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CAR LINES

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EUROPE

1. European Commission Attempts to Defuse Vehicle Emissions Row

On January 19th, the European Commission said it would propose new rules on providing information about vehicle air pollutant emissions to car-buyers in an attempt to defuse opposition to a draft European Union regulation that would relax standards on emissions of nitrogen oxides (NOx) from passenger cars.

Commission spokeswoman Lucia Caudet told reporters on January 19th that the commission would propose this year to require the inclusion of the vehicle “conformity factor,” meaning the degree to which the vehicle exceeds legally mandated nitrogen oxide levels in tests, in documentation given to buyers of new cars. “The emission performance of a vehicle will therefore be fully transparent to the consumer,” Caudet said. She was unable to provide information on the exact timing of the proposal.

The nitrogen oxides limit for new cars sold in the EU has been 80 milligrams per kilometer since Sept. 1, 2015, but in October 2015, an EU regulatory committee voted to allow a conformity factor of 2.1, meaning the legal nitrogen oxides limit could be exceeded by 110 percent, resulting in emissions of up to 168 mg/km being permissible.

The 2.1 conformity factor would last from September 2017, when the real-driving emissions tests will be introduced, through 2020. Thereafter, the conformity factor would fall to 1.5, or a 50 percent permitted overshoot.

The European Parliament's environment committee voted last December to reject the proposed conformity factors on the basis that they allowed automakers too much leeway to exceed emission limits. To take effect, the veto must be ratified by the full European Parliament, which is scheduled to vote on the draft regulation during a Feb. 1–4 plenary session.

A European Parliament debate on January 18th showed lawmakers evenly split on the issue. Green, liberal and center-left lawmakers supported the veto, while center-right lawmakers said they would back the commission's draft regulation. The vote, on an objection to a plan to allow automakers to exceed nitrogen oxides (NOx) emissions limits by up to 110 percent, was scheduled to take place during a plenary session January 18–21, but will now be held in February.

It had looked likely that the Parliament would overturn the draft decision of the European Commission. The delay was reportedly requested by the largest political group in the Parliament -- German Chancellor Angela Merkel's European People's Party.

2. Parliament Decides Not To Veto Car Emissions Test Update

A move to veto a plan to temporarily raise NOx emission limits for diesel cars was rejected by MEPs on February 3rd, after the EU Commission promised a review clause and tabled a long-term legislative proposal to revamp the EU car approval regime. This followed pressure from Parliament in the wake of the Volkswagen scandal.

“Intense negotiations took place with the European Commission and member states after the Environment Committee backed the objection, and the European Commission delivered” said Environment Committee chair Giovanni La Via. “We now have clear commitments from the

European Commission for a review clause with a precise timeframe, in order to bring down the maximum emission values to the levels which were agreed upon by co-legislators. A proposal for a long-term reform of the EU approval regime for cars is also on the table, as requested by Parliament”, he added. (See story below)

“I therefore welcome the responsible decision from the plenary, which will allow us to go ahead with the RDE procedure in order to bring down NOx emissions from cars which are, at the moment, 400 to 500% above the official limits. We have avoided uncertainties, because industry now has strict but sustainable deadlines to meet. In Europe, we will have better air quality for our citizens without losing jobs”, he concluded.

According to the European Commission, the transitional relaxation of limits is justified by the need to take account of technical uncertainties to do with the use of the new Portable Emission Measurement Systems (PEMS) device, as well as “technical limits to improving the real world emission performance of currently produced diesel cars in the short-term”.

The draft motion for a resolution from the Environment Committee was rejected by 323 votes to 317, with 61 abstentions.

Today’s vote clears the way for the European Commission to go ahead with the second RDE package. Two more are to be tabled in order to complete the process. One (third) includes cold-start provisions, and PN Conformity Factors plus associated testing procedure and the other (fourth) is market surveillance (and perhaps CO2 monitoring).

The proposed requirements are to be introduced in two steps:

- as a first step, car manufacturers would have to bring down the discrepancy to a “conformity factor” of a maximum of 2.1 (110%) for new models by September 2017 (and for new vehicles by September 2019), and
- as a second step, this discrepancy would be brought down to a factor of 1.5 (50%), taking account of technical margins of error, by January 2020 for all new models (and by January 2021 for all new cars). A conformity factor for the number of particles (PN) remains to be determined.

On February 12, EU member-state ministers formally approved the package.

3. EC Proposes Car Emissions Test Overhaul

The European Commission has proposed increased EU oversight of car emissions testing in response to the Volkswagen test rigging scandal. The overhaul would also see the ‘type approval’ system - a network of national authorities that test emissions for compliance purposes - made more financially independent of the car industry.

Market surveillance would also increase, which would bring the EU system closer to that of the US, where Volkswagen’s test rigging was discovered.

A review of the type approval system was already underway before the Volkswagen affair broke in September. But EU industry Commissioner Elżbieta Bieńkowska said Volkswagen’s cheating and the lack of EU mechanisms to remedy it had highlighted the “urgent need for change” in regulation.

Until now the approval system has been governed by a directive but the Commission wants the new rules to be brought in as a regulation, which would mean member states would have much less flexibility in how they implement them.

Jyrki Katainen, Vice-President for Jobs, Growth, Investment and Competitiveness, said: "In a Single Market where goods circulate freely, everyone must play by the rules. The Volkswagen revelations have highlighted that the system which allows cars to be placed on the market needs further improvement. To regain customers' trust in this important industry, we need to tighten the rules but also ensure they are effectively observed. It is essential to restore a level playing field and fair competition in the market."

Commissioner Elżbieta Bieńkowska, responsible for Internal Market, Industry, Entrepreneurship and SMEs, said: "The Single Market requires rigorous enforcement across sectors, including the car industry. With our proposals today we will raise the quality and independence of vehicle testing and improve the oversight of cars already in circulation. This complements our efforts to introduce the most robust emissions testing procedures in the world, which we will keep refining and reviewing to ensure the strictest emissions limits are really met."

The current type approval system is based on mutual trust: once a car is certified in one Member State, it can circulate freely throughout the EU. While the EU sets the legal framework, national authorities are fully responsible for checking car manufacturers' compliance. The draft Regulation on the approval and market surveillance of motor vehicles maintains the principle of mutual recognition, which is at the core of the EU Single Market, but seeks to correct the flaws in the system.

The proposal for a Regulation will help to achieve three objectives:

- Reinforce the independence and quality of testing that allows a car to be placed on the market: The majority of Member States designate technical services, which are paid directly by car manufacturers, for the testing and inspection of the vehicle's compliance with EU type approval requirements. The Commission proposes to modify the remuneration system to avoid financial links between technical services and manufacturers, which could lead to conflicts of interest and compromise the independence of testing. The proposal also foresees more stringent performance criteria for these technical services, which should be regularly and independently audited to obtain and maintain their designation. National type approval authorities will be subject to peer reviews to ensure that the relevant rules are implemented and enforced rigorously across the EU.
- Introduce an effective market surveillance system to control the conformity of cars already in circulation: While the current rules deal mainly with ex ante controls, in the future Member States and the Commission will carry out spot-checks on vehicles already on the market. This will make it possible to detect non-compliance at an early stage, and ensure that immediate and robust remedial action is taken against vehicles that are found to be non-compliant and/or to present a serious safety risk or harm to the environment. All Member States should be able to take safeguard measures against non-compliant vehicles on their territory without waiting for the authority that issued the type approval to take action. Member States will have to review regularly the functioning of their market surveillance activities and make the results publicly available.
- Reinforce the type approval system with greater European oversight: The Commission will have the power to suspend, restrict or withdraw the designation of technical services that are underperforming and too lax in applying the rules. In the future the Commission will

be able to carry out ex-post verification testing (through its Joint Research Centre) and, if needed, initiate recalls. By allowing the Commission to impose financial penalties, the proposal will deter manufacturers and technical services from allowing non-compliant vehicles onto the market. The Commission will also chair an Enforcement Forum which will develop common compliance verification strategies with Member States and organize joint audits of technical services and peer reviews of type-approval authorities.

The Commission's proposal maintains the current ban on defeat devices, which national authorities have a standing obligation to police and enforce, but goes a step further. Under the draft Regulation, the manufacturer will have to provide access to the car's software protocols. This measure complements the Real Driving Emissions package, which the Commission argues will make it very difficult to circumvent emission requirements and includes an obligation for manufacturers to disclose their emissions reduction strategy, as is the case in the US.

The draft Regulation will now be sent to the European Parliament and Council for adoption. Once adopted, it will be directly applicable. It will repeal and replace Directive 2007/46/EC (the 'Framework Directive').

Ms. Bieńkowska said no new EU agency is needed for car emissions regulation, as some NGOs and MEPs have called for. No additional EU resources are required to implement the proposed regulation, she added.

Green transport group T&E welcomed some of the measures proposed by the Commission but lamented the lack of specific sanctions for compromised national testing authorities or specific measures to stop car makers from "shopping around" different national testing authorities.

T&E also called on the Commission to propose a concrete target for the number of cars on the road that have to be rechecked, such as one in three new models.

The European Parliament's environment committee chair Giovanni La Via (EPP) and the Green Group both urged member states to retain the level of ambition in the Commission's proposal. Member states weakened the Commission's proposal for technical emissions testing rules last year.

4. European Parliament Sets Up Diesel Pollution Inquiry Committee

On January 21st, the European Parliament approved a panel of 45 lawmakers to investigate issues around car exhaust pollutants in the wake of the exposure of cheating on emissions tests by German manufacturer Volkswagen. The European Parliament committee of inquiry will examine alleged European Union institutional failures to properly regulate test procedures for exhaust pollutants and to effectively sanction breaches by manufacturers of pollutant emission limits.

In particular, the committee of inquiry will evaluate whether the European Commission and EU member states were too slow to upgrade emissions testing procedures, and whether they did enough to enforce a provision in a 2007 EU law (Regulation (EC) No 715/2007) that bans "defeat devices" from cars.

The European Parliament said in a statement that the committee would conclude its inquiry with a final report at the beginning of 2017. An interim report will be published after six months.

The Committee of Inquiry shall:

- investigate the alleged failure of the Commission to comply with the obligation imposed by Article 14(3) of Regulation (EC) No 715/2007 to keep under review the test cycles used to measure emissions and to adapt them if they are no longer adequate or no longer reflect real world emissions so as to adequately reflect the emissions generated by real driving on the road, despite information related to serious and persistent exceedances of the emissions limit values for vehicles in normal use, in contravention of the obligations set out in Article 5(1) of Regulation (EC) No 715/2007, including the Commission's Joint Research Centre's reports of 2011 and 2013 and research by the International Council on Clean Transportation (ICCT) made available in May 2014;
- investigate the alleged failure of the Commission and the Member States' authorities to take proper and effective action to oversee the enforcement and to enforce the explicit ban on defeat devices, as provided for in Article 5(2) of Regulation (EC) No 715/2007;
- investigate the alleged failure of the Commission to introduce tests reflecting the real-world driving conditions in a timely manner and to adopt measures addressing the use of defeat mechanisms, as provided for in Article 5(3) of Regulation (EC) No 715/2007;
- investigate the alleged failure of Member States to lay down provisions on effective, proportionate and dissuasive penalties applicable to manufacturers for infringements of the provisions of Regulation (EC) No 715/2007, including the use of defeat devices, the refusal to provide access to information, and the falsification of test results for type-approval or in-service conformity, as required by Article 13(1) and 13(2) of that Regulation;
- investigate the alleged failure of the Member States to take all measures necessary to ensure that the provision on penalties applicable for infringements of Regulation (EC) No 715/2007 are implemented as required by Article 13(1) of this Regulation;
- collect and analyze information to ascertain whether the Commission and the Member States had evidence of the use of defeat mechanisms before the Notice of Violation issued by the US Environmental Protection Agency on 18 September 2015;
- collect and analyze information on the implementation by the Member States of the provisions of Directive 2007/46/EC, in particular as regards Art 12(1) and 30(1)(3)(4);
- collect and analyze information to ascertain whether the Commission and Member States had evidence of defeat devices being used for CO₂ emissions tests;
- make any recommendations that it deems necessary in this matter;

5. VW's Scandals Continuing Fallout in Europe

Volkswagen CEO Calls for Revised Emissions Tests

Volkswagen AG Chief Executive Officer Matthias Mueller called for emissions tests in Europe to be reworked to close the gap between laboratory and real-world results, an issue brought to public attention by the German car manufacturer's cheating scandal.

A recall of 8.5 million affected cars in Europe will begin this week, Mueller said January 25th at a company reception in Brussels. "The industrywide discrepancies between official test results and actual usage is no longer tolerable," Mueller said, according to a statement from Volkswagen. "We, the industry, need to take a new path."

The CEO has been meeting with politicians and regulators to win back trust as Volkswagen seeks to emerge from a crisis that has wiped more than 17 billion euros (\$18.4 billion) off its market value. While European cars will get low-cost repairs, Volkswagen has yet to agree on a fix with U.S. regulators.

The company also faces fines and hundreds of lawsuits and has yet to reach an accord with workers on cost-cutting measures.

Mueller also vowed to make Volkswagen more environmentally friendly. The effort will include 20 additional plug-in hybrids and pure electric cars by 2020. To support this effort, he called on politicians to support the development of a network of fast-charging stations.

Volkswagen Probe Finds Manipulation Was Open Secret in Department: Newspaper

Volkswagen's development of software to cheat diesel-emissions tests was an open secret in its engine development department, Germany's Sueddeutsche Zeitung newspaper said recently, citing results from VW's internal investigation.

Many managers and staff dealing with emissions problems in the department knew of or were involved in developing the "defeat devices", said the newspaper. A culture of collective secrecy prevailed within the department, where the installation of the defeat software was openly discussed as long ago as 2006, Sueddeutsche said. But it said there were exceptions: a whistleblower, who was himself involved in the deception and has been giving evidence to investigators hired by Volkswagen, alerted a senior manager outside the department in 2011.

This manager, however, did not react, the newspaper said.

Staff members in engine development felt pressure from the management board to find a cost effective solution to develop clean diesel engines for the U.S. market. Rather than telling Volkswagen's management board the rules could not be adhered to, staff members in engine development decided to push ahead with manipulation, Sueddeutsche reported.

"Within the company there was a culture of 'we can do everything', so to say something cannot be done, was not acceptable," Sueddeutsche Zeitung said, quoting the VW internal report which included testimony from a staff member who took part in the fraud.

"Instead of coming clean to the management board that it cannot be done, it was decided to commit fraud," Sueddeutsche reported. Staff in engine development took comfort from the fact that regulators would not be able to detect the fraud using conventional examination techniques, the paper further said.

Engine management software delivered by Bosch was then manipulated in Wolfsburg Sueddeutsche Zeitung said. Manipulation started in November 2006, Sueddeutsche Zeitung said.

Volkswagen has said that to the best of its knowledge only a small circle of people knew about the manipulation. It has said it is not aware of any involvement by top management or supervisory board members in the affair.

European Bank Suspends Loans to VW Pending Outcome of Probe

The European Investment Bank has suspended loans to Volkswagen AG while the German automaker remains under investigation for cheating on emissions testing, EIB President Werner Hoyer told reporters in Brussels on January 14.

The EIB is examining a 400 million-euro (\$436 million) facility it awarded to VW in 2009 that was repaid in 2014, and which could be connected to the manipulations, Hoyer said at a press conference. No other EIB funds have ties to the scandal, he said, citing internal assessments by the bank.

"We were astonished, disappointed, and we are now concerned about the allegations, including indications by senior company executives of improper and possibly fraudulent behavior," Hoyer said. "To be on the safe side, we have decided to put on hold any new lending to Volkswagen" and will reassess "at the latest within one year" after reviewing findings from its own investigations and official inquiries.

The Luxembourg-based EIB is the European Union's bank, providing financing for investment projects that advance policy objectives spanning research and development, environmental initiatives, infrastructure and small businesses. As the world's largest multinational institutional borrower on sovereign debt markets, it has resisted calls to take on more risk to spur growth in the aftermath of the euro-area crisis, instead working with the European Commission and national governments on subsidized lending efforts.

"This is a nonprofit organization but it is definitely not a for-loss bank," Hoyer said.

Sweden to Open Fraud Probe into Volkswagen Emissions Scandal

A Swedish prosecutor said he had opened a preliminary fraud investigation into Volkswagen over the German carmaker's emissions test cheating scandal. Sweden's National Unit Against Corruption said the preliminary investigation was regarding serious fraud and the keeping of false records.

"The investigation will also address the conditions for the imposition of a corporate fine," it said in a press release.

A spokesman for Volkswagen in Sweden welcomed the investigation and denied the Swedish branch of the company was guilty of the accusations.

UK Government to Spend £650k Re-Testing Affected Vehicles

The government is to undertake a vehicle re-testing program in the wake of the Volkswagen emissions scandal. Testing is expected to cost the taxpayer upwards of £650,000, according to Parliamentary Under Secretary of State for Transport, Andrew Jones.

Cars that represent the British car market will be tested, so the sample is likely to include the Nissan Qashqai, Volkswagen Golf and Ford Fiesta. Both petrol and diesel models will be examined.

The testing procedure will include a real-world element, to increase trust between consumers and the car industry. The government is also working together with the German government to cover more cars, with the possibility of collaborating with more countries to extend this.

In addition to NOx and CO2 emissions, the tests will determine whether 'defeat devices', such as those which caused the emissions scandal, have been used.

A government spokesperson said: "The Volkswagen story has shown how current emissions testing has its limitations. The UK has pushed for change in emissions testing, to bring 'Real Driving Emissions Testing' for real-world emissions figures."

Although the money comes from taxpayers, none of the cost will be recovered from the manufacturers, in order to maintain the scheme's independence. The estimated £650,000 cost of the scheme has been allocated from the Department for Transport's annual budget, rather than using fresh money from the Treasury.

The results of the testing will be published once the program is complete, with Transport Secretary Patrick McLoughlin promising a progress update by the end of 2016. A more real-world oriented emissions testing system will be introduced in 2017 in Europe, in response to the emissions scandal.

EU May Follow U.S. Lead to Nab Emissions Cheaters

The European Union is considering adopting methods used by the U.S. EPA and secretly testing cars to avoid a repeat of the Volkswagen diesel-emissions cheating scandal. Members of the European Parliament's environment, public-health and food-safety committee learned at a February 23 hearing that with test procedures kept secret, automakers cannot design and fit cheating devices to subvert controls.

Alois Krasenbrink, head of the sustainable-transport unit at the Joint Research Center, the in-house science and technology arm of the EU's executive branch of the European Commission, confirms the EU wants to stage EPA-style secret checks. The JRC, which has a pivotal role in designing new EU type-approval systems, would apply "a kind of secret test," Krasenbrink says, adding, "We're not telling the kind of car we will be testing."

The hearing focused on the new real-driving-emissions (RDE) test, which the EU has started approving, to measure tailpipe emissions on roads using portable measurement systems rather than laboratory assessments. The test is being phased in over four stages, initially for monitoring purposes. The EU then will set application dates and limits, including a controversial tolerance its conformity factor allows on the 80 mg/km nitrogen-oxides emissions limits; a European Parliament bid to block this tolerance limit failed February 3.

The other half of the package will be implemented later this year, with the third step introducing cold-start procedures and extending tests to hybrids; the fourth in service-conformity testing.

Some EP lawmakers, notably Dutch Green Party member Bas Eickhout, contends the RDE test, while an improvement, still doesn't truly reflect real-world conditions. Citing various exemptions,

he says, “RDE still reads like a very bad novel.” Eickhout notes cars would not be tested for cold starts under 50° F (10° C) for the first 4,260 ft. (1,300 m) or under 19.4° F (-7° C) and says, “so we should stop talking about real emissions.”

But secretary general Erik Jonnaert of the ACEA, the European automakers’ group, told the hearing that while real emissions and test results were getting closer, there always would be differences. Citing factors such as driver behavior, Jonnaert said, “It’s never going to be 100% what happens in the real world.”

Both regulators and the auto industry were criticized at the hearing. Jürgen Resch of Deutsche Umwelthilfe, a German environmental group, told the committee his organization had tested the Opel Zafira, Renault Espace, Mercedes C-Class and models from BMW, Nissan, Fiat Chrysler and General Motors over the past few months and found all tested cars “exceed NOx values up to twenty-fivefold.”

Noting differences between laboratory test results and emissions found in real driving conditions, Resch said: “This isn’t external conditions. This is intentional fraud which is being committed.” He also warned the RDE still was vulnerable to cheating. More effective, he said, was the EPA’s independent testing involving 15% to 20% of all new cars, U.S. labs’ software-recognition technology and the “surprise factor” of spot checks on in-service vehicles.

Germany: VW Emissions Problems Spreading

An administrative court in Wiesbaden, known for a historic hot spring and a giant U.S. military base, ordered the regional government to clean up diesel exhaust fumes by September or face a fine. The ruling last month was the first to enforce emissions limits, flinging the state administration into a quandary over how to comply and causing alarm in the automobile industry.

With Volkswagen AG’s admission that the automaker cheated on pollution controls in millions of diesel-powered cars fresh in the public mind, the court’s ruling signals frustration that regional authorities are moving too slowly to clean up the air. That is increasing pressure on Germany’s automakers, including BMW AG, Audi AG and Daimler AG, to boost alternatives to the diesel technology, which is still at the heart of their business models.

“Either we find a common solution—we have perhaps two years—or a solution will be dictated to us externally,” Volkswagen Chief Executive Officer Matthias Mueller said at a February 1 event in Hamburg, where industry executives were invited to discuss a solution to the spreading crisis.

The court’s ruling is a sign of the pressures building on government to take action following the revelations about VW’s diesel engines. The European Commission, the EU’s executive arm, last June opened infringement proceedings against Germany as 29 regions—including its biggest cities Berlin, Hamburg and Munich—have failed to adhere to limits on Nitrogen Oxides, a byproduct of burning diesel.

“None of the cities has any idea how we can fall below the limit values,” Olaf Scholz, mayor of Hamburg, said when he met with Mueller and other auto executives.

The Wiesbaden court gave Hesse, the state where the city is located, two-to-three years to curb nitrogen oxide emissions. Hesse responded that it may lack an adequate plan, saying the state has “made use of all reasonable instruments” to reach the limits. Hesse is appealing the ruling.

Diesel pollution is a widespread issue. Nitrogen oxide emissions exceeded permissible limits at 60 percent of Germany's 374 testing stations in 2015, the Federal Environment Office said in January. The fine particles that come from diesel exhaust along with nitrogen oxides could cause 10,000 deaths in Germany a year, the European Environment Agency estimates.

The issue is damaging for German automakers, which dominate sales of diesel cars both in the U.S. and Europe. Almost half of the 3 million new cars sold each year in Germany are diesels, according to the VDA industry association. In the U.S., VW, BMW, Audi and Mercedes-Benz had 92 percent of the market for new diesel cars, according the International Council on Clean Transportation.

Some 74 percent of BMW AG's sales are diesels, and for Audi the figure is 67 percent. As the European car industry switches to valid driving emissions tests for vehicles and pushes development of cleaner diesel motors, German courts could pre-empt the fixes, potentially grounding motorists in outright bans within city limits or making them pay costly tolls.

For Germany's auto industry association, "short-term driving bans and penalty payments help little and they have an impact on everyone," said Eckehart Rotter, a spokesman for the organization known as VDA. "We must improve air quality in cities in a sustainable way mainly through fleet renewal and by improving traffic flows."

Hamburg's Scholz expects a wave of litigation across Germany unless inner city nitrogen oxide levels are slashed. "Everyone including cities, businesses, the car industry, ultimately city residents, will increasingly face legal claims," Scholz said. Diesel cars, trucks and buses may be barred from inner cities "already this or next year," the Social Democrat added.

The court decision marks a "fundamental turning point in transport policy, not just in Hesse but nationwide," said Remo Klinger, a law professor representing the Environmental Action Germany, the advocacy group that brought the lawsuit against the state. "Other courts will follow—that's for sure."

Almost half of the 3 million new cars sold each year in Germany are diesels. Seventy-four percent of BMW's sales are diesels, and 67% of Audi sales.

Environmental Action Germany said on February 16 that its real-conditions test of a Fiat Chrysler SUV with a Euro 6 engine — supposedly the best for emissions — showed its nitrogen oxide levels were 11 to 22 times higher than the legal limit. This again demonstrates that it is not only VW that has cheated.

VW Sees EU Diesel Recall on Track with 4,300 Vehicles Fixed

Volkswagen AG said its European diesel-car recall is on track, with the first 4,300 of some 2.4 million affected vehicles in Germany fixed in the past three weeks.

The automaker has repaired about half the affected Amarok pickup trucks with 2.0-liter engines in its home market. It started the recall with the Amarok late last month; next up in late March is the Passat sedan and station wagon. The cars now comply with the Euro 5 emissions limit, Volkswagen said in a February 18 statement.

The German recall will serve as a blueprint for repairing engines with rigged emissions software all over Europe. During “the next few months,” fixes will be extended to vehicles with 1.2- and 1.6-liter engines, the automaker said.

Though the recall of some 8.5 million cars in Europe is progressing, talks with U.S. regulators about some 600,000 vehicles continue to drag. Volkswagen's proposals have been rejected so far, and the time frame for a solution is unclear. The German automaker is facing billions of dollars in regulatory fines and costs for lawsuits on top of expenses for fixing manipulated cars in the U.S. or buying them back from customers.

In Europe, all three affected engine variants require a software update, which VW said takes less than 30 minutes per car to complete. The 1.6-liter version also needs a hardware fix, a new part fitted to the intake duct that is supposed to change air flow so the engine's filters work better. Adding the part should result in a repair time of less than 45 minutes, according to Volkswagen.

The 2.0-liter engines account for about 5.2 million of Volkswagen's rigged European diesels, compared with 3 million 1.6-liter engines and about 300,000 of the smallest 1.2-liter motors.

