses currently operate in many markets across Latin America, including Chile, Brazil, Colombia, Ecuador, Argentina, Peru, and Uruguay. Globally, BYD buses and taxis can be found in over 300 cities of more than 50 countries and regions.

GENERAL

50. Tightened Gothenburg Clean Air Protocol Enters Into Force

European and North American countries took a major stride in cleaning up the atmosphere on 7 October through the implementation of an amended legally binding treaty to limit the amount of emissions polluting the air.

With 18 countries and the European Union now having ratified the amended treaty, from a total of 51 who have previously signed, including many of the countries which are part of the UN Economic Commission for Europe (UNECE), the official entry into force marks an important step to curb pollutants closely-linked to climate change, ecosystem degeneration, and potentially life-threatening human health.

The Gothenburg Protocol, established back in 1999, sets forth legally-binding emissions reduction commitments for 2020 and beyond, for major air pollutants, and is rooted in the UNECE's 1979 Convention on Long-range Transboundary Air Pollution (LRTAP), originally intended to prevent the occurrence of acid rain.

Beyond targeting acid rain related air pollutants, the Protocol was updated in 2012 to include reduction of fine particulate matter.

UN experts have deemed air pollution a human rights violation - a deadly, man-made problem responsible for some seven million premature deaths every year, according to the World Health Organization (WHO). The agency has said toxic air is "the world's largest single environmental health risk" and a leading cause of death by cancer.

The Protocol sets emission ceilings for major polluters: sulphur dioxide (SO₂), nitrogen oxides (NO_x), ammonia (NH₃), volatile organic compounds (VOCs) and fine Particulate Matter (PM_{2.5}), shown to damage human health.

The compounds are released from various household and ambient sources; from motor fuel combustion, heat and power generation, cooking and heating fuels; having lasting health effects even with only mild exposure.

Of the pollutants the Protocol aims to target, Particulate Matter, NO_x and SO₂, show the strongest evidence of causing adverse health effects, WHO found. Smoke poses the most serious threat to

humans, as a pollutant composed of fine particles that can enter the lungs, travel through the bloodstream and penetrate vital organs.

Approximately 3 billion people cook and heat their homes using polluting fuels, and around 3.8 million die each year from exposure to indoor air pollution., WHO says.

Slashing levels of particulate matter, specifically a component known as black carbon, could also help in the fight against climate change. Scientists have found that black carbon, which has light-absorbing properties, remains in the atmosphere for little time, yet has drastically darkened snow and ice in the Arctic region, thereby contributing to regional warming.

As parties break new ground in clean air policy, additional UNECE Member States are expected to ratify the Protocol in coming months.

The 1979 LRTAP Convention will see 40 years since its inception in December, growing from 32 countries to now 51 Parties, and giving birth to eight protocols which have set emission reduction commitments through the decades, including Gothenburg.

UNECE has recognized that the LRTAP and its protocols have reached achievements that are “unparalleled”, from decoupling emissions and economic growth, cutting back certain air pollutants by 40 to 80 per cent, recovering forest soils from acidification, and avoiding some 600,000 premature deaths per year.

51. UN Aviation Body Agrees on Plans to Cut Greenhouse Gases

A United Nations organization agreed on October 4 to work toward a goal for cutting climate-warming gases from aviation and reduce the industry’s contribution to climate change. The International Civil Aviation Organization’s plenary of 181 nations was meeting in Montreal to set its agenda for the next three years. The body sets standards for the global aviation industry, and it was under pressure during its two-week meeting to improve its plan to cut greenhouse gas emissions.

ICAO’s main plans for reducing the pollutants include an offsetting scheme that begins in 2021 and a major expansion in the use of biofuels for aviation.

The plenary of all nations voted in favor of a package of environmental resolutions October 4 that included working toward a long-term aspirational goal for emissions cuts, declaring ICAO’s emissions offsetting scheme the only one for global flights, and taking greater stock of biofuels’ full environmental footprint.

The resolution declaring the offsetting scheme—the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)—as the only such scheme for global flights has drawn interest because of the potential impact on the European Union’s emissions trading system, which has applied to flights between European countries since 2012.

Uncertainty remains around how the two schemes will co-exist and whether one might take precedence. European Union member states didn’t raise the potential clash during a meeting of the ICAO’s executive committee September 29.

The executive committee debated the environmental resolutions and the reports that accompany them prior to the plenary meeting October 3 and 4.

Russia, China, and India are highly critical of CORSIA and argue the plan favors developed countries and their airlines. Much of the aviation industry's future growth is expected to take place in Asia.

