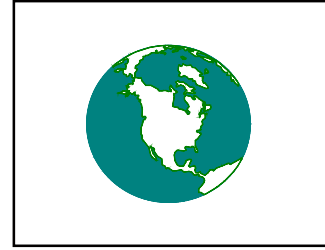


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CAR LINES

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EUROPE

1. Transport Impacts Cost Europe €1trn A Year

Transport in Europe is costing more than €1trn a year through air pollution, carbon emissions and other so-called 'external costs' largely met by society at large rather than polluters, a European Commission study has found. The cost is the equivalent of almost 7% of EU GDP, with environmental costs from pollution, carbon emissions and noise the biggest contributors.

The report which will be used by the Commission to help find ways to internalize costs, found that road transport is the biggest contributor, accounting for three-quarters of the total external costs in absolute terms, as well as leaving the biggest amount of unpaid costs.

For all modes of transport, the research suggests, the total costs are substantially higher than what is paid by the user.

The study will help the Commission assess its work implementing the 'polluter pays' principle, said transport commissioner Violeta Bulc. "The findings will help us define the right incentives and charging models in order to promote a level-playing field among transport modes," Bulc said.

2. Agreement Reached On Car CO2 Limits

Member states and the European Parliament agreed on a pathway to cut CO2 emissions from new cars and vans very substantially by 2030. Under the leadership of the Austrian presidency representatives from the EU Council and Parliament finally settled on 2030 targets to cut CO2 emissions from new cars by 37.5% and vans by 31%, relative to 2021 levels with an interim reduction target of 15% by 2025 for both vehicle types.

The compromise goes most of the way to meeting MEPs' demands for a 40% cut in overall greenhouse gas emissions by 2030. A handful of member states led by Germany had strongly opposed any increase on the 30% cut proposed by the European Commission, while the Austrian presidency had put forward a 35% target.

Under the agreement, the benchmark system for zero- and low-emission (electric or plug-in hybrid) vehicles (ZLEV) has been rejected. The benchmark ("malus") system, proposed by the Parliament, would penalize manufacturers that could not reach the ZLEV quota. Instead, the regulation will use the "super-credit" approach for ZLEV vehicles, proposed by the Commission. A cap was added to the double counting of ZLEV cars sold in Central and Eastern Europe at 5% of new car sales in those countries.

Electricity sector association Eurelectric said the targets indicate Europe will be home to more than 40 million electric cars by 2030. "This legislation will trigger a significant shift towards [a] climate-friendly transport sector," said secretary general Kristian Ruby.

Greg Archer, clean vehicles director at Transport & Environment, said the deal means around a third of cars will be zero-emission by 2030. "That's progress but it's not fast enough to hit our climate goals," Archer added.

In addition, 'niche' carmakers will enjoy special arrangements until 2028, despite opposition from the Parliament's lead negotiator, Miriam Dalli.

However, the talks did lead to limits on proposed credits for sales of plug-in hybrids, which green campaigners feared would reward inefficient luxury cars and sports-utility vehicles (SUVs).

Responding to the deal, Dalli highlighted the Parliament's success in introducing a requirement for the Commission to track fuel consumption from 'real-world' driving data in addition to laboratory tests. She also said Commission officials would now be obliged to consider setting up a fund for a "just transition" to a low-carbon economy.

"Now that a provisional agreement has been reached, I look forward to seeing member states legislating in favor of cleaner and greener proposals," she said.

3. 39% Gap Between Official And Real Car Fuel Consumption

The gap between official fuel consumption figures for new cars in Europe and actual fuel use decreased slightly in 2017 to 39%, according to updated research from the International Council on Clean Transportation. The independent research group expanded its data sources for the latest update, to around 1.3 million cars from 15 sources and eight countries, to determine the divergence between official and real world values from European passenger cars. The gap increased from 8% in 2001 to 39% in 2017, down slightly from 40% in 2016.

The slight decrease could be caused by increased public attention on real-world performance following Dieselgate, according the authors, or by the fact that with manufacturers having met their 2015 emission reduction targets and with only limited regulatory pressure, 2017 was the first year on record average emissions failed to decline.

The gap undermines the EU's efforts to mitigate climate change and transition from fossil fuels, the researchers said. "While type-approval figures declined from 170 g/km of CO₂ in 2001 to 119 g/km in 2017, a 30% decrease, the real-world estimate decreased by only 10%."

ICCT blamed the "unrepresentative" official emission values as the cause of the divergence, and warned that the new WLTP, introduced in the wake of the dieselpgate scandal, will not on its own close the gap.

Last month EU legislators agreed a new CO₂ emission reduction target of 37.5% between 2021 and 2030 and requirements for manufacturers to track fuel consumption from 'real-world' data. Regulations prescribing fuel consumption meters in new passenger cars could be used to provide official real-world data, the researchers said, while values on EU fuel consumption labels for consumers should reflect on-road measurements.

The researchers also suggested the policy should factor in the gap between real-world and lab measures, with more accurate data used to assess CO₂ mitigation.

4. Automakers Potentially Face Big Fines In Europe For Missing CO₂ Targets

As global leaders meet in Poland to hammer out details about how to meet Paris Climate Accord targets, a new study shows that European automakers aren't introducing electric cars nearly fast enough to meet European standards—and the delay could cost them.

The European Union has set the strictest limits on carbon-dioxide emissions from cars anywhere on the planet: 95 grams of CO₂ per 100 kilometers, which would require cars there to average the equivalent to about 57 miles per U.S. gallon.

And most of Europe's automakers aren't meeting that standard.

A new study published by PA Consulting, a global consulting firm based in London, shows that 8 out of Europe's 13 largest automakers have fallen behind and will face serious fines for missing the standard according to a report in the Times of London. The automakers include, Volkswagen, Ford, Fiat Chrysler, Mazda, Hyundai, BMW, Daimler, and the PSA Group.

The fines take effect in 2021 and will vary by how much each automaker has missed the targets. Volkswagen, Europe's largest automaker, faces the largest fines of almost \$1.6 billion (1.4 billion euros), equal to about 10 percent of the company's annual earnings.

French automaker PSA, parent of Peugeot, Citroen, and GM's former European arm, Opel, faces a fine of \$682 million, about 20 percent of its annual earnings.

Volkswagen has announced serious efforts to build and sell electric cars, investing \$11 billion to build electric cars by 2023 and develop up to 10 new electric cars.

Even with such efforts, though, electric car sales remain slow in Europe, amounting to just 0.6 percent of the market in Britain in June, for example. Another study showed that emissions of CO₂ from new cars in Europe rose for the first time last year, as automakers focused on reducing emissions of nitrogen oxides from diesels over reducing CO₂ emissions.

The Society of Motor Manufacturers and Traders, an auto industry advocacy group, has argued that the standards are too rigid and has called for more public charging stations to make electric cars easier for consumers to choose.

5. Ministers Agree Truck CO₂ Targets And LIFE Funding

In May 2018, the EU Commission proposed a regulation setting the first-ever CO₂ emission performance standards for new heavy-duty vehicles in the EU, as part of the third mobility package. It would require the average CO₂ emissions from new trucks in 2025 to be 15 % lower than in 2019. For 2030, the proposal sets an indicative reduction target of at least 30 % compared to 2019. Special incentives are provided for zero- and low-emission vehicles. The proposed regulation applies to four categories of large trucks, which together account for 65 %-70 % of CO₂ emissions from heavy-duty vehicles. The Commission proposes to review the legislation in 2022 in order to set a binding target for 2030, and to extend its application to smaller trucks, buses, coaches and trailers.

Heavy-duty vehicles are responsible for around a quarter of CO₂ emissions from road transport in the EU. Without further action, their emissions are expected to grow due to increasing road transport volumes.

In the European Parliament, the proposal was referred to the Committee on Environment, Public Health and Food Safety, which adopted its report on 18 October 2018. Parliament voted on the report on 14 November 2018 and agreed in November to strengthen the proposed targets by five percentage points.

Analysis by the ICCT indicates that in 2030 commercially available technologies could reduce the fuel consumption of long-haul tractor-trailers by 43% at payback periods of less than three years, delivering net economic benefits to transport operators. Long-haul tractor-trailers are responsible for the largest share of CO2 emissions from freight transportation.

“The economic returns and short payback times favor investment in heavy-duty vehicle efficiency technologies,” said Felipe Rodríguez, researcher at the ICCT. “But there are well-understood market barriers that tend to inhibit the adoption of available and ready-to-be-deployed technologies.”

EU environment ministers backed European Commission proposals for the bloc’s first ever CO2 emission reduction targets for trucks, despite MEPs and environmentalists demanding higher ambition. At an EU Environment Council before the Christmas holiday, the ministers backed the proposed binding 2030 target of 30% average emissions reduction for new trucks compared to 2019, with a mid-decade interim target of 15% and a 2022 review.

The Council also backed the Commission’s proposed ‘super credit’ incentive scheme to promote zero and low emissions truck production but said it should be replaced with a sales target for zero and low-emission trucks from 2025. Green group Transport & Environment welcomed the proposal to delete the super credit ‘accounting trick’ which it said would allow the double counting of zero emission trucks’ contribution to the target “lead[ing] to higher CO2 emissions”.

Stef Cornelis, cleaner trucks officer at Transport & Environment warned that super-credits “are not the right incentive mechanism” because they undermine progress on fuel efficiency. “The European Parliament’s approach to the benchmark and the malus is therefore the right approach,” Cornelis added. “The malus is a key part of the incentive system. Without it, we would be left with a voluntary system.”

Cornelis urged member states to support a proposal from the Netherlands to establish a zero-emissions quota of 20% with a malus. “It’s very inspiring that the second biggest EU heavy-duty truck manufacturing nation wants more ambition than the European Commission proposal,” he said. “It is right to do so: technologically it is feasible.”

The automakers’ lobby group ACEA said the targets would be a major challenge for industry and operators. “Truck makers are willing to further cut carbon emissions but this should happen at a pace that is realistic, as it will not be possible with today’s technology alone,” said secretary general Erik Jonnaert.

Imposing fines on manufacturers that fail to meet a quota on zero-emission truck sales would be “extremely risky” for Europe’s truck industry, ACEA warned citing “insufficient market demand”.

Joachim Drees, who chairs ACEA’s commercial vehicle board, said the truck industry would need policymakers to invest in recharging infrastructure for electric vehicles, support investment in new technologies and provide incentives for transport operators to renew their fleets.

Drees described the proposed emissions reduction levels as “highly ambitious”, stating they “will require a rapid and large-scale deployment of new powertrain technologies - many of which are not yet readily available for widespread market introduction”. He suggested that electric powertrains might not be the “right choice” for long-haul operators “even in the long run”.

Nevertheless, Drees said he was in favor of the Commission's proposed 'super-credit' system to incentivize the uptake of zero- and low-emission vehicles.

ACEA is a fierce critic of the recent European Parliament amendment to the proposal that would replace the super-credit with sales targets for zero-emissions trucks of 5% of total sales by 2025 and 30% by 2030, complete with a financial malus for manufacturers failing to meet those targets.

"The rules agreed today mean that between 2020 and 2030 we will emit 54 million tons of CO₂ less," said Elisabeth Köstinger, environment minister of outgoing Council president, Austria.

Separately, the Environment Council also agreed a partial general approach on regulations to extend the LIFE Program, the EU's dedicated environment fund, from 2020 to 2027. Ministers backed the Commission's proposed budget of €5.45bn, around 0.4% of the total proposed multiannual financial framework for the period, with €3.5bn for environment and €1.95bn for climate action.

The Parliament is calling for a total budget of 0.6% of the MFF, while environmentalists want 1%.

"The LIFE program has proved its worth. It has co-financed projects everywhere in Europe which protect biodiversity, restore habitats and save endangered wildlife from extinction," said Köstinger.

Negotiations between the Council and Parliament on both files are expected to begin in January under the new Romanian presidency.

Besides the European Union, the United States, Canada, China, Japan, and India have established heavy-duty vehicle efficiency regulations. In addition, Argentina, Brazil, Mexico, and South Korea are all in various stages of developing policies to improve the efficiency of their commercial vehicle fleets. In 2016, the U.S. Environmental Protection Agency published a second phase of its greenhouse gas standard for heavy-duty vehicles. That regulation mandates efficiency improvements in long-haul tractor-trailers of between 23% and 27% by 2027 (from a 2017 baseline), for an annual rate of improvement between 2.6% and 3.1%; similar to the European Commission's proposal. Similarly, China's Phase 3 standards will reduce fuel consumption by up to 27% by 2019 from a 2012 baseline, corresponding to annual improvements of over 4%.

"Long-term efficiency standards create the right environment for industry to invest in sustainable low-carbon technologies," said Rachel Muncrief, ICCT program director. "The stringent, far-sighted standards proposed by the European Commission will accelerate the market uptake of existing fuel-saving technologies, while providing enough lead time for the development and deployment of emergent technologies."

National governments appear to favor less ambitious emission cuts than those demanded by MEPs under the EU's first-ever proposed CO₂ limits for new heavy-duty vehicles, according to a document prepared by the EU Council's Austrian Presidency.

The text proposes that CO₂ emissions be reduced by 15% "for the reporting periods of the year 2025 onwards", and "for 2030 and later by at least 30%".

The other key element concerns the MEPs' decision to replace the Commission's 'super-credits' by the zero- and low-emission vehicles (ZLEVs) schemes, with a 5% sales target for 2025 rising to 20% by 2030.

The reference CO2 emissions shall be based on 2019 monitoring data, according to the Commission proposal and the Parliament's position. However, the Council text changes the reference period to "the period from 1 July 2019 to 30 June 2020", giving more time to manufacturers to adjust to the new legislative demands.

6. The Commission Calls For A Climate Neutral Europe By 2050

The European Commission has adopted a strategic long-term vision for a prosperous, modern, competitive and climate neutral economy by 2050 – A Clean Planet for all. The strategy shows how Europe can lead the way to climate neutrality by investing into realistic technological solutions, empowering citizens, and aligning action in key areas such as industrial policy, finance, and research – while ensuring social fairness for a just transition.

The Vice-President responsible for the Energy Union, Maroš Šefčovič said: "We cannot safely live on a planet with the climate that is out of control. But that does not mean that to reduce emissions, we should sacrifice the livelihoods of Europeans. Over the last years, we have shown how to reduce emissions, while creating prosperity, high-quality local jobs, and improving people's quality of life. Europe will inevitably continue to transform. Our strategy now shows that by 2050, it is realistic to make Europe both climate neutral and prosperous, while leaving no European and no region behind."

Commissioner for Climate Action and Energy, Miguel Arias Cañete said: "The EU has already started the modernization and transformation towards a climate neutral economy. And today, we are stepping up our efforts as we propose a strategy for Europe to become the world's first major economy to go climate neutral by 2050. Going climate neutral is necessary, possible and in Europe's interest. It is necessary to meet the long-term temperature goals of the Paris Agreement. It is possible with current technologies and those close to deployment. And it is in Europe's interest to stop spending on fossil fuel imports and invest in meaningful improvements to the daily of all Europeans. No European, no region should be left behind. The EU will support those more impacted by this transition so that everyone's ready to adapt to the new requirements of a climate neutral economy."

Commissioner for Transport, Violeta Bulc said: "All transport modes should contribute to the decarbonization of our mobility system. The goal is to reach net-zero emissions by 2050. This requires a system approach with low and zero emission vehicles, strong increase in rail network capacity, and a much more efficient organization of the transport system, based on digitalization; incentives for behavioral changes; alternative fuels and smart infrastructure; and global commitments. All this driven by innovation and investments."

Following the invitation by the European Council in March 2018, the Commission's vision for a climate neutral future covers nearly all EU policies and is in line with the Paris Agreement objective to keep temperature increase to well below 2°C, and pursue efforts to keep it to 1.5°C. For the EU to lead the world towards climate neutrality means achieving it by 2050.

The purpose of this long-term strategy is not to set targets, but to create a vision and sense of direction, plan for it, and inspire as well as enable stakeholders, researchers, entrepreneurs and citizens alike to develop new and innovative industries, businesses and associated jobs.

The road to a climate neutral economy would require joint action in seven strategic areas: energy efficiency; deployment of renewables; clean, safe and connected mobility; competitive industry

and circular economy; infrastructure and interconnections; bio-economy and natural carbon sinks; carbon capture and storage to address remaining emissions. Pursuing all these strategic priorities would contribute to making our vision a reality.

Member States will submit to the European Commission, by the end of 2018, their draft National Climate and Energy Plans, which are central for the achievement of the 2030 climate and energy targets and which should be forward-looking and consider in the EU long term strategy.

7. Electric Cars on Course to Be the New Normal in Norway

Almost one-third of all new cars sold in Norway last year ran on batteries, reinforcing the Nordic country's reputation as the world's best market for electric vehicles. Oil-rich Norway aims to eliminate all emissions from new cars by 2025 and offers generous subsidies for buyers who opt to go electric. Other countries, including China, plan to follow suit later. In 2018, all-electric cars made up 31.2 percent of the Norwegian market, an improvement of more than 10 percentage points from the previous year, the Norwegian Road Federation said December 31.

Three of the five most popular models were electric, with the Leaf from Nissan Motor Co. claiming the top spot, ahead of BMW AG's i3 and Tesla Inc.'s Model X.

"In 2018, alternative-fuel cars consolidated their strong position in the market," the federation's director, Oyvind Solberg Thorsen, said in a statement.

Norway, a country of 5.3 million, has long been a world leader in sales of electric vehicles. It wasn't until the first quarter of last year that it was surpassed by Germany, Europe's biggest car market. The incentives that propped up the Norwegian market include exemption from sales taxes and road tolls.

Solberg Thorsen said he expects an even bigger share of battery-powered cars going forward, as there is still an untapped demand for more family-friendly electric vehicles, with longer range at reasonable prices. "As more models reach the market this year, we should see an even larger share of zero-emission vehicles in the sales numbers," Solberg Thorsen said.

8. Automakers Face Perfect Storm in Europe With Added Brexit Chill

After a decadelong boom, Europe's automakers are facing a chill wind. Demand in the region fizzled late in 2018 due to a combination of emissions-testing bottlenecks and economic headwinds, signaling an abrupt end to years of robust growth. British consumers led the change and more pain could lie ahead as doubts linger about the U.K.'s relations with the European Union after it leaves the bloc.

Ford Motor Co. took the most aggressive action so far, announcing thousands of job cuts January 10 in a broad review of its European business that could include plant closures. Following in Ford's footsteps, Jaguar Land Rover, Britain's biggest automaker, announced 4,500 layoffs, roughly 10 percent of its global workforce.

Both manufacturers are reliant on the U.K., the region's second-largest market. That makes them particularly exposed to the risks of a disorderly Brexit, but all European manufacturers would be affected by disrupted trade flows between Britain and the continent due to the close links between assembly plants and suppliers on both sides of the English Channel.

Globally, the auto industry is grappling with tougher environmental rules, a costly shift to electric vehicles and the risk of ride-hailing services luring away consumers. The sudden slowdown of demand for conventional vehicles risks diluting the cash flow needed to fund this transition, while Brexit adds an extra dose of uncertainty in Europe.

Europe's struggles include a broader economic slowdown, with Germany at risk of slipping into a technical recession after a dramatic plunge in industrial activity late last year. The slump in the region's biggest economy was partly driven by automakers battling to adapt to new emissions-testing procedures, which caused production bottlenecks and sales gyrations across the region.

Expectations from the likes of Volkswagen AG and Daimler AG for a demand rebound haven't yet materialized. Deliveries in Germany fell 7.6 percent in December 2018, indicating broader troubles in a market expected to contract in 2019, according to Evercore ISI.

China poses another challenge. Trade tensions with the U.S. contributed to Chinese sales last year declining for the first time in two decades. That means the world's largest car market is unlikely to come to the industry's rescue like it did in the aftermath of the financial crisis. If China fails to stimulate car sales, it would pose challenges to Japanese automakers, who have fared better than the rest of the industry in the world's biggest automobile market, said Man.

As economic headwinds intensify, automakers' plans to generate the billions of euros needed to pay for investments in self-driving and electric cars look increasingly tenuous, and the payoff is less than certain.

9. VW Eyes Components Savings to Fund Shift to Electric Cars

Volkswagen AG is counting on savings from its newly-reorganized components division to free up more funds to invest in electric-car technology. The world's largest automaker has bundled its fragmented parts operations into a single unit and plans to reduce headcount by about 10 percent at the unit in a bid to boost efficiency. The business will measure itself against the auto industry's leading suppliers, VW purchasing chief Stefan Sommer said January 25 in Salzgitter, Germany.

The overhaul is designed to tackle a fundamental industry shift toward battery-powered vehicles and will include fading out or divesting operations with weak future prospects, Sommer said. Ending production of parts like heat exchangers frees up funds for projects like a plan to build mobile charging stations in Hanover, Germany, in 2020. VW is also open to forming partnerships with other parts makers to generate economies of scale, Sommer said. It's in "intensive talks" over the possible production of battery cells for e-cars, which would require a large-scale investment.

VW reorganized the components operations as part of a plan to invest 3.8 billion euros (\$4.3 billion) by 2023 on electric vehicle parts. Cost savings stemming from a 2016 labor pact reached 750 million euros and will widen to 2 billion euros by 2025, the carmaker said. The business is spread across 61 factories worldwide, and the push to fold them into a single unit follows similar moves by rivals. But unlike Toyota Motor Corp. or General Motors Co., for example, VW doesn't plan a partial or complete spin-off of the business, Sommer said.

The VW parts business employs about 80,000 people and is a traditional stronghold of the company's powerful German labor unions. It generates about 22 billion euros in annual revenue, according to its head, Thomas Schmall. He said the manufacturer will cut another 6,000 jobs by

2023 after eliminating 1,900 positions since 2016 through voluntary measures like early retirement.

Schmall said the unit targets an operating return on sales of about 6 percent and might publish more key figures starting next year. It has an “overall business volume of some 35 billion euros,” Schmall said, making it one of the world’s largest vehicle-component makers.

10. Italy To Introduce ‘SUV Tax’ And Subsidize Clean Cars

Italy plans to penalize motorists who purchase the most polluting types of car and support the uptake of low emission vehicles with a new taxation system to be put in place in the spring. The pilot scheme, which will be in force from 1 March 2019 to 31 December 2021, is part of a new budget law adopted by Italy’s parliament on 30 December.

New cars that generate more than 160 grams of CO₂ per kilometer will be subject to an annual eco-tax ranging from €1,100 to €2,500, depending on the level of emissions. The tax will apply to cars newly registered in Italy, even if they were previously registered in another country.

In parallel, there will be a system of incentives for the purchase of cars that emit less than 70g of CO₂ per kilometer. Subsidies will again be tied to emission level and range from €2,500 to €6,000 if a polluting car is scrapped, or €1,500 to €4,000 euros without the disposal of an old car.

11. Germany Paves Way For Upgrading Exhaust Systems On Older Diesel Cars

Germany has cleared away legal hurdles for carmakers to upgrade exhaust emissions filtering systems on older diesel cars as a way to avoid vehicle bans but failed to quell doubts among manufacturers and suppliers over the effectiveness of retrofits.

Carmakers have been forced to consider upgrading exhaust treatment systems on older cars after German cities started banning heavily polluting diesel vehicles to cut pollution from fine particulate matter and toxic nitrogen oxides.

Carmakers want customers to buy new cars with cleaner engines, while environmentalists and consumer groups argue that retrofitting older vehicles may be more cost-effective.

The transport ministry released a 30-page document setting out guidelines for getting regulatory approval to install upgraded exhaust filtering systems on older cars. “Now it is the turn of the retrofit industry to develop effective systems to meet all limits and regulations,” transport minister Andreas Scheuer said in a statement.

The Federal Motor Transport Authority would grant approval quickly so that the retrofit systems could be offered on the market as soon as possible, he added.

Baumot Group, which makes exhaust filtering upgrade kits, welcomed the guidelines. “Under a normal vehicle certification process, we believe we can deliver our system in 2019 in a timely fashion,” said Marcus Hausser, the company’s chief executive.

German auto lobby group VDA, however, said that customers should buy new cars rather than spend money on installing new exhaust filtering mechanisms on older vehicles. “We cannot give a guarantee for a vehicle in which third-party exhaust purification systems have been retrofitted,”

VDA president Bernhard Mattes told Die Welt newspaper. "If a customer has his vehicle modified, then he and the retrofitter are responsible for any consequential damage."

German environmental lobby group Deutsche Umwelthilfe (DUH) won a landmark ruling in February to force diesel bans after it sued cities that failed to meet clean air rules.

Cities have considered banning older vehicles which do not conform to the latest Euro 6d engine emissions standards. Hamburg has banned older diesel cars from the city center, and other cities, including Berlin and Stuttgart, the home of Germany's car industry, are set to introduce similar bans.

Of the 15 million diesel cars on Germany's roads, only 2.7 million have Euro-6 technology. Evercore ISI has estimated that upgrading the exhaust cleaning of just the Euro-5 fleet could cost up to 14.5 billion euros (\$17.9 billion).

German carmakers have already agreed to spend up to 3,000 euros (\$3,431) per vehicle to upgrade engine management software to make exhaust filtering systems more effective, but environmentalists say these measures are insufficient.

Carmakers are divided over who will pay the retrofit costs, given that most older diesel cars met clean air rules at the time when they were sold. Volkswagen and Daimler announced they would cover some retrofit costs, while BMW has refused, only proposing incentives to trade in old vehicles for new ones.

Volkswagen said that customers may not benefit from installing new exhaust systems on older cars. "All concepts known to us to date have disadvantages for our customers, such as increased fuel consumption and thus increased CO2 emissions and, in some cases, reduced performance," VW research and development head Frank Welsch said in a statement.

BMW said exhaust system upgrades that would not penalize fuel consumption or cause additional wear and tear could take up to three years to develop and certify. Selling newer cars through incentives combined with the ramp-up of electric car charging infrastructure would bring down pollution levels in inner cities much faster than trying to retrofit older vehicles, BMW said.

Supplier Continental supported the carmakers' critical stance. A spokesman said developing retrofits for each model would be extremely costly and time-consuming.