Finnish Tire Manufacturer Nokian Admits to Manipulating Tests in the Past

Apparently, the cheating in the automotive industry isn't restricted to just diesel emission levels or fuel consumption, as this latest scandal involving winter-tire specialist Nokian proves now. In recent days, local media outlets ran reports on how the tire manufacturer misled the consumer by willingly using specially created tires for media tests. As a result, the company's stock exchange shares took a 9.6 percent dive, but analysts say the worst has passed.

Following the press reveals, the company's CEO, Ari Lehtoranta, has admitted to his company offering special tires to be used during tests, tires that were not otherwise available to the public in the exact same form. He's been in charge of Nokian Tires since autumn 2014 and guarantees that this practice hasn't been in place ever since he took over, insisting that the company now has a very strong policy that “specifically forbids any planning or manufacturing of tires that are targeted only for car media tests.”

The tire industry is a very competitive one, with a handful of manufacturers battling to achieve supremacy. There have been other scandals in the past involving rigged tests (performed by German organization ADAC), but it's the first time that one manufacturer has taken responsibility for its actions, even though similar allegations have been made in the past.

Analysts (and even Nokian CEO, Ari Lehtoranta) agree that it's very likely other manufacturers did the same thing in the past, arguing that the market was lacking proper regulations. With the whole Volkswagen emissions test thing still fresh in everybody's minds, the regulators are starting to show increased interest in the way the parts suppliers test their products.

This new finding involving Nokian is a far cry from the magnitude of the Volkswagen scandal, but it is, in essence, the same thing: a manufacturer knowingly using a device created specifically to cheat a test. It remains to be seen whether Nokian's wrongdoing - brought to the light by local business newspaper Kauppalehti - will have a ripple effect on the other tire manufacturers. So far, it was only the French giant Michelin who made a statement denying ever cheating on any type of test.

6. Renault Shares Fall With French Government Emissions Probe

Agents from the Economy Ministry's fraud office visited Renault's headquarters, as well as sites in Guyancourt and Lardy near Paris, during the week of January 4th. The French automaker is cooperating fully with the investigation, the company said in an e-mailed statement January 14, without providing details on what was seized. French peer PSA Peugeot Citroen said it wasn't raided and no anomalies were found in its vehicles.

As part of the backlash from the VW scandal, French authorities started a probe last September into whether VW deceived customers about the emissions levels of its diesel cars and promised to expand the investigation to cover all automakers. Separately, the country's environmental regulator began randomly testing vehicles to check differences between lab results and real-world emissions.

Four Renault models had been tested by the end of December 2015, part of the effort to screen as many as 100 cars—including 25 from Renault, the company said.

No fraudulent systems have been found on Renault cars, and shareholders and employees should “rest easy,” Environment Minister Ségolène Royal said at a news conference January 14 in Paris after Renault's stock slumped. “That's good news for Renault,” the company said in its statement, seeking to quell concerns. Still, real emissions were found to be higher than in test conditions for models from Renault and several non-French carmakers, Royal said.

Authorities have visited several automakers, and there is no specific stigma attached to Renault, Economy Minister Emmanuel Macron said at an event in Berlin. The Renault case is in no way comparable to that of VW, said Macron, who declined to name the other automakers that were visited. The French state is the biggest shareholder in Renault, with a 19.7 percent stake.

Renault dropped 10 percent to close at 77.75 euros in Paris after falling as much as 23 percent. Peugeot fell 5.1 percent. Other European automakers declined as well. Fiat Chrysler Automobiles NV tumbled 7.9 percent in Milan and Daimler AG slipped 3.6 percent in Frankfurt.

“If some other problems than Volkswagen occur, it's not good news for the whole automotive industry. But as far as PSA is concerned, we have no problem. We want that to be crystal clear,” Gilles Le Borgne, Peugeot's executive vice president for research and development, said in a Bloomberg TV interview.

The fraud office began an investigation in parallel with the French government's random environmental testing, the company said. The facility in Lardy is Renault's main site in France for engine development, said Florent Grimaldi, an official with the CGT union there. The raids were earlier reported by Agence France-Presse. “For several months, work has been ongoing on emission tests at the Lardy site and the departments that were raided were those of certification and adjustment of engine control systems,” Grimaldi said. “We have been asking for more resources for months at Lardy to work on pollution control.”

According to a statement by Ségolène Royal, the country's Environment Minister, Renault's filtering system on certain vehicles failed when temperatures dipped below 17 degrees Celsius or 63 degrees Fahrenheit. Testing for engine emissions in Europe is conducted at temperatures between 68 °F and 86 °F (20 °C and 30 °C).

Renault was however quick to deny any wrongdoing: "Renault Group vehicles are not equipped with fraudulent software or systems created to bypass the emission control system", and the recall was a "known issue that was corrected on production vehicles from 4th September 2015".

Instead, the carmaker says diesel-powered Capturs may be suffering from a fault at the manufacturing stage, and Renault will offer a software upgrade to around 700,000 customers should they choose to participate in the recall. Renault's mechanics will have to modify a filter that will require half a day of work per engine. The French carmaker will detail the planned adjustments in March for vehicles with the latest Euro 6 generation of diesels and begin offering voluntary engine checks to owners four months later.

The issue came to light when a commission ran tests and found that Renault vehicle emissions of both nitrogen dioxide and carbon dioxide were too high.

7. Renault's Chief Sees Need for Clearer Rules amid Emissions Probe

Renault Chief Executive Officer Carlos Ghosn said regulators have to determine new terms for checking vehicle emissions after probes sparked by Volkswagen AG's test cheating exposed differences between laboratory results and cars' on-street performance.

Readings from day-to-day vehicle use are always "multiples" of figures from testing, and "real driving emissions" aren't yet regulated, Ghosn said January 21st in his first remarks since a French government investigation of Renault came to light. "The question is what's acceptable" to authorities, and "we are hoping that there is going to be a position from the European Commission on that."

Renault shares have been under pressure since the search of the automaker's offices by French fraud investigators became public. Renault agreed January 18 to recall 15,800 cars to adjust pollution-filtering systems and to offer technology upgrades to about 700,000 customers, after official findings that some vehicles didn't meet environmental standards.

"We said from the beginning, there is no cheating, and second, all the norms are being respected," Ghosn said January 21 during a Bloomberg Television interview at the World Economic Forum in Davos, Switzerland.

Renault rose as much as 5.5 percent, the steepest intraday gain since Nov. 4, 2015, and was up 4.4 percent to 77.77 euros at the close of January 21 trading in Paris. That pared the stock's decline this year to 16 percent, the fifth-worst performance on the Stoxx 600 Automobiles & Parts index of European manufacturers. "The share price mainly is more about the unknown" regarding investigation results, with a recovery possible "within the next weeks, when all the data will come and confirmation of everything we're saying," Ghosn said.

The chief executive also said Renault, Europe's third-biggest automaker, plans a "much more massive" presence in Iran, with a wider range of local partners, when it returns to the country now that trade sanctions have been eased. Renault will commit to investments once an international legal framework for restoring business ties is in place, according to Ghosn. "We're waiting for the light to go from orange to green," he said.

The automaker halted business in Iran three years ago to comply with trade sanctions, resulting in a 514 million euro (\$560 million) provision that hurt earnings. French competitor PSA Peugeot

Citroen said last year that it was struggling to reach an agreement for a possible return to Iran because of resentment following its departure in 2012.

8. Cars Failing Emission Standards Says Which

The consumer watchdog Which claims the majority of cars contravened emissions regulations when it carried out realistic tests, and is calling for more rigorous assessment. All of the vehicles officially complied with recent EU emission regulations (either Euro 5 or the tougher Euro 6 depending on the age of car) but it said it found 95% of diesel cars, and 10% of petrol cars, pump out more NOx than limits allow.

The majority of petrol cars it tested also exceeded EU carbon monoxide (CO) limits, and even some hybrid cars exceeded NOx and CO limits

It added that some modern cars are so excessive in their production of NOx and CO that, in its tests, they would fail to meet any EU emission limits from this century, and 38 of the cars tested were even unable to meet the Euro 1 emissions standards from 1993.

Which said the New European Driving Cycle (NEDC) test, which is currently used to test emissions, is too lenient and exploitable, and called for more challenging and realistic testing.

In a statement, the Society of Motor Manufacturers and Traders (SMMT) commented: "All cars sold in the UK undergo an official test under EU law to ensure they meet the latest emission standards. The testing method employed by Which is very different from the official EU test, so it is no surprise it delivers different results.

"The existing test is a laboratory test and was never designed to reflect the infinite variations of 'real world' driving. New technology now means the test can be changed to make it more representative of what consumers experience. However, given the huge differences in temperature, road and vehicle conditions as well as driving styles, no test can ever replicate exactly what happens on the road all the time.

"Industry wants this new test in place as soon as possible but it must be robust, credible and repeatable – the benchmark of any objective assessment."

9. Policy Needed To Promote Electric Bikes - Research

Uptake of electrically driven bikes should be supported by dedicated policies such as tax benefits and stricter urban noise regulation, EU scientists have said. Both electric bicycles and electric motorbikes have environmental benefits distinct from electric cars, for which the market is more advanced, a study co-authored by the Joint Research Centre showed last week. The Alternative Fuels Directive, which promotes the uptake of electric cars, makes no mention of bikes.

On-road benefits include reduced in CO2 emissions and noise pollution. Production benefits include less use of lead for batteries relative to normal motorbikes, as European electric motorbike batteries use nickel–metal-hydride and lithium-ion.

Thanks largely to a boom in China over the past 10 years, the battery capacity of the global electric bike fleet exceeds that of battery-electric cars by a factor of 30.

Electric bikes will only have significant environmental benefits for the EU when they enter the market at large scale, however. Higher costs than conventional counterparts are a barrier to deployment, the researchers said.

In 2013, over 900,000 electric bicycles were sold in the EU, representing 5% of the European bicycle market. But electric scooters and motorcycles accounted for only around 1% of the motorcycle market.

Whereas electric bicycles offer additional ‘use-value’ relative to normal bicycles through their mobility assistance for users, the researchers identified no additional use value for electric motorcycles. Uptake of these therefore relies on external factors such as fuel price, fuel taxing and infrastructure.

The researchers recommend that European policymakers consider support for electric bicycles through tax breaks, stricter noise regulation in urban areas which would favor electric bikes, dedicated driving lanes, parking and charging infrastructure and effective anti-theft protection.

The study said the Chinese experience suggests that a mandatory phase out of conventionally-powered bikes from urban environments is an effective measure to increase the market uptake of electric alternatives.

But given regional variability in the EU, specifically around climate and differing user trends of bikes, electric bike policy should be considered on case-specific assessments.

The anticipated benefits of electric bicycles could also turn into occasional shortcomings if these substitute public transportation and normal bicycle use, the researchers noted.

10. EU May Tackle Lead Car Batteries

The EU may review the unlimited exemption allowing the use of lead in vehicle batteries, in what would be a major regulatory change for the last major use of the toxic heavy metal.

The European Commission told member state experts on 30 November that “the existing unlimited exemption for the use of lead in automotive batteries may be coming to an end as there is evidence about the forthcoming market availability of automotive batteries without lead”, according to the minutes of the meeting.

“Therefore, a review date for this entry is now being considered,” the minutes state.

Consultants for the European Commission are finalizing their analysis of three current exemptions from the ban on lead in vehicle material and components, including the open-ended exemption for batteries, under the End of Life Vehicles (ELV) Directive. These exemptions, which are being reviewed with a view to the eight amendment to the ELV Directive’s Annex II in line with technical progress, are:

- Exemption 2(c): Aluminum with a lead content up to 0.4 % by weight
- Exemption 3: Copper alloy containing up to 4 % lead by weight
- Exemption 5: Lead and lead compounds in batteries.

11. London Takes Just One Week to Breach Annual Air Pollution Limits

London has already breached annual pollution limits just one week into 2016, and only weeks after the government published its plans to clean up the UK's air. At 7am on Friday, Putney High Street in West London breached annual limits for nitrogen dioxide (NO₂), a toxic gas produced by diesel vehicles that has been linked to respiratory and heart problems.

Under EU rules, sites are only allowed to breach hourly limits of 200 micrograms of NO₂ per cubic meter of air 18 times in a year, but this morning Putney broke that limit for the 19th time. Chelsea and Kensington are expected to do the same later today. Oxford Street has almost certainly also broken the limit already, having breached the hourly level a thousand times last year, but the monitoring station has malfunctioned.

Nationally, a roadside near the South Wales town of Swffryd appears to be the only other place to have broken the hourly limit, though it is still far from having breached the annual limit. Other sites recording high readings so far this year include ones in Aberdeen, Belfast, Exeter, Glasgow and Stoke-on-Trent, and several other roads in London.

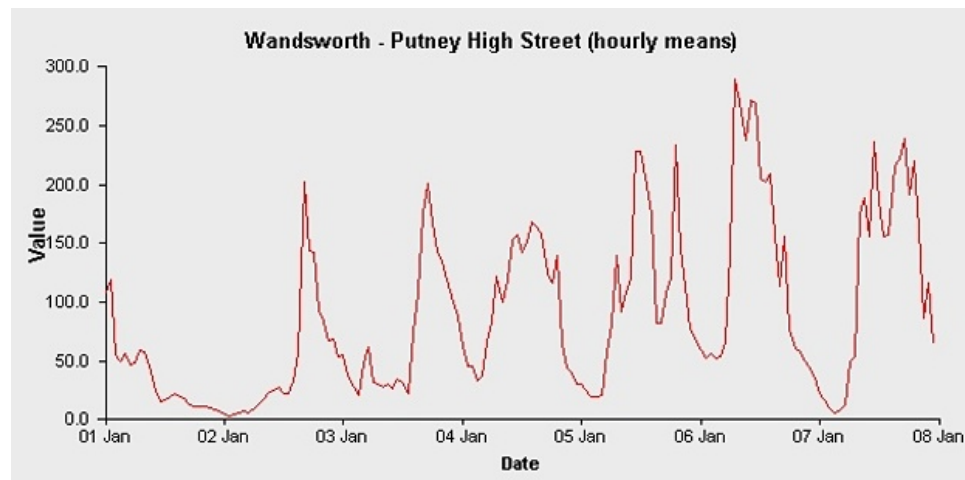
The UK has been in breach of EU NO₂ pollution limits for five years now and last spring was ordered by the Supreme Court to publish an action plan on how to tackle the major health crisis, following a challenge by environmental law group ClientEarth. The resulting government plan was published in December, but London, Birmingham, Leeds, Liverpool, Cardiff and Edinburgh and other major cities will still be in breach of NO₂ limits for at least another five years, despite the new measures. Private passenger cars are exempt from the plan.

Nitrogen dioxide exceedance: Exceedance and projected dates of compliance

Zone/Agglomeration	2013 assessment – maximum annual mean limit value exceedance	Compliance with NO₂ limit values projected with no new measures	Compliance estimate based on this plan
Greater London Urban Area	Yes	2030	2025
West Midlands Urban Area	Yes	2025	2020
Greater Manchester Urban Area	Yes	2020	2020
West Yorkshire Urban Area	Yes	2025	2020
Tyneside	Yes	2020	2020

Campaigners and politicians blamed the government for the breach.

Alan Andrews, a lawyer for ClientEarth, said: “This is exactly why we are taking the government back to court [over the plan it published in December]. Its failure to deal with illegal levels of air pollution, which causes thousands of early deaths in London every year, is a scandal.”



Air quality readings for nitrogen dioxide (red line) in London (Putney High Street) in January 2016. The hourly limit is 200 micrograms of NO₂ per cubic meter.

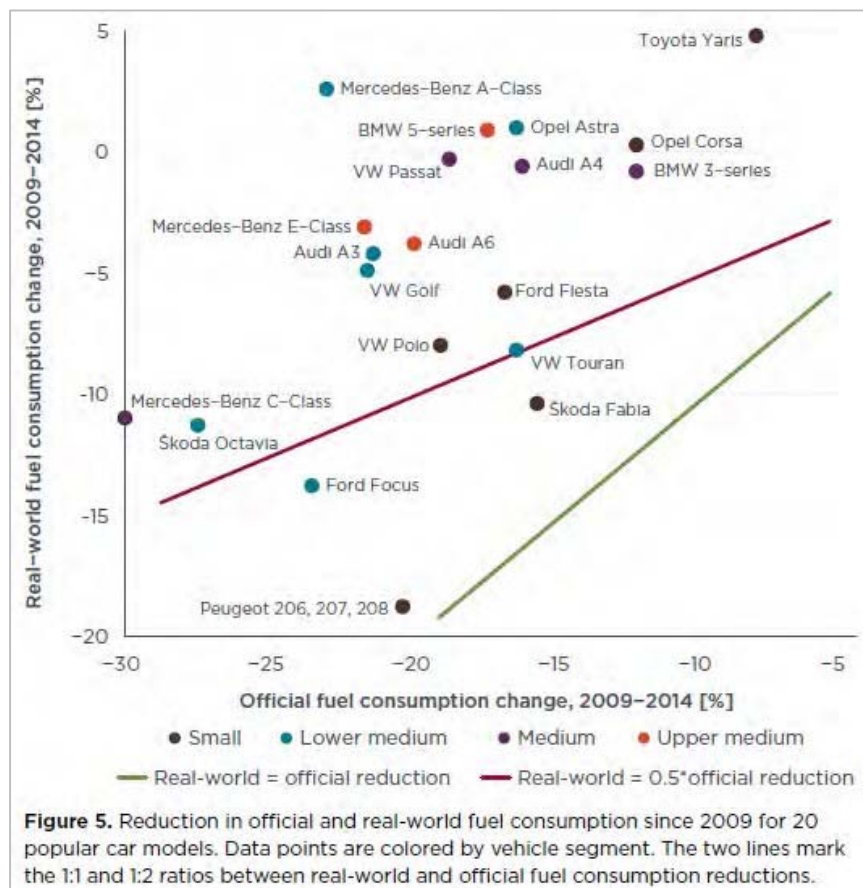
Andrews said that ClientEarth would go to the high court by 17 March and would ask for the case to be fast-tracked because people’s lives were at risk. Nearly 6,000 people die prematurely each year in London alone because of NO₂, according to one study.

12. ICCT Finds Real-World Fuel Consumption Worse Than Official Numbers

Official fuel consumption values of new passenger cars in Europe are becoming increasingly unrepresentative of real-world performance. The divergence between official and real-world fuel consumption values more than quadrupled over the last fourteen years. After EU-wide CO₂ standards were introduced in 2009, official fuel consumption values decreased by 15 percent while real-world figures only decreased by 2 percent. This divergence undermines climate change mitigation efforts and costs the average car owner €450 per year.

This study compares official fuel consumption values measured in laboratories with the real-world performance of 20 popular vehicle models. All models claim significant improvements in fuel efficiency since 2009, with reductions in official fuel consumption values ranging from 8 to 30 percent. On-road measurements, however, indicate that eight models made little to no improvement in real-world fuel efficiency. Five models achieved more than a 10 percent reduction in real-world fuel consumption since 2009. Model overhauls are frequently followed by abrupt reductions in official fuel consumption values. Real-world fuel consumption values are, however, rarely reduced to the same extent, indicating that fuel

efficiency improvements measured during laboratory testing do not fully materialize on the road.



The trend toward increasingly unrealistic fuel consumption values can be traced back to the exploitation of flexibilities in the current vehicle testing procedure. While the Worldwide Harmonized Light Vehicles Test Procedure (WLTP) will be introduced in the EU in 2017 and will help align official and real-world fuel consumption values, it will not by itself solve the problem of unrealistic fuel consumption values. Further actions are needed, including in-use conformity testing of randomly selected vehicles on the road and the establishment of an EU-wide type-approval authority.

13. Italy's Smog Sparks Calls for More Government Action

Suffering from some of the worst smog levels in decades, dozens of Italian cities—including Rome and Milan—have set restrictions on vehicle traffic in an effort to combat the air quality problems. In most of the cities affected, electric and hybrid cars, as well as public transport vehicles, are not affected by the bans.

The poor air quality has resulted largely from the long-standing problem of unchecked traffic and industrial policies and an unusually dry winter with less than the usual amount of wind, Giorgio Zampetti, science director with the environmental lobby group Legambiente, said January 6th.

Legambiente has called for a series of steps to confront the problem, including new investments in public transport, bans on diesel cars in urban areas, tighter controls on vehicle emissions, lower speed limits and more inspections of industrial plants.

Loredana Musmeci, a researcher from Italy's Istituto Superiore di Sanita (High Institute for Health), applauded the measures the cities have taken, but said they are not nearly sufficient. Musmeci said the air quality problems like those that have surfaced in Italy in recent weeks have an impact on very young and old people, and those with respiratory problems. Prolonged exposure, she said, can lead to increased levels of leukemia and other forms of cancer.

Around three dozen Italian cities banned fireworks for New Year's in order to avoid adding to the smog problem, and in late December 2015, temporary car bans were put in place in multiple cities, including Rome and Milan—Italy's two largest metropolitan areas.

14. Diesel Hydrocarbons Linked to Ozone And Particulate Matter.

Hydrocarbons from diesel make up over 50% of all hydrocarbons in the air in London, a new study¹ has found. The authors also estimate that they contribute up to half of total ozone production potential in London, and say future air quality control strategies must focus more on these pollutants.

Around three quarters of the European population now live in urban areas, and as a result are exposed to hazardous air pollution. The primary urban air pollutants are particulate matter (PM), nitrogen oxides (NOx), ozone (O₃) and volatile organic compounds. These pollutants are linked to respiratory and cardiac disease and can reduce life expectancy.

Hydrocarbons (chemicals made up of hydrogen and carbon) are precursors to two priority air pollutants: ozone and PM. Small hydrocarbons (containing between two and seven carbons) are relatively simple to observe and levels have been successfully reduced in many cities. However, those with longer carbon chains —typically released from diesel vehicles —are more difficult to measure, and therefore are not explicitly considered in air quality strategies.

British researchers recently measured these elusive pollutants in their capital city, London, a typical large European city. They conducted two, five-week studies at a background site as part of the Clean Air for London project. The researchers continuously monitored the hydrocarbons present in the atmosphere in January/February and July/August 2012.

The comprehensive chemical measurements show that, on average, diesel-related hydrocarbons make up over half of atmospheric hydrocarbons (by mass). They are also an important source of secondary pollutants, such as ozone —a major component of urban smog that damages vegetation and is a risk factor for respiratory disease.

The researchers went on to more precisely calculate how these hydrocarbons contribute to ozone formation. They assessed the effects on local ozone production by calculating the 'ozone formation potential' of each emission source. They estimate that diesel-related hydrocarbons contribute up to 50% of London's ozone production potential.

Finally, the researchers compared their measurements to emissions inventories, finding that diesel-related compounds in the atmosphere are under-reported in emission inventories. Although it is thought to represent best practice for international reporting methodologies, the UK national emissions inventory under-reported various diesel-related hydrocarbons by factors of 4 up to 70. As diesel use in the UK is within the European average, the authors say this underestimation is likely the case across the EU. These underestimations are significant, because national emissions estimates drive policy.

¹ Dunmore, R., Hopkins, J., Lidster, R., Lee, J., Evans, M., Rickard, A., Lewis, A. & Hamilton, J. (2015). Diesel-related hydrocarbons can dominate gas phase reactive carbon in megacities. *Atmospheric Chemistry and Physics Discussions*, 15(6), pp.9541-571. DOI: 10.5194/acp-15-9983-2015

There are existing policy challenges for cities when it comes to controlling the nitrogen dioxide emitted by modern diesel vehicles. This study shows there may be a similar —but as-yet unrecognized —challenge when it comes to controlling reactive carbon emissions.

There is a need to focus policy on these diesel-related hydrocarbons, as the fuel is estimated to take over petrol as the main transport fuel used globally by 2020. This is the first direct evidence of significant diesel hydrocarbons in London's ambient air, although the authors do note limitations to the study, including a lack of data on the atmospheric fate of long chain hydrocarbons, and say methodological improvements are needed to more accurately measure diesel hydrocarbons.

15. BA Blames UK Government for Scrapping Of £340m Green Fuels Project

British Airways says that it has been forced to shelve a groundbreaking £340m scheme to create 16m gallons of jet fuel from London's rubbish every year, partly due to a lack of government support. The shadow transport minister, Richard Burden, pledged to table parliamentary questions about the affair, saying that government backing for the project had been derisory.

The Green Sky project was due to open in 2017 at an ex-oil refinery in Thurrock, Essex, where it would have turned into gas 575,000 tons of household waste otherwise destined for landfill sites or incinerators. Enough green fuel would have been produced to power all BA's yearly flights from London City airport twice over, with carbon savings equivalent to taking 150,000 cars off the road.

But BA told reporters that the project had now been mothballed because of low crude oil prices, jitters among investors, and a lack of policy engagement from 10 Downing Street. "The government needs to support innovative aviation biofuels projects such as this if they are to progress," said Cathy West, a BA spokeswoman. "Aviation fuels are not eligible for incentives that road transport fuels receive, making it difficult to build a business case to invest in UK aviation fuels projects. This affects investor confidence."

"British Airways' decision to scrap their green fuels project is immensely disappointing," Burden said. "The government has questions to answer on why it is not looking to support the industry's innovative attempts to recycle waste to use as fuel."

"At a time when the government has delayed a decision on Heathrow and Gatwick partly for environmental reasons, it is ludicrous that the government is not backing the industry's attempts to deliver cleaner fuels."

BA wants jet biofuels brought under the government's Renewable Transport Fuels Obligation, a move it believes could help trigger the building of a dozen green fuel plants by 2030. Without such guarantees, airlines may feel obliged to sign alternative fuel deals at market rates that become less attractive when oil prices suddenly drop.

Aviation is the fastest-growing source of carbon dioxide emissions, currently thought to be responsible for around 5% of global warming by scientists at the UN's Intergovernmental Panel on Climate Change. New market mechanisms to green the industry will be debated at an International Civil Aviation Organization conference later this year. Use of second-generation biofuels to power jets is widely seen as one of the most promising technologies.

16. UK Electric Car Market Enjoys Record Surge in Demand

Demand for electric and plug-in hybrid vehicles is soaring, according to new figures released recently by the Society of Motor Manufacturers and Traders (SMMT). The data shows the number of new cars eligible for the government Plug-in Car Grant scheme rose from 14,532 in to 28,188 last year, an increase of 94 per cent.

