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CAR LINES

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EUROPE

1. London Launches Aggressive Ultra-Low Emissions Zone

An ultra-low emissions zone (ULEZ) has been launched in London that sets the toughest vehicle emission standards for any urban air quality scheme in the world. Only petrol cars that meet the Euro 4 standard or cleaner and diesel vehicles that meet the tighter Euro 6/VI standard will be exempt from paying a daily charge of £12.50 (€14.50), with lorries, buses and coaches that fail to meet emissions limits paying £100 (€116) a day.

The ULEZ was intended to enter force next year but London mayor Sadiq Khan brought it forward as part of a package of measures to tackle air quality and plans to expand it substantially in 2021.

Data from the mayor's office shows the ULEZ improved air quality even before it was introduced, as organizations and businesses began moving to cleaner fleets to avoid the extra cost. The proportion of compliant vehicles entering the zone rose from 39% in February 2017 to 61% last month, while daily traffic has fallen by 11,000 vehicles.

Roadside measurements of nitrogen dioxide (NO₂) within the zone have already dipped by 20%, according to official data.

The ULEZ, combined with a package of other measures being put in place by the mayor, is expected to deliver compliance with EU NO₂ limits within six years. The European Commission noted last week that the UK is one of 18 member states struggling to reduce nitrogen oxide emissions to within EU limits.

Simon Alcock, head of public affairs at environmental law group ClientEarth, noted that two million Londoners are living with illegal levels of air pollution. "That is why the Mayor of London is absolutely right to introduce the ULEZ," he said. Nevertheless, "the ULEZ isn't perfect," Alcock added. "It needs to be expanded as soon as possible to cover the whole of Greater London." He also called on policymakers to follow Germany's lead by forcing automakers to commit money towards a clean air fund.

Yoann Lepetit, clean vehicles officer at Transport & Environment, told ENDS the London scheme is "one of the best in Europe, even if it's not an outright ban" on older car models. He added that fears of a spike in vehicle emissions outside the zone may not materialize. While the results will differ from city to city, initial data from Madrid, which introduced a similar scheme in November, found a slight fall in emissions in the surrounding areas, he said.

2. Ricardo Analyzes Real-World Emissions In The London ULEZ

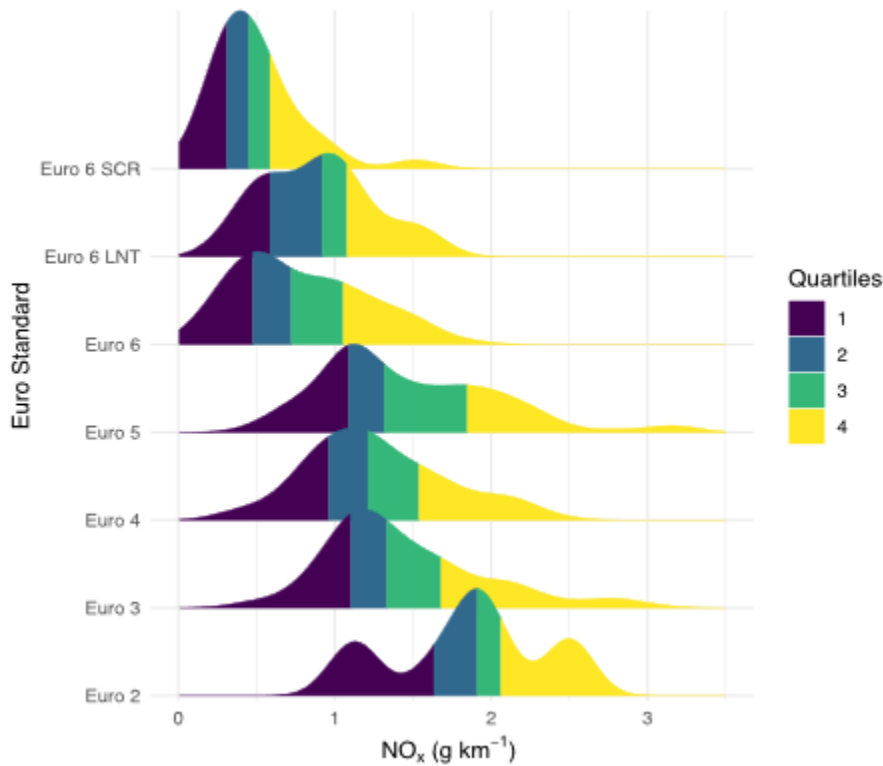
Relying on Ricardo's unique database of real-world vehicle emissions underpinned by measurements made using remote sensing technology that accurately records the real-world driving emissions from vehicles, at the roadside, under actual driving conditions, David Carslow summarized the current situation in UK's Air Quality News Newsletter.

One of the advantages of remote sensing measurements he noted is that they directly provide fleet-weighted average real-world emissions. An important strength of this approach is that it provides insight into the whole vehicle fleet. In principle, this allows for the quantification of emissions from vehicles directly affected by a LEZ as well as those that are not. Both pieces of

this jigsaw are needed for a robust understanding of what any LEZ policy will bring regarding vehicle emissions reductions.

Ricardo's real-world vehicle emissions database provides estimates of the g km^{-1} of nitrogen oxides (NO_x) by vehicle type, Euro standard and vehicle model. Figure 1 shows the distribution of NO_x emissions from diesel passenger cars, where over 400 individual models of vehicle have been considered. For each Euro standard, the distribution of NO_x emissions is shown as a 'density plot'. The color bandings show the four quartiles of emissions (i.e. the lowest 25%, 25%-50%, 50%-75% and the highest 75%-100%).

Figure 1. Distribution of NO_x emissions by Euro standard for diesel passenger cars (for each Euro standard, the four quartiles of NO_x emission are shown)



The results in Figure 1 broadly indicate that emissions of NO_x did not change by much from Euro 2 to Euro 5, shown by the similarity of the distributions. The data also highlights a distinct shift to the left in the Euro 6 distribution, which hit the fleet from 2014, indicating lower emissions overall than earlier Euro standards.

This is really the first time there has been a dramatic change in NO_x from diesel cars. A closer look at the Euro 6 distribution shows that about three-quarters of these vehicles have emissions that are cleaner than the lowest 25% of the previous Euro 5 standard vehicles. As such, a shift to Euro 6, driven by the implementation of the ULEZ, or any other LEZ/CAZ policy, clearly has the potential to considerably reduce NO_x emissions.

What is also very apparent from Figure 1 is that all distributions overlap to some degree (i.e. some pre-Euro 6 vehicles are lower-emitting than some Euro 6 vehicles). From a LEZ perspective, this means that some older, but low emission vehicles, will be barred from entering a LEZ (unless owners pay the charge). This reality has consequences for the optimum design of emissions

reduction policies, arguably raising the question as to whether LEZ schemes based on Euro standards are too blunt an approach to effectively tackle air pollution.

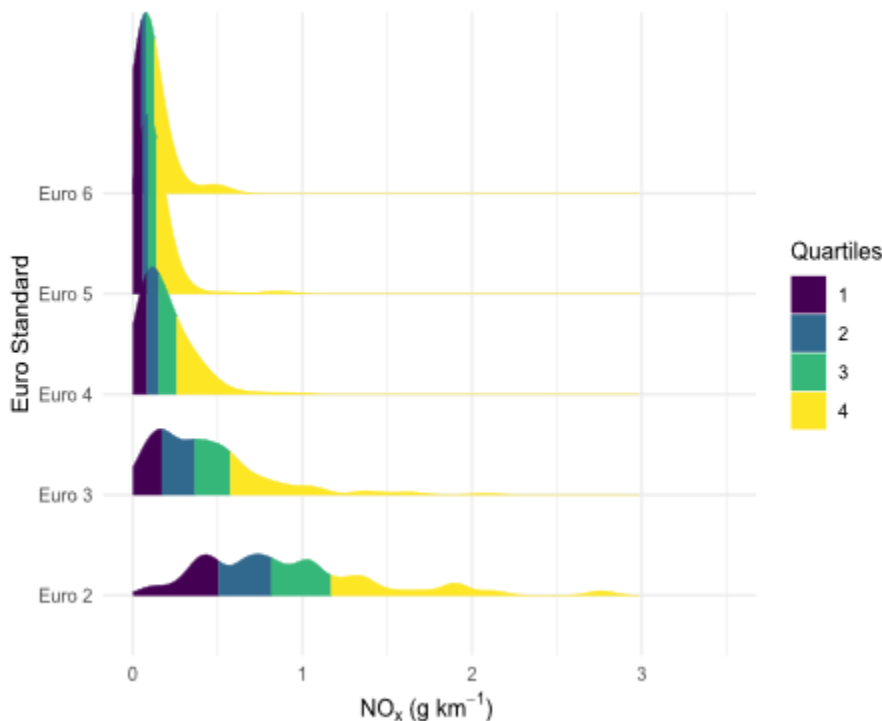
Figure 1 also provides a closer look at the emerging story of the Euro 6 standard. As highlighted above, Euro 6 brings lower emissions overall than earlier Euro standards – about 50% lower on average than Euro 5. Automotive manufacturers deliver Euro 6 through two main NO_x after treatment technologies: Lean NO_x traps (LNT) and Selective catalytic reduction (SCR). The data shows that emissions from SCR-equipped vehicles are about half that of LNT vehicles.

The data shown in Figure 1 does not fully reveal the complexity of Euro 6 and the many stages involved (Euro 6b, c, d-temp and d). Therefore, within Euro 6, there is a wide range of emissions performance. Vehicles that have been entering the fleet in the past year or so have considerably lower emissions than early generation Euro 6 vehicles that entered the fleet from 2014. The difference is striking, at least a factor of two overall – and higher for many individual models.

The situation for petrol passenger cars differs markedly from diesel cars as shown in Figure 2 (note that Figure 1 and Figure 2 share a common scale). The first thing to note is the far lower NO_x emissions from petrol passenger cars than those from diesel cars.

Euro 5 and Euro 6 petrol vehicles have very low emissions, and Euro 4 and older vehicles exhibit wider distributions and higher emissions along with some indication of vehicle emissions deterioration effects. These older petrol vehicles, while higher emitting than new petrol vehicles, are generally very low emitters compared with diesel vehicles – thus a LEZ based on Euro 4 or newer vehicles seems a very reasonable approach from an emissions evidence perspective.

Figure 2, Distribution of NO_x emissions by Euro standard for petrol passenger cars (for each Euro standard, the four quartiles of NO_x emission are shown)



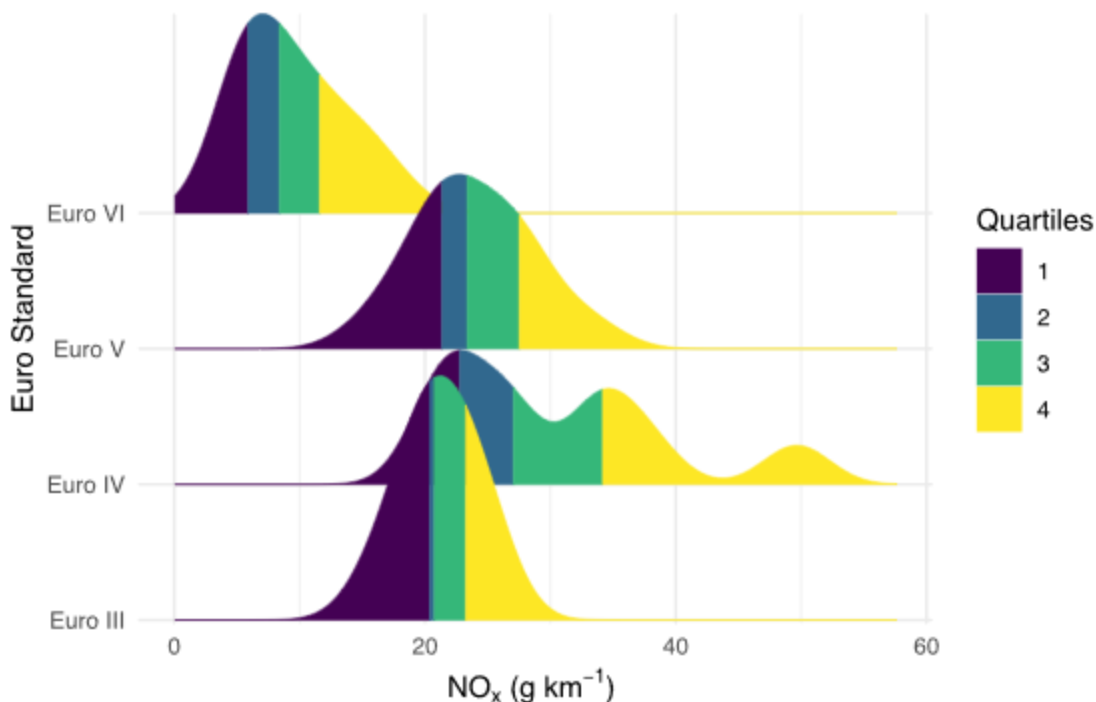
As mentioned earlier, the insight that this approach can bring to the whole vehicle fleet is a key strength. For instance, when considering light commercial vans, there is a similar situation to that

shown for diesel cars in Figure 1 – albeit a slightly larger average emissions reduction between Euro 5 and Euro 6.

The situation for heavy goods vehicles (HGVs), shown in Figure 3, is different again. In the case of HGVs, the real-world reduction in NO_x realized from moving from Euro V to VI is quite considerable – shifting the HGV fleet to Euro VI is a clear win.

This data helps to demonstrate the importance of understanding real-world behavior and why fleet-weighted average real-world emissions offer a sound basis upon which to develop truly evidence-based, low-emission policy. This also highlights the real-world benefits that are likely to be seen from implementing LEZs and CAZs.

Figure 3 Distribution of NO_x emissions by Euro standard for HGVs over 12.5 tons (for each Euro standard, the four quartiles of NO_x emission are shown)



The initial stage of the London ULEZ will cover the same area as that of the existing Congestion Charge. Here, understanding the whole fleet is important. This zone has a very different fleet composition compared with that for the rest of London, including a higher proportion of Transport for London (TfL) buses and taxis than the wider London or UK fleet. These vehicles are important contributors to NO_x emissions, and nitrogen dioxide (NO_2) in particular, in the zone.

Data collected by Ricardo, in partnership with the International Council on Clean Transportation, highlights that good progress is being made in reducing NO_x emissions from buses with big gains accrued from the move to Euro VI.

However, the situation for taxis is far more challenging. Taxis, as high NO_x emitters, will continue to make an important contribution to central London emissions for some time to come. Ricardo's real-world emissions measurements suggest that Euro 5 black cabs emit around 2.2 g km^{-1} (i.e. at the high end of the distributions shown in Figure 1).

There are also other factors at play that are emerging from the latest evidence. For instance, recent analysis of ambient air quality concentration data from across Europe, coupled with insight delivered from our real-world emissions data, is highlighting the important role of primary NO₂ emissions in this mix. Primary NO₂ emissions have reduced significantly since 2010. However, much of the work that has been done in developing LEZs has not accounted for these changes. This evidence has the potential to be an important insight as it is possible, maybe likely, that emissions and concentrations of NO₂ will decrease more rapidly than is predicted.

For more information on Ricardo's remote sensing real-world emissions measurements work, visit: <https://ee.ricardo.com/air-quality/case-studies/remote-sensing-blog-2>

3. Member States Sign Off On New Car Emissions Limits

Rules requiring cuts in carbon dioxide emissions standards for new cars and vans from 2025 are set to become law after they received final approval from the Council of the EU. Member states approved limits agreed with the European Parliament in December that require new car emissions to be 37.5% lower than in 2021, while for new vans the reduction should be 31%. An interim target will require new vans and cars to emit on average 15% less carbon dioxide between 2025 and 2029.

Hungary was the only member state to vote against the rules, with Bulgaria abstaining.

European Automobile Manufacturers' Association (ACEA) secretary general Erik Jonnaert said in a statement that reaching the targets "will require a much stronger market uptake of electric and other alternatively-powered vehicles than is currently proving possible".

He added: "All our member companies will continue to invest in their portfolios of alternatively-powered cars and vans, but there are still several obstacles putting the brakes on widespread consumer acceptance, such as affordability and the lack of a sufficiently dense network of recharging and refueling infrastructure."

However, Julia Poliscanova, clean vehicles manager at campaign group Transport & Environment, suggested that the targets were well within reach. "You know that the electric vehicle target for 2025 lacks ambition when Volkswagen, Volvo and others are already committing to go further," she said. "The challenge now is to accelerate the transition to electromobility beyond these minimum requirements and deliver the cleaner air, lower fuel bills and future-proof jobs EU citizens demand."

A European Environment Agency report (See story below.) released recently indicates that average carbon dioxide emissions from new cars grew slightly in 2017, with European consumers spurning less carbon-intensive diesel engines in favor of petrol and choosing larger vehicles. Pure electric cars made up only 1.5% of new registrations.

4. New Car Emissions Rose In 2017 - EEA Report

Car manufacturers must scale up their efforts to cut carbon dioxide emissions, the European Environment Agency (EEA) has urged, after releasing figures showing new car emissions increased in 2017. In a report based on 2017 figures, the EEA indicates that average carbon dioxide emissions from new cars sold in the EU increased by 0.4 grams per kilometer (g/km) from 2016, reaching 118.5 g/km.

Although below the current target of 130 g/km, which has applied since 2015, the report notes that this is well above the 95 g/km target to be achieved under the EU's recently agreed post-2020 rules.

In the next decade manufacturers will be required to cut average CO2 emissions from new cars by 15% in 2025 and 37.5% in 2030 compared to 2021 levels.

Automobili Lamborghini, Mazda Motor Corporation and Société des Automobiles Alpine all exceeded emission targets in 2017 and were required to pay excess emissions premiums, according to the EEA report.

Credit rating agency Moody said that carmakers might face up to €10.69 billion in financial penalties for failing to comply with the new targets.

The report identifies two significant factors contributing to the increase. Sales of petrol cars – which emit more CO2 than diesel – have increased since 2009, reaching 53% of new cars in 2017 and now outnumbering diesels. Meanwhile, sales of smaller cars have contracted. “Over the years, for both petrol and diesel, a shift towards the medium-sized segment has been observed,” the report reads.

While 2017 saw a significant increase in registrations of electric vehicles, they only represented 1.5% of total new car registrations.

The association of car manufacturers ACEA complained about the lack of sufficient resources to encourage the uptake of cleaner cars. “We urge national governments and EU policy makers to make the much-needed infrastructure investments so that sales of electrically-chargeable cars can really take off in Europe”, secretary general Erik Jonnaert said.

5. EU And China Join Forces In The Clean Energy Transition

EU and Chinese leaders have agreed to foster mutual cooperation in achieving the Paris Agreement goals through the clean energy transition. Meeting in Brussels for their twenty-first annual summit, they issued a joint statement on energy.

Efforts to decrease greenhouse gas emissions should be met “through maximizing the benefit of energy efficiency, increasing the share of renewable energy sources in the energy mix, and supporting fuel-switching to low-carbon energy sources traded on open and transparent global markets”, the joint statement reads.

China, the EU's second-largest trade partner after the US, has previously pledged it would work closely with Europe on climate change. In July 2018, the EU and China signed a joint declaration stating that “collaboration on climate change and clean energy will become a main pillar of their bilateral partnership”.

After difficult negotiations leading up to the summit, the statement confirms China's commitment to complying with WTO rules on industrial subsidies, to further discuss rules of origin, to conclude a bilateral investment deal by the end of 2020 and to implement the 2030 Agenda on Sustainable Development and the Addis Ababa Action Agenda.

“Both sides will increase their exchanges on international development cooperation and explore cooperation with other partner countries in a joint effort to work for the implementation of the 2030 Agenda on Sustainable Development”, the statement reads.

Also, on Tuesday, the EU Council issued conclusions calling for implementation of the 2030 Agenda to be accelerated “both globally and internally, as an overarching priority of the EU”. It called on the Commission to draw up a strategy outlining timelines, objectives and measures.

6. EU ‘On Track’ To Halve Emissions By 2050 - Report

Existing climate policies will halve the EU’s greenhouse gas emissions by 2030 on 1990 levels, but the bloc could realistically reduce its emissions by almost 60% through new measures, a report has shown. The European Commission said last year that the EU is already set to surpass its 2030 target, by reducing emissions by 46% against a 40% goal. But a study carried out by thinktank Sandbag puts the figure at 50%, principally because of new announcements from member states to phase out coal power.

The report comes as green groups and progressive political parties are clamoring for the Commission and member states to increase the level of ambition of the EU’s 2030 target. An earlier report by the European Climate Foundation indicated the EU would have to reduce its emissions by 55-65% over that time period in order to reduce emissions to net zero by 2050.

The Sandbag analysis sets out two climate scenarios that go beyond business-as-usual projections to help the block meet those more ambitious targets. With ‘moderate’ new climate policies, including a total phase-out of coal by 2035 and an increase in electric vehicles to 13% of the total light vehicle stock, the bloc could increase that figure to 53%.

An ‘advanced’ set of policies, including a 40% energy efficiency target, a carbon price of €35 per ton by 2030 and a 34% renewable energy target, could push emissions reductions to 58% of 1990 levels.

“This report is a good news story, showing that the EU is already well on track to significantly overshoot its 2030 emissions reduction target – even the conservative assumptions in our model allow the EU to reach cuts of 58%,” said Suzana Carp, EU engagement lead at Sandbag. “Going beyond 58% is possible with political will,” she added.

Half of the emissions cuts modelled come from the power sector alone, the report notes. Setting a 2030 phase-out date for coal power would lead to an emissions cut of 52% - six percentage points above the Commission’s projections.

However, rapid emissions cuts risk undermining the effectiveness of the EU emissions trading scheme (ETS), the report notes.” Further ETS reform is needed to ensure that carbon prices do not fall back to irrelevance,” it says. That could include a one-off adjustment of the cap on emissions allowances to prevent a surplus building up, as occurred after the 2008 financial crisis.

7. EU Talks to Be Used to Keep U.S. in Paris Accord, Official Says

European Union negotiators are expected to use upcoming trade talks with the U.S. as a way to pressure the Trump administration to stay in the Paris climate agreement, an EU official said. The comment by the official involved in trade talks follows a vote by EU member governments on a mandate to restart EU-US trade talks over the objection of France, which said the EU shouldn’t

sign any free trade deal with a country that isn't in the climate pact. The Paris Agreement was signed in 2016 by hundreds of nations to combat climate change.

Members of Parliament opposed to any trade deal with the U.S. — if the Trump administration maintains plans to pull out of the Paris Agreement — aren't panicked about the mandate being passed, the official said. They think the U.S. withdrawal issue will be pushed during negotiations and that a trade deal won't pass if President Donald Trump follows through with leaving the agreement, the official said.

"This is just the opening of a mandate, it's not a conclusion," said Maria Demertzis, deputy director of the Brussels-based Bruegel think-tank that focuses on EU economic policy.

"I think the objective here is to make sure that whatever trade agreement comes, if it ever comes, it respects the Paris Agreement. That's a view in Europe that's not just being expressed by the French."

Former President Barack Obama brought the U.S. into the Paris Agreement in 2015, but Trump announced June 2017 that he will take the U.S. out. Under the pact's rules, the U.S. can't leave until November 2020 — coincidentally just after the next U.S. presidential election.

Multinationals, including Apple, BP, Shell, Google, Walmart, Morgan Stanley and mining company BHP Billiton, have urged the Trump administration to stay in the accord. U.S. businesses, including coal companies such as Peabody Energy and Cloud Peak, have expressed concern the U.S. will be disadvantaged by not being at the table to form rules for the global energy regime that includes all the world's countries.

President Emmanuel Macron and other French officials said last year the EU won't sign any free trade deal with a country not in the Paris Agreement. EU Trade Commissioner Cecilia Malmstroem said on Twitter at the time: "Yes, Paris deal reference needed in all EU trade agreement today."

Though a mandate for the Commission to begin negotiations only needs to be approved by a majority of EU member states, final approval would need agreement by all 28 EU countries and a majority in the European Parliament.

The European Parliament didn't give a mandate to begin negotiations, which isn't needed for the Commission to start talks. Last year a majority of parliament voted to adopt a non-binding resolution to "make ratification and implementation of the Paris Agreement a condition for future trade agreements." The new parliament's position will be known after next month's election.

Demertzis said the threat of a French or European Parliament veto could pressure the Trump administration to cancel plans to withdraw from the Paris deal. "I think that's a credible strategy because it would be very difficult for a trade agreement to pass without these guarantees," she said. "But whether this manages to discipline Mr. Trump and his objectives, that's a very difficult thing to judge. His agenda is not perfectly open, and it's not always rational."