Paris, Madrid, Mexico City and Athens have said they plan to ban diesel vehicles from city centers by 2025, while the mayor of Copenhagen wants to ban new diesel cars from entering the city as soon as next year. France and Britain will ban new petrol and diesel cars by 2040.

12. Volkswagen Denies Chairman Knew Early About Emissions Cheating: Report

Volkswagen has denied allegations that Chairman Hans Dieter Poetsch knew about the carmaker's emissions test cheating almost three months before U.S. authorities made it public in September 2015. Citing internal documents from investigators, German weekly Bild am Sonntag reported that Poetsch, VW's finance head at the time, learned about the carmaker's violations of the rules in late June 2015. The paper cites a confidential presentation from the VW legal department, available to investigators in proceedings about the carmaker's alleged market manipulation.

According to the report, a presentation dubbed “Sacramento” and dated June 24, 2015, stated that U.S. emissions rules were being violated and that the company may also have breached its supervisory obligations.

The paper also reported that, according to testimony from a leading VW lawyer, referred to as “witness P.”, Poetsch received the presentation on June 29, 2015. He was also informed then that 600,000 vehicles in the U.S. were affected and that the financial risk for VW stood at 35 billion euros (\$39.8 billion).

Volkswagen said in a statement that it had been aware of the allegations for some time. “The presentation by the witness P. is emphatically rejected as inaccurate.”

The diesel issue was the subject of a number of discussions with Poetsch in the summer of 2015, Volkswagen said. “However, none of these discussions had the content and quality which could have made capital markets law relevant for Mr. Poetsch.”

Volkswagen added that until the publication of the Notice of Violation by the U.S. authorities on September 18, 2015 it did not have sufficiently concrete indication of a situation that could be share price sensitive.

Poetsch became VW chairman shortly after the “Dieselgate” scandal broke in 2015.

Plaintiffs in a market manipulation lawsuit in Germany say Volkswagen failed in its duty to inform investors about the potential financial implications of the emissions test cheating, which has so far cost the company 27.4 billion euros in penalties and fines. The company has argued it did not inform investors of the issue because it did not want to endanger the chance of reaching a settlement with the U.S. authorities.

13. Cars, Taxis And Vans Are The Biggest Source Of Pollution In The UK

Britain's gridlocked roads are busier than ever, according to recently released official figures. Vehicle numbers have continued to increase and drivers have clocked up the highest number of miles on record. Britain's increasingly crowded transport network has seen it become the biggest source of greenhouse gas emissions, overtaking the energy sector for the first time.

Despite moves to cut down on car use in urban areas and increase low-emission vehicles, government figures show that road use is at an all-time high. Campaigners complained that the lack of progress to link up different methods of travel, and so cut pollution, was 'lamentable'.

The Transport Statistics Great Britain report, produced for the Department for Transport, shows that UK travelers clocked up 502 billion miles in 2017. Their journeys in cars, taxis and vans made up 83 per cent of the total, and they travelled 416.3 billion miles last year compared with 413.8 billion in 2016.

Around 27 per cent of journeys were made by commuters, with some 40 per cent for leisure activities, the figures showed.

There were 37.8 million licensed vehicles on the roads last year. Of this total, 80.9 per cent were cars, 11.7 per cent were light goods vehicles and 3.7 per cent were motorcycles. Lorries, buses and coaches made up the rest.

A total of 32.16 million cars were licensed in the UK in 2017, up from 31.79 million the previous year.

Low emission vehicles, such as electric and hybrid cars, made up 1.7 per cent of newly registered vehicles.

The energy sector produced 113.7 million tons of greenhouse gas emissions in 2016, while transport produced 124.4 million tons. Critics questioned whether the Government was doing enough to stimulate environmentally friendly travel.

Edmund King, president of the AA, said 'It is lamentable that for all the pontificating about the sins of driving, the alternatives continue to fail to evolve. 'For years, the AA has called for 'joined-up thinking' that combines the benefits of car use with public transport hubs offering inner city travel at the right place, at the right price. 'It can be done, as Cambridge has shown with a park and ride service that now transports 4.1million passengers a year, helping to reduce average journey times into the city.

The Department for Transport said: 'We are investing a record £23 billion on our roads to reduce congestion and make journeys better for motorists. 'We are giving councils record amounts of capital funding – more than £7.1 billion up to 2021. We will also be spending £28.8 billion between 2020 and 2025 to improve England's most strategically important roads.

'A £2.5 billion fund will also see innovative public transport schemes developed to further tackle congestion in some of England's biggest cities.'

14. London's Black Cabs 'Up To Thirty Times As Toxic As Personal Cars Of Same Age'

Some of the most common models of London's world-famous black cabs are emitting up to 30 times as much pollution as personal cars the same age, research has found. Measurements of nitrogen oxide (NOx), particulate matter and carbon dioxide (CO2) emissions from over 100,000 vehicles in London have revealed the "disproportionate impact of black cabs on London's streets", The Real Urban Emissions (True) initiative report said.

Some newer models of the black cabs were found to emit even more pollution than older models.

The Chinese-owned London Electric Vehicle Company, formerly known as the London Taxi Company, based near Coventry, was the maker of the TX4 Euro 5 model which was found to produce at least 50 per cent more NOx than either of the company's earlier Euro 3 or Euro 4 models. This means the average NOx emissions from black cabs have risen, per kilo of fuel used, over the past five years.

The research shows Euro 5 models along with older models are responsible for about 60 per cent of greater London's NOx emissions from passenger cars.

Euro 5 and Euro 6 diesel cars are on average producing six times more NOx than equivalent petrol cars, the research adds.

Sheila Watson, deputy director of the FIA Foundation which works with the True initiative, said: "Dirty vehicles, have been clogging the air with their toxic exhaust fumes, and taking a huge toll on the health of Londoners, especially children, for too long. Both policy makers and consumers

have not seen the improvements in emissions which they should have based on the measured emissions of vehicles.”

“The issue of dirty air is seen in cities across Europe, particularly as a result of a policy focus on diesel vehicles over petrol.” She added: “Cities like London have been working to improve air quality for years, with limited success as they haven’t had the data to address the real emissions on the streets. The whole point of supporting this remote sensing work, is that it brings information and data to the policy arena which is not currently available. That data can only help policymakers, consumers and even manufacturers to understand better what is happening on our roads.

True used the International Council on Clean Transportation’s (ICCT’s) methodology to create a traffic light rating system which grades cars based on their real-world nitrous oxide (NOx) exhaust emissions.

The mayor of London, Sadiq Khan, said: “London’s air is so toxic it damages children’s lung growth, causes thousands of premature deaths and increases the risk of asthma and dementia. “We know that dirty vehicles are responsible for half of our NOx air pollution – and this new data from True and ICCT reveals the stark health impact of polluting diesel taxis on our streets.”

He added: “We all need to play a part in cleaning up our toxic air and while I am encouraged that almost 1,000 taxi drivers have switched to cleaner electric taxis, this damning report really highlights why we need to accelerate their uptake.”

A spokesperson for the London EV Company (LEVC), which no longer makes the Euro 5 diesel vehicles and manufactures London’s first electrified black cab told reporters it has invested £500m “to achieve the best-possible emission standards in developing the latest generation of London taxis.

“Recognizing the growing challenge of inner-city congestion and pollution, we have been the industry leaders in developing ultra-low emission electrified taxis, symbolized by the new electric taxi TX eCity.”

“More than a thousand LEVC electric taxis are now on the road in the UK and we are confident of further significant expansion of the fleet over the next few years. These new vehicles will gradually replace existing diesel taxis and we have tabled a number of proposals to the Mayor’s Office aimed at speeding up this transition so we can meet the Mayor’s target to have 9,000 electric taxis in London by the end of 2020.”

15. London Motorists Protest Against Ultra Low Emissions Zone

Motorists have reacted with fury at a new London pollution charge covering large swathes of London which is expected to hit one million drivers. Mayor Sadiq Khan confirmed that the ULEZ (Ultra Low Emission Zone) - being introduced in Central London next year - will stretch to cover an area surrounded by the North and South Circular roads from October 2021.

The £12.50 per day fee means cash-strapped Transport for London will collect up to £1.5billion a year - six times as much as the £230million from the congestion charge.

One motoring group has now issued warnings of 'Yellow Vest'-style protests similar to those in France over the past few weeks that were sparked over fuel tax increases. And the Royal

Automobile Club (RAC) said it will be most felt 'by those from low income backgrounds, as well as those who work in roles such as hospitality and depend on using a car at night'.

Meanwhile, 21,500 people have now signed a Change.org petition to stop the ULEZ extension, saying it will 'price working Londoners off the road'. ULEZ will cover central London from 2019, but under the new plans will be extended massively to all of inner London two years later

Nigel Humphries from the Alliance of British Drivers said: 'Many people think that as they don't drive in London, or that they drive newish 'eco' cars, this won't affect them. They are wrong. 'The UK Government have given powers to local authorities to introduce emissions-based charges pretty much at their whim and with no justification. 'Councils all over the UK are looking to copy Sadiq Khan's lead, Manchester being well advanced in its plan.

'Values of the many affected cars, and even some that are not currently affected, will fall due to fear of future charges long before they even happen.

'If the government wish to avoid 'Yellow Vest' style protests they need to act now, remove such powers from local authorities and ban all such schemes.'

By 2021, owners of petrol cars that are more than 15 years old and diesel vehicles that are more than six years old will have to pay £12.50 to use them in London. This means that someone who bought a diesel car only three years ago could now have to get another one to avoid being hit by the charge.

It is estimated that an additional 100,000 cars, 35,000 vans and 3,000 lorries might be affected by the expanded zone every day. The Alliance of British Drivers has published a list of cars from the past three years which will fall foul of ULEZ charges:

Gareth Bacon, leader of the Conservative group on the London Assembly, told The Times: 'This could be Sadiq's poll tax. It has flown under the radar and people do not know what is going to hit them.' Mr Bacon even referenced the current protests in France and noted that Mr Khan could have his own 'gilets jaunes' moment once Londoners realize how much they could be paying.

The ULEZ charges across London will cover vehicles that fail to meet certain emissions standards and be policed by the capital's network of Automatic Number Plate Recognition (ANPR) cameras. TfL's own 'integrated impact assessment' says about 565,000 cars registered in the capital will be liable if driven. It also says 276,000 vans registered in London would be affected by it, as well as minicabs and HGVs, taking the total vehicles that could be eligible to one million.

Khan made the announcement at the same time he launched a new study to measure the impact of air pollution reduction strategies on the health of children in London and Luton. Confirmation of the expanded ultra-low emission zone comes after research showed the health damage from cars and vans across the UK costs £6billion a year to the NHS and society, with the bill in London £650million.

Officials said expanding the ULEZ and stricter standards for heavy vehicles across London would result in more than 100,000 Londoners no longer living in areas exceeding legal air quality limits in 2021 and all areas in the capital are expected to see reductions in pollution.

Mr Khan previously said: 'Tackling London's lethal air and safeguarding the health of Londoners requires bold action. 'Air pollution is a national health crisis and I refuse to stand back as

thousands of Londoners breathe in air so filthy that it shortens our life expectancy, harms our lungs and worsens chronic illness.

RAC roads policy spokesman Nicholas Lyes said: 'Nobody doubts the need to clean up London's air, however the expansion of the ULEZ represents a huge move into residential areas within the North and South Circular. Residents and small businesses within this area now have just three years to become compliant with the Mayor's emission standards.

'This means many now face the daunting challenge of having to spend substantial amounts of money on a newer vehicle or face a daily charge of £12.50 to use their vehicles from October 2021. These time pressures and costs will be keenest felt by those from low income backgrounds, as well as those who work in roles such as hospitality and depend on using a car at night when public transport is not readily available.

'Motorists currently have no quick and easy means of knowing for certain what Euro emissions standard their car, or one they are looking to buy, meets – so it is absolutely vital that a central database is developed as quickly as possible.'

Mr Khan has been pushing hard for London to spearhead new measures to reduce vehicle emissions in the capital since being sworn in as mayor in 2016. This includes the introduction of the T-Charge (officially known as the Emissions Surcharge) last year, which will be superseded by ULEZ in 2019.

16. Aviation Emissions: Industry Disappointed At EU Position On CORSIA

National governments have decided to notify the International Civil Aviation Organization (ICAO) of key differences between EU climate-related aviation legislation and the ICAO's global CORSIA system.

The future implementation of the carbon offsetting scheme for the aviation sector could shift airlines operating in Europe into the worldwide scheme instead of the EU ETS. MEPs and campaigners have expressed misgivings about CORSIA, for which a failure by governments to register differences or reservations by 1 December would have implied acceptance in full.

The International Air Transport Association (IATA) regretted the direction taken by the European Commission in a draft regulation released ahead of the governmental agreement in the EU Council. "CORSIA's monitoring, reporting and verification (MRV) standards were drafted at ICAO with plenty of European input", IATA said. Hence, this is an "unfortunate step away from the global standards that are crucial to effectively manage aviation's climate change impact", the association said.

Campaign group Carbon Market Watch said the European member states' decision shows the EU is "committed to finding effective measures to tackle the growing problem of aviation emissions" and warned that promoting a "global deal at any cost, regardless of its true impact on the climate, will do nothing to solve the current crisis".

MEPs recently called on the Commission to reveal its intentions, include international flights within the EU's ETS, and boost its ambition regarding a global scheme to control greenhouse gas emissions from aviation, ahead of the December deadline to notify the ICAO.

IATA also criticized the EC's draft regulation for applying to CORSIA the standards developed for the EU's ETS. This is a "disappointing development in a region that has traditionally prided itself on both climate leadership and the importance of multilateralism", IATA said.

CORSIA will first call on airlines to offset emissions voluntarily from 2021, and a mandatory phase will follow from 2027, with about 2.5 billion tons of CO₂ to be offset.

Transport & Environment welcomed the fact that the Council rejected signing up fully to CORSIA "before key elements are known, such as offset rules". Nevertheless, T&E labelled the outcome as a "conservative approach", pending of a future decision by member states and the European Parliament.

17. Europe Aviation CO₂ To Rise 21% By 2040

CO₂ emissions from European aviation are continuing to rise and are expected to increase by at least 21% by 2040 despite industry targets to slash emissions, new figures show.

Data produced by the EU's aviation safety (EASA) and environment agencies (EEA) shows CO₂ emissions rose 10% from 2014 to 2017, reduced to a net 3% increase by the emissions trading scheme (ETS). NO_x emissions increased 13% over the same period and are expected to rise 16% by 2040, the figures reveal.

Industry targets include a cap on net emissions growth from next year and a 50% reduction from 2050 compared to 2005.

The second European Aviation Environmental Report said flights in the EU and EFTA increased 8% between 2014 and 2017 and are expected to grow by 42 % by 2040. However, the report said the environmental efficiency of aviation continues to improve, with average fuel burn per passenger kilometer flown predicted to fall by 12% by 2040.

EU transport commissioner Violeta Bulc said the report showed "our joint actions are working". "We have reduced fuel burn ... investments have delivered more efficient technologies; airports are becoming carbon neutral, and finally we are starting to implement the first-ever global scheme to offset CO₂ emissions."

Under the global CORSIA scheme, which will include EU-connected international flights not covered by the EU ETS, airlines will offset emissions voluntarily from 2021, becoming mandatory from 2027. Environmentalists have called the deal "greenwash" because of the inclusion of 'clean oil'.

Responding to the new report, EEA executive director Hans Bruyninckx said current trends were "not compatible with protecting the environment, climate and people's health". He called for "strong policies and robust implementation".

Chair of the European Parliament transport committee Karima Delli (Greens/EFA) said aviation "represents a growing challenge for the environment in the years to come", but regulators and industry are acting to reduce the environmental footprint with new fuels and EU research funding.

Andrew Murphy, aviation manager at Brussels-based NGO Transport and Environment which sat on the stakeholder group for the report, said the numbers were no surprise "as no effective measures have been put in place since the last [2016] report". The report did show that the rising

allowance price was making the EU ETS “a more effective tool”, said Murphy, and that new fuels, such as electro fuels, were “a viable solution to deep decarbonization”.

18. Cruise Ship Captain Fined €100,000 For Using Dirty Fuel

The captain of a cruise ship found to be burning fuel with excessive sulfur levels has been fined €100,000 (£88,500) in a Marseille court, the first such ruling in France. The prosecution was intended to signal a new seriousness in tackling pollution from cruise ships after a spot-check in March on the Azura, operated by P&O Cruises, found it contained unauthorized bunker fuel.

The American captain, Evans Hoyt, knew the fuel was illegal – it contained 1.68% sulfur, 0.18% above the European limit – and the company was using it to save money, prosecutors said during the trial.

The judge handed Hoyt a fine of €100,000 but specified that the parent company of P&O, the US-based Carnival, should pay €80,000 of the sum.

A recent report in the journal Nature attributed 400,000 premature deaths and 14m cases of childhood asthma a year to emissions from dirty shipping fuel.

A spokesman for Carnival said: “The Carnival group carries over 12 million guests on its vessels each year and takes its legal and moral obligations towards the protection of the environment very seriously indeed. We were therefore very disappointed to be prosecuted for this offence, which was based on a European law the French environment ministry had explicitly informed the cruise industry would not be applied to cruise ships and which, in any event, has still not been properly implemented. The captain was using the fuel in good faith, as directed by us, based on our understanding of the law. We have lodged an appeal and will consider the full decision of the court once it is available.”

Marseille is a popular stop for giant cruise ships that ply routes in the Mediterranean between Spain and Italy and port services are an important part of the local economy. However, smog has increased in the city in recent years and shipping is thought to be responsible for a large part of the pollution, which causes respiratory problems and lung disease.

High-sulfur fuel, which is cheaper than cleaner versions, produces sulfur oxides that contribute to acid rain and the acidification of oceans.

19. New BMW Diesel Models Way Below Euro 6d-Temp NOx Limits

Since the introduction of the Euro 6d-temp emission standard, newly launched models must keep their NOx emissions below 80 mg/km in lab conditions (WLTP) and under 168 mg/km during the RDE test. ADAC has now found that some OEMs, such as BMW, have done a good job. The Bavarian carmaker announced that real-world tests resulted in maximum points in the emissions section of the ADAC EcoTest for a series of its models: the BMW 520d touring, the 218d Active Tourer Steptronic and the X1 sDrive 18d Steptronic.

The BMW 520d Touring performed well in the nitrogen oxide tests, with a reading of less than 16 mg/km in urban driving and under 10 mg/km in rural driving and on the motorway. About the 218d, ADAC had the following to say: “BMW is dealing extremely well with the issue of emissions. There are no abnormal figures for any type of pollutant, and the nitrogen oxide emissions are so low

they could even be a record. Even the sensitive measuring equipment used for the test barely managed to detect any emissions in some cases.”

In general, ADAC lab tests performed between 2012 and now shows a decline of 85 % in terms of NOx emissions between Euro 5 and Euro 6d-temp diesels, and still 76 % between Euro 6b and Euro 6d-temp models.

The best Euro 6d-temp diesels even outperform the average Euro 5 diesel by up to 99 %. The implication is double: Euro 5 diesels were really bad – ADAC’s EcoTest measured an average of 528 mg/km, i.e. nearly three times the allowed maximum of 180 mg/km – and Euro 6d-temp diesels performed very well.

Euro 6b models, which were believed to be a lot cleaner than their Euro 5 predecessors, averaged a still worrying 341 mg/km on the ADAC’s stringent lab test, which is more than 4 times the maximum value allowed by the emissions standard, i.e. 80 mg/km.

The 25 tested models posted an average NOx emission level of 81 mg/km in lab conditions according to ADAC’s protocol – which is just 1 mg/km above the limit applied by the Euro 6d-temp standard.

52% of all models tested kept their average below the prescribed 80 mg/km. Nine of the 25 tested models stayed below this limit in all test phases, including the one involving motorway driving. The best car, the BMW X1 sDrive 1.8d, posted a very low 8 mg/km on ADAC’s test bench.

20. Court Confirms EU Illegally Relaxed Diesel Emission Rules

The previous fears of a high-ranking European Commission official were confirmed on 13 December, when the General Court of the European Union ruled that a 2016 relaxing of car emissions limits was, indeed, illegal.

"The commission did not have the power to amend the Euro 6 emission limits for the new real driving emission tests," the court said in a press statement. The ruling confirms what senior commission official Daniel Calleja wrote an internal note in 2015 - when he acknowledged that the commission had to find a legal basis to "mitigate" concerns by car industry lobbyists.

It is one of the most important developments in the ongoing Dieselgate scandal, which saw carmakers cheating with tests and the EU failing to substantially reduce nitrogen oxides (NOx) emissions from diesel cars.

The court case involves rules about cars approved for the EU market since September 2014 – labelled 'Euro 6'. The Euro 6 limit is 80 milligrams of NOx per kilometer, compared to the Euro 5 limit of 180 mg/km, and Euro 4's 250 mg/km.

European authorities have been aware of a large gap between toxic emissions as measured in laboratory tests, and those emitted by diesel cars in real life since at least the end of 2010. Studies by the EU's Joint Research Centre showed that Euro 4 and Euro 5 vehicles emitted four to five times as much as their respective limits allowed.

In response, the EU commission set up a working group to develop a new, more realistic emissions measurement – the Real Driving Emissions (RDE) test. However, carmakers realized

that if the emission limits remained unchanged, meeting the RDE test would be much more difficult than the laboratory test.

They lobbied to have some leniency – with success. In October 2015, one month after German carmaker Volkswagen Group admitted it had cheated with emission tests, representatives from the EU's national governments approved a piece of legislation to introduce the RDE test.

The bill would make the RDE test mandatory but would allow carmakers to miss the target significantly. For the first couple of years, the NOx limit was more than doubled, from 80 mg/km to 168 mg/km. As of 2020, cars emitting up to 120 mg/km during the RDE test would still receive a stamp of approval.

The Netherlands was the only EU country to vote against the bill, which formally was a European Commission proposal.

The European Parliament approved the decision in February 2016. MEPs were not able to amend the legislation – only adopt or reject it – because it was written following the so-called comitology method. Comitology allows the commission to propose slight technical changes or additions to existing directives and regulations.

The court ruled that in the case of RDE, the NOx emission limits were "an essential element of that regulation, which cannot be amended by the commission, and that that regulation provides that those limits must be complied with during real driving and, therefore, during RDE tests". That it may be technologically difficult for carmakers to meet these limit under a new test, was not a sufficient argument, the court ruled.

In mid-2015, Calleja, director-general at the commission's internal market and industry department, wrote that the idea to introduce the RDE test in two phases – the first one being more lenient – lacked a legal basis. "For the moment this should be understood as a political intention," he wrote.

"An appropriate legal justification still needs to be developed, because Euro 6 co-decision legislation in principle applies the respective emission limits without exception and does not allow for such "transitional" measures driven by technology concerns," Calleja added. Co-decision refers to the original regulation on Euro 6.

Despite these concerns about the legal basis, the commission went ahead anyway.

The case was brought to the Luxembourg-based court by the municipalities Paris, Brussels, and Madrid. "The citizens of Paris and cities around the world demand clean air to breathe," said Paris mayor Anne Hidalgo in May.

The ruling was also celebrated by Green MEPs, who in February 2016 voted against the more lenient limits.

21. Switzerland Updates Standard for Premixed Fuel For 2-Stroke Gasoline Engines

Switzerland has a technical standard for fuels to be used for handheld 2-stroke engines such as chainsaws. This was based on a much older Swedish standard but has recently been updated to also include the lubricants in the premixed fuel.

The main purpose was to avoid any carcinogenic substances so Swiss authorities have limited Benzene to a very low level and banned metal additives. VERT is working together with the Austrian AK (Arbeiterkammer) and the German VDI in order to expand the use of these much less toxic fuels. VERT has also visited the European Commission to explore interest in incorporating this into European legislation, but so far without success.

However, that may change as a Member of the European Parliament Karin Kadenbach, MdEP has made an official inquiry regarding the issue. Based on the Commission response it appears that benzene in petrol for non-traffic applications must be limited to < 1 ppm. This could result in enormous health progress for groups such as forest workers but it is apparently not enforced other than by the Swiss Standard SN181163.

22. VW Says It Is Now Developing Its Last Generation Of Gas, Diesel Engines

Volkswagen's strategy chief, Michael Jost, said the last generation of Volkswagen cars to use combustion engines is now under development and will be introduced in 2026. Beyond that date, new models from Volkswagen will be based on one of its several upcoming electric-car platforms.

"In the year 2026 will be the last product start on a combustion engine platform," Jost said at the Handelsblatt automotive summit conference, as reported by Reuters.

That's not to say 2026 marks the last year VW will build a gas car. Like most automakers, the company generally tries to get about 10 years out of new platforms, with major and minor updates along the way. But they won't get new gas-engine designs.

Volkswagen is developing electric cars under government pressure following its emissions cheating scandal, in which the company lied about pollution from its signature diesels.

The past, however, doesn't always presage the future. Volkswagen has also announced the largest investments of any traditional automaker in electric cars and has the most electric platforms under development across its brands of any U.S., European, or Japanese automaker. It also is now the first automaker that builds gas engines to have put an end date on them.

"We made mistakes," Jost said. "We have a clear responsibility here. Our colleagues are working on the last platform for vehicles that aren't CO2 neutral. We're gradually fading out combustion engines to the absolute minimum."

23. Madrid Bans Old Cars To Reduce Emissions

Spanish authorities have introduced new driving restrictions in the center of the country's capital, Madrid, aimed at reducing air pollution by up to 40%. The tough measures mean motorists will have to test their vehicles' emissions, with the oldest and most polluting vehicles banned from the city center.



Drivers entering the controlled zone in breach of the rules will ultimately have to pay a fine of €90 (£80).

The move is also to help reduce noise and encourage more cycling in the city.

Madrid City Council estimates that the project, which was labelled Madrid Central, will affect about 20% of the cars that enter

the city center.

The new rules form part of a plan by Spanish authorities to create a cleaner environment by prioritizing cyclists, pedestrians, and the use of public transport. Restrictions for those entering the designated low emission zone vary depending on the type of vehicle and its "label", which is issued following emissions tests.