Zero and low emission vehicles still make up only a fraction of an overall market, with total new vehicle registrations reaching a record 2.6 million.

However, demand for alternative fueled and low emission vehicles is outperforming the wider market across all categories. The auto market as a whole grew 6.3 per cent, but demand for pure electric vehicles rose 48 per cent to nearly 10,000 vehicles and demand for plug-in hybrids soared 133 per cent year-on-year to over 18,000 vehicles.

Since the Plug-in Car Grant scheme was launched with its promise of up to £5,000 off the cost of electric vehicles, 47,690 eligible cars have been registered.

Conventional hybrids enjoyed a similar strong performance last year with annual demand for petrol hybrids growing 18 per cent to 40,707 registrations and demand for diesel hybrids climbing 36 per cent to over 3,800.

Overall, the market for alternative fueled vehicles rose 40 per cent to 72,775 units, increasing the sector's market share from 2.1 per cent in 2014 to 2.8 per cent last year.

In contrast, demand for diesel vehicles rose just three per cent, as the fall-out from the VW scandal no doubt contributed to the technology's market share slipping to 48.5 per cent.

17. Source Indicates that Peugeot May Introduce Filters for Gasoline Cars

French carmaker PSA Peugeot Citroën will soon begin equipping some of its petrol-powered vehicles with filters to cut down on carbon particles. Sources inside the company reportedly confirmed the strategy to *WirtschaftsWoche*, the German business weekly.

Diesel engines already have particle filters but petrol engines have not been subject to the same strict emission limits in Europe, at least up until now.

One reason for PSA's decision might be the bad air hanging over Paris where the carmaker has its headquarters. When the "City of Light" was covered by thick smog in March 2014, alarmed authorities imposed driving bans for the first time – and have repeatedly done so since, including implementing a "car-free" day ahead of the UN Climate Change Conference in December.

To prevent it from becoming "The City of Haze," French environmental minister Ségolène Royal even proposed a general prohibition of diesel vehicles in Paris until 2020. The plan has been discarded but France is debating how the city's air can be improved.

Small gasoline engines in particular spew out more particles than modern diesel engines equipped with particle filters. But strict emission levels that diesels have had to meet since 2013 will only apply to gasoline-powered cars from September 2018. Until then they are not required to have particle filters.

The price impact is expected to be modest at first. In 2011, analyses ordered by the European Commission concluded that the cost of introducing particle filters would add between €40 and

€130 (\$143) to prices, depending on material and complexity of construction as well as the vehicle type. The experts also said new filters would increase gas consumption over a vehicle's lifetime, up to 24 liters for compact cars and 78 liters for vans.

If PSA now gets a head start on installing particle filters for gasoline engines, then pressure will mount on the entire automotive industry.

18. ACEA Releases Position Paper: Reducing CO2 Emissions from Heavy-duty Vehicles

According to ACEA, heavy-duty vehicles account for roughly 5% of Europe's greenhouse gas emissions while transporting 75% of all land-based freight in Europe. Driven by market forces, ACEA estimates that truck manufacturers have delivered a 60% reduction in fuel consumption since 1965.

Based on an integrated approach, ACEA believes that there is the potential to cut 20% of CO2 emissions from road transport by 2020 compared to 2014.

Fuel efficiency is one of the most important competitive factors in developing and selling heavy-duty vehicles, according to ACEA. Combined with the integrated approach, ACEA supports the development of an EU-funded standardized simulation tool to certify the fuel efficiency of complete heavy-duty vehicles and vehicle combinations. This tool, called VECTO, will enable vehicle manufacturers, to calculate the specific CO2 emissions data for each individual bus or truck configuration. VECTO will empower customers to compare customized offers and choose the most fuel-efficient vehicle combination based on their specific needs.

19. Car Makers Want Taxpayers to Pay £600bn Bill For Eco Roads

A leaked report, seen by reporters, shows that the European car industry wants taxpayers to foot a £600billion road improvement bill in a bid to reduce CO2 emissions. The proposal is part of a draft paper from the European Automotive Manufacturers' Association (ACEA), due to be released next month. It argues that car makers are doing all they can to meet the 2021 vehicle emissions target of 95g/km of CO2, but to meet later and more stringent targets in 2030, Government involvement is needed.

Resurfacing the roads of all 28 member states should be a priority, according to the ACEA. The report states: "One of the key drivers for reducing CO2 emissions is ensuring Europe's roads have low-resistance and well maintained surfaces."

The ACEA is keen to fund the project via public investment, with £600billion spread across 20 years. If all of Europe's roads were resurfaced with low-friction surfaces, there would be CO2 reductions of "up to five per cent [compared to 2015] by 2035".

The continent as a whole would pay roughly £30billion a year to achieve these figures. However, countries like the UK, which has a 13-year backlog of road repairs, would undoubtedly have to fork out more. The ACEA estimates the UK would need a one-time catch-up investment of £12billion. Green transport agencies have hit back against the ACEA's claims, calling them "out of touch with reality".

Carlos Calvo Ambel, transport and energy analyst at campaign group Transport & Environment, reportedly said: "The problem is not that our roads aren't good enough, we don't drive efficiently

or that we can't find parking fast enough – car makers simply don't want to clean up their vehicles, and instead, are shifting the responsibility on to everyone else. Fuel efficiency standards will force the next wave of cleaner vehicles.”

20. France to Focus on Energy Transition, Emissions Reductions

Riding momentum from the Paris climate summit's triumphant conclusion in late 2015, France plans to use its ambitious new energy-transition framework law to lead the way on implementing the Paris Agreement's country-tailored approach to fighting global climate change. Segolene Royal, minister of ecology, sustainable development and energy, said that France will immediately implement programs to reduce its greenhouse gas emissions, well before the Paris Agreement officially takes effect in 2020.

The 21st Conference of the Parties (COP-21) to the United Nations Framework Convention on Climate Change ended with a historic agreement by nearly 200 countries that calls for holding “the increase in the global average temperature to well below” 2 degrees Celsius (3.6 degrees Fahrenheit) above pre-industrial levels and for pursuing “efforts to limit the temperature increase” to a more ambitious 1.5 degrees Celsius (2.7 degrees Fahrenheit). The backbone of the agreement is formed by some 185-plus diverse national pledges, called Intended Nationally Determined Contributions (INDCs), in which countries pledged to cut carbon emissions, boost renewable energy and take other steps. As a European Union member state, France is included in the EU's INDC, which in particular commits member states to cut greenhouse gas emissions “at least” 40 percent by 2030 compared with 1990.

France “is the only country in the world that already has written into law its international commitments” for COP-21, said Royal, referring to the Law for an Energy Transition Related to Green Growth that Parliament adopted in 2015.

Royal noted that the energy law in 2016 will set out a broad plan for slashing France's reliance on fossil fuels and boosting use of clean renewable energies. It also aims to eliminate the tax advantage that diesel fuel has over cleaner burning gasoline in French law.

With the law stressing clean transportation, Royal called on the automobile industry to produce electric automobiles that sell for less than 7,000 euros (\$7,686), to help reach a national target of having 20 percent of automobiles be electric by 2020.

The Law for an Energy Transition Related to Green Growth targets cutting primary fossil fuel use 30 percent by 2030 compared with 2012 levels and halving France's energy consumption by 2050 compared with 2012 levels, setting an intermediate 20 percent goal for 2020. It sets out a framework for energy efficiency, through building renovation, permitting and other measures.

President Francois Hollande said France's carbon price of 15 euros a ton will rise to 27 euros a ton by 2017, to give companies a “clear signal.” The energy transition law calls for that to rise gradually to 100 euros by 2030. But the French Constitution gives Parliament approval over each increase along the way.

21. Germany's Coalition in Dispute over Electric-Car Push

Chancellor Angela Merkel finds herself in the middle of a dispute within her governing coalition over two topics close to Germans' hearts—autos and fiscal discipline. With the government's goal of 1 million electric vehicles on German streets by 2020 slipping away, Vice Chancellor Sigmar

Gabriel wants to shell out about 2 billion euros (\$2.2 billion) in incentives to offset the higher price of the environmentally friendly cars for his autobahn-loving residents. Finance Minister Wolfgang Schaeuble is dead set against it.

Merkel is searching for a compromise between the two ministers that is likely to include incentives and tax breaks. The chancellor also is keen to avoid another rupture with her coalition partners after negotiating a deal to end a spat over the refugee crisis.

Merkel, who is currently far off from reaching her target, is aiming to keep the country's auto industry—home to Mercedes-Benz, Audi, Porsche, VW and BMW—globally competitive. In total, slightly more than 30,000 electric cars had been registered in Germany, which historically has leaned on diesel technology to reduce emissions. Other countries such as France, Norway and the U.S. have had greater success with electric vehicles because of the rebates and tax breaks they offer. Last year alone, nearly 26,000 electric cars were sold in much smaller Norway.

Gabriel's solution is to follow the path of other countries and offer about 5,000 euros in incentives per car through 2020 to get the ball rolling. With the government planning to provide billions of euros to care for the more than 1 million asylum seekers who poured into the country last year, Schaeuble has come out against spending money to essentially entice people to buy more expensive cars. The finance minister, who is Germany's most popular politician, says the government should focus instead on expanding the infrastructure needed to fuel the vehicles. The country has about 5,600 charging plugs, according to the VDA.

NORTH AMERICA

22. VW Scandals Continuing Fallout in the US

Air Resources Board Rejects VW 2-Liter Diesel Recall Plan and Issues Notice Of Violation

The California Air Resources Board (CARB) has notified Volkswagen that it is rejecting VW's submitted recall plan for 2-liter diesel passenger vehicles sold in California between 2009 and 2015. It also notified VW of violations of California air quality regulations associated with the company's use of a "defeat device" in those cars.

"Volkswagen made a decision to cheat on emissions tests and then tried to cover it up," said CARB Chair Mary D. Nichols. "They continued and compounded the lie and when they were caught they tried to deny it. The result is thousands of tons of nitrogen oxide that have harmed the health of Californians. They need to make it right. Today's action is a step in the direction of assuring that will happen."

These actions do not preclude a recall, but allow for a broader array of potential remedies. CARB will continue its investigation and technical evaluations with EPA to return the vehicles to legally required emission levels, determine mitigation for past and future environmental harm, and assess penalties.

Background:

Volkswagen officials admitted the existence of the defeat device to CARB and United States Environmental Protection Agency officials in early September. On September 18, 2015, CARB issued an In-use Compliance Letter to the company listing violations and giving them 45 business days to submit a proposal to recall and repair the affected vehicles. U.S. EPA issued a Notice of

Violation to the company on the same day. The defeat devices were installed on VW's 2.0L diesel vehicles manufactured for model year (MY) 2009 through MY 2015 to circumvent CARB and EPA emission test procedures. This made it possible for VW to obtain Executive Orders from CARB and Certificates of Conformity from EPA for these vehicles so the vehicles could be sold in California. As a result, the certifications were illegally obtained. The consequences of VW's actions are significant and must be addressed expeditiously.

Recall Rejection:

The rejection of VW's submitted recall plans details the specific areas that are required under California law in order for a recall plan to be formally approved. VW's recall plan fell short in several areas, including:

- The proposed plans contain gaps and lack sufficient detail.
- The descriptions of proposed repairs lack enough information for a technical evaluation; and
- The proposals do not adequately address overall impacts on vehicle performance, emissions and safety.

This rejection only applies to VW's diesel 2.0L vehicles, not 3.0L vehicles. The submission of the recall plan for 3.0L vehicles is due to CARB on February 2, 2016.

Notice of Violation:

The NOV details 13 specific violations of California regulations, including failure to comply with the emission standards or test procedures; invalid certification applications; the use of Defeat Devices; the importation, delivery, purchase, acquisition, or receipt of uncertified vehicles; the sale of vehicles that do not meet emission standards; and failure to comply with onboard diagnostic (OBD) system requirements.

CARB will continue its investigation. The NOV may be supplemented or amended, as needed.

Environmental Harm:

The defeat devices on VW's diesel vehicles have caused substantial excess, illegal, and ongoing emissions of nitrogen oxides (NOx) from the vehicles. NOx emissions in California are the most important contributor to ambient ozone and a key contributor to fine particulate matter pollution, which is associated with premature death, increased hospitalizations, emergency room visits due to exacerbation of chronic heart and lung diseases, and other serious health impacts. California is home to both the highest ozone levels (South Coast) and ambient particulate matter levels (San Joaquin Valley) measured in the United States. Twelve million Californians live in communities that exceed the federal ozone and particulate matter ambient air quality standards that were put in place to protect public health. VW must mitigate the harm that these vehicles have already caused and continue to cause.

CARB's response comes a week after the U.S. Justice Department filed a suit against VW for violating federal clean air laws and attempting to deceive consumers and regulators about the vehicles' actual performance.

The suit was filed on behalf of the EPA, which announced that it concurs with CARB's rejection. In a statement addressing the EPA's plan to take VW to court, Assistant Administrator Cynthia

Giles, who represents the Office of Enforcement and Compliance Assurance, said that legal action was an initial step in “bringing VW to justice.” Giles continued: “So far, recall discussions with the company have not produced an acceptable way forward. These discussions will continue in parallel with the federal court action.”

Two issues that contributed to the plan’s rejection include lack of specificity in detail that would allow enforcement officials to adequately evaluate the repairs from a technical standpoint; and the failure of the plan to fully address the emissions problems caused by the cheat devices.

After months of stating that the defeat devices were the action of two rogue engineers and not a concerted effort by the corporation to deceive consumers about the potential performance of the cars, VW’s management now seems to have another way to explain the problem that has engulfed its global business model. In a private interview with National Public Radio, Volkswagen CEO Matthias Mueller countered assertions that VW lied when it was directly asked by EPA officials for details about its emissions systems. Mueller said the problem was a misunderstanding in language, not a deception.

“[We] had a ... not the right interpretation of the American law,” said Mueller, who added that they “didn’t understand the question at first” when the investigators asked about defeat devices in the cars.

“We all know that we have let down customers, authorities, regulators and the general public here in America, too ... We are — I am — truly sorry for that.”

VW Meeting With EPA on Diesel Emissions Ends After an Hour

Volkswagen AG Chief Executive Matthias Mueller met with Environmental Protection Agency Administrator Gina McCarthy for about an hour on January 13th, as the German carmaker discussed revamped proposals to overcome a diesel emissions-cheating scandal. Mueller pulled out from the EPA courtyard in a black Audi sedan without commenting on the meeting. The company issued a short statement acknowledging that Mueller and VW brand chief Herbert Diess had met with McCarthy.

“Volkswagen will continue to fully cooperate” with regulators, the company said in a statement. A spokeswoman for the EPA, had no immediate comment.

Expeditious Fix Needed

The EPA is insisting on an “expeditious” fix to bring Volkswagen vehicles into compliance with U.S. emissions standards, Chris Grundler, director of EPA's office of transportation and air quality, said in Detroit. The agency doesn't know how long it will take for VW to fix the vehicles, he added. “As a rule we don't talk about ongoing enforcement matters. I can't get into the details,” Grundler said. “This is a very, very serious matter. We take our responsibility for overseeing emissions very seriously.”

VW Criminal Charges Possible Despite Civil Lawsuit

The federal government may follow up a multibillion dollar civil complaint filed by the government against Volkswagen AG with a criminal indictment related to the automaker's use of illegal technology in its diesel vehicles, according to attorneys following the case. The civil lawsuit could end up being a prelude to the Justice Department filing a variety of criminal charges against

Volkswagen, including potential charges of obstruction of justice, conspiracy and making false statements to government officials. It is also possible the government could choose to pursue charges against individual Volkswagen executives, which attorneys said would be consistent with the DOJ's memorandum in September 2015 encouraging such prosecutions.

The Justice Department opened a criminal investigation of Volkswagen in the fall.

The civil complaint, filed in federal district court in Michigan, highlighted four separate violations of the Clean Air Act related to Volkswagen's alleged use of illegal defeat devices and asked the court to impose significant penalties and require the company to take appropriate steps to mitigate the excess pollution emitted by the diesel vehicles (United States v. Volkswagen AG, E.D. Mich., No. 2:16-cv-10006, 1/4/16).

'Not the Last Step.'

While the federal government has historically chosen to file criminal charges prior to a civil lawsuit, the civil complaint does not prevent the DOJ from subsequently filing criminal charges. Wyn Hornbuckle, a Justice Department spokesman, told reporters in a January 6 e-mail the filing of a civil complaint is "an important step, but not the last step" the government could take against Volkswagen. "A civil complaint does not preclude the government from seeking other legal remedies, including criminal charges," Hornbuckle said. "The United States' investigation is continuing and will follow the facts and evidence wherever they lead."

A variety of interested parties, including advocacy organizations and members of Congress, have called on the Justice Department to pursue criminal charges against Volkswagen. "If there was ever a case for criminal charges, it's Volkswagen," Clarence Ditlow, executive director of the Center for Auto Safety, told reporters. Ditlow, whose organization is seeking to intervene in the civil litigation against Volkswagen, said it would be a "travesty of justice" if the government didn't follow through with a criminal indictment.

Several Charges Possible

The civil complaint contains a four-page section outlining a history of Volkswagen's interactions with federal regulators since the study that found on-road emissions from two Volkswagen diesel models were significantly higher than EPA standards. The complaint alleges that Volkswagen "impeded and obstructed" the government's investigation and engaged in "affirmative misrepresentations" to the government. This would imply that the criminal investigation is likely focusing on a range of potential violations, including fraud and lying to government officials.

Attorneys agreed that if criminal charges were brought against Volkswagen, they likely would include charges under 18 U.S.C. Sec. 1001, which covers false statements made to government officials. Based on the reported facts of the Volkswagen case, it appears that Volkswagen officials made false material statements to the EPA.

VW Hires Former FBI Director to Deal With U.S. Regulators

Earlier this month, the U.S. Justice Department announced that it was suing Volkswagen for alleged violations of the Clean Air Act--meaning the company now faces potentially billions of dollars in penalties. So it's not surprising that Volkswagen is looking for backup.

And it apparently thinks a former head of the U.S. Federal Bureau of Investigation (FBI) can provide it. Louis Freeh led the FBI from 1993 to 2001, and Volkswagen plans to hire him to deal with regulatory issues related to the diesel scandal, according to a report from the German newspaper Sueddeutsche Zeitung, translated by Automotive News Europe.

Freeh would reportedly come aboard as an adviser to help VW deal with U.S. regulators, although the company has not confirmed his appointment.

The former FBI chief was hired by Daimler in 2010 to monitor anti-bribery measures after the company agreed to pay a \$185 million fine to the U.S. government as the result of a corruption case. Christine Hohmann-Dennhard--Volkswagen's new director of integrity and legal affairs--worked with Freeh at Daimler, and has pushed for his appointment by VW, according to the Sueddeutsche Zeitung report.

Other Legal Actions Against VW Outside the US

As well as the U.S. Justice Department lawsuit and numerous customer suits, the company is now being sued by the South Korean government--and by its own shareholders.

South Korea's environmental agency filed criminal charges against VW that could lead to \$48 billion in penalties. It also filed charges against Johannes Thammer, head of VW Korea, who faces a fine of up to \$24,800 and up to five years in prison.

Meanwhile, VW shareholders in Germany are suing over the losses in stock value caused by the diesel-emission scandal. Shares stood at around \$170 before news of the scandal broke in late September, but are now valued at about \$110--with some dips below \$100 over the past few months.

New Mexico Sues Volkswagen

New Mexico is suing Volkswagen and other German automakers over the emissions cheating scandal that involves millions of cars worldwide, the first state to do so but almost certainly not the last. Attorney General Hector Balderas filed the lawsuit in state district court in Santa Fe alleging that Volkswagen, Audi, Porsche and their U.S. subsidiaries violated New Mexico's air quality standards and engaged in deceptive marketing to pass off certain diesel models as clean and efficient.

"Supported by a massive advertising campaign, defendants claimed that superior engineering allowed their cars to perform better, consume less fuel and emit fewer harmful pollutants than diesel cars of the past, making them a great fit for eco-conscious consumers. In fact, the complete opposite was true," the lawsuit states.

New Mexico's case is likely just the first among states. Dozens of attorneys general have teamed up for a civil investigation of VW. Texas and California attorneys general are conducting separate inquiries, and earlier this month the U.S. Justice Department sued on behalf of the federal Environmental Protection Agency.

Then there are hundreds of pending private class-action lawsuits filed by VW owners in many states.

According to New Mexico's lawsuit, somewhere between 4,000 and 10,000 of the affected models were delivered, marketed and sold in the state — from Beetles and Jettas to several Audi models and the Porsche Cayenne. Prosecutors say the vehicles exceeded average nitrogen oxides emission limits by as much as 30 to 40 percent. Such pollution contributes to smog and has been linked with serious health effects such as asthma attacks.

Balderas said the German automakers should be held accountable. "Volkswagen preyed upon hardworking New Mexicans who want to protect the environment or save money with fuel efficiency," he said.

The company has hired a U.S.-based law firm to conduct an internal investigation.

New Mexico prosecutors are seeking a jury trial as well as damages, including penalties for each day and each violation of the state's air quality act. They also want the companies to forgo the profits they obtained from selling the affected vehicles.

Volkswagen Solution Deadline Set

A federal judge set a March 24th deadline for Volkswagen to say whether they have a solution to the emission problems that affect 600,000 U.S. diesel vehicles. San Francisco's U.S. District Judge Charles Breyer noted that VW leaders admitted the problem in September. "Six months is long enough to determine if this is a fixable problem," Breyer reportedly said.

Volkswagen actually had developed a fix and came up with a proposal last month which the company submitted to the Environmental Protection Agency (EPA) and the California Air Resources Board (CARB). Since the automaker's proposal was turned down, it has yet to reach an agreement to launch a recall program involving almost 600,000 affected cars in the United States.

The company's recall in Europe wherein 8.5 million vehicles are involved is now underway. (See story above.)

Volkswagen is currently facing a \$46 billion lawsuit filed by the U.S. Justice Department last month for the charge of violating the environmental laws in the United States. As a result, the company, along with its Porsche and Audi brands, have been banned from entering the U.S. market with new 2016 diesel car models.

Robert Giuffra, Volkswagen's legal representative, told Breyer at the court proceeding that the carmaker is making some progress in coming up with a settlement agreement with the Justice Department, EPA and CARB. When asked about the details of the settlement, Giuffra declined to discuss the specifics following the advice of the Justice Department.

Volkswagen had to postpone the announcement of its 2015 results and had to delay its annual shareholders' meeting because of the difficulties involved in determining the exact price it had to spend on the scandal.

Volkswagen Faces Huge US Lawsuit

Volkswagen faces potentially huge damages to pay over pollution cheat devices on its diesel-engine cars in a class-action lawsuit filed in a San Francisco court. Lawyers consolidated the cases of almost 200 owners of VW, Audi and Porsche diesels equipped with the devices into a

suit that accuses the German auto giant of major damages to the environment and to owners of more than a half million of the cars sold in the United States.

The case accuses Volkswagen AG, its US VW, Porsche and Audi arms, several top company executives and German auto parts giant Bosch of racketeering in "one of the most brazen corporate crimes in history, a cautionary tale about winning at any cost." The main charge, for a "fraudulent scheme and conspiracy" to market and sell the cars, makes use of the broad RICO Act, originally designed for use in combatting organized crime.

The charges also include fraud, warranty violations, and unjust enrichment.

"From 2009 to 2015, Volkswagen sold and/or leased approximately 580,000 dirty diesels that its defeat device disguised as clean," the suit says. "In doing so, Volkswagen secretly turned the most environmentally-conscious consumers into some of the biggest polluters on the road -- and charged them a premium in the process."

Volkswagen has admitted the existence of the illegal cheat software on its cars, which limits the output of toxic nitrogen oxides to US legal limits during emissions tests by regulators.

The suit said owners of the cars have suffered losses on the vehicles' value and also have suffered in discovering that they were adding more pollution to the air than they thought they were. It also estimated the damages to the health of Americans generally from the extra toxic gases in their air at \$450 million.

"Volkswagen actively concealed the defeat devices and actual emission levels of the Class Vehicles to pad its profits and avoid the perception that the Class Vehicles did not comply with federal and state laws governing clean air and emissions," it said. "Volkswagen valued its profits over the trust that Plaintiffs and other Class members entrusted to it."

There was no total estimate of the penalties requested in the lawsuit, but it could conceivably run into the billions of dollars, given the 580,000 cars potentially represented by the suit.

Plaintiffs have asked for compensation for losses on the cars by owners, including buying them all back; environmental reparations; and what could be sizeable federal and state damages under the RICO law.

'Clean-Air Reparations' Could Be Required From VW

Volkswagen AG may have to do more than fix the cars implicated in the emissions-cheating scandal, it also could be forced to undo the environmental damage. Environmental and consumer groups are pushing the federal government to consider a long list of possible reparations, from a VW-funded program to build the infrastructure to power electric cars, to high fines, to cleaning up five times the amount of pollution released by the dirty diesel engines.

"The clean-air reparations must be so large that Volkswagen or other companies will never again be tempted to cheat," said Frank O'Donnell, president of Clean Air Watch, an environmental group based in Washington.

There is precedent for a U.S. settlement with automakers going beyond repairing or replacing affected vehicles. In the 1990s, the U.S. Environmental Protection Agency forced truck

manufacturers that had cheated on emissions tests to invest \$1 billion on cleaner engines, among other measures.

The EPA in March 2015 updated its policy of accepting company actions as part of a settlement if they support key government objectives, such as reducing the impact of climate change, promoting innovative technology or improving children's health.

The EPA and the California Air Resources Board now must decide how VW not only can bring the cars into compliance and reimburse owners of models that can't be retrofitted, but also what other fines or penalties the German automaker should face.

The agencies are being pushed by environmental and consumer groups to require VW to take steps to remediate the pollution its cars released.