The vote comes after a week of escalating trade tensions between the U.S. and EU, with Trump administration tariff threats over a long-running subsidy dispute involving Airbus SE. Trump also threatened to hike tariffs on imports of German cars.

Asked whether she is caving in on the Paris issue because of fears over Trump's tariff threats, Malmstroem replied: "This Commission is not afraid of anything." She said the commission will be evaluating the environmental impacts of a free trade deal, including implications for the Paris Agreement, over the coming months.

Malmstroem added that she thinks the talks could wrap up by the end of 2019. However, Demertzis said that's unlikely, as negotiations may be drawn out until Trump's term ends, to stop him from imposing the auto tariffs.

The new mandate will replace the Transatlantic Trade and Investment Partnership, which stalled after Trump's election.

8. Record Number Of Electric Cars Sold In Norway

For the first time ever, the number of new all-electric passenger cars registered in Norway in March has exceeded the number of petrol, diesel and hybrid cars combined. In terms of new cars bought, the proportion of battery electric vehicles (BEVs) amounted to 58.4% in March. For the first quarter of the year, the number of new BEVs also reached a record high of 48.4%.

Norway has long been a leader in the number of electric cars on the road. In a white paper adopted in June 2017, the government established an ambitious goal that all new passenger cars and light vans should be zero-emission vehicles by 2025.

According to an official from the Norwegian transport ministry, "improvements in zero-emission technologies are an important prerequisite for the ambition". A strong incentive scheme granting tax exemptions, free parking and toll exemptions for "has led to these spectacular sales of EVs in Norway."

There is political consensus to keep the EV tax benefit until the end of 2021, including exemption from both VAT and sales tax. Local authorities may decide to charge EVs a maximum of 50% of the full rate on toll roads and ferries. It is also up to the local authorities to decide if they want to grant EVs free parking and access to bus lanes.

The Norwegian EV Association maintains that the BEV market share will remain around 50% for 2019 as a whole. The launch of Tesla's Model 3 BEV appears to have been very popular, overtaking the number of Nissan Leaf cars sold in March.

The record number of BEVs is also good news for the used car market, according to Christina Bu from the Norwegian EV Association, because increasing numbers of cars are becoming available.

"We are now aiming for 1.2 million BEVs on Norwegian roads by 2025, which is a little more than five times today's number," she said.

Norway is currently compiling its National Transport Plan for 2022-2033.

9. EU Countries Ranked In Transport Sustainability 'Scoreboard'

Electrification and renewable forms of energy are gaining momentum in the transition to decarbonized mobility, according to a transport 'scoreboard' published on March 15th by the European Commission. Sweden, which tops the scoreboard in 15 categories, has the highest

share of renewable energy in the transport sector, followed by Austria, France, Finland, Slovakia and Portugal, according to the 2016 data used for the survey.

Biofuels are included in this category as of 2011 for those countries that comply with the sustainability criteria established by the 2009 Renewable Energy Directive (RED), the revision of which recently drew mixed reactions from environmentalists.

Sweden is also the EU country where electric cars had the highest market share in 2017, while the Netherlands had the most electric vehicle charging points at 2.6 per 1,000 urban inhabitants in 2017, the Commission said.

This shows, in the executive's view, "how the EU further deepens the progress towards a safer, cleaner and more efficient internal market in transport, and promotes the shift towards low-emission mobility", in line with its recent call to clean up road transport.

Draft conclusions suggest the European Council is planning to emphasize "the importance of the EU submitting an ambitious long-term strategy by 2020 striving for climate neutrality in line with the Paris Agreement, while taking into account Member States' specificities and the competitiveness of European industry".

EU governments will also call on the Commission to present by March 2020 a long-term vision for the EU's industrial future, touching upon all relevant policy areas, "in view of the importance of a globally integrated, sustainable and competitive industrial base".

The Netherlands and Finland perform "particularly well" in the efficiency of air, rail and seaport services, the Commission concludes, while noting that "investments in transport infrastructure takes time to show effects".

In a separate report this week, the European Environment Agency (EEA) found that urban air quality management has improved over the past five years in 10 cities studied, though many challenges remain in tackling a problem closely linked to transport. These include "how to effectively communicate air quality issues to the public, and how to achieve coherent governance across various administrative levels, in particular in terms of analyzing the co-benefits of measures implemented in the areas of climate change, noise, urban planning, and air quality".

In an earlier report published in October the EU found that up to 98% of Europe's urban population was exposed to polluted air, mainly due to road transport emissions, proving a major cause of disease and premature death.

10. Commissioner Presents Post-Dieselgate Clean-Up Plan

The European Commission has outlined actions to ensure a 'Dieselgate free future' and called on governments and industry to ensure that polluting vehicles are cleaned up or taken off the road. Internal market and industry commissioner Elżbieta Bieńkowska presented the 'roadmap towards clean vehicles' at an Automotive Industry Forum hosted by Romania, the current holder of the EU Council presidency.

Alluding to the scandal where manufacturers cheated in emissions tests, the official said the EU would need to first "sort out" the industry's "disappointing" recent past. "This roadmap sets out benchmarks for making sure we will never go through a similar story again," Bieńkowska said.

The document calls on governments and manufacturers to 'encourage' hardware retrofits to reduce pollution from cars already on the road and said the Commission would 'investigate the feasibility of harmonizing rules on retrofiting'. This is weaker than a recent statement to the European Parliament's environment committee, where an official from Bieńkowska's department said the executive was considering whether to propose making retrofits a legal requirement across Europe.

In its new roadmap, the Commission also encourages national 'fleet renewal', or car scrappage, schemes, among a range of recommendations such as more stringent periodic testing to detect possible further manipulation of EU emissions tests.

Bieńkowska highlighted the recent adoption of new rules on testing and emissions, notably CO2 limits for new cars, vans and lorries, which she said would not be met without electrification.

Speaking in turn, the head of the automotive industry association ACEA said car makers were now "addressing the challenge" and investing "big time" in alternative forms of power, including fuel cells and gas. Eric Jonnaert went on to question the focus on electrification. "We are going to need to take a more holistic view versus only looking at tailpipe emissions, because one could ask whether electric vehicles are still green if electricity is produced in a non-environmentally friendly way," he said.

It was time to "stop the car bashing and the diesel bashing", the ACEA secretary general said.

Governments are scheduled to discuss the roadmap at a Competitiveness Council meeting of ministers which convenes on 18 May.

11. Former VW Boss Charged Over Diesel Emissions Scandal

The former chief executive of the carmaker Volkswagen has been charged in Germany over his involvement in the company's diesel emissions scandal. The public prosecutor in Braunschweig charged Martin Winterkorn and four other managers with fraud.

Mr Winterkorn is already facing criminal charges in the US, but is unlikely to face trial, as Germany does not extradite its citizens.

The 71-year-old resigned soon after the scandal erupted in September 2015.

In a statement, prosecutors accused Mr Winterkorn of a "particularly serious" fraud, as well as a breach of competition laws. They said Mr Winterkorn should have alerted car owners and authorities in Europe and the US about the manipulation of diesel emissions tests sooner.

They also accused him of approving a "useless" software update designed to conceal the true reason for the cars' higher emission levels.

If found guilty, the former executive could face a prison sentence of up to 10 years.

Prosecutors did not name the other four senior managers charged.

To date, the dieselgate scandal has cost Volkswagen roughly €28bn, (\$31bn; £24bn).

12. Daimler Denies Removing Test-Cheating Software From Diesel Cars

Daimler has denied that it removed emission-test-cheating software from a range of Mercedes GLK 220 CDI diesel models, highlighting the German car industry's legal struggles over diesel exhaust manipulation since Volkswagen was caught using illegal devices in 2015.

Germany's 'Bild' newspaper has reported that the KBA German Federal Motor Transport Authority detected a software function in the compact SUV's OM 651 engine in autumn 2018 and that suspicions of software cheating were later confirmed. The function was quietly removed during software updates, the newspaper said.

In denying the report, Daimler said it was working with authorities in a formal hearing initiated by the KBA in April. The hearing relates to GLKs produced between June 2012 and June 2015, it said. As many as 60,000 vehicles could be affected, according to 'Bild'.

"We fully co-operate with the Federal Motor Transport Authority and are reviewing the facts," Daimler said in a statement. "The allegation that we wanted to hide something with the voluntary service measure is incorrect."

Daimler said the carmaker is adhering to the approval process agreed with the Transport Ministry and the KBA in implementing the voluntary service measures, which include software updates, for more than three million affected Mercedes-Benz vehicles. A Stuttgart court in January published a filing that seeks to have a mass investor lawsuit certified over claims that Daimler informed markets too late about its use of defeat devices in diesel vehicles. A Daimler spokesman said subsequently that the suit is unfounded.

13. BMW, Daimler, Volkswagen Charged By EU Regulators With Emissions Collusion

European Union antitrust regulators have charged BMW, Daimler and the Volkswagen Group with colluding to block the rollout of emissions-cleaning technology in a move that could lead to big fines.

In the latest emissions scandal to hit the auto industry, the European Commission said it had sent so-called statements of objections to the companies setting out the charges, nearly two years after carrying out dawn raids at their premises.

The Commission said the collusion occurred between 2006 to 2014 and took place during the automakers' technical meetings.

"Daimler, VW and BMW may have broken EU competition rules. As a result, European consumers may have been denied the opportunity to buy cars with the best available technology," European Competition Commissioner Margrethe Vestager said in a statement.

The EU focus is on selective catalytic reduction systems to reduce harmful nitrogen oxide emissions from diesel cars through the injection of urea, which is also called AdBlue, in the exhaust gas stream.

It is also concerned about potential collusion on "Otto" filters to reduce harmful particulate emissions from gasoline cars.

Daimler, which alerted regulators about the collusion, reiterated it did not expect to be fined as a result of its information.

BMW said in a press release that its review of the charges is ongoing. The automaker said, however, that it regards these proceedings as "an attempt to equate permissible coordination of industry positions regarding the regulatory framework with unlawful cartel agreements" and said the situation "cannot be compared with cartel investigations involving territorial and price agreements, for example."

EU fines could go as high as 10 percent of a company's global turnover.

14. Jaguar Land Rover Recalls 44,000 UK Cars Over CO2 Emissions

Jaguar Land Rover (JLR) has recalled 44,000 UK cars over inaccurate emissions information, the firm admitted recently. UK regulators from the Vehicle Certification Agency found the vehicles, which span 10 JLR models, are emitting more carbon dioxide than official emissions tests certified. An alert published by the European Commission suggested that certain JLR diesel vehicles "may emit excessive levels of CO2 and may not conform with the certified condition".

In a statement, JLR said it was "conducting a voluntary recall" of the cars after regulators alerted the carmaker to the issue. "Affected vehicles will be repaired free of charge and every effort will be made to minimize inconvenience to the customer during the short time required for the work to be carried out," the firm said.

JLR will likely try to act quickly to minimize any reputational fallout from the recall, especially in light of the 'dieseldate' scandal which engulfed fellow carmaker VW in 2015. JLR has been eager to take a leadership role in the growing market for electric cars, declaring in 2017 that it will only make electric or hybrid cars from 2020. Earlier this month the zero emission Jaguar I-Pace was named as Europe's Car of the Year.

15. EC: Green Rules Could Save Member States €55 Billion A Year

On 5 April 2019, the Commission published the second Environmental Implementation Review (EIR), part of its initiative launched in 2016 to improve the implementation of European environmental policy and commonly agreed rules in all EU Member States. Implementing EU environmental policy and law is not only essential for a healthy environment, but also opens up new opportunities for sustainable economic growth, innovation and jobs. Full implementation of EU environmental legislation could save the EU economy around €55 billion every year in health costs and direct costs to the environment commissioner Karmenu Vella said recently.

However, introducing new environmental implementation reports for member states, Vella said many national governments are still struggling to meet targets on air quality, wastewater and conservation. "These implementation gaps are bad for the environment, they are bad for people's health and bad for sustainable economic development," he told reporters.

Two-thirds of member states are struggling to meet wastewater treatment targets, most need to speed up their efforts to complete the Natura 2000 network of protected sites, while over half are consistently breaching limits for nitrogen dioxide and particulate matter emissions, he explained.

In a communication accompanying its individual member state reports, the Commission noted that progress on key areas such as recycling is still some way off track. While recycling rates have

risen from 44% in 2014 to just over 46% in 2017, some member states are at risk of missing the 2020 target of 50% of municipal waste.

Landfill taxes, extended producer responsibility and 'pay-as-you-throw' schemes are all viable economic tools to tackle the problem, the Commission said.

Although member states have made progress on expanding the Natura 2000 network of protected sites, "major efforts are still necessary to ensure the implementation – including financing – of [conservation] measures on the ground", according to the communication.

"Significant gaps in implementation, enforcement, financing and policy integration are affecting efforts to protect European ecosystems," it said. "Biodiversity loss continues in the EU, even if some progress has been achieved at local level."

Vella said he was concerned at the continued loss in biodiversity but pointed to the need for global action. "What concerns me is we are doing more of the same," he said. "We know what the problems are, but we should start urging each and every organization – member states, countries outside of the EU – to start committing."

The implementation reports also highlight areas of success. "There is a good level of implementation of climate legislation throughout the EU," the Commission stated, "and the 2020 targets are thereby likely to be met." In particular, it noted that installations covered by the emissions trading scheme covered around 99% of their emissions with the required number of allowances.

16. German Transport Ministry Calls For Billion-Euro EV Fund

German transport minister Andreas Scheuer has said he will push for a billion euros in new funding to develop electric charging infrastructure as part of his bid to encourage electric vehicle uptake. Speaking to Bild am Sonntag, Scheuer said the fund would be focused on installing charging points in private garages. "To do that we immediately need a billion euros," he said. "That must be reflected in the 2020 budget."

Data from Germany's transport ministry indicates that between 75-85% of drivers charge their electric vehicle either at home or at their place of work, with the ministry hoping to subsidize the installation of new private charging points by up to 50%.

Industry groups broadly welcomed Scheuer's pledge. Stefan Kapferer, head of the utilities association BDEW, said that it would send "exactly the right signal". He added: "Particularly when it comes to charging infrastructure in apartment blocks, at the workplace or in industrial estates, there are still many hurdles to surmount."

However, senior Green party MP Oliver Krischer questioned whether financial support was the best tool to build more charging points. "More important than an incentive would be if the government finally removed bureaucratic restrictions for charging points in underground garages and parking places," he said. Rather than requesting additional funding, Krischer added, the transport ministry could simply divert existing resources away from "pointless new motorways or expensive public-private partnerships".

Scheuer's announcement came as an expert group from the National Platform on the Future of Mobility (NPM) published its preliminary recommendations on encouraging charging

infrastructure. In the report, the group had called for “public support” for private charging stations in blocks of flats and workplaces. Scheuer said in a statement that the group’s recommendations would be “a big challenge for the whole government”, and that he would be presenting a package of measures to tackle the issue. “The aim is to address the challenges and obstacles in areas such as private charging infrastructure in underground garages or accelerating the deployment of additional charging points,” he said.

NORTH AMERICA

17. EPA Transportation Chief Promises ‘In-Use’ Focus For Truck NOx Standard

The head of EPA’s transportation office is promising a “laser” focus on “in-use” reductions in nitrogen oxides (NOx) from heavy-duty trucks when the agency develops new standards for the sector next year, suggesting the rule will focus less on new vehicle design standards and more on how vehicles actually perform in practice.

Speaking April 2 at a meeting of EPA policy advisers in Arlington, VA, Office of Transportation and Air Quality chief Chris Grundler said “we are focusing like a laser on in-use performance” as the agency develops the first update to its heavy-duty NOx standards in 18 years. He said EPA intends to propose a new rule in 2020. It is unclear, however, how long it might take to finalize the measure.

Without speaking to the stringency of a new emissions standard, Grundler said “we are off and running,” after a hiatus during the early phase of the Trump administration while the political leadership decided what to do. Grundler noted that California and 19 other states and other entities have petitioned EPA to tighten the standards.

California is now fairly advanced with its planning for a new truck NOx proposal, based on new research and collaboration with industry in the state. California has unique Clean Air Act authority to enforce its own emissions standards tougher than federal limits, though the Trump administration has fought this, particularly regarding vehicle greenhouse gas standards.

Grundler, however, avoided comment on the GHG dispute, and instead said “we are working very closely” with California on NOx. “We have a lot of catching up to do” with the state’s pioneering work on NOx, Grundler said.

The agency in the fall announced its Cleaner Trucks Initiative, a plan to update outmoded emissions standards, as the share of NOx emitted by heavy trucks continues to grow relative to other sectors. Trucking continues to grow as freight volumes increase, even as other major sources of NOx such as power plants are seeing dramatic reductions in emissions.

EPA has so far revealed few specifics about the initiative. Matthew Leopold, EPA’s general counsel, told a Feb. 7 conference organized by the American Law Institute-Continuing Legal Education that the agency is looking to draft a rule “locking in” advances in vehicle technology that have slashed NOx emissions in recent years. Leopold gave no indication of what level of performance EPA might “lock in,” however.

This lack of detail has led to accusations from some environmentalists that the initiative is an empty gesture, and not a serious effort to tighten NOx standards. “So far, it’s just a phantom, lacking details or pollution reduction targets, far from being even a proposed rulemaking,” said

John Walke, an attorney with the Natural Resources Defense Council and a former EPA air official, in an April 2 tweet.

“It’s a talking point” for EPA Administrator Andrew Wheeler “because he lacks anything positive in their current air pollution agenda,” Walke added, after Wheeler raised the initiative in testimony to a House Appropriations Committee panel the same day.

Meanwhile, at a meeting of the Clean Air Act Advisory Committee’s Mobile Sources Technical Review Subcommittee, Grundler said EPA would take a “comprehensive approach” to a new NOx regulation. This would include updated emissions testing requirements, an examination of whether vehicle emissions control warranties need extending, consideration of expanding the “useful life” of vehicles, and advances in technology such as vehicle sensors, Grundler said.

These are all areas California has already been exploring. The California Air Resources Board, the state’s air regulator, says it is likely to propose that manufacturers meet a standard of between 0.01 and 0.035 grams per brake horsepower-hour (g/bhp-hr), with a potential phase-in beginning in 2024 and the full standard possibly taking effect for all engines in 2027. The state coalition petitioning EPA for tougher NOx standards has asked for a standard of 0.02 g/bhp-hr, roughly equivalent to a 90 percent reduction in NOx from current requirements.

In-use controls are restrictions on vehicle use that serve to reduce emissions. Examples could include tougher vehicle maintenance and inspection requirements, on-board diagnostic systems to track performance, telematics to track emissions in real time, or other measures such as speed restrictions, best practices to minimize emissions or idling bans.

Grundler told the mobile source committee that EPA remains very committed to an active enforcement agenda, despite reduced agency resources. This will mean a continued focus on eliminating illegal “defeat devices” that nullify pollution controls.

18. EPA Attempts to Speed Up Science Reviews in Chaos

The Environmental Protection Agency's decision last year to disband an air pollution science panel may be coming back to bite the administration. Last October, the Trump administration dissolved the panel of outside experts advising the agency on the environmental and health impacts of harmful soot pumped into the air, arguing that it would speed up the often-sluggish pace of air quality standards review.

As Administrator Wheeler said in response to questions from Sen. Chris Van Hollen (D-Md.) during an April 3 budget hearing, “Part of the problem was having subcommittees, which are not required under the statute, took a lot of time to go back-and-forth between the subcommittee and the full CASAC committee.

Van Hollen pushed back, asking Wheeler why the EPA couldn’t give the subcommittees a deadline by which to submit their information. Wheeler said prior administrations have taken that step but have still been unable to meet the five-year review timeline.

“It is that formal subcommittee review process that took literally months and years,” Wheeler said. He added that he assured the head of the CASAC that the members could seek outside technical assistance and scientific review as needed. “The agency has never met the five year-deadline that is required under the Clean Air Act, so we reformed the process in order to meet the deadline given to us by Congress,” Wheeler added.

The defense from Wheeler is a step beyond what he's been willing to say previously. Up until this point, Wheeler has maintained that the full committee, which has seven members, has enough expertise to complete the reviews and the subcommittees weren't needed.

Scientists and former CASAC members, however, are pushing back on Wheeler's claims.

The committee's process isn't the reason the EPA has had trouble meeting the five-year timeline, Christopher Frey, a former chairman of the committee and an environmental engineering professor at North Carolina State University, told reporters in a statement. Instead, the EPA has been slow to initiate reviews and to work on rules after receiving the committee's advice, he said.

"Taking experts away from CASAC does not 'streamline' the review process—it hamstring the review process," Frey added.

And Wheeler's critics say eliminating the subcommittees takes away another avenue for the EPA to receive independent scientific advice on its regulations.

In an April 11 letter to Wheeler, CASAC acknowledged it does not have sufficient expertise to do the work once done by a 20-member panel. The EPA should "reappoint" the disbanded Particulate Matter Review Panel or "appoint a panel with similar expertise" on particulate pollution that comes from cars, coal-fired power plants and other sources, CASAC wrote to Wheeler. "The breadth and diversity of evidence to be considered exceeds the expertise of the statutory CASAC members, or indeed of any seven individuals," the seven panelists concluded.

The EPA is reportedly weighing whether it should reverse its decision. "The agency thanks the CASAC for their review and advice and will carefully consider the comments and recommendations in the CASAC report," the EPA said in a statement.

EPA was hoping to get both quality and speed by reassigning the review of soot pollution to the smaller panel. Now it appears they're getting neither.

Chris Frey said the letter amounted to "a stunning slap in the face" to EPA's leadership. He suggested Wheeler simply reinstate the panel with the members who had served on it last year, since the EPA wants the work done quickly and he and the others have already been vetted.

The disbanding in October of two specialized pollution panels — one on particulate matter and another on ozone — was viewed by many as an effort to sideline science that stands in the way of President Trump's pro-industry agenda.

Despite concluding it lacked the expertise to fully review the draft, the committee — made up of Wheeler appointees that included environmental officials from Alabama, Georgia, Texas and Utah — still found the career staff did not "provide a sufficiently comprehensive, systematic assessment" of potential links between breathing particulate matter and the risk of certain health problems, such as pulmonary inflammation and cancer.

But it does not appear that there is a consensus on this conclusion in the committee.

For example, Mark Frampton, the sole research scientist on CASAC lambasted panel Chairman Tony Cox's controversial new approach to assessing air pollution science for reviewing the

agency's particulate matter (PM) air standards, saying it undermines and misstates the latest data on PM.

Conclusions about the uncertainty on PM and its adverse health effects that Cox outlined in a March 7 draft letter to EPA “does not accurately reflect the results of that discussion or represent a consensus among CASAC members,” Frampton warned in comments on the letter.

The comments show the high-profile split within the independent CASAC over Cox's new approach to reviewing science underpinning EPA's national ambient air quality standards (NAAQS). Cox is proposing that the panel use the new approach for its ongoing review of the agency's PM NAAQS. Cox is an industry consultant and longstanding skeptic of the agency's conclusions on health effects and considered something of a fringe voice by some scientists.

The agency's integrated science assessment (ISA) for the PM NAAQS is a key step in the Clean Air Act-mandated five-year NAAQS review process, summarizing the most policy-relevant science on the health and environmental impacts of PM air pollution. The ISA will inform the agency's ultimate decision on whether to tighten its fine PM (PM_{2.5}) and large “coarse” PM standards. The ISA under review by CASAC supports findings from prior reviews about the harmful effects of the pollutant, but also adds some new conclusions about the likely causal relationship between various forms of PM and neurological effects.

Cox's draft letter broadly condemns the method used by agency staff to determine whether air pollutants cause specific adverse health effects. His attacks go well beyond questions specific to PM, calling for a wholesale change in EPA's approach to NAAQS reviews.

Perhaps most provocatively, Cox in his draft letter to the agency accuses EPA of ignoring evidence that PM_{2.5} air pollution does not, in fact, cause death as many scientists believe it does.

Cox also says the ISA “does not provide a comprehensive or systematic assessment of the available science relevant to understanding the health impacts of exposure to fine particulate matter, nor does it follow widely accepted scientific methods for deriving sound, independently verifiable, scientific conclusions from available data.”

Cox offers a scathing critique of EPA's “causality framework,” and advocates for a new, narrower approach to determining causation of health effects than the weight-of-evidence approach used so far. But Frampton says the “framework used by the EPA for determining causality was extensively discussed in the comments of individual CASAC members” in a public meeting in December. Yet Cox's conclusion “does not accurately reflect the results of that discussion or represent a consensus among CASAC members.”

Frampton writes, “The causal determination categories as used in this as well as previous ISAs, provide clear and workable descriptions of the level of certainty for potentially causal relationships.”