For example, hybrid cars with an "eco label" are permitted to drive freely in the center and use public or designated car parks with no time restrictions. However, diesel vehicles produced prior to 2006 and petrol vehicles prior to 2000 will not receive a label and can only enter the zone if they are registered in advance and have access to private parking. From 2020, these vehicles will not be permitted to enter the emissions zone.

Meanwhile, residents who live within the controlled zone can drive freely at any time once registered but can only park on their own street.

The Madrid Central area, which is marked with red lines on road surfaces and signs displaying red circles at the point of entry, is being policed with surveillance cameras.

Concerns about the impact of exhaust pollutants emitted from older vehicles and diesel engines have risen in recent years. The World Health Organization (WHO) has said that millions of deaths around the world every year are linked to exposure to outdoor air pollution. Diesel engines contribute to the problem in two key ways - through the production of particulate matter (PM) and nitrogen oxides (NOx). Very fine soot PM can penetrate the lungs and can contribute to cardiovascular illness and death.

Back in 2016, the mayor of Madrid, Manuela Carmena, said the issue needed to be addressed urgently in order to improve the health of "our children, our grandparents and our neighbors".

Madrid is not the only capital city to focus on improving its air quality. Paris, Mexico City and Athens have all pledged to ban diesel vehicles from city centers by 2025.

24. Jumbo Takes Delivery Of First DAF CF Electric

DAF Trucks has delivered its first fully electric truck to Dutch supermarket chain, Jumbo. The CF Electric has been developed in a joint venture between DAF and VDL and will be used by Jumbo to supply its supermarkets in the south of the Netherlands.

The first DAF CF Electric to enter in-service operations represents a significant milestone for DAF Trucks, VDL and Jumbo. Delivery of the fully electric DAF commercial vehicle marks the start of a series of long-term field tests using both fully electric and hybrid trucks.

"The transport sector is about to undergo a major transformation, " said DAF Trucks President Harry Wolters, "Electric trucks look set to become the norm for deliveries in urban areas. Not today and not next year, but definitely within the foreseeable future. I am particularly proud that today marks the beginning of a large-scale field testing project that will see DAF working in collaboration with VDL and Jumbo. This project, "he added, "will allow us to gather useful data and experience in relation to both the technology and the operational aspects. We can then use our findings to ensure that the final series-production model provides the ideal solution to future market requirements."

"Introducing this new electric truck is the next step towards our goal of implementing a sustainable strategy for our vehicle fleet", said Jumbo CEO Frits van Eerd. "Our business puts us right at the heart of the community, and our ultimate goal is to be using electric vehicles to supply 45% of our shops. By 2020, we hope to have reduced CO2 emissions from Jumbo's vehicle fleet by 50% compared with 2008."

The DAF CF Electric is capable of deliveries within a radius of about 50 kilometers with zero local emissions and with minimal noise pollution. A charging station to charge the truck has been installed at the Jumbo distribution center in Veghel. V-Storage, a joint venture between VDL Groep and Scholt Energy Control, is working with Dutch research body, TNO, to assess the feasibility of fitting solar panels to power the charging station.

The DAF CF Electric is a 4x2 tractor unit developed for road haulage at up to 37 tons in urban areas, for which single-axle or dual-axle trailers are standard. The vehicle is based on the DAF CF—named 'International Truck of the Year 2018'—and is electrically operated using VDL's E-Power Technology. The center of this intelligent powertrain is a 210-kW electric motor powered by a lithium-ion battery pack with a current total capacity of 170 kWh. The CF Electric has a range of approximately 100 kilometers, making it suitable for high-volume transport in the urban distribution market. The battery has a 30-minute quick-charge feature and a full charge takes just 1.5 hours.

NORTH AMERICA

25. Developments Regarding Trump Auto GHG Rollback

Carper Says EPA To Finalize 0.5 Percent Hike In Vehicle GHG Standards

EPA and the Transportation Department are planning to finalize rules requiring a 0.5 percent annual improvement in vehicle fuel economy and reducing greenhouse gas emissions, according to Sen. Tom Carper, the top Democrat on the environment committee, a move only marginally tougher than the agencies' plan to fully freeze Obama-era rules through 2026.

Carper revealed the plans during his opening statement in a January 16 confirmation hearing for acting EPA chief Andrew Wheeler to lead the agency permanently. He noted a 0.5 percent annual

stringency gain is 10 times weaker than current rules. "This will only lead to extensive litigation and uncertainty for automakers," he said. "That's not a win-win outcome. It's a lose-lose."

But Wheeler suggested during a subsequent exchange with Carper the agency appears unlikely to craft a deal with California and other states adopting more aggressive targets, saying the agency is on a tight deadline to finalize the rule by the end of March.

It was recently reported any "deal" on vehicle standards is not likely to be reached until after EPA and DOT finalize their joint rule and litigation begins, with most observers expecting an aggressive rollback of Obama-era rules. Carper's comments thus align with widespread expectations the White House is moving ahead with a significant reduction in the stringency of the standards, even if it does not finalize a "freeze" the agencies originally proposed.

If it plays out as expected, though, it could make it even more complicated to resolve differences among Trump officials, California and allied states and automakers, given any negotiating would be occurring amid high-stakes litigation over the federal rollback.

"Nobody is very optimistic about a near term deal," a former EPA official told the press. "If there is a deal, it is probably going to be later."

Safe Climate Campaign's Daniel Becker, a longtime backer of strong fuel economy rules, told reporters there is ongoing uncertainty about reaching a deal, but any agreement "can supersede whatever else happens." However, he added that it might be up to automakers to seek out an agreement with California.

"Auto companies do want certainty and California doesn't want its authority taken away. The challenge is, what is it that California can agree to with either the Trump administration or automakers that allows California to keep its authority and actually use it?"

During the exchange with Wheeler on the topic later in the hearing, Carper said in recent talks with automakers, they told him "they don't want to end up in a lawsuit with California and 12, 13 other states for the next five years." Carper then gave the broad outlines of a bargain to give industry "flexibility" in the short term while requiring "more rigor" in the out years. "Why are you, why is EPA, why is California and these other 13 states -- why are we unable to come to an agreement?" he said.

In response, Wheeler said "nobody wants a 50-state deal more than I do. I haven't given up hope on that." But he added "we're also looking at the calendar and know that we need to finalize our proposal by March 30," a self-imposed deadline that is getting increasingly close.

Wheeler said he has met with California's top air regulator, Mary Nichols, and remains hopeful a bargain on the standards can be reached.

Carper then reiterated "there is a deal ready to be made," and urged Wheeler to "feel some sense of urgency on this stuff" because transportation is the nation's largest source of carbon emissions and threats from climate change are becoming clearer.

EPA and DOT's proposal would preempt California's authority to regulate vehicle GHGs. Assuming that portion of the rule is finalized, California and its allies would certainly challenge such preemption as well as the rollback of the standards. If the preemption provisions were ultimately scrapped in court, it could result in automakers having to comply with two sets of

standards -- one covering about a third of the auto market in the California-aligned states and weaker federal rules for the remainder of the country.

California Tailpipe Rules Now Washington State's in Trump Rebuke

New cars and light-duty trucks sold in Washington state will have to meet California's more stringent greenhouse gas and fuel efficiency standards starting with the 2021 model year.

The state adopted the Department of Ecology's rule, which applies to the 2021 through 2025 model year cars and trucks, in response to a Trump administration proposal to weaken federal standards. The U.S. Environmental Protection Agency and the National Highway Traffic Safety Administration in August proposed freezing the greenhouse gas and fuel efficiency standards at 2020 levels.

"Reducing vehicle emissions is absolutely critical for continuing to clean our air and combat climate change," Gov. Jay Inslee (D) said in a January 2 statement. "The Trump Administration has signaled it intends to roll back progress at the national level, which makes the collective actions of states all the more crucial."

The rule mirrors a 2012 agreement by the Obama administration, California, and automakers requiring manufacturers to increase efficiency and reduce emissions year over year through model year 2025.

With its adoption, Washington becomes one of 14 states and the District of Columbia to reject the Trump administration proposal in favor of California's more stringent standards. The states are California, Colorado, Connecticut, Delaware, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington.

Regulators with the Department of Ecology had to rush to adopt the rule before the end of 2018 to ensure that it would apply to the 2021 model year, according to spokesman Andrew Wineke.

"We can either enforce the federal standards or California's," Elena Guilfoil, senior rule writer in the state air quality program, said in a January 2 interview. The state's response to the Trump administration proposal was a decision made in the state Legislature in 2005 when lawmakers decided to implement the California standard, she said.

Vehicles are responsible for the largest share of Washington's greenhouse gas emissions at 40 percent, Wineke said. "So, adopting the California standards with these more aggressive greenhouse gas reductions is really important if we are going to meet the targets for our state."

California Adopts Rule To Keep Vehicle GHG Limits, Reinforcing Doubts On Deal

California officials have officially finalized an air board rule that allows the state to continue enforcing strict Obama-era vehicle greenhouse gas standards even if the Trump administration rolls back federal standards, casting additional doubts on a potential compromise between state and federal officials. California's Office of Administrative Law (OAL) approved a California Air Resources Board (CARB) regulatory amendment adopted on September 28 to clarify that automakers must still comply with existing light-duty vehicle GHG standards through model year 2025 in the state even if EPA and the Transportation Department approve a rollback of the equivalent national rules.

Specifically, the amendment clarifies that auto companies would not be "deemed to comply" with California's vehicle GHG standards unless they meet the current federal and state rules, not any less stringent rules that may be adopted by the Trump administration.

During CARB's September 28 meeting at which the board approved the amendment, the board directed its executive officer Richard Corey to hold off on filing it for final OAL approval to allow state officials to continue exploring options for reaching a compromise with the Trump administration to preserve a unified national program for vehicle standards. But OAL's finalization of the regulatory amendment appears to reflect new CARB doubts that any such compromise can be reached.

CARB adopted the regulatory amendment amid strong lobbying by eight states that have adopted California's vehicle GHG rules and backed the CARB proposal during the September 28 board meeting in Sacramento. The state officials said they wanted the board to swiftly approve the amendment to allow them to copy the measure in their own regulations.

"When the board finalizes this action and adopts the staff proposal, we will commence a rulemaking to adopt it in New York as expeditiously as possible," testified Jared Snyder, deputy commissioner of the New York State Department of Environmental Conservation. Representatives of Massachusetts, Connecticut, Vermont, New Jersey, Delaware, Oregon, Washington and the Northeast States for Coordinated Air Use Management echoed similar sentiments during the meeting.

Oil Industry Funding Supports Campaign To Roll Back Fuel-Economy Rules

A new investigative report by the New York Times has revealed the puppeteer pulling the strings in the Trump administration's efforts to undo fuel-economy and emissions improvements: no surprise, the oil industry. Backed by America's largest refiners and organizations tied to or funded by the Koch brothers, an underground network coordinated a lobbying, advertising, bill-drafting, and letter-writing campaign, centered around two main ideas, according to the Times report: that America no longer needs to conserve oil because, after the fracking boom of the early 2010s, the country is awash in cheap oil; and that support for electric cars limits consumer choice—i.e., the choice to buy large, gas-guzzling vehicles. The campaign also says that these choices shouldn't be made by unelected regulators either in Washington or statehouses.

The campaign's language, drafted in a memo circulated to lawmakers by the Koch-funded American Legislative Exchange Council, is echoed in the Safer Affordable Fuel-Efficient Vehicles Act, proposed by the EPA and NHTSA in August. "With oil scarcity no longer a concern," Americans should be given a "choice in vehicles that best fit their needs," reads a draft of the memo.

After the proposal was introduced, President Trump famously noted that the proposal would increase global greenhouse-gas emissions by only 0.02 percent over the six years the rule is in effect. What he didn't say is that that's the amount of annual emissions from a mid-size developed country.

In a response to the Times, a Koch Industries spokesman pointed to the company's "long, consistent track record of opposing all forms of corporate welfare, including all subsidies, mandates and other handouts that rig the system," referring to tax credits for electric cars that were passed by Congress.

It appears he wasn't referring to tax incentives for oil companies, such as deductions for drilling wells, depleting oil and gas deposits (including in shale formations), exploration and development of shale oil and shale injection solutions, and domestic manufacturing for oil and gas production, which are reportedly worth \$37.7 billion in tax revenue over 10 years. Funding for electric car tax incentives has been estimated at \$200 million over 10 years.

The campaign also takes issue with California's ability to set its own emissions standards, which enabled the state to set quotas for electric cars to be sold there. Those mandates are followed by 12 other states.

In one of the Obama administration's first acts, it engineered an agreement among major U.S. automakers, the EPA and NHTSA, and the California Air Resources Board to agree on a common set of fuel-economy and emissions standards.

Now that the Trump administration's new fuel economy proposal undoes that agreement, the automakers are balking and say the proposal goes too far, because it may require them to make separate fleets of cars for California and 13 other states that follow its lead on fuel economy and emissions standards. (Colorado, which recently joined the coalition follows those standards but not the electric-car mandate.)

In a recent investor call, the CEO of Marathon Oil, America's largest refiner, was already counting the increased sales the company expects from the Trump proposal: 350,000 to 400,000 barrels of gasoline a day.

States Fight for Their Right to Follow California Car Rules

States' efforts to protect their authority to adopt California's vehicle greenhouse gas limits could be futile if the Trump administration succeeds with its proposal to strip that power from them. The Environmental Protection Agency, which regulates vehicle emissions, and the National Highway Traffic Safety Administration, with jurisdiction over fuel efficiency, want to eliminate state authority to deviate from federal standards as part of a broader push to freeze fuel economy limits nationwide at 2020 levels.

In its August proposal, the EPA suggests reinterpreting the Clean Air Act to strip away states' authority to adopt California's tailpipe standards, even if those limits are upheld. The proposed change tees up a high-stakes legal fight over states' role in tackling GHG emissions from transportation, the biggest source of greenhouse gases in the U.S.

If the EPA succeeds, it would be a huge blow to the coalition of more than a dozen states that see a strong fuel economy program as critical to their climate goals. These states make up more than a third of the U.S. auto market.

"This is one of the biggest, if not the biggest, environmental issue for a number of these states because it goes to the very heart of a state's ability to address pollution within its borders, particularly in the absence of any strong federal push to do so," Elizabeth Klein, deputy director of New York University School of Law's State Energy and Environmental Impact Center, told reporters.

More than half of those states have taken regulatory steps to secure their link to California's program, even if the federal government reverses course. Those steps could be moot if the EPA's proposal succeeds.

The majority of major automakers—including Ford Motor Co., General Motors Co., and American Honda Motor Company Inc.—have urged the Trump administration to back away from their proposed plan. Instead, the companies favor striking a deal on one national program. Automakers' worst-case scenario, they say, would be uncertainty brought on by years long litigation and separate greenhouse gas standards for cars in different parts of the country.

The steps that states are taking to protect their emissions programs could factor into future litigation, too. They are showing “these standards are achievable,” said Meredith Hankins, an environmental law and policy fellow at the UCLA School of Law. “It turns into a factual dispute: California and the Section 177 states versus EPA over whether automakers are able to comply.”

California can obtain a waiver under the Clean Air Act to set its own tailpipe greenhouse gas standards stricter than federal limits. The EPA and NHTSA are also seeking to eliminate that authority. Other states can adopt California's rules under Section 177 of the law. To date, 13 states and the District of Columbia have done so.

But the EPA has now proposed to reinterpret Section 177 of the Clean Air Act to exclude greenhouse gases. The agency argued that section of the law deals specifically with areas not achieving federal limits on criteria pollutants, such as ozone and nitrogen oxides. Criteria pollutants have national air quality standards that define allowable concentrations in the air. That doesn't include greenhouse gases.

“It's the one-two punch: withdraw the waiver, and then reinterpret Section 177 to ensure that even if the waiver survives, no state besides California could then adopt California's standards,” Caitlin McCoy, a climate, clean air, and energy fellow with Harvard's Environmental and Energy Law Program, told reporters.

State attorneys general have begun to lay out their legal arguments. The agency's justification for reinterpreting Section 177 is thin, contrary to past practice, and in violation of the agency's obligations, the attorneys general for 20 states wrote in comments to the agencies last fall.

The coalition included attorneys general from California and nearly all the states that follow its standards, as well as top litigators from states that don't, such as Virginia, Minnesota, New Mexico, and North Carolina.

Regulators in the Section 177 states are lining up to preserve their authority by adopting into state law a change California made to its vehicle rules in December. These steps are to make it clear the states “are not tied to the hip of the federal government” if it weakens national limits, Ben Grumbles, Maryland's top environment official, said.

California air regulators adopted an update to its rules December 12 clarifying its “deemed to comply” provision. Crafted during the Obama administration, the provision stated that compliance with the EPA's vehicle greenhouse gas limits would also meet California's rules. But the update said the provision doesn't apply if the Trump administration weakens federal standards from the Obama-era levels through 2025, which California has already adopted. (See story above.)

Colorado, Connecticut, Maryland, Massachusetts, New Jersey, Oregon, Vermont, and Washington have formally adopted that change. Maine and Pennsylvania don't need to take a formal step to adopt the changes, because their regulations will automatically incorporate the most updated California standards. Rhode Island is still reviewing California's update, but it would

need to undertake a regulation to adopt the changes, Mike Healey, chief public affairs officer for the state's environment agency, said.

New York environment regulators appear to be moving forward with a vehicle standards-related proposal, with a hearing scheduled for March 11, but details are still vague.

Environmental advocates say the changes made by California and the other states are small but significant clarifications to sever ties to the federal limits, even before they see the Trump administration's final standards. The moves make a statement that chips away at Trump administration arguments that the current standards aren't feasible.

It is hard to predict how much judges would value the states' regulatory steps, but they are sending a signal that the technology is possible and the standards are within their authority.

Groups Ramp Up Bid To Obtain EPA Vehicle GHG Rule Cost Assumptions

Environmentalists are joining Capitol Hill Democrats in an effort to obtain more information on EPA cost assumptions related to the Trump administration's planned rollback of vehicle fuel economy and greenhouse gas standards, arguing the agency has improperly ignored its own data in favor of more pessimistic estimates from the Transportation Department.

A December 3 lawsuit from the Natural Resources Defense Council (NRDC) and Environmental Defense Fund (EDF) urges a federal court to compel EPA to release information related to a technology cost modeling tool it has long used to develop vehicle GHG standards but omitted in the Trump administration's proposed rollback.

The lawsuit comes just days after an oversight request from House Energy & Commerce Committee ranking member Frank Pallone (D-NJ) and other Democrats seeking similar information.

"Important analysis shows that automakers can meet the clean car standards at a reasonable cost, saving drivers money at the pump," said NRDC lawyer Pete Huffman in a December 3 press release announcing the suit. "The obvious reasons EPA would refuse to release the records of its analysis is that they would further undermine the already flimsy arguments for a rollback."

The lawsuit, filed under the Freedom of Information Act (FOIA), is the latest development in the evolving legal war against the Trump proposal to freeze fuel economy and GHG limits after model year 2020 -- a battle brewing even before the proposal goes final.

It joins an earlier effort by environmentalists and Democratic-led states to challenge EPA's formal determination that it must weaken Obama-era GHG rules, a suit that recently cleared a hurdle when an appellate court panel agreed to consider the critics' arguments and rejected requests to dismiss the case.

In procedural terms, the new lawsuit in the U.S. District Court for the Southern District of New York -- NRDC and EDF v. EPA -- seeks a judgment that EPA has violated FOIA by failing to produce records sought "on or before" August 2018 related to a model known as the Optimization Model for reducing Emissions of Greenhouse Gases from Automobiles (OMEGA).

The suit asks that the court compel release of the records "without further delay."

The litigation's focus on OMEGA is significant because EPA has long used the tool to assess the cost effectiveness of technologies for reducing vehicle GHGs. Cost considerations are one of two main arguments -- the other being safety -- that the Trump administration has cited to justify its rollback plan.

The groups' lawsuit notes that the proposed rollback jettisons reliance on OMEGA in favor of another tool, known as the Volpe model, favored by the National Highway Traffic Safety Administration (NHTSA) -- one of many Trump administration moves that critics say ignores the technical recommendations of EPA's own staff.

In general terms, automakers favor use of the Volpe modeling because it provides what they argue is more realistic projections of future technology deployment. Supporters of strong rules, however, have argued that EPA's modeling is more accurate in part because it highlights the benefits of combining various technologies in one vehicle.

Automakers had urged the administration to use only NHTSA's modeling as one effort to better "harmonize" the two agencies' programs, a request that the agencies embraced in the rollback proposal.

NRDC and EDF characterize EPA's failure to release OMEGA-related information -- including ongoing updates to that model -- as unprecedented, in a bid to highlight the differences between the agencies' models to show that the rollback plan ignores cost-effective technologies to reduce emissions.

"EPA did not rely on OMEGA in the August 2018 [rollback] proposal. . . . EPA nevertheless continued to utilize OMEGA and to update OMEGA and its inputs," the groups write, citing examples such as an April 2018 presentation to the White House during interagency review of the proposal.

They add: "Despite repeated requests from Plaintiffs and others, including the State of California, EPA continued to withhold the requested OMEGA-related records through the entire public comment period" on the rollback plan.

The groups further note that during the public comment period, "multiple commenters, including Plaintiffs, noted deficiencies with Volpe and suggested that EPA should validate aspects of the proposal using its latest OMEGA model."

The lawsuit echoes part of a November 20 oversight letter from Pallone and other House Democrats seeking detailed information from EPA related to the vehicle proposal, as well as the administration's weakening of power plant and oil and gas industry climate rules.

In that letter, the Democrats seek information including "presentations, briefings and any memorandums" developed by EPA staff that compare OMEGA modeling results to those from NHTSA.

The lawmakers also seek an explanation of why EPA has not posted "updates to OMEGA models" related to the proposed rollback on its website and call for a "deadline by which EPA will publicly post modeling inputs and technology cost estimates for OMEGA models and results supporting this rulemaking."

The lawsuit comes as the Trump administration is separately under fire for its safety assumptions in the rollback plan. Numerous critics -- including parts of the auto industry itself -- argue that the most or all the rule's claimed safety benefits rely on flawed assumptions related to consumers scrapping of old vehicles.

In that vein, Politico recently quoted an administration official indicating that EPA and NHTSA plan to reduce their projections of lives saved by the regulation when they finalize it. It also quotes NHTSA, however, pushing back on that by calling it "premature and inaccurate" to report specific changes to the analysis.

26. Former EPA Regional Head to Run California Environmental Agency

New California Gov. Gavin Newsom (D) appointed an Obama-era official January 8 to run the California Environmental Protection Agency. If confirmed by the state Senate, Jared Blumenfeld will run the agency that oversees regulation of air, water, pesticides, health assessments, toxic substances, and recycling.

Blumenfeld was previously named a U.S. Environmental Protection Agency regional administrator in November 2009 and served through May 2016. In 2016, he started consulting firm Advising Impact.

While at the EPA, Blumenfeld covered the region that encompasses California, Hawaii, Nevada, Arizona, the Pacific Islands, and 148 tribal nations. During his tenure, he helped advance clean vehicle efforts, force California to better use federal money on community drinking water initiatives, and settle pollution cases, including the cleanup of leaking underground storage tanks that threatened Humboldt Bay.

He also helped ban cruise ships and large vessels from discharging treated sewage within three miles of California's shoreline.

Prior to the EPA, Blumenfeld spent eight years as director of the San Francisco Department of Environment and was chairman of the 2005 United Nations World Environment Day, according to his resume.

More recently, Blumenfeld got into the world of podcasts. He began the weekly environmental show Podship Earth in February, and former EPA Secretary Gina McCarthy was his first guest.

His goal was to be accessible on complex topics. "I want to make sure that Podship Earth communicates environmental issues in a way that resonates with everyone, not just the eco-elite who are already members of advocacy groups, not just Tesla owners, but everyone, because this mighty battle is going to take all of us," Blumenfeld said at the time. "The environment was allowed to become a polarizing political issue. That should never have happened."

Newsom also reappointed Karen Ross as Secretary of the California Department of Food and Agriculture.

27. Sharp Rise Seen for U.S. Greenhouse Gas Emissions in 2018

The increase was driven by carbon dioxide emissions generated by industrial manufacturing, which had an annual increase of 5.7 percent, and commercial and residential buildings, which generated 10 percent more emissions, according to the report by the Rhodium Group.

“Limited progress” has been made in cutting emissions in these areas, adding to the difficulties for the U.S. to meet its reduction targets under the 2015 Paris climate agreement, the report by the research organization said.

Transportation, which remains the U.S. economy’s largest source of carbon dioxide, had a 1 percent annual increase of carbon dioxide emissions. In electricity generation, more coal-fired power plants were retired in 2018, but natural gas, another source of carbon emissions, supplied most of the growth in electricity demand, and power sector emissions had an annual increase of 1.9 percent.

The report called industry and buildings the “forgotten sectors” in carbon-reduction policy.

While regulators can raise efficiency standards and change building codes for new construction, they can’t do much to control energy use in existing homes and offices.

Manufacturing production increased last year, buoyed by a generally robust economy. But great news for factories can be a headache for carbon-cutters. “The industrial sector is still almost entirely ignored” by climate policy makers, the Rhodium report said.

“Absent a significant change in policy or a major technological breakthrough we expect the industrial sector to become an increasingly large share of US greenhouse gas (GHG) emission in the years ahead (including non-CO2 gases),” it added. “We expect it to overtake power as the second leading source of emissions in California by 2020 and to become the leading source of emissions in Texas by 2022.”

The overall 3.4 percent gain was the largest since an annual increase of 3.6 percent in 2010 when the U.S. was emerging from recession.

Industry and buildings make up about a third of U.S. carbon dioxide, with industrial sources contributing 22 percent and buildings 11 percent in 2016, according to the Environmental Protection Agency.

28. EIA: US Crude, NGL Production Broke Records In November

US crude oil and natural gas liquids production broke records in November and the first 11 months of 2018, the US Energy Information Administration reported. November’s total US crude production averaged nearly 11.7 million b/d, 15.7% higher than a year earlier, as NGL production for the month climbed 11.2% to an average of almost 4.6 million b/d during the same period, EIA said.