One criteria the EPA uses to evaluate offsetting projects is whether they provide "significant, quantifiable benefits to public health or the environment," Cynthia Giles, the agency's assistant administrator for enforcement and compliance assurance, said in a memo. The agency says it may reduce a company's financial penalties if it agrees to implement such supplemental projects.

Volkswagen is continuing to cooperate with EPA and CARB, and trying to develop remedies acceptable to the agencies "as quickly as possible," company spokeswoman Jeannine Ginivan said. She declined to comment on specific environmental projects that could become part of the settlement.

EPA spokeswoman Julia Valentine also declined to comment on negotiations with VW.

Due to the scale of the cheating, the EPA could ask VW to eliminate more pollution than the raw amount of nitrogen oxides that the cars emitted, said Margo Oge with the ClimateWorks organization and a former head of the EPA's Office of Transportation and Air Quality. Other options could include funding environmental projects like retrofitting older trucks or buses in cities with smog problems, or selling electric cars, she said.

The EPA is talking to Volkswagen about producing electric vehicles at its plant in Chattanooga, Tenn., as part of the diesel emissions negotiations, the German weekly *Welt am Sonntag* reported on February 21st. The agency and VW also are discussing getting the automaker to help build a nationwide network of electric charging stations, the newspaper reported but didn't cite specific sources in relaying that information.

Excess pollution from the affected Volkswagens will cause 60 early deaths in the U.S., according an estimate in a study by researchers at the Massachusetts Institute of Technology and Harvard University. If the company recalls all affected cars by year-end, another 130 premature deaths could be avoided, the study projected.

The American Lung Association has asked the EPA to make Volkswagen promote zero-emissions vehicles like those powered by batteries or hydrogen, build infrastructure to charge electric cars, or retrofit older diesel engines with better pollution controls. Communities will be burdened by pollution from VW's emissions cheating for another generation until the vehicles retire, the lung association said in a September 2015 letter to EPA, CARB and U.S. Attorney General Loretta Lynch.

“People can't unbreath the air they've already breathed,” said Paul Billings, the lung association's senior vice president for advocacy. “But you can make the air cleaner than it would have been otherwise.”

Volkswagen also should make sure there are generous incentives to persuade consumers who may be hesitant to bring in a recalled car for repair, said Dan Becker, director of the Safe Climate Campaign in Washington. Incentives are important because there is no recall in which everyone brings the car back, even when a matter of safety, he said.

“You can't put the genie back in the bottle,” Becker said. “Until they're fixed, they're going to pollute much too much. Volkswagen, which created the problem, will need to incentivize consumers to bring them in.”

Dieseldgate Redefines U.S. Pollution Testing

In an interview with Handelsblatt, a top U.S. EPA official, Christopher Grundler, said the agency will now test all cars on the road, not just in the lab. It's one of the biggest changes to come out of Volkswagen's Dieseldgate scandal so far. According to Grundler, “Even before the scandal we had been testing the vehicles at three different times in their life cycle: before they are built, right when they get off the production line and after they have been bought by the consumer. What is new is that the cars are now not only being tested according to certain predefined cycles. We test in unpredictable ways in the laboratory and we also test the cars on the road, with portable emissions measurement systems, called PEMS units.”

Mercedes Facing Lawsuit over Clean Diesel Emissions

Shares in Mercedes maker Daimler were down 3 per cent after news of the class-action lawsuit filed by Hagens Berman, which also has a lead role in class-action suits against Volkswagen.

Daimler has repeatedly denied that it has rigged tests as well, and said it saw the suit, filed in the U.S. District Court for the District of New Jersey, as unfounded. A spokesman reportedly said the car maker would defend itself against the suit.

Hagens Berman said in a statement that on-road testing had shown Mercedes's Clean Diesel cars produced average on-road NOx emissions that were 19 times above the U.S. standard, with some instantaneous readings as high as 65 times more than the U.S. limit.

Diesel Car Sales Negligible In January; Trucks and SUVs Fare Better

When news of Volkswagen's use of illegal "defeat device" software in its TDI diesel cars broke back in September, it was assumed the ensuing scandal would negatively impact diesel sales. The public's trust in diesel was obviously shaken, and Volkswagen's cessation of diesel sales removed a large number of models from the equation. And sure enough, sales of diesel passenger cars in the U.S. have taken a dive, although diesel trucks and SUVs are faring slightly better.

Just 222 diesel cars were sold in the U.S. in January, according to sales data from WardsAuto cited by ExtremeTech. That's out of 1.15 million total U.S. new-car sales during the same month. Diesel SUV sales weren't quite as dismal, with 1,300 recorded for the month of January.

And--thanks mainly to sales of vehicles for work use--diesel light-duty truck sales stood at 22,000 for January. That's still about 4,000 fewer sales compared to January 2015.

A year ago, Volkswagen alone sold 3,500 diesel vehicles, while Audi sold 800.

Before news of the company's emissions cheating broke, diesels typically accounted for about 25 percent of Volkswagen's monthly sales.

Without diesel models from VW, Audi, and Porsche on sale, the bestselling diesel car in the U.S. for January 2016 was the BMW 328d. Available as either a sedan or wagon, the diesel 3 Series recorded just 69 sales. In addition to the 328d, BMW continues to offer diesel versions of its X3 and X5 SUVs, and a handful of other carmakers continue to offer diesels as well.

BMW rival Mercedes-Benz offers diesel powertrains in the E-Class sedan and GLE and GL-Class SUVs.

Fiat Chrysler Automobiles still offers its 3.0-liter "EcoDiesel" V-6 in the Ram 1500 full-size pickup truck and Jeep Grand Cherokee SUV.

Land Rover offers its own 3.0-liter diesel V-6 in the Range Rover and Range Rover Sport.

And General Motors recently launched diesel versions of its Chevrolet Colorado and GMC Canyon mid-size pickup trucks. It also plans to revive the diesel engine option in the Chevy Cruze compact at a later date.

Meanwhile, there is no indication that 2016 Audi, Porsche, or Volkswagen diesel models will be certified for sale by the U.S. Environmental Protection Agency anytime soon.

Average Diesel Used Car Values Fall below Petrol for the First Time Ever

Motorists contemplating buying a diesel car should think about doing so soon as they have become significantly more affordable in the shadow of the emissions scandal, new data suggests. Auto Trader's bi-annual Market Report said the average price of used diesel cars has fallen below petrol — for the first time on record, according to the car buying site.

And with diesel currently marginally cheaper at the pump than petrol, used-car buyers could easily be persuaded to buy a diesel-powered motor.

23. U.S.: ECA Tier III Requirements Enter Into Force

Ships constructed on or after 1st January, 2016 and entering into the North American or US Caribbean Emission Control Areas (ECA) must comply with the Tier III NOx requirement of MARPOL Annex VI. This affects any ship whose keel is laid or where the vessel is at a similar stage of construction. The regulatory change also applies to a major conversion defined in Regulation 13.

However, the new rule will not apply to marine diesel engines installed on a ship with a combined diesel engine propulsion power of less than 750 kW if it is demonstrated to the satisfaction of the administration that it cannot comply with the standards because of design or construction limitations of the ship.

Currently, no other ECA has NOx Tier III compliance requirements. Compliance is also required for ships operating in an ECA that is eventually designated for Tier III NOx - other than the North

American or Caribbean ECAs. In such cases, a later date may be specified in the amendment designating the NOx Tier III ECA.

Failure to comply with the NOx Tier III requirements would be a violation of the US Act to Prevent Pollution from Ships (APPS). This could result in civil penalties of \$25,000 per violation with each day of a continuing violation considered a separate violation.

In addition, civil penalties of \$5,000 per day may be applied for false statements or other fraudulent representation of a continuing violation. Finally, vessel clearance may be revoked and a surety bond may be required to sail.

24. U.S. Action Aims to Lock in Climate Protections

President Barack Obama's environmental legacy is in the balance as the administration spends its last year in power defending major climate rules in court. With one year remaining in the Obama administration, the EPA must now convince judges across the country that the work it has been doing is legal.

The EPA this year also intends to complete multiple additional high-profile regulations meant to bolster domestic efforts to fight climate change. Those include regulations on methane emissions from new oil and gas operations, strengthened federal efficiency standards for medium- and heavy-duty trucks and a formal finding that greenhouse gas emissions from aircraft endanger human health and the environment.

Pushing out a full suite of rules to address climate change has been a top priority of the Obama administration. Formally completing the rulemakings would make it more difficult to undo them should a Republican win the presidential election in November.

Probably the biggest effort set to be finalized is a series of regulations targeting emissions of methane, an extremely potent greenhouse gas. This summer, the EPA intends to finalize a package of actions, including new source performance standards under Section 111(b) of the Clean Air Act, meant to curb greenhouse gas emissions from future oil and gas operations. The public comment period on the proposed regulations closed in early December 2015. Industry groups have said repeatedly the standards are unnecessary and raised concerns about the administration's use of a new figure—the social cost of methane—to justify the rules.

Janet McCabe, the EPA's top air official, could not say when the agency might move to set similar standards for the existing oil and gas industry under Section 111(d) of the Clean Air Act.

And the agency plans to promulgate final methane emissions limits for both new and existing solid waste landfills in July. As proposed, the regulations would significantly slash the landfill gas control threshold from 50 metric tons of non-methane organic compounds a year to 34 metric tons of non-methane organic compounds for both active and new landfills.

25. Senate Committee Divided Over Changing or Preserving RFS

The Renewable Fuels Standard has problems that need to be addressed, US Senate Environment and Public Works Committee members suggested at a February 24 hearing about the federal program. But they disagreed over whether its renewable fuel volume goals are unrealistic or not ambitious enough.

“Most of the rationale originally justifying the RFS has disappeared,” Chairman James M. Inhofe said in his opening statement. “All we have left is an unstable program rooted in [the US Environmental Protection Agency’s] waiving entire portions of annual requirements, allowing imported soybeans and ethanol from South America to count toward the RFS, and regularly missing implementation deadlines.”

Ranking Minority Member Barbara Boxer said, “The implementation of the RFS has not been perfect, but the law is sound. Congress designed the RFS to be managed in a flexible, commonsense way, and we gave EPA the authority to make certain adjustments when needed.” Legislative changes are needed, she said, adding that she would do everything she could to stop any bill which tries to undermine the law.

Other committee members questioned one of the hearing’s witnesses—EPA Acting Assistant Administrator for Air and Radiation Janet McCabe—regarding the agency’s problems meeting deadlines for establishing annual renewable fuel quotas for motor fuel suppliers. EPA issued final quotas for fiscal 2014, 2015, and 2016, and biomass-based diesel for 2014-17 in November which were more ambitious than what it proposed in June.

David Vitter said that EPA’s missing quota announcement deadlines makes it difficult for biofuel manufacturers to attract investment. “I think the signals we send are intended to push the market,” McCabe responded. “But the market itself determines how much biofuels are actually used.”

Others disapproved of EPA’s exercising its authority to waive mandates in 2014 and 2015. “I think when you set volumes below the RFS’s goals, it discourages growth,” said Deb Fischer.

“Both Big Oil and Big Agriculture are effective in making their voices heard in Congress,” said Sheldon Whitehouse. “I’m concerned that smaller groups, such as cellulosic ethanol producers, are not being given the chance they deserve.” Democrats Jeff Merkley and Edward J. Markey each said biofuel businesses in their states would benefit if EPA followed RFS quota mandates.

McCabe said EPA’s recently issued final rule tries to ensure that growth of renewable fuel production and use continues, consistent with congressional intent. It also uses waiver authority—judiciously—to establish ambitious quotas that are also responsible and achievable, she added. “Wherever the industry is, they can see continued and steady growth in the volumes we set,” McCabe said.

Many stakeholders and members of Congress have asked why some of the RFS’s volume targets can’t be reached, she said. Reasons include slower than expected development of the cellulosic biofuel industry and the resulting supply shortfall, gasoline consumption which declined instead of growing as was expected in 2007, and constraints in supplying certain biofuels, particularly gasoline with more than 10% ethanol, McCabe said.

“EPA has taken steps to enable the use of E15 in certain light-duty cars and trucks beginning with model year 2001,” she said in her written testimony. “[The US Department of Agriculture] has also put resources into expanding ethanol refueling infrastructure. At the same time, EPA recognizes that there currently are real limitations in the market to the increased use of these higher ethanol fuels, including current near-term limits on fuel infrastructure.”

US Energy Information Administration Deputy Administrator Howard Gruenspecht told the committee that the premise that advanced biofuels, particularly liquid cellulosic biofuels, would be available in significant amounts at reasonable costs within 5-10 years of the 2007 RFS targets

has not been borne out. “Ethanol faces demand, distribution, and regulatory challenges that make it difficult to increase its use as a motor fuel regardless of its source,” Gruenspecht said.

EIA’s recent Annual Energy Outlooks, including 2015’s, project motor gasoline demand declines in contrast to earlier forecasts of stronger demand, while actual and projected reliance on crude oil imports is significantly lower than it was when the expanded RFS program was enacted in 2007, he said in his written testimony.

The committee’s leaders, Inhofe and Boxer, clearly disagreed with each other about the RFS. Both said that it’s time to reexamine the program, and considered the February 24 hearing an important first step. Committee sources said the next steps would be to investigate specific problems with the RFS more closely, and determine whether bills are needed for necessary reforms.

26. EPA Announces Availability of \$26 Million to Clean Up Diesel Engines Nationwide

The U.S. Environmental Protection Agency (EPA) has announced the availability of \$26 million in grant funding to establish clean diesel projects aimed at reducing emissions from the nation’s existing fleet of diesel engines.

Diesel-powered engines move approximately 90 percent of the nation’s freight tonnage, and today nearly all highway freight trucks, locomotives, and commercial marine vessels are powered by diesel engines.

EPA is soliciting proposals nationwide for projects that significantly reduce diesel emissions and exposure, especially from fleets operating in areas designated as having poor air quality. Priority for funding will be given to projects that engage and benefit local communities and applicants that demonstrate their ability to promote and continue efforts to reduce emissions after the project has ended.

Eligible applicants include regional, state, local or tribal agencies, or port authorities with jurisdiction over transportation or air quality. Nonprofit organizations may apply if they provide pollution reduction or educational services to diesel fleet owners or have, as their principal purpose, the promotion of transportation or air quality. The applicants may apply until Tuesday, April 26, 2016.

Under this competition, EPA anticipates awarding between 10 and 40 awards. The top and bottom funding limits that will be considered for each proposal varies by region:

- Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont): EPA is requesting proposals between \$100,000 and \$800,000.
- Region 2 (New Jersey, New York, Puerto Rico, and U.S. Virgin Islands): EPA is requesting proposals between \$500,000 and \$1,800,000.
- Region 3 (Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia): EPA is requesting proposals between \$750,000 and \$2,700,000.
- Region 4 (Alabama, Georgia, Florida, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee EPA is requesting proposals between): EPA is requesting proposals between \$300,000 and \$1,900,000.
- Region 5 (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin): EPA is requesting proposals between \$500,000 and \$2,500,000.

- Region 6 (Arkansas, Louisiana, New Mexico, Oklahoma, and Texas): EPA is requesting proposals between \$400,000 and \$2,700,000.
- Region 7 (Iowa, Kansas, Missouri, and Nebraska): EPA is requesting proposals between \$300,000 and \$1,500,000.
- Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming): EPA is requesting proposals between \$300,000 and \$1,500,000.
- Region 9 (Arizona, California, Hawaii, Nevada, American Samoa, Guam, and Northern Mariana Islands): EPA is requesting proposals between \$500,000 and \$4,400,000.
- Region 10 (Alaska, Idaho, Oregon, and Washington): EPA is requesting proposals between \$300,000 and \$800,000.

Tribes are welcome to apply under this RFP, although EPA anticipates releasing a separate Request for Proposals for Tribal applicants during March.

Since the first year of the DERA program in 2008, EPA has awarded nearly 700 grants across the U.S. Many of these projects fund cleaner diesel engines that operate in economically disadvantaged communities whose residents suffer from higher-than-average instances of asthma, heart and lung disease.

27. US EPA's 2017 Budget Request Seeks to Fund Diesel Control

As part of the President's 21st Century Clean Transportation Plan, the President proposes to establish a new mandatory fund at EPA. The existing fleet of cars, trucks, and buses is aging, contributing to climate change and putting our children's health at risk. To protect the health of the most vulnerable populations and reduce childhood exposure to harmful exhaust, EPA will provide a total of \$1.65 billion through the Fund over the course of 10 years to retrofit, replace, or repower diesel equipment. The proposed funding, which is separate from the Agency's discretionary funding request, will provide up to \$300 million in FY 2017 to renew and increase funding for the Diesel Emissions Reduction Grant Program, which is set to expire in 2016.

28. Paris Climate Deal Said to Open New Lines of Research

A groundbreaking international agreement to rein in greenhouse gas emissions "opens lines of research" necessary to help the U.S. and other countries meet commitments made under the deal, the National Academies said on February 19th. The 13 federal agencies that are responsible for studying climate change as part of the U.S. Global Change Research Program should meet this need by focusing even more on research that can be used to inform mitigation and adaptation decisions, according to a review of the program's long-term research plan.

Federal researchers working on an update to that plan were told to look in particular at not just the benefits of mitigation but also how mitigation targets can be achieved and at what cost, including comparisons with the costs of doing nothing. "Greater understanding of adaptation is also needed," the reviewers said, as climate change impacts unfold.

The proposed research plan update was drafted before the global deal was reached in Paris at the end of 2015. Making sure science responds to society's growing demand for information on climate change and related issues was one of the review's main recommendations.

Federal researchers have been seeking feedback from those dealing with climate change across the U.S.—from drought managers to transportation infrastructure planners—since they published

the latest edition of the National Climate Assessment in 2014. But they could do a better job explaining how the knowledge they've gained from those conversations will drive their research priorities over the next three years, said Richard Moss, who directed the research program during the Clinton and George W. Bush administrations and took part in the review.

Moss said researchers also should provide more details on how they will bring social science issues, such as poverty, into their traditionally natural science-heavy agenda. "The social sciences have something to tell us about who is vulnerable, where and why," he told reporters. Poverty can mean some populations don't have the resources needed to rebuild after extreme weather events or don't have access to air conditioning needed to withstand prolonged heat waves that can threaten health.

29. Canada Proposes Tighter Ambient Sulfur Dioxide Standard

Canada's health agency has proposed lowering the country's national ambient air quality objectives for sulfur dioxide, last updated more than two decades ago and more than four times higher than allowable levels across the border in the U.S. While exposure to sulfur dioxide emissions has dropped significantly since the national objectives were adopted in 1989, research on the health impacts of short-term exposure to sulfur dioxide at current levels shows a risk that should be addressed, Health Canada said on February 13th.

"The human health assessment has identified potential health risks to the Canadian population from exposure to ambient concentrations of SO₂ that is below the current National Ambient Air Quality Objectives," it said. "It is therefore recommended that the current [standards] be revised or new ambient air quality objectives or standards be introduced."

Canada's current National Ambient Air Quality Objectives for sulfur dioxide specify maximum acceptable concentration levels averaged over one hour at 344 parts per billion. By comparison, under 2010 standards, the allowable one-hour average level in the U.S. is only 75 parts per billion.

Total sulfur dioxide emissions levels across Canada have decreased by 96 percent since 1970, largely due to the use of low-sulfur fuels and pollution reduction programs, the health agency said. Still, the U.S. Environmental Protection Agency's 2008 assessment of sulfur oxides, together with other research, shows short-term exposure to sulfur dioxide—at current ambient air levels in Canada—can cause respiratory disease in adults and children, particularly those ages 40 and older and people with asthma, Health Canada said in a notice published in the February 13 issue of the Canada Gazette, Part I.

Health Canada said National Air Pollution Surveillance data through 2011, the most recent year for which full data is available, show sulfur dioxide levels so low that they are barely detectable, but with short-lived spikes to levels above 332 parts per billion. The spikes are above the level at which research suggests a link between exposures — of as short as five to 10 minutes — and respiratory disease, it said.

The federal government originally set air quality objectives for sulfur dioxide in the 1970s based on recommendations from a national advisory committee, along with objectives for suspended particulates, carbon monoxide, ozone and nitrogen dioxide. The objectives for sulfur dioxide were updated in 1989, and the overall framework for setting air quality objectives was updated in 1992.

In addition to the current one-hour allowable limit of 332 ppb, Canada currently sets other allowable sulfur dioxide levels at 24 hours (114 ppb) and annually (23 ppb). It specifies the

maximum desirable levels averaged over one hour at 172 ppb, 24 hours at 57 ppb and annually at 11 ppb. And it states the maximum tolerable level averaged over 24 hours is 305 ppb.

In a second notice published February 13, Health Canada cited research confirming a health risk from public exposure to coarse particulate matter, but did not recommend action to address the risk. Canada has since 2013 had 24-hour and annual exposure ambient air quality standards for fine particulate matter smaller than 2.5 microns in diameter and an 8-hour standard for ozone. The standards are lower than those in the U.S., but are not considered directly comparable due to significant differences in air quality and legislative and regulatory frameworks, the government said.

The notice on particulate matter with a diameter between 2.5 and 10 microns concluded that evidence of health effects linked to exposure, particularly respiratory effects, has increased during the past few years. The evidence remains limited, however, compared to evidence of the health risks posed by fine particulate matter smaller than 2.5 microns in diameter, Health Canada said.

“Based on dosimetric, epidemiological and toxicological studies performed in industrialized/urban areas, the existence of adverse health effects on the respiratory system resulting from short-term exposure to coarse particles cannot be dismissed,” it said.

Canada's federal, provincial and territorial governments are in the process of approving, potentially before the end of 2016, a significantly more stringent air quality standard for sulfur dioxide in response to the assessment that the pollutant continues to pose a risk to human health, the government said February 19.

The announcement came just days after the updated scientific assessment declared a need to revise the national standard.

New standards that a multi-stakeholder committee recommended are being considered for approval by the deputy ministers of federal, provincial and territorial environment departments and will then be considered for final approval by the Canadian Council of Ministers of the Environment (CCME), Barbara Harvey, a spokeswoman for Environment and Climate Change Canada, said February 19.

Once the recommended Canadian Ambient Air Quality Standards are approved by the CCME, which is composed of the federal, provincial and territorial environment ministers, the federal department will publish them in the Canada Gazette, she said.

ASIA PACIFIC

30. China Accelerates New Vehicle Standards

On January 15th, MIIT and MEP jointly announced the new schedule for introducing China 5/V vehicle emissions standards. The new schedule is:

- On April 1, 2016, the 11 Eastern provinces (Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhenjiang, Fujian, Shandong, Guangdong and Hainan) will require all new light duty gasoline vehicles, light duty diesel buses and certain heavy duty diesel vehicles (Public buses, sanitation and postal trucks, and other civil vehicle fleets but not including heavy trucks) to meet China 5/V standards,

- On January 1, 2017, light duty gasoline vehicles and the heavy duty diesel vehicles listed above must meet China 5/V nationwide,
- On July 1, 2017, all heavy duty diesel trucks must meet China V, and
- On January 1, 2018, all light duty diesel vehicles must meet China 5.

Note that heavy duty diesel truck implementation is delayed by 15 months compared to other vehicles because their current technology is poor and they need time to upgrade. In addition, light duty diesel implementation is delayed 2 years because rural vehicles are being phased out and new low speed rural vehicles will be required to meet “normal” diesel standards starting in 2017. These vehicles are very low technology and thus need more time to comply.

A draft of China 6 Light Duty vehicle emissions standards has been selectively released and is undergoing review. The proposal is more than 300 pages long with lots of technical appendices. In general, this is a strong proposal. Key elements include:

- **Coverage:**
 - Vehicle fuel types: covers both gasoline and diesel (including dual fuel and hybrid) vehicles.
 - Regulated pollutants: the proposal included GHG species: CO₂ and N₂O but the limit levels are not determined yet
- **Stringency:**
 - There are two versions of emission limits, China 6 a and b but these are NOT corresponding to Euro 6a and b. The China 6a limits are close to Euro6 but are fuel neutral and the limits are whichever the more stringent ones between petrol and diesel vehicle limits in Euro 6. PM limits are 10% below that of Euro 6 level. PN limits are same as Euro 6 levels.
 - China 6b limits are much more stringent than 6a. CO and PM limits are 30-40% down from Euro 6 levels, and HC, NO_x, NMHC limits are 67% down from Euro 6 levels. If you ignore the difference in driving test cycle, 6b levels are pretty much mimicking those of Beijing 6. But 6b does include PN limits (same as Euro 6 level) while Beijing 6 doesn't.
 - MEP intends to encourage key regions to adopt the more stringent China 6b. Or in other words, MEP allows a more stringent choice for regions that are willing to go further.
 - The above limits are based on WLTC/P
 - Durability requirement is 160,000km. According to VECC, manufacturers are complaining that the deterioration factors are too high.
 - RDE test: similar to the Euro 6c proposal, using CF of 2.1 for NO_x; they intend to use whatever EU determines to use.
- **Evap emissions:**
 - Evap emission limit value is 0.7-1.2 g/test for various vehicle categories, which are much lower than that of Euro 6, and close to US Tier 2 levels.

Auto manufacturers or importers will be responsible mainly for the self-management of the policy with oversight by the Ministry of Environmental Protection, while local environmental protection bureaus will supervise compliance and inspection to make sure producers and importers follow the rules, the ministry said.

31. Air Pollution Falls By 10% In China's Major Cities

Air pollution levels fell by 10.3% in China last year. However, 80% of cities are still in breach of national standards, according to a new report by Greenpeace East Asia.

China's efforts to clean up air pollution appear to be having an effect. The average concentration of PM2.5 particulate in the air of 366 major cities has fallen to 50.2 micrograms per cubic meter. However, it remains well over the government-set standard of 35 micrograms and that of the World Health Organization, which is 10 micrograms.

The five municipalities or provinces with the worst levels of PM2.5 pollution were Henan, Beijing, Hebei, Tianjin and Shandong. The purest air was found in Hainan, Tibet, Yunnan, Fujian and Guizhou, according to the [2015 China City Rankings](#).