Cox's criteria “essentially eliminate determination that a PM effect is causal because such a requirement is unachievable in accountability studies,” he writes. Accountability study is a nascent field that seeks to verify whether air rules produced not only cuts in pollution but also the projected improvements in public health.

Cox doubts EPA's conclusion, accepted by many in the scientific community, that PM_{2.5} exposure can cause death, saying EPA ignores some scientific studies that do not find increased

mortality rates from exposure to elevated PM2.5. But Frampton in his written comments counters that, "Overall the ISA presents a reasonably balanced view of the convincing evidence linking long-term PM2.5 exposure and mortality."

Cox in the draft letter says, "the Draft ISA does not clearly communicate what science has revealed about the real-world effects of changing PM exposures on human health and welfare -- and hence about whether or under what conditions changes in PM are needed to protect human health. Substantial discordant and conflicting evidence remains ignored or unresolved." But Frampton says this criticism is too broad. "This is not an accurate assessment of most of the draft ISA, and such sweeping statements are inappropriate," arguing the draft letter departs from CASAC's task of reviewing the assessment.

Janes Boylan, a Georgia air regulator, says in his comments that, "There is substantial controversy over CASAC's recommendations with regards to the causal framework approach used by EPA. Since this subject is outside my area of expertise, I do not feel comfortable providing consensus on a controversial subject that I am not intimately familiar with."

On a March 28 teleconference, CASAC agreed to ask EPA to either reconstitute the dismissed panel, or to form a similar panel of experts in diverse scientific fields. The advisers argued that they need additional expertise to complete their already-overdue review, hence the April 11 letter.

Much of Cox's preferred approach depends on the emerging field of accountability studies, which are designed to determine whether air pollution controls produced not just their expected emissions reductions, but also the projected health improvements. The Health Effects Institute (HEI), a joint EPA-industry funded body, is pioneering such studies at EPA's own request, noted HEI President Dan Greenbaum. But Greenbaum on the call warned that while accountability research is helpful, it cannot substitute for EPA looking at the "broadest set of evidence." John Bachmann, a former long-serving EPA air official, said that Cox's demand for tougher causality analysis "blindsided EPA staff," and is unreasonable "at this point in the process." Several public commenters remarked that Cox's draft letter pressed for an inappropriate mandate.

The EPA currently bases its air pollution regulations on a wide range of scientific studies about the relationship between health outcomes, such as asthma or premature death, and different types of air pollution, such as soot of different microscopic sizes.

"The EPA has a very well-vetted process that has been going on over the years called the weight of the evidence," says Francesca Dominici, a biostatistician at the Harvard T.H. Chan School of Public Health who recently wrote about the draft recommendations in the journal *Science*. "This is a process that has been endorsed not only by the EPA, but by the National Academy of Sciences, [and] is pretty well accepted by the scientific community."

"Every time you try to assess the link between exposure to a contaminant and health," Dominici says, "you have to make sure there is consistency in the evidence across many, many studies, across many disciplines," including atmospheric chemistry, toxicology, epidemiology and exposure, and data science. That's important, she explains, because no one study captures everything about a given pollutant.

"You can't randomize millions of [people] around the world to breathe higher pollution or lower pollution, so we have to rely on observational data," Dominici says.

Decades of broad analysis have enabled scientists to make clear recommendations to the EPA about how to protect Americans from air pollution. "They're providing a very robust message that air pollution is harmful to human health," Dominici says.

The new specialized panel, if agreed to by EPA, would participate in a public meeting to review CASAC's requested second draft of EPA's integrated science assessment (ISA) that will inform the agency's review of its national ambient air quality standards (NAAQS) for PM.

19. Agencies Set to Ease Auto Standards Soon, EPA's Wheeler Says

The head of the EPA is defending Trump administration plans to weaken federal fuel economy standards that he said automakers can't meet without relying on compliance credits. "There is growing evidence that automakers cannot comply with the trajectory of the current standards," Environmental Protection Agency Administrator Andrew Wheeler said April 4 at the Washington Auto Show.

Recent Transportation Department data suggests a looming shortfall of compliance credits, he said. "This data begs the question: Why not revise standards that most automakers can only comply with through fees?" Wheeler added. "The truth is the changes are needed."

Under the fuel economy program, the EPA regulates greenhouse gas emissions through tailpipe standards, and the National Highway Traffic Safety Administration governs cars' fuel efficiency. Automakers can earn credits—by applying technologies not included in the standards—to use to help meet the limits.

The Trump administration, however, would eliminate or sharply reduce many of those credit opportunities in its August 2018 proposal to freeze fuel economy standards at 2020 levels. Trump officials, including Wheeler, have justified the move in large part by claiming the proposal would save lives by making new cars more affordable and taking older cars off the roads.

But Wheeler's remarks at the auto show suggest the Trump administration is also wary of a program in which companies comply using credits.

Automakers and auto part manufacturers have historically supported the EPA and NHTSA's credit programs and have asked the agencies to expand those programs in the revised fuel economy standards. Expanding the credit programs could also have offered a path toward compromise with California regulators.

The Trump administration has proposed to revoke California's authority, and California officials have threatened to sue if the agencies finalize that approach. Wheeler said at the auto show he hopes court fight is "not inevitable," but if California is going to sue, "we want to get this into the courts as quickly as possible" to provide certainty for automakers "as quickly as we can."

The administration expects to finalize its proposal in the spring or early summer, Wheeler said.

20. EPA Backs States' Use Of Auto GHG Limits In SIPs, Undercutting Rollback

EPA is approving state implementation plans (SIPs) to meet federal ozone standards that rely on Obama-era vehicle greenhouse gas limits for reducing emissions even as the agency prepares to scrap such measures after finishing its controversial rule preempting states from enforcing their own vehicle GHG rules.

In the most recent action, EPA in an April 2 Federal Register notice formally approved New York's request to include ozone reductions stemming from its GHG vehicle program, also known as a low-emissions vehicle (LEV) program, in its ozone SIP.

The approval adds further complexity to EPA's broader proposed rollback of federal vehicle GHG requirements, which is coupled with the preemption revocation provisions, and it could further undermine automakers' desire for a single GHG and fuel economy program across the country.

New York and other states that adopt the California GHG standards as a low-emission vehicle (LEV) rule have copied them as allowed under section 177 of the Clean Air Act after California received a waiver of federal preemption from the Obama administration as part of a broader deal to align the national and California programs.

The states do not need permission to adopt vehicle rules identical to California's, but they do need EPA's approval if they want to include emission cuts achieved by those rules in their SIPs to comply with federal air quality limits for criteria pollutants.

The SIP issue rises in importance because the Trump EPA in the coming months plans to finalize a joint rulemaking with the Transportation Department (DOT) to rescind the waiver for the LEV rules, as well as California and other states' zero-emission vehicle (ZEV) sales mandates.

EPA in the proposal notes that states that have the programs in their SIPs will still be able to implement the programs, while those that do not will no longer be able to once the rule is final.

Also, while EPA April 2 approved New York's request to add the LEV rule to its ozone SIP, the agency appears likely to try to force that state and others to remove LEV measures from their SIPs after it finishes its preemption rule.

In the vehicle proposal, EPA suggests it will use a so-called "SIP call" to force states to scrap LEV programs from their SIPs, even though the agency -- including under the Trump administration -- approved the programs for their ozone emission cuts as well.

Currently, 13 states and California have adopted the LEV limits identical to the Obama-era GHG rules through MY25. New York, New Jersey and California all include the program in their SIPs. Colorado, which most recently adopted the LEV program and is moving to adopt ZEV this year, will not include them in its SIP.

Nine states have adopted California's ZEV rule. California has included that measure in its ozone SIP, though New York and New Jersey have not.

An EPA Region 2 spokesman says neither New York nor New Jersey has SIP-approved ZEV rules, though EPA did approve New Jersey ZEV regulations between 2008 and 2011, "because at the time that was the extent of the waiver that EPA had given to California. New Jersey hasn't submitted anything since."

States may opt not to include the program in their SIPs because they do not need those reductions to meet the current national ambient air quality standard (NAAQS) and want to "save" them if they need the credit to meet a tighter future NAAQS, one environmentalist explains.

However, those programs face immediate jeopardy from a final EPA rule, though the Register notice does not mention the agency's pending vehicle standards rollback and preemption proposal, though that could be because it remains in the proposal stage.

The notice says the action is an alternative to a Clean Air Act section 185 requirement that major emissions sources pay fees in areas classified as in severe or extreme nonattainment with EPA's air quality standards. The LEV program's ozone emissions reductions "are at least equivalent to the reductions associated with" the fee program, the notice says.

"Under the Clean Air Act, the Administrator is required to approve a SIP submission that complies with the provisions of the Act and applicable Federal regulations. Thus, in reviewing SIP submissions, EPA's role is to approve state choices, provided that they meet the criteria of the Clean Air Act."

If the final Safer Affordable Fuel Efficient (SAFE) Vehicles rule revokes California's waiver, as expected, that would mean a LEV or ZEV rule no longer meets the criteria of the air law, unless the preemption portions of SAFE are overturned in court.

It is unclear what would happen if a state were to submit a LEV or ZEV measure as a SIP control after the SAFE rule is final. Sources say EPA does not appear to have disapproved a SIP in the past because it disagreed with a control measure, though one source notes that the agency has rejected SIPs that try to win credit for voluntary -- rather than regulatory -- programs.

EPA's SAFE proposal, issued in August in conjunction with DOT, acknowledges that SIP requirements remain federally enforceable even if the agency's regulations change, and it confirms that those programs would remain in effect even if the agency finalizes the California preemption provisions.

That is a nod to a 1990 Supreme Court holding in *General Motors Corp. v. United States* that, "The language of the Clean Air Act plainly states that EPA may bring an action for penalties or injunctive relief whenever a person is in violation of any requirement of an 'applicable implementation plan.' There can be little or no doubt that the existing SIP remains the 'applicable implementation plan' even after the State has submitted a proposed revision."

The SAFE proposal says, "Where states have adopted [California's] ZEV and GHG standards into their SIPs, under section 177, the provisions of the SIP would continue to be enforceable until revised. If this proposal is finalized, EPA may subsequently consider whether to employ the appropriate provisions of the [Clean Air Act] to identify provisions in section 177 states' SIPs that may require amendment and to require submission of such amendments."

The proposal adds that states that have adopted LEV or ZEV standards, but not included them in SIPs, "cannot implement these standards" if the waiver revocation becomes final.

21. EPA Staff Crafts New Analysis Of Flaws, Possible Fixes For Vehicle GHG Plan

EPA staff has prepared a new draft review that includes possible remedies for widely criticized assumptions in the Trump administration's proposed freeze of vehicle greenhouse gas and fuel economy standards, assumptions that critics say artificially boost the safety, cost and other benefits of the proposal while understating its environmental impacts.

It is not clear whether the analysis will significantly alter the pending joint rulemaking with the Transportation Department (DOT), amid numerous signs that the administration is poised to finalize a near-freeze of the Obama-era standards and that protracted litigation with states and environmentalists appears inevitable.

But it also could ultimately provide fresh fodder for future legal challenges of the rulemaking, with critics already arguing the plan faces significant legal risk. Even automakers are expressing unease and are largely avoiding public support for the rollback.

Sources familiar with the EPA staff work say it builds upon already public analyses -- from agency staff and many outside groups -- identifying shortcomings in the proposal, including claimed safety benefits that disappear after addressing modeling anomalies related to driving habits, "vehicle miles traveled," and other controversial assumptions from the proposal.

"There is a new paper," says one source, referencing the draft staff analysis that outlines alleged modeling weaknesses in the proposal on safety and the cost of the current standards. This source says the analysis has gone to the Office of Management & Budget (OMB) as well as DOT, but there are no indications that it is prompting a major change in the plan.

A second source following the issue reportedly describes the analysis as a technical tear down of the DOT-spearheaded proposal, as well as ways to "improve and fix" the rule.

Another knowledgeable source refers to the analysis as a "draft technical report" that represents a more in-depth and comprehensive critique of the assumptions behind the proposal, and potential fixes, than what is already public.

Whether and how the analysis might alter -- or merely tweak -- the final vehicle GHG rule rollback is not clear, but the third source reportedly suggests it is more likely to create an "honest accounting" of the issues that could factor into likely court fights on the regulation.

EPA Administrator Andrew Wheeler in an April 11 Reuters interview suggested the administration is unlikely to moderate its rollback enough to avert a massive legal battle with California and its allies, though Wheeler said the final rule would not freeze the GHG rules at model year 2020 levels through MY26 as the proposal did. "Our final regulation is not going to be the same as the proposal," he said, expressing hope that the final rule will be something everybody can "get behind and support."

The expected small increase in the required vehicle fuel economy improvements appears unlikely to avert a major legal battle, as EPA is also continuing to say it will rescind California's waiver of federal preemption to implement tougher GHG rules than the federal limits.

The administration's proposal, dubbed the Safer Affordable Fuel Efficient (SAFE) Vehicles rule, has already been the subject of withering criticism by EPA staff and others of the plan's underlying analysis, including its claims of thousands of lives saved and assertions that the current rules are too costly.

Such critiques include prior EPA staff briefing materials drafted for April and June 2018 pre-proposal meetings at OMB. Among other conclusions, these briefings state the proposal would be "detrimental to safety rather than beneficial," assuming that apparent flaws in DOT's modeling are not corrected. Those flaws include improperly assuming reduced driving will occur under the proposal compared to the current program.

Since then, an array of groups -- and even the industry itself -- have offered similar critiques of the safety, cost, and other assumptions in the proposal. Such critiques include the Association of Global Automakers' formal October comments citing "anomalies" in DOT's assumptions of old vehicle scrappage. When removed, these assumptions result in the plan's safety benefits becoming "negligible."

Other comments from the Environmental Defense Fund (EDF) claim that the proposal understates its environmental effects in terms of both GHGs and criteria pollutants. EDF says the proposal would result in cumulative premature deaths from fine particle pollution of between 14,500 and 32,000 through 2050, which translates to between \$89 billion and \$197 billion in damages that the group claims were "totally ignored" in the proposal.

Capitol Hill Democrats, meanwhile, have been ramping up questioning of Wheeler's recent public statements that the rule will result in GHG emissions comparable to those under the Obama-era rules. Rep. Doris Matsui (D-CA) at an April 9 House hearing noted that such claims appear wholly inconsistent with a September EPA presentation to the Clean Air Act Advisory Committee stating that the proposed freeze would result in 3.8 billion tons of cumulative additional carbon emissions through 2050.

And House Energy & Commerce environment panel Chairman Paul Tonko (D-NY) pressed Wheeler on "internal" EPA analysis that would undercut the rule's safety claims. A Hill source says Tonko was referring to the 2018 pre-proposal briefing materials for OMB.

Sources indicate that the more recent EPA analysis updates and expands upon the agency's prior analysis. Such analyses are typically made public after the conclusion of the rulemaking process, but there is some doubt on when and whether EPA political staff will let it see the light of day.

An April 11 New York Times report suggests the rule will require "about" a 1 percent improvement while also allowing credits for advanced refrigerant use in air conditioning, which would cut releases of high global warming potential chemicals. The latter issue suggests a possible change from the proposal that did not count air conditioning leakage toward tailpipe emissions compliance, though one observer says it is not clear precisely how that might work given that DOT is limited in factoring such GHG credits into its fuel economy program.

Also unclear is the extent to which the final rule will include additional flexible credit provisions -- or allow more benefits -- from air conditioning or other "off-cycle" technologies than the plan envisioned. These details could affect the claimed benefits or real-world stringency of the program based on factors including whether the credits spur vehicle improvement or merely ratify technologies the industry is already adopting.

In addition, regulators have already projected some continued improvement in the vehicle fleet over time as the industry moves to compete in global markets with increasingly tough fuel economy and electric vehicle requirements.

One industry source also cites some indication that the final rule will rein in fees for noncompliance with the fuel economy program, after prior DOT attempts to delay an Obama-era fee increase were blocked by an appellate court.

The Times report also says automakers are bracing for the disruption of potentially having to meet the requirements of two different emissions standards -- one for California and the states that

follow its rules, and another for the remainder of the country subject to EPA rules. Such an outcome would be theoretically blocked by EPA's preemption provisions, though there are major questions about whether the agency successfully defend those in court.

Given no real sign of any deal that could avert a court battle, industry is increasingly raising this issue of bifurcated markets as part of ongoing meetings with the White House, according to the Times. Trump officials during these meetings with individual auto companies have been pressing the industry to support its rollback.

The Times article also quotes Alliance of Automobile Manufacturers' Gloria Bergquist raising the prospect that states with stricter standards might have to create new rules against buying cars from other states. "Because this is all such new territory, no one's quite sure how this is going to work," she said. "We're trying to figure it out. But it's going to be a headache."

It also cites former EPA transportation air quality chief Margo Oge as saying automakers "will have to choose between Trump and California."

22. California Sues U.S. Agencies Over Data On Vehicle Emissions Freeze

The state of California filed a lawsuit recently seeking to force two federal agencies to provide data they used to justify rolling back landmark Obama-era vehicle emission standards, accusing the Trump administration of "willfully withholding" information.

In a lawsuit filed in U.S. District Court in Washington, D.C., California Attorney General Xavier Becerra said the National Highway Traffic Safety Administration and Environmental Protection Agency failed to respond to a Freedom of Information Act request seeking data and analysis backing their proposal to freeze federal vehicle emission standards at 2020 levels through 2026.

In addition to weaker fuel efficiency standards, the Trump administration proposal would strip California of the ability to impose stricter rules, which a dozen other states have adopted.

In 2011, California had agreed to harmonize its emissions with the Obama administration's vehicle emissions requirements through 2025.

"This lawsuit will break down their silence and secrecy," said Mary Nichols, chair of the California Air Resources Board. "The public has a right to see all the facts and analysis used to support a rollback that increases oil consumption, hurts consumers, and pumps more air pollution and hundreds of million tons of climate-changing gases into the atmosphere."

The Obama-era rules called for a fleetwide fuel efficiency average of 46.7 miles per gallon by 2026, compared with 37 mpg under the Trump administration's preferred option.

The lawsuit is the latest escalation in the feud between California and the Trump administration over vehicle emission standards.

Deputy NHTSA Administrator Heidi King said recently that dramatically higher fuel efficiency rules can "hinder safety" by raising the price of new, safer vehicles.

23. CARB Chief Looks Beyond Fight Over Vehicle Rules To Push EV, GHG Agenda

California's top air regulator is looking beyond the state's current fight with the Trump administration over vehicle greenhouse gas and fuel economy standards to advance the state's ambitious climate change agenda, primarily the acceleration of multiple programs to transition the transportation sector to all-electric vehicles (EVs).

"In order to make this transition happen, we just have to get over the interval of the next few years, and keep our eyes fixed on the horizon of where it is that we're trying to drive to," said California Air Resources Board (CARB) Chairwoman Mary Nichols, during a March 14 EV forum hosted by Veloz, a non-profit group of utilities, auto companies, charging firms and other entities that support transportation electrification.

"If we do that, I think we have a very good chance of beating the odds. We may still see some rising seas, but we will also at the same time be enabling our country to actually be what it can be in terms of the model that we can provide for the rest of the world," she said during a keynote speech at the event.

Even though the Trump administration is proposing to roll back Obama-era vehicle GHG and fuel economy standards and revoke CARB's Clean Air Act authority to continue enforcing its own more stringent regulations, Nichols and other California officials appear confident that whenever Trump leaves office, they will have their powers reinstated and programs supported at the federal level.

"While we are getting some blowback at the national level from the head of EPA and even from the president about whether we should be concerned about things like rising sea levels, we think that this is a fundamentally unstoppable revolution," Nichols said, referring to the decarbonization of the transportation sector.

To help propel the transition, CARB is planning to strengthen its zero-emission vehicle (ZEV) sales mandate rule. The changes would take effect starting in model year 2026, requiring a significant ramp up in sales of EVs, plug-in hybrids and hydrogen-fueled cars.

Currently, nine other states have adopted CARB's ZEV sales mandate rules, covering about a third of the national vehicle sales market.

The stricter MY26 ZEV rules would be predicated on California retaining its air act authority to enforce such rules, potentially through a successful court challenge of EPA's looming final rule to preempt the state's rules. In addition, the state likely would require EPA to issue a new waiver covering the rules, or a formal finding that the rules are covered by the state's current waiver -- decisions that California is unlikely to receive from the Trump EPA.

As such, the air board's planning for the MY26 ZEV rule represents another instance in which California is starting to look beyond the Trump White House when developing its climate strategy.

CARB's current ZEV regulation requires 1.4 million ZEVs to be on California roads by 2025 and 15.4 percent of new car sales to be ZEVs in 2025. While state officials expect to hit the total ZEV goal, they have admitted that compliance with the rule might only require as few as 8 percent of new car sales being ZEVs in 2025. Former California Gov. Jerry Brown (D) also established through an executive order a target of 5 million ZEVs on California roads by 2030.

As she looked ahead, Nichols also appeared eager to end debate about the potential for low-carbon fuels such as renewable natural gas to play a long-term role in transportation energy.

"I believe that it is now clear to most people, including all the major auto manufacturers . . . that the future of transportation -- both personal transportation and commercial heavy-duty transportation -- is zero emissions. And it is electric. And it could be battery or could possibly be fuel cells in some of those applications. But most likely it's going to be battery . . . either directly or indirectly through increasingly advanced kinds of hybrid technologies," she said.

Further, policymakers need to "get over whether we're tipping the scales in favor of one technology and recognize the need to provide long-term certainty about the willingness to invest in the infrastructure of EVs. This is not a niche experiment. It is now the reality and just has to affect the way we do business."

In terms of national policy, Nichols said it is "somewhat reassuring" that there are "stirrings of some action" in Congress by members of both parties, "who are trying to come together and search for solutions" to climate change problems.

"But we're going to have to continue to fight to get to where we need to go, because . . . the grip of the fossil fuel industry on our national policy -- and the ways in which incumbent technologies are imbedded in so many parts of our civilization -- have to be addressed," she added.

24. White House Continues Pressure On Industry To Back Vehicle GHG Plan

The White House has been hosting a series of meetings with individual auto manufacturing companies, prodding them to publicly back the administration's planned rollback of vehicle greenhouse gas and fuel economy standards and preemption of state rules, according to several sources familiar with the issue.

The meetings come amid continuing questions about whether EPA and the Transportation Department (DOT) will finalize the rule as proposed -- freezing standards at model year 2020 levels -- or issue a marginally stronger measure that still represents a significant rollback.

Aside from the stringency of the standards, a key issue is widespread expectations that the agencies will finalize their plan to preempt California and other states from enforcing their own, stronger, vehicle GHG rules. A key focus of the White House meetings is urging automakers to support this aspect of the rule in near-certain litigation, according to one source. "The real issue is the litigation," the source says, adding the White House is "calling in the companies to see how they align," on both the rules and legal battle with California.

The White House has been meeting with companies this month to try to get the auto companies "in line," says a second knowledgeable source. "Some are more in line than others." At least some companies are telling the administration that a full-scale rollback and preemption of California's rules "is not what they want," the source adds, though the source sees little sign that the Trump administration will back away from its plan to essentially gut the program.

Reuters reported on one such meeting held in early March, and sources tell Inside EPA that additional meetings have happened since then.

These efforts also follow a February call with industry officials to "urge them to publicly support the rollback," as reported by E&E News.

In formal comments on the proposal and in subsequent public statements, no auto company has wholeheartedly embraced either the proposed regulatory freeze or the California preemption plan. Instead, they have continued to urge the two sides to reach a deal -- a possibility seen as increasingly remote.

EPA Administrator Andrew Wheeler recently said it may take until late June for the agencies to issue a final rule, after he and others had hoped to issue the measure by the end of March.

But whenever the regulation comes out, automakers face a decision about the extent to which they would back the effort, both in public statements as well as litigation that is likely to drag on for years over the final standards and the preemption provisions.

Automakers and their trade associations have been engaged for much of the past year in a public balancing act, having urged the agencies to reopen the Obama administration's mid-term review of the MY22-25 regulations while rejecting the notion of a rule freeze in both public statements and formal comments on the proposal.

The Alliance of Automobile Manufacturers, for example, stated in its October comments that a "workable set of standards could incorporate continued increases in stringency," along with "appropriate flexibilities." The group further suggested that the program's stringency should fall "somewhere between" a freeze and alternative 8 -- the most aggressive alternative scenario the Trump officials proposed, which would nonetheless ease the program.

The Association of Global Automakers in its comments pushed back a bit harder against the freeze, stating that "none of the proposed options would yield the most optimal policy outcome" - - including meaningful increases in fuel economy, feasible standards that encourage ongoing innovation and investment, and environmental benefits that would keep California on board.