The plan has several elements that favor the three countries. For example, the offsetting requirements are based on average growth across the entire sector, meaning slower-growing airlines in developed nations will have to offset more than those in developing countries, Annie Petsonk, international counsel with the Environmental Defense Fund, said.

The three countries also have tried to slow momentum toward an aspirational long-term emissions goal, much like the International Marine Organization has done for global shipping.

The executive committee's reception toward a long-term goal was stronger this year compared to the last assembly three years ago, but the wording of the final resolution is the exact same as one adopted last time, Andrew Murphy, manager of aviation at Transport & Environment, said in a press interview.

The resolution requires the ICAO to pick a long-term goal among a set of options developed by a technical committee at the next assembly in 2022.

52. Exposure to Air Pollution Increases Violent Crime Rates, Study Finds

Breathing dirty air can make you sick. But according to new research, it can also make you more aggressive. That's the conclusion from a set of studies recently authored by Colorado State University researchers in economics, atmospheric science and statistics. Together, the team found strong links between short-term exposure to air pollution and aggressive behavior, in the form of aggravated assaults and other violent crimes across the continental United States.

The results, derived from daily Federal Bureau of Investigation crime statistics and an eight-year, detailed map of daily U.S. air pollution, will be published in a forthcoming edition of the *Journal of Environmental Economics and Management*.

The paper's lead author is Jesse Burkhardt, assistant professor in the Department of Agricultural and Resource Economics, who teamed up with fellow economist Jude Bayham in the same department; Ander Wilson in the Department of Statistics; and several air pollution experts in civil engineering and atmospheric science.

The CSU researchers cross-analyzed three highly detailed datasets: daily criminal activity from the National Incident-Based Reporting System managed by the FBI; daily, county-level air pollution from 2006-2013 collected by U.S. Environmental Protection Agency monitors; and daily data on wildfire smoke plumes from satellite imagery provided by the National Oceanic and Atmospheric Administration's Hazard Mapping System.

Air pollution scientists typically measure rates of pollution through concentrations of ozone, as well as of "PM2.5," or breathable particulate matter 2.5 microns in diameter or smaller, which has documented associations with health effects.

Eighty-three percent of crimes considered "violent" by the FBI are categorized as assaults in crime databases. In the researchers' study, they observed whether crimes occurred inside or outside

the home; they found that 56 percent of violent crimes and 60 percent of assaults occurred within the home, which is an indication that many such crimes are tied to domestic violence.

The research results show a 10 microgram-per-cubic-meter increase in same-day exposure to PM2.5 is associated with a 1.4% increase in violent crimes, nearly all of which is driven by crimes categorized as assaults. Researchers also found that a 0.01 parts-per-million increase in same-day exposure to ozone is associated with a 0.97% increase in violent crime, or a 1.15% increase in assaults. Changes in these air pollution measures had no statistically significant effect on any other category of crime.

"We're talking about crimes that might not even be physical - you can assault someone verbally," co-author Bayham said. "The story is, when you're exposed to more pollution, you become marginally more aggressive, so those altercations - some things that may not have escalated - do escalate."

The researchers made no claims on the physiological, mechanistic relationship of how exposure to pollution leads someone to become more aggressive; their results only show a strong correlative relationship between such crimes and levels of air pollution.

The researchers were careful to correct for other possible explanations, including weather, heat waves, precipitation, or more general, county-specific confounding factors.

The team published a companion paper in the *Journal of Environmental Economics and Policy* with similar results that used monthly crime statistics. A third paper in *Epidemiology*, with lead author Jesse Berman at University of Minnesota and co-authors from CSU, used EPA pollution monitor databases and different statistical techniques and came to similar conclusions.

The tool that allowed the team to overlay crime data with pollution data was originally used in collaboration with CSU epidemiologist Sheryl Magazmen to study health effects from air pollution, explained co-author Jeff Pierce, associate professor in the Department of Atmospheric Science and a Monfort Professor. Pierce, associate professor Emily Fischer and researchers Kate O'Dell and Bonne Ford, had previously worked with Magazmen to detail how smoke and particulate matter exposure correlated with things like hospitalizations and asthma inhaler refills.

Burkhardt had been wanting to study whether breathing smoke could enact behavioral change when he met atmospheric scientist Pierce.

"Several years ago, Fort Collins experienced a fairly severe wildfire season," Burkhardt said. "The smoke was so bad that after a few days, I started to get frustrated, and I wondered if frustration and aggression would show up in aggregate crime data."

Pierce recognized that the pollution-concentration product he and colleagues had designed, which provided detailed concentrations of total particulate matter and the fraction from smoke, would be useful for Burkhardt's desired application.