Greenpeace's city rankings are based on real-time monitoring data published by the cities themselves. The report praised China's progress in making air quality data public. In 2014, only 190 Chinese cities disclosed their PM2.5 levels. In 2015, 367 cities published six different types of air quality measurements, including the level of PM2.5 in the air. This is the largest release of data since new government standards came into effect in 2012.

Beijing's average PM2.5 level fell 3.3% year-on-year, to 80.4 micrograms per cubic meter between 2014 and 2015.

32. Shanghai Under Pressure to Hit PM 2.5 Targets As Air Quality Worsens.

Shanghai's air quality was worse last year than it was in 2014, the city's environmental authority said on January 21, 2016. According to a January 22, 2016 report in ShanghaiDaily.com eight heavily polluted days (with an air quality index of 300-plus) were recorded in 2015, twice as many as in the previous year, the Shanghai Environmental Protection Bureau said.

Similarly, the proportion of days on which the air was classed as good or excellent — indicated by an AQI reading of 100 or less — fell to 71 percent last year from 77 percent in 2014, it said.

PM2.5 particles remained the major pollutant, with their mean density rising slightly to 53 micrograms per cubic meter, from 52 a year earlier. The World Health Organization's recommended safe level for PM2.5 is 10 micrograms per cubic meter over a 12-month period, while China's equivalent standard is 35.

"The air quality in 2015 was within our expectations," said Liu Dailing, deputy director of the bureau's Total Pollution Emission Control Division. "We saw a huge improvement in 2014 compared to 2013, and had predicted a slight fluctuation for 2015," she said.

The Shanghai government earlier set a target to reduce the average annual PM2.5 density to 49.6 micrograms per cubic meter by 2017, representing a 20 percent drop from 2013 levels.

While Shanghai has done well in recent years to reduce the use of coal and eliminate boilers fired by fossil fuel, two of the major tasks for this year will be to cut emissions by cars and boats, and curb the volume of volatile organic compounds (VOCs) discharged by factories, Liu said.

The bureau's law enforcement team handled 2,590 environmental law violations last year — up 34 percent from 2014 — and collected 173 million yuan (US\$26.3 million) in fines, a rise of 68 percent from the previous year.

The “daily fine” policy introduced in late 2014 was applied to 12 companies last year, generating 6.9 million yuan. Companies are liable to pay a penalty if they fail to take pollution control measures after an initial inspection and warning.

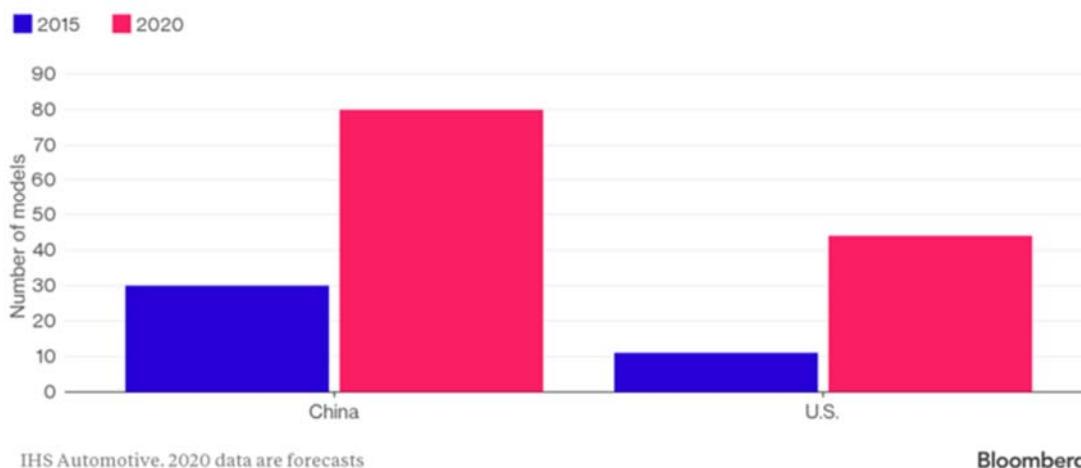
33. China's Air Pollution Influencing Car Models, Technology

As China struggles with its air-pollution crisis, Beijing increasingly influences the models and technology Detroit, Europe and Japan sell around the world. In response to government rules and incentives that have spurred electric-car sales in China, automakers are beefing up their global electric-vehicle and plug-in offerings.

General Motors plans to make a plug-in hybrid version of every Cadillac model. Ford Motor Co. has budgeted \$4.5 billion to develop 13 new EVs and plug-in hybrids by 2020, and China is a big reason for both automakers. Mercedes-Benz is selling five plug-ins in China, two of which also sell in the U.S. Similarly, BMW is engineering plug-in hybrids it sells worldwide to meet China's electric-drive mandates.

China Beats U.S.

China sells more electric-drive models now, and this will continue through 2020



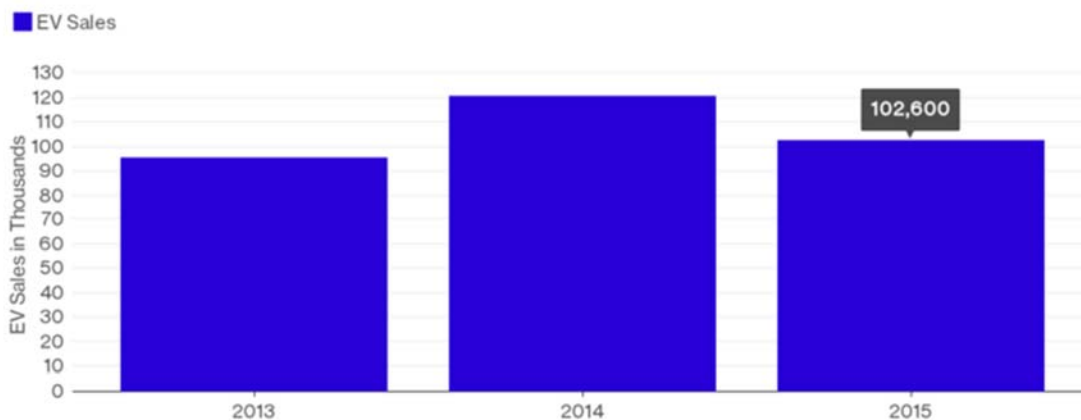
Even gasoline engines are getting a global tweak to meet Chinese fuel-efficiency standards: Cadillac specifically designed the most powerful engine in its CT6 sedan, a twin-turbo three liter, to avoid stiff Chinese taxes on any engine over three liters.

While China wants to boost sales and become a key destination for global automakers to sell new models, it also wants cleaner air. So it now requires that agency- and government-owned companies' fleets consist of at least 30 percent plug-in hybrids or electric cars. If they don't comply, they risk losing important subsidies for utilities such as electricity and water.

With about 132,400 EVs and plug-in hybrids delivered through November, China already has sold more electrified vehicles than the U.S. for the first time ever, according to data compiled by Bloomberg. Sales of these models fell 17 percent to 102,600 in the U.S. last year, according to researcher Autodata Corp.—even as the industry reported record total sales.

Sales Slump

Deliveries of plug-in electric vehicles in the U.S. tumbled 17 percent last year



Source: Autodata
*Data includes estimates for Tesla

Bloomberg

Electric vehicle sales in China probably will continue climbing as the central government hands out incentives of more than \$8,000 for EVs and about \$4,600 for plug-ins to encourage people to buy so-called New-Energy vehicles, which include hybrids, plug-in hybrids and electric cars.

Local governments often match those incentives. The city of Shanghai already gives \$13,000 for the cost of a license plate for plug-ins and EVs, and buyers of those vehicles can avoid a long waiting list to get one.

Not only will more plug-ins and EVs soon be plying Chinese highways and byways, they also will go farther on a single charge. Under China's new regulations, government-controlled companies and agencies won't get subsidies for their plug-ins unless the cars can travel 50 kilometers, or 32 miles, before the gasoline engine kicks in. The Volt already can go 50 miles just in electric-drive mode.

BMW is getting ready for ever-stiffer regulations. The German automaker will have six plug-in hybrids and an electric car on the market in China by the end of this year, and its plug-ins will soon be capable of going 60 kilometers, or 37 miles, on a single charge. What is more, it is designing the cars with extra space to accommodate larger batteries so they'll be ready for more stringent requirements expected in a few years.

The country already sells far more electric-car models than the U.S., with 30 available now. That will rise to 80 by 2020, though many of them will come from China's small domestic producers, according to IHS Automotive. The U.S. has just a handful of models now; 44 will be available in 2020.

Still, electric cars have been a tough sell in China because of the lack of charging stations. That soon may change: The government is considering a program to spend \$16 billion on stations that could handle 5 million EVs by 2020, Bloomberg has reported.

34. Beijing to Expand Vehicle Restrictions

Beijing's municipal government is reportedly planning to impose a set of vehicle restrictions commonly used for special events for the rest of the winter period to fight air pollution. Vehicles will be barred on alternate days from Beijing's roads depending on the last digit of their license plates, excluding public holidays. The restrictions will be imposed for the rest of winter as air pollution is typically worse during this period due to the extra demands on power plants to provide electricity for seasonal heating. The "odd-even" rule, as the restriction has come to be known, is routinely used before and during important events such as the Beijing Olympics, an APEC meeting and military parades. China's capital has been struggling with hazardous smog this winter, issuing "red alert" warnings to residents to avoid outdoors activity, and vehicular exhaust has been blamed as a major contributor to the pollution along with industrial emissions.

35. China's Economy Slowing But Vehicle Industry Growth Still Likely

China's economy grew only 6.9 percent last year -- the slowest increase since 1990, according to the National Bureau of Statistics. While a weakening economy will affect demand for new cars and trucks, two statistics are worth noting.

The first bit of news is about per capita income, which has steadily increased -- especially in rural areas. Last year, the per capita disposable income of rural residents rose 7.5 percent to 11,442 yuan (\$1,700), while urban incomes grew 6.6 percent to 31,195 yuan. In recent years, vehicle sales in major coastal cities have declined as some municipalities restricted car sales to ease traffic congestion and air pollution. But sales in small cities and rural areas have maintained double-digit growth, thanks to rising incomes of local residents. Data released by the bureau suggest that rural incomes will continue growing, which should ease fears of stagnation.

The second bit of news is about population trends. According to the statistics, China's population is aging -- but not shrinking. Last year, the population topped 1.37 billion people, up 0.5 percent from 2014. Approximately 44 percent of the people still live in the countryside. To prevent population decline, Beijing has relaxed its 35-year-old restrictions on family size, which allowed couples to have only one child. Now they can have two, which will likely increase population growth.

Further, pent-up vehicle demand remains strong because vehicle ownership in China is still quite low despite rising sales over the past decade. There are only 124 vehicles per thousand people, a much lower rate than in most developing economies.

China's finance minister and government-affiliated think tanks have predicted that the economy will grow 6.5 percent annually over the next few years. By Chinese standards, that's slow. But thanks to rising per capita income and population growth combined with greater urbanization of that population, the auto market will still likely grow.

36. Late Surge Lifts 2015 Light-Vehicle Sales 7.3%

China's 2015 light-vehicle deliveries rose 7.3 percent year on year to 21.1 million cars and trucks, thanks to a late sales surge triggered by the government's purchase tax cut on small cars, reported the China Association of Automobile Manufacturers. In December, light-vehicle sales in China surged 18 percent from a year earlier to 2.44 million, according to the association.

Last summer, industry sales slumped due to the slowing economy and a midyear stock market collapse. That resulted in lost sales of half a million vehicles, according to the association's

estimates. Car purchase limits put in place in seven major cities erased another 2 million potential deliveries.

But in the last three months of the year, automakers enjoyed strong sales triggered by the 50 percent tax cut on vehicles with engine displacements of 1.6 liters and smaller that took effect on October 1st.

The tax incentive gave an additional boost to compact crossovers, which already were in great demand. Last year, sales of SUVs and crossovers jumped 52 percent to 6.22 million.

Meanwhile, deliveries of multipurpose vehicles increased 10 percent to 2.11 million.

But demand for compact sedans and microvans declined as car buyers migrated to crossovers and MPVs. For the year, sedan sales dropped 5.3 percent to 11.72 million, while microvan sales slumped nearly 18 percent to 1.10 million.

Sales of commercial trucks and buses remained sluggish last year, dropping 9 percent from a year earlier to 3.45 million.

China's total vehicle sales -- including passenger vehicles, trucks and buses -- reached 24.61 million, up 4.7 percent from a year earlier.

The association expects China's auto sales to increase 6 percent this year thanks to the tax incentive.

37. BYD Expects EV, Plug-In Hybrid Sales to Double In Each of the Next 3 Years

BYD Co., China's largest producer of electric cars, expects sales of its electric vehicles and plug-in hybrids to double each year over the next three years, company Chairman Wang Chuanfu told Chinese media. The Chinese government will reduce subsidies for EVs and plug-in hybrids by 40 percent in the next four years, but the impact of the move on alternative energy vehicle deliveries will be offset by two factors, Wang told Caixin, a Beijing-based business magazine.

As automakers build more vehicles and achieve economies of scale, the production cost per unit will fall. Secondly, consumer acceptance is growing, Wang said.

BYD sales have reflected the trends. Last year the company sold a record 61,772 EVs and plug-in hybrids, and volume continues to gain momentum, with December deliveries reaching 10,925.

For the first time, BYD's EVs generated more sales -- 22 billion yuan (\$3.3 billion) -- than its gasoline-powered lineup, which accounted for revenues of 19 billion yuan.

BYD is headquartered in the south China city of Shenzhen. It is partly owned by U.S. billionaire Warren Buffett. The company makes gasoline-powered vehicles as well as several EV and plug-in hybrid models. Its product lineup includes the e6 electric compact sedan and the K9 electric bus, while its plug-in hybrid lineup comprises the F3DM and Qin compact sedans and the Tang and Song compact crossovers.

38. EV, Plug-In Hybrid Deliveries Expected To Double To 700,000 In 2016

Automakers are expected to deliver 700,000 electric vehicles and plug-in hybrids in China this year, double the number of vehicles sold in 2015, the China Association of Automobile Manufacturers predicts.

Combined sales of EVs and plug-in hybrids totaled 331,092 vehicles last year, soaring 340 percent year on year from 2014, the association said last week. The 2015 tally includes 247,482 EVs and 83,610 plug-in hybrids. Among the EVs, 146,719 were passenger vehicles and 100,763 were commercial vehicles. Of the plug-in hybrids, 60,663 were passenger vehicles and 22,947 were commercial vehicles.

Only EVs, plug-in hybrids and fuel-cell powered vehicles qualify for subsidies from the Chinese government. Conventional hybrids are not eligible. The association did not disclose sales of fuel-cell vehicles in 2015.

The Chinese government has gone all out to promote alternative-powered vehicles to reduce vehicle emissions and encourage development of EV technology by domestic automakers.

It has also set minimum EV sales targets for China's 27 provinces and four municipalities. By doing so, the government expects domestic Chinese automakers to sell 1 million EVs and plug-in hybrids annually by 2020 and 3 million a year by 2025.

39. China to Probe Reports of Electrified Vehicle Subsidy Fraud

China's central government will investigate reports that companies are committing fraud to obtain state subsidies for electrified vehicle sales as it seeks to ensure the huge sums spent on promoting the use of emission-free autos are going to legitimate automakers. The finance, industry and science ministries will start a probe with the National Development and Reform Commission and severely punish and blacklist violators, Finance Minister Lou Jiwei said at a recent forum in Beijing. Results of the investigation will be released to the public, he said.

Chinese media have reported on companies that sold poor-quality vehicles to shell companies to obtain state subsidies. If true, the reports suggest that China has made less progress in promoting the use of electrified vehicles than painted by official statistics.

China has given consumers and automakers subsidies to promote the use of electrified vehicles as part of a national push to reduce tailpipe emissions and imported oil consumption.

40. As China Cuts Subsidies, Automakers' Electrified Vehicle Plans Differ

China will maintain plans to gradually phase out subsidies for electrified vehicles until they are eliminated in 2021 and allow the market to determine the direction of green car development, Finance Minister Lou Jiwei said.

But auto executives speaking alongside Lou at an industry conference this month in Beijing laid out different visions as to which technology the market will favor: Tesla-style electric vehicles or plug-in hybrids currently produced by Volkswagen AG and others.

Green car sales more than quadrupled in 2015 after years of subsidies and preferential government policies, as China surpassed the United States to become the world's largest market for electric cars.

The government sees so-called new-energy vehicles, a catch-all for pure electric, hybrid and fuel cell powered cars, as a means for China's automakers to catch up to foreign competition while combating pollution that chokes many urban areas.

Lou reiterated plans to cut subsidies 20 percent over the next two years and 40 percent by 2019-20. China will eliminate subsidies altogether after 2021 so that the industry does not grow dependent on them.

Instead, Lou said China should pursue market-based policies. He praised California's emissions policy, under which Tesla can generate environmental credits from its emissions-free vehicles and then sell the credits to other companies.

California's policy is an example to learn from, he said. China has yet to institute a similar system.

"Credit trading is the most effective way to ensure government neutrality on the technology's development. The market should be able to choose the technical route," said Lou.

Other automakers, such as Beijing Automotive Group and startup electric car maker NextEV, also praised Tesla as a model for development.

Executives from Volkswagen and BMW AG said they remain focused on plug-in hybrids as the most viable technology in the near term as China transitions toward EVs.

"Once we leave the city we are forced to confront the problem of a nationwide high-powered charging infrastructure -- if you really see it as a realistic goal, I personally have some doubts -- to drive pure electric over long distances," said Jochem Heizmann, head of Volkswagen Group China.

VW instead favors plug-in hybrids that can use electric motors for city driving and switch to gasoline engines for longer intercity drives.

Chairman Wang Chuanfu of BYD, which makes China's best-selling plug-in hybrid, said he expects buses to achieve full electrification, with commercial vehicles being completely electrified within the decade and passenger cars being fully converted by 2030.

41. China Issues E-Vehicle Infrastructure Policy

China's Ministry of Finance released details of a plan to increase subsidies to build charging stations for hybrid and electric plug-in vehicles. In documents released January 18, the ministry said central government subsidies will be given to charging infrastructure operators, particularly those in three "key air pollution control areas" in the region around Beijing municipality, Tianjin municipality and Hebei province; the region around Shanghai, including Jiangsu and Zhejiang province; and the region around the Pearl River Delta in Guangdong province. Other targeted areas include Shandong, Shanxi and Hainan provinces.

Local governments will have to meet certain plug-in vehicle quotas to access the subsidies as part of the overall promotion plan, according to the documents. Under the new program, if a state-level municipality such as Shanghai can get 30,000 new plug-in vehicles on the road, it would be eligible for 90 million yuan (\$13.7 million) in subsidies from the central government that would go toward paying back charging operators and installers for putting in the infrastructure. Additional

funds would be available for hitting targets above that amount, with a cap of 120 million yuan per province or state-level municipality.

Lower targets and smaller subsidy levels would be available in the provinces of Anhui, Jiangxi, Henan, Hubei, Hunan and Fujian, with another tier of targets and subsidies applicable to the rest of the country.

These areas would have to provide plans on charging infrastructure and management to the Ministry of Finance, Ministry of Science, Ministry of Industry and Information Technology, National Development and Reform Commission, and National Energy Administration before the end of April, or they will not be allowed to participate in the program.

Expanded charging infrastructure, subsidies for purchases, streamlined registration for license plates in certain cities, and policies that allow e-vehicles access to areas where conventional vehicles may be prohibited are helping to spur sales countrywide.

The Ministry of Finance said areas should not engage in “invisible local protectionism” or “disguised obstacles” that promote locally made vehicles over other domestic or foreign brands.

The China Association of Automobile Manufacturers also released a document January 18 outlining e-vehicle policies it expects to see in 2016, including e-vehicle battery recycling regulations, a draft lithium ion battery industry technology policy, several charging system standards, business regulations for e-vehicle manufacturers, and charging infrastructure management policies for private residences.

At the end of November 2015, the Development and Reform Commission released a charging infrastructure development plan for the 13th Five-Year Plan (2016-2020) period, which set a goal of installing 4.8 million charging stations by the end of the plan.

42. China Launches New Pollution Prediction System

The Chinese Ministry of Environmental Protection (MEP) has created a new air quality forecasting system, which allows people to predict when pollution levels will be hazardous to health. The government site was launched on New Year’s Day, just weeks after US technology giants IBM and Microsoft revealed they were developing smog forecasting systems for the Chinese market. The MEP technology allows users to see forecasts up five days in advance across 32 major cities and 27 provincial capitals. The advances in pollution forecasting, a nascent but fast-growing market, come in response to growing public awareness.

43. China's First Environmental Inspectorate Gets To Work

China has launched its first central environmental inspection team, reported state news broadcaster Xinhua. The central government has sent a team to conduct a month-long environmental protection inspection of Hebei Province to the west of Beijing. Hebei is one of China’s most heavily-industrialized provinces. “The inspection team will go about its work in a number of ways, including hearing reports, reading materials, carrying out investigations and holding forums, holding private talks, accepting reports and doing random on-the-spot checks,” said Zhai Qing, deputy chief of the inspection team. The commission is expected to report its findings later this year.

44. China Continues Its Hunt for Environmental Transgressors

China has tightened regulations for companies violating environmental protection laws, announced the MEP. The government said that forging or tampering with monitoring data will be severely punished. A new document published on the MEP website sets out around 30 scenarios that count as an infringement as a warning to companies. The move is part of a two-year probe to root out falsified air quality data. Some local governments make monitoring stations fabricate or tamper with air quality data to help meet national pollution standards, Xinhua reported. Last year, provincial governments were told to cut air pollutants by 5%-25% by 2017, compared with 2012 levels. China will target more “key” pollutants in 2016 under its next Five Year plan in March.

45. China Imposes Price Floor for Oil Products

China has imposed a floor price of US\$40 (264 yuan) per barrel of oil, around 25% above the international market price, reported the China News. The measure is part of government efforts to curb fuel consumption and shore up domestic oil production.

The National Development and Reform Commission said the price of fuel, such as gasoline, will not be cut in line with crude oil as long as it trades below US\$40 a barrel. Analysts say the price floor is, in effect, a massive subsidy that will be paid for by consumers to China's oil companies.

The measure could also prevent a spike in consumption of petrol and diesel from Chinese motorists at a time when vehicle pollution is a major cause of smog. The government is also trying to meet targets on raising sales of electric vehicles, which become less attractive to some motorists when oil prices are low. In the US, the crash in oil prices has been blamed for increasing demand for gas-guzzling vehicles.

46. China to Increase Technology Use to Monitor Pollution

China will increase its use of advanced technologies to monitor pollution, according to a plan the National Development and Reform Commission released January 21. Broad aims of Internet+Ecology give the NDRC—the country's top planning body—the lead in helping other ministries, provinces and local governments establish natural resource and environmental monitoring systems.

The plan envisions what eventually would become an integrated database of information on energy use, coal use, water, air, forest, grassland, wetland and marine resources to be jointly established by the Ministry of Land and Resources, Ministry of Environmental Protection (MEP), Ministry of Water Resources, Ministry of Agriculture, State Oceanic Administration (SOA), and State Forestry Administration (SFA).

An energy-consumption database—gathering real-time data from major energy users—will be created for “big data” analysis, with pilots to start this year, the NDRC said.

The plan includes a multisource system of mobile emissions and pollution monitoring to supplement fixed monitoring. That Ministry of Environmental Protection and the State Oceanic Administration will run that project. The agencies expect to begin posting real-time data online by the end of this year, the government said.

Other aspects of the plan outlined January 21 include:

- the State Forestry Administration will use mapping and sensing data to monitor forests;

- several ministries will gather data to map and monitor “ecological red lines,” areas where development will be restricted, and to surveil endangered species and habitats;
- NDRC, MEP and the Ministry of Industry and Information Technology will pilot an improved system of processing environmental data and information related to corporate “green credit” transactions and loans;
- MEP and SOA will establish early warning and risk monitoring networks for potential environmental problems, with primary focus on heavy metals, hazardous waste and dangerous chemicals;
- government also said it will use data to help it improve recycling and track electronic waste.

47. China Asks For Urban Ban On High-Sulfur Diesel in Clean Fuel Push

China has asked local governments in 11 more economically developed Eastern provinces to ban in urban areas the selling of high-sulfur diesel that is used for industrial and farming purposes rather than in automobiles. The request comes after China rolled out "national five" emissions standards for gasoline and diesel vehicles in these provinces. The standards are equivalent to Euro V specifications that allow a maximum sulfur content of 10 parts per million (ppm).

Due to lax supervision, however, "general diesel" or diesel with a high-sulfur content is still being sold at urban petrol stations in the provinces that come under the new policy, said the National Development & Reform Commission (NDRC) in the document posted on its website.

Only kiosks in rural areas or along the rivers should be allowed to sell high-sulfur diesel, the NDRC said.

The tighter fuel standards are an attempt to tackle air pollution. Emissions from automobiles, especially from diesel-burning trucks, are one of the main contributors to the choking smog that plagues many Chinese cities. "Along with China's accelerating fuel upgrades, the problem of having the lower-grade fuel quit the market has become increasingly prominent," the agency said. "Especially as general diesel is being sold to automobiles illegally, marketing of (higher quality) automotive diesel has been adversely affected."

The agency requires all service stations to mark clearly the names and quality of their fuels to help motorists select the grades they want and to allow authorities to supervise fuel quality, the NDRC said.

By January 2017, "national five" will cover the whole country, it said, in line with an announcement last April that moved the roll-out up by one year.

Refiners have started boosting output of cleaner fuels, and also raised imports of diesel to 145,000 tons in January as recorded by customs data, despite an overall domestic surplus that has turned China into a leading exporter of the fuel. Traders said the rare imports, which were about 20 percent of the diesel China exported last month, were driven in part by the need to meet the cleaner fuel standards.

China, the world's largest fuel user after the United States, has more than 90,000 petrol stations. Nearly 60 percent of them are owned or run by dominant state refiners Sinopec Corp and Petro China, the rest by smaller state oil companies like Sinochem Corp and independents.

The big state refiners say they have spent billions of dollars upgrading facilities to make the cleaner fuels.