Meanwhile, EPA staff were told last month that the rulemaking -- with DOT in the driver's seat -- remained focused on a freeze, but some reports indicate that the rule could wind up at least nominally more stringent. Factors affecting this decision include the possibility that the final regulation could retain or include credits for certain technologies, even if the regulations ultimately require almost no new real-world improvements from vehicles.

25. Electric Vehicle Adoption Improves Air Quality And Climate Outlook in the US

If you have ever wondered how much electric vehicle (EV) adoption actually matters for the environment, a new study provides evidence that making this switch would improve overall air quality and lower carbon emissions.

The Northwestern University study¹ quantified the differences in air pollution generated from battery-powered electric vehicles versus internal combustion engines. The researchers found that even when their electricity is generated from combustion sources, electric vehicles have a net positive impact on air quality and climate change.

¹ Jordan L. Schnell, Vaishali Naik, Larry W. Horowitz, Fabien Paulot, Paul Ginoux, Ming Zhao, Daniel E. Horton. Air quality impacts from the electrification of light-duty passenger vehicles in the United States. *Atmospheric Environment*, 2019; 208: 95 DOI: 10.1016/j.atmosenv.2019.04.003, Northwestern University. "Electric vehicle adoption improves air quality and climate outlook: Ozone pollution reduced even when electricity is produced by combustion sources." *ScienceDaily*. *ScienceDaily*, 12 April 2019.

"In contrast to many of the scary climate change impact stories we read in the news, this work is about solutions," said Northwestern's Daniel Horton, senior author of the study. "We know that climate change is happening, so what can we do about it? One technologically available solution is to electrify our transportation system. We find that EV adoptions reduces net carbon emissions and has the added benefit of reducing air pollutants, thereby improving public health."

To quantify the differences between the two types of vehicles, the researchers used an emissions remapping algorithm and air quality model simulations. They used these methods to closely examine two pollutants related to automobiles and power emissions: ozone and particulate matter. Both are main components of smog and can trigger a variety of health problems, such as asthma, emphysema and chronic bronchitis.

To fully account for the complexity of changes to air pollution chemistry, the researchers took multiple variables into consideration:

- Generation of electric vehicle power supply, including our current combustion-dominant mix, combustion-only sources and enhanced emission-free renewables
- Geographical locations
- Seasons and times of day

Ozone levels decreased across the board in simulations of warmer weather months. In the wintertime, however, ozone levels increase slightly but are already much lower compared to summer due to a chemical reaction that occurs differently during times of lesser winter sunlight.

"Across scenarios, we found the more cars that transitioned to electric power, the better for summertime ozone levels," Schnell said. "No matter how the power is generated, the more combustion cars you take off the road, the better the ozone quality."

Particulate matter, which is also called "haze," decreased in the wintertime but showed greater variation based on location and how the power was generated. Locations with more coal-fired power in their energy mix, for example, experienced an increase in haze during the summer. Locations with clean energy sources, however, saw drastic reductions in human-caused haze.

"We found that in the Midwest, the increased power demands of EV charging in our current energy mix could cause slight increases in summer particulate matter due to the reliance on coal-fired power generation," Schnell said. "However, if we transition more of the Midwest's power generation to renewables, particulate matter pollution is substantially reduced. In the Pacific Northwest or Northeast, where there is already more clean power available, EV adoption -- even with the current energy mix -- will decrease particulate matter pollution."

26. Toyota Down Plays Electric Cars as Volkswagen Vows an Embrace

A \$255 billion debate is raging among the world's biggest automakers. Some think electric cars made by companies besides Tesla Inc. stand the chance to be hits, while others think they'll fail to really sell.

Toyota Motor Corp. may have kicked off the green-car movement with its Prius hybrid more than 20 years ago, but the company is not nearly as bullish as rivals about the American consumer embracing EVs. Bob Carter, executive vice president of sales for Toyota Motor North America, said at a conference affiliated with this week's New York auto show that batteries are still too expensive and place plug-in cars out of reach for many buyers.

“On electrification, we see an opportunity in North America, but it’s much further down the road,” Carter said April 16 at a forum co-hosted by the National Automobile Dealers Association. “The average vehicle today costs \$34,000 and for many EVs, the battery costs \$34,000. The economics are not there.”

Carter commented about an hour after Scott Keogh, the chief executive officer of Volkswagen AG’s U.S. unit, told the same audience of auto dealers and industry executives that Tesla has proven electric cars are here to stay. VW plans to sell them globally, with a U.S. debut starting in 2022.

The German giant still dealing with the fallout from its diesel scandal that erupted almost three years ago plans to build a small, all-electric sport utility vehicle as part of an \$800 million investment in its Chattanooga, Tenn., assembly plant.

“Even if it’s 10 percent of the market, we want to pursue it,” Keogh said after his presentation. Speaking of Tesla’s success and its Model 3 sedan, he said: “We have not seen in the history of the auto business, a company going from zero to fourth place in luxury in a matter of a few years.”

Battery-powered cars are a big gamble for automakers. Many of them are racing to market with electric models both to meet stricter emissions standards around the globe, and since Tesla’s Model 3 started selling briskly last year. Collectively, carmakers will spend \$255 billion making electric autos by 2022, according to consulting firm AlixPartners.

Keogh said that VW’s research shows an electric car will be on top of many consumers’ shopping lists either the next time they buy a vehicle, or upon their following trip to the market.

Besides Tesla, Keogh said General Motors Co. also appears dedicated to selling electric vehicles and will be a key competitor. The Detroit-based automaker has said it plans to sell 20 electric cars globally by 2023.

Toyota’s Carter remains unconvinced. He said after his speech that Toyota will sell an electric model in the U.S. but declined to say when. “This is going to be a slow evolution in the U.S. market, unlike in China and Europe where there are government regulations” hastening electrification, Carter said in an interview. “Nobody is selling electric vehicles at a profitable margin.”

27. Electric Cars "Not Going To Work," Trump Says Of GM's Plan

In an interview with Fox News, President Trump revealed his inner thoughts about electric cars—not that many had any doubts. "All-electric is not going to work," he said, referring to General Motors' stated goal to transition to "a world with zero crashes, zero emissions, and zero congestion." The company announced last year that it will launch 20 new hybrid, plug-in, and electric cars by 2023 to meet more stringent emissions standards in China, Europe, California, and elsewhere.

Referring to GM CEO Mary Barra's announcement of the plan, Trump said, "“They’ve changed the whole model of General Motors. They’ve gone to all-electric. All-electric is not going to work ... It’s wonderful to have it as a percentage of your cars but going into this model that she’s doing I think is a mistake.”

GM announced last month that it would shut down five assembly plants, including the Detroit Hamtramck factory that builds the Chevy Volt and the Lordstown, Ohio, factory that builds the compact Chevrolet Cruze that underpins the Volt. At the same time, the company plans to lay off 15,000 workers. Those workers, in Michigan and Ohio were some of the supporters that handed Trump the election in 2016.

When GM made the announcement in the end of November, Trump vowed retaliation against the company, and he reiterated that stance last week. "I don't like what she did," Trump told Fox News, referring to Barra. "It was nasty. To tell me a couple of weeks before Christmas that she's going to close in Ohio and Michigan, not acceptable to me. General Motors is not going to be treated well."

As GM as looked to ramp up production in China to meet the country's demand for electric cars, Trump has imposed new tariffs on Chinese-made products to make them harder to import. That has thrown a monkey wrench into GM's plans (and those of other automakers) to sell some of those cars in the U.S.

28. Canada Announces Federal \$300M Green Vehicles Incentive Program

The federal government's three-year, \$300-million electric-vehicle purchases incentive program will go into effect May 1, Economic Development Minister Navdeep Bains said Wednesday while providing more details about the initiative designed to increase sales of more zero-emissions vehicles.

The program, first announced in the federal budget in March, covers battery electric, plug-in hybrid and hydrogen fuel-cell vehicles and is part of the government's commitment to zero-emission vehicle strategy by 2040.

To be eligible for incentives, a vehicle must have a base-model manufacturer's suggested retail price of less than \$45,000 for passenger vehicles with six or fewer seats and less than \$55,000 for vehicles with seven or more seats. For eligible vehicles with six or fewer seats, higher-priced versions with more expensive trims are eligible as long as the final manufacturer's suggested retail price is \$55,000 or less.

The program will offer a \$5,000 incentive for the purchase of EVs, longer-range PHEVs and hydrogen fuel-cell vehicles and will be stacked upon the provincial rebates offered by Quebec and British Columbia. Ontario cancelled its rebate program last September.

Customers who purchase or lease a shorter-range PHEV will receive an incentive of \$2,500, said Bains, who unveiled the program's details at Plug 'n Drive in North York.

29. Forecast: In 2030, Gasoline Will Still Power 7 Out Of 10 New U.S. Vehicles

Given the growing number of electric-car announcements, major manufacturing investments, and battery supply-chain news, it could be a little hard to understand one reality-check projection: that even in 2030, a solid majority of vehicles sold could still burn fossil fuel.

Recently, LMC Automotive, a consulting firm, rounded up some of its current estimates. It anticipates that in the U.S. internal combustion engines will still make up 69 percent of the new-car market in 2030—and that more than half of global vehicle demand then will still have tailpipes and fuel tanks.

The biggest reality check, LMC says, will come for India, where its government said in 2017 that the entire market there will be electrified by 2030. The current 2030 target of 30 percent applies to a wide range of vehicle types, but LMC anticipates that just 3 percent of light vehicles in India will be electric by then.

In the U.S., on the way to 2030, LMC estimates that vehicles with internal combustion engines will lose one to three percent of market share per year.

China will be one of the few markets in which the firm anticipates that electric vehicles will be the majority. In 2030, fossil-fueled vehicles there will add up to about 48 percent of the market.

It should be noted that LMC's predictions correspond roughly to other industry forecasts for this sector, and that many analysts have pointed out that the massive growth for EVs may start to taper off in the later part of the next decade, when costs may quit falling as quickly for battery production and charging infrastructure. Bloomberg New Energy Finance, for instance, sees electric cars as making up 55 percent of the global market by 2040.

In the U.S., outside of regulatory outcomes, low fuel prices and the slower migration of pickups and trucks to electric could limit the rate of change. A significant share of those models is likely to be hybridized, however, and far more efficient than they are today.

30. The Fledgling Electric Bus Business Is Taking a Page From Solar

For all the talk about electric cars taking over the roads, electric buses still make up less than 0.1 percent of America's public transportation fleet. Proterra Inc. thinks it's found a way to change that—by taking a page from rooftop solar.

The electric-bus maker is partnering with Japanese trading house Mitsui & Co. to lease batteries to public transportation agencies through a \$200 million, first-of-its-kind credit facility that will support the delivery of 1,000 electric buses. They're betting that by lowering the upfront costs of zero-emission buses to compete with diesel ones they can help bring electric buses to the mainstream.

It worked for rooftop solar. A decade ago, solar installers including Sunrun Inc. began offering panels for no-money down and monthly payments. That leasing model ignited a solar boom, with annual U.S. home installations surging from 623 megawatts in 2012 to almost 2,250 megawatts last year.

Ryan Popple, Proterra's chief executive officer, is hoping for a similar boom for electric buses. "We're removing the last remaining objection for why cities can't move faster" toward electrification, he said in an interview.

That's a challenge the industry has faced even in progressive, environmentally conscious California, where the entire bus fleet is required to go emissions-free by 2040, and yet just 1 percent meets that criteria now.

Another, more bureaucratic reason a leasing strategy might work for electric buses: Some public transportation agencies have separate budgets for buying vehicles and maintaining them. Proterra's program would allow them to tap their maintenance budgets for a battery lease, just as they would for diesel fuel.

For its part, Mitsui was already a Proterra investor, so the leasing venture builds on that. The company described the program in a statement as “a unique opportunity” to provide capital for an “imminent transition to 100 percent battery-electric bus fleets.”

31. Citizens Win Landmark Ruling Setting Standing, Mobile Source Precedents

A federal district judge in Utah is backing a citizen suit alleging diesel aftermarket parts makers violated the Clean Air Act (CAA), with the decision notable because it may be the first successful private enforcement case against a mobile source manufacturer and because it granted standing to the plaintiffs even though the emission contribution of the alleged violations was small.

As a result, industry sources expect environmentalists to cite the ruling in an effort to bring similar suits in other courts, especially since the judge appeared to lower the bar for plaintiffs to demonstrate they have standing to sue.

“At the end of the day, at least in that court, it’s going to be a lot easier to bring citizen suits. . . . Don’t be surprised if environmental groups glom onto this and use to bring suits elsewhere,” one industry attorney says.

Chief Judge Robert Shelby of the U.S. District Court for the District of Utah ruled March 12 in *Utah Physicians for a Healthy Environment (UPHE) v. Diesel Power Gear LLC, et al.*, to grant partial summary judgment to UPHE and to deny the companies’ motions to dismiss.

The defendants had admitted they violated the air law but argued the plaintiffs lacked standing because their pollution contributions were “a drop in the ocean” compared to overall pollution in the Wasatch Front air basin and therefore did not satisfy the requirement that plaintiffs demonstrate that any emissions caused harm, one of the three tests plaintiffs must meet to demonstrate standing.

Specifically, the defendants had argued that their emissions were too small to satisfy the “meaningful contribution” standard established by the Supreme Court in *Massachusetts v. EPA*, the landmark 2007 ruling which held that the 6 percent greenhouse gas contribution from vehicles in that case was a “meaningful contribution” to climate change.

But Shelby found that even though the defendants’ “emissions are a small fraction of total emissions” in the area, their argument failed to “articulate a principled threshold requirement for causation.” He said “a causation standard that precludes citizens from suing for CAA violations directly contributing pollution to the air they breathe would seriously undermine” the statute’s enforcement provisions.

He also found the case to be more like a water violation enforcement case than GHGs, because the airshed is well defined.

“UPHE meets this burden by showing Defendants’ violations contribute nitrous oxides (NOx) and particulate matter (PM) to the air in the Wasatch Front” as well as evidence that that pollution contributes to the injuries its members suffered, he wrote.

Shelby also found the plaintiffs satisfied the redressability arm of standing for the same reasons.

The suit alleges three businesses and four individual owners illegally modified diesel trucks, sold defeat devices and sold illegally modified trucks. One of the companies, Diesel Brothers, has a reality TV show on the Discovery Network where they buy “used or broken down trucks and trick them out for sales.”

The ruling came after a September hearing, and the remedy phase is next, though defendants could seek to appeal.

Attorneys for the law firm Sidley Austin in Washington, D.C., took note of the decision and issued a March 18 bulletin that notes the judge “ruled that private litigants can use the Clean Air Act’s citizen suit provisions to bring lawsuits against aftermarket automotive parts companies for violating” the law’s prohibition on the sale or installation of “defeat devices.”

“The traditional view has been that only the government is empowered to enforce the CAA’s prohibition” on such devices, “and that the citizen suit provision is applicable to the stationary source portions,” the lawyers note.

Also, significant, according to the bulletin, is that the decision held that sellers of vehicles already containing such devices, known as “pass-through sales,” are liable, even though they did not participate in the tampering.

“Application of this decision might lead to an increase in the number of civil suits seeking monetary penalties and injunctive relief brought by environmental nonprofit organizations, citizen groups and others against companies operating in the aftermarket sector. Time will tell whether citizen litigants will seek to leverage this decision to pursue other companies in the auto sector, though countervailing appellate precedent not binding on this district court suggests the impact of the Utah decision may be limited.”

The bulletin stresses that citizen groups “are primed to continue what they see as a ‘gap-filling’ role” in enforcement “in the face of what is perceived as” the Trump administration’s deregulatory agenda, even though EPA has said enforcement against aftermarket parts makers remains a high-profile priority.

The Sidley bulletin also calls Shelby’s conclusion that the citizen suit provisions authorizes suits for violations of “an emission standard of limitation,” including standards under state implementation plans, “a potentially novel, and expansive, application.”

One law professor adds that the requirement that causation is “fairly traceable” to the defendants’ actions is not a bright-line test, and that given the nature of pollution issues, “obviously there are often going to be a lot of small sources combining” to contribute. This decision is noteworthy in that respect.

An attorney for the plaintiffs says some of the 2013 trucks used on the Diesel Brothers television show removed all of the pollution controls and emitted 30 to 40 times the PM and NOx that was lawful, according to testing conducted by the plaintiffs. The source adds that only 2 to 3 percent of all the trucks in the basin need to be tampered with to double their pollution. This means the judge’s causation decision is not as much of a reach as the industry lawyers say. The show also gave the company a “national presence” attracting attention, the source says.

While the attorney seeks to downplay the importance of the standing holding, the source says the ruling is more significant because it appears to be the first reported citizen enforcement case

under the CAA against mobile sources. "What I can say is this is the only case that I am aware of that addresses standing in the mobile source context in a discrete geographical area. The law has been reasonably well established that if you have a discrete watershed or airshed under the Clean Air Act and Clean Water Act, and you add illegal pollution, that people using the water or breathing the air have standing. That's definitely well-established for stationary sources."

32. US EPA Forces Fiat Chrysler Recall

The US Environmental Protection Agency (EPA) has announced that carmaker Fiat Chrysler has agreed to voluntarily recall more than 860,000 vehicles, after EPA investigators found they do not meet US emissions standards. The recall follows in-use emissions testing conducted by the EPA and Fiat Chrysler, the EPA confirmed. "EPA welcomes the action by Fiat Chrysler to voluntarily recall its vehicles that do not meet US emissions standards," said EPA Administrator Andrew Wheeler. "We will provide assistance to consumers navigating the recall and continue to ensure that auto manufacturers abide by our nation's laws designed to protect human health and the environment."

The recall affects cars manufactured from 2011 to 2019, and the recall will take place starting with the oldest vehicles first, regulators said.

33. Justices Grapple With Whether To Narrow EPA Regulatory Deference

Supreme Court justices at March 27 oral argument appeared unlikely to completely overturn a key precedent granting deference to EPA and other federal agencies' interpretations of their regulations, though several of the justices appeared open to the Trump administration's call to narrow the deference.

At issue in *Kisor v. Wilkie*, a case involving the Department of Veterans Affairs, is whether the justices should overturn the precedent set by a 1945 ruling *Bowles v. Seminole Rock & Sand Co.* and its 1997 successor *Auer v. Robbins*, which says judges should defer to agencies' "reasonable" interpretations of ambiguous provisions in their rules.

The Justice Department (DOJ) agrees with opponents of the deference doctrine that it has been applied too broadly, but the department says those concerns can be addressed through strict new limits on when deference is appropriate, rather than by overturning it altogether. While EPA is not involved in the case, any high court ruling that either narrows or terminates the deference doctrine could put major constraints on the agency's rulemaking powers.

During questioning of *Kisor* attorney Paul Hughes, Justices Stephen Breyer, Elena Kagan and Sonia Sotomayor were vocal in their opposition to overturning *Auer*. And Justice Ruth Bader Ginsburg questioned the effects on the lower courts of overturning *Auer*.

Chief Justice John Roberts and Justice Samuel Alito raised questions about overturning Supreme Court precedent, with Roberts appearing to be open to some change and Alito asking both Hughes and Solicitor General Noel Francisco what they thought the effect of overturning *Auer* would be.

During questioning of Francisco, Justices Neil Gorsuch and Brett Kavanaugh suggested *Auer* needs further revision, with Kavanaugh suggesting that judges find it easier to defer to agency interpretation than wrestle with whether that interpretation is reasonable.

Speaking to Hughes, Breyer was critical of the argument that instead of relying on an agency's interpretation, judges should decide whether a rule is correct. "I mean, I want to parody it, but, I mean, this sounds like the greatest judicial power grab since Marbury v. Madison, which I would say was correctly decided," Breyer said.

Kagan questioned whether there was a good enough reason to overturn Auer and Seminole Rock, noting that in the many years since Seminole Rock, Congress could have changed the deference principle but has not. "That's a reason for us to say, you know, we don't think that we should step in where Congress has not," she said.

Hughes responded that Auer did not have any underpinning when it was announced, and that it has never been reconciled with the Administrative Procedure Act (APA). "Its underpinning is agency expertise. Its underpinning is an idea that judges are far less suited to make these kind of minute decisions of agency policy than agency decision-makers are," Kagan countered.

Breyer then jumped in to say that Auer repeats Seminole Rock, which was decided before the APA was enacted. "Wouldn't somebody have said something about it if, in fact, those words were meant to change what was pretty well established law at the time?"

34. Trailer Makers Question CARB Over Cross-State Application Of New GHG Rules

Amid uncertainty over U.S. EPA rules, truck-trailer manufacturers from across the country are raising concerns about whether out-of-state manufacturers must comply with the California Air Resources Board's (CARB) Phase 2 greenhouse gas regulation requiring new trailers sold in the state to comply with fuel-efficiency and other standards.

"If a Nevada-based company buys a trailer, registering it in Nevada, and runs that trailer into California, will California EPA come after that trailer manufacturer?" John Freiler, engineering manager for the Virginia-based Truck Trailer Manufacturers Association (TTMA), asked in an email to a March 25 CARB workshop in Sacramento.

Freiler's was one of many questions raised during the meeting covering how CARB will certify that trailers for sale in California meet the Phase 2 GHG rule requirements, beginning with model year 2020 trailers.

The confusion stems from the fact that U.S. EPA's similar GHG rule for trailers has been stayed by a court as the Trump administration is reconsidering the standards -- meaning the trailer industry will soon face a fractured regulatory landscape across the country.

It is unclear how many trailer manufacturers will be subject to CARB's Phase 2 rule. While U.S. EPA's 2016 rule estimated there would be about 100 trailer makers affected, "we don't know if all those will certify here in California," one board staffer said during the March 25 workshop.

But CARB staff clarified several times during the meeting -- including in response to Freiler's question -- that the Phase 2 regulation only affects new trailers sold in California.

However, they added that owners of fleets operating in California -- including those based outside the state -- must comply with CARB's separate Phase 1 tractor-trailer GHG rule, which took effect in 2010 and requires in part that 53-foot or longer trailers be equipped with side skirts and rolling-resistant tires to improve fuel economy.

CARB's Phase 2 rule was adopted in February 2018. It is nearly identical to rules that U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) adopted in 2016, though that measure was stayed by an appellate court before it was slated to take effect in 2018.

In the litigation, TTMA v. EPA, the industry association argues the federal agency lacks Clean Air Act authority to regulate trailers because they do not meet the statute's definition of a self-propelled motor vehicle. In October 2017, the U.S. Court of Appeals for the District of Columbia Circuit stayed the requirements while the Trump administration reconsiders the Phase 2 trailer provisions. CARB intervened in the case to keep the federal rules in place.

Soon after the Trump administration took office in 2017, U.S. EPA and NHTSA decided to reconsider the rules.

In a Feb. 8 status report in the litigation, Department of Justice (DOJ) attorneys say that in September 2018, "EPA's leadership met with [TTMA] and its counsel to discuss the ongoing administrative process to develop a proposed rule to revisit the Rule's trailer provisions. NHTSA continues to assess next steps after granting [TTMA's] request for rulemaking."

Further, NHTSA "has prioritized addressing safety-sensitive matters, though it also plans to schedule a meeting with [TTMA] and to continue discussions in the near future." The DOJ lawyers say they will submit another status report on May 9.

Meanwhile, CARB's nearly identical Phase 2 rule aims to ensure that new trailers sold in California in 2020 and afterwards meet the new requirements. According to a CARB staff presentation made during the March 25 workshop, the rule takes effect on April 1, which is the date trailer manufacturers can begin submitting their certification applications to the board.

To submit the applications, manufacturers can register with U.S. EPA to receive a "unique manufacturer code" or use an existing code they have from the federal agency for trailers and include the 3-character code in their applications.

An industry source says CARB staff indicated that U.S. EPA is currently "issuing manufacturer codes despite the court-order stay of the federal rulemaking," which may indicate some companies are already in the process of preparing to comply with the CARB regulation.

Jan. 1, 2020, marks the "start" of the CARB Phase 2 trailer program -- "implementation begins with 2020 MY . . . specifically trailers manufactured on or after Jan. 1, 2020," the presentation says.

By March 31, 2021, manufacturers must submit "end-of-year production" reports for 2020 MY trailers.

TTMA's Freiler said there appeared to be a discrepancy between the MY effective date of CARB's regulation and how EPA had planned alignment of different requirements in the stalled federal rule, with other industry stakeholders expressing some confusion about whether trailers built in 2019 but not sold until 2021 would have to comply.

CARB staff told Freiler they would follow-up with him offline to answer his questions, while telling one manufacturer representative that trailers built in 2019 but not sold until 2021 would have to meet the new standards.