"The results are fascinating, and also scary," Pierce said. "When you have more air pollution, this specific type of crime, domestic violent crime in particular, increases quite significantly."

The economists calculated that a 10 percent reduction in daily PM2.5 could save \$1.1 million in crime costs per year, which they called a "previously overlooked cost associated with pollution."

The authors remain interested in the relationships between pollution and cognitive outcomes, Burkhardt said. They are now working with a large online chess platform to determine if increased pollution exposure is correlated with worse chess performance.

The results are just one outcome of CSU's philosophy around "cluster hiring" faculty from disparate fields to study interdisciplinary problems. In this case, several of the researchers came to CSU under the Partnership for Air Quality, Climate and Health initiative launched several years ago by the Office of the Vice President for Research.

53. Hapag-Lloyd Fleet Set to Ditch Heavy Fuel Oil

Starting next July, the Hapag-Lloyd Cruises luxury and expedition fleet will use marine gas oil with a maximum sulfur content of 0.1 percent (LS-MGO) exclusively. By transitioning to the low-pollutant fuel voluntarily, the sulfur emissions of the Hapag-Lloyd Cruises' fleet will be cut by 80 percent, according to a statement, as the company has vowed not to use HFO (heavy fuel oil).

Additionally, the switch to marine gas oil means a reduction in soot and particulates of up to 30 percent.

"With our years of expertise in the luxury and expedition segment, we set the highest standards in the industry with our ships and are committed to adhering to strict environmental protection standards," said Karl J. Pojer, CEO

"Already we have made significant progress in this context and never stop working to improve even further. These efforts have taken us far beyond the minimum statutory requirements. The decision not to use heavy fuel oil is a significant step towards operating environmentally-conscious cruises and an important investment in our future."

In 1993, Hapag-Lloyd Cruises stopped using heavy fuel oil in the Arctic on its own and only uses marine gas oil with a maximum sulfur content of 0.1 percent.

Additionally, all the new ships of Hapag-Lloyd Cruises, including the Europa 2 and the new expedition class are compatible with cold ironing and have been fitted with modern SCR (selective catalytic reduction) catalytic converters.

These converters clean exhaust gases and lower nitrogen oxide emissions by up to 95 percent, the company said.

54. Electric Bus Fleets Are The Latest Tool For Improving Air Quality

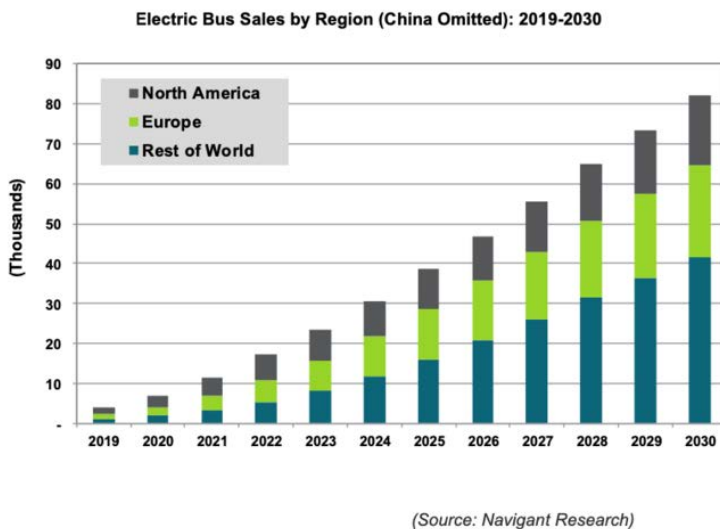
Concerns about air quality and vehicle emissions are rising globally. According to the Health Effects Institute (PDF), air pollution is one of the top-ranking risk factors for death and disability, with vehicle emissions the main contributor of outdoor pollution. Local and regional governments are increasingly focused on improving their ambient air quality.

While the bus market historically has been dominated by internal combustion engines, electric buses are increasingly popular in transportation headlines. More and more, transportation agencies are setting sunset timelines for the purchase of diesel buses and announcing goals to transition to zero-emission fleets — primarily through bus electrification. The market growth making these goals possible can be attributed to China's massive drive to establish new manufacturing chains and to electrify its own bus market over the past decade.

China's electric bus market has seen rapid growth thanks to central and regional government support. Navigant Research estimates that sales have grown from roughly 500 battery electric buses in 2010 to nearly 163,000 in 2019, a compound annual growth rate of 78.4 percent.