48. China to Boost Government Purchases of New Energy Vehicles

China will increase to more than half the ratio of purchases of new energy vehicles by some government departments, the State Council said recently, the latest move to boost green development in a country battling to rein in pollution. The government has been pushing electric vehicles as a way of reducing the smog that frequently blankets Chinese cities, helping sales to quadruple last year.

"The annual purchase ratio of new energy vehicles for central government bureaus, city government departments with new energy vehicle promotions, and public institutions will be raised above 50 percent," the State Council, or cabinet, said in a statement on a meeting chaired by Premier Li Keqiang.

That target is much higher than the State Council's directive in 2014, which stipulated that more than 30 percent of government fleet purchases from 2014 to 2016 must be EVs or plug-in hybrids.

But the statement on the meeting, posted on the government's website, gave no details of when the policy would take effect.

Automakers' latest projections for rapid growth of China's green car market have added to concerns of worsening smog as the uptake of electric vehicles powered by coal-fired grids races ahead of a switch to cleaner energy. China plans to convert the grid to renewable fuel or clean-coal technology as part of efforts to cut carbon emissions by 60 percent by 2020.

49. Environmental Protection Needs Spur China's Jing-Jin-Ji Experiment

China is in the midst of a massive, long-term project to unify the infrastructure, bureaucratic and regulatory systems in the area known as the Jing-Jin-Ji—which includes Beijing and Tianjin municipalities and the surrounding province of Hebei—to create a megalopolis in the next decade in an area that is home to 130 million people.

The area is notorious for some of the world's worst air pollution, with Beijing's average small particulate matter (PM-2.5) density level at about 80 micrograms per cubic meter—around twice the national target.

The area is seeing more constraints on water resources due to overuse and contamination. Some areas also are acutely damaged by soil pollution, in addition to the residential, industrial and construction waste piling up around the capital.

China's hope is that by building more infrastructure, including high-speed rails, metro systems and intercity fast trains, and upgrading the economic profile of the region by reducing its dependence on heavy industry, it can begin to clean up the air, shorten lengthy commutes, ease traffic congestion and make the region more livable.

Unifying the region's environmental policy is the goal behind several recently announced plans and pilot projects. Late last year, officials unveiled an ecological protection plan for the Jing-Jin-Ji and are crafting a pollution prevention and treatment plan. Buttressed by amendments to China's new Air Pollution Control Law that went into effect January 1, the Jing-Jin-Ji will aim to

lower its small particulate matter density level to 73 micrograms by the end of 2017 and 64 micrograms by the end of 2020.

The challenge ahead will be how to manage and allocate all these targets, as different cities within the region have different levels of economic development and industrial structures. For instance, most major heavy industry has moved out of Beijing to neighboring Hebei and other nearby provinces. Knowledge and capacity for implementing environmental management differs throughout the region, with areas of Hebei often seen as lagging behind the two state-level municipalities that make headlines when air pollution levels meet red-alert status, as they did last December for the first time since the new warning system was established.

Hebei will need assistance in terms of mechanisms to fund industrial transformation, pollution treatment and prevention, said Wang Jinnan, deputy director of the Ministry of Environmental Protection's (MEP) environmental sciences academy.

On January 4, the MEP said a special investigation team has been established to help Hebei governments handle environmental problems. The same day, it announced that Hebei is being made a pilot province for the rollout of an environmental monitoring network the ministry hopes to eventually extend nationwide. And on February 4, the MEP announced in initial findings from the investigations that at least 120 company executives and local officials had been found to have violated environmental regulations, or were derelict in their duty. Some of the more severe cases could be transferred to judicial authorities.

Hebei also will be the first pilot province where bureaucratic reforms will implement vertical management of the environmental protection bureau (EPB) system, with the federal Ministry of Environmental Protection at the top and provincial environmental protection bureaus directly overseeing those below them.

In the past, local EPBs were funded by, and answered directly to, the governments in their jurisdiction.

Hebei is also among the first provinces to start implementing new pollutant emissions licensing management policies, and judicial departments in the province have started to set up special teams to handle ecological crimes.

50. Beijing's Air Quality Improving, Despite Winter Setback, Official Says

Air quality in China's capital, Beijing, has improved over the last two years, a senior environment official said on February 19th, despite a dramatic three-week episode of hazardous smog that drew worldwide attention last year. The thick smog that shrouded the city for 22 days over November and December had distorted the picture of Beijing's environmental record since 2014, city official Yu Jianhua told reporters.

"Many people feel things got worse, because the impression of the pollution in December remains very deep," said Yu, referring to an episode that sparked Beijing's first pollution red alerts.

The impression would have been different if the same number of heavy smog days had been scattered over several months, Yu, a director at the Beijing Municipal Environmental Protection Bureau, told a news briefing.

Concentrations of sulfur dioxide, a gas that can cause breathing difficulties, fell 49 percent in Beijing from 2013 to 2015, while particulate matter smaller than 2.5 micrometers, a dangerous airborne component of smog, fell 10 percent, Yu added.

Weather conditions, including unusually high humidity and low wind speeds, had worsened the smog last year, but authorities still needed to respond better to emergencies, Environment Minister Chen Jining told reporters.

Yu was speaking at a briefing on efforts to integrate Beijing with neighboring Hebei province and the port city of Tianjin, a priority set by President Xi Jinping in 2014 to ease regional economic and environmental pressures and cut congestion in the capital. (See story above.) The efforts include a five-year plan for integrated development until 2020 that envisages a 1,000-km (621-mile) rail network, among other projects, as well as unified regional pollution standards.

Wang Haichen, an official of Beijing's planning commission, said it aimed to shift manufacturing industries, research bodies and other organizations that have no critical reason to be in the capital to outlying cities. Environmental concerns had prompted authorities to force a total of 718 firms to move out of Beijing in 2015, he added.

Hebei, which produces around a quarter of China's steel, had seven of the country's 10 smoggiest cities last year, despite efforts to clean up industries and cut coal consumption.

The reluctance of China's provincial governments to pool resources with each other has fed industrial overcapacity and created huge income disparities. Unable to lure investment in high-tech businesses, Hebei had long relied on low-end steel production to keep its economy afloat, worsening pollution and leaving it painfully exposed to China's industrial slowdown.

51. Indian Government Decides To Directly Shift From BS-IV to BS-VI Emission Norms

Ministry of Road Transport & Highways has decided to leapfrog from BS-IV to BS-VI emission norms directly by 01.04.2020. A unanimous decision was taken in a meeting chaired by Minister of Road Transport & Highways and Shipping Shri Nitin Gadkari and attended by Minister of Heavy Industries and Public Enterprises Shri Anant Geete, Minister of Environment, Forest and Climate Change Shri Prakash Javadekar, and Minister of Petroleum and Natural Gas Shri Dharmendra Pradhan along with senior officials of the Ministries to directly switch over to BS-VI emission norms from the present BS-IV emission norms. Therefore, the Government has taken a decision to skip BS-V emission norms altogether.

The Ministry will soon issue a notification in this regard. The Ministry of Petroleum and Natural Gas has assured supply of BS-VI fuel across the country by 01.04.2020. The Ministry has withdrawn an earlier draft which had suggested shifting to BS-VI after switch to BS-V. The Ministry is also sure that the Indian Automobile industry with its technical competence and commitment to environment will rise to the occasion and support the decision.

It may be mentioned that the Auto Fuel Policy had recommended implementation of BS-VI norms by 2024. Earlier in the draft notification by the Ministry the date was advanced to 01.04.2021 and now it has been further advanced to 01.04.2020.

The announcement is the latest step taken by India's government and courts to fight urban smog after New Delhi and nine other Indian cities landed on a World Health Organization list of the world's 15 most polluted municipalities, with the capital topping the ranking. On January 6 the

country's Supreme Court upheld a temporary ban on registrations of large diesel cars in New Delhi. Automaker executives, already reeling from that decision, said the accelerated emissions timetable poses a risk due to hasty implementation.

Toyota Motor Corp. is looking at the government's decision and will continue to improve the environmental performance of its cars, as air pollution is a growing concern that requires a "comprehensive approach going forward," the Japanese manufacturer said in an e-mailed response to questions from the press.

"We need to have some certainty on whether we'll be able to sell our cars," said Pawan Goenka, executive director at Mahindra & Mahindra Ltd., India's biggest sport utility automaker. "If we invest all this money in developing vehicles that meet these norms, and after meeting these norms, they're banned, it's pointless. I would like to see some clarity, and a framework would help me decide on investments."

Maruti Suzuki India Ltd., the largest car manufacturer in the country, also criticized the ministry's plan. While shifting to BS-6 will be relatively easy for gasoline models, meeting the norms with diesel engines will be difficult, Chairman R.C. Bhargava said. "Nobody in the world has done it," Bhargava said in a telephone interview from New Delhi. "We need time to adequately test the technology, as it needs to be customized for each car. If cars start catching fire, who'll be responsible?"

The government is not reconsidering its decision, Nitin Gadkari, India's minister for road transport and highways, said during a January 11 press briefing in New Delhi. "When the same carmakers are following the same norms across the globe, then why not here?" he said. "Pollution is a growing problem and we need to wake up."

The transport ministry plan comes after the Supreme Court upheld an order that restricted registrations of cars with diesel engines larger than 2.0 liters through March in a bid to stem worsening air pollution in the capital. The Delhi government also is testing a program that restricts the use of a vehicle according to its license plate number.

Cars currently sold in the country are subject to BS-4 standards, which were rolled out in 2010 and are being phased in through 2017.

52. Indian Automakers Agree To Produce BS-VI Compliant Vehicles from April 2020

Major automobile manufacturers assured the government that they will produce BS-VI fuel compliant vehicles of new models from April 2020. However, they demanded that the government unveil a scrapping policy to phase out old vehicles and ensure that there are no policy flip-flops in shifting the clean fuel timeline due to pressure from any quarter.

Over two dozen CEOs from the industry including Pawan Goenka, Vikram Kirloskar, Sumit Sawhney, Pawan Munjal and Rajiv Bajaj attended a meeting called by road transport minister Nitin Gadkari for roll out of BS-VI fuel complaint vehicles.

The industry asked the government to give it some more time to produce existing models which will be compliant to BS-VI emission norms and also to ensure that the fuel is made available across the country.

While automobile manufacturers submitted that vehicular pollution is a small contributor to air pollution, sources said Gadkari said that there is huge public demand for cleaner air and for "every bit of pollution counts" irrespective of its source.

Gadkari has sought views of the industry on the scrapping policy that his ministry proposes to introduce soon.

Accepting the target set by government as a "challenging" one, Society of Indian Automobile Manufacturers (SIAM) president Vinod Dasari said, "We explained to the minister that world over shifting from BS-IV to BS-V takes about five years. Shifting from BS-V to BS-VI takes six years. There is no country ever which has bypass BS-V directly. It takes 10-12 years to go directly from BS-IV to BS-V". "We had suggested that we will do it in seven may be even in six years (2023). But he asked us to bring BS-VI by 2020. We will work out the way to bring new models by that time."

Two representatives from a major foreign player and a domestic manufacturer, who attended the closed-door meeting, said it is not "mission impossible" and they have to comply once the government has taken the decision to roll out the emission norms.

Earlier in the day, addressing a conference organized by Scania, Gadkari had said that there is no question of shifting the timeline set by the government. "Neither will we put pressure on anyone nor will we come under anyone's pressure. Those who fail to comply will face the music," he had said.

The minister has also asked the industry to make the vehicle safer as "nothing is costlier than anyone's life" even as the industry welcomed steps being taken by government to fix road engineering faults to avoid crashes.

Gadkari also urged automakers to develop home-grown technologies to build environment-friendly car engines under the Make in India drive.

53. BS-VI Compliant Car to Cost Rs 36k for Manufacturer; But 82% Less Polluting

To upgrade a BS-IV emission norm compliant diesel car to BS-VI compliant would cost a manufacturer just Rs 36,000 but such a vehicle would be 82% less polluting, amicus curiae Harish Salve told the Supreme Court. This information negated the stand taken by the automobile industry, which had claimed before the SC during the last hearing that BS-VI norms were proposed to be enforced from 2024 and if advanced to 2020, it would force manufacturers to invest huge amounts in technology, making their business unviable.

Salve, in his detailed analysis submitted to the SC, tried to demolish the manufacturers' argument. Citing a private study, Salve said to upgrade a BS-IV compliant diesel car to conform to BS-V emission standards, the manufacturer would have to spend Rs 15,800.

BS-V norms did not involve any significant change in engine technology except for improvement in fuel atomization with injection pressure 1600-1900 bar, Salve said. Even a BS-VI compliant diesel car had BS-IV compliant engine technology, he added.

But an additional cost of Rs 20,280 would be incurred in making the car BS-VI compliant to improve injection pressure to 1800-2100 bar and fit diesel particulate filter for PM control and lean NOx trap, Salve said.

In petrol vehicles, upgrading a BS-IV car to make it BS-VI emission norm compliant would cost just Rs 1,200.

The benefits in terms of reduction in emission of pollutants by investing just Rs 36,000 in a diesel car was huge, Salve said. It would reduce PM emissions by 82% and NOx by 68%. In a petrol car, a Rs 1,200 investment in a car would reduce NOx emissions by 25%.

But making cars BS-VI compliant would be meaningless if the fuel supplied by government-owned oil companies continued to be BS-IV or BS-III standard, Salve said. And these oil companies stood to bear the brunt of anti-pollution measures.

"The capital investment estimated for refiners for fuel quality change to BS-IV all over the country is Rs 45,000 crore and to go to BS-V and BS-VI norm is Rs 35,000 crore," Salve said. Salve suggested leapfrogging of fuel norms from BS-IV to BS-VI by skipping BS-V.

"It will be more cost-effective to go to Euro-V/VI level at one go as the two step cost improvement could be avoided. It is clear that falling fuel prices is making it possible to make this investment at the earliest," he added.

Salve said the world was moving fast to Euro-VI fuel standard and by 2017, it is estimated that most countries, including Sri Lanka, would be using Euro-VI fuel. "Most of these countries are fuel and vehicle importing countries and so it could impact our competitiveness if India does not move to Euro-VI level," he added.

54. Government's Fuel Policy Was Major Culprit SIAM Tells Supreme Court

With 'polluting' diesel cars becoming a concern leading to a ban on registration of big diesel cars and SUVs in the National Capital Region (NCR) till March 31, the Society of Indian Automobile Manufacturers (Siam) told the Supreme Court that the government's fuel policy was the major culprit behind pollution.

Siam attempted to dispel the impression of the court and amicus curiae Harish Salve that diesel cars emitted much more pollutants than petrol cars by submitting data gathered through studies.

However, it said faster implementation of BS-V and BS-VI emission norms would drastically reduce pollution caused by cars. However, it was doubtful of achieving results on the ground if the fuel supplied did not conform to BS-V and BS-VI standards.

During the last hearing before a bench headed by Chief Justice T S Thakur, the government had admitted that it would be able to provide BS-, IV grade petrol and diesel all over India only by April 2017. At present, only north India and 33 select cities get BS-IV fuel supply.

Siam said automobile manufacturers were ready to bring in BS-V compliant cars by 2019, one year before the government deadline. However, it said that without matching fuel, curbing pollution caused by cars would not be possible.

"Non-availability of BS-V fuel by 2019 is holding the industry back. It is ironical that on the one hand, India has been exporting higher grade BSV/VI fuel to other countries for many years and on the other hand, the same high grade fuel is not made available for domestic use to overcome the serious pollution challenge," Siam said.

"Industry would ideally have liked to see BS-V emission norm being implemented in 2019 -- one year earlier than what is being planned by the government -- which will bring diesel engines almost at par with advanced diesel engines in the US with DPF (diesel particulate filter) devices and start the process of PM 2.5 reduction one year earlier than the government proposed deadline of 2020," it added.

The industry body countered Salve's charge that diesel cars caused 27 times more pollution than a petrol car citing studies by World Health Organization (WHO) and International Agency for Research on Cancer (IARC). Siam said, "WHO and IARC studies pertain to untreated diesel exhaust from old vintage technology diesel engine in closed environment. The exhaust emitted by such an engine was not treated by a catalytic converter or a particulate trap which is used in a modern technology vehicle."

55. December Passenger Vehicle Sales Up in India

Domestic passenger vehicle sales in December rose 10.46% from a year ago, according to data released by the Society of Indian Automobile Manufacturers (SIAM). The increase was mainly attributed to low fuel prices and year-end discounts.

Sales of commercial vehicles in the same month increased 11.45% from a year ago to 56,840 units, SIAM said.

Weak consumer sentiments in rural markets, however, affected two-wheeler demand. Sales of two-wheelers dropped by 3.10% to 1,167,633 units during the month, while demand for motorcycle went down by 5.93% to 724,807 units, while that of scooters increased by 3.12% to 386,305 units.

56. Plea in India Supreme Court to Extend Diesel Ban to Small, Mid-Segment Cars

An appeal filed in the Supreme Court (SC) has sought a modification to its recent order banning registrations of diesel SUVs of more than 2000cc engines. Dr Sanjay Kulshrestha, a pediatric surgeon who impleaded himself in the MC Mehta vs Union of India case against high air pollution levels in Delhi, appealed that mid- and small-segment diesel cars be also brought under the ambit of the ban.

SC is likely to hear the case on February 18 and revisit the ban imposed till March 31. The auto industry has already sought vacation of the order.

Dr Kulshrestha, in his submission to the SC, referred to how auto companies were "trying to defy the SC order of banning big-segment diesel cars...by making the engine capacity 1.99 thousands, i.e., just less than the limit for banning high-end diesel cars. This does not reflect moral commitment of auto companies towards the health of our citizens".

The petition against poor air quality in cities was being heard by National Green Tribunal (NGT) until recently. But after the NGT bench recused itself as it was already being heard by the SC, Kulshrestha impleaded himself in the MC Mehta case.

In his submission, he said the SC was considering a one-time green tax or a compensation charge to discourage the sale of certain segments of diesel cars, but people who bought these cars after paying the tax would continue to have the "legal right to pollute".

He added that Euro-IV-compliant diesel cars were emitting about 27 times more particulate matter (PM) and 10 times more oxides of nitrogen (NOx) than their petrol counterparts. "In fact, only at Euro-VI/BS-VI are diesel cars more or less at par with petrol ones".

The plea also cited how one company was already making a petrol-run SUV of engine capacity 2.2 liter, but only for export.

"That clearly shows that every alternative is already there in the pipeline. If we allow such diesel cars, (the) petitioner feels there should be some guidelines up to what extent such polluting vehicles would be allowed in a year", the submission said. Kulshrestha demanded that auto companies and refineries work on leapfrogging to BS-VI at the earliest.

57. India Budget 2016 Increases Taxes on Auto Industry

Union Budget 2016 has proved to be a mixed bag for the automotive industry. While there has been a significant focus on bettering the road infrastructure across the country which might benefit the auto industry, additional taxation on cars could impact the growth of the automotive industry.

An allocation of Rs. 55,000 crore² in the Budget for Roads and Highways has been proposed which will be further topped up by additional Rs. 15,000 crore to be raised by the National Highways Authority of India through bonds. The total investment in the road sector including PMGSY³ allocation would be 97,000 crore during 2016-17.

The Automotive industry had been expecting a scrappage policy which would also help address the pollution but no major announcement came in the budget.

Car & SUV prices will increase substantially which can cause a major drop in demand. An additional 1% infrastructure cess is to be levied on Petrol, CNG, LPG cars while an additional 2.5% infrastructure cess is to be levied on diesel cars below certain engine capacity and 4% on bigger diesel cars and SUVs. While an additional 1% extra luxury cess to be put on cars costing above Rs 10 lakh⁴.

There seems to be some focus on controlling pollution from cars but nothing was introduced for electric and hybrid vehicles other than exempting them from the infrastructure tax.

58. India's Air Pollution Levels Could Surpass China's

The average Indian faced more particulate pollution than the average Chinese person in 2015 — the first time on record, Greenpeace India said in a February 24 study. Air pollution levels in India, especially North India, have risen during the past decade with 2015 being the most polluted year on record, it said in the report after analyzing satellite-based particulate matter measurements. Pollution exposure for the average Chinese person peaked in 2011 and has seen dramatic improvement, said Greenpeace. Concentrations of fine particulate matter fell 17 percent in China

² 1 crore equals 10 million.

³ Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched on 25th December 2000 as a fully funded Centrally Sponsored Scheme to provide all weather road connectivity in rural areas of the country. The program envisages connecting all habitations with a population of 500 persons and above in the plain areas and 250 persons and above in hill States, the tribal and the desert areas.

⁴ 1 lakh equals one hundred thousand.

from 2010 to 2015 and rose 13 percent in India, according to Greenpeace. The U.S. experienced a 15 percent decline. China could serve as an example of how specific measures can help reduce pollution, Greenpeace said. The world's second-biggest economy has established a set of targets for improving air quality in key regions and for boosting clean energy use. China's national-level efforts have produced improvements along with stricter emission standards for heavy industry and curbs on coal consumption, it said. Greenpeace advised India to set a deadline for national air quality standards to be met and to create a regional action plan involving the highly polluted areas from the states of Punjab in the north to West Bengal in the east.

59. IIT-Roorkee Study Says Odd-Even Didn't Dent Delhi's Air Pollution

The odd-even rule is set to make a comeback in Delhi from April 15, but scientists seem to be divided over the success of the much-hyped formula that restricted plying of cars on the capital's roads for the first 15 days of the year. According to a new research from the Indian Institute of Technology (IIT)-Roorkee, no "significant" change in air quality was registered after the odd-even scheme came into force in Delhi.

The study, conducted by the IIT-Roorkee's civil engineering department and center of excellence in disaster mitigation & management, has said the odd-even formula for cars implemented in Delhi from January 1 to 15 this year failed to bring significant improvement in air quality.

The researchers analyzed data from Delhi Pollution Control Board (DPCB) and Delhi Pollution Control Committee (DPCC) for four locations in Delhi - Mandir Marg, RK Puram, Punjabi Bagh and Anand Vihar. The data was for the month of December 2015 and January 2016.

Researchers measured air quality profile before, during and after the odd even trial was implemented in Delhi and found no significant change in air quality due to the scheme. Kamal Jain, professor of civil engineering at the institute, who conducted the study with his team, said, "We noticed Air Quality Index (AQI) values at 550 on an average both the months. We found no long-lasting fluctuations in this value. So, our study does not suggest any significant change in air quality after the vehicle restriction scheme came into effect in Delhi." An AQI greater than 300 is considered "hazardous" and would trigger health warnings.

Jain also said that the fluctuations seen in levels of sulfur dioxide (SO₂), particulate matter (PM 2.5), coarse dust particles (PM 10), nitrogen dioxide (NO₂) and ammonia (NH₃) in the period may not have been due to reduced vehicle volume during odd-even scheme but other factors such as weather, temperature and wind speed.

A study by researchers at the Energy Policy Institute at the University of Chicago (EPIC) and Harvard University had found reductions in pollutants in the afternoon hours in Delhi from January 1 to 15. According to the study, PM 2.5 declined by 13% on an average during the odd-even period.

Commenting on the Delhi government's decision to roll out the odd-even formula from April 15 to April 30, Jain said, "The scheme will have an insignificant impact on decreasing air pollution levels in Delhi. Vehicular pollution only constitutes about 5% of total air pollution; there are other sources of air pollution such as paddy burning in Punjab and Haryana, and pollution due to industries."

The study, which included PhD student Himani Maheswari, said that the Delhi government should come up with other measures to decrease air pollution. "We suggest other measures to curb

pollution than the odd-even scheme," said Jain. Jain suggested that the government should make it mandatory for consumers to have parking space for cars.

60. Emission Norms for All Vehicles in India to Get Tougher From April 2020

Ending all speculations, the government has issued a draft notification for stricter emission norms (BS-VI) for all categories of vehicles including two-wheelers and three-wheelers, which will come into effect from April 1, 2020. The road transport ministry has gone ahead with stricter norms for two-wheelers, which will be at par with the emission standards set in Europe.

At present, the nitrogen oxide (NOx) emission limit for a BS-IV petrol car is 0.08 gram/km, while for a two-wheeler it is 0.39 gram/km. BS-IV norms for two-wheelers have been notified and will become effective from April 2016 for new models and April 2017 for the existing models.

But once the BS-VI emission norms are enforced, the NOx emission will be limited to 0.06 gram/km and it will be equivalent to Euro norms.

Long-term NOx exposure may decrease lung function and increase the risk of respiratory symptoms. According to studies, most of the NOx pollution in cities come from motor vehicle exhaust. The decision gains importance considering the findings of certain studies pointing at more pollution being caused by two-wheelers in cities, including Delhi.

61. Trade Pact Provisions Loom Large in South Korean Policy

Bilateral free-trade agreements with China and the European Union will increasingly influence South Korea's environmental policymaking this year. The agreement with China, which is awaiting ratification in both countries, would bring a set of improvements to efforts to contain air pollution between the neighbors.

Cross-boundary air pollution from China is a high priority for South Korea because of the country's proximity to China-based pollution origins. The free-trade agreement, formally signed in June 2015, requires both countries to uphold each other's environmental laws and promote bilateral cooperation. "The parties recognize that it is inappropriate to encourage trade or investment by weakening or reducing the protections afforded in its environmental laws, regulations, policies and practices," the trade agreement states.

Increased cooperation is pledged "in the field of environment, including in the areas of prevention and control of air pollutants, committed in the existing bilateral agreements."

Ju Dae-young, director of the Planning and Budget Division at the environment ministry, said, "We are pursuing cooperation on airborne particulate matter reduction to curb air pollution in China as a source and promote South Korean companies' involvement in China's environmental industry."

A pilot program for applying South Korean environmental technology to China's thermal power stations and steel mills, started in 2015, will also continue in 2016.

The European Union's Euro diesel engine emissions standards have been embedded in South Korea's pollution regulation of motor vehicles since 2005, even though the South Korea-EU free trade agreement did not take effect until 2011. Accordingly, Euro 6/VI has been in force for new diesel passenger and commercial vehicles since September 2015.