Reported total US crude production through November 30 averaged more than 10.8 million b/d in 2018, 16.4% more than the monthly average of almost 9.3 million b/d for the comparable 2017 period, according to figures from EIA’s December 2018 Monthly Energy Review. Average monthly NGL production through November of more than 4.3 million b/d was almost 14.8% more than average monthly NGL production in 2017’s first 11 months, it said.

EIA’s figures confirmed findings in the November Monthly Statistical Report, which the American Petroleum Institute released a day earlier.

US crude production averaged a record 11.6 million b/d as NGL production also broke its record at an average 4.8 million b/d, it said. Crude oil exports also hit a record high at 2.4 million b/d during the month and US petroleum net imports fell to their lowest monthly level in more than 50 years at 2.2 million b/d, it added.

29. New White House Environment Chief to Push Climate Resilience

The Trump administration has committed to boosting U.S. resiliency to flooding and other risks linked to climate change as part of a deal to confirm a top White House environmental official. Council on Environmental Quality chairwoman Mary Neumayr, whom the Senate unanimously confirmed January 2, agreed to work with the Federal Interagency Floodplain Management Task Force to better prepare for extreme weather events and develop better infrastructure, according to letters sent to the Senate Environment and Public Works Committee last year that were released January 7.

“I commit to working with you and your staff on matters relating to improving the nation’s preparedness and resilience to future risks,” Neumayr told Environment and Public Works ranking member Sen. Tom Carper (D-Del.).

Congress set up the task force in 1975 to help develop a national flood plain management plan. It includes members from the U.S. Army Corps of Engineers and the departments of agriculture, commerce, and energy, and other agencies.

Neumayr also told Carper she would schedule a public hearing in the Mid-Atlantic region on upcoming regulations to revise how the National Environmental Policy Act is implemented. The 1970 law requires agencies to assess environmental impacts of large development projects and continue to report greenhouse gas emissions across the federal government while promoting federal sustainability efforts.

Neumayr and two other nominees—Alexandra Dapolito Dunn to head the Environmental Protection Agency’s Office of Chemical Safety and Pollution Prevention and W. Charles “Chad” McIntosh to lead the EPA’s Office of International and Tribal Affairs—were confirmed by the Senate only after CEQ and the EPA agreed to comply with requests from Senate Democrats on chemicals and pesticides policy and sustainability matters.

President Donald Trump had nominated Neumayr in June 2018 for the position, which coordinates and facilitates environmental policy issues across federal agencies.

30. Exxon Rejected By U.S. Supreme Court on Climate Change Documents

The Supreme Court won’t hear Exxon Mobil’s appeal of a Massachusetts court decision that forces it to turn over records of its climate change research dating back to 1976. The court’s January 7 announcement in the case came without comment.

The action “clears the way for our office to investigate Exxon’s conduct toward consumers and investors,” Massachusetts Attorney General Maura Healey (D) said in a tweet. “The public deserves answers from this company about what it knew about the impacts of burning fossil fuels, and when.”

Exxon—which is headquartered in Texas—had argued that Healey had no basis to seek documents to conduct an investigation. But Healey responded that hundreds of ‘Exxon and Mobil

retail service stations operate in Massachusetts, and that the company has entered into franchise agreements giving it the right to control—and a share of the profits from—those service stations.

Massachusetts's Supreme Court agreed last April that those stations' presence in the state gave Healey sufficient jurisdiction over the company.

In October, then-New York Attorney General Barbara Underwood (D) sued Exxon, accusing the company of misleading investors with public statements about climate change.

The two states launched their investigations following news reports in 2015 that Exxon's own scientists had determined that fossil fuel combustion needed to be reduced to mitigate climate change's impacts. Exxon has called the states' efforts meritless and politically motivated.

31. Volvo Trucks to Take \$780 Million Charge Over Emissions Flaw

Volvo AB, the world's second-largest truck maker, will set aside 7 billion kronor (\$780 million) to address a faulty emissions-control component that's worn out more quickly than expected. The charge will eat into operating income in the just-finished fourth quarter, while the impact on cash-flow impact will last for several years, the Gothenburg, Sweden-based manufacturer said in a January 3 statement issued after trading closed in Stockholm.

Volvo fell the most in six months on Oct. 16 after disclosing that the cost to fix the problem with the part, which comes from an outside supplier, "could be material." The company has said that a component was degrading faster than expected, potentially leading to the release of emissions exceeding limits.

The company is still working through how to address the problem and is working with authorities to come up with a solution, it said. The U.S. Environmental Protection Agency said in October it was in talks with Volvo to address the issue.

U.S. diesel-engine maker Cummins Inc. said in July that it would pay \$404 million through 2020 for repairs to ensure its engines keep pollution below legal limits as they age. The EPA and the California Air Resources Board had found previously that some older Cummins engines failed emissions tests as parts wore out.

32. Fiat Chrysler to Pay \$800 Million to Settle Emissions Lawsuits

Fiat Chrysler Automobiles NV will pay an estimated \$800 million in fines and costs related to recalling and fixing thousands of vehicles under civil settlements announced recently by California and the U.S. Justice Department, which alleged some of its diesel-powered vehicles violated clean-air rules.

"A multinational corporate bad actor seriously violated American emissions laws to the detriment of the health and welfare of the people of the United States," said Jeffrey Bossert Clark, assistant attorney general for the Justice Department's Environment and Natural Resources Division. "That is a very serious offense."

The total costs of the settlements to Fiat Chrysler could top \$800 million, based on the settlements with the U.S. government, California, and consumers. The total \$307.5 million consumer settlement—with Fiat Chrysler responsible for as much as \$280 million—is based on 100 percent

participation by consumers, so is likely to be a lower number. Consumers will get an average of \$2,800 per vehicle in compensation, according to Fiat Chrysler.

German parts supplier Robert Bosch GmbH has also agreed to pay up to \$27.5 million as part of the settlement with consumers. It will also pay a total of \$103.7 million to 50 jurisdictions, according to Maryland Attorney General Brian Frosh.

The settlements mark a milestone in the second major case brought by U.S. officials against an automaker for Clean Air Act violations stemming from diesel vehicles equipped with pollution controls prohibited by U.S. law. In January 2017, Volkswagen AG pleaded guilty to criminal charges and agreed to pay some \$4.3 billion in U.S. penalties for its scheme to deliberately rig hundreds of thousands of U.S. diesel vehicles to cheat on emissions tests. The VW scandal extended to some 11 million other vehicles the company sold worldwide and led to U.S. criminal charges against eight people. The company has set aside more than \$30 billion to cover costs and settlements, including \$15 billion to buy back or fix vehicles in the U.S.

Fiat Chrysler won't have to admit wrongdoing, according to the documents. It will pay owners of roughly 104,000 diesel-powered SUVs and pickups to update the emissions software on the vehicles via a recall, according to a consumer consent decree filed in federal court in California.

"The settlements do not change the company's position that it did not engage in any deliberate scheme to install defeat devices to cheat emissions tests," the automaker said in a statement. "The consent decree and settlement agreements contain no finding or admission with regard to any alleged violations of vehicle emissions rules."

The pact will resolve civil claims by the Justice Department on behalf of the Environmental Protection Agency that some Jeep Grand Cherokee and Ram 1500 models contain pollution-control software that improperly limits pollution during lab tests while allowing the vehicles to spew excess emissions on the road.

Fiat Chrysler has also agreed to corporate governance reforms intended to prevent future emissions violations. To mitigate the vehicles' excess emissions, Fiat Chrysler will also provide funds and work with a catalytic converter manufacturer to offer drivers better emissions reductions when they replace that part. Fiat Chrysler will be on the hook for additional penalties if it fails to update the software on at least 85 percent of the affected vehicles within two years, the EPA said in a statement.

The company has already set aside about \$810 million to cover settlements and other costs stemming from the diesel matter.

33. Senators, EV Backers Redouble Deployment Calls To Tackle Climate Change

Two Senate Democrats are re-introducing legislation to create an ambitious national zero emissions vehicle (ZEV) mandate to be overseen by EPA, offering a rebuttal of calls to scrap state ZEV and greenhouse gas rules and joining broader calls from electric vehicle (EV) supporters to hike deployment of the cars to address climate change.

The legislation, S.3664 from Sens. Jeff Merkley (D-OR) and Sheldon Whitehouse (D-RI), is being viewed in part as a political response to the Trump administration's proposal to freeze EPA's vehicle GHG standards and preempt states' GHG and ZEV regulations.

In addition, the bill also effectively serves as a much-stricter counter to General Motors' recent call for a national ZEV program that critics have derided as a business-as-usual policy threatening state programs.

EV backers are urging much wider deployment of the vehicles through both public and private action in order to address mounting climate risks, even as they tout initial successes with more than 1 million EVs now on domestic roads.

The Democrats say their ZEV legislation “builds on the movements of 10 states, including California, Oregon, Maine and New York, that have enacted state-level ZEV standards,” according to a November 28 press release.

“A bold national ZEV standard would put the U.S. at the forefront of the emerging electric vehicles market, positioning the U.S. to lead in innovation and manufacturing. [And a] federal policy is needed to ensure the entire country experiences the benefits of ZEVs,” the release adds.

The legislation would require half of new car sales to be ZEVs by 2030, followed by a 100 percent requirement by 2050.

One environmentalist notes that the bill is not entirely novel, echoing prior provisions in a broader 2017 Merkley measure that called for 100 percent renewable energy by 2050. However, the new stand-alone bill offers a convenient counterpoint to both the Trump administration's rollback and GM's recent plan, the source says.

GM's plan roughly equates to a 5 percent ZEV sales target in 2025, and a 7 percent mandate by 2030, though those figures are projections because the automaker's plan relied on credits rather than specific sales figures.

A state source has few expectations the Merkley-Whitehouse plan will become law anytime soon, but says it is nevertheless an important contribution to the public discussion on climate change.

The bill's ZEV targets are “in line with what is needed” to reduce carbon emissions by 80 percent by 2050. Such a cut is widely cited as necessary to prevent dangerous climate change over the long term.

The measure's backers are also tying the legislation to several recent reports painting a troubling picture of both the consequences of global warming and the gap between countries' goals and their progress on GHGs, including the recent National Climate Assessment citing a potential 10 percent hit on national GDP within the next century from climate change.

The Democrats' ZEV plan also follows the Trump administration's August proposal to freeze vehicle GHG and fuel economy standards after model year 2020 -- in tandem with revoking states' authority to enforce current GHG standards and ZEV sales mandates.

The environmentalist argues that the GM plan is even weaker than it might seem because it appears to upend current state ZEV programs and substitute them with a weak “50-state solution,” coupled with the company's call to ease fuel economy requirements.

The source interprets the new bill as demonstrating a commitment to a ZEV mandate bolder than GM's, and as a bid to be “part of the discussion” on climate solutions in the next Congress.

The lawmakers floated their legislation days before a November 30 forum hosted by the utility trade group Edison Electric Institute (EEI), which brought together automakers, policymakers, power companies, the EV charging sector and environmentalists to celebrate the deployment of 1 million such vehicles on the road, a threshold that was crossed in October.

That milestone represents a long-time target floated by the Obama administration, though the original goal was to achieve that deployment by 2015.

While many observers scoffed for years that the target was too optimistic, EV backers argue that missing the target by roughly three years is not overly important, given real progress on improving the technology and lowering costs, and signs of a looming fundamental transformation in the vehicle market.

However, EV backers also cite the need to accelerate that transformation quickly enough to be relevant from a climate change perspective, and acknowledge challenges including the fact that deployment is overwhelmingly concentrated in California and a few other states.

In that vein, nearly one-fifth of all EVs on the road are owned by customers of Southern California Edison (SCE), SCE's Jill Anderson noted at the event.

And a recent report from the California Business Roundtable notes that in California, total sales of "true" ZEVs -- completely electric vehicles -- plus plug in hybrids since 2009 account for just under 10 percent of the state's 2030 goal of 5 million such vehicles on the road.

EEI President Tom Kuhn said reaching the one million vehicle milestone nationally was a "pretty bumpy road," but suggested the market will only grow from here as more people embrace the vehicles.

Participants noted accelerating deployment in the United States but also acknowledged that the country remains behind both China and Europe on EV deployment, with China having three times as many vehicles

EEI in tandem with the event released a sales projection based on five independent forecasts, concluding that EVs on the road will reach 18.7 million in 2030, with annual sales reaching more than 3.5 million vehicles, or more than 20 percent of total sales that year. The report also boosts EEI's 2017 estimate of EV sales in 2025 from 1.2 million to 1.4 million.

Rep. Paul Tonko (D-NY), who is slated to take over as chair of the House Energy & Commerce Committee's environment panel in the next Congress, told the event that EV technology has evolved dramatically even as transportation GHGs have surpassed electricity at the largest source of emissions domestically.

And he said lawmakers could enact climate policy "singles and doubles" next year, including an extension of EV tax credits and measures to bolster charging infrastructure.

Kathy Kinsey of the Northeast States For Coordinated Air Use Management used the occasion to defend state ZEV programs, arguing "we would not be here" celebrating the 1 million EV milestone without such programs. "Our states are more committed than ever to the successful implementation of state ZEV programs," she added.

And Natural Resources Defense Council's Luke Tonachel defended "strong vehicle standards" as one of several federal policy priorities to help drive innovation and certainty for the sector. Others include extension of EV tax credits and including EV charging in any Hill infrastructure package.

34. Trump Threats Won't Put Brakes on Electric Cars, GM Official Says

President Donald Trump's threats to pull electric car subsidies for GM won't deter the overall trend toward electric vehicles, the automaker's head of North American policy said. "We pay a lot of attention to what any president says. But the reality is the electrification movement is going forward anyway," Dan Turton, vice president of North American policy for General Motors Co., said November 30 at an Edison Electric Institute event to celebrate 1 million electric cars on U.S. roads.

Trump said in a series of tweets November 27 he would consider cutting GM's subsidies, including for electric cars, after the company announced it would close five U.S. factories and lay off about 14,000 employees during a restructuring.

Trump didn't specify what subsidies he was referring to. Consumers can qualify for a federal tax credit of up to \$7,500 toward the purchase of electric vehicles, including GM's Chevrolet Bolt. Major carmakers such as GM, Nissan Motor Co., and Tesla Inc. are urging Congress to extend the incentive, which is set to phase down in January 2019 and expire in January 2020.

White House economic adviser Larry Kudlow said the Trump administration wants to end subsidies for electric cars and other items, including renewable energy sources. "As a matter of our policy, we want to end all of those subsidies," Kudlow said. "And by the way, other subsidies that were imposed during the Obama administration, we are ending, whether it's for renewables and so forth." Asked about a timeline, he said: "It's just all going to end in the near future. I don't know whether it will end in 2020 or 2021."

The tax credits for electric vehicles and for plug-in hybrids are capped by Congress at 200,000 vehicles per manufacturer, after which the subsidy phases out. Tesla has already reached the limit. GM expects to hit the threshold by the end of 2018, which means under the current law its tax credit scheme would end in 2020. Other automakers may not hit the cap for several years.

Congress doesn't seem to share Trump's desire to kill electric car subsidies. "The biggest driver for future electric vehicle adoption is the extension of the federal tax credit," Rep. Paul Tonko (D-N.Y.) said at the November 30 event. Tonko, who (as noted above) is poised to chair the environment panel of the House Energy and Commerce committee in the new Congress, added he hopes the Democratic majority in the House can work to extend the credit next year.

Tonko also plans to include electric vehicle charging stations in any discussions on infrastructure, he said.

Auto executives said electric car adoption will continue to grow—though factors such as policy, consumer acceptance, and charging infrastructure will determine the speed of transition.

Trump's trade policy choices could affect electrification if it ties up the production path of batteries or other vehicle parts, Bryan Jacobs, government affairs manager for BMW of North America, said. "Open and free trade is a formula for success," Jacobs said at the November 30 event. But

he added that BMW is working to make its production network flexible to absorb any uncertainty in the markets or parts of the country.

Broad electric vehicle adoption might also take advances in technology to bring electrification to larger vehicles, such as SUVs and pickup trucks, Jacobs said. BMW is working to roll out an electric crossover vehicle in 2021.

“Americans want to buy an SUV more than anything else, and most of the EVs coming out are sedans,” Jacobs said. “We need to put an SUV out on the market that they want. That way they don’t have to make this binary choice” between a traditional engine and an electric car.

35. California Transitioning To All-Electric Public Bus Fleet By 2040

The California Air Resources Board has approved a statewide goal for public transit agencies to gradually transition to 100 percent zero-emission bus fleets by 2040. The Innovative Clean Transit regulation is part of a statewide effort to reduce emissions from the transportation sector, which accounts for 40 percent of climate-changing gas emissions and 80-90 percent of smog-forming pollutants. The transition to zero-emission technologies, where feasible, is essential to meeting California’s air quality and climate goals.

Full implementation of the regulation is expected to reduce greenhouse gas emissions by 19 million metric tons from 2020 to 2050 – the equivalent of taking 4 million cars off the road. And it will reduce harmful tailpipe emissions (nitrogen oxides and particulate matter) by about 7,000 tons and 40 tons respectively during that same 30-year period.

As longtime partners for clean air in California, the state’s 200 public transit agencies play a pivotal role in transitioning vehicle fleets away from fossil fuel-powered technologies to zero-emission alternatives. Eight of the 10 largest transit agencies in the state are already operating zero-emission buses, including battery electric and hydrogen fuel cell vehicles.

Transit agencies are particularly well suited for introducing these technologies. They operate largely in urban centers, where pollution and noise are of greater concern. Their buses drive in stop-and-go traffic where conventional internal combustion engines waste fuel while idling. And their fleets run out of central depots where charging infrastructure can be installed and conveniently accessed.

Deployment of zero-emission buses is expected to accelerate rapidly in the coming years – from 153 buses today to 1,000 by 2020, based on the number of buses on order or that are otherwise planned for purchase by transit agencies. Altogether, public transit agencies operate about 12,000 buses statewide.

To successfully transition to an all zero-emission bus fleet by 2040, each transit agency will submit a rollout plan under the regulation demonstrating how it plans to purchase clean buses, build out necessary infrastructure and train the required workforce. The rollout plans are due in 2020 for large transit agencies and in 2023 for small agencies.

Agencies will then follow a phased schedule from 2023 until 2029, by which date 100 percent of annual new bus purchases will be zero-emission. To encourage early action, the zero-emission purchase requirement would not start until 2025 if a minimum number of zero-emission bus purchases are made by the end of 2021.

CARB will continue to work with transit agencies on a successful transition and conduct regular reviews of progress. Benefits of the regulation are many:

- Transit-dependent riders, especially in disadvantaged and low-income communities, will breathe cleaner air and enjoy quieter rides.
- Transit agencies are expected to save \$1.5 billion in maintenance, fuel and other costs by 2050 after the full buildout of infrastructure.
- The deployment of zero-emission buses in California will bring new workforce training and employment opportunities including high-quality manufacturing jobs to communities across the state.

Electrifying the heavy-duty transportation sector is supported by a range of government policies and programs. Public funding for zero-emission vehicles and related charging infrastructure is administered by CARB, the California State Transportation Agency, Caltrans, the California Energy Commission, and local agencies.

In addition, utilities are supporting this transition with new electricity rate designs and investments in charging infrastructure. The Department of General Services is also streamlining bus purchases through a single statewide zero-emission bus purchase contract.

36. Michigan Buying Electric School Buses With VW Money

Michigan school students will benefit from money Volkswagen AG is paying out to settle claims it rigged its vehicles to cheat emissions tests. The state will buy electric school buses with a portion of the \$64.8 million it received from the \$2.9 billion VW must pay into a mitigation trust fund. The fund was created under a settlement with the Justice Department over allegations the automaker violated the Clean Air Act in a diesel-emissions cheating scandal.

Some of the state's children could ride in electric buses on the first day of classes next fall.

Michigan, Illinois, Iowa, Minnesota, Ohio, and other Midwestern states decided to focus their first tranches of VW money on replacing older diesel-powered school, shuttle, and public-transit buses with clean-diesel technology or other fuel sources such as electric or propane.

"In Michigan we recognize how vulnerable children are to diesel emissions, and therefore we thought it was a priority to replace school buses early on," Debra Swartz, state manager of the Michigan Department of Environmental Quality's VW settlement agreement, said.

Michigan carved out \$3 million of its state share specifically for electric buses, in part to test the funding process on a small scale but also to boost environmental innovation in the state. Replacing public transit buses is part of the state's longer-term strategy, Swartz said.

Wisconsin dedicated \$32 million of its \$67.1 million to upgrading state transit buses because of a statutory requirement, but other states are making the switch because of environmental and health priorities.

The bus replacement program also benefits the makers of those vehicles, including Durham School Services LP, which is replacing nearly 100 vehicles with the help of a \$2 million grant in Ohio, and First Student Inc., a unit of FirstGroup America Inc., which is participating in several state school-bus replacement strategies.

Many environmental groups are pushing states to use their VW money to make a break from carbon fuels and purchase all-electric buses, but those buses can be two or three times more expensive than a new bus using clean-diesel technology. Compared with an older diesel bus achieving the same fuel economy, a new clean-diesel still produces carbon emissions but comparatively less nitrogen oxide and particulate-matter emissions. Buses powered by propane produce less air pollutants and greenhouse gas emissions.

After the court overseeing the VW settlement approved the payout structure in 2017, states began developing required mitigation plans summarizing how they would spend their allocations. Each state has until 2027 to request their allocation and implement mitigation actions.

Michigan and other states finalized their mitigation plans earlier in 2018 and will begin spending their VW money in early 2019. Mark Nabong, a Natural Resources Defense Council senior attorney, told reporters the idea of focusing initial funding on updating the region's bus fleet makes sense because it not only reduces emissions but allows many people, not just those who can afford to purchase electric cars, to use vehicles that decrease emissions.

The appetite to convert to lower-emission or no-emission buses has been strong throughout the region, state agency representatives said. In Minnesota, more than 500 bids are seeking part of the \$2.4 million to replace "slightly more than 100" school buses were received. Bid winners receiving up to \$20,000 per bus will be announced in January.

On November 28, Wisconsin announced it will award the \$32 million to nine cities and one county for the purchase of 58 transit buses, including six all-electric buses for the city of Racine, and other eligible expenses such as charging equipment for electric buses. The state still hasn't designated a use for \$25.1 million, meaning upgrades to the state's bus fleet may continue.

37. MSC Mediterranean Shipping Company Pays \$630K For Air Quality Violations

MSC Mediterranean Shipping Company S.A. paid \$630,625 in penalties to the California Air Resources Board for violating the Ocean-Going Vessel At-Berth regulation. The violations were discovered during a routine audit of the company's 2014 visits to the Port of Oakland and the twin ports of Los Angeles and Long Beach. The investigation by CARB revealed more than 2500 violations for both the Oakland and LA/LB fleets for failing to reduce auxiliary engine power generation by at least 50 percent and for exceeding limits for auxiliary engine run time as required by the At-Berth regulation.

"Ocean-going vessels are significant contributors to air pollution," said CARB Enforcement Division Chief Todd Sax. "Even in port, their auxiliary engines generate toxic diesel particulate pollution that impacts not only port-adjacent communities, but also entire inland regions. This regulation helps to protect all Californians and is necessary to ensure we meet our clean air goals."

Adopted in 2007, the At-Berth Regulation was designed to reduce emissions from diesel auxiliary engines on container ships, passenger ships and refrigerated-cargo ships while berthing at a California port. Vessel operators can either turn off auxiliary engines and connect to grid-based shore power or use alternative technologies to achieve equivalent emission reductions while in port. The regulation ultimately requires a fleet operator to reduce at-berth oxides of nitrogen (NOx) and particulate matter (PM) emissions from its vessels' auxiliary engines in port by at least 80 percent by 2020.

Based in Geneva, Switzerland, MSC is one of the largest worldwide container shipping companies. MSC cooperated with the investigation and subsequently converted its California fleets to include 100 percent shore power-equipped vessels and has had no further violations of the At-Berth regulation. The fine was paid to the California Air Pollution Control Fund to support air pollution research, and the company agreed to comply with all requirements of the regulation.

38. Daimler Trucks North America Delivers Its First Battery-Electric Commercial Truck

Daimler Trucks North America (DTNA) recently delivered the first vehicle in its Freightliner Electric Innovation Fleet – a Freightliner eM2 – to Penske Truck Leasing, fulfilling its promise to put an electric commercial truck in customer hands in 2018.

“With increased hauling demands and regulatory pressures, combined with ongoing concerns over energy resource depletion, it is more important than ever that DTNA continues to rigorously test and research electric vehicle solutions together with our customers,” said Roger Nielsen, president and CEO of DTNA. “Electric commercial vehicles present a real opportunity to advance the ideal of emissions-free mobility while improving our customers’ real cost of ownership (RCO).”

The introduction of the eM2 into Penske’s fleet is also a first in DTNA’s co-creation approach with customers as it co-develops technology to shape the future of transportation.

As the first step in its infrastructure deployment, Penske Truck Leasing will install 20 high-power charging stations across five of its California locations starting this month. Next year, Penske will put an additional nine medium-duty electric eM2 trucks and 10 heavy-duty eCascadia electric trucks into targeted service in California and the Pacific Northwest. Penske will place the electric vehicles into service within its expansive logistics, truck leasing and truck rental fleets.

The Freightliner Electric Innovation Fleet is partially funded with a nearly \$16M grant from South Coast Air Quality Management District (SCAQMD). The U.S. Environmental Protection Agency and the ports of Los Angeles and Long Beach also contributed to the grant.

Following the handover ceremony, the keys to the eM2 were turned over to Santa Claus to make its first holiday delivery of native plant seedlings to help restore communities that continue to suffer from devastating wildfire damage. Along with the seedling delivery, DTNA and Penske Truck Leasing made a joint \$50,000 donation to the TreePeople, a local non-profit organization that plants and cares for trees throughout Los Angeles County and nearby mountain forests. This holiday delivery brings much needed resources for cleaning the air, creating green spaces, and cooling the city.