Trailers subject to the regulation include long-box dry vans (greater than 50 feet in length); long-box refrigerated vans (greater than 50 feet in length); short-box dry vans (50 feet and shorter in length); short-box refrigerated vans (50 feet and shorter in length); tank trailers designed to transport liquids or gases; flatbed trailers with continuous, flat platforms; and container chassis of all lengths.

The GHG standards are phased in, with carbon dioxide grams per ton-mile (g/ton-mile) requirements getting more stringent with the 2021, 2024 and 2027 MYs. To meet the standards, manufacturers must make aerodynamic improvements, use low rolling-resistant tires potentially with tire pressure monitoring systems and automatic tire inflation systems, and implement weight reduction measures.

For example, for “full aero” box-type long dry vans the regulation requires manufacturers to meet an 81.3 g/ton-mile level standard in MY 2020, a 77.2 g/ton-mile level for MY 2024-26 and a 75.7 g/ton-mile standard for 2027 and subsequent MYs, the presentation shows.

To demonstrate compliance, full- and partial-aero box trailer manufacturers must calculate a projected CO₂ performance for each family of vans based on modeled CO₂ emission rates using equations included in the regulation.

Trailer manufacturers must also include a copy of the emissions warranty statement provided to consumers, which entails five years for emissions-related components and one year for tires. Components covered include all those “whose failure would increase a vehicle’s GHG emissions,” the presentation says. These include aerodynamic technologies, tires, tire pressure systems, lightweight components and “other added emission-related components to the extent they are included in the application for certification.”

Maintenance instructions must also be provided by manufacturers.

Meanwhile, whether CARB must obtain from U.S. EPA a Clean Air Act waiver of federal preemption to implement and enforce the Phase 2 regulation continues to loom. CARB officials have refused to comment about whether they believe they need a waiver, though they obtained one to implement and enforce the Phase 1 rules.

One of the reasons CARB is being guarded about the issue appears to be the fact that the Trump administration is proposing to revoke California’s waiver for its vehicle GHG standards and likely would reject any future waiver requests. Some observers have suggested that CARB officials are hedging on the issue in the hopes that Trump is voted out of office in 2020 and the dispute becomes moot.

35. Carbon Capture, Diesel Reduction Bills Sail Through Senate Panel

Bills boosting carbon capture technology and reviving grants to retrofit dirty diesel engines were approved by the Senate Environment and Public Works Committee without any opposition. The Senate environment committee approved the measures by voice vote April 10. The move tees up the bipartisan bills for a potential vote on the Senate floor this year.

Both bills will “reduce emissions that contribute to climate change, and there will be more to come,” Sen. John Barrasso (R-Wyo.), chairman of the committee, said during the April 10 markup. Barrasso has said he wants to move the carbon capture legislation quickly. The Senate environment committee advanced both bills last Congress, but they didn’t make it to the floor.

That bill, S. 383, known as the Utilizing Significant Emissions with Innovative Technologies (USE IT) Act, was reintroduced Feb. 7 by Barrasso and Sens. Shelley Moore Capito (R-W. Va.) and Sheldon Whitehouse (D-R.I.). That trio helped advance bipartisan tax credits for carbon capture technologies signed into law in 2018.

Their latest bill would boost carbon capture research and development, including direct air capture. It would also help speed up permitting for carbon dioxide pipelines that could transport captured carbon to facilities where it could be stored or used.

Carbon capture separates the greenhouse gas carbon dioxide from other emissions from power plants and other facilities so that it can be permanently stored or used, rather than released into the atmosphere.

The Diesel Emissions Reduction Act (S. 747) has support among Republican and Democratic lawmakers because it helps reduce diesel emissions. Diesel emissions contain nitrogen oxides, hydrocarbons, carbon dioxide, and various other pollutants that contribute to ozone formation and can lead to respiratory and cardiac problems.

The bill, introduced March 12 by Sen. Tom Carper (D-Del.), the top Democrat on the committee, would reauthorize the Environmental Protection Agency's program offering grants and rebates to states and localities to move away from diesel engines or to upgrade older diesel-engine vehicles, such as heavy-duty trucks, school buses, and equipment at ports and airports.

The program was last reauthorized in January 2011.

36. House Democrats Unveil Bill To Block Withdrawal From Paris Climate Deal

House Democrats have unveiled new legislation that would bar use of federal funds to withdraw from the Paris climate deal and require the Trump administration to develop a plan to meet the U.S. emissions targets, signaling a clash with the White House over the issue should lawmakers seek to enact such mandates in upcoming spending legislation.

The legislation is also likely a prelude to additional congressional hearings on the climate issue, where Democrats are expected to make the case for a possible spending bill rider as they seek to draw attention to the Trump administration's attacks on climate policies, whether or not they can succeed in curbing such attacks in specific spending legislation for EPA or other federal agencies.

And it also serves as the most specific response to date by House Democratic leaders to calls from their base for a Green New Deal, a concept that to date remains more a framework for advocacy than an indication of concrete policies likely to come out of Capitol Hill.

"This bill is only step one," House Speaker Nancy Pelosi (D-CA) said at a March 27 press conference by numerous Democratic lawmakers to unveil H.R. 9, dubbed the Climate Action Now Act. "Our caucus has made this a caucus-wide priority," she added, promising action on climate change in multiple Hill committees.

Pelosi led off the press conference by calling climate change an "existential threat" and a threat to health and national security but calling solutions to the problem a boon to the economy. "This

is about jobs, this is about good paying green jobs, advancing our economy and global pre-eminence on green energy technology,” Pelosi said.

“When Americans see a crisis we respond,” added Rep. Kathy Castor (D-FL), chair of the House Select Committee on the Climate Crisis.

And House Energy and Commerce Committee Chairman Frank Pallone (D-NJ) and others pressed the Trump administration to do something other than oppose efforts to address GHGs. “Mr. President, we are saying to you with this legislation, we are not withdrawing from Paris, we want to know what your plan is, and if you don't have one, we are going to move forward on our own and come up with things we can do here in the Congress and the Energy and Commerce Committee to address climate change in various ways,” he said.

The legislation specifies that “no funds are authorized to be appropriated, obligated, or expended to take any action to advance the withdrawal of the United States from the Paris agreement.”

As such it is in some ways the mirror image of riders Republicans have sought -- but often unsuccessfully -- to insert into spending bills during Democratic administrations in a bid to block climate and other affirmative environmental policies, with Democrats now objecting to Republican plans to withdraw from the Paris deal and repeal or drastically scale back numerous Obama administration GHG regulations

The bill also would instruct the Trump administration to submit within 120 days to “appropriate congressional committees” -- and make public -- a plan for the United States to meet the emissions target of 26 to 28 percent below 2005 levels by 2025, the domestic emissions target agreed to by the Obama administration as part of Paris agreement related climate talks.

The Trump administration has announced its intention to withdraw from Paris but cannot complete that step until 2020 under the terms of the agreement.

A fact sheet distributed by Castor declares that combating the climate crisis is a “moral imperative that compels us to act to ensure we live in and leave behind a healthier, safer and more sustainable world for our children and grandchildren. The first step is keeping our word to work with the rest of the world to cut carbon pollution and rise to the challenges of climate change.”

Lawmakers also touted additional hearings planned in the House on climate change, including a House Foreign Affairs Committee hearing on the national security threat of climate change and a House Energy and Commerce panel hearing on state and local actions to respond to the climate threat.

37. Biofuels Group Urges EPA To Withdraw Draft Deal On RFS Study Deadlines

A key biofuels group, represented by a former top official in the George H.W. Bush administration, is urging EPA to withdraw its proposed consent decree with Sierra Club that would set deadlines for the agency to complete a delayed congressionally mandated study of the environmental impacts of its Renewable Fuel Standard (RFS).

In new comments submitted on the draft pact, C. Boyden Gray, who served as White House counsel to Bush, argues that Sierra Club does not meet procedural hurdles to challenge the delayed “anti-backsliding” study and that entering the decree in court would set a bad precedent on standing for other pending cases.

Gray is writing on behalf of the Urban Air Initiative (UAI), a group that seeks to increase the use of “clean burning ethanol in our gasoline supply to replace harmful aromatic compounds in gasoline.” It is also pushing an array of other pro-ethanol policies at EPA, including the agency’s proposal to allow year-round sales of 15 percent ethanol blends.

In addition, the Renewable Fuel Association (RFA) in separate comments is expressing concern that EPA will rely on faulty science in the RFS study and expresses concern with modeling and other tools EPA currently uses to determine other aspects of the RFS.

The two comment letters were filed on EPA’s March 25 deadline for public comment on the draft consent decree it inked last month with Sierra Club. The suit has been considered the first test case of former Administrator Scott Pruitt’s bar on the practice of “sue-and-settle,” in which he accused environmental groups of entering “sweetheart deals” with the Obama administration by filing a deadline suit, reaching a settlement, winning attorneys’ fees and commandeering the agency’s agenda.

Pruitt has since left the agency, but Administrator Andrew Wheeler has not formally withdrawn the directive, which outlines a series of steps -- including broad public consultation requirements that many industry attorneys warned against -- the agency must take before it can enter a settlement. EPA did not follow the steps in the draft settlement at issue in *Sierra Club v. EPA* in the U.S. District Court for the District of Columbia, according to UAI’s March 25 comments.

“The proposed consent decree violates EPA’s consent decree transparency directive,” which is another term for the sue-and-settle policy, the comments say. “EPA has not involved regulated entities or potentially affected states in the negotiations leading up to the proposed consent decree, and the consent decree anticipates that Sierra Club’s claim for attorneys’ fees will be resolved ‘informally,’ in violation of the directive.”

They add that the decree “would set a bad precedent” because it would encourage other environmental groups “to bring frivolous informational injury lawsuits in the hope of controlling the agency’s regulatory priorities through litigation.”

The pro-ethanol group adds that the decree “would prematurely resolve Article III standing allegations that are similar to allegations currently pending before the [U.S. Court of Appeals for the District of Columbia] Circuit. The D.C. Circuit will soon decide whether Sierra Club has standing to challenge last year’s RFS standards based on recreational injury allegations that are very similar to Sierra Club’s standing to sue in this case.”

That suit challenges EPA’s 2018 RFS rule. There, Sierra Club asserts recreational injury based on allegations of impaired water quality allegedly due to the RFS, which is also one of the group’s standing arguments in the RFS study case. But in the 2018 RFS case -- which had oral arguments Feb. 20 -- EPA is opposing Sierra Club’s standing.

The RFS study pact “could substantially resolve the recreational injury standing questions presented here. EPA should wait to settle the anti-backsliding litigation until the D.C. Circuit case has been resolved,” Gray’s group says.

RFA’s March 25 comments say the group wants to ensure “that the air quality benefits of ethanol . . . are accurately reflected” in the study because the findings will determine whether mitigation regulations are needed. “Recent scientific studies and analyses demonstrate that the inclusion of

ethanol in gasoline provides net reductions in the emissions of key pollutants. . . . Thus, we are confident that EPA's Anti-backsliding Study -- if based on credible and sound scientific methods, data and modeling -- will confirm the air quality benefits attributable to growth in ethanol consumption under the RFS."

38. With New Deputy, EPA Air Office Continues Broad Deregulatory Agenda

EPA has tapped Anne Idsal, its Region 6 Administrator, to be the new principal deputy administrator in the air office, selecting another former state official -- and political appointee -- to serve as the deputy in the office that has one of the agency's largest portfolio of deregulatory actions.

Anne Idsal's appointment continues the administration's practice of having two political appointees serve as air office deputies.

Among the Office of Air & Radiation's (OAR) top priorities is its effort to either scale back or retain its national ambient air quality standards (NAAQS), as EPA complies with a Clean Air Act mandate to review the six criteria pollutant standards every five years.

One of the most controversial on the schedule is the pending review of the agency's particulate matter (PM) standards, which the agency's Clean Air Scientific Advisory Committee (CASAC) is slated to consider at a March 28 meeting.

Mark Frampton, the sole research scientist on EPA's Clean Air Scientific Advisory committee (CASAC), is lambasting panel Chairman Tony Cox's controversial new approach to assessing air pollution science for reviewing the agency's particulate matter (PM) air standards, saying it undermines and misstates the latest data on PM.

In other cases, the agency has decided to retain its ambient air standard for sulfur dioxide (SO₂), despite calls from industry to soften it.

Another high-profile and controversial issue is the agency's pending plan to repeal the threshold finding that mercury air standards for power plants are "appropriate and necessary," a step that critics say will make the underlying regulation legally vulnerable. Coal company Murray Energy is expected to file a lawsuit to scrap the entire utility emissions rule if EPA finalizes its plan.

EPA's proposal to scrap the Obama-era finding that its power plant air toxics rule was "appropriate and necessary" while leaving the overall rule in place is spurring debate over expected legal challenges to the plan, suits that could set new precedents on issues including "co-benefit" cost-benefit analysis and the fate of the utility regulation.

Another hot-button issue is EPA's pending plan to roll back Clean Air Act new source review (NSR) permit requirements, an issue that is likely to gain some attention once the White House completes its review of the agency's pending regulation exempting most coal-fired power plants from the requirements.

EPA appears to have decided to split its controversial plan to essentially exempt most coal-fired power plants from new source review (NSR) permitting requirements from its broader, pending final Affordable Clean Energy (ACE) rule to limit coal plant greenhouse gas emissions, according to several sources.

In addition to OAR's efforts to address conventional pollutants, it is also pursuing a suite of measures to roll back Obama-era climate rules.

Chief among them is its planned Affordable Clean Energy Rule, which seeks to repeal and replace the Obama-era Clean Power Plan governing greenhouse gas emissions from existing power plants.

After years of declines, new EPA data shows that power plants' carbon dioxide emissions increased in 2018, potentially complicating the agency's message just as it is preparing to finalize its Affordable Clean Energy (ACE) rule, a major rollback to Obama-era greenhouse gas standards for the sector.

The agency is also working to rollback rules for the landfill and oil and gas sectors governing releases of the potent GHG methane. Some oil- and gas-heavy states are pushing back on aspects of EPA's proposal to roll back Obama-era methane standards for new oil and gas equipment, particularly on the key issue of how frequently operators must check for emissions leaks at wells.

ASIA PACIFIC

39. Beijing Slashes Subsidies For EVs And Plug-In Hybrids

Beijing has drastically reduced its subsidies for electric vehicles and plug-in hybrids and barred provincial governments from subsidizing the vehicles with the goal of winding up the subsidy program by the end of 2020. Under rules that recently took effect, electric passenger vehicles must have a range of at least 250 kilometers (155 miles) to qualify for subsidies, up from 150 km (93 miles) before, according to the Chinese Ministry of Finance.

Electric passenger vehicles with ranges of 250 km to less than 400 km (249 miles) are entitled to 18,000 yuan (\$2,679) in subsidies. Before, electric passenger vehicles with ranges of 150 km to less than 400 km were eligible for subsidies of 15,000 to 45,000 yuan. The subsidies for electric passenger vehicles with ranges of 400 km and more have been halved to 25,000 yuan.

For plug-in hybrid passenger vehicles, the subsidies have been slashed to 10,000 yuan from 22,000 yuan.

Beijing has also cut its subsidies for electric and plug-in hybrid buses and trucks by roughly 50 percent.

Under previous rules, governments of provinces, municipalities and autonomous regions in China could subsidize local sales of EVs and plug-in hybrids with amounts up to 50 percent of the central government subsidies. Now local governments must stop providing subsidies for EVs and plug-in hybrids and use the money for the construction of battery charging stations for these vehicles, according to the new rules.

Thanks to generous government subsidies, sales of EVs and plug-in hybrids in China have been strong for years. In the first two months of this year, total sales of EVs and plug-in hybrids in China nearly doubled from a year earlier to 148,000. In 2018, sales of such vehicles across the country approached 1.26 million, a jump of 62 percent year on year.

The aggressive subsidy reduction step is mainly intended to prevent automakers from relying on subsidies for sales and to curb local protectionism, government ministries said. But other factors may well have prompted Beijing to slash the subsidies deeper than expected.

Beijing is eager to ease the fiscal burden central and provincial governments have come under because of the generous program. The Chinese government hasn't disclosed how much in subsidies it has provided for EVs and plug-in hybrids but The International Institute of Strategic Studies, a Washington think tank, estimated last year that China spent 245 billion yuan (\$36.5 billion) in government subsidies for electrified vehicles from 2009 to 2017.

Beijing is now cutting business taxes to stimulate the slowing economy. To avoid adding to the country's budget deficit, it faces a pressing need to wind down the subsidy program.

Central government leaders also face international pressure, especially from the Trump administration, to end interventionist industry policies. According to a February report in The Wall Street Journal, during trade negotiations between China and the United States, the Chinese side floated a plan to scrap subsidies for domestically produced electrified vehicles as part of concessions to help resolve bilateral trade disputes.

Beijing is also anxious to prevent the rapid expansion of electrified vehicle output by domestic brands from derailing its new carbon credit program. That may sound ironic because the subsidies and carbon credit program are both crafted to incentivize the production and sales of EVs and plug-in hybrids.

Under the carbon credit program, effective this year, passenger vehicle manufacturers in China must accumulate enough credits by producing enough EVs and plug-in hybrids to hit a threshold equal to 10 percent of annual sales in 2019. The level will rise to 12 percent for 2020.

The program also allows carmakers that fail to produce sufficient numbers of electrified vehicles annually to buy carbon credits from peers. But the reality is that as domestic Chinese automakers, enticed by government subsidies, continue to churn out electrified cars, the price of carbon credits they generate keep falling.

In 2018, EV production surged 66 percent to 792,000 while plug-in hybrid output soared 143 percent to 278,000. As a result, carbon credits traded at a range of between 300 yuan and 500 yuan each in January, according to ChinaEV100, a Beijing industry trade group whose members include a wide range of domestic EV makers and suppliers. The low prices have made it hard for the carbon credit program to entice companies to expand electrified vehicle output.

By slashing subsidies for EVs and plug-in hybrids, the government can stabilize production and improve the effectiveness of the carbon credit program.

Beijing is set to phase out the subsidy program for EVs and plug-in hybrids by the end of 2020. It expects the carbon credit program to take over thereafter to push car manufacturers in China to keep up their electrified vehicle output.

40. The \$18 Billion Electric-Car Bubble at Risk of Bursting in China

An iPhone assembler, e-commerce emporium and real-estate developer typically don't compete in the same business—except when it comes to electric vehicles in China. That's because of a seismic shift toward EVs, which has spurred billions of dollars in investments by traditional

carmakers, startups and titans of the internet, electronics and real-estate industries. The rush is on even as the government pulls back on the subsidies that juiced the industry to begin with.

There are now 486 EV manufacturers registered in China, more than triple the number from two years ago. While sales of passenger EVs are projected to reach a record 1.6 million units this year, that's likely not enough to keep all those assembly lines humming, prompting warnings that the ballooning EV market could burst and leave behind only a few survivors.

"We are going to see great waves sweeping away sand in the EV industry," said Thomas Fang, a partner and strategy consultant at Roland Berger in Shanghai. "It is a critical moment that will decide life or death for EV startups."

At least two dozen of those electric-car brands will be showcasing models at the Shanghai auto show starting this week. They range in expertise from nascent supercar maker Qiantu Motor to U.S.-traded startup NIO Inc. and elder statesman BYD Co.

Dozens of startups have entered the global EV business in recent years, raising \$18 billion since 2011, according to BloombergNEF. Most of the biggest fundraisers are Chinese, including NIO, WM Motor, Xpeng Motors and Youxia Motors. The startups promise to deliver a collective manufacturing capacity of 3.9 million vehicles a year. That's excluding what some of the world's biggest automakers are planning.

China's big, but it's not that big. Annual sales of passenger EVs only surpassed 1 million units for the first time last year, spurred by the subsidies that could slice thousands of dollars off the sticker price.

Yet EV sales make up just 4 percent of overall passenger vehicle sales of 23.7 million units, according to the China Association of Automobile Manufacturers.

At the same time, sales of traditional cars are currently in a free fall, plunging for the 10th straight month in March as a slowing economy and trade tensions with the U.S. weigh on consumer sentiment.

"There is still huge room out there in the new-energy vehicle market with China's relatively low vehicle-penetration rate," said Cui Dongshu, secretary-general of the China Passenger Car Association, an industry group. "Yet that market is for the competitive players, not the weakest ones, and the latter will be squeezed out."

The government started pushing development of electric cars to help eliminate air pollution, reduce oil imports and develop high-technology manufacturing.

By 2025, China's leaders want annual sales of new-energy vehicles -- including pure-battery electrics, plug-in hybrids and fuel-cell cars -- to reach 7 million units. That's the equivalent of about 20 percent of China's total auto market. Even that amount would barely be enough to sustain a few dozen companies -- not hundreds. A factory typically needs to produce at least tens of thousands of vehicles a year to be profitable.

Another headwind is the subsidy cut announced last month by the finance ministry; a move meant to encourage manufacturers to rely on innovation rather than assistance. Some subsidies that could total \$7,500 per vehicle were halved. (See story above.) "With the subsidy adjustments,

some less technologically advanced EV startups will disappear,” said Zhou Lei, a Tokyo-based partner for Deloitte Tohatsu Consulting. “There will be a reshuffle.”

Then there’s the swarm of global giants from Tesla Inc. to Volkswagen AG to Ford Motor Co., all planning to flood the market with locally produced EVs.

Elon Musk’s company started selling its first mass-market model in China this year and plans to begin building vehicles in Shanghai by year’s end. Tesla sold 14,467 vehicles in China last year, according to the Ministry of Industry and Information Technology.

Toyota Motor Corp., Fiat Chrysler Automobiles NV, Honda Motor Co., and Mitsubishi Motors Corp. chose a quicker way in they all plan to sell what’s essentially the same car, developed by Guangzhou Automobile Group.

More established local manufacturers, such as BYD, likely can withstand the competition and the subsidy cuts, given a track record spanning years, a lineup including cars and buses, and an existing customer base. The Warren Buffett-backed company has boosted revenue for six straight years and turned a profit since at least 2000, according to data compiled by Bloomberg.

“Only companies that have solid technology reserves can stand out amid competition,” said Wang Chuanfu, founder and chairman of BYD. “By owning core technologies, we can see further and deeper.”

The ones facing the biggest risk are the upstarts still seeking their footing. Many are founded or funded by people with an internet or technology background, used to hefty cash-burn rates but still not necessarily fully aware of the massive investment needed for car manufacturing, Roland Berger’s Fang said.

41. China Pollution Rose Slightly in February; Coal, Vehicles Are Blamed

Most cities in China saw a slight increase in air pollution in February, the Ministry of Ecology and Environment said in its latest monthly report. In the 337 cities measured, 76 percent of days in February had good air quality. However, that was 2.3 percentage points less than February last year on average.

The report said the average PM2.5 density nationwide rose by 1.9 percent year-on-year to 55 micrograms per cubic meter, and that northern cities contributed more polluting particles than did cities in the Yangtze River Delta region.

Eleven cities in Henan, Shanxi and Shaanxi provinces performed the worst last month, with an average of seven and a half days having good air quality. Its average PM2.5 readings hit 108 micrograms per cubic meter for February, an increase of 42.1 percent year-on-year.

Twenty-eight cities in the Beijing-Tianjin-Hebei province cluster and nearby areas recorded the same level of PM2.5, up 35 percent compared with the previous February.

Although southern China had better air than the north, it nevertheless was not as good as the previous year. Forty-one cities in the Yangtze River Delta region had an average 20 days of fresh air last month.

The report didn't explain the increasing air pollution. Experts attributed it to weather conditions unfavorable for dispersal, combined with high emissions.

Chai Fahe, a senior researcher at the Chinese Research Academy of Environmental Sciences, said that vehicle emissions and coal combustion were responsible for the increasing pollution in northern China. "Heavy industries are gathered here and they consume about 40 percent of the country's coal. Also, the heating season led to more coal combustion and pollution," he said.

"In addition, 80 percent of transportation is related to vehicles on highways, which added to emissions."

He said unfavorable meteorological conditions had made things worse and that actions to control emissions should be strengthened.

In June, the State Council released a three-year action plan to curb air pollution by 2020. It aims to achieve an average of 80 percent of days with good air quality by 2020, with PM 2.5 density set to decrease 18 percent from 2015 levels.

Electricity consumption increased 7.2% in February compared to last year, according to government data released by the National Energy Administration. January and February combined was up 4.5% on last year, reports Caixin Energy. This period usually sees a dip in energy use as factories and businesses close for Chinese New Year. The industrial sector contributed a large proportion of the uptick this year, with a 6.7% increase in consumption in February alone. However, it was household electricity consumption that saw the fastest growth. China's carbon emissions grew for the second year in a row in 2018 largely due to swelling electricity demand being met by coal-fired power. If electricity consumption continues to grow in 2019, China will face the challenge of ensuring that new installations and generation from renewable sources can keep pace.