China is leaps and bounds ahead of the rest of the world. According to Bloomberg New Energy Finance, China's battery electric fleet made up over 99 percent of the global total. As an example of the country's market strength, Shenzhen, China, has over 16,000 battery electric buses in its fleet — more than the entire bus fleet of the top five transit agencies in North America combined.

In the next decade, electric bus sales are expected to grow both in China and abroad. China's days of rapid market growth are likely numbered thanks to market saturation and China's recent reduction in EV incentives. Instead, rapid growth of the electric bus market is expected to come primarily from sales in markets that prioritize the reduction of greenhouse gas (GHG) emissions and other pollutants affecting ambient air quality, while also offering government support for new fleet vehicles.



North America and Europe are primed for battery electric bus growth, as both regions have air quality targets and policies encouraging fleets to replace existing buses. With the Chinese market's adjustment to gradual growth, Chinese electric bus manufacturers are also looking for additional growth in other markets. OEMs such as BYD and Yutong already have begun shipments to fleets in Latin America. (See story above.)

The presence of battery electric buses is due to more than just government policy; they have a number of benefits over conventional internal combustion engine buses. These benefits include:

- **Lower total cost of ownership (TCO):** Battery electric buses can positively affect a fleet's bottom line if managed correctly. They are expected to have lower maintenance costs than internal combustion engine buses because they have fewer moving parts and thus fewer potential points of failure. Fleets can save on fuel costs by switching to electricity over other fuels, although charging and infrastructure must be closely managed to achieve these savings.
- **Air quality improvements:** Battery electric buses significantly improve a fleet's air quality profile because they have no tailpipe. Any emissions related to the bus's operation are sourced at the point of where the electricity is generated. Shifting to this technology immediately improves local air quality.
- **Lower GHG emissions:** Battery electric buses improve the GHG profile of a fleet by

improving the efficiency of the vehicles. Well-to-wheels, electric buses are more efficient than their ICE counterparts and have fewer GHG emissions associated with running them off grid-sourced electricity. As grids improve and reduce their carbon intensity, the operations only get cleaner. Ultimately, the operation of battery electric buses may be completely net carbon zero because they are 100 percent powered by renewable energy.

Despite these benefits, several potential roadblocks stand in the way of fleet managers moving full speed ahead toward electric bus adoption:

- **TCO and cost management:** Fleets need to closely manage the charging of battery electric buses to keep costs low. Depending on use case and the required infrastructure, electricity costs may outweigh any potential savings due to the time of charging and high-powered charging needed for the vehicles to meet the use cases required of the vehicle. It is also likely that many electric buses will need mid-life battery replacements. However, the market is still in the growth stage so little data is available on when and how much this may cost fleets in the long run.
- **Upfront vehicle costs:** Even in a well-managed fleet, where the TCO for an electric bus over time is lower than an internal combustion engine counterpart, the higher upfront cost can be a hurdle for fleet managers who are hesitant to adopt new technologies. Public fleets and school districts, in particular, may have a difficult time convincing the required stakeholders that the upfront costs of electrification are worth the investment.
- **Charging infrastructure requirements:** A diverse selection of charging station options available to fleets adds complexity to the electrification process. This product diversity and importance of selecting the correct chargers to obtain lower TCO adds challenges as the number of charging options can become overwhelming. Charging infrastructure also can have specific space requirements within depots that a fleet may not be ready to give up for battery electric buses.

55. Scientists Discover Record Methane Emission in the Russian Arctic

A group of scientific researchers has discovered a record methane emission coming from the eastern Siberian Sea, expedition organizer Tomsk Polytechnic University (TPU) said in a statement. The scientists found concentrations of the greenhouse gas — which can significantly influence the planet's climate — up to nine times the global average.

“This is the most powerful gas fountain I've ever seen,” said Igor Semiletov, the head of the expedition and a TPU professor. “No one has ever recorded anything like this before.”

Nearly 80 scientists from Russia, China and Sweden traveled to the eastern Arctic to study methane emissions.

The statement said that while the researchers determined the exact location of the greenhouse gas fountain using instruments, it was so large that they were also able to see it bubbling through the seawater with their own eyes.

56. The World Needs A Massive Carbon Tax To Limit Climate Change, IMF Says

A global agreement to make fossil fuel burning more expensive is urgent and the most efficient way of fighting climate change, an International Monetary Fund study found. The group found that

a global tax of \$75 per ton by the year 2030 could limit the planet's warming to 2 degrees Celsius (3.6 degrees Fahrenheit), or roughly double what it is now. That would greatly increase the price of fossil-fuel-based energy — especially from the burning of coal — but the economic disruption could be offset by routing the money raised straight back to citizens.