Earlier this year, DTNA formed the Freightliner Electric Vehicle Council composed of 30 customers with strong use-cases for electric trucks, including Penske Truck Leasing, to further drive its sustainable transportation program. The company is working with the council members to ensure a holistic approach to launching electric trucks. Members of the customer council benefit from co-development of deployment strategies for battery electric vehicles including applicable use cases, current legislation and requirements for facilities, charging infrastructure and service support.

The Freightliner eM2 truck is an electrified solution for local distribution, pickup and delivery, food and beverage delivery, and last-mile logistics applications. The Freightliner eCascadia is a Class 8 tractor designed for local and regional distribution and drayage. Both trucks enter series production in 2021. The Freightliner eCascadia and eM2 are part of Daimler Trucks’ global

electrified truck initiative, joining the company's Thomas Built Buses all-electric Saf-T-Liner eC2 school bus, the FUSO eCanter, and the Mercedes-Benz eActros.

39. Volvo Trucks to Demonstrate VNR Electric Models in 2019; Commercialize in 2020

Volvo Trucks has announced that it will introduce all-electric Volvo VNR regional-haul demonstrators in California next year, operating in distribution, regional-haul and drayage operations. Sales of the VNR Electric in North America will begin in 2020.

"We are proud to announce the Volvo VNR Electric, designed to support cities focused on sustainable urban development and fleets operating in a range of regional-haul and distribution operations," said Peter Voorhoeve, president of Volvo Trucks North America. "The Volvo VNR Electric leverages the versatility of the new Volvo VNR series with a proven fully-electric powertrain and represents a strategic stride toward a comprehensive electrified transport ecosystem. Cities prioritizing sustainable urban development can leverage electrified transport solutions to help improve air quality and reduce traffic noise. Cleaner, quieter, fully-electric commercial transport also creates opportunities for expanded morning and late-night operations, helping cut traffic congestion during peak hours."

The Volvo VNR Electric demonstration units will be based on the propulsion and energy storage technology currently being used in the Volvo FE Electric and builds on the Volvo Group's accumulated expertise in electrified transport solutions. Sister company Volvo Buses has sold more than 4,000 electrified buses since 2010.

"The Volvo VNR is ideal for applications like heavy urban distribution, drayage and other regional applications where electric trucks will first have the greatest impact," said Johan Agebrand, Volvo Trucks North America director of product marketing. "The VNR series has received tremendous industry acceptance since its April 2017 introduction and the addition of an all-electric powertrain provides even greater opportunities to expand its footprint in the regional-haul market."

Introduction of the Volvo VNR Electric models are part of an innovative partnership, known as LIGHTS (Low Impact Green Heavy Transport Solutions) between the Volvo Group, California's South Coast Air Quality Management District (SCAQMD), and industry leaders in transportation and electrical charging infrastructure.

"The LIGHTS project is a truly unique opportunity to showcase a holistic approach to electrification of the freight transport industry as we handle ongoing challenges including electricity generation and battery optimization," said Voorhoeve.

"Electric trucks bring many unknowns and our holistic focus through the LIGHTS project will help our fleet partners transition securely and smoothly based on their individual needs regarding driving cycles, load capacity, uptime, range and other parameters," said Agebrand. "Within the project we'll look at everything from route analysis and battery optimization to servicing and financing. We always aim to offer high uptime and productivity."

CARB has preliminarily awarded \$44.8 million to SCAQMD for the Volvo LIGHTS project. The Volvo LIGHTS project will involve 16 partners and will transform freight operations at the facilities of two of the United States' top trucking fleets. Volvo LIGHTS is part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy and improving public health and the environment – particularly in disadvantaged communities.

The Volvo VNR Electric will be based on fully-electric powertrain technology currently being used in the Volvo FE Electric, which Volvo Trucks presented in May and will begin selling in Europe in 2019.

40. Scientist Rejects EPA's Claim Of Monitoring Hurdle For Stricter PM NAAQS

An air pollution scientist is disputing a top EPA official's claim that limitations in current emissions monitoring technology could effectively preclude the agency from significantly tightening its fine particulate matter (PM_{2.5}) air standard, countering that science justifies a stricter limit and technology is able to measure such a standard.

George Allen, chief scientist with the Northeast States for Coordinated Air Use Management (NESCAUM) that represents air quality agencies in the region, told a recent meeting of EPA advisers in Arlington, VA, that monitors are able to measure PM emissions as low as 5 micrograms per cubic meter (ug/m³).

EPA set the current PM_{2.5} national ambient air quality standard (NAAQS) at 12 ug/m³ in 2012 and is currently performing a Clean Air Act-mandated five year review to determine whether to change the limit.

Some studies have pointed toward a much tougher NAAQS, perhaps even 5 ug/m³, as the appropriate level. Like ozone, PM has so far proven to be a "no threshold" pollutant, meaning there is no level of the pollutant deemed "safe," driving stricter NAAQS but also creating implementation problems for states and industry.

But the Trump administration is unlikely to pursue stricter ambient air limits because of its deregulatory agenda. And Clint Woods, deputy assistant administrator in the Office of Air & Radiation, has said that limitations in emissions monitoring could make it technically impossible to set a 5 ug/m³ standard.

Speaking at the Texas Environmental Superconference in Austin, Woods said it would not be feasible to implement such a strict limit, given monitoring and other restrictions. "I think there's a lot of those who think that science that has been developed since 2012 suggests that that standard needs to be in the single digits, and maybe as low as 5 [ug/m³], which is well below what any current monitor can measure."

NESCAUM's Allen, however, told the December 12 PM NAAQS review meeting of EPA's Clean Air Scientific Advisory Committee (CASAC) that he disagreed with Woods' comments, saying they are "not consistent with the measurement capabilities of existing instruments."

Woods was referring to the annual PM NAAQS, which has a form of a three-year average of 24-hour PM measurements on at least every third day, Allen said. This three-year average is composed of around 300 individual daily (24-hour) measurements. "While it is true that some continuous PM measurement methods have substantial uncertainty at 5 ug/m³ for 1-hour measurements, the Federal Reference Method [FRM] for PM_{2.5} is capable of measuring a 3-year average concentration of 5 ug/m³ with sufficient accuracy and precision for use in comparison to an annual PM_{2.5} NAAQS," Allen said. The FRM is the official EPA-approved method to measure PM and determine NAAQS compliance.

Further, he said that in "the last few years, continuous Federal Equivalent Methods [FEMs] for PM2.5 using optical measurement techniques have become more common, and these methods produce data that are very stable at low PM concentrations, even for hourly average concentrations," referring to FEMs that are EPA-approved alternative measurement methods deemed as accurate as FRMs.

Allen's comments could help supporters of a more-stringent PM2.5 NAAQS in their push for CASAC to recommend such a limit to the agency when it completes its review of the 2012 standard.

However, some CASAC panelists have criticized the Trump administration's new abbreviated NAAQS review process that they are operating under. One former CASAC member at the meeting even called the process a "joke" that will lead to an inadequate review, posing the risk of lawsuits over the conclusion of the review.

EPA is aiming to complete its PM2.5 NAAQS review by December 2020 and the issue of whether there are technological limitations to meeting a stricter standard is emerging as a major dispute.

Under Supreme Court precedent established in a 2001 ruling, many observers consider EPA prohibited from considering technical feasibility or cost of implementing NAAQS when setting the standards. The agency has long regarded itself as limited to addressing such questions after standards are set, in the implementation phase.

Critics say this still risks states being asked to implement standards that could be technically infeasible or cost-prohibitive to implement. For example, industry groups and states challenging EPA's 2015 ozone standards in litigation before the U.S. Court of Appeals for the District of Columbia Circuit are arguing that high naturally occurring "background" ozone levels can render the ozone standard impossible for some states to implement. Hence, the standard is not "achievable" and is therefore unlawful, industry groups and states argue.

The NAAQS' opponents made this case despite years of D.C. Circuit precedent holding cost and feasibility considerations to be off-limits for EPA when setting standards.

Lawyers for EPA at oral argument December 18 in the ozone suit, *Murray Energy Corp. v. EPA*, said there is no Clean Air Act obligation on EPA to consider feasibility of meeting NAAQS in standard-setting. But they further said EPA intends to explore if the agency may consider feasibility if it wishes in the ongoing review of ozone NAAQS that is due to conclude in October 2020.

In addition, the Trump EPA has tasked CASAC for the first time with providing advice on cost and feasibility of implementing NAAQS, although it is unclear how the committee will approach this. So far, CASAC has not considered such issues in the PM and ozone NAAQS reviews. However, critics say that EPA is in effect risking an unlawful co-mingling of public health and implementation issues in the context of NAAQS reviews.

41. High Costs Don't Justify New Power Plant Mercury Cuts, EPA Says

The cost of forcing power plants to further reduce mercury and other toxic air pollutants they emit would far outweigh any additional health benefits, the EPA said as part of a proposal released December 28. The Environmental Protection Agency's proposal would leave in place the mercury and air toxics standards, or MATS, set by the Obama administration in 2012. Along with the

agency's reexamined cost and benefit analysis, required by the U.S. Supreme Court in 2016, the EPA also completed the periodic review of the toxic pollution standards.

Using that reexamined economic analysis—which slashes the health benefits of reducing pollutants such as airborne particles that aren't regulated by the toxic pollution rule—the EPA found no justification for further reducing mercury and other toxic pollutants. The latest EPA proposal estimates the power industry spent between \$7.4 billion and \$9.6 billion to comply, but the direct benefits of reducing mercury only amounted to between \$4 million and \$6 million.

The EPA said its analysis found that no new advances in pollution controls justify the cost of further reducing mercury and other toxic pollutants. The agency said residual risks due to emissions of air toxics were acceptable “and that the current standards provide an ample margin of safety to protect public health.”

Based on this review and related analyses, the EPA said December 28: “We are proposing that no revisions to MATS are warranted.”

The agency's own estimates show that mercury pollution from power plants fell 81.7 percent between 2011 and 2017 to 10,517 pounds, mainly due to the limits imposed in 2012. Power plants' mercury emissions end up back on land and water where they are converted to methylmercury, the most toxic form of mercury. It reaches concentrations in fish that are 10 times to 100 million times greater than concentrations in water, scientists say.

People are exposed to the neurotoxic metal by eating fish and shellfish.

The EPA plans to seek comment on its finding that the electric utility sector shouldn't be required to make further cuts to mercury emissions. It also plans to seek comment on whether to establish a subcategory of separate limits for toxic acid gases given off by existing power plants that burn coal slag from eastern coal mines.

Even the power industry, which claims it has reduced mercury emissions by 90 percent since the standards took effect, urged the agency in a July letter to leave the rules in place since it already has spent billions to comply.

Though the agency is proposing to leave the rule in place, it is taking comment on the option of repealing it, claiming that the direct benefits of reducing mercury aren't justified by the high costs of meeting the 2012 limits. That is an option that has the power industry—as represented by the Edison Electric Institute—and public health scientists, Obama EPA officials, and environmental engineers crying foul.

The scientific evidence is overwhelming that the direct benefits of reducing mercury far outweigh the costs of making cuts in this neurotoxic metal, Charles Driscoll, a professor in Syracuse University's Department of Civil and Environmental Engineering, told reporters.

And a medical group opposes watering down the standards as well. “Coal-fired and oil-fired power plants are among the biggest sources of mercury and other toxic air pollutants posing a grave risk to human health. Physicians for Social Responsibility joins other trusted and respected public health voices in urging the EPA to strengthen, not weaken, these lifesaving standards for the sake of the health and safety of American families around the country,” the group said.

“The utility industry by and large sees no value in this exercise because they already spent the money to install the technology and are recovering the cost of that installation through rates,” Crowell & Moring LLP partner Thomas Lorenzen, said. Engaging in this analysis raises additional risk and prolongs uncertainty for the power industry, said Lorenzen. He said the EPA was “speaking from both sides of its mouth” by proposing to retain and repeal the standards. “From the perspective of my clients here, the question is: Why undertake this exercise when it puts at risk the standards the power industry has successfully implemented?” Lorenzen said.

The option to repeal the 2012 standards was pushed by Murray Energy Corp., the nation’s largest underground coal mining company, that claimed the stringent limits hurt the domestic coal market.

A subset of power companies that generate energy from decades-old coal waste piles—especially in Pennsylvania—also had urged the EPA to reconsider the 2012 limits, saying they had trouble meeting the limits for acid gases, which the EPA says it is now prepared to reconsider.

Former EPA Administrator Scott Pruitt, as well as his successor, acting Administrator Andrew Wheeler, objected to the Obama administration’s cost-benefit analysis. They said it unnecessarily justified the 2012 limits by relying heavily on “co-benefits” gleaned from reducing fine airborne particle pollution, which MATS didn’t directly target but would be reduced by the controls power plants were required to install.

Janet McCabe, who headed the EPA air and radiation office under President Barack Obama, said the proposal sets “a very troubling precedent for how the EPA evaluates the impact of policy on public health,” claiming the agency is going against its own decades-old practice by deciding which public benefits should matter.

The EPA is opening itself up to litigation by merely relying on cost-benefit analysis to justify its decision to retain 2012 limits, Joe Goffman, executive director of Harvard Law School’s environmental and energy program, told Bloomberg Environment.

Cost is simply one factor that agencies consider in determining whether it is appropriate and necessary to regulate mercury and other toxic air pollutants, said Lorenzen, who at the Justice Department supervised the defense of the Bush-era Clean Air Mercury Rule. “I think that creates legal vulnerability for EPA’s proposed reversal of the appropriate and necessary finding that is based on cost above all else.”

Once challenges are filed, federal judges will be asked to resolve what role, if any, cost-benefit analysis plays in regulating power plant hazardous air pollutant emissions under the Clean Air Act, said Goffman, a former EPA counsel who was involved in defending the 2012 limits before the Supreme Court. He said the judges also will be asked to address the appropriate role of co-benefits in this particular analysis.

While the proposal would leave the actual emission limits in place, it concludes that the Obama administration erred in heavily relying on “co-benefits” attributed to reductions in pollutants besides those targeted in the regulations to justify the expected compliance costs.

Despite tens of billions of dollars’ worth of expected co-benefits, acting EPA Administrator Andrew Wheeler “has concluded that the identification of these benefits is not sufficient, in light of the gross imbalance of monetized costs and [hazardous air pollutant] benefits to support” the appropriate and necessary finding, the agency said.

The proposal comes as no surprise. As early as last spring, EPA air chief Bill Wehrum had signaled his interest in revisiting the appropriate and necessary determination. But it also brings potential peril to the Trump administration, both because of mercury's well-documented role as a neurotoxin that can affect children's brain development and because the power industry is now largely in compliance with MATS.

In a separate statement, Sen. Tom Carper (D-Del.) criticized both the draft rule and Wheeler's decision to make it public only hours before EPA is expected to suspend operations because of a lack of funding. "By releasing this proposal today, Acting Administrator Wheeler can only be attempting to rush an egregious policy before EPA staff are furloughed that is not only wildly unpopular, but also rolls back years of critical protections that keep toxic emissions out of the air we all breathe," said Carper, the ranking member on the Senate Environment and Public Works Committee.

"There is no legitimate justification for this action," American Lung Association President and CEO Harold Wimmer said, adding that mercury can cause brain damage in babies.

Also watching with dismay were Obama-era EPA officials involved in MATS's creation. In a conference call last week held in anticipation of the proposal's release, former EPA Administrator Gina McCarthy told reporters that the Trump administration also wants to target the use of co-benefits more broadly, a step that could undercut efforts to justify future limits on air pollution.

"The main reason why they want to do this is to cut the legs off of EPA in terms of our ability to protect public health and the natural resources from toxics that are impacting our kids' lives today," McCarthy said. She also portrayed the planned rollback as another attempt to aid one of President Trump's favorite industries.

"I think it's no secret that the administration's agenda for EPA was really written by coal companies and in particular by Bob Murray," McCarthy said. "He's interested in making sure that this was relooked at because he saw it as a burden to the coal industry in terms of its ability to compete."

Murray heads Ohio-based Murray Energy Corp., the nation's largest privately owned coal company. An enthusiastic Trump supporter, Murray last year unsuccessfully pressed the administration to suspend MATS, even though implementation by then was nearly complete. At the time, Wheeler was a contract lobbyist for Murray Energy.

42. Incoming House Chairs Eager for Piece of the Climate Action

A new House panel focusing on climate change won't be alone in addressing the issue in the 116th Congress: Roughly half a dozen incoming committee chairs are itching to jump into the fray.

Nearly a decade ago, when Democrats last controlled the House, the Energy and Commerce Committee was front and center on climate. It remains likely to play a role in any broad legislation Democrats try to move in the next two years, but other panels on agriculture, foreign relations, science, oversight, and natural resources also will have new Democratic chairs eager to put climate change and its impacts on center stage.

Rep. Nancy Pelosi (D-Calif.), the new House Speaker, has already pledged to resurrect a panel on climate change she launched more than a decade ago, though it couldn't write legislation. Even that idea has set off resistance from other House chairmen.

In addition to incoming Energy and Commerce chairman Frank Pallone (D-N.J.), the presumed leaders of two other panels already have pledged to hold two days of hearings early next year on climate impacts and actions to combat them: Science, Space, and Technology, which will be led by Eddie Bernice Johnson (D-Texas), and Natural Resources, which Raul Grijalva (D-Ariz.) will chair.

The Foreign Affairs panel will put President Donald Trump's 2017 announcement pulling the U.S. out of the Paris climate accord in the crosshairs, as well as the overall retreat from climate in meetings between world leaders. "There's tremendous interest in it from me, and there's tremendous interest in it from members of my committee," Rep. Eliot Engel (D-N.Y.), who is slated to head the committee in January, told reporters.

Florida Rep. Ted Deutch, a senior Democrat on Foreign Affairs, said that among the long list of global issues, climate change "sits, I think, squarely in the center because it affects the entire globe." "There's a question of American leadership and our relationship with our allies around the world on this issue," said Deutch, who last month joined three Republicans in introducing the first bipartisan climate bill in a decade.

Rep. Peter DeFazio (D-Ore.), expected to chair the Transportation and Infrastructure Committee, said his panel can do plenty to accelerate U.S. efforts to cut carbon pollution from vehicles in the next surface transportation bill. He also is considering incremental bills to boost transportation efficiency. "Obviously, we are going to run into roadblocks in the [GOP-controlled] Senate and in the White House, but we are going to make a case to the American people" for tackling the climate issue, he said.

Rep. Jim McGovern (D-Mass.), is poised to chair the House Rules Committee, which decides what amendments go the floor. He said his panel will be open to members offering climate-related ones. The rules panel "is going to be a lot more accommodating to amendments to combat climate change," McGovern said. "Unfortunately, on this issue, under a Republican-controlled Congress we've done nothing—we've had committee chairs who are climate change deniers."

At least one Senate GOP committee chairman, however, has plans to look at climate change in 2019. Senate Energy and Natural Resources Chairman Lisa Murkowski (R-Alaska) said December 12 that possible topics include energy efficiency for buildings, manufacturing, and farming, renewable energy, and microgrids.

At the Natural Resources Committee, which oversees public lands and mining, Grijalva said he will press the Interior Department to defend pro-extraction policies that don't take climate impacts into account. "The whole idea here is that facts and science should have a role in decision-making," Grijalva told reporters, "rather than just expediting extraction without considering any consequences."

Outgoing Natural Resources Chairman Rob Bishop (R-Utah) said Republican members will raise the economic costs of climate action. Republicans "will take the opportunity to explore all the other options that his side may not want to bring up," Bishop said.

On the science panel, Johnson promised to explore "strategies to mitigate the impacts of our changing climate," citing a recent federal report warning that warming trends are pushing the Arctic into uncharted territory.

That cautiousness is a warning sign of things to come as Pelosi wrestles with demands for ambitious climate action from mostly newer arrivals, including Rep.-elect Alexandria Ocasio-Cortez (D-N.Y.) Pelosi is under pressure from more than 30 Democrats who back a “green New Deal” that would take steps to quickly decarbonize the U.S. economy. The plan calls for upgrading energy efficiency in all residential and industrial buildings and building a national “smart” electricity grid.

Ocasio-Cortez told reporters recently she wants to ensure actual legislation gets moving. “My goal is to really get things done, and my red line is that we need this legislation by 2020” in hopes of Democrats retaking the Senate and White House, she said.

43. Drivers Running on Empty Say Mexico Must Fix Fuel Shortage

Across central Mexico, drivers are running on empty or lining up for hours at service stations, as the government’s efforts to rein in fuel theft compound a nationwide gasoline shortage. More than one-fourth of Mexico City’s 400 gasoline stations are facing problems, Mexico City mayor Claudia Sheinbaum said in a Twitter video, while assuring viewers that supply would normalize January 9. The states of Mexico, Hidalgo, Jalisco, Michoacán, Guanajuato, and Queretaro are among the worst affected.

President Andres Manuel Lopez Obrador has sought to curb rampant gasoline theft, which costs state-owned Petroleos Mexicanos about \$3.5 billion a year. But his strategy has caused major distribution delays at a time of high seasonal demand.

To stop the theft, the government has shut down and increased surveillance of pipelines, relying on slower moving—and more expensive—tanker trucks to transport fuel across the country. It also deployed the army to Pemex fuel terminals and refineries, which are operating at about a third of their capacity due to prolonged maintenance cycles and underinvestment. The country also lacks fuel storage infrastructure.

The distribution issues have exacerbated bottlenecks at Mexico’s ports, where a record number of fuel tankers have been waiting to unload their cargoes following weather-related ports closures over the past several months. Tanker ships transporting at least 8.3 million barrels of gasoline, diesel, and jet fuel waited to unload outside of the ports of Pajaritos, Tuxpan, and Tampico late January 8, with some there since December 23, 2018, shipping reports show. Demurrage, or fees for detaining vessels beyond the scheduled time, typically costs about \$22,000 to \$24,000 a day.

The fight against illegal pipeline taps by fuel thieves known as huachicoleros will take some time, and gasoline supply will begin to normalize bit by bit, Lopez Obrador said in a TV interview late January 8. “We have enough gasoline, there’s no problem, it’s a matter of distribution,” he said.

Many Mexicans, however, are running out of patience.

44. Mexico City Smog Could Get Worse as Fuel Crisis Continues

Mexico City’s notoriously high air pollution may get worse as Pemex’s refineries are under pressure to send lower quality diesel to the country’s central region, which has been plagued by major fuel shortages since January 5. Regulations that would have forced Mexico to sell more environmentally-friendly ultra-low sulfur diesel, or ULSD, at the start of January have been pushed back because refineries run by state-owned Petroleos Mexicanos can’t meet the standards.

Pemex's infrastructure deficiencies have been compounded by the government's fuel theft plan, which has seen it shut pipelines and increase surveillance of refineries and terminals, leading to fuel distribution delays. (See story above.)

The central Bajío region will have six months before it must convert to ULSD, unlike the rest of the country which has had to do so since the start of the year, the Energy Regulatory Commission, or CRE, said in a December 28 statement on its website.

Pemex's Salamanca and Tula refineries that serve the central region of Mexico "do not have the capacity to produce ULSD, nor do the conditions of transport and storage infrastructure exist to guarantee the supply of imported ULSD," it said.

Pemex issued a force majeure on the fuel at the end of last year, saying that it could not supply ULSD to all of the country in the first days of January because it needed time to prepare its storage and transport infrastructure, according to an internal company document.

Higher international prices for ULSD also make it less economic to circulate the cleaner diesel. While previously Mexico sought to smooth out international price volatility by applying a so-called "fiscal stimulus" to the special tax on production and services, or IEPS, for diesel and gasoline, the Finance Ministry has kept the stimulus at zero for a second week, it reported in the Official Gazette on January 11.

There are few options for private gasoline retailers including BP Plc and Repsol SA, which are scrambling for alternatives to Pemex to supply their service stations. In addition to truck shortages, the ports are swarming with more than 30 fuel tankers waiting to unload.

45. Canada Fails to Get National Deal to Boost Clean Car Sales

Canadian provinces and territories refused to sign on to a federal plan to increase purchases of cleaner vehicles, spurring uncertainty over how Ottawa will meet new sales targets that carmakers describe as aggressive.

Ontario, the country's largest province and a regular critic of Prime Minister Justin Trudeau's environmental policies, said the plan goes too far in deciding which technologies can best reduce greenhouse gas emissions, an opinion shared by larger vehicle manufacturers, David Adams, Global Automakers of Canada president and CEO, told reporters on January 23.

"Our frustration is sometimes with the focus on particular types of technology as opposed to the end goal, which should be greenhouse gas emission reductions from transportation," said Adams, whose member car companies represent 57 percent of vehicle sales in Canada.

Provincial and territorial buy-in would have expanded the tools available to the federal government in its drive to reduce pollution from transportation, which accounts for 24 percent of Canada's greenhouse gas emissions. Authority over transportation in Canada is shared at the federal and provincial level.

Transport Minister Marc Garneau, whose department worked with vehicle manufacturers for over two years on the strategy, is now considering next steps after provinces declined to sign on during a meeting in Montreal January 21, according to spokesperson Delphine Denis.

The political landscape in Canada has changed since Garneau started courting the provinces and territories for support a year ago, with six new ministers arriving on the scene after provincial elections, Denis said. “Some [ministers] raised concerns that the distinct regional characteristics of their respective provinces and territories make it difficult to commit to our robust goals,” she wrote.

Canada told the provinces and territories it wants zero-emission vehicles to make up 10 percent of all vehicle sales by 2025, 30 percent of sales by 2030, and 100 percent by 2040.

Zero-emission vehicles include electric cars, hydrogen vehicles, and hybrids that use electric and combustion engines.

The U.K. announced last year that it wants half of new cars sold in 2030 to have “ultra-low emissions,” and France aims to end gasoline and diesel car sales in 2040.

Adams, the Global Automakers of Canada president, said the Canadian sales targets are “aggressive.” “I don’t think vehicle makers necessarily disagree with the idea that at some point transportation will be decarbonized, what we disagree on is how quickly we’re going to be able to get there,” he said.

Canada earmarked C\$182.5 million (US\$136.8 million) in the last two federal budgets to grow zero-emission vehicle sales, increase the number of electric charging stations, and open more refueling stations for vehicles that use natural gas and hydrogen.