42. China To Promote Methanol Cars

The Ministry of Industry and Information Technology has released guidance on promoting the use of methanol in cars as an alternative to petrol. Methanol is produced from hydrogen and carbon monoxide. Normally the feedstock is petroleum based, such as natural gas or coal, but it is possible to use electrolysis, as well as biomass and factory emissions. Currently used in race cars, methanol has not yet been rolled out commercially in vehicles. The ministry's guidance states that industrial policies and technical standards will be improved to facilitate the adoption of methanol cars. The vehicles will mainly be used in the provinces of Shanxi, Shaanxi, Guizhou and Gansu, where pilots have been carried out since 2012.

43. India Pushes For Significantly Greater Electric Mobility

In the rush for global domination of the electric mobility market, India has thrown its hat aggressively into the ring. The Modi-led government has announced that it would offer US\$1.4 billion in subsidies for both buyers and manufacturers of electric vehicles and impose higher import tariffs to spur domestic companies to build vehicles.

The government aims for 30 per cent of its public transport to be electric by 2030. With prime minister Narendra Modi emphasizing that he wants India to lead across the value chain from battery production to smart charging to electric vehicle manufacturing. "Policies will be designed

as a win-win for all who want opportunities in the automobile sector,” said Modi, although he emphasized that public transport would remain the focus of the electric mobility push.

At present, India has only two electric car manufacturing companies, Tata motors and Mahindra. International car giants Hyundai and Kia Motors are developing electric fleets designed specifically for the Indian Market, with Kia signing a memorandum of understanding with Andhra Pradesh to aid in the growth of electric mobility in the state. Meanwhile, many cities planned trials of electric buses including Hyderabad, Chennai and Guwahati.

The issue of air pollution in Asia was discussed at the 2nd UN Science Business Policy Forum in Nairobi in March 2019. Dechen Tsering, regional director of Asia-Pacific for UN Environment, said that the Indian private sector had shown a lot of interest in developing electric cars, but the problem was still battery prices. “They are struggling with how to avoid importing everything,” Tsering said. “They are trying to find out how much is available on the domestic market.”

The issue of renewable energy components availability in lower-middle income countries, remains a challenge. Often essentials such as solar panels or lithium batteries are not produced locally, or at least not at scale, which prevents the private sector from entering renewable energy infrastructure. Yet 92 per cent of Asia and the Pacific’s population— about 4 billion people—are exposed to levels of air pollution that pose a significant risk to their health.

According to the report Air Pollution in Asia Pacific: Science-based Solutions, if governments adopted 25 clean air policy actions—including promoting the use of electric vehicles— there would be less of a need for expensive pollution control. While the US\$300-600 billion per year investment would be only one twentieth of the increase of US\$12 trillion increase in wealth by 2030.

Arnico Kumar Panday, regional program manager for atmosphere at the International Centre for Integrated Mountain Development, said that it was possible to create a rapid uptake of electric vehicles in Asia through taxes. He gave the example of Nepal, where cars running on petrol and diesel are taxed at 220 per cent when purchased, while electric cars at 10 per cent. “The same car is cheaper as an electric than it is petrol or diesel,” Panday said.

Meanwhile, Nobuyuki Konuma, from the Ministry of Environment of Japan, said his country had used two approaches in tackling the air pollution of 1970s Japan:

- First, they had put in place strict regulations on factories emitting pollution in the form of the Air Pollution Control Act, and
- Second, they had set strict standards for emissions from vehicles, both passenger and freight. Vehicles who cleared the stern regulations could get tax reductions, which were a great incentive to buyers as Japan has heavy taxes on vehicles.

“So, consumers were encouraged to select those cars,” said Konuma.

Of the US\$1.4 billion released by the Indian government, about US\$1.2 billion has been earmarked for subsidies, US\$140 million for charging infrastructure, and some US\$5 million for administrative expenses and advertising.

UN Environment’s e-mobility program supports countries, particularly emerging economies, in introducing electric mobility. It helps governments to develop policies, exchange best practices,

pilot technology options, track electric vehicle uptake, and calculate emissions and economic benefits.

44. India Goes Electric With Battery-Swapping Rickshaws

Pankaj Kumar drives his autorickshaw up to a charging station in a covered parking lot in Gurugram, a satellite city of New Delhi. He flips open a lid on the side of the box that was the driver's seat. One at a time, he pulls out the two batteries powering the small vehicle, each about a foot high, five inches wide, and weighing 26 pounds. Kumar taps his key fob on the station, a large black box a bit shorter and wider than a vending machine. A locker pops open, revealing a fully charged battery. He pops it in, then repeats the action for the second battery. After just a few minutes of downtime, Kumar and his electric ride are back on the road, fully charged and looking for the next fare.

Globally, transportation accounts for 15 percent of greenhouse gas emissions, and electric vehicles are a big part of the solution. In the US and Europe, governments have worked to push people into electric cars. But in India, where fewer than four million cars are sold annually, two wheelers, autorickshaws (called tuk-tuks in other Asian countries), and buses remain the dominant modes of transportation. Which is why some manufacturers are now, for the first time, starting to power them with electricity instead of gasoline.

For Indians, this is about more than meeting the commitment they made in the Paris climate agreement. A study published in *The Lancet* found that in 2017, the country's air pollution—some of the worst in the world—killed 1.24 million people. In February, the government, in a bid to get more people out of gas-burners, approved a \$1.4 billion, three-year scheme to subsidize electrics. (See story above.) Still, the vehicles remain out of reach for most buyers.

One company thinks it has an answer: drive down costs by splitting the vehicle from its most expensive component, the battery. A not quite two-year-old joint venture between electric car maker Virya Mobility 5.0 and solar power company SUN New Energy Systems, SUN Mobility is working with EV makers, providing the batteries for those vehicles. The twist is that SUN retains ownership of the batteries. When they run low, the driver heads to a SUN station and exchanges them for fresh ones, paying only for the electricity he has consumed.

"Our solutions for India need to be a little different," says cofounder Chetan Maini, a longtime advocate for ditching internal combustion. He built India's first electric car, the Reva, in 1999. The tiny two-seater ran on lead acid batteries and never broke past novelty status. Today's lithium-ion batteries offer better performance and pricing, but in India, even a \$35,000 Tesla Model 3 is nowhere near workable for the vast majority of drivers. "When you separate the batteries, it's cost neutral in the immediate term and cheaper in the mid to long term," Maini says.

SUN Mobility is starting off not with cars, but with autorickshaws and buses. It has an agreement to provide bus manufacturer Ashok Leyland with batteries and charging services for 18 buses. It will supply batteries for 500 three-wheelers to SmartE, a startup that runs electric autorickshaws from metro stations to neighborhoods within a few miles. (Both companies are also working with battery providers running on traditional plug-and-charge models.) "We have tied up with SUN Mobility for when swap solution makes sense," said Karthick Athmanathan, head of electric vehicles and e-mobility at Ashok Leyland. "It's offering an innovative concept."

If this sounds familiar, it's because battery swapping has been tried before, most notably by Better Place. In the late 2000s, the Israeli company had raised more than \$800 million and convinced

Renault to make a car model using swappable batteries. But the idea never caught on, and Better Place went bankrupt in 2013. Maini dismisses the comparison, saying his business model is different. For one, the Israeli firm was focused only on cars and had tied up with one client (Renault) to sell its products. For another, its charging stations were expensive to install, and at least some were miles from the highway. SUN, Maini says, can work with any manufacturer. It can install its autorickshaw swapping stations, like the one Kumar uses for his vehicle, in crowded neighborhoods. SUN will fit its bus changing stations into 20-foot containers, using a robotic system to swap out the 1,430-pound battery in less than three minutes.

Not everyone is so confident. “There are no global standards on swapping, no large proven test cases,” says Jasmeet Khurana, who works on mobility for the World Business Council for Sustainable Development. “Conventional wisdom is that swapping works for smaller, lighter vehicles like two and three wheelers.”

The autorickshaw side of the business, indeed, has a more positive example to follow than Better Place. Since launching its battery swappable scooters in Taiwan in 2015, Gogoro has expanded to Japan, France, and Germany. Its riders now swap some 86,000 batteries a day.

Maini is convinced the market will support swappable batteries, and is in the process of signing new clients, including food and package delivery companies whose drivers are out and about on two-wheelers all day long. If those drivers are like Kumar, Maini shouldn't have a problem. “The other one takes too much time to charge,” Kumar says. “This is quick and I can get back to work and get back to earning money.” And keep the air cleaner while doing it.

45. Seoul to Restrict Polluting Vehicles From Popular Downtown Area

South Korea's capital city is taking aim at its fine dust with a rollout of changes to public and private transportation. With hazardous fine-particulate matter at the top of the national agenda since it reached a record-high last month, the Seoul Metropolitan Government announced April 15 that it will restrict high-emissions vehicles from popular downtown streets and swap out city buses for more environmentally friendly options.

Starting in July, “Grade 5” emissions vehicles will be forbidden from entering Seoul's Green Transport Promotion Zone, a 6.5-square mile region known for its picturesque fortress walls and palace gates dating back to the late 1300s, for most hours of the day.

Grade 5 emissions vehicles, which are mostly diesel-fueled cars, are considered the worst offenders for pollutants that give rise to fine dust particles and contribute to air pollution.

The decision to restrict the vehicles from the tourist district in Seoul came after the Korean government placed temporary restrictions on older diesel-fueled models last year during spikes of fine particulate matter (PM2.5) and poor air quality.

The ban will start at 6 a.m. and end sometime between 7 p.m. and 9 p.m., according to Lee Hye-young, an official who works on air policy at the Ministry of Environment. Drivers who violate the restrictions will face a face a 250,000 South Korean won (\$220) daily fine, starting in December.

Between 20,000 and 30,000 highly polluting Grade 5 vehicles are estimated to travel daily through the Green Transport Promotion Zone.

The environment ministry plans to eventually extend the restrictions on highly polluting cars to other parts of Seoul, according to Lee, but those areas have yet to be identified.

In addition to the expected crackdown on high-emissions private vehicles, the Seoul Metropolitan Government announced April 15 a 22 billion won plan to swap out city buses and motorcycles with better alternatives. South Korea's capital city will replace 444 diesel-powered buses with electric alternatives by 2023. The change is expected to cut nitrogen oxides emissions by at least 37 metric tons, Lee said.

City officials also will work with restaurants and food companies to phase out 100,000 diesel and gas-fueled delivery motorcycles with electric versions by 2025, according to a government release, which emphasized Seoul city roads as a "breathing space for citizens."

46. DOTr Suspends 6 Philippines Emission Testing Centers For Falsifying Results

Six Private Emission Testing Centers (PETCs) have been suspended for 90 days for falsifying results, the Department of Transportation (DOTr) said recently. In an advisory, DOTr said it issued the preliminary suspension order through its Investigation Security and Law Enforcement Staff on March 13 to the following PETCs:

- Cotabato Emission Diagnostic Testing Center – Midsayap, Quezon Ave., Poblacion 8, 9410, Midsayap
- Blue Circle Private Emission Testing Center – 2nd East Extension, Tubo, 9200, Iligan City
- B and B Emission Test Center – B1 Sasa Commercial Center, Km. 11, Sasa, 8000, Davao City
- Palomino Private Emission Test Co. – Zone 1, Bantiles, Bugo, 9000, Cagayan de Oro City
- Alfonso Lista Emission Testing Center – Sta. Maria Alfonso Lista, 3608, Ifugao
- MDS Emission Testing Center – Baloc, Sto. Domingo, 3133, Nueva Ecija

Similarly, DOTr said it also served suspension orders to IT service providers of the six emission testing centers, saying they "shall be subject to the same penalties should it disregard the said order by continuing to process any data transmitted by such PETCs."

47. Australia's Transport Pollution From Cars And Trucks Is Soaring

A damning report from international research firm Climate Analytics is lending substantial weight to the argument that Australia needs to improve its scorecard on clean transport. Pollution from light passenger vehicles and heavy transport is soaring, the report shows, up 57% in 2017 since 1990 and projected to rise to 82% from 1990 levels by the end of the decade.

Cars are the worst offenders, with CO₂ levels emitted by passenger vehicles increasing 25% from 1990 to 2017 and accounting for the majority of CO₂ levels overall.

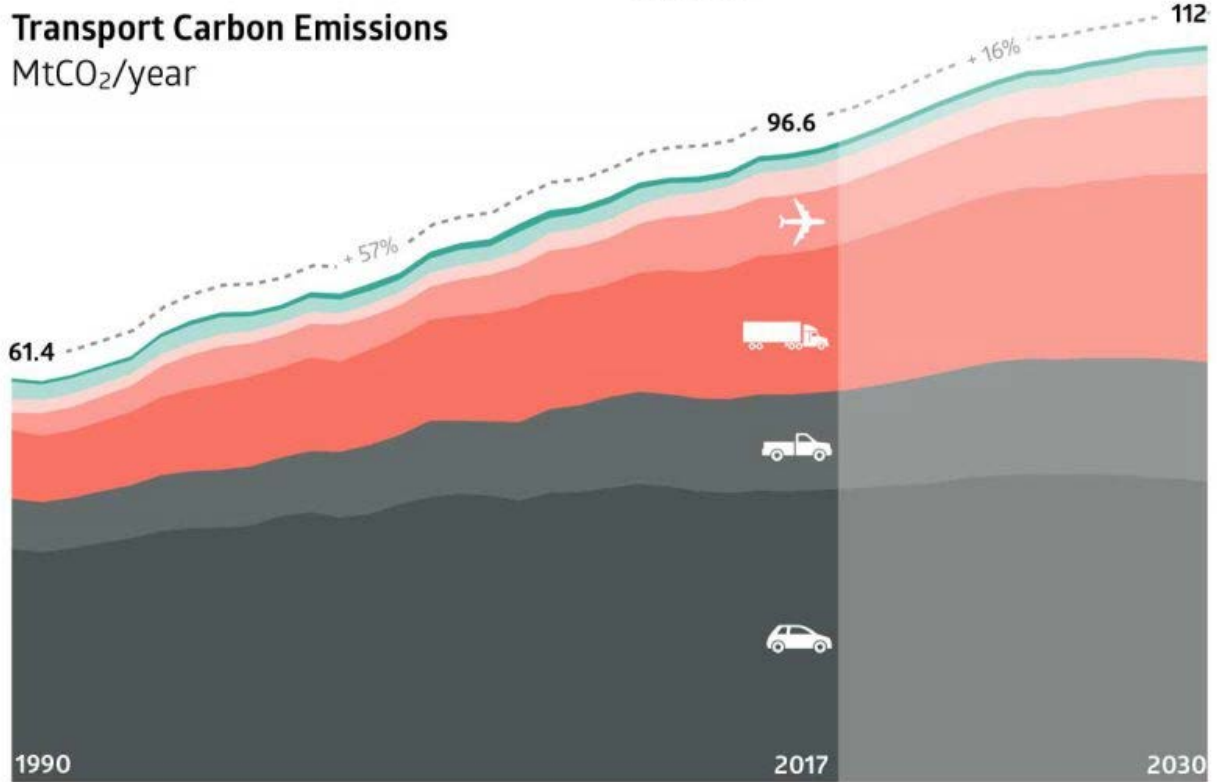
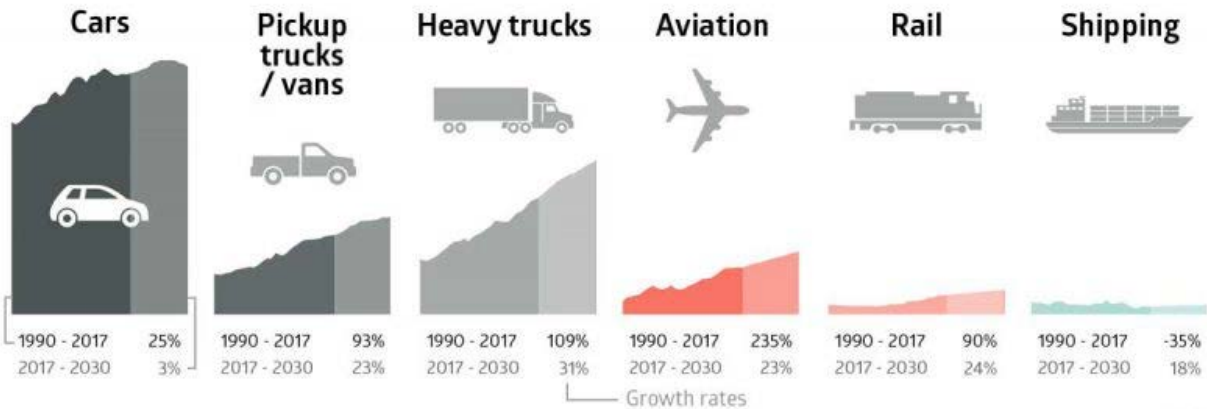
Heavy trucks and Utes/vans combined account for an equal amount of CO₂ emissions as cars, with both doubling in emissions from 1990 – 2017.

Aviation, while accounting for a much smaller proportion of CO₂ emissions, increased by an incredible 235% from 1990 – 2017.

The rapidly rising levels of CO2 are due to a lack of strict fuel emissions regulations that now govern 80 per cent of light vehicles globally.

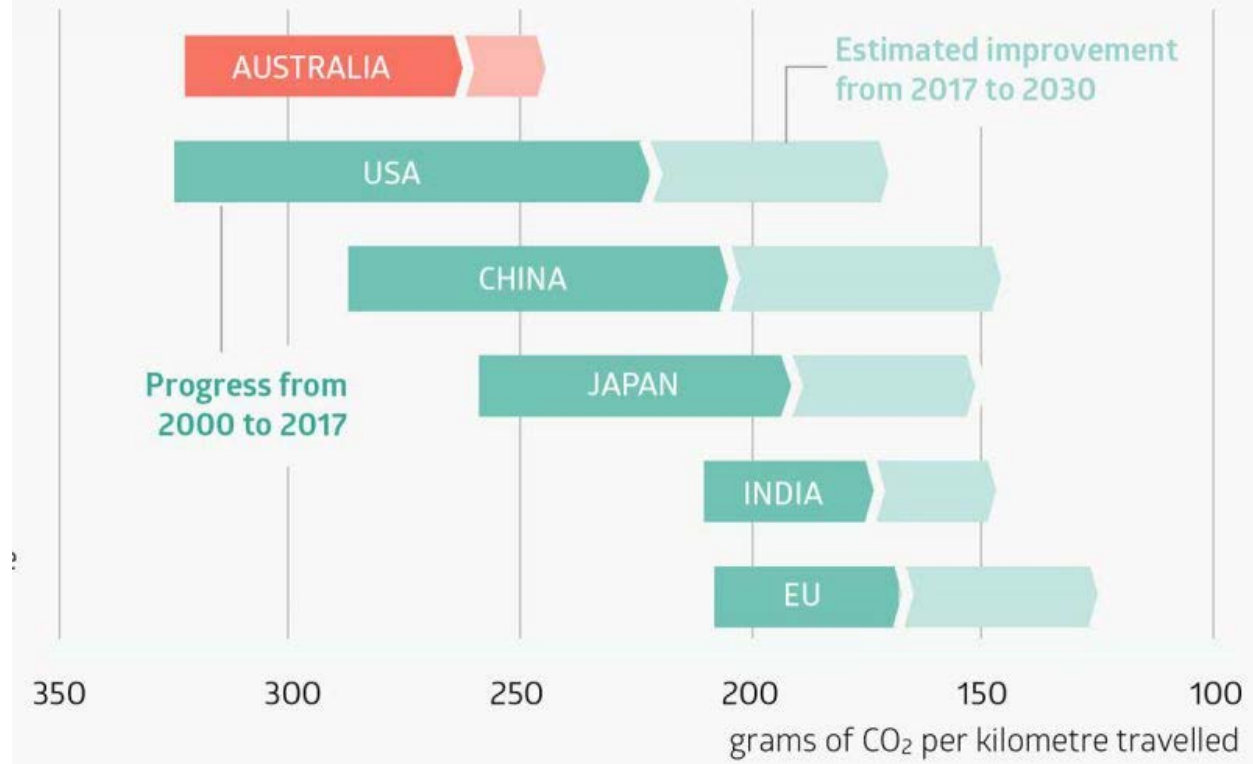
The USA, China, Japan, India and the EU have all improved fuel emissions, with the EU leading the way followed closely by India.

While the USA's auto market is most closely compared to Australia's in terms of segment popularity (e.g. "pickups" or Utes, and SUVs), the USA is far ahead of Australia in terms of grams of CO2 released per kilometer.

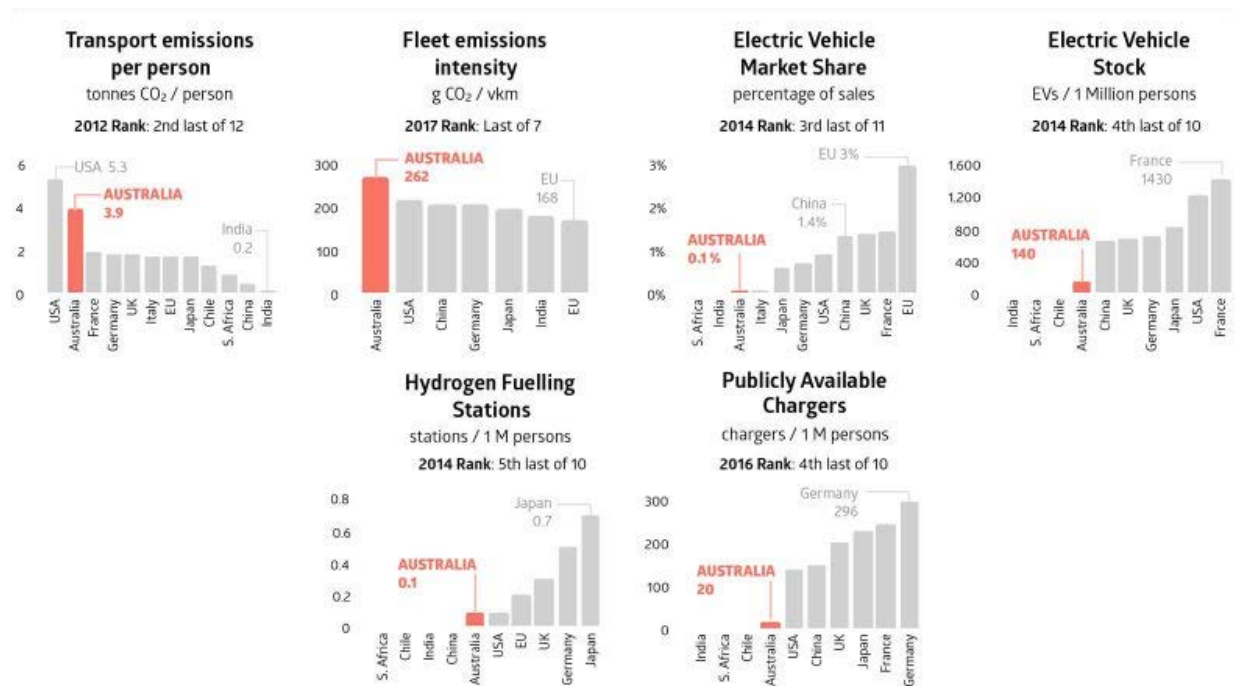


Source: Climate Analytics

Comparing emissions performance of car and truck fleet



Source: Climate Analytics



In many key indicators considered by the report, such as transport emissions per person, EV market share and access to charging infrastructure, Australia is falling well behind other markets.

The figures, which show that if Australia is to help meet the obligations of the Paris Agreement it must work towards zero emissions transport by 2050, have elicited a call from the Australian Conservation Foundation (ACF) for stricter fuel efficiency standards and a ban on sales of high emissions vehicles.

ACF's Chief Executive Officer, Kelly O'Shanassy, said in a note that successive governments had dropped the ball on mandatory fuel efficiency standards, incentives to take up electric vehicles and installing charging infrastructure.

The call comes as Australia gears up for an imminent federal election, with a dire need for a purposeful climate change policy fueling discussion on the state of electric vehicles in Australia.

"Australia has been considering mandatory climate pollution and fuel standards for years and years – but governments have fallen for reckless scare campaigns and shirked implementation. "As a result, Australia is the only country in the OECD without mandatory climate pollution standards for cars and trucks. "Australia has also been slow to encourage the adoption of electric vehicles and has no national strategy, targets or infrastructure support.

"Countries like China, India and France have started to adopt forward thinking regimes that Australia should follow."

Recently the Coalition government confirmed that it would not be releasing a national electric vehicles strategy until mid-next year.

The statement has sparked response from opposition party Labor which only this morning announced a new climate policy highlighting an electric vehicle strategy of 50% passenger electric vehicle sales by 2030 and 50% government electric vehicle sales by 20205. (See story above.)