“If you compare the average level of the carbon tax today, which is \$2 [a ton], to where we need to be, it's a quantum leap,” said Paolo Mauro, deputy director of the fiscal affairs department at the IMF.

The IMF report comes out as financial institutions increasingly grapple with the risks associated with climate change, including damage from sea-level rise, extreme weather events and billions in fossil fuel reserves that might be in excess of what can be burned while also limiting warming. The Federal Reserve, for example, is taking a closer look at how climate change may pose a risk to economic stability.

In the United States, a \$75 tax would cut emissions by nearly 30 percent but would cause on average a 53 percent increase in electricity costs and a 20 percent rise for gasoline at projected 2030 prices, the analysis in the IMF's Fiscal Monitor found.

But it would also generate revenue equivalent to 1 percent of gross domestic product, an enormous amount of money that could be redistributed and, if spread equally, would end up being a fiscally progressive policy, rather than one disproportionately targeting the poor.

The impact of a \$75-per-ton tax would also hit countries differently depending on burning or exporting coal, which produces the most carbon emissions per unit of energy generated when it is burned.

In developing nations such as China, India and South Africa, a \$75 carbon tax reduces emissions even more — by as much as 45 percent — and generates proportionately more revenue, as high as 3.5 percent of GDP in South Africa's case, the IMF found.

The idea of making it expensive to produce greenhouse gas emissions is hardly new and has been widely embraced by economists despite the immense political difficulties involved in imposing such taxes. “No environmental economist should disagree with the main argument of the paper: Carbon pricing is the single most powerful tool we have for reducing CO2 emissions from burning fossil fuels, and our current set of policies leaves us nowhere close to meeting our climate goals,” said Marc Hafstead, a climate policy expert with Resources for the Future.

But several experts said that the IMF stance was important even as they noted that the carbon price may need to be a lot higher, rendering an already gigantic lift even more difficult.

Kenneth Gillingham, an economics professor at Yale University who worked on environmental issues during a stint as part of the Obama administration's Council of Economic Advisers, said the IMF's position added to the urgency recent scientific and economic assessments had shown in discussing how to tackle the climate problem. “From my perspective this is an exciting change in that they're thinking more deeply than they had previously,” he said.

But Gillingham said a \$75 per ton carbon tax may actually be too low to hold climate change to 2 degrees, noting that he had expected the figure to be closer to \$100 per ton, given the world's high emissions path.

Gernot Wagner, who studies climate policy at New York University, agreed. He co-wrote a paper published recently arguing that a carbon price should start high and gradually be reduced to take into account the costs of future damage from global warming. “If one takes climate risk and uncertainty seriously, the numbers rise much higher still,” Wagner said.

Most economists and policymakers have designed carbon tax policies that start relatively low and ramp up quickly over time. Proponents say it would minimize economic hardship for consumers and companies for their past choices while changing future decisions such as purchases of polluting equipment or automobiles.

The Nobel Prize-winning Yale economist William D. Nordhaus has argued that a carbon tax of \$300 per ton or even higher might be required.

“Their estimate is, in my view, if anything on the low side of what is needed” but on the high side compared with policies already being implemented in some countries, Nordhaus said.

Moreover, the latest science suggests the world will sustain massive damage, such as the loss of nearly all coral reefs, even if it holds warming to, or just under, 2 degrees Celsius. To keep warming to just 1.5 degrees Celsius, the carbon tax would have to be even higher, the IMF’s Mauro noted, though he said he is not sure how high because the group did not do that analysis.

“The climate crisis is so dire, and public/popular determination to attack it is suddenly so strong and unquenchable, that even \$75/ton by 2030 seems far too moderate a target,” wrote Charles Komanoff, director of the Carbon Tax Center, in response to the IMF study.

The IMF report considers not just economic policy options, but the political feasibility of these proposals as well, including how they might affect different segments of society and how to make them more politically palatable, such as by redirecting the revenue back to the populace through tax cuts or direct dividend payments.

It shows that in the Group of 20 largest economies, the tax would raise energy costs by an average of 43 percent for electricity and 14 percent for gasoline in the countries considered.

This reflects the growing recognition that policies that impose financial burdens that fall hardest on a particular segment of society could trigger unintended blowback. France’s tax hike on gasoline and diesel, for example, helped spur the violent “yellow vest” protests this year.

57. 35 Cities Unite To Clean The Air Protecting The Health Of Millions

Recently, 35 mayors pledged to deliver clean air for the more than 140 million people that live in their cities. By signing the C40 Clean Air Cities Declaration, the mayors recognize that breathing clean air is a human right and commit to work together to form an unparalleled global coalition for clean air.