Large Canadian provinces have chosen vastly different approaches to reducing emissions from vehicles.

Ontario canceled a rebate program in September that offered electric vehicle buyers up to C\$14,000 (US\$10,500), triggering a successful lawsuit from Tesla Motor Canada who said it was unfairly targeted in the program’s cancellation. The province, home to the majority of Canadian vehicle manufacturing, reportedly decided not to opt in to the federal strategy because of its focus on zero-emission vehicles exclusively. Ontario is focused on those technologies as well as propane, autonomous, and other unspecified low-carbon technologies.

British Columbia has gone in the other direction, announcing in November that it wants zero-emission vehicles to make up all vehicle sales by 2040, a target Ottawa has since matched.

Quebec launched a program in January 2018 that requires all vehicle manufacturers to make zero-emission vehicles a percentage of their total sales, depending on their size.

An October election brought in a new government, and Quebec Transportation Minister Francois Bonnardel is reportedly still deciding what changes he’d like to make to the program.

46. EPA Releases Final Renewable Fuels Standards

On November 30, 2018, EPA finalized volume requirements under the Renewable Fuel Standard (RFS) program for 2019 for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel, and biomass-based diesel for 2020. The final volume requirements are listed in the table below.

Final Volume Requirements

	2017	2018	2019	2020
Cellulosic biofuel (million gallons)	311	288	418	n/a
Biomass-based diesel (billion gallons)	2.0	2.1	2.1 ^b	2.43
Advanced biofuel (billion gallons)	4.28	4.29	4.92	n/a
Renewable fuel (billion gallons)	19.28	19.29	19.92	n/a

Notes:
^a All values are ethanol-equivalent on an energy content basis, except for BBD which is biodiesel-equivalent.
^b The 2019 BBD volume requirement was established in the 2018 final rule (82 FR 58486, December 12, 2017).

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47. VW Says Cars Compliant With Norms but Will Pay NGT- 100 Crore Penalty

The Volkswagen group said it will pay Rs 100-crore penalty slapped by the National Green Tribunal (NGT) for "violating vehicular emission norms" despite the company challenging the decision before the Supreme Court. The Tribunal warned that if Volkswagen fails to pay the stipulated cost within 24 hours, its India head may be arrested and all his properties may be seized.

The development came after the NGT slammed the company for not complying with its November 2018 order to deposit Rs 100 crore with the Central Pollution Control Board (CPCB) within a month for causing "serious environmental damage" by using a cheat or defeat device that lowered vehicular emissions only during tests.

The major German automaker issued the following statement in light of recent events, 'The Volkswagen Group reiterates that all cars from the Group are compliant with the emission norms in India. The order of the Honorable NGT is already under challenge before the Honorable Supreme Court. However, The Volkswagen Group India will comply with the order of Honorable National Green Tribunal (NGT) and deposit the money, as directed.' Volkswagen Group India Spokesperson.

The Supreme Court asked the National Green Tribunal (NGT) to consider whether to widen the scope of scrutiny into compliance of all car manufacturers with the emission norms, as German auto major Volkswagen has challenged a punitive action of the tribunal. A bench, headed by Justice D Y Chandrachud, said that there was no occasion to take punitive action against the

directors of Volkswagen for the delay in depositing of Rs 100 crore fine to the Central Pollution Control Board (CPCB), as it had already extended the deadline.

The NGT had on January 17 imposed a penalty of Rs 100 crore on Volkswagen, saying its cars were violating the pollution norms.

A four-member committee constituted by the NGT had recommended a fine of Rs 171.34 crore on Volkswagen for excess nitrogen oxide emissions. The committee in its report had estimated that Volkswagen cars allegedly released 48.678 tons of NO in 2016 in the National Capital Region.

The Volkswagen Group challenged the NGT's fine, contending that all its cars are "compliant with emission norms in India." Senior advocate Abhishek Manu Singhvi, appearing for Volkswagen, told the apex court bench that the company had deposited the amount of Rs 100 crore on January 17 as directed by the NGT.

The tribunal had said that non-compliance can lead to the arrest of the company's India head.

"We would like to clarify that intent and purpose of this court in December extending time for compliance was to ensure that until this court took up the matter on next date, the coercive measure cannot be taken for non-compliance of the order," said the Supreme Court bench.

It asked the NGT to include Union Ministry of Road Transport and Highways in a four-member committee appointed by the expert panel. The NGT had constituted a joint team of representatives of the Central Pollution Control Board (CPCB), the Ministry of Heavy Industries, the Automotive Research Association of India (ARAI) and the National Environmental Engineering Research Institute.

The tribunal had asked for a report on whether Volkswagen has exceeded the prescribed environmental norms and fair estimate of the damage caused to the environment.

The Supreme Court also noted that the committee had submitted its report and proceedings are now pending before the NGT. The bench said it is now proper for the tribunal to deal with the report on merits.

The tribunal's order had come on pleas filed by a school teacher, Saloni Ailawadi, and a few others seeking a ban on the sale of Volkswagen vehicles for alleged violation of emission norms.

A growing concern is that the VW scandal will be treated as one of a kind and India's regulators can now go back to business as usual. As CSE points out, what is needed is a regulatory overhaul. CSE notes, "A government must quickly enforce strong, independent and transparent emission testing regime and in-use compliance mechanism with a recall program. We cannot be fooling the system to negate air quality and public health benefits of new investments."

48. One In Eight Deaths In India Due To Air Pollution: ICMR

Air pollution caused one in eight deaths in India last year, besides lowering the average life expectancy by 1.7 years, the Indian Council of Medical Research (ICMR) said in a recent report. It said air pollution contributed more to the disease burden of Indians than consuming tobacco.

The first comprehensive estimates of deaths, disease burden and life expectancy reduction associated with air pollution across states were collated under the India State Level Disease

Burden Initiative—a joint initiative of the ICMR, Public Health Foundation of India (PHFI) and Institute for Health Metrics and Evaluation (IHME), in collaboration with the health ministry. The findings have also been published in *The Lancet Planetary Health*.

About 77% of the populace is exposed to outdoor air pollution levels breaching the safe limit set by the National Ambient Air Quality Standards, said the report. North India recorded particularly high levels of pollutants.

In 2017, the mean ambient particulate matter PM_{2.5} annual exposure of 90 g/m³ was one of the highest in the world. The highest PM_{2.5} exposure level was in Delhi, followed by Uttar Pradesh, Bihar and Haryana. The report said 1.24 million deaths in India in 2017 were due to air pollution, which included 670,000 deaths due to outdoor particulate matter air pollution and 480,000 deaths due to household air pollution.

The average life expectancy in India would have been 1.7 years higher if air pollution levels were less than the minimal level causing health loss. The highest increase was in Rajasthan (2.5 years), Uttar Pradesh (2.2 years), and Haryana (2.1 years), it added.

“The upsurge in respiratory problems in the winter months with peak air pollution is well known, but what is now also becoming better understood is that air pollution is a year-round phenomenon particularly in north India which causes health impacts far beyond the seasonal rise of respiratory illnesses,” said Randeep Guleria, director, All India Institute of Medical Sciences (AIIMS).

“Air pollution is now the leading risk factor for chronic obstructive lung disease in India, and a major contributor to pneumonia and lung cancer. With 18% of the global population, India suffered 26% of premature mortality and health loss attributable to air pollution globally.”

The report also said that over half of deaths due to air pollution claimed people below 70 years. Air pollution now contributes more to the disease burden in India than tobacco use, primarily by causing lower respiratory infections, chronic obstructive lung disease, heart attacks, stroke, diabetes, and lung cancer.

“We are undertaking a number of initiatives for experts to convene in order to develop strategies that would increase awareness among communities on what each one of us could do to reduce the adverse impact of air pollution on health, which would benefit from the state-specific findings reported by this study,” said S. Venkatesh, director general of health services.

49. Chinese EV Manufacturers May Help Boost India's 2030 Electric Mobility Vision

India's electric vehicle (EV) dream set for 2030 is already on a roll and in the latest move to propel it further, the country is now inviting Chinese industries participation and investment. As per a recent statement by NITI Aayog Principal Advisor Anil Srivastava, the Chinese EV players will play a substantial role in India's goal to go fully electric with its mobility. The statement came after Srivastava met Chen Qingtai, President of China EV100 and invited China's participation in India's EV plans.

China EV100 is a private electric vehicle association of the top 200 plus electric mobility industries of China.

Srivastava further mentioned that the market size of both India and China is huge and there is a correspondingly large potential for cooperation between the countries' EV industries as well. To

make the best of this scenario, he proposed that the EV industries of both the nations, including the China EV100 and NITI Aayog supported EV industry in India, should have more interaction through a 'formal interaction mechanism' that needs to be set in place. To initiate this, Srivastava proposed an industry meeting for both the nations in the first half of this year in Beijing in order to explore cooperation possibilities.

Chen had a favorable response to this, stating "India is an important country for Chinese EV players" and welcoming the Chinese industries participation and investment in Indian EV market.

China is currently the largest producer as well as the largest consumer base of the EV market. While the overall automobile sales in the country declined for the first time ever in the last two decades, one particular section that saw substantial growth is that of the New Energy Vehicles (NEVs).

NEVs include battery electric, fuel cells and plug in hybrid vehicles, that basically reduce the dependence on fossil fuels. China's strict regulations to bring the vehicle emissions under control has led to the sharp shift in the Chinese market towards the NEV culture, both in terms of production as well as adoption of these vehicles.

This is not the first time that India has aimed to learn from China on how to propagate the EV culture. Earlier, Delhi Transport Minister Kailash Gahlot and a delegation of senior officials visited China in order to understand the working of electric buses in the country. The idea was to replicate the working here in Delhi to bring down the ever-rising pollution levels.

India, however, is not too far behind when it comes to EV adoption. While China leads in the sheer diversity of these EVs, India's total tally of EVs on roads beats that of any other country in the world. The count, however, is mostly made of electric two-wheelers and largely ignores any other category of EVs present.

50. China Targets Heavy Polluting Diesel Trucks With New Guidelines On Reducing Emissions

The Ministry of Ecology and Environment said in a new policy document it would aim to "significantly increase" the number of diesel trucks capable of meeting emission standards by 2020, targeting a compliance rate of at least 90 per cent by next year.

It also promised to improve the quality of diesel, crack down on low-grade fuel, and reduce overall nitrogen oxide and particulate matter emissions from fuel combustion.

New trucks that fail to comply with state requirements will not be allowed to enter the market, and some regions will be ordered to implement advanced "China VI" fuel standards starting from July, the document said.

China is in the fifth year of a "war on pollution" but average emission levels in many smog-prone northern cities remain significantly higher than the levels recommended by the government.

Northern regions near the capital Beijing will eliminate more than 1 million outdated diesel-fueled trucks by the end of 2020. Tougher controls on diesel freight will also be imposed during smog build-ups, it said.

National rail freight rates will be increased by 30 per cent compared with 2017, and authorities will work to ensure that long-distance bulk commodity deliveries are done via rail or ships, it said. Tackling truck emissions has become a major part of China's efforts to curb pollution. Though trucks produce 13 times more pollution per unit of cargo than trains, the share of rail in total freight amounted to just 7.7 per cent in 2017.

The environment ministry said last year that while diesel trucks accounted for just 7.8 per cent of China's total vehicles, they contributed more than 57 per cent of total nitrogen dioxide emissions and more than three quarters of airborne particulate matter.

51. Pollution Battle Reaching New Level As Air Gets Clearer

Beijing's environmental watchdog has vowed to further bolster cross-regional control of air pollution and to better manage pollution sources at a more detailed level as the capital saw continuous improvement of its air quality in 2018.

The capital saw the average density of PM2.5 particulate matter drop by about 12 percent year-on-year to 51 micrograms per cubic meter in 2018, said Liu Baoxian, deputy head of the environmental monitoring center at the Beijing Municipal Ecology and Environment Bureau. Liu spoke at a news conference.

Other major air pollutants also decreased. The concentration of sulfur dioxide, for example, stood at 6 mg per cubic meter, down by 25 percent from 2017. Its density remained below 10 mg/cu m, even during the cold months when the increased need for heating can drive up pollution, Liu said.

The number of days with heavy pollution in the capital dropped from 58 in 2013 to only 15 last year. The past year also saw 195 consecutive days without heavy air pollution, 108 more than 2013.

Shi Aijun, deputy head of Beijing Municipal Research Institute of Environmental Protection, said PM2.5 density in the capital peaked at 244 mg/cu m in 2018, down by 46 percent year-on-year.

Xing Jia, associate professor from the School of Environment, Tsinghua University, said their research and calculations showed about half of the capital's air quality improvement in the past five years came from reduction of local emissions. While favorable meteorological conditions contributed 30 percent of the improvement, decrease of pollutant discharges in nearby regions also helped, Xing said.

In Hebei province, the PM2.5 concentration dropped 12.5 percent last year, according to preliminary results from the provincial environmental authority. Almost 1.8 million households in the province turned to natural gas and electricity as heating sources instead of highly polluting coal. Almost 6,500 coal-burning boilers with a capacity of about 12,700 metric tons of steam energy were eliminated in 2018.

In Beijing, about a third of air pollutants in 2018 were from outside the city, according the Beijing bureau. Among the locally generated pollutants, emissions from vehicles, dust and industrial emissions contributed about 45, 16 and 12 percent, respectively.

Though diesel trucks represent only about 4 percent of total internal combustion engines in Beijing, they contributed 90 percent of the particular matter from such engines.

Bureau officials said they have taken tailored measures based on their research. While establishing a monitoring network that targets dust, they also are better managing diesel trucks. They say they have weeded out 47,000 such trucks and established a database that includes 145,000 trucks with excessive emissions.

Li Kunsheng, head of vehicle emission management, said trucks in the database that are registered in other regions will be forbidden from entering the capital. Li said his department will carry out surprise inspections of those with local plates to ensure owners rectify their violations.

Li Xiang, the Beijing authority's director of air pollution management, said that during three decades, the biggest part of their work was reducing coal consumption and shutting down small polluting enterprises. With most of that work completed, Beijing now has to turn to more detailed management to further cut pollution.

Beijing and Hebei have been on the front line of a war on pollution launched in 2014 to soothe public disquiet about the state of China's skies, rivers and soil following more than three decades of untrammled economic growth.

Average emissions are still significantly higher than China's official air quality standard of 35mcg. Beijing managed to meet the target in January, August and September, the local government said.

It said 656 polluting enterprises were forced to relocate last year, with firms and individuals fined a total of 230 million yuan (US\$33.5 million) for violations, up 22.5 per cent from last year.

52. China's New Light-Vehicle Sales Fell 4.1% In 2018

New light-vehicle deliveries in China declined in December for the sixth straight month, slumping 16 percent from a year earlier to roughly 2,233,100. The multipurpose vehicle segment posted the steepest fall last month, tumbling 23 percent to around 176,200, according to the China Association of Automobile Manufacturers. In the month, sales of crossovers and SUVs fell 16 percent to approximately 981,600. Sedan deliveries dropped 14 percent to some 1,028,500 while minibus sales contracted 10 percent to about 46,800.

For 2018, China's new light-vehicle sales totaled 23.7 million, decreasing 4.1 percent from 2017.

But deliveries of new commercial vehicles, including trucks and buses, maintained growth last year, rising 5.1 percent to roughly 4,371,000. As a result, total new-vehicle sales in China approached 28.1 million in 2018, dipping 2.8 percent from a year earlier.

Electrified vehicle deliveries kept forging ahead last year. Aggregate sales of new battery electric vehicles, plug-in hybrids and fuel cell vehicles reached 1,256,527, a jump of 62 percent year on year. The tally includes about 984,000 battery EVs, 271,000 plug-in hybrids and 1,527 fuel cell vehicles.

The industry group predicted that new vehicle sales in China will total 28 million in 2019, virtually unchanged from 2018.

53. VW Ready to Set Up China Venture for Charging Electric Cars

Volkswagen AG is setting up a network of fast-charging stations in China with local partners as part of its multibillion-dollar push to boost electric-vehicle sales in the world's largest market. Volkswagen and long-standing automaker partner China FAW Group Co. will each reportedly own 30 percent of the venture operating charging facilities nationwide. Two other Chinese companies will hold the rest.

Global manufacturers such as Volkswagen and Ford Motor Co. are shifting their focus to electric cars in China as waning sales of gas guzzlers led to the first full-year slump in China's auto market in at least two decades.

While electric vehicles make up just a few percent of total car sales, the growth rates are impressive, and China is targeting sales of 2 million new-energy vehicles in 2020 as part of a push to clean its air and reduce dependence on imported oil.

The charging venture is part of Volkswagen's plan to invest 4 billion euros (\$4.5 billion) together with partners on electrification and smart cars this year.

The companies will jointly invest an initial 1 billion yuan (\$147 million) in the venture and plan to increase their bets over the years, they said.

Talks for the venture are near completion and it is scheduled to be set up in the first half of this year. SAIC Motor Corp., another VW partner, is ready to get on board, with more Chinese auto and battery makers expected to join in future.

Last November, Volkswagen said it was exploring the construction of a public fast-charging network in China that allows drivers to refill their vehicles in 15 minutes for a driving range of 400 kilometers (249 miles).

54. EV Gold Rush Lures Hopefuls As Tesla Looms

The gold rush that is China's electric-car market is getting its latest entrant as a slew of local manufacturers fight for a foothold ahead of Tesla Inc.'s planned offensive.

Xpeng Motors started deliveries of its first commercial model four years after its founding by entrepreneur He Xiaopeng and partners in Guangzhou. The G3 crossover gives Xpeng instant credibility and revenue, while hundreds of other startups are still working on their prototypes and competing for investors' funds.

At stake is a market that is set to balloon to hundreds of billions of dollars in the coming decades as China's government promotes greener vehicles at the expense of gas guzzlers. Local brands are trying to gain relevance and secure their survival before Elon Musk's Tesla starts building cars in Shanghai next year and global giants from Volkswagen AG to Ford Motor Co. flood the market with their locally produced electrified models.

Xpeng handed over the first batch of its five-seater crossovers, priced at about \$33,000 to \$37,500 before subsidies, after having its employees test the model for the past 14 months. Tesla is set to start delivering U.S.-made, higher-end versions of the Model 3 sedan priced at about \$78,000 next year before starting local production of the vehicle.

While the Chinese contenders' lower prices are likely to appeal to buyers, they need to convince customers of their vehicles' quality and brand appeal. At the same time, the startups face

challenges in ramping up manufacturing capacity, which can easily cost hundreds of millions of dollars and is something that rivals from Tesla to Nio Inc. have struggled with.

He said Xpeng has a healthy cash balance that can sustain the company for at least the next 25 months. The company needs to sell more than 100,000 vehicles to break even, and its profit margin is set to pick up rapidly after it achieves more scale and starts making money on services, he said. Xpeng has no "immediate" timetable for an initial public offering, President and Vice Chairman Brian Gu said.

Xpeng has raised more than 10 billion yuan (\$1.4 billion) from investors including Alibaba Group Holding Ltd., Foxconn Technology Group and Xiaomi Corp. founder Lei Jun., all interested in backing a maker of data-collecting vehicles that tech companies can monetize through apps and services. With Alibaba maps and software, voice controls, live video and streaming music, the G3 is like a smartphone on wheels.

Chinese competitors such as WM Motor Technology Co. and Byton have also attracted billions of dollars in total investments in recent years as they prepare for product launches. Nio Inc. raised more than \$1 billion in its stock sale in September that valued the company at \$6.4 billion, even as the company had delivered fewer than 2,000 vehicles up until its IPO filing.

EV contenders include:

- Tesla is the benchmark for EV startups, though its sales have been hit by import tariffs amid a trade war between China and the U.S. Its Model S sedan starts at 782,900 yuan and the Model X SUV from 861,800 yuan. Tesla plans to start delivering Model 3 variants priced from 540,000 yuan next year before starting production in China.
- Nio has been ramping up delivery efforts after raising about \$1 billion in a U.S. IPO in September. The Tencent Holdings-backed company had delivered 3,368 units of its seven-seater ES8 SUV priced from 548,000 yuan as of the end of September.
- Founded by Freeman Shen, a former Volvo Cars veteran, WM Motor had raised about \$2 billion from investors as of last December. It started delivering its EX5 crossover priced from 186,600 yuan in September.
- Byton aims to launch its first production model in 2019 in China and targets a U.S. entry in 2020 with its electric crossover priced from \$45,000. The startup, founded by former BMW AG executives, raised about \$500 million earlier this year.

55. Thailand's Capital Blanketed By Harmful Smog, Stricter Vehicle Emissions Expected

Worsening smog has shrouded Bangkok, with hazardous particulate pollution recorded in some areas of the Thai capital. The Pollution Control Department reported the level of particulate matter with 2.5 micrometers (PM 2.5) ranged from 51 to 93 micrograms per cubic meter of air recently, while the safety standard of PM 2.5 is 50 mcg/m³. The air quality index of Bangkok was recorded at 122, which is defined "unhealthy" for some sensitive groups.

Feeble winds and a lack of precipitation were blamed for the poor air quality in five of the six metro provinces including Bangkok, leading to new talk of cracking down on vehicle emissions. The Bangkok Metropolitan Administration said it will purchase more green buses that use a cleaner bio-diesel blend. Police have set up 20 checkpoints to prevent large trucks from entering Bangkok in rush hours.

Thailand's Pollution Control Department declared air quality in the Thai capital unhealthy, leading to the closure of 400 public schools through the end of the week.

The city's air quality, contaminated mostly by vehicle emissions pollution, has reached such harmful levels that the air quality index, or AQI, was above 160 early Thursday morning local time, a period during which readings are at their lowest while most of the megalopolis sleeps. Even still, it ranked among the worst major urban readings globally. (The range for "good" and "moderate" AQI levels are 0 to 100.)

Additionally, officials fear conditions will be exacerbated by next week's Lunar New Year celebration which will include widespread use of fireworks and incense. They are urging the public to refrain from lighting either as they welcome the new year.

"We will assess the situation on Saturday and Sunday to see whether there would be the need to close all schools further next week," government spokesman Puttipong Punnakan said.

Other measures the government has taken to clear the air of choking smog include spraying water out of giant cannons into the sky. A strategy that the director general of the Pollution Control Department of Thailand said is well-intentioned "but maybe this is not the best thing."

Local air pollution experts have urged lawmakers to pass a series of driving and parking restrictions to ease traffic congestion across the city and bring down levels of PM2.5. The number of vehicles on Bangkok's roads have increased dramatically in recent years, from 6 million in 2005 to nearly 10 million in 2018.

Supat Wangwongwatana, former chief of Thailand's Pollution Control Department, made a series of recommendations in the Bangkok Post last year, including a 90-day ban on certain vehicles on days when the AQI is especially high. He also suggested heavy trucks could be barred from entering the city during rush hour and that authorities limit car usage to even or odd days of the month.

The New York Times reported at one point the government also considered using giant fans to blow the pollution out of town.

The World Health Organization says 4.2 million people die every year as a result of exposure to outdoor air pollution, and when combined with household air pollution deaths, the number spikes to 8 million. Additionally, 91 percent of the world's population lives in places where air quality exceeds the agency's guideline limits.

56. New Zealand Minister Says Emissions To Rise

New Zealand has set itself apart from neighboring Australia by declaring climate change a top priority. But despite some lofty goals, greenhouse gas emissions continue to rise in the South Pacific nation and could do so for years to come. And the country faces some unusual challenges with half of those emissions coming from farm animals.

New Zealand Climate Change Minister James Shaw, who travelled to Poland to attend U.N. climate talks, said in an interview with The Associated Press that he expects emissions to peak by 2025 and only then start to decline.

Under the terms of the Paris climate agreement, New Zealand is supposed to reduce its emissions by 30 percent of 2005 levels by 2030. Is it possible? "Well, we're a long way off to tell you the honest truth," Shaw said.

He said the biggest challenge is cars and trucks. "Our transport emissions have gone up 24 percent in the last decade," he said. "For every electric vehicle that we import, we import 24 Ford Rangers."

New Zealand's government has promised to plant 1 billion trees over the next 10 years and intends to pass legislation next year requiring the country to become carbon neutral by 2050. But vital details of the law are still being negotiated, including whether the country will be able to trade carbon credits overseas.

"We've got an aversion to using international credits before we've really exhausted all of the domestic options," Shaw said. "But we could see the possibility that a future government might need to have that option open."

Shaw said research indicates it is possible for New Zealand to become carbon neutral within its own borders, although it will be challenging.

Also at stake is the degree to which farmers will be affected. Agriculture is a vital industry in New Zealand, and the human population of 5 million is dwarfed by the country's 10 million cows and 27 million sheep. The animals add to nitrous oxide emissions and release methane gas. But just how to classify methane remains contentious. It's a far more potent greenhouse gas than carbon dioxide, but also disappears from the atmosphere much more quickly.

Shaw said New Zealand has taken a more bipartisan approach to climate change than in Australia, where he said successive leaders have failed on the issue. He said part of the problem is that Australia has a long history with industries such as coal mining. "It's deeply rooted in people's sense of self and culture," he said. "So, when you talk about the need to make that transition, even over quite long timelines, it meets with resistance."

Shaw said New Zealand doesn't face the same existential threat from rising seas as some of its low-lying Pacific neighbors such as the Marshall Islands and Kiribati, although the nation would still be severely affected. "If you look at where New Zealanders live, most of us live very close to the sea," he said. "And our largest cities have significant infrastructure quite close to the shoreline."

57. The Biggest Source Of Air Pollution In Hong Kong is Shipping

Ships are the leading source of the major components of air pollution in Hong Kong.

The trade that made Hong Kong rich also happens to be the one choking it. Ships – container ships in particular – are far and away the leading source of the major components of air pollution, producing most of the harmful sulfur dioxide, nitrous oxides and PM2.5 particulates that Hong Kong citizens breathe in daily.

According to the Environmental Protection Department's latest emission inventory, in 2016, shipping in Hong Kong waters produced 8,540 tons of sulfur dioxide, 32,900 tons of nitrogen oxide and 1,480 tons of PM2.5 pollution.