48. Government Accused Over Australia's Failure To Cut Vehicle Emissions

Cuts to carbon emissions from vehicle efficiency standards have been left out of government projections for meeting Australia's Paris climate commitments, indicating the policy has been shelved. The office of the transport minister, Michael McCormack, said the government had not decided on "how or when" standards to cut carbon pollution from vehicles might be implemented.

After almost five years of submissions a spokesman said the government "is not going to rush into a regulatory solution" with regards to vehicle emissions.

New data shows Australia's emissions from transport are soaring and projected to be 82% higher in 2030 than they were in 1990.

Australia lags behind the rest of the world in setting vehicle efficiency standards, with most countries in the OECD adopting policies to reduce emissions and improve the efficiency of cars.

The ministerial forum on vehicle emissions was set up under the Turnbull government in 2015, and stakeholders are frustrated at the lack of progress.

Fact sheets produced by the government that set out how it intends to reach Australia's emissions reduction targets under the Paris agreement suggest any policy on vehicle emissions standards has been abandoned.

In 2015, the government produced a graph indicating it expected to achieve cuts of about 100m tons between 2020 and 2030 through vehicle emissions standards. The government's latest climate package contains no mention of this, and projects only about 10m tons of abatement through an electric vehicle strategy, with no reference to vehicle emissions standards.

The Victorian government asked what progress had been made on vehicle standards at the December meeting of environment ministers, but its questions were dismissed, sources told Guardian Australia.

Environment groups and the automotive lobby have asked for clarity before the election.

The chief executive of the Australian Conservation Foundation, Kelly O'Shanassy, said it had hoped for more progress towards cleaning up the "woefully dirty" national car fleet. "But 18 months of radio silence and the removal of proposed standards from pollution abatement estimates out to 2030 strongly suggests the government now has no intention of establishing them."

In 2017, interest groups consulted as part of the ministerial forum were sent a model proposing a standard of 105g of carbon dioxide per kilometer for Australian light vehicles, phased in from 2020 to 2025. The proposal would have brought Australia broadly into line with vehicle standards in the US and was forecast to deliver a net economic benefit of \$13.9bn. But it faced opposition from the National party and the automotive lobby and was painted as a carbon tax on cars.

The independent senator Tim Storer, who chaired a Senate inquiry into electric vehicles last year, said the lack of progress was "embarrassing", given there was "clear evidence of cost benefit" in bringing in the standards.

Labor's climate policy, due to be announced soon, is expected to point to a target of 105g of carbon dioxide per kilometer. The Greens have proposed vehicle emissions standards "that lead up to a complete ban on new internal combustion vehicles by 2030".

The chief executive of the Australian Automobile Association, Michael Bradley, said the industry wanted both sides of politics to make their positions clear, but the AAA remained opposed to the 2017 model. "We're supportive of an emissions standard but we're supportive of one that's reflective of Australians' vehicle preferences and our market," Bradley said.

A spokesman for McCormack said the ministerial forum was exploring ways to encourage the uptake of electric and low emissions vehicles. "The government has not made a decision on how or when noxious emission or fuel efficiency standards may be implemented," he said.

"It is interested in developing a sensible framework that places savings for motorists and health benefits for the community front and center while ensuring that the vehicles that Australians enjoy and love remain in the market."

He added: "The government is not going to rush into a regulatory solution, especially where it has the potential to increase the up-front costs of motor vehicles for Australians".

Much of the focus on Australia's carbon emissions has been on the electricity sector. But climate scientists and environment groups have been calling for more attention to carbon pollution from other industries. Transport accounts for 18% of Australia's greenhouse gas emissions, making it the second largest source.

Modelling produced by climate scientist Bill Hare for the Australian Conservation Foundation shows emissions from transport are climbing fast and are projected to be 82% higher in 2030 than they were in 1990. Cars represent the largest source of transport emissions and have grown by 25% since 1990.

Nearly 80% of new light duty vehicles sold globally, including in China, Japan, India, UK, the US and the EU, are subject to emission or fuel economy standards, while Australia has failed to implement any policy. "Australia is almost alone in not having any motor vehicle emissions standards for carbon dioxide and/or vehicle efficiency standards for liters per 100km," Hare said.

"That means that vehicles in Australia are much more inefficient and more costly to run than in the US or Europe or Japan."

Sarah Fumei, the project manager for ClimateWorks, said the federal government's own estimates showed emissions from the transport sector would grow by a further 9% from 2018 to 2030. She said introducing standards would be "a win-win policy" for the environment and motorists' hip pockets. "The Australian government should implement the strongest standard put forward in the 2016 Regulatory Impact Statement, which by 2030 would save motorists \$500 a year on fuel and reduce emissions by 12m tons," she said.

"Weaker standards will not achieve the same benefits."

49. Australian Opposition Reveals Ambitious Climate Change Action Plan

The opposition Australian Labor Party (ALP) has revealed its plan to cut the nation's emissions by 45 percent by 2030.

The ALP has released its Climate Change Action Plan, a 10-point plan to reduce emissions and increase Australia's reliance on renewable energy to 50 percent by 2030. It also includes an ambitious target for 50 percent of national vehicle sales to be of electric vehicles by 2030 and tax incentives for businesses who buy electric vehicles.

If victorious in May's general election, Labor will expand the existing safeguard mechanism that holds companies to strict emissions caps and will apply it to 250 businesses.

"Labor will take real action on climate change, by working with industries to bring down pollution, protect competitiveness and jobs, and build the industries of the future," the action plan said.

Climate policy will be a major issue in the lead-up to May's general election, with the ALP hopeful it can capitalize on some voters' dissatisfaction with the incumbent Liberal-National Party Coalition (LNP) on the issue.

Ahead of releasing the action plan, ALP leader Bill Shorten said in a statement that "climate change is real, and it's doing real damage to our environment and our economy." "Australians know the truth of this. Farmers understand that if we don't act on climate change, there will be more frequent and more protracted droughts, floods, dust storms and hail storms," he said.

"All Australians are aware that if we don't act on climate change, we're passing on a tougher problem and a worse environment to our children and grandchildren.

“For the sake of our economy, for the sake of our environment and for the sake of the country we want to hand on to the next generation, Labor has a clear plan to take real action on climate change.”

Responding to the policy proposal, Finance Minister Mathias Cormann compared it to the previous Labor government’s “carbon tax,” a policy which was key in Labor losing the 2013 election.

“What they have put out would harm the economy, would harm families, would cost jobs, would drive up unemployment and, indeed, Labor would bring back a carbon tax, they would force people across Australia to pay tens of billions of dollars in higher taxes, only for them to send that money overseas to pay for international carbon credits,” he told Australian Broadcasting Corporation (ABC) radio.

The electric vehicle policy would be the first of its kind in Australia and has won the support of the National Roads and Motorists’ Association (NRMA), which went even further in calling for a ban on the sale of petrol vehicles as early as 2025. “I would expect to start seeing targets that are between 2025, 2030 for banning (the sale of new) petrol-driven cars in this country,” NRMA Chief Executive Rohan Lund told the ABC.

“We don’t manufacture cars here. We’re recipients of the cars coming from Europe and from Asia.

“I think in many ways we won’t have a choice in this country.”

AFRICA

50. Auto Giants Battle Used Car Dealers For Africa's Huge Market

At the edge of Nairobi’s Ngong Forest, thousands of used cars glitter in the hot sun on a dusty field, waiting for buyers. Imported from Japan or the Middle East, they offer an affordable route to vehicle ownership in Kenya and have dominated the market for decades.

That is an obstacle big carmakers must overcome if they are to crack Africa, a market promising rapid growth as trade tensions threaten sales elsewhere. African consumers also still need conventional engines just as demand in more traditional markets is curbed by restrictions on carbon emissions.

Volkswagen, BMW, Toyota, Nissan and others have joined forces to lobby governments for steps that would reduce the imports that have made sub-Saharan Africa notoriously difficult terrain and allow local production to flourish.

“The question on Africa isn’t, ‘Is it a market of the future?’” Mike Whitfield, Nissan’s top executive for Africa, told Reuters. “It’s a case of when.”

Four years after forming the Association of African Automotive Manufacturers (AAAM) their efforts are starting to bear fruit. Carmakers that set up local assembly plants could get tax holidays of up to 10 years and duty exemptions in Nigeria, Kenya and Ghana, according to government plans seen by Reuters.

Thomas Schaefer, who heads Volkswagen’s Africa business, said there is a potential market in sub-Saharan Africa for 3 to 4 million new cars, up from just 420,000 in 2017. But that will require

addressing the well-entrenched interests of second-hand car dealers, smugglers and lowering the price of new cars. "It will largely depend on how successful the African governments are in limiting the amounts of second-hand imports and how price-competitive new vehicles can be with their tariffs," said Craig Parker, Africa research director at Frost & Sullivan, a U.S.-based market research firm.

Africa's population and household incomes are rising rapidly. But its 1 billion inhabitants account for only 1 percent of the world's new passenger car sales, industry data shows. South Africans bought over 85 percent of those vehicles.

The AAAM identified Kenya, Nigeria and Ghana as potential manufacturing hubs and helped draft legislation setting up standards and incentives.

Details of governments' plans provided to Reuters demonstrate that African nations are keen to secure a spot as a beachhead for the industry. Nigeria and Ghana are preparing to offer automakers tax holidays of up to 10 years and duty-free imports of parts and components used in local assembly. Nigeria also plans to double the levy on new, fully-built imported vehicles to 70 percent to boost demand for locally produced cars, though the policy's approval has been delayed. In Kenya, automakers will pay no import or excise duties and get a 50-percent corporate tax break. For African nations facing massive demographic pressures, such concessions make sense if they create jobs, said Jelani Aliyu, of Nigeria's National Automotive Design and Development Council. "The multiplying effects are exponential," said Aliyu, who foresees supporting industries developing around the plants.

Legislative and fiscal frameworks are being finalized, but companies are already investing millions of dollars in new plants.

VW and Nissan have set up operations in Nigeria, Kenya and Ghana or have pledged to do so. Honda and Peugeot have launched assembly plants in Nigeria, and Peugeot has done the same in Kenya. Carmakers sorely need the business. Their South African divisions, which typically direct operations elsewhere on the continent, face stagnating domestic sales and scant growth prospects in their main export market, Europe. A chaotic Brexit or U.S. tariff hikes could further dampen sales.

Toyota South Africa's chief executive Andrew Kirby said the strategy is: "Focus on Africa because Africa is going to grow significantly."

A pivot to Africa could also help insulate automakers from the immediate effects of the electric vehicle revolution. The continent is ill-placed to join it at the moment due to the higher prices of EVs and unreliable power grids. Just 66 electric cars were sold last year in South Africa - the continent's most developed economy.

"Africa will most likely remain as the last bastion of internal combustion engines," Parker said.

Nevertheless, industry officials say the biggest hurdle to developing the market for new cars is dumping from countries such as Japan, where strict vehicle inspections force cars out of circulation after just a few years.

They say this distorts the market by allowing dealers to buy the cars at scrap prices and export them to Africa.

They blame the cheap imports for killing off assembly sectors in a number of African countries including Nigeria, which built around 150,000 cars per year until the 1980s.

Political will is needed to change that, and without it there is little point in considering a country for local production, according to VW's Schaefer. "The markets ... are literally not functioning right now due to importation of used vehicles," he said.

In Kenya, the government plans to wind down imports of cars more than three years old by 2021. Exceptions will be made for passenger vehicles with 1.5 liter or smaller engines.

The policy could see mid-range imported models double in price, according to the 300-member Kenya Auto Bazaar Association (KABA). The lobby group has taken out ads in local newspapers denouncing the policy and is demanding a meeting with Kenya's president.

Mark Oburu, KABA's vice-chairman, said the move would hit an industry that delivers 85 percent of Kenyan car purchases. "The middle class will not be able to own a vehicle of their choice," he said.

In the Nairobi bazaar, Grace was shopping for her eldest son's first car. She said she could not afford to buy a new one. "If they don't rescind that decision, we will be on boda bodas (motor-bikes)."

Both Ghana and Nigeria have also pledged to tackle the issue. Nigeria hiked taxes on imported used cars in 2014, but smuggling has undermined that effort to boost demand for local production, according to manufacturers and government officials.

Used cars are also among the leading imports in many African countries, and governments will have to wean themselves off the associated tax revenues.

There are other stumbling blocks: access to financing is limited, and countries that don't host assembly plants must also be persuaded to limit used imports and reduce tariffs on African-made vehicles. That will be hard to do if the only outcome they see is higher sticker prices.

"The purpose is not to take the most lucrative slice of the industry," said Ghana's minister of trade and industry, Alan Kyerematen, suggesting that neighbors could produce components for his country's assembly plants.

Auto executives acknowledge the challenges but point to a famous precedent. When VW and GM entered China in the 1980s and 90s, vehicle ownership rates were lower than in many African markets. Today, those two companies alone sell over 3.5 million vehicles annually in China. "Everybody was laughing, saying China doesn't need cars, they only need bicycles," Schaefer said.

51. China Taking Lead In Promoting Use Of Clean Vehicle Technologies: UN Official

Chinese companies and government have taken the lead in promoting the use of cleaner vehicle technologies around the world through partnerships with national and city authorities, a UN Environment Program official said.

Jane Akumu, program officer in charge of the Air Quality and Mobility Unit at the Economic Division of UNEP, said through its work with Chinese authorities, progress is being made locally and regionally to introduce cleaner city transport technologies in Africa.

"We are collaborating with China. China is looking for partnerships on how to implement some of these technologies through awareness creation," Akumu told Xinhua in a recent interview.

"They are willing to transfer these technologies and plants to Africa," she added.

Chinese electric cars and motorcycle maker TAILG announced recently in Nairobi its plans to donate electric cars and motorcycles to African city authorities to be used in pilot studies ahead of possible introduction of the more technologically efficient vehicles for city transport.

The Chinese firm is presently engaged in efforts to increase the ownership of electric bicycles and other two-wheelers as a strategy to reduce the consumption of oil, which leads to greenhouse gas emissions.

"Air pollution has become a serious problem because of industrialization...if developing countries can use new technologies such as the electric cars to reduce air pollution, we are willing to partner in the pilot projects. These would require government policy support," said Jayson Huang, General Manager at TAILG.

The UN environment officials are also currently in discussions with the Chinese authorities on how to accelerate the production and availability of vehicle sensors to regulate the emissions from fossil fuels used in cars.

According to Akumu, the UNEP is currently encouraging governments to use tax measures to promote the use of clean technologies. "It would take policies, taxation and standards to achieve these clean technology use. There is also the issue of consumer awareness. How can you encourage these? You do it by making consumers know that a certain product is good. Awareness is quite important," Akumu said.

She said those discussions are focused on how the Chinese manufacturers could engage in producing the vehicle sensor systems to detect carbon emissions from all types of fuels used in cars in developing countries. These would be mounted on the vehicles to monitor carbon emissions.

"We are partnering with China to see how they can bring these technologies to developing countries. The developed countries are quite ahead in technology; our work is in developing countries," Akumu said.

In Kenya, the Chinese firm has partnered with the County government of Kisumu in western Kenya, to introduce an initial 50 electric motorbikes with plans to introduce other more technology efficient vehicles and street lighting using solar technology to reduce the consumption of fossil fuels, Jayson said.

"The power of success will help us deal with the resistance to technology," said Anyang Nyong'o, Governor of Kisumu who said the county government will benefit from the use of electric bikes.

GENERAL

52. State of Global Air 2019 Report Released

On April 3rd, HEI's State of Global Air 2019 report was released. It presents information on patterns and trends in air pollution and the associated health effects based on the results from the Global Burden of Disease 2017. This is the third release of this report, and key highlights include:

- A major new section on life expectancy (magnitude of life loss for a child born today – an average of 20 months lost worldwide)
- High pollution levels in India and South Asia, and
- Positive news about initial emissions reductions in China from 2013-2017.
- Additional estimates for diabetes in calculation of the disease burden

Overall, air pollution is the fifth ranking risk factor worldwide – just below smoking and above many others – with nearly 5 million early deaths estimated from outdoor and indoor air pollution, and India and China leading the health burden. South Asian countries including Nepal, Pakistan, India and Bangladesh collectively account for more than 1.5 million deaths. Also, globally, more than 90% of the population continues to live in areas where the PM_{2.5} concentrations do not meet the WHO Guidelines for healthy air.

Some of the Key Facts in the report include:

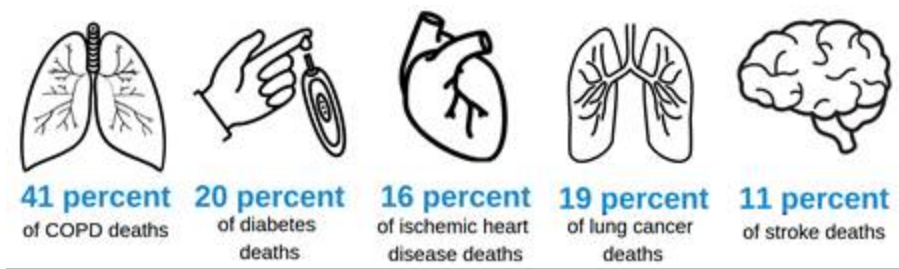
- More than 90 percent of the world's population lives in areas where fine particle levels exceed WHO Guideline for healthy air.
- Air pollution is the fifth leading risk factor for mortality worldwide. Each year, more people die from air pollution-related diseases than from road traffic injuries or malaria.
- In 2017, air pollution is estimated to have contributed to close to 5 million deaths globally — nearly 1 in every 10 deaths.

Number of Deaths Attributable to Air Pollution in 2017.



- Air pollution exposures, including exposure to outdoor fine particulate matter (PM_{2.5}), household air pollution (HAP), and ozone, have been linked with increased hospitalizations, disability, and early death from respiratory diseases, heart disease, stroke, lung cancer, and diabetes. Most (82%) deaths are from chronic non-communicable diseases.
- In 2017, exposure to PM_{2.5} was the third leading risk factor for deaths and years of healthy life lost due to type 2 diabetes, after high blood sugar and high body mass index.

Percentage of global deaths from each cause attributed to air pollution in 2017



- Air pollution collectively reduced life expectancy by 1 year and 8 months on average worldwide, a global impact rivaling that of smoking. This means a child born today will die 20 months sooner, on average, than would be expected in the absence of air pollution.
- In 2017, the highest annual average exposures to PM2.5 (population-weighted concentrations) were in South Asia, led by Nepal (100 $\mu\text{g}/\text{m}^3$), India (91 $\mu\text{g}/\text{m}^3$), Bangladesh (61 $\mu\text{g}/\text{m}^3$), and Pakistan (58 $\mu\text{g}/\text{m}^3$).
- The region with the second-highest average PM2.5 exposure was western sub-Saharan Africa with 59 $\mu\text{g}/\text{m}^3$.
- In East Asia, China continues to experience the highest population exposures to PM2.5 (53 $\mu\text{g}/\text{m}^3$). However, PM2.5 levels have declined by nearly 20% since the implementation of stringent air pollution controls in 2013.
- Nearly half of the world's population — a total of 3.6 billion people — were exposed to household air pollution in 2017.
- Globally, the proportion of people cooking with solid fuels has declined from about 64% in 2005 to 47% in 2017. However, disparities persist, and less-developed countries continue to suffer the highest exposures to household air pollution.
- Ozone contributed to approximately 472,000 deaths globally from COPD in 2017.

53. Marketing: Who's Winning The Electric Vehicle Race?

Oil-rich Texas is an unlikely spot for an electric vehicle demand surge. But John Luciano, general manager of a Volkswagen dealership in Amarillo, says his customers are juiced about EVs, suggesting the market might finally emerge from niche status nationally. "If there is interest in Amarillo, Texas—which is truck country—there is definitely interest," he says.

Automakers are banking on it. Billions of dollars are flowing into the sector, with Ford, General Motors, Nissan, Honda and other big auto brands making grand pronouncements about their electric vehicle ambitions. Volkswagen Group, whose brands include Audi and Porsche, recently announced it will launch an estimated 70 new electric models in the next 10 years—up from its previous 50-model projection—accounting for 22 million vehicles globally. Audi last month ran a Super Bowl ad touting its claim that one-third of its new models will be electrified by 2025. "A thrilling future awaits. On Earth," the ad boasted.

But there could be plenty of chills along with the thrills as brands look to overcome long-held consumer concerns about EVs. These include their relatively expensive price tag when compared to similar gas-powered models, and so-called "range anxiety," which refers to fears of being stranded, out of power, with no charging station in sight.

Technological advances, including investments in charging infrastructure, will quell some of the angst. But it will be up to marketing departments to get the word out with advertising that reaches beyond tree-hugging EV loyalists or wealthy, tech-obsessed buyers—all without overspending on a sector that remains unpredictable.

"It's very much a build-it-and-they-will-come belief that's going on now, which is very difficult," says Mark Wakefield, a managing director at global consulting firm AlixPartners. The firm projects that automakers will spend \$260 billion on EV development in the eight-year period that began in 2016. "The marketing spend will start to follow," Wakefield says. But because the segment has been so small—and largely unprofitable—brands so far "haven't really wanted to do the 'why-buy-now' bottom-funnel marketing," he says.

A tipping point could come in 2022, when the cost of owning a battery electric vehicle will finally be on par with owning a gas-powered one, according to a report by Deloitte published earlier this year (before VW made its production forecast). This will help spur global EV sales to reach 21 million vehicles annually by 2030, up from just 2 million last year, the report predicts.

Governments are playing a role. Twenty global cities, including Paris, plan to ban gas- and diesel-powered cars by 2030, according to Deloitte. The regulation situation is cloudier in the U.S., where the Trump administration last week proposed ending the \$7,500 consumer tax credit on purchases of new electric cars. Presently, the credit phases out once an automaker sells 200,000 EVs, a level that GM and Tesla have already hit.

With so many models in the pipeline, Deloitte projects a global supply glut of 14 million EVs by 2030. The supply-demand imbalance could lead to intense brand battles in the years ahead, with advertising playing a key role.

In the U.S., Tesla has been winning the EV war, without much competition. The trendsetting electric vehicle maker accounted for 80 percent of the 239,492 battery electric vehicles sold in the States last year, not including gas-electric hybrids, according to figures provided by Kelley Blue Book. While total EV sales jumped from 105,949 in 2017, the segment still only accounts for about 2 percent of total auto sales.

And Tesla has stumbled trying to enter the mainstream market, leading to a cash crunch. In late February the company announced it was closing almost all its stores in a cost-cutting move meant to fund a price cut on the Model 3, its first mass-market EV, to the long-promised \$35,000 level. (The starting price had most recently been \$42,900.) Days later Tesla reversed course, saying that it would indeed keep some stores open but would raise prices on its more expensive Model S and Model X vehicles. Wealthy buyers have fueled demand for those vehicles, a factor that has led competing luxury brands like Audi, Porsche, Jaguar and Mercedes to step up their EV plans or risk losing clout with affluent buyers.

"They want in. They have seen Tesla eating into their sales," says Tim Fleming, a forecaster at Kelley Blue Book, of the luxury automakers.

Tesla broke through by mostly shunning traditional advertising, unless you count the seemingly daily headlines garnered by its mercurial CEO, Elon Musk. "They have already built a very strong brand," says Autotrader analyst Michelle Krebs.

But marketing could play a bigger role as the luxury EV market heats up. Krebs expects established brands to do more traditional advertising, but asks, "What is Tesla going to do?"

Certainly, they don't have the kind of money that an Audi or a Porsche has to do that kind of advertising."

Audi's marketing push comes as it prepares to launch three battery electric vehicles—part of its new e-tron series—in the next three years in the U.S., beginning with an SUV that has a \$74,800 starting price. Marketing includes influencer deals with Judner Aura, who runs a YouTube page reviewing tech products that has more than 2 million subscribers. A recent video shows him test-driving an e-tron at a car-racing resort in Spain.

Audi is also planning TV ads for the SUV, which will hit dealers in the second quarter. Loren Angelo, VP of marketing for Audi of America, declined to reveal details, but says, "What we want to do is dispel some of the myths around EVs."

Range anxiety and lack of charging infrastructure are the top two consumer concerns limiting EV growth, according to an AlixPartners survey. But according to the Deloitte report, fears will fade with the next generation of battery electric vehicles, with new models capable of getting anywhere from about 250 miles to 620 miles per charge.

Audi says its e-tron SUV gets 160 miles after 30 minutes of high-speed charging. The brand touts a partnership with Amazon Home Services in which buyers can sign up to have an electrician install a home-charging unit. For e-tron buyers, Audi is giving away 2,000 miles worth of charges at sites run by Electrify America, which is building a nationwide network of such sites, expected to number 484 across 42 states by July. Audi parent Volkswagen formed Electrify America in 2016 as part of a legal settlement related to VW's diesel scandal, in which it had installed devices on diesel cars to cheat on emissions tests.