The pledge unveiled at the C40 World Mayors Summit in Copenhagen commits cities to set ambitious pollution reduction targets and implement substantive clean air policies by 2025. By publicly reporting on their progress, the cities plan to generate a ‘race to the top’ in cleaning the air in the world’s big cities. The cities signing the C40 Clean Air Cities Declaration are:

Amman, Austin, Bengaluru, Barcelona, Berlin, Buenos Aires, Copenhagen, Delhi, Dubai, Durban (eThekweni), Guadalajara, Heidelberg, Houston, Jakarta, Los Angeles, Lima, Lisbon, London,

Madrid, Medellin, Mexico City, Milan, Oslo, Paris, Portland, Quezon City, Quito, Rotterdam, Seoul, Stockholm, Sydney, Tel Aviv-Yafo, Tokyo, Warsaw, Washington D.C.

Mayors, speaking at a press conference in Copenhagen had a clear message “We know we need to tackle the twin dangers of air pollution and the climate emergency. Both need swift, unprecedented and collective action to remove the pollution that is harming our health and warming our planet.”

According to the World Health Organization, 9 in 10 citizens around the world breathe dirty air, and 7 million people die prematurely each year due to air pollution. Air pollution is creating a global public health crisis -- one that is rooted in social injustice. Typically, it is the poorest and most vulnerable communities that are most affected by dirty, polluted air.

Through the C40 Clean Air Cities Declaration, mayors commit to using their power and influence to reduce air pollution and work towards meeting the World Health Organization’s Air Quality Guidelines. This means cities will continually reduce their local emissions, and advocate for reductions in regional emissions, resulting in continuous declines in air pollution levels that move towards the WHO guidelines:

Signatories of the declaration pledge to: Set ambitious pollution reduction targets within two years that meet or exceed national commitments, putting them on a path towards meeting World Health Organization guidelines; Implement substantive clean air policies by 2025 that address the unique causes of pollution in their cities; and publicly report progress on achieving these goals.

If the 35 signatories reduce annual average PM2.5 levels to WHO guidelines (10 ug/m³) it could avoid 40,000 deaths each year.

Mayors have a wide array of tools at their disposal for improving air quality, including expanding low- or zero-carbon public transport; creating zero-emissions zones; requiring and promoting cleaner fuels for heating and cooking; enhancing incentives and infrastructure to support walking and cycling, and establishing city-wide air quality monitoring. However, they also recognize cities often do not have the ability to address all causes of pollution, and are calling upon nation states, businesses and all those who care about climate change and public health to match this commitment. The Declaration includes this message for all responsible actors: “We will use all the powers at our disposal as mayors to tackle air pollution and call on others responsible for the sources of air pollution that poison the air in our cities to match this commitment.”

Over the last decade, cities have been taking action to address underlying causes of air pollution, including high-emission transportation systems. 35 cities, including Milan, London, and Copenhagen, have committed to the C40 Green and Healthy Streets Declaration, through which they have pledged to procure only zero-emissions buses from 2025 and make a major area of the city transport emissions-free by 2030.

C40 research shows that if all C40 cities cleaned their transport, buildings and industry this would reduce GHG emissions by 87%, PM2.5 by nearly 50% and would avoid over 220,000 premature deaths per year. At a city level, this work also highlights the benefits from specific climate and air quality actions:

By switching the bus fleet to clean vehicles and implementing a zero-emission zone in Paris, the city could avert 385 premature deaths and save 0.5MtCO_{2e} per year. Mexico City has launched a program to incentivize industry to improve their efficiency as well as adopt sustainable

technologies. This is expected to avert 60 premature deaths and prevent over 575 hospital admissions per year. Los Angeles' Green New Deal includes policies on transportation, buildings, and industry that could reduce GHG emissions by 26.1 MtCO₂e and prevent 1,650 premature deaths and 660 hospital admissions per year from reduced air pollution.

On October 9th, C40 mayors announced their support for a Global Green New Deal to "drive an urgent, fundamental and irreversible transfer of global resources away from fossil fuels and into action that averts the climate emergency." The C40 Clean Air Cities Declaration is just one example of how cities are delivering on that vision.

58. 'Dramatic' Rise Of SUVs Risks Trashing Global Climate Goals, Warns IEA

The world's growing appetite for fuel-hungry sports utility vehicles (SUVs) is more than offsetting CO₂ emission reductions in the transport sector prompted by the uptake of electric cars and efficient small vehicles, according to the International Energy Agency (IEA).