In 2015, the government introduced a law requiring marine vessels to switch to low sulfur fuel while at berth in Hong Kong. In the following year, officials said sulfur concentrations had dropped by between 30 and 50 per cent. The regulation will be changed in 2019 to compel all ships operating in Hong Kong waters to switch to low sulfur fuel, whether stationary or moving.

The number of ships arriving in Hong Kong fluctuates with the global economy. Marine Department statistics show that overall, the number of ocean-going vessels arriving in Hong Kong has fluctuated over the past 10 years, but the figure rose 7.8 per cent last year from 2016. The numbers suggest that the city will remain a major player in the shipping industry for the foreseeable future – that is good for business, but bad for health.

The city's second-largest contributor of airborne pollutants is electricity generation. Hong Kong's largest power stations are those at Castle Peak, burning coal and oil-gas; and Lamma, burning coal. After 2008, power plants began instituting emission caps mandated by the government, and a notable reduction in sulfur dioxide has been seen: from about 50,000 tons in 2008 to 8,020 tons in 2016. But with 25,620 tons of nitrogen oxide produced in 2016, power generation is still second only to shipping when it comes to emissions, though it is worth noting that the power plants produce far less PM2.5 pollution – 310 tons in 2016 compared with shipping's 1,480 tons.

The government does not appear to have plans to invest in large renewable energy generation in the short or medium term. A general notice on the government's web portal reads: "Hong Kong does not have favorable conditions for large-scale commercialized RE [renewable energy] generation", though it adds that small-scale pilot projects are under way, including floating photovoltaic systems at two of the city's reservoirs.

The overwhelming majority of Hong Kong's cars, buses, trucks and motorcycles – more than 98 per cent – are still powered by fossil fuels via their internal combustion engines. Despite this, owing to the introduction of fuel and vehicle emission standards, measured rates of particulate matter, sulfur dioxide and nitrogen oxides have seen drops of between 50 and 70 per cent since 1999. However, roadside pollution in busy areas remains extremely hazardous to health, as the densely packed, tall buildings create canyons in which particulates and gases gather.

The bustling shopping district of Causeway Bay is often cited as having the worst roadside pollution in the city, with PM2.5 concentrations registering above the WHO's guideline limit of 25 micrograms per cubic meter on 227 days of the year in 2016.

The use of electric vehicles in Hong Kong has expanded from 100 in 2010 to more than 11,000 at the end of 2017, though the government has recently lowered tax concessions for electric private cars. As for public transport, Hong Kong's record is woeful: according to the government's Pilot Green Transport Fund, only 21 single-deck electric buses are currently on trial runs in the city. By comparison, Hong Kong's mainland neighbor, Shenzhen, already boasts a 100 per cent electric bus fleet of about 16,000 vehicles.

Aviation is responsible for about 1 per cent of Hong Kong's overall air pollution. But data collected via air quality monitoring in Tung Chung suggests that the local impact can be severe, with huge fluctuations in pollutants found near the airport. Ozone spiked at concentrations as high as 86 micrograms per cubic meter of air in 2017, compared to highs of about 40 micrograms per cubic meter at the roadside in Causeway Bay.

While it is true that newer aircraft are being designed for better efficiency and should therefore produce fewer emissions, air traffic at the airport has soared from a total of 295,000 international

passenger and cargo flights in 2007 to 421,000 in 2017, an increase of 43 per cent. That figure is set to rise further following completion of the third runway in 2024 – though the government has claimed that the development, intended to handle an additional 30 million passengers per year, will not create more air pollution.

The Environmental Protection Department defines “other combustion” as involving mainly non-road machinery, such as construction machinery. Construction machinery often relies on “dirtier” fossil fuels such as diesel, meaning that this more obscure source of pollution produces far more than its fair share of particulates.

There are also non-combustion sources, which include chemicals found in paints, printing inks, solvents, adhesives and some consumer products. Non-combustion sources are a key contributor to the presence of volatile organic compounds in the air.

As polluted as the city’s air can seem, it is important to look at the bigger picture: in the long term, efforts to cut emissions do appear to be having a positive impact. The government’s annual air quality health index (AQHI) shows a steady decline in the mean concentrations of pollutants. The index suggests levels of PM2.5 pollution in Causeway Bay, the aforementioned pollution black spot, dropped by almost half between 2011 and 2017. Meanwhile, the Hedley Environmental Index, operated by the University of Hong Kong’s School of Public Health, reports that in 2017, there were 1,866 deaths linked to air pollution in Hong Kong. This is a decline of about 40 per cent from the total recorded in 2012, the first year for which the index has data.

58. Tata Power Seeks to Tap Delhi EV Charging as Demand Growth Slows

Tata Power Co. is seeking to set up electric vehicle chargers in the Indian capital, a company official said, as one of the most polluted cities on earth plans an ambitious push toward cleaner vehicles.

Tata Power Delhi Distribution Ltd., which supplies electricity to 1.64 million consumers in Delhi, has written to the local government saying it wants to set up charging stations for EVs and has requested land to build the infrastructure, Chief Executive Officer Sanjay Kumar Banga said in an interview last week.

“Delhi has a power surplus” even as demand has plateaued due to energy-efficient devices and consumers opting for rooftop solar or open access, Banga said, adding that setting up charging stations would help boost power demand and raise revenue.

The company could also offer cheaper rates for charging during off-peak hours, which could translate into the cost per kilometer for electric vehicles falling to as little as 0.30 rupees, versus 5 rupees for fossil-fuel driven cars, he said.

Lack of charging infrastructure has been one of the biggest hurdles to India’s ambitions to ensure more electric vehicles on its roads, with the federal government dithering on setting clear policy goals. The government recently pushed back yet another deadline to get officials driving 10,000 electric vehicles as most of India’s 29 states don’t have a policy to promote the use of electric cars and lack sufficient charging infrastructure.

In contrast, Delhi’s local government has targeted 25 percent of all new vehicle sales to be electrically powered by 2023 in a draft policy that aims to improve air quality by bringing down

transport emissions. The Indian capital was eleventh in the World Health Organization's 2016 rankings of the world's most-polluted cities, as measured by fine particulate matter, or PM 2.5.

Separately, Tata Power signed a pact last year with oil retailer Hindustan Petroleum Corp. to set up charging stations at HPCL's outlets and other locations across India. State-run NTPC Ltd. and Bharat Heavy Electricals Ltd. have also announced plans to set up electric vehicle chargers.

59. India Air Pollution Plan Takes on Big Problem With Little Money

India's nationwide plan to address the world's worst urban air pollution began this month with ambitious goals, but without the budget or implementation framework needed to succeed, critics said.

India is home to 14 of the 15 most polluted cities in the world, according to the World Health Organization. Kanpur, Varanasi, and the capital Delhi rank high on the list, and are among the 102 urban centers targeted by the new plan. The National Clean Air Program (NCAP) was launched in the wake of a study that found 1.24 million deaths in India in 2017 due to air pollution—12.5 percent of the nation's total deaths.

In fact, people living in India's cities are exposed to an annual average of more than twice the recommended upper limit of fine particulate matter, among the most dangerous air pollution, according to India's National Ambient Air Quality Standards.

The program sets a goal to reduce urban particulate matter pollution by 20 percent to 30 percent by 2024, with 2017 as a baseline year, and also strengthen national air quality monitoring networks. The plan focuses on agriculture, mobility, waste management, urban planning, and transportation.

However, reduction targets for the lung-damaging particulate matter of less than 2.5 microns in diameter (PM-2.5) and the larger PM-10 pollution are not binding, and most costs to clean up the air "will have to be majorly borne by States," the plan specifies. The total budget available for the first two years is 3 billion rupees (\$42.2 million).

"It's not a surprise that the NCAP in its present version falls short of the ambition necessary to address the air pollution crisis in India," says Anup Bandivadekar, India lead with the International Council on Clean Transportation. "In addition to setting specific national level emission reduction targets, NCAP framework should help establish similar targets at the state and city level and include a new thrust on compliance ... supported by necessary enforcement actions," Bandivadekar said. He added that unless states and cities are all held responsible for not meeting the NCAP goals, "action will continue to be not commensurate with the scale of the problem."

But the seemingly modest budget will be enough to kick start the plan, because it will be combined with investments from individual states and other government schemes whose goals are overlapping with NCAP's, according to Ritesh Kumar Singh, joint secretary for the Ministry of Environment, Forest and Climate Change.

When it comes to compliance, "a binding target looks really good on paper," he said. "But in the Indian context lots of binding targets are never met."

India's Centre for Science and Environment, while praising the effort also raised concerns regarding funding. "The most baffling part of NCAP is the absence of a robust fiscal and funding strategy. Only a pittance of Rs 300 crore is being earmarked for NCAP. Clearly, NCAP cannot be

sustainable nor can it gain strength or make a difference on a longer-term basis if it does not have a clear fiscal strategy. It is also not clear if the proposed allocation is a one-time exercise or a continuous support. NCAP will require long-term commitment and support. The Ministry of Finance will have to be on board to ensure that cross sectoral and inter-ministerial programs have inbuilt indicators aligned with the NCAP objectives for restructuring of budget and allocation if we want to see serious action and change on ground.”

CSE continued, “It is very surprising that NCAP has not provided for innovative financing mechanism at central and state/city level. It has not taken on board the ‘polluter pay’ based taxation mechanism to mobilize resources for dedicated funding of pollution control action and also to discourage polluting products, processes and activities. It should have taken precedence from emerging practices in the country—pollution cess in Delhi on truck entry, big diesel cars, and diesel fuel sales and the coal cess—to generate dedicated funds to finance clean air action plan. Such funds should be managed through unified window for the purpose of admissible pollution control activities identified in the action plan. Without a funding strategy, NCAP will become a simple wish list and a statement of intent.”

60. Diplomatic Dust-Up by China, South Korea Follows Bad Air in Seoul

South Korean and Chinese officials have been trading barbs for weeks over who’s to blame for a spike in air pollution in Seoul this winter. South Korean President Moon Jae-in on January 22 said South Koreans suffered last week due to “an unprecedented number of days of dense fine dust” and said he was “well aware of the fact that our people have great concerns about fine dust coming from China,” South Korea’s Yonhap News Agency reported.

Moon called for more cooperation with China and the joint establishment of an early warning system for air pollution.

Liu Bingjiang, director of the air pollution department of China’s Ministry of Ecology and Environment, urged the countries to deepen scientific and governmental cooperation to reduce regional air pollution. China’s air quality had “improved substantially” since 2013 while air quality in South Korea had “remained stable or slightly worsened,” Liu said January 21.

China last winter had the biggest improvement in air quality in over a decade. Air quality in northeastern China, however, has gotten worse this winter compared to last year.

Winter winds from the west and southwest blow both Chinese air pollution and emissions from South Korea’s coal plants—also to the south and west—directly into Seoul. NASA measurements of air pollutants over South Korea in 2016 found that around 52 percent was from domestic sources and as much as 38 percent was coming from China.

During a heavy air pollution period in mid-November last year, South Korea’s energy ministry moved to reduce operations at several major coal power plants to 80 percent capacity. Still, South Korea is increasing coal consumption even as the world’s scientists say fossil fuel use must be cut deeply to avoid severe impacts of climate change.

Net imports of coal by South Korea nearly doubled since 2000, according to U.S. Energy Information Administration data. South Korea produced about 1.6 million short tons of coal, a small fraction of its estimated coal consumption of 151 million short tons in 2017. The country is the world’s fourth-largest coal importer, after China, India, and Japan.

Three new coal fired power plants came online in 2017 in South Korea, and there are currently 85 coal-fired power units in operation with another seven under construction.

61. FCA Korea Fined Billion Won For Manipulating Emissions

Fiat Chrysler Automobiles (FCA) Korea will be fined 3.2 billion won (\$2.8 million) for selling 2,428 diesel vehicles equipped with a software device that manipulates emissions levels, the Ministry of Environment has announced.

The vehicles include 1,610 Jeep Renegade compact SUVs sold here from March 2015 to July 2016 and 818 Fiat 500X crossovers the importer sold in Korea from April 2015 to June 2017.

The environment ministry plans to decertify the cars and refer the company to the prosecutors.

According to the ministry, the vehicles were found to be equipped with a software device that reduces nitrogen oxide emissions during the indoor testing, while allowing cars to emit larger amounts of exhaust fumes on the roads.

Volkswagen, which was involved in the emissions scandal in 2015, used the same tactic for its diesels.

FCA Korea was also found to sell 1,377 Renegades from July 2016 to July 2018 here without getting a certification for the modified software. The global headquarters of FCA reportedly upgraded the software in 2016 as the European Union raised doubts about emissions levels of FCA cars.

The ministry, however, said it will not decertify the 1,377 vehicles.

It is also investigating the Fiat Freemont and the Jeep Cherokee, both of which are equipped with engines subject to a limit for Euro 5. The engines of the Renegade and the 500X are subject to a limit for Euro 6.

62. Japan To Tighten Reduction Targets on Climate-Warming Coolants

Japanese chemical companies should start preparing ahead of time for a new reduction target for producing and using potent greenhouse gas refrigerants, or face stiff legal consequences, according to environmental lawyers. Starting January 1, Japan's Ozone Layer Protection Act designates hydrofluorocarbons (HFCs) as a controlled substance to be subject to gradual production and consumption restrictions. Companies must follow a permitted volume of HFCs allocated to them by the Ministry of Economy, Trade and Industry.

Under the Montreal Protocol on substances that deplete the ozone layer, industrialized countries including Japan are required to gradually reduce their national baseline on the production and consumption of HFCs from 10 percent in 2019 to 40 percent in 2025 then to more than 70 percent after 2029 and beyond.

The reductions are aimed at protecting the ozone layer and could help meet climate goals.

Companies shouldn't delay preparing for compliance with the high HFC reduction targets for 2029, as the potential legal liability for exceeding the national baseline can be severe, according to environmental lawyers. "Efforts should be made by relevant businesses now to ensure that

they will be able to meet the said target and those set for years following 2029,” said Osamu Inoue, environmental law partner at Ushijima & Partners in Tokyo.

Companies that produce and import HFCs without the ministry’s permission could be liable for a maximum of five years’ imprisonment, and 500 million yen (\$4.5 million) in fines for unauthorized importation of the substance, according to Inoue.

HFCs are widely used as refrigerants and in spray foams and aerosols.

Chemical companies sell HFCs to automobile and electrical appliance manufacturers, which are regulated under Japan’s Rational Use and Proper Management of Fluorocarbons Act, according to Hajime Kanagawa, founder of Kanagawa International Law Office in Tokyo.

Companies have to find alternative substances if they use more HFCs than they have been allocated.

Daikin Industries Ltd., the Japanese multinational air conditioning manufacturer headquartered in Osaka, already developed a commercial system that “will offer significantly enhanced environmental performance compared to the conventional models currently available on the market,” said George Dimou, Daikin’s Europe product manager. If companies have the need, however, the ministry “will accept applications for additional HFC quotas, for both production and importation purposes, if the substance will be used as a raw material for an end product,” Itabashi said.

63. Indonesia to Allow Duty-Free Imports of Electric Cars

Indonesia plans to allow duty-free imports of electric vehicles and offer fiscal incentives to companies planning local production as President Joko Widodo sees potential savings of billions from switching to battery-powered transport.

The government will soon issue a regulation that will enable Southeast Asia’s largest economy to compete with other countries in developing electric vehicles, Widodo, known as Jokowi, told reporters in Jakarta. The potential savings from lower fossil fuel dependence and imports are seen at about 798 trillion rupiah (\$56 billion) he told a cabinet meeting, without elaborating.

Hyundai Motor Co. and Volkswagen AG are among companies interested in manufacturing electric vehicles in Indonesia as the nation of more than 260 million people is targeting 20 percent of its cars and motorbikes to be electric by 2025, Industry Minister Airlangga Hartarto told reporters. Jokowi’s administration will also slash luxury tax on electric vehicles in the early stages to promote their use, he said.

While Indonesia is a late entrant to the global race toward electrification of vehicles, a widening current account deficit and currency rout have nudged Jokowi’s administration to pursue policies that can lower imports in the long run. The country widened a mandate to blend palm oil biodiesel to 20 percent last year to reduce its reliance on crude oil imports.

Indonesia will offer incentives to manufacturers of hybrid as well as electric vehicles, Hartarto said. Nissan Motor Co. has submitted a prototype of electric vehicle for consideration, he said.

SOUTH AMERICA

64. New Brazilian Regulations Will Reduce Emission Of Ozone Precursors And PM

CONAMA (The National Council for the Environment) has approved two new PROCONVE Resolutions (Air Pollution Control Program for Motor Vehicles), establishing the 8th phase (P8) for heavy duty commercial vehicles, as well as the 7th and 8th phases (L7 and L8) for light duty passenger and commercial vehicles, to go into effect on January 1, 2022 (P8 and L7) and January 1, 2025 (L8).

Decreasing ozone formation in the lower atmosphere is the current priority for improving air quality in Brazil, with emphasis on the reduction of evaporative and exhaust NMOG emissions from gasoline and ethanol flex-fuel LDV, and NO_x emitted by Diesel HDV. Another priority is the further reduction of fine particulate emissions.

As published on November 16, 2018, the PROCONVE P8 phase which is equivalent to the Euro 6-e standard according to its most up-to-date version, will be enforced for new models by January/2022 and for all HDV by January/2023.

The L7 phase will be enforced in January/2022 for all passenger and commercial LDV, and the next L8 phase starts in January/2025 and will be developed through 2031 by reducing the corporate averages. On that year the emissions limits of commercial diesel LDV will be leveled with those of flex-fuel cars and other LDT (NMOG + NO_x <30 mg / km). Both regulations will also reduce emissions of particulate matter of diesel vehicles by up to 90% and (NMOG + NO_x) emissions by 80%.

To boost the control of ozone precursors, the control of evaporative emissions has undergone significant revision, after being limited in the last 20 years to the Cold + Hot Soak emission control (<2.0 g / test). Brazilian authorities concluded that evaporative emissions from LDV have become the biggest challenge from the environmental point of view and are much higher than the current HC exhaust emission.

Therefore, the most significant innovation brought by the L7 phase for ozone formation reduction is the control of evaporative emissions that have to comply with a 48 hour test and a strict limit (0.5 g / day) and the ORVR (<0.050 g / liter) requirements, which will reduce almost 90% of vehicle refueling, diurnal and running losses evaporative emission.

In addition, other requirements have been improved in the On-Board Diagnostics system (OBD) for continuous monitoring failures, advanced emission control and the identification of defeat devices.

In summary, this new CONAMA Resolutions represent one of the most profound updates of PROCONVE since its creation in 1986. It is very interesting that the same individuals that played the key role in creating the original PROCONVE, Fábio Feldmann and Gabriel Branco, also played a major role in creating these new steps.

MIDDLE EAST

65. Israel Tax Break Prods Taxis to Move From Diesel to Hybrid

Israel Finance Minister Moshe Kahlon signed an order December 31 granting accelerated depreciation for low-emission diesel and hybrid taxis, part of the government's drive to reduce emissions from the country's 20,000 taxis.

The benefit will create an incentive for owners of diesel-fueled vehicles to replace them with electric hybrids, which also get a subsidy of 20,000 shekels (\$5,352) per vehicle from the Ministry of Environmental Protection. As of August 2018, 566 hybrid taxis had been purchased under the program, which began in 2017.

Most Israeli taxis are powered by diesel, partly because of an old excise tax benefit that encouraged the use of that fuel when it was thought to be less polluting than regular gasoline. The government began phasing out the excise benefit in 2016. "These are high mileage vehicles, which travel mainly in city centers, and the environmental impact of the use of diesel vehicles is high," the Israel Tax Authority said in a statement.

Under the new order, the taxable value of qualifying diesel vehicles registered before December 31, 2018, and sold for private use before December 31, 2021, will be lower than the value for non-qualifying taxis and will be reduced to zero after 36 months of use. The taxable value of hybrid vehicles will be reduced to zero after 48 months.

66. Scrapping Clunker Cars, Heavy-Duty Vehicles Key To Ease Tehran Air Pollution

In combatting air pollution, the key measure is to scrap clunker cars and heavy-duty vehicles, Masoud Zandi, head of the national center for air quality and climate change affiliated with the Department of Environment, has said.

Within the framework of a LEZ (Low emission zone) scheme the number of traffic enforcement cameras has increased from 300 to 2,000 which would definitely affect air quality in the capital, IRIB quoted Zandi as saying. The scheme is aiming at reducing traffic emissions in Tehran. LEZ is a defined area where access by certain polluting vehicles is restricted or deterred with the aim of improving the air quality. This may favor vehicles such as hybrid electric vehicles, or zero-emission vehicles such as all-electric vehicles.

To bring the LEZ scheme into effect all the vehicles in Tehran were required to get inspection stickers indicating the level of emission they produce which are easy to track down by the traffic cameras thanks to the newly integrated vehicle inspection system. The first phase of the scheme in Tehran which went into effect on September 5, 2016, focused on mitigating air pollution in the metropolis, which was running from 6 a.m. to 7 p.m. each day except for holidays.

The second phase of the scheme running 24-7 in the metropolis of Tehran was launched on October 23.

The newly-installed traffic enforcement cameras will help in controlling vehicles inspection stickers more effectively, he added.

Zandi went on to say that last year (March 2017-March 2018) heavy-duty vehicles including buses which released great amounts of emission in the city were plying the city but this year they are all required to receive inspection stickers showing they are meeting emission standards.

Currently clunker heavy-duty vehicles are not permitted to ply the city and cannot be sold, he highlighted, adding that they were the main source of air pollution particularly during cold seasons.

According to a report by the World Bank published in April 2018 there are about 4.24 million vehicles in Tehran. Cars are the largest vehicle type, with a total fleet of 3.37 million, or 80 percent

of all vehicles. Of all cars, 90 percent are passenger cars, 8 percent are pick-ups, and only 2 percent are taxis. The second largest category, in terms of sheer numbers, are motorcycles, amounting to a total of 0.76 million, or 18 percent of total vehicles. The smallest category is heavy-duty vehicles, with a total of 0.1 million vehicles, or about 2 percent of total vehicles in the streets of Tehran.

Even though cars are the most abundant and the most congestion-causing vehicle type on the streets of the capital, they only contribute to about 3 percent of the city's mobile PM pollution. Similarly, despite motorcycles being the most pollution intensive vehicle per passenger, they only contribute to about 12 percent of the total mobile PM emissions.

In turn, heavy-duty vehicles contribute to about 85 percent to mobile PM emissions. Amongst heavy-duty vehicles, private sector buses (35 percent), followed by Tehran municipal buses (28 percent), and trucks (28 percent), hold the largest shares of the causes of pollution. Heavy-duty vehicles mostly run on diesel, which has a much higher PM emissions factor than petroleum or natural gas.

GENERAL

67. NORDEN Conducts First Ever Test Voyage On CO2 Neutral Biofuel

NORDEN has successfully finalized a test voyage with a large commercial ocean-going vessel being powered by CO2 neutral biofuel. Commenting on the test CEO Jan Rindbo, NORDEN, says: "NORDEN is proud to be at the forefront of testing and introducing CO2 neutral fuel that truly makes an impact on the highly important agenda of reducing the carbon footprint of shipping."

The test voyage on CO2 neutral biofuel is supported by an international NGO.: Kåre Press-Kristensen, Senior Adviser, Ecological Council, says "We appreciate that NORDEN is investigating specific solutions to the climate challenge. We need actions here and now to meet the climate goals of the IMO and we are proud that NORDEN takes action, taking a leading role in biofuels, and look forward to following the development."

The test documented that 2nd generation CO2 neutral biofuel is a technically and economically suitable and thereby a realistic alternative to comparable fossil fuel. The test onboard the NORDEN vessel documented that the engine performance is not affected, i.e. the full performance envelope can be delivered without restrictions. The initiative is in line with NORDEN's efforts to reduce its carbon footprint.

"NORDEN has come a long way in increasing fuel efficiency and has reduced CO2 emissions per ton cargo transported on owned tanker vessels by 25% between 2007 to 2017. With the newly introduced IMO targets on CO2 reductions, however, it is evident that increased fuel efficiency alone is not enough. We need alternative solutions and with this test, NORDEN has shown a viable method towards reaching these targets," says Jan Rindbo.

Jan Rindbo expects that once the CO2 neutral transport becomes available it will be in high demand:

"Now that we have proven CO2 neutral transport as a viable alternative, I am convinced many carbon conscious customers within a foreseeable future will demand this type of transport."

NORDEN acknowledges that biofuel may not be the sole solution in the long run, however, believes that the carefully chosen second generation biofuels used can contribute significantly to reducing our CO2 emission here and now.

The test voyage was conducted in September 2018 in co-operation with Rotterdam-based GoodFuels – an innovative and market leading company in the field of advanced sustainable fuels. The test voyage was a ballast trip from Rotterdam in the Netherlands to Tallinn in Estonia, on the 37,000 dwt, 182-meter-long Handysize product tanker vessel NORD HIGHLANDER.

To compare how the engine reacted on the biofuel as an alternative to low sulfur fossil fuel, the departure from Antwerp was conducted on fossil fuel. After a visual inspection of the engine, the vessels switched to biofuel. During the voyage the engine was operated at different loads for sufficiently long periods to establish stable performance. After the test, a final visual inspection of the engine was conducted, which confirmed that the engine was not negatively affected by the biofuel.

NORDEN will continue working with GoodFuels to gain further experience with biofuel as an alternative to low sulfur fossil fuel. NORDEN is also considering other possibilities to lower the carbon footprint. The goal is to offer commercially attractive CO2 neutral transport to customers within the foreseeable future.

*CO2 neutral biofuel is defined as tank-to-wake 100% reduction, well-to-wake 85-89% reduction.