Furthermore, all new diesel cars and light-duty diesel-powered vehicles sold in South Korea will be required to meet on-road emissions standards based on real-world driving conditions beginning in September 2017 in line with the Real-Driving Emissions-Light Duty Vehicles testing scheme finalized by the European Commission in October 2015.

South Korea has been implementing official climate change policy programs since 1999 under a national strategy. The government is currently working on a new five-year national strategy, the second such plan mandated by the 2010 Framework Act on Low Carbon Green Growth to require the central and local governments to formulate various climate change efforts.

“The Second National Climate Change Adaptation Plan for the next plan cycle of 2016–2020 will put forth more proactive greenhouse gas reduction efforts,” Song Young-il, director of the Korea Adaptation Center for Climate Change, a government-run climate change think tank, told reporters. “There will be an increased emphasis on grass-roots participation from local governments and private citizens.”

In a departure from the previous pattern, the burden of pressure on compliance with climate change regulatory action will weigh more heavily on motor vehicles relative to industrial factories. The transportation sector as a whole is currently mandated to meet a 34.3 percent greenhouse gas reduction by 2020, compared to business-as-usual levels. The Ministry of Environment's notice (No. 2014-235) on automotive fuel economy and emissions standards, as revised Dec. 30, 2014, will lower the ceiling on greenhouse gas emissions from 140 grams per kilometer for new passenger cars in 2015 to 127 grams in 2016 and to 97 grams in 2020.

The environment ministry's automotive reduction program goes hand in hand with its push for the diffusion of electric vehicles. Government subsidy coverage for electric vehicle purchases will expand to 8,000 units in 2016 from 3,000 units in 2015.

62. Japan to Focus on Return to Nuclear Power, Fuel Cells

In 2016, Japanese Prime Minister Shinzo Abe wants to boost the growth of private-sector environmental technologies with government subsidies and regulatory reforms, while restarting more of the country's 48 nuclear power reactors.

The prime minister said his plans would help reduce greenhouse gas emissions to levels the country had committed to internationally and secure an ample low-cost energy supply.

It also is part of his plan to substantially boost the country's economy by 2020, when Tokyo will host the Summer Olympic Games.

Topping the agenda are multiyear programs to promote hydrogen-powered automobiles and autonomous driving technology, while relaxing tolerance levels on nuclear waste and agricultural chemicals, and reducing subsidies for solar power generation facility construction.

In October 2015, Abe formed his third cabinet after being reappointed to head his ruling Liberal Democratic Party in no-contest, no-vote party election. Abe immediately announced a new plan to boost Japan's gross domestic product by 22 percent by 2020.

The goal is predicated on cheap and stable electric utility bills when more of Japan's nuclear power reactors—48 of which were halted after the Fukushima accident five years ago—are

restarted. Another byproduct of a fuller return to nuclear power would be reduced carbon dioxide emissions, according to various government reports.

In the country's pledge to the United Nations before last year's Paris climate summit, Japan promised to cut carbon emissions 26 percent by 2030 compared with 2013 levels, or a 17 percent cut from 1990.

Japan is further accelerating the development of fuel cell technology to tap hydrogen as a future power source for motor vehicles, homes, offices and factories. Buoyed by the 2015 spring commercial sales of Toyota Motor Corp.'s Mirai, the world's first fuel cell car, Honda Motor Co. and Nissan Motor Co. now are gearing up to follow the lead, while U.S. and German automakers are trying to catch up.

Late last year, Honda CEO Takahiro Hachigo showed off the company's fuel cell concept car that he claimed can travel more than 700 kilometers (437 miles) per charge of hydrogen without releasing any carbon dioxide emissions.

Nissan officials said the company also is developing a fuel cell car and conducting on-road tests. Nissan's fuel cell uses electric vehicle technology, unlike Toyota's and Honda's, and Nissan is developing the technology jointly with Daimler AG and Ford Motor Co., the officials said.

But progress on hydrogen production and distribution has been slow. "The cost is the major hurdle" for building more hydrogen filling stations, as well as the logistics to deliver hydrogen to those stations, said Mikihiko Shibata, manager of information of the Research Association of Hydrogen Supply and Utilization Technology, a government-private organization promoting a shift from fossil fuel to hydrogen. One hydrogen station costs as much as 500 million yen (\$4.1 million) to build, while a gasoline station cost is no more than 150 million yen (\$1.25 million), Shibata said.

By the end of 2015, the number of hydrogen stations in Japan stood at 28, compared to 20 at the start of the year, he said. By the end of March 2016, however, a total of 81 stations are scheduled to start operating—at least officially—and an additional 20 are planned in fiscal 2016, which begins April 1, he said. The Abe government had set a target of 100 hydrogen stations by the end of 2015.

Having experimented with fuel cell technology over several years, the Japanese automakers now are allying with housing, communications and electric appliance manufacturers to tap fuel cells as emergency and eventually night-time power sources.

Kenichiro Yoshida, general manager of the Technology ITS Office in the Ministry of Economy, Trade and Industry, told a recent seminar that fuel cells, electric storage batteries and other next-generation vehicle technologies are not just for mobility but also can be an important source to supply energy to homes, offices and community areas. He said METI would step up development of new materials that can replace lithium-ion batteries in fiscal 2016. The goal is to develop a car that can travel 500 kilometers per charge, or about three times the maximum travel coverage of currently sold electric vehicles, he said. The ministry is preparing to allocate 3.2 billion yen (\$26 million) for this project in fiscal 2016.

In 2016, top Japanese automakers plan to unveil autonomous-driving vehicles that can cruise highways without the driver keeping hands and feet at the controls. Toyota, Nissan and Honda demonstrated their autonomous-driving technologies at a Tokyo auto show in November 2015. Nissan even said it plans to launch for commercial sales a fully-autonomous vehicle in 2020.

For the Abe government, autonomous driving, to be realized by mobilizing advanced information technology, is at the core of Japan's 600 trillion yen (\$5 trillion) growth strategy because it is seen as the ultimate solution to traffic congestion. According to Ministry of Land, Infrastructure and Transport (MLIT) estimates, road congestion from heavy traffic and accidents costs the country as much as 12 trillion yen (\$100 billion) a year.

That economic loss calculates direct losses related to labor, delayed delivery and other logistical impacts, and it does not include the cost of fuel and carbon emissions, according to an MLIT official.

The prime minister's new climate change adaptation program, to be deployed beginning this year, is made up of 76 undertakings in seven areas. Some of the goals of the program are:

- reinforcing sea wave breaks and building stronger river banks,
- extension of technology and financing to Pacific island countries threatened by rising tides,
- development of farm products resistant to rising temperatures and powerful storms, and
- research and development on pharmaceuticals for new generations of diseases induced by rising temperatures.

The Japanese government said it would review the program after five years.

In November 2015, Japan and the U.S. pledged to curb the financing of coal-fired power plants using traditional technology. But this year, Japan is expected to continue promoting plants that employ "clean coal" technology with lower air emissions, not only on its soil but also in other countries.

However, the Organization for Economic Cooperation and Development warned last year that so-called "clean coal" technology won't reduce carbon dioxide as much as had been thought. Nevertheless, Nippon Keidanren, Japan's top business lobby, is prodding the government to cooperate in exporting Japan's coal power plants, which they claim are the world's most efficient and generates far less carbon dioxide than conventional coal-fired plants.

Japan is building a large coal power plant in Indonesia as it also negotiates to sell more plants in Brazil and other countries. Japanese power utilities now operate 48 coal-fired plants, and when non-utility power plants are added, the number is believed to exceed 100 and is still increasing, according to Kiko Network, Japan's top environmental nongovernmental organization

63. Shanghai Bunker Market Sees Minimal Impact Ahead Of Tighter Sulfur Limit

The Shanghai bunker market is seeing little impact ahead of the April 1 requirement for ships at berth to use bunker fuel with a maximum sulfur content of 0.5%, traders in China said recently. "We've talked to ship owners about it and they are aware of it," a trader in Shanghai told the press. "There is ample time to prepare ahead of the April 1 implementation, so there's no big issue," he added.

Shanghai is one of the key ports in the Yangtze River Delta Emission Control Area or ECA, and there are two other two ECA zones, the Pearl River Delta and Bohai Rim.

Traders said Shanghai was understood to be the first port to announce it would implement ECA measures, but other ports in the same ECA zone were expected to announce similar measures before April 1.

It was not yet confirmed if ports in the Pearl River Delta and Bohai Rim ECA zones would follow suit by April 1, but traders said it was unlikely. "This will be a sort of experiment, particularly in the case of Shanghai, which they will watch closely," according to a trader. "They will probably trial it for three months or so to see what reaction there will be and then gradually roll it out to other areas," he added.

Tighter sulfur limits are part of broader regulations detailed in a four-year road map laid out by China's Ministry of Transport to cap the maximum sulfur content of bunker fuel used in ECA zones at 0.5% by January 1, 2019.

The current move to tighten sulfur limits for ships at berth would meet the ministry's requirement that by January 1, 2017, berthed vessels at the specified ports switch to fuel with a maximum sulfur content of 0.5%, except during the first hour after arrival and the last hour before departure.

Apart from tightening sulfur regulations, the Maritime Safety Administration, an agency of the Ministry of Transport, issued a separate notice January 29 on the enforcement of regulations for vessels entering ECAs. It included local authorities having the authority to check engine logbooks recording fuel operations such as fuel switchover dates and times and the sulfur content of that fuel, with documents detailing the ship's fuel supplies to be kept onboard for three years and fuel samples for a year.

That notice also required vessels to switch to using shore power where available and keep records if clean energy fuel was used, and noted the penalties for non-compliance of logbook regulations ranged from warnings to detention and/or fines of Yuan 10,000-100,000 (\$1,530-\$15,303).

"I believe they will be strict about enforcing these regulations," a trader said. "Because this is the first time that they are doing this, they probably don't have much experience, so they won't go too hard on the vessels that run afoul of the regulations... but I think they will progressively tighten and have loopholes plugged as time goes on," he added.

64. South Korea Continues Probe of VW

On February 12, South Korean prosecutors searched the local Volkswagen and Audi offices as part of a probe into emissions fraud, Reuters said. A conviction could result in a jail term of up to seven years, plus fines. Volkswagen and Audi sell most imported cars in South Korea, which is the second-biggest Asian market for diesel cars after India.

65. Fueled By Battery Boom: A Lithium Rush For Australia's Outback?

If electric-car sales continue to rise, then demand for battery cells will rise along with them. That, in turn, will lead to increase demand for the raw materials that make up those cells. Lithium-ion is currently the dominant chemistry for battery cells in electrified cars, and that's creating a lithium-mining boom in the Australian Outback, according to reports.

It's reportedly become a "bright spot" for miners in the region, as prices for other raw materials have fallen. Prices of lithium carbonate--an industrial chemical used in lithium-ion battery cells--have risen 47 percent in 2016 from last year's average, according to Benchmark Mineral

Intelligence Ltd. Those price gains are expected to continue into 2017 and beyond. Citigroup forecasts demand will increase 64 percent from 2015 levels by 2020.

Australian mining companies expect electric cars to be the source of much of this growth. "The demand in vehicles, electric bikes, trucks and buses is going to be enormous," Neil Biddle--executive director of Pilbara Minerals--told reporters.

Lithium from batteries generally comes from three sources--ore mined from the ground, battery recycling, and the evaporation of brine from salt ponds. Of the two methods that don't involve recycling, mining is considered more expensive, but with lower costs in the area of capital spending, and quicker yields.

Most lithium harvested via the brine-evaporation method comes from Chile, where companies use solar-power plants in the country's deserts.

While miners are enthusiastic about the growth of electric cars, some analysts believe their predictions may be overly optimistic. Much of bullish talk behind lithium-ion cells is based on anticipated electric-car demand from China--which still hopes to put 5 million "new-energy vehicles" on its roads by 2020.

SOUTH AMERICA

66. Chile's Top 2016 Priority: Clean Up the Air

Limiting air pollution tops the government's environment policy priorities this year as authorities begin to implement a series of decontamination plans to clean up Chile's dirtiest cities.

On January 5th, Environment Minister Pablo Badenier unveiled a draft version of a new decontamination plan for the capital Santiago, home to more than a third of the population, after it was declared a saturated zone for breathable particulate material (PM2.5). That followed last winter's declaration of the first environmental emergency for air pollution in Santiago in 16 years, reflecting increased vehicle use, low rainfalls and tighter standards for PM2.5.

The document Badenier unveiled, which is now subject to public consultation, includes a controversial proposal to ban 20 percent of all light-duty vehicles from the roads on a rolling basis between the winter months of May and September, when pollution is most likely to reach critical levels. The plan also would tighten monitoring of industrial sources, bring buses into line with the current Euro 6 emissions standards, and ban the use of firewood for domestic heating and cooking in the city.

In total, President Michelle Bachelet has promised to implement decontamination plans for 14 cities throughout the country by the time she leaves office in 2018.

An even bigger issue for cities in the south of Chile is firewood, estimated to be the source of up to 90 percent of dust emissions. Authorities have sought the use of more efficient stoves and looked to ban sales of damp firewood, which creates more smoke. But significant improvements will come only by encouraging residents to switch to more expensive but cleaner fuels, such as propane or natural gas.

Last year, Metrogas, Chile's largest distributor of natural gas, unveiled a \$1.1 billion plan to double its number of clients to 1.5 million by expanding its services to new cities in the north and south

of the country. New legislation currently in Congress would expand controls over gas prices, making it more competitive with alternatives.

Elsewhere the plans must target activities specific to each city.

In Andacollo, almost 80 percent of the dust is produced by two large mines operating on the city's outskirts. In the northern port of Huasco, electricity generation and metallurgy are the principle causes.

Another measure targeting cleaner air is the new sales tax on vehicles, which rose to 50 percent of its final full amount January 1. The tax on four-wheel diesel vehicles rose from Chilean peso 500,000 (\$694) to Chilean peso 700,000 (\$972); it is scheduled to rise to Chilean peso 900,000 (\$1,249) in 2017.

The tax on an average gasoline-driven car rose from Chilean peso 70,000 (\$97) to Chilean peso 80,000 (\$111).

Meanwhile, the government is coming under pressure to delay the implementation of a new emissions standards for smelters, many of which are under threat of closure after copper prices slid to seven-year lows. One option would be to close some capacity and modernize and expand the rest with cleaner, more efficient technology, but that would take longer than the January 2018 deadline to reduce emissions of nitrous oxides and other pollutants.

The debate over a bill to broaden protection of the country's glaciers is expected to conclude this year after months of discussion. Pressured by environmentalists, Chile's deputies have tried to toughen up the legislation, which would provide full protection only to glaciers located in national parks, while others would be evaluated according to economic and environmental criteria. The issue is of critical importance to the development of new mining projects in Chile, many of which are located high in the Andes.

The year should see further gains for renewable energy, which has grown rapidly in Chile over the past five years. Wind and solar energy projects dominated a major power tender in 2015 and developers expect to achieve a similar result in 2016. The strength of sun and wind resources in northern Chile means such projects can compete without subsidy against conventional fuels such as coal and gas.

Meanwhile, new transmission lines strengthening links between the sunny north and major cities in the center should provide more opportunities for renewables.

But the contracts on offer this year are for supplies beginning in 2021, giving more time for technologies with longer lead times, such as combined cycle plants and geothermal energy, for which Chile also has considerable potential.

GENERAL

67. Comprehensive Study Finds Substantial Health Benefits from Cleaner Diesel Engines

The most comprehensive examination to date of the emissions and health effects of new technology heavy duty diesel (NTDE) engines –engines meeting the US 2007/2010 and EURO VI/6 fuel and emission standards –has demonstrated dramatic improvements in emissions and

the absence of any significant health effects (especially cancer). In the newly released Executive Summary of the Advanced Collaborative Emissions Study (ACES), the Health Effects Institute (HEI) concludes that “the overall toxicity of exhaust from modern diesel engines is significantly decreased compared with the toxicity of emissions from traditional-technology diesel engines.”

Overall, the ACES results show that the aftertreatment technologies used in such modern diesel engines are highly effective and that they meet —and exceed —the reductions mandated by U.S. and EURO regulations. The study reports the effectiveness of diesel particulate filters in reducing particulate matter (PM) emissions by more than 90% and of selective catalytic reduction systems in reducing smog-forming nitrogen oxide (NOx) emissions by 94%. Emissions of more than 300 other compounds —some with known carcinogenic and toxic properties —were also significantly reduced compared with exhaust from older diesel engines.

This combination of new technology enabled by ultra-low sulfur diesel fuel (10 ppm sulfur) meets US 2007/2010, EURO VI/6, China 6, and Bharat Stage VI standards. These new engines move well beyond the previous diesel engines (e.g. US 2004, EURO IV/4 and V/5 —and the equivalent China 4 and 5 and Bharat Stage IV and V) to substantially reduce both PM and NOx exposures.

ACES reported as well that lifetime exposure to NTDE did not cause cancer in laboratory rats, unlike exposure to traditional-technology diesel exhaust from older engines, which is known to cause lung tumors under similar conditions.

The ACES results are expected to play an important role in future risk reviews of diesel engines by international and US agencies. “We are already seeing a transition in America’s roads with over 30% of the trucks and buses in use today meeting these new standards; these vehicles are now being subjected to significant in-use on-road compliance testing to ensure that these improvements occur outside the laboratory,” said Dan Greenbaum, President of HEI. “These results confirm the great strides that government and industry have made to reduce diesel risk — and argue for even greater efforts to accelerate the replacement of older diesel engines.”

“These results are impressive for what they can mean for reducing exposure in the US and Europe, but also for the promise they hold in the developing countries of Asia and elsewhere in the world,” said Bob O’Keefe, Vice President of HEI and Chair of Clean Air Asia (Asia’s largest city network dedicated to clean air). “Countries like China and India are already moving toward implementing the ultra -low sulfur diesel fuel that is required for these new cleaner technologies.” ACES was initiated by HEI and its partners and sponsors to undertake the detailed characterization of new technology diesel exhaust (NTDE) emissions and health effects , applying an extraordinarily rigorous engine drive cycle reflecting real world conditions to engines compliant with U.S. Environmental Protection Agency rules for model -year 2007 and 2010 heavy -duty diesel engines. The project was supported by a wide range of public and private entities and conducted under the independent oversight of HEI and the Coordinating Research Council (an Atlanta -based non - profit organization specializing in emissions characterization).

68. Antarctic Icebergs Have Surprise Role in Slowing Warming: Study

The biggest icebergs breaking off Antarctica unexpectedly help to slow global warming as they melt away into the chill Southern Ocean, scientists have announced. The rare Manhattan-sized icebergs, which may become more frequent in coming decades because of climate change, release a vast trail of iron and other nutrients that act as fertilizers for algae and other tiny plant-like organisms in the ocean. These extract carbon dioxide from the atmosphere as they grow, a

natural ally for human efforts to limit the pace of climate change blamed on man-made greenhouse gas emissions.

Ocean blooms in the wake of giant icebergs off Antarctica absorbed 10 to 40 million tons of carbon a year, the study estimated, roughly equivalent to annual man-made greenhouse gas emissions of countries such as Sweden or New Zealand.

Until now, the impact of ocean fertilization from the demise of giant icebergs, defined as floating chunks of ice longer than 10 nautical miles (18 kms) or almost the length of Manhattan, had been judged small and localized. "We were very surprised to find that the impact can extend up to 1,000 kms," (625 miles) from the icebergs, Professor Grant Bigg of the University of Sheffield, an author of the study published in the journal *Nature Geoscience*, told reporters.

The scientists studied satellite images of 17 giant icebergs off Antarctica from 2003-2013 and found that algae could turn the water greener for hundreds of kilometers around the icebergs, with nutrients spread by winds and currents.

There are typically 30 giant icebergs floating off Antarctica at any one time - they can linger for years. The study said the giant icebergs had an outsized impact in promoting ocean fertilization when compared with small icebergs.

Bigg noted that global man-made greenhouse gas emissions had been growing at about two percent a year. "If the giant icebergs weren't there, it would be 2.1 to 2.2 percent," he said.

The Sheffield University scientists noted other estimates that the amount of ice breaking off Antarctica had gained by five percent in the past two decades and that it was likely to rise in future with warming. That in turn could spur more ocean fertilization.

69. BYD Sold the Most Plug-In Electric Cars In 2015

Five years after the Nissan Leaf and Chevy Volt first went on sale, plug-in vehicles represent slightly less than 1 percent of U.S. new-car deliveries. With about 200,000 sold, the Leaf is the world's most popular electric car.

But which carmaker sold the most cars with plugs last year, worldwide?

BMW said it sold "around 30,000" of its i3 and i8 in 2015, globally.

Ford's plug-in hybrid Fusion and C-Max Energi models, and its Focus Electric battery hatchback, are largely confined to North America. U.S. sales of those cars totaled 18,923. Including sales in Canada and Europe, total sales are estimated to be about 20,000.

General Motors sold 15,393 Volts and 2,629 Spark EVs in the U.S. last year, along with some in Canada and a few Spark EVs in South Korea for a similar total of about 20,000 as well.

The Nissan Leaf had 17,269 deliveries in the U.S., but it's sold in dozens of countries around the world--and Nissan also sells lower numbers of e-NV200 electric delivery vans. As of October 2015, Nissan had delivered 39,000 Leafs--but global full-year figures for the Leaf and e-NV200 aren't out yet. Assuming steady sales the annual total would be around 50,000.

Tesla says it delivered 50,557 vehicles globally last year.

BYD launched the world's first production plug-in hybrid, the F3DM in December 2008--exactly two years before the Chevrolet Volt. The crude F3DM was far less refined than the Volt, but it nonetheless earned an historic first for BYD. BYD continues to make both battery-electric vehicles (including the E6 hatchbacks used as taxis) and a variety of plug-in hybrids, including the newer Qin compact sedan and Tang compact SUV. According to year-end figures released by the company, it delivered 31,898 Qins and 18,375 Tangs, along with 7,029 of the older e6, during 2015. Added to that are small numbers of the T3 small commercial van and e5 battery-electric compact sedan, along with 2,888 Denza compact hatchbacks built by its joint venture with Daimler.

Altogether, BYD sold a total of 61,722 vehicles with plugs last year--all but a tiny handful in China--more than Nissan or Tesla.

For the record, those are all highway-capable cars; the numbers don't include what would be defined in North America as low-speed or neighborhood electric vehicles. Those vehicles make up a significant portion of the Chinese electric-car sales statistics, but they make direct comparisons of the Chinese and U.S. markets tricky, since low-speed vehicles don't count toward reported U.S. sales.

Aside from a tiny number of exports to minor markets like Costa Rica, the BYD passenger-vehicle sales are almost entirely in China.

BYD also produces electric buses--one with a battery pack of 549 kilowatt-hours--with which it has had some success entering the U.S. public-transport market.

70. Brent Crude Oil Prices Settle Under \$29/Bbl

Light, sweet crude oil prices dropped nearly \$1/bbl on the New York market on January 20, the first day of US floor trading since the lifting of sanctions against Iran. Analysts and traders say the oil price decline could likely continue while Iranian oil exports add to already oversupplied world oil markets.

World oil prices are apt to continue falling, agreed the International Energy Agency's first monthly report for 2016, citing growing crude oil supply. IEA said the world could face an estimated excess 1.5 million b/d of crude supplies through this year's first half. Markets will face enormous strain in absorbing new supplies from producers such as Iran, IEA said, adding the oil market will face its third successive year where supplies exceed demand by 1 million b/d.

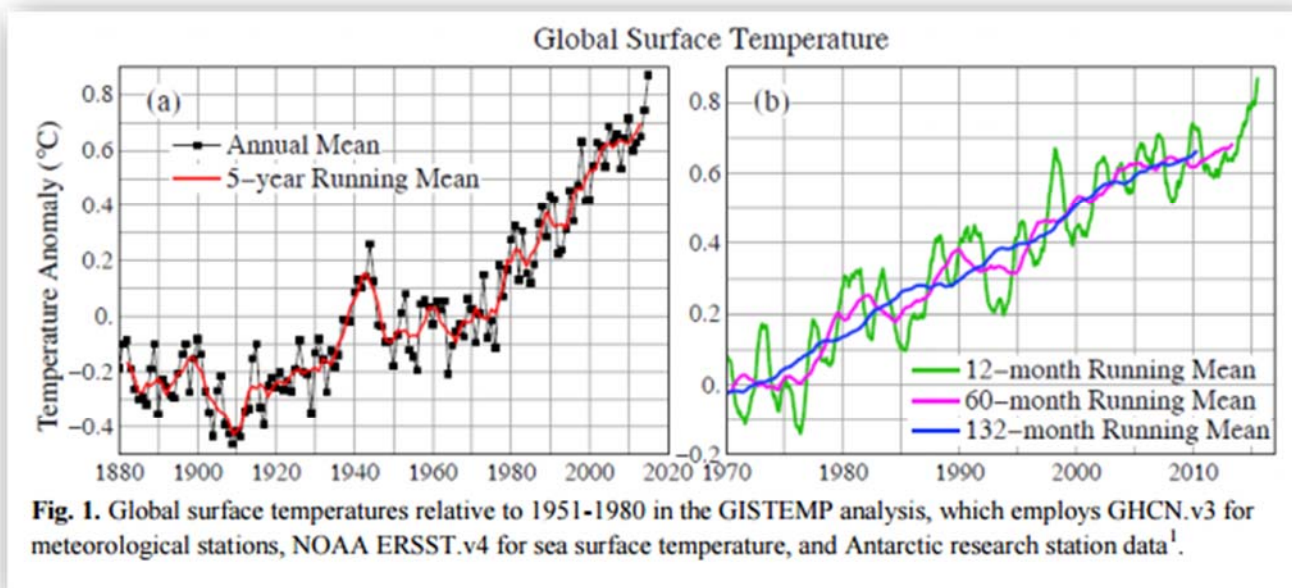
Separately, the International Monetary Fund slashed its global growth forecast to 3.4% for 2016. IMF cited sharper downturns in many developing countries and a weaker-than-expected US expansion as the reasoning for cutting its previous forecast for 2016 global growth.