Presenting details of its World Energy Outlook, which will be published in November, the Paris-based agency says that SUVs are the second largest contributor to the increase in global emissions since 2010, behind only the power sector.

Their meteoric rise in popularity - up from 35m in 2010 to 200m today - means they now account for 40% of all annual car sales globally. "This dramatic shift towards bigger and heavier cars has led to a doubling of the share of SUVs over the last decade," the IEA warns.

"If consumers' appetite for SUVs continues to grow at a similar pace seen in the last decade, SUVs would add nearly 2 million barrels a day in global oil demand by 2040, offsetting the savings from nearly 150 million electric cars," it adds.

The agency forecasts that by 2030, only around 7% of the global car fleet will be electric, up from around 0.5% today.

The European Environment Agency said in June that SUVs' growing market share in Europe was in part responsible for an increase in CO₂ emissions from new cars, with green group Transport & Environment accusing car makers of "deliberately postponing sales of cleaner cars to maximize SUV-fueled profits".

48% of car sales in the United States last year were SUVs, which was the highest percentage worldwide, but other countries are catching up. Large cars can be seen as a status symbol, and sales are rising in countries like China and India where the middle class is growing.

The shift towards bigger, less fuel-efficient cars is somewhat at odds with the auto market generally, where heavy R&D spending is fueling developments in energy-efficient vehicles.

Given the advances in electric vehicles, as well as the knowledge that SUVs are less fuel-efficient, the researchers called the growing number of larger cars and the impact on global emissions "nothing short of surprising."

Encouraged by rising government support, global spending on electric vehicle purchases grew more than 70% in 2018 to \$82 billion. \$52 billion of this went on battery electric light-duty vehicles (BEVs), and the remainder on plug-in hybrid electric light-duty vehicles (PHEVs).

While this represented little more than 2.5% of the total light duty vehicle market last year, it does mean that \$36 billion was added to the global electric vehicle market in just one year. This carries electric vehicles past freight ships in terms of market size for new orders and represents more than double the investment in new biofuels production capacity worldwide.

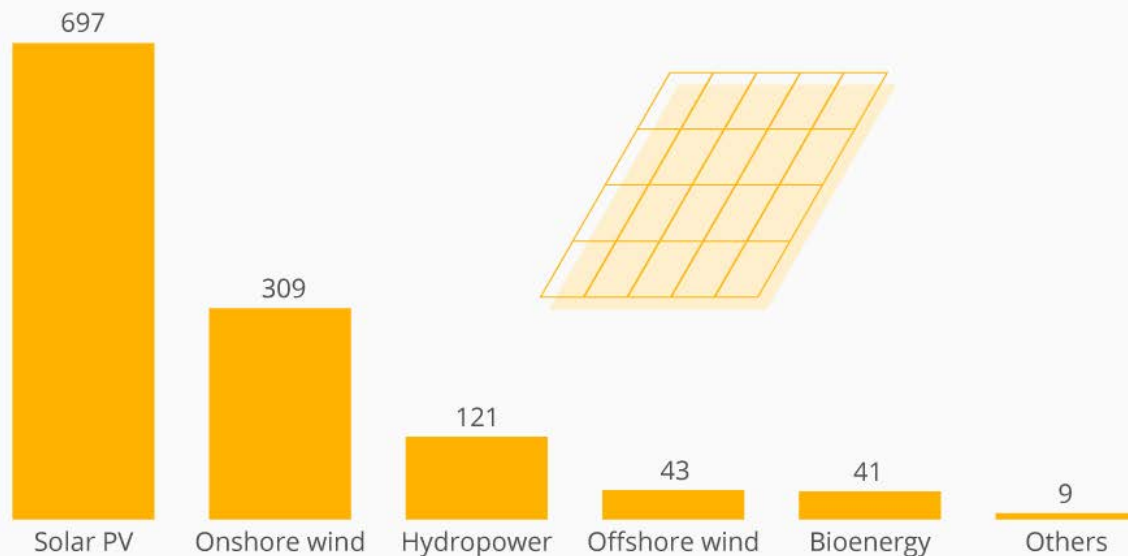
59. Renewables Set For Spectacular Growth In The Next 5 Years

Global electricity capacity from renewables is set to grow by 50% over the next five years, an increase equivalent to adding the current total power capacity of the United States, according to a recent IEA market report and forecast, Renewables 2019.

Solar PV is expected to account for the majority of that growth as costs continue to fall. A big part of solar PV's expansion will come from PV systems installed on homes, commercial buildings and industrial facilities. These applications of solar PV outside of traditional electricity providers – known collectively as distributed PV – are a main focus of the new report, which looks at how their rapid growth is likely to transform the ways in which electricity is generated and consumed, and examines the implications for policy makers, utilities and consumers.