Electrify America is also shoveling millions of dollars into a brand-agnostic electric vehicle awareness campaign. The group earlier this month tapped San Francisco agency Eleven to oversee a 30-month, \$62 million marketing effort that begins in July. Mike McKay, chief creative officer at Eleven, suggests the best ad approach is to lean in to practical points—such as the fact that most EVs today look like normal cars—rather than to play up environmental benefits. "Everyone is aware that the electric car is better for the planet. I think that job is done," he says.

Honda—whose goal is to generate two-thirds of its global sales from electrified vehicles, including gas-electric hybrids—also favors a practical approach. "A lot of it is just simplicity in the messaging," says Susie Rossick, assistant VP of Honda national and regional marketing.

Honda recently began an Electrification Education program that includes dealership point-of-purchase kits "so we have something next to the vehicle that speaks English, that doesn't speak technology," Rossick says. On its website, Honda runs a quiz to help people pick the right electrified car—a hybrid or fully electric one—based on factors like where buyers live. Currently, Honda only sells its all-electric Clarity in California and Oregon—where charging stations are widely available—while its hybrids are available nationally.

In the meantime, Hyundai is prepping a "green family" campaign that will debut later this year. It will combine Hyundai's multiple hybrid and electric models as well as its hydrogen-powered Nexo fuel cell SUV. "We feel that from an efficiency standpoint, a messaging standpoint, we've got to roll everything up into a family to show some breadth and width of the offering," says Dean Evans, chief marketing officer at Hyundai Motor America.

Volkswagen of America has yet to outline marketing details for its forthcoming EV onslaught, which includes a line of vehicles under its new I.D. sub-brand. "Given the importance of EVs to the brand, we plan to put significant dollars against marketing efforts," a VW spokesman stated in an email. Crafting VW's EV marketing future was a key part of the automaker's recent global ad agency review. Last month, Johannes Leonardo was named the automaker's lead shop in the U.S.

In Texas, VW dealer Luciano says there's a lot of chatter about VW's I.D. Buzz, modeled after the classic Microbus. It won't hit the market until 2022. "I've been doing this 38 years and it's been a long time since I've seen the interest in a vehicle like I've seen with I.D. Buzz," he says. Once a skeptic about EVs, Luciano is now sold. "There are many people who will never drive them. But there are just as many people who think it is the only way to go."

54. Ship Owners Worry About Clean Fuel Bill As Ports Ban 'Scrubbers'

More ports around the world are banning ships from using a fuel cleaning system that pumps waste water into the sea, one of the cheapest options for meeting new environmental shipping rules.

The growing number of destinations imposing stricter regulations than those set by the International Maritime Organization (IMO) are expected to be a costly headache for cruise and shipping firms as they face tough market conditions and slowing world trade. They might have to pay for new equipment and extra types of fuel and adjust their routes.

Singapore, China and Fujairah in the United Arab Emirates have already banned the use of the cleaning systems, called open loop scrubbers, from the start of next year when the new IMO rules come into force.

Reuters has learned that individual ports in Finland, Lithuania, Ireland and Russia, have all banned or restricted such equipment, according to interviews with officials and reviews of documents by Reuters. One British port has occasionally imposed restrictions.

Norway is also working on open loop scrubber bans around its world heritage fjords, an official with the climate and environment ministry told Reuters. A ban on all types of scrubbers is also proposed, the official added.

The IMO rules will prohibit ships from using fuels with sulfur content above 0.5 percent, unless they are equipped with exhaust gas cleaning systems. The open loop scrubbers wash out the sulfur and some industry experts believe they are the cheapest way to meet the new global rules.

Companies that invested in open loop scrubbers will be unable to use them while sailing through those port waters. They also fear the IMO rules could change again and ban open loop scrubbers altogether.

The world's top cruise operator Carnival Corporation has invested over \$500 million to deploy the devices.

Carnival's Mike Kaczmarek, senior vice president for marine technology and refit with oversight of the group's scrubbers program, said the port moves were "very troubling". "The more ports that participate in this, the greater the (economic) impact," he said.

“A lot of people out there...in good faith have made significant investments.”

Ships with open loop scrubbers docking or sailing through those ports would need to store waste in tanks until it could be discharged elsewhere or avoid the ports. The other option is to use a scrubber with a “closed loop”, which stores the waste until it can be treated on land. There are also hybrid scrubbers with a loop that can be open or closed.

Ship owners could also choose another energy source such as low sulfur fuel or liquefied natural gas (LNG). Some experts say there will be enough low sulfur fuel available to avoid fitting scrubbers.

Data from Norwegian risk management and certification company DNV GL shows there will be a total of 2,693 ships running with scrubbers by the end of 2019 - based on current orders – and over 80 percent of them will be open loop devices, compared with 15 percent using hybrid scrubbers and 2 percent opting for closed loop scrubbers.

Initial research to date into the environmental impact of open loop scrubbers has produced a range of results. The ports and authorities that have banned them have acted in anticipation of studies that conclusively show the discharge is harmful, environmental groups say.

International regulation often lags local action and the IMO rules were agreed in 2016 after years of tense discussions.

An official with Sweden’s Gothenburg port said it recommended shipowners in their waters not to use open loop scrubbers as a precautionary principle to “avoid discharges of scrubber wash water in coastal waters and port areas”.

Businesses are waiting to see if the IMO rules will change.

“What is terrible for business is uncertainty in regulation and changes which are not broadcast well in advance,” said Hamish Norton, president of dry bulk shipping group Star Bulk Carriers, among the biggest investors in scrubbers.

Jurisdictions that have not imposed restrictions are also watching closely.

The IMO encouraged member states in February to research the impact of scrubbers on the environment. An IMO spokeswoman said it was up to countries to make any proposal to tighten scrubber regulation, which would need consensus approval by its 174 member states.

The 28 European Union countries submitted a paper to the IMO which said the use of open loop scrubbers was “expected to lead to a degradation of the marine environment due to the toxicity of water discharges”. It said it wanted to see “harmonization of rules and guidance”.

A separate paper submitted to the IMO, commissioned by Panama - the world’s top ship registration state - and conducted by the Massachusetts Institute of Technology, said more scientific investigation was needed.

A number of jurisdictions without bans, including Gibraltar, South Korea and Australia said they were investigating. “We will study to find out how harmful it is to oceans and then consider what actions we can take,” said an official with South Korea’s Ministry of Oceans and Fisheries.

“If the IMO sets out a guideline on this, we will comply.”

Others are pushing back. Japan’s Ministry of Land, Infrastructure, Transport and Tourism, said it concluded in research last year that there was little impact on the marine environment from scrubber water discharges.

Carnival said a study it commissioned concluded that scrubbers were safe and discharges were over 90 percent lower than maximum allowable levels in various waters.

Nevertheless, many in the industry expect the rules to change.

Ivar Hansson Myklebust, chief executive with Hoegh Autoliners, said at a recent Marine Money conference the vehicle transporter was not ordering any scrubbers. “The (open loop) scrubbers have a hard time passing the front page test taking pollutants from the air and dumping it into the sea,” he said.

New Report Finds Global CO₂ Vehicle Emission Reduction Measures Falter

Vehicle fuel economy improvements have slowed globally, according to the latest report from the Global Fuel Economy Initiative (GFEI): [Fuel Economy In Major Car Markets: Technology And Policy Drivers 2005-2017](#).

The slowdown was especially pronounced in advanced economies; 27 countries saw an increase or stagnation in average vehicle CO₂ emissions in the two years up to 2017.

The report, which this year for the first time includes an online, interactive country data browser, reviews developments in fuel economy and highlights the changes which have shaped the modern global fleet of light-duty vehicles (LDVs) over a 12-year period. It was authored by the International Energy Agency (IEA), in collaboration with the International Council on Clean Transportation (ICCT), and was funded by the FIA Foundation, through GFEI.

Overall, global fuel economy has improved by an average of 1.7% per year over the past 12 years, although the rate of improvement has slowed to 1.4% in the past two years.

Improvements in fuel consumption slowed in advanced economies to an average of just 0.2% per year between 2015 and 2017. A total of 27 countries—including Sweden, Canada and the United Kingdom—saw the fuel economy of their fleets stagnate or worsen from 2015 to 2017.

In advanced economies with fleets which have the worst fuel economy, such as the US and Canada, the average fuel consumption runs between 7.9 and 9 L_{ge}/100 km, while the best (France and Italy) fell to between 5.2 and 6.5 L_{ge}/100 km. There are several reasons for these differences, including fuel prices, and average vehicle size.

In contrast, the improvement of fuel use per kilometer in emerging economies accelerated to 2.3%. China saw new registrations of LDVs increase 17% per year in the period 2005 to 2017 while India saw an increase of 9% and Indonesia 7%. LDV sales in these economies have tripled since 2005 with the biggest rise in China, where sales were seven times higher in 2017 than in 2005.

These slumps in efficiency improvements are particularly concerning within the wider global context, GFEI noted. GFEI set a target to double fuel economy of LDVs by 2030, which is mirrored

by the UN's Sustainable Development Goal 7.3. To achieve these targets now, annual improvements to the global fleet would have to be around an average of 3.7%—more than triple the improvement rate between 2016 and 2017.

A key driver of the recent developments of the average fuel consumption include the rapid decline of diesel sales in several major vehicle markets, most notably in Europe. Since 2015, diesel shares have fallen by 5-15 percentage points in the largest EU markets, a change that was not sufficiently counterbalanced by the 1-3 percentage point growth of electrified LDVs to maintain efficiency improvements over gasoline vehicles.

The electrification of LDVs is going to be crucial to ensure that fuel economy can be effectively improved, especially if diesel shares keep falling. Electrified vehicles are already contributing positively to improve the country-weighted average fuel consumption by up to 3.5%. Japan experienced the largest gains due to having to the largest market share globally for hybrids, followed by the United States with a mix of electrified vehicle types (HEV, BEV and PHEV). Electrification in China was also very relevant to improve the average fuel economy, thanks to a fast-growing market share for BEVs and PHEVs. Countries that currently have high average fuel consumption values (which typically go hand-in-hand with high shares of large and heavy vehicles) can benefit the most from electrification since electrified vehicle efficiency is less dependent on size and weight.

Another significant barrier to fuel economy improvements has been the growing market share of sport-utility vehicles (SUVs) and pick-ups, the market share of which increased by 11 percentage points over the last three years. SUVs now represent nearly 40% of the global LDV market. North America and Australia have a particularly high market share of SUVs, reaching almost 60% in 2017.

While all vehicles types saw improvements in their fuel efficiency, the shift in market shares to these larger, less efficient vehicles pulled down average vehicle fuel economy.

Countries with policies to encourage fuel economy through a mix of regulation and efficiency-based purchase incentives saw 60% faster improvements than those without. Higher improvement rates were also seen in markets with higher shares of electrified vehicles (hybrid, plug-in hybrid and battery electric).

The growing gap between tested value and the real driving fuel economy is another issue of concern. Every key vehicle market, with the exception of the US, has shown an increased gap between tested results and real-driving CO₂ emissions of more than 10%, diverging to as high as 50%.

55. Slashing Fossil Fuel Use Could Save Millions Of Lives At Risk Due To Air Pollution

Many premature deaths around the globe are due to air pollution, which can cause heart, lung and other diseases. New research suggests that a rapid reduction in air pollution emissions would save millions of lives.²

² Effects of fossil fuel and total anthropogenic emission removal on public health and climate, J. Lelieveld, K. Klingmüller, A. Pozzer, R. T. Burnett, A. Haines, and V. Ramanathan, PNAS April 9, 2019 116 (15) 7192-7197; first published March 25, 2019, <https://doi.org/10.1073/pnas.1819989116>

Anthropogenic greenhouse gases and aerosols are associated with climate change and human health risks. The authors used a global model to estimate the climate and public health outcomes attributable to fossil fuel use, indicating the potential benefits of a phaseout. They show that it can avoid an excess mortality rate of 3.61 (2.96–4.21) million per year from outdoor air pollution worldwide. This could be up to 5.55 (4.52–6.52) million per year by additionally controlling nonfossil anthropogenic sources. Globally, fossil-fuel-related emissions account for about 65% of the excess mortality, and 70% of the climate cooling by anthropogenic aerosols. The chemical influence of air pollution on aeolian dust contributes to the aerosol cooling. Because aerosols affect the hydrologic cycle, removing the anthropogenic emissions in the model increases rainfall by 10–70% over densely populated regions in India and 10–30% over northern China, and by 10–40% over Central America, West Africa, and the drought-prone Sahel,³ thus contributing to water and food security. Since aerosols mask the anthropogenic rise in global temperature, removing fossil-fuel-generated particles liberates 0.51(±0.03) °C and all pollution particles 0.73(±0.03) °C warming, reaching around 2 °C over North America and Northeast Asia. The steep temperature increases from removing aerosols can be moderated to about 0.36(±0.06) °C globally by the simultaneous reduction of tropospheric ozone and methane. The authors conclude that a rapid phaseout of fossil-fuel-related emissions and major reductions of other anthropogenic sources are needed to save millions of lives, restore aerosol-perturbed rainfall patterns, and limit global warming to 2 °C.

56. Just Two Countries Away From Global Elimination Of Lead In Petrol

The Partnership for Clean Fuels and Vehicles held its 12th Global Partners' Meeting in March 2019 in Paris, France to discuss progress towards cleaner transport in developing and transitional countries.

Almost two decades since the partnership was established, the partners' resolve to promote cleaner fuels and vehicles in low- and middle-income countries remains strong. Close to 40 partners from the oil and vehicles industry, academia, civil society, and developing and developed countries met to review progress since 2016 in three areas: the elimination of lead in petrol, reduction of Sulphur levels in fuel and the adoption of vehicle emission standards.

There are many reasons to celebrate. Over the years, the partnership has reached several key milestones, including the elimination of leaded petrol in 84 out of 86 countries—a 98 per cent achievement. The two remaining leaded countries have also progressively introduced unleaded petrol. In addition to this, 36 countries have switched to low and ultra-low Sulphur fuels and 15 countries adopted Euro IV equivalent vehicle emissions standards. Despite the acknowledgment that good progress has been made, the work remains far from over.

Many low- and middle-income countries still grapple with inadequate fuel and vehicles regulatory standards. According to the Public Eye Report, several West African countries unwittingly import fuels with Sulphur levels as high as 10,000 ppm from Europe, posing a major public health risk.

The lack of adequate regulation on the importation of used vehicles further complicates the issue. Poor regulation of used vehicle imports in developing countries opens the market to an influx of vehicles that lack the latest technologies required to limit the emission of harmful pollutants. Old, outdated vehicles running on toxic fuel are a perfect recipe for harmful emissions resulting in

³ The Sahel is a region of western and north-central Africa that includes Burkina Faso, Chad, Mali, Mauritania, Niger and Senegal. It has been suffering from chronic food shortages caused by economic crisis, poverty, desertification and climate changes since the early 1970s.

deteriorating air quality, particularly in urban areas. It is for this reason that the partnership resolved to continue focusing on the three campaigns of the Partnership for Clean Fuels and Vehicles: eliminate lead in petrol worldwide, reduce Sulphur levels in fuels and promote cleaner vehicle standards.

As part of these three campaigns, new areas of interest for the partnership were highlighted through the findings of two working groups formed at the last global meeting, held in 2016. The groups worked on the topics of lubricants and used vehicles. From the working group on lubricants, Rich Kassel emphasized that as countries continued to introduce cleaner fuels and vehicle standards, it is important that, “the right lubricants are used for the right vehicles”. The right lubricants, he stated, play an important role in reducing vehicle emissions. Mike Walsh presented the report of the used vehicles working group, proposing that used vehicle importing and exporting countries should consider sustainable strategies for improved safety, better fuel economy and vehicle emission standards.

It was noted that apart from the work of the partnership, there are other initiatives and programs that complement the goals of the partnership. The Real Urban Emissions (TRUE) initiative by the FIA Foundation and other partners is one such initiative. It aims to collect and publish real-world emissions data to raise awareness about the magnitude and extent of vehicle emissions exceeding the set limits. This is important, as some of the preliminary findings of on-road vehicle emission testing in developed countries found out that some vehicles were emitting 15–30 times more pollutants than is permitted.

The initiative supports city efforts towards effective policy formulation and consumer awareness by providing them with transparent emissions data. Among other programs identified were the Global Fuel Economy Initiative which promotes vehicle fuel efficiency; the Climate and Clean Air Coalition (CCAC) that supports reduction of short-lived climate pollutants; UN Environment’s Electric Mobility Programme; and Towards Zero Foundation that is supporting a campaign on zero fatalities and zero emissions. Partners agreed to continue to link the work of the Partnership for Clean Fuels and Vehicles with other programs that promote its goals.

In the coming years, the partnership will focus on regional harmonization of clean fuels and vehicle standards.

57. Electric Car Price Tag Shrinks Along With Battery Cost

Every year, BloombergNEF’s advanced transport team builds a bottom-up analysis of the cost of purchasing an electric vehicle and compares it to the cost of a combustion-engine vehicle of the same size. The crossover point — when electric vehicles become cheaper than their combustion-engine equivalents — will be a crucial moment for the EV market. All things being equal, upfront price parity makes a buyer’s decision to buy an EV a matter of taste, style or preference — but not, for much longer, a matter of cost.

Every year, that crossover point gets closer. In 2017, a BloombergNEF analysis forecast that the crossover point was in 2026, nine years out. In 2018, the crossover point was in 2024 — six years out.

The crossover point, per the latest analysis, is now 2022 for large vehicles in the European Union. For that, we can thank the incredible shrinking electric vehicle battery, which isn’t so much shrinking in size as it is shrinking — dramatically — in cost.

Analysts have for several years been using a sort of shorthand for describing an electric vehicle battery: half the car's total cost. That figure, and that shorthand, has changed in just a few years. For a midsize U.S. car in 2015, the battery made up more than 57 percent of the total cost. This year, it's 33 percent. By 2025, the battery will be only 20 percent of total vehicle cost.⁴

The author of the research note provided further insights. The first is that he expects electric vehicle chassis and body costs to drop slightly, while those same costs will rise modestly for combustion vehicles "as a result of light-weighting and other measures to help comply with emissions targets."

Second, he expects bigger cost improvements in the electric powertrain, as "large-volume manufacturing is only now beginning for such parts." By 2030, costs for motors, inverters and power electronics could be 25 to 30 percent lower than they are today.

The incredible shrinking electric vehicle battery doesn't just mean cheaper electric passenger cars. It also means all sorts of other vehicles that weren't previously practical to electrify now are — and beyond proof-of-concept scale, too. One example: Komatsu Ltd. has just announced a small all-electric excavator.

There are new electric vehicles at sea as well. Stena Line plans to install batteries in one of its car ferries between Sweden and Denmark, rolling out its battery systems incrementally. The first, a 1 megawatt-hour battery, will power the ship when it is maneuvering in port. The next, a 20 megawatt-hour battery, will provide power for port operations and "about 10 nautical miles" beyond. The final, a 50 megawatt-hour battery, will provide 50 nautical miles' worth of power. "As both the size and cost of batteries decrease, battery operation becomes a very exciting alternative to traditional fuels for shipping, as emissions to air can be completely eliminated," says Stena Line's CEO Niclas Martensson.

Smaller EV batteries will soon be flying, too. Harbour Air Ltd., which operates 42 planes in 12 short routes in British Columbia, is adding an electric plane to its fleet. "The intent is to eventually convert the entire fleet," says founder and CEO Greg McDougall, who offers a familiar rationale for his optimism: Ranges and capabilities "are changing very rapidly with the development of the battery technology."

58. EV Market Growing Rapidly; EVs Changing Rapidly Says Report

According to Adamas Intelligence, in 2018, 4.28 million BEVs, PHEVs and HEVs were sold globally – an increase of 28.6% over the year prior – amounting to 5.2% of total global passenger vehicle sales. Not only is the EV market growing extremely fast, the modern EV itself is also undergoing a rapid technological evolution, from model to battery pack to cell and cell chemistry.

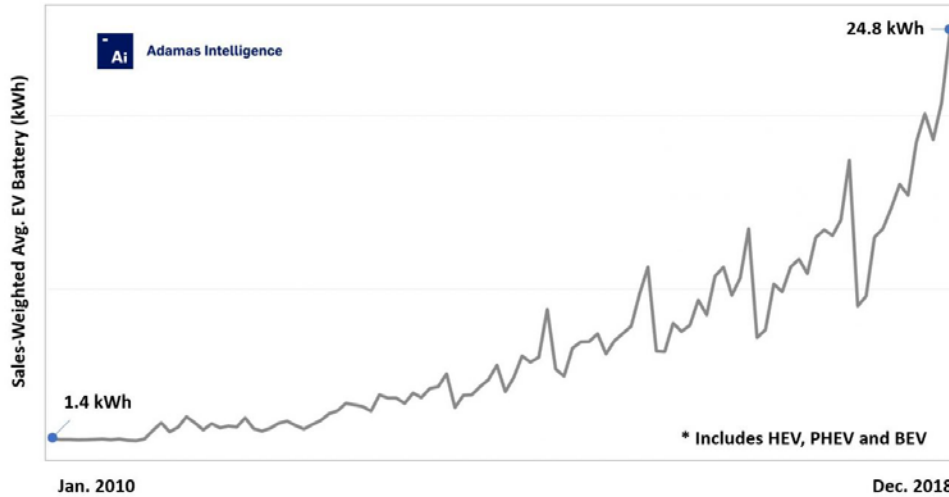
Automakers like VW are building their next-generation EVs around the concept of a low-cost and scalable modular platform that will be shared across the maker's model lineup, enabling it to thrust its EVs from niche to affordable mass market. Volkswagen in particular is planning to commence mass production in late-2022 with the aim of producing 10 million EVs based on the VW electrification platform "in the first wave alone".

The average EV pack capacity (in kWh) is continually increasing. This increase is happening for a number of reasons; such as advances in cell chemistry, greater sales of BEVs relative to HEVs,

⁴ Source: BloombergNEF, Note: Includes profit margins and costs other than direct manufacturing costs.

and due to an urgency on the part of automakers to expand driving range (distance per charge) so as to differentiate their EV model(s) from those of incumbents.

Global Average EV Battery Capacity Steadily Rising



Overall, the global sales-weighted average EV battery capacity has increased by a factor of 18x in nine years, from 1.4 kWh in January 2010 to 24.8 kWh in December 2018 according to Adamas Intelligence.

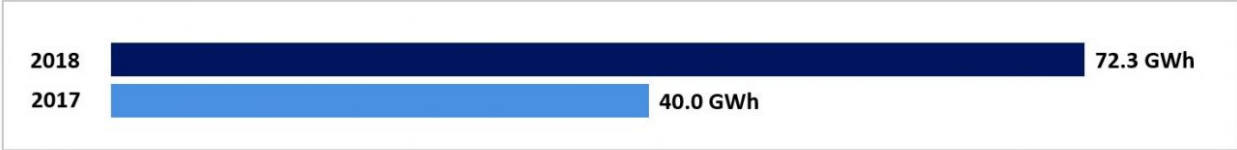
The sales-weighted average cell volume and capacity continues to

expand, as reflected by Tesla's switch from 18650 to 21700 cylindrical cells, as well as CATL's shift from 45Ah to 50Ah prismatic cells, and beyond.

Lastly, at the cell chemistry level, the landscape is rapidly moving towards 'higher' nickel cathode varieties (i.e. NCM 523/622) but remains broadly cautious of adopting the 'highest' nickel varieties (i.e. NCM 811) due to cost, reliability and safety concerns.

In 2018, global deployment of NCM 523 (in GWh) for passenger EVs increased 129% year-over-year and deployment of NCM 622 increased 230% year-over-year while global deployment of NCM 811 among first movers decreased 46% year-over-year (see recent [insight](#) from Adamas Intelligence).

In 2018, 72.3 GWh of battery capacity was deployed in passenger EVs globally, an increase of 81% year-over-year



Capacity Deployed by Country: 2018 (All EV Types)

© OpenStreetMap contributors

'Higher' not 'Highest' Nickel Cathodes Preferred in 2018

<p>NCM 811</p> <p>▼</p> <p>- 46% YoY</p>	<p>NCM 622</p> <p>▲</p> <p>+ 230% YoY</p>
<p>NCM 523</p> <p>▲</p> <p>+ 129% YoY</p>	<p>NCM 111</p> <p>▲</p> <p>+ 41% YoY</p>

Source: Adamas Intelligence's "EV Battery Capacity and Battery Metals Tracker"