68. Coming Changes In Marine Fuel Sulfur Limits Will Affect Global Oil Markets

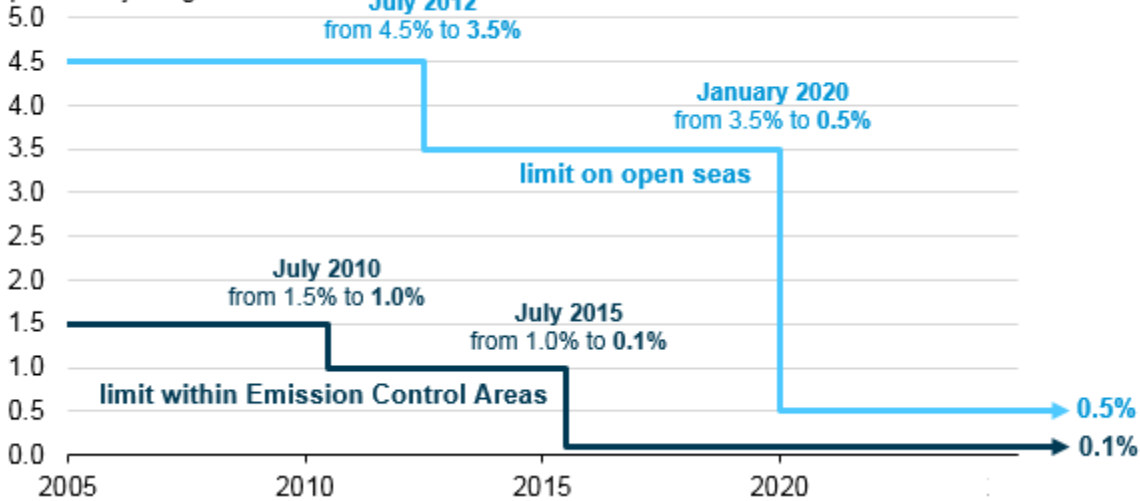
International regulations limiting sulfur in fuels for ocean-going vessels, set to take effect in January 2020, have implications for vessel operators, refiners, and global oil markets. Stakeholders will respond to these regulations in different ways, increasing uncertainty for crude oil and petroleum product price formation in both the short and long term.

When burned, the sulfur in marine fuel produces sulfur dioxide. The sulfur content of transportation fuels has been declining for many years because of increasingly stringent regulations implemented by individual countries or groups of countries.

The upcoming 2020 rules apply across multiple countries' jurisdictions to fuels used in the open ocean, representing the largest portion of the approximately 3.9 million barrel per day global marine fuel market, according to the International Energy Agency.

Global marine fuel sulfur limits

percent by weight

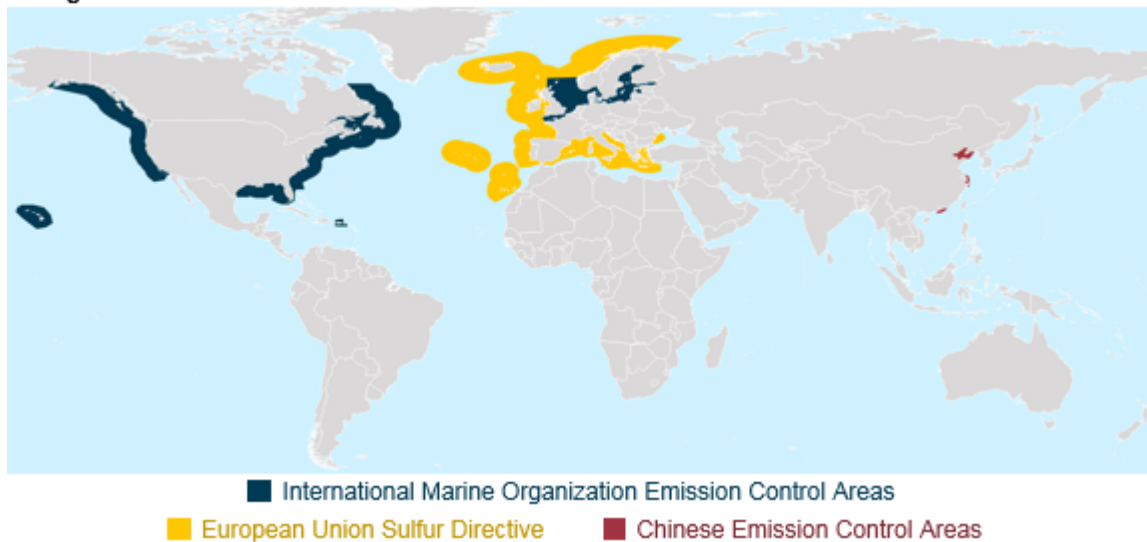


Source: U.S. Energy Information Administration, based on International Maritime Organization (IMO)

The International Maritime Organization (IMO), the 171-member state United Nations agency that sets standards for shipping, is set to reduce the maximum amount of sulfur content (by percent weight) in marine fuels used on the open seas from 3.5% to 0.5% by 2020. These regulations are intended to reduce sulfur dioxide, nitrogen oxides, and other pollutants from global ship exhaust.

The 2020 reduction in sulfur limits follows a series of similar reductions in marine fuel sulfur limits, such as those that reduced sulfur content of marine fuels in IMO-designated Emission Control Areas from 1.0% to 0.1% in 2015. Other areas around ports in Europe and parts of China have adopted similar sulfur restrictions.

Designated marine sulfur limitation areas



Source: U.S. Energy Information Administration, based on International Marine Organization, European Union, and China's Ministry of Transport

Vessel operators have several choices for compliance with the new IMO sulfur limits. One option is to switch to a lower-sulfur fuel compliant with the new IMO rules. However, the cost, widespread availability, and specifications of a new fuel for use in marine engines is still uncertain.

Another option is to use scrubbers to remove pollutants from ships' exhaust, allowing them to continue to use higher-sulfur fuels. However, the process of installing scrubbers can be costly and can increase a ship's operating costs. A small portion of existing marine vessels has already installed scrubbers, and that portion is not expected to increase greatly before 2020 because of time constraints and limited installation capacity. Even if scrubbers become widely adopted, which would allow the continued use of fuels with higher-sulfur content, the price and availability of higher-sulfur fuels after 2020 remains uncertain.

Ships also have the option to switch to nonpetroleum-based fuels. Some newer ships and some currently being built have dual-fuel engines that would allow them to use nonpetroleum-based fuels such as liquefied natural gas (LNG) after minimal modifications. However, the infrastructure to support use of LNG as a shipping fuel is currently limited in both scale and availability.

The upcoming IMO regulations pose a significant challenge for global petroleum refineries: how to increase the supply of low sulfur products for use in marine applications and minimize the output of high sulfur oils.

Residual oil—the long-chain hydrocarbons remaining after lighter and shorter hydrocarbons such as gasoline and diesel have been separated from crude oil—currently makes up the largest component of marine fuels used by large ocean-going vessels, also known as bunker fuel. Removing sulfur from residual oils or upgrading them to more valuable lighter products such as diesel and gasoline can be an expensive and capital-intensive process.

The choice of compliance path for vessels also introduces a risk to refiners: if scrubbers become widely adopted, higher-sulfur residual oils might still be used, potentially reducing the value of existing and new refining units capable of upgrading the residual oils.

While the use of scrubbers has proved controversial, drawing criticism from environmental groups and some owners, it remains to be seen whether more sulfurous fuel would do any damage to aquatic life. Critics say that using the equipment transfers pollution from the skies to the seas. Some countries, such as Singapore, have banned vessels from using the systems. The companies installing scrubbers say the process poses no threat to the oceans.

One approach refineries could pursue is to divert more low sulfur distillate fuel into the bunker fuel market, which would mean ocean-going ships would be competing with trucks, heavy equipment, trains, and planes for supplies of distillate fuels at a time when global demand for distillate is already high. To respond to added demand for distillate fuels, refineries can increase the rate they process crude oil or invest and build more refinery capacity to produce distillate fuels. Both options would increase demand for crude oil.

Refineries might also choose to process crude oils that are lower in sulfur, yield a greater amount of distillates, and yield lower amounts of residual oils. Changes in the types of crude oil refineries purchase would then change how different crude oils are priced relative to each other and crude prices overall.

The decisions refiners and shippers make in response to the IMO 2020 rules heavily influence one another, adding to uncertainty and complexity. In January 2019, EIA will release the first

Short-Term Energy Outlook that includes monthly projections through December 2020. This report will discuss short-term implications and uncertainties surrounding the IMO regulations. Later that month, the Annual Energy Outlook 2019 will describe potential long-term implications of the regulations.

69. International Bunker Industry Association Shares its View

Compliance with the International Maritime Organization's global sulfur limit rule is expected to be high with about 95% of the compliant bunker fuel demand likely to be met by marine gasoil and low sulfur fuel oil in 2020, Simon Neo, regional manager Asia at International Bunker Industry Association (IBIA), said recently.

"Before 2020, things need to be ready as the date is cast in stone ... IMO 2020 is final and there will be no delay," Neo said at an industry event in Singapore.

Shipowners will have to switch to more expensive cleaner fuels or consider alternative fuels such as LNG or use HSFO with scrubbers to comply with this rule.

Scrubbers uptake will likely remain limited by 2022 or 2023, with the number of ships with scrubbers expected to reach about 3,800 at most, Neo said. That equates to less than 5% of the global fleet. Reliability around scrubber technology and potential changes in the regulatory framework create uncertainty around the accelerated use of scrubbers, he said.

Specifications to use alternatives such as LNG, LPG and methanol are not ready yet to foster their widespread adoption as bunker fuels, while infrastructure availability for LNG also poses a concern, particularly in the smaller ports, Neo said. Besides LNG, LPG and methanol form part of the hydrocarbon chain and will not help much in meeting upcoming greenhouse gas emissions rules, Neo said.

Blended fuels come with their own complexities, Neo said.

"If a vessel is taking LSMGO, there is not much of an issue but if a shipowner is buying low sulfur marine fuel oil, then the question is are we getting a straight run or a blended fuel?" Neo said.

Another concern is around how much gasoil should one blend with fuel oil to get a 0.5%-sulfur compliant fuel or should one be blending with cutterstocks or other blends, he said.

"Cargo traders and oil majors have not issued clarity around this aspect. So, a lot of question marks are out there," he added.

Today, bunkers have big issues around quality, Neo said, adding that during the past few months, over 300 vessels globally were affected by fuel contamination matters. The contamination, which originated in Houston early in 2018, spread worldwide, with about 50 vessels estimated to be tainted with chemicals in Singapore alone around June-July, Neo said.

Shipowners worried about quality or contamination may have to consider gasoil because gasoil itself is already 0.5%-S compliant fuel, Neo said. This just goes to show that a majority of the vessels will likely rely on traditional fuels—gasoil or low sulfur fuel oil, he said.

Meanwhile, the carriage ban on HSFO in bunker tanks from March 1, 2020 on ships without scrubbers will likely help ensure compliance to the IMO rule in the high seas, Neo said.

Port authorities are also expected to step up enforcement measures at the ports through imposing fines, penalties or even vessel arrests in case ships don't comply, he said.

IBIA will continue to build a better understanding of the guidelines ahead of 2020, to prevent chaos, Neo said.

70. Pollution Linked to Climate Change Kills 7 Million a Year: Report

About 7 million people are dying annually because of air pollution that contributes to climate change, according to a World Health Organization report published on December 5.

Pollution-related disease, including respiratory illnesses, heart disease, and infectious diseases, cost the world's top 15 greenhouse gas polluters more than 4 percent of their GDP, said the report, released at the United Nations Climate Conference in Poland. Meeting the emissions-cutting goals of the 2015 Paris climate agreement will save roughly 1 million lives annually worldwide by 2050.

"The Paris Agreement is potentially the strongest health agreement of this century," Tedros Adhanom Ghebreyesus, WHO's director-general, said in a statement. "The evidence is clear that climate change is already having a serious impact on human lives and health. It threatens the basic elements we all need for good health—clean air, safe drinking water, nutritious food supply and safe shelter."

Katowice, Poland, part of an industrial region that often chokes in wintertime air pollution billowing from residential coal stoves and factories, served as a backdrop for the report's release at the climate conference, called COP24.

Small towns in the region bathe in a pall of smoke that forms halos around street lights and casts a cloud of smog on the horizon.

Black carbon, methane, ozone precursors, and other "short-lived" pollutants are emitted from some of the same sources, such as coal-fired power plants, that contribute to both climate change and poor air quality.

A global transition from fossil fuels to renewable energy sources will help slow the changing climate while also reducing air pollution and reducing pollution-related deaths, report lead author Diarmid Campbell-Lendrum, WHO climate change team leader, said, speaking at an organization event at COP24.

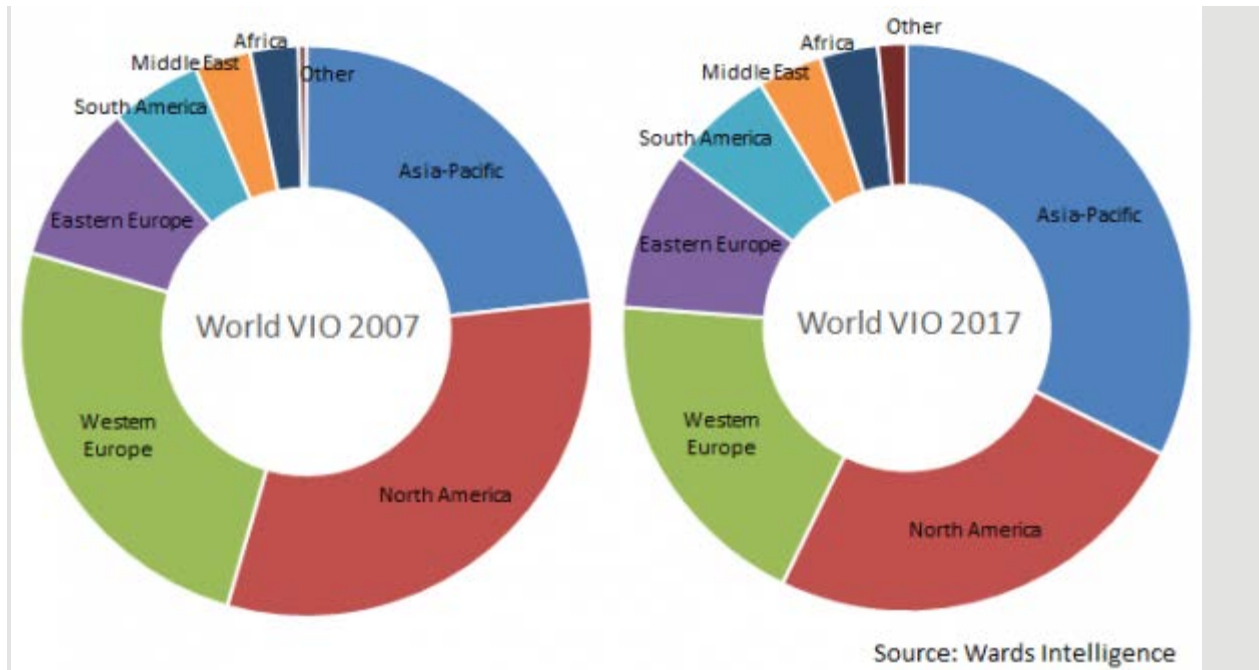
Local governments have a lot of power to cut air pollution through promotion of energy efficiency, public transportation, food waste reductions, efficient building design, and other measures, according to the health organization.

"Many of the most important actions that could be taken are now at the city level and with other kinds of sub-national governments," Campbell-Lendrum said, adding that it's crucial to public health to "mobilize the power of the city mayor."

As ways to improve both public health and slow climate change simultaneously, the WHO report recommends that countries include short-lived climate pollution cuts in their commitments to the

Paris climate agreement and that they encourage public health officials to become advocates for climate action.

71. World Vehicle Population Up 4.1% in 2017



There were an estimated 1.37 billion vehicles on the road worldwide in 2017, a 4.1% increase from 2016's 1.32 billion. Much of the growth came from developing regions where a rising middle class has expanded the market. While the accelerated growth of China's new-vehicle sales tempered in 2017, rising demand for used vehicles there helped keep the vehicles in operation (VIO) growth above 11% at 215.6 million. Though still at a high 6.5 persons-per-vehicle ratio across the ...

72. Last Year 4th Warmest, CO2 'Still Rising' Says EU Data

The last four years have been the warmest on record, globally, while CO2 levels continue to rise, according to new data from the EU's Copernicus Climate Change Service. The latest results from the Earth observation program show the global average surface air temperature in 2018 was 14.7°C, 0.2°C lower than the warmest year on record, 2016.

Copernicus said last year was the fourth warmest, not far short of 2015. The average temperature of the last five years was 1.1°C higher than the pre-industrial average.

Europe, which suffered a summer of heatwaves and wildfires, saw annual temperatures less than 0.1°C below the two warmest years on record, 2014 and 2015.

"Dramatic climatic events like the warm and dry summer in large parts of Europe or the increasing temperature around the Arctic regions are alarming signs to all of us. Only by combining our efforts, can we make a difference and preserve our planet for future generations," said head of the Copernicus Climate Change Service Jean-Noël Thépaud.

Copernicus found from satellite measurements of global atmospheric concentrations that CO₂ continued to rise in 2018, up 2.5 +/- 0.8 ppm/year. The increase was greater than in 2017 which was 2.1 +/- 0.5 ppm/year.

The data showed the planet was “in crisis”, said Wendel Trio, director of NGO Climate Action Network Europe. “Decision-makers need to make every effort to limit temperature rise to 1.5°C,” Trio said.

The EU should agree to achieve net zero emissions by 2040, added Trio, increase its 2030 climate pledge from the current 40% reduction, before the UN secretary general’s climate summit in September even beyond the 55% favored by some member states.

Friends of the Earth Europe climate justice campaigner Clémence Hutin said the new data was the “latest in a long line of alarming climate warnings, confirming what many people felt in 2018, that a climate breakdown is underway and already impacting us”.

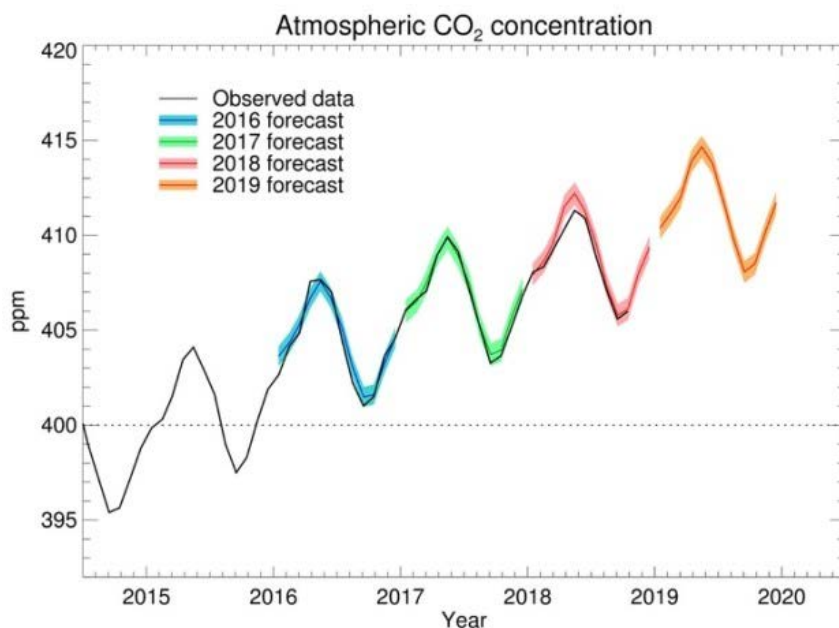
The EU must now “turn over a new leaf”, she added, “abandon its half-hearted approach to climate change, shift away from all fossil fuels, and initiate an ambitious and socially fair energy transition.”

73. Global Carbon Emissions Is Seen Reaching Another Record in 2019

The amount of climate-damaging carbon dioxide in the atmosphere is likely to reach another record in 2019, driven by an increase in fossil fuel use and a decline in the area of the planet covered by forests, the British Met Office said.

The U.K.’s official weather forecaster said the gain this year is likely to be one of the largest since it began measuring emissions 62 years ago.

The prediction is the latest evidence that a lull in the upward path of emissions has finished and that concentrations of greenhouse gases in the atmosphere are now at levels comparable to those before the last ice age, when ocean levels were significantly higher.



The findings will focus more attention on deforestation, especially in Brazil, where scientists were hoping that protecting the Amazon rainforest would help absorb more of the most damaging emissions.

“Each year’s CO₂ is higher than the last, and this will keep happening until humans stop adding CO₂ to the atmosphere,” said Richard Betts, a professor at the Met Office Hadley Centre

“This has been a particularly bad year for carbon emissions from tropical forests. Deforestation in the Brazilian Amazon increased to around 8,000 square kilometers in 2018, which is equivalent to losing a football pitch of forest every 30 seconds,” said Jos Barlow, professor of conservation science at Lancaster University.

“With this uptick in the rate of CO₂ increase this year, we are continuing to head towards CO₂ concentrations not seen in the geological record since the warmest Pliocene, 3 million years ago, and accelerating rapidly on to even hotter time periods,” said Tom Chalk, Research Fellow in Ocean and Earth Science at the University of Southampton.

Rise in atmospheric carbon dioxide is also down to the Earth’s weather pattern likely moving towards an El Nino event this year. That will cause drier and warmer weather in the tropics leading to a weakening in the amount of carbon dioxide that forests are capable of sucking up.

74. Race for Next-Generation Battery Supremacy Has Early Leader

To deliver an electric vehicle that’s cheaper, safer, and capable of traveling 500 miles on a single charge, the auto industry needs a breakthrough in battery technology. Easier said than done.

Scientists in Japan, China, and the U.S. are among those struggling to crack the code of how to significantly boost the amount of energy a battery cell can store and bring an EV’s driving range into line with a full tank of gas. That quest has zeroed in on solid-state technology, an overhaul of a battery’s internal architecture to use solid materials instead of flammable liquids to enable charging and discharging. The technology promises major improvements on existing lithium-ion packs, which automakers say are hitting the limits of their storage capabilities and may never hold enough power for long-distance models.

If it can be mastered, solid-state technology could help speed the demise of the internal combustion-engine car and potentially slash EV charging times to about 10 minutes from as much as several hours. The supercharger network built by Tesla Inc., now offering some of the fastest charge times, needs approximately 30 minutes to bring a depleted car to 80 percent.

“We don’t see another way to get there without solid-state technology,” said Ted Miller, Detroit-based senior manager of energy storage strategy and research at Ford Motor Co., which has studied various technologies aimed at delivering a more powerful EV battery. “What I can’t predict right now is who is going to commercialize it.”

Currently, the best prototype with solid-state batteries is only powerful enough to propel a one-person vehicle across a Toyota Motor Corp. parking lot near Japan’s Mount Fuji. Car companies such as Daimler AG and Fisker Inc. are working on the task, as are a Chinese lithium giant, the French oil company Total SA, and spinoffs from the Massachusetts Institute of Technology and Stanford University. Fisker may conduct vehicle tests as early as this year, while Toyota and Daimler timelines extend into the 2020s.

The stakes are enormous. Adoption of electric vehicles is already expected to fuel an exponential increase in lithium-ion batteries, the reigning replacement for the internal combustion engine. The latest report from Bloomberg NEF found that electric buses and passenger cars accounted for 44 gigawatt hours of lithium-ion battery demand in 2017—and by 2030 that demand is forecast to surge to over 1,500 gigawatt hours per year. Anyone with a viable solid-state battery that can outperform lithium-ion technology could gain the upper hand in a market for all EV batteries that

will be worth about \$84 billion by 2025, compared with about \$23 billion now, according to UBS Group AG.

Lithium-ion technology, the standard for decades in mobile phones and personal electronics before moving into EVs and utility-scale energy storage, uses a liquid electrolyte to shuttle ions between the anode and cathode to charge or discharge a battery. A solid-state battery, as the name suggests, replaces this liquid with a solid material such as ceramic, glass, or a polymer.

That should reduce the risks of batteries bursting into flames and allow for thinner cells and smaller packs that fit under a car seat. Researchers also want to pair the solid electrolyte with a lithium metal anode to improve energy density and enable EVs to travel longer distances without stopping. That could help stoke sales by erasing consumer worries about running out of juice midtrip.

To achieve all that, there's a list of puzzles to solve. Prototypes currently have battery life that's too short for a vehicle and suffer from poor conductivity, uncompetitive costs, and a sometimes violent swelling and shrinking of materials when charged or discharged.

China's Qingdao New Energy Research Institute will experiment with cars within two years and considers a commercial product possible by 2025. Contemporary Amperex Technology Ltd., China's biggest cell-producer, includes solid-state in its advanced-battery research. South Korea's Samsung SDI Co., SK Innovation Co., and Hyundai Motor Co. said they're also studying the technology, as is Dyson Ltd., the U.K.-based home-appliance maker now targeting EVs.

Volkswagen AG plans to begin trial production with partner QuantumScape Corp. as soon as 2022.

Tesla, which says it talks frequently to developers and reviews battery prototypes, doesn't yet see a technology that's better than its existing lithium-ion packs. Its Model S can travel as far as 335 miles (539 kilometers) on a single charge. "We've looked as hard as we possibly can," Chief Technology Officer JB Straubel told an annual meeting in June. "We are all ears, we'd love to find it, but we haven't found it yet."

Tesla supplier Panasonic said it continues researching solid-state technology, though there are "many hurdles left before commercialization is possible."

The biggest hope for a breakthrough rests on Toyota, according to rivals, academics, and patent data. Asia's largest automaker has at least 233 patents or applications concerning the technology—almost triple the number of its closest competitor. The company is investing 1.5 trillion yen (\$13.9 billion) in its battery business and plans to commercialize solid-state technology by the early 2020s, according to its annual report released in October.

During the past decade, Toyota has deployed as many as 200 employees at a time to pursue the technology, primarily at its Higashi-Fuji research center close to Mount Fuji. The company has progressed in using solid-state batteries to power a digital clock, a two-wheel scooter and a conveyor belt before testing the technology in an adapted version of the COMS, its single-seat, low-speed car.

With many existing EV battery makers focused on lifting volumes and lowering costs, Toyota's key challengers could be a cluster of U.S. startups. In a reflection of this possibility, VW last year

paid \$100 million to increase its stake in QuantumScape, founded by former Stanford researchers and based in San Jose, California.