The Sun Is Shining Bright on Solar Energy Growth

Global renewable capacity growth estimates between 2019 and 2024 in gigawatts



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 @StatistaCharts Source: IEA

statista

The share of renewables in global power generation will rise to 30% in 2024, from 26% today. However, without key actions from governments, global deployment of renewables will remain well short of what is needed to meet the world's long-term climate, air quality and energy access goals.

Offshore wind currently accounts for just a tiny fraction of global power generation, but its potential growth over the next two decades is huge, according to the upcoming Offshore Wind Outlook 2019 that will be released soon.

Offshore wind's rise comes at a time when the world's need for low-carbon technologies is greater than ever. To get the best possible picture of offshore wind's global potential, the IEA initiated a state-of-the-art geospatial analysis of the speed and quality of wind along hundreds of thousands of kilometers of coastline around the world. The resulting report provides the most comprehensive analysis to date of the global outlook for offshore wind, its contributions to electricity systems and its role in clean energy transitions.

Dr Fatih Birol, the IEA's Executive Director, will be presenting the findings in Copenhagen, Denmark – the country where offshore wind originated – with the Danish Minister for Climate, Energy and Utilities, Dan Jørgensen.

This special report is an excerpt from the World Energy Outlook 2019, the flagship IEA report that will be launched in Paris on 13 November. The Outlook provides strategic insight on what today's policy and investment decisions mean for long-term trends and key issues such as sustainable energy goals and energy security.

60. Morgan Stanley Estimates the Cost of Stopping Global Warming at \$50 Trillion

The world needs to spend \$50 trillion on five areas of technology by 2050 to slash emissions and meet the Paris Agreement's goal of halting global warming, Morgan Stanley analysts wrote in a recent report.⁶

To reduce net emissions of carbon to zero, the world would have to eradicate the equivalent of 53.5 billion metric tons of carbon dioxide a year, according to the report, which identified renewable energy, electric vehicles, hydrogen, carbon capture and storage, and biofuels as the key technologies that could help meet the target.

Carbon emissions from fossil fuels hit a record last year, but estimates vary of how much it would cost to meet the Paris target of keeping the global temperature rise to within 2 degrees. The International Renewable Energy Agency says \$750 billion a year is needed in renewables over a decade. United Nations scientists say \$300 billion spent on reclaiming degraded land could offset emissions to buy time to deploy zero-carbon technologies.

Here are Morgan Stanley's estimates for the five key technology areas.

Renewables

Renewable power generation will require \$14 trillion by 2050, including investments in energy storage. Renewables would need to deliver about 80% of global power by then, up from 37% today, meaning an additional 11,000 gigawatts of capacity, excluding hydro-power.

Solar energy's rapidly falling cost will make it the fastest-growing renewable technology over the coming decade with a 13% compound annual growth rate.

⁶ Climate Change Mitigation Opportunities Index 2017, Navigating In-Country Opportunities for Technology-Enabled Sustainable Investing, Morgan Stanley Institute for Sustainable Investing

Electric vehicles

With passenger cars currently pumping out about 7% of greenhouse gas emissions, some \$11 trillion will be needed to build factories, expand power capacity and develop the batteries and infrastructure needed to switch to electric vehicles.

With increased investment, annual EV sales could grow from 1.3 million units in 2018 to 23.2 million in 2030, lifting the total number of electric vehicles to 113 million by 2030 and 924 million by 2050.

Carbon capture and storage

Almost \$2.5 trillion would be needed for technologies that capture carbon and store it.

While it currently costs about \$700 million to capture a million tons of carbon a year, the cost of building CCS plants is expected to drop 30% by 2050.

With more than 200,000 megawatts of new coal-fired generation capacity under construction, CCS is the only option to offset the emissions of these plants, Morgan Stanley says.

Hydrogen

About \$5.4 trillion is needed for electrolyzers to make the gas, which can help provide clean fuel for power generation, industrial processes, vehicles and heating.

In addition, \$13 trillion would be required to increase renewable energy capacity to power the plants.

Another \$1 trillion would be needed for storage, with additional investment for transportation and distribution.

Biofuels

Almost \$2.7 trillion should go into biofuels like ethanol, which are currently mixed with petroleum products but will spread eventually to areas such as aviation.

About 4% of global transportation fuel will be biofuel in 2030.

Ethanol, the most-used biofuel at the moment will grow at about 3% a year, while a type of biodiesel called hydrotreated vegetable oil will achieve much faster growth, quadrupling production by 2030.