71. Global Temperature in 2015 Reaches Record

According to a new study⁵, global surface temperature in 2015 was +0.87°C (~1.6°F) warmer than the 1951-1980 base period in the GISTEMP analysis, making 2015 the warmest year in the period of instrumental data. The 2015 temperature was boosted by a strong El Niño, nearly of the same

⁵ Authored by James Hansen, Makiko Sato, Reto Ruedy, Gavin A. Schmidt and Ken Lo

strength as the 1998 “El Niño of the century”. The updated global temperature record makes it clear that there was no global warming “hiatus”. Global temperature in 2015 was +1.13 (~2.03°F) relative to the 1880-1920 mean. Accounting for interannual variability, it is fair to say that global warming has now reached ~1°C, almost ~2°F



Two American government agencies — NASA, the National Aeronautics and Space Administration, and NOAA, the National Oceanic and Atmospheric Administration — compile separate analyses of the global temperature, based upon thousands of measurements from weather stations, ships and ocean buoys scattered around the world. Meteorological agencies in Britain and Japan do so, as well. The agencies follow slightly different methods to cope with problems in the data, but obtain similar results.

The American agencies released figures showing that 2015 was the warmest year in a global record that began, in their data, in 1880. British scientists released figures showing 2015 as the warmest in a record dating to 1850. The Japan Meteorological Agency had already released preliminary results showing 2015 as the warmest year in a record beginning in 1891.

On January 7, NOAA reported that 2015 was the second-warmest year for the lower 48 United States. That land mass covers less than 2 percent of the surface of the Earth, so it is not unusual to have a slight divergence between United States temperatures and those of the planet as a whole.

The end of the year was especially remarkable in the United States, with virtually every state east of the Mississippi River having a record warm December, often accompanied by heavy rains. A warmer atmosphere can hold more water vapor, and an intensification of rainstorms was one of the fundamental predictions made by climate scientists decades ago as a consequence of human emissions. That prediction has come to pass, with the rains growing more intense across every region of the United States, but especially so in the East.

It will take a few more years to know for certain, but the back-to-back records of 2014 and 2015 may have put the world back onto a trajectory of rapid global warming, after a period of relatively slow warming dating to the last powerful El Niño, in 1998.

Politicians attempting to claim that greenhouse gases are not a problem seized on that slow period to make arguments like “global warming stopped in 1998”; such claims have reappeared recently on the Republican presidential campaign trail.

Statistical analysis suggested all along that the claims were false, and that the slowdown was, at most, a minor blip in an inexorable trend, perhaps caused by a temporary increase in the absorption of heat by the Pacific Ocean.

“Is there any evidence for a pause in the long-term global warming rate?” said Gavin A. Schmidt, head of NASA’s climate-science unit, the Goddard Institute for Space Studies, in Manhattan. “The answer is no. That was true before last year, but it’s much more obvious now.”

When temperatures are averaged at a global scale, the differences between years are usually measured in fractions of a degree. In the NOAA data set, 2015 was 0.29 degrees Fahrenheit warmer than 2014, the largest jump ever over a previous record. NASA calculated a slightly smaller figure, but still described it as an unusual one-year increase.

72. ICCT Issues Heavy-Duty Diesel Vehicles Emissions Control Cost Analysis

Authored by Francisco Posada, Sarah Chambliss, and Kate Blumberg, this report presents the manufacturing costs of emission control technology used to meet recent U.S. and European emission standards for heavy-duty diesel engines and vehicles. The costs assessed include both the in-cylinder technologies to control engine-out emissions and the aftertreatment technologies that act on the exhaust stream. With the benefit of hindsight, this report focuses on the primary technology pathway that was or is in widespread commercial use, to provide reasonable cost estimates for the increasingly sophisticated technology packages used in each regulatory stage.

The analysis treats Euro II and US 1994 standards, the first in which 500 ppm sulfur diesel was required in each region, as the baseline for technology determination and cost estimation. In the final regulatory stage considered, Euro VI and US 2010, the two regions are again well aligned in fuel sulfur levels, emissions limits, and technology pathways. While the interim regulatory steps and their incremental costs differ, the cumulative costs for compliance with Euro VI or US 2010 (compared to Euro II or US 1994) are the same: \$6,937 (in inflation-adjusted 2015 dollars). A conservative approach was used in the analysis, which does not incorporate learning, scaling or emerging technologies.

The current Euro VI and US 2010 standards achieve an approximately 95% reduction in emissions of the primary pollutants of concern from heavy-duty vehicles, fine particulate matter (PM_{2.5}), and nitrogen oxides (NOX), from the Euro II and US 1994 baselines. These stringent standards have been implemented even as fuel consumption and greenhouse gas emissions from heavy trucks decline. The strong benefits and reasonable costs of full implementation of Euro VI and US 2010 standards, along with some of the downsides and the reduced cost-effectiveness of the interim standards, suggest that other regions should move as quickly as possible to harmonize with these world-class standards.

73. ICAO Committee Backs Aircraft Particulate Matter and CO₂ Standards

The highlight of the Committee on Aviation Environmental Protection's meetings in Montreal was approval of a global standard for carbon dioxide emissions from civil aircraft, which it announced on February 8th. The standards will on average require a 4% reduction in the cruise fuel

consumption of new aircraft, compared to 2015 deliveries, with the actual reductions ranging from 0 to 11%, depending on the maximum takeoff mass (MTOM) of the aircraft. In its current form the standard equitably acknowledges CO₂ reductions arising from a range of possible technology innovations—structural, aerodynamic or propulsion-based.

During two weeks of meetings, the committee also approved a standard for ultrafine soot particles and a method to measure air cargo emissions, ICAO said February 12th in a statement after the meetings concluded. Approval of the standards by the 170-member expert committee clears the way for final adoption by ICAO's 36-member governing council, which is expected to meet in the last week of February.

The committee also approved updated projections for emissions and aircraft noise, which will form the basis for decisions on those issues at the ICAO Assembly's meeting scheduled for September, as well as new guidance on community engagement on more comprehensive aviation environmental management and airport planning, including adaptation to the impacts of climate change, ICAO said.

ICAO noted in its February 12 statement that the group reviewed a “vast amount” of technical work on a market-based measure for emissions, which it said will provide a “solid basis” for expected adoption in September. If adopted, the measure is expected to be implemented by 2020, it said.

The committee's ongoing work on aircraft noise will clear the way for ICAO's member states to consider “noise neutral” growth in aviation starting in 2030, as well as the possibility of resuming supersonic flights through progress on a new supersonic noise standard for future aircraft, it said.

74. Diesel Cars May Be Worse Than Petrol for CO₂ Emissions, Report Claims

Diesel engines may be doing nothing to slow global warming despite being the backbone of Europe's policy to reduce car emissions, a new report claims. Tailpipe emissions of sooty ‘black carbon’ could be as much as 25-50% higher than the EU estimates for cars made before 2005, says the paper by Professor Erckard Helmers of Trier's University.

On this analysis, some 20m cars in use since the 1990s may each have produced 40-80g of CO₂ equivalent per kilometer more than previously thought.

However, the finding was questioned by the car industry and other experts.

Diesel engines made after 2005 have all had particulate filters installed, but Helmers' study cites French research which found that 75% of the devices tested were not working properly.

“Diesel cars are intensifying rather than mitigating global warming,” Helmers told the press. “EU policy has produced the opposite result to what it intended, and has exposed its population to more pollutants than was necessary.”

Brussels has used tax perks to favor diesel over petrol since the 1990s, even though they are a leading emitter of the air pollutant nitrogen dioxide (NO₂), which is responsible for an estimated 70,000 premature European deaths each year.

An over-riding priority to lower CO₂ emissions helped make the case for the fuel, and a liter of diesel today costs €0.184 less than petrol in Germany and €0.173 less in France. More than half of all new car sales in Europe have diesel engines.

But new cars sold in Japan emitted 20g of CO₂ equivalent less than European ones in 2013, due to the country's high share of efficient petrol-hybrid cars, which receive no tax advantages here.

"The Japanese car industry was forced to invest in new technology 20 years ago, leading to the development of the hybrid car," the report says. "This technical alternative in the EU could have saved – and in the future may save - Europe a very significant amount of CO₂ emissions as well as toxic fine particles and NO_x [the group of gases which includes NO₂] emissions."

The Liberal MEP Gerben-Jan Gerbrandy said that it was time to stop taxing diesel and petrol so differently. "I don't see why we should stimulate diesel through tax incentives in such a way," he said. "There are very good reasons to stimulate renewable electric cars or hybrids but diesel is generally not seen as the cleanest way to drive your car."

The European commission refused to comment on the report. But the car industry says that diesel cars still emit 15% less carbon dioxide per kilometer than their petrol equivalents.

"Diesel fuel has a higher energy content per liter than other fuels," said a spokesperson for the European Automobile Association. "Moreover, diesel engines convert more of this energy into useful work. Due to these two factors, diesel cars consume about 20-25% less fuel by volume than equivalent petrol cars."

The new report was also dismissed as "nonsense" by Axel Friedrich, a former transport director at the German Federal Environment Agency and the co-founder of the International Council for Clean Transportation, which revealed the VW scandal.

"A diesel engine with a filter removes 99.99% of black carbon emissions and today all the diesel cars have filters, so there are virtually no black carbon emissions anymore," he said. "We can see the filters are working because the concentrations of black carbon are going down year by year."

Monitoring stations in German cities such as Berlin, Munich and Dusseldorf have recorded dramatic falls in measurements of black carbon, which are down by nearly one half in the last decade, Friedrich said.

This may not be the case everywhere though. Campaigners point to a black market cottage industry in tampering with – or removing – particulate filters to increase car performance, acceleration and fuel efficiency, in several EU states, including the UK.

"Removing a filter is not illegal," said Greg Archer the clean vehicles director at Transport and Environment. "Driving a car without a diesel particulate filter is. So we are in the ridiculous situation where businesses can advertise to do this, earn money through doing it and then afterwards, the car is illegal to drive but it's very hard to detect what's been done because they tamper with the software that would detect it."

Black carbon is a light-absorbing component of fine particulate matter (PM) formed during fossil fuel and bioenergy combustion processes. Some climate scientists believe it to be the second most potent greenhouse gas after carbon dioxide.

The substance tends to concentrate at road level, where its primary effect is felt on public health. If it is blown towards polar and glacier regions, black carbon can also reduce the 'albedo' of snow and ice, preventing it from reflecting sunlight away from the Earth, again boosting global warming.

75. Exposure to Air Pollution Increases the Risk of Obesity

Laboratory rats who breathed Beijing's highly polluted air gained weight and experienced cardio-respiratory and metabolic dysfunctions after three to eight weeks of exposure.

A study appearing in the March issue of the Journal of the Federation of American Societies for Experimental Biology (FASEB) placed pregnant rats and their offspring in two chambers, one exposed to outdoor Beijing air and the other containing an air filter that removed most of the air pollution particles.⁶

After only 19 days, the lungs and livers of pregnant rats exposed to the polluted air were heavier and showed increased tissue inflammation. These rats had 50 percent higher LDL cholesterol; 46 percent higher triglycerides; and 97 percent higher total cholesterol. Their insulin resistance level, a precursor of Type 2 diabetes, was higher than their clean air-breathing counterparts.

All of these measures support the study's conclusion that air pollution exposure results in metabolic dysfunction, a precursor to obesity. Indeed, pollution-exposed rats were significantly heavier at the end of their pregnancy even though the rats in both groups were fed the same diet.

Similar results were shown in the rat offspring, which were kept in the same chambers as their mothers.

However, the results showed that the negative effects of air pollution were less pronounced after three weeks than they were at eight weeks, suggesting that long-term exposure may be needed to generate the continuous inflammatory and metabolic changes that ultimately increase body weight. At eight weeks old, female and male rats exposed to the pollution were 10 percent and 18 percent heavier, respectively, than those exposed to clean air.

The results of this study, which was funded by several agencies of the Chinese government, are consistent with other studies that show air pollution induces oxidative stress and inflammation in the organs and circulatory system. The findings also echo previous studies linking air pollution with increased insulin resistance and altered fat tissue.

"Since chronic inflammation is recognized as a factor contributing to obesity and since metabolic diseases such as diabetes and obesity are closely related, our findings provide clear evidence that chronic exposure to air pollution increases the risk for developing obesity," said Junfeng "Jim" Zhang, a professor of global and environmental health at Duke University and a senior author of the paper.

"If translated and verified in humans, these findings will support the urgent need to reduce air pollution, given the growing burden of obesity in today's highly polluted world," Zhang said.

⁶ "Chronic Exposure to Air Pollution Particles Increases the Risk of Obesity and Metabolic Syndrome: Findings from a Natural Experiment in Beijing," Yongjie Wei, Junfeng (Jim) Zhang, Zhigang Li, Andrew Gow, Kian Fan Chung, Min Hu, Zhongsheng Sun, Limin Zeng, Tong Zhu, Guang Jia, Xiaoqian Li, Marlyn Duarte, Xiaoyan Tang. Journal of the Federation of American Societies for Experimental Biology (FASEB), March 2016.

76. Poor Air Quality Kills 5.5 Million Worldwide Annually

New research shows that more than 5.5 million people die prematurely every year due to household and outdoor air pollution. More than half of deaths occur in two of the world's fastest growing economies, China and India.

Power plants, industrial manufacturing, vehicle exhaust and burning coal and wood all release small particles into the air that are dangerous to a person's health. New research, presented at the 2016 annual meeting of the American Association for the Advancement of Science (AAAS), found that despite efforts to limit future emissions, the number of premature deaths linked to air pollution will climb over the next two decades unless more aggressive targets are set.

"Air pollution is the fourth highest risk factor for death globally and by far the leading environmental risk factor for disease," said Michael Brauer, a professor at the University of British Columbia's School of Population and Public Health in Vancouver, Canada. "Reducing air pollution is an incredibly efficient way to improve the health of a population".

For the AAAS meeting, researchers from Canada, the United States, China and India assembled estimates of air pollution levels in China and India and calculated the impact on health.

Their analysis shows that the two countries account for 55 per cent of the deaths caused by air pollution worldwide. About 1.6 million people died of air pollution in China and 1.4 million died in India in 2013.

In China, burning coal is the biggest contributor to poor air quality. Qiao Ma, a PhD student at the School of Environment, Tsinghua University in Beijing, China, found that outdoor air pollution from coal alone caused an estimated 366,000 deaths in China in 2013.

Ma also calculated the expected number of premature deaths in China in the future if the country meets its current targets to restrict coal combustion and emissions through a combination of energy policies and pollution controls. She found that air pollution will cause anywhere from 990,000 to 1.3 million premature deaths in 2030 unless even more ambitious targets are introduced. "Our study highlights the urgent need for even more aggressive strategies to reduce emissions from coal and from other sectors," said Ma.

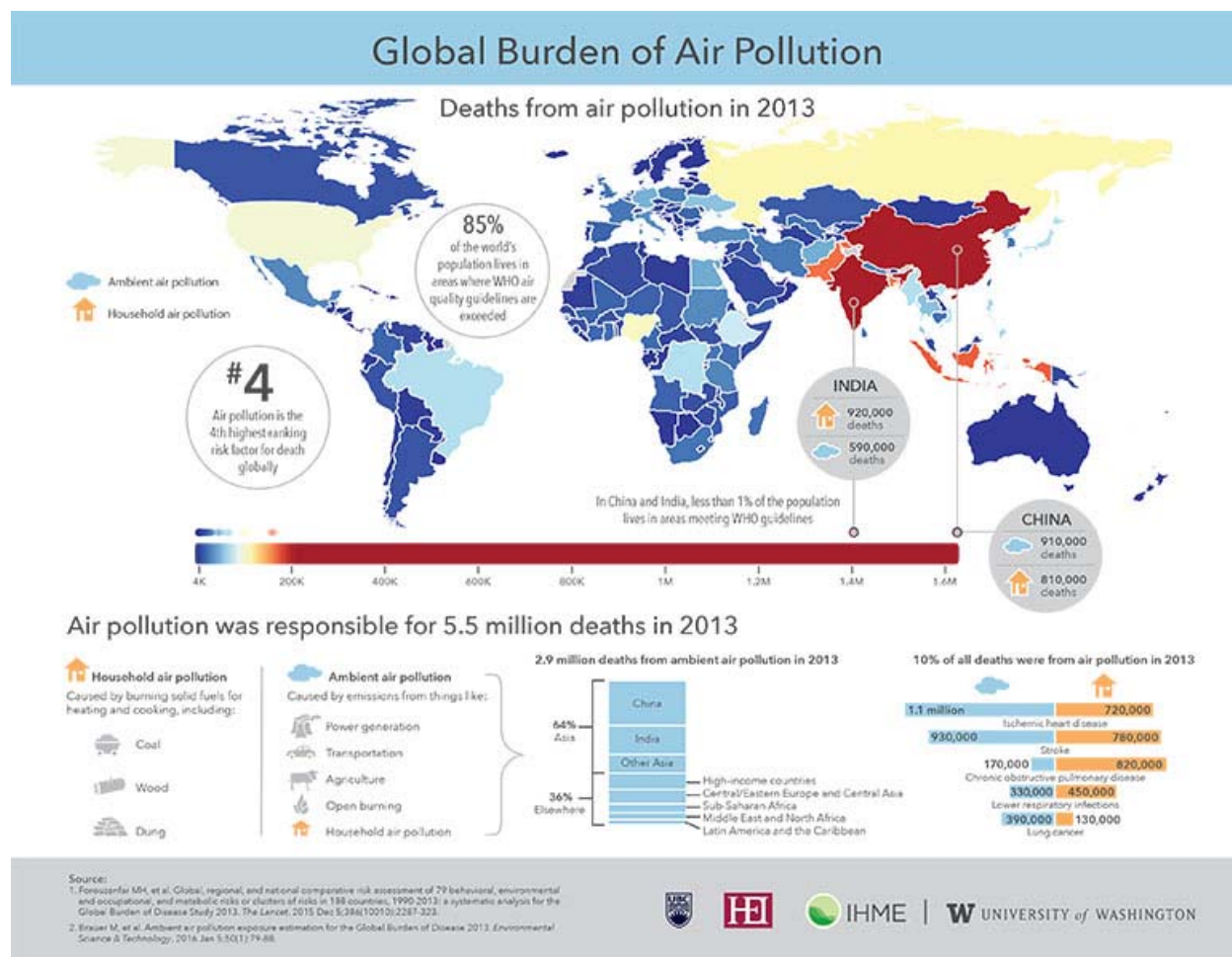
In India, a major contributor to poor air quality is the practice of burning wood, dung and similar sources of biomass for cooking and heating. Millions of families, among the poorest in India, are regularly exposed to high levels of particulate matter in their own homes.

"India needs a three-pronged mitigation approach to address industrial coal burning, open burning for agriculture, and household air pollution sources," said Chandra Venkataraman, professor of Chemical Engineering at the Indian Institute of Technology Bombay, in Mumbai, India.

In the last 50 years, North America, Western Europe and Japan have made massive strides to combat pollution by using cleaner fuels, more efficient vehicles, limiting coal burning and putting restrictions on electric power plants and factories.

"Having been in charge of designing and implementing strategies to improve air in the United States, I know how difficult it is. Developing countries have a tremendous task in front of them," said Dan Greenbaum, president of Health Effects Institute, a non-profit organization based in Boston that sponsors targeted efforts to analyze the health burden from different air pollution

sources. "This research helps guide the way by identifying the actions which can best improve public health."



The research is an extension of the Global Burden of Disease study, an international collaboration led by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington that systematically measured health and its risk factors, including air pollution levels, for 188 countries between 1990 and 2013. The air pollution research is led by researchers at the University of British Columbia and the Health Effects Institute.

77. UN Top Climate Official Figueres to Step Down in July

Christiana Figueres, head of the United Nation's climate change secretariat, announced February 19 that she will step down at the end of her term in July, ending a six-year run that started in the wake of the collapsed 2009 climate summit in Copenhagen and culminated with the adoption of the landmark Paris Agreement last December.

Figueres's announcement came days after Laurent Fabius, president of the 21st Conference of the Parties summit that produced the Paris Agreement, stepped down from that role as part of a government shake-up.

The back-to-back departures will leave the multilateral climate negotiation process without its two most recognizable faces as it starts to build toward the ratification and implementation of the Paris Agreement, the world's first universal agreement to combat climate change.

“It is with deep gratitude to all of you that I write to formally announce that I will serve out my term as Executive Secretary of the United Nations Framework Convention on Climate Change, which finishes on July 6, 2016, and not accept an extension of my appointment,” the 59-year-old Figueres wrote in a letter to UN Secretary-General Ban Ki-moon. The letter was dated February 12, but made public February 19.

UN sources said that the next step is for Ban to formally ask countries to nominate candidates to fill Figueres's role, with hopes that a new executive secretary will be in place “well before” the start of the next Conference of the Parties talks in November in Morocco.

Figueres will still be at the UNFCCC's helm through the April ceremony for the formal signing of the Paris Agreement at UN headquarters in New York, and through the May 16–26 climate negotiations near the UNFCCC offices in Bonn.

Figueres—a diplomat from Costa Rica, where her father and brother both served as president of the country—was the UNFCCC's fourth executive secretary but the first from a developing country.

Her successor will be an executive director rather than an executive secretary, as was the case for Figueres and her predecessors: the top UNFCCC official is set to be elevated to an undersecretary-general later this year. That puts it a level above its current status in the UN hierarchy, on par with the larger UN Environment Program (UNEP) that was once the UNFCCC's parent agency.

Figueres earned praise for her role in resurrecting a climate negotiations process still smarting from a high-profile collapse in Copenhagen in December 2009. Those talks were expected to produce the world's first binding climate agreement, but that goal was reached only last year in Paris.

“Christiana Figueres is a climate hero,” NextGen Climate America Chief Operating Officer Dan Lashof said in a statement. “Overcoming many obstacles, she shepherded the crucial Paris climate talks to a successful conclusion. She recognized that success in Paris could not be achieved by negotiations among diplomats alone—broadening the effort to include businesses, social activists, local governments and others representing the diversity of the international community working to solve climate change.”

Nicholas Stern, a leading U.K. climate economist, called Figueres “one of the great leaders of our time.”

Figueres took over the UNFCCC six months after Copenhagen, in May 2010, when then-executive-secretary Yvo de Boer resigned.

The term for the next UNFCCC head will run until 2022, meaning that person will shepherd the process through the ratification process for the Paris Agreement, its expected implementation in 2020 and the start of the process for a successor agreement.

Figueres and Fabius were not the only key climate figures to step down in recent days: Hela Cheikhrouhou, head of the Green Climate Fund, also announced February 19 that she will leave her post at the end of her three-year term, which concludes in September.

78. The ECA Crisis That Didn't Happen

As the start of last year approached, the market readied itself for the reduction of sulfur limits in emission control areas (ECA) from 1.0% to 0.1%. Expectations were that the surge in demand for compliant marine gasoil (MGO) would lead to product shortages and huge price increases. Drove of ship operators would cheat to save money, and nobody would be caught because of lax enforcement. Short sea operators within ECAs would lose their competitive edge over other modes of transport and lose customers. Ships would shudder to a halt due to thermal shock in the busy English Channel as they switched from hot, highly viscous heavy fuel oil (HFO) to a cool, low viscosity MGO, or engines would be starved of fuel because of filter clogging or leaks on the fuel line.

But that isn't what happened at all. In fact, the switch to the 0.1% sulfur went much more smoothly than anticipated.

Supply did not seem to be an issue and compliant fuel was much more affordable than companies had budgeted for. By the start of 2015, MGO prices were on a par with where HFO prices had been in mid-2014, and prices stayed low throughout 2015. On the enforcement side, several countries significantly increased fuel spot checks in 2015, typically finding less than 5% of ships to be in breach of the limit. True, some loss-of propulsion incidents were reported in the US, but no accidents were reported as a result. Of course, it is possible that fuel switch related engine problems were underreported, but overall it wasn't the catastrophic issue that was predicted.

Meanwhile, short sea operators within ECAs appear to have weathered the storm and at least two North European ferry firms reported record results during 2015 due to higher freight volumes and revenues. One stated that investments in scrubbers and fleet efficiency played a part in its strong financial performance. The incentive to make those investments, however, weakened as the outlay for MGO fell.

The differential between HFO and MGO remains significant, but has increased the payback time for scrubber installations.

Current low oil prices may have put a break on a shift to LNG, as price advantages have been eroded and the market has been put off by the huge investment required, both for ships to run on LNG, and for the supporting supply infrastructure.

As we arrived at 2016, oil and hence fuel prices had fallen even further and few think they will recover much this year. However, lower fuel costs have now been budgeted for and if prices unexpectedly rally, the market may be adversely impacted.

As for ECA enforcement, it will be tightened in 2016 as EU member states now have mandatory requirements for checking ships for compliance. This is a huge change as in the past only about one in 1,000 ships visiting ports inside ECAs in Europe were subjected to fuel sulfur checks. Now EU countries inside ECAs are required to check the sulfur content in fuels on 40 out of every 1,000 ships. In the US, the inspection regime is less clear but US authorities have a history for coming down hard on any attempts at falsifying records, meaning operators calling at US ports should think hard about cheating.

There are other environment moves to watch this year as well. The Paris climate talks at the end of 2015 were expected to produce a global framework to limit CO₂ from shipping. It was not to be, however, due to conflicts of interest regarding political principles. Pressure to regulate CO₂ emissions will undoubtedly continue at the IMO during 2016, initially focused on matching the EU's monitoring, reporting and verification (MRV) regime. While this won't impact the bunker industry directly, it will increase focus on accurately measuring fuel consumption, and by association how much was supplied to the ship. The long term signal is to reduce fossil fuel use to cut CO₂.

79. IMO Committee Agrees to Amendments for Draft Bunker Delivery Note

The International Maritime Organization (IMO) says that the Sub-Committee on Pollution Prevention and Response (PPR) has agreed to draft amendments of the MARPOL Annex VI bunker delivery note (BDN), which relates to the supply of fuel to vessels fitted with alternative mechanisms to address sulfur emissions requirements, such as scrubbers.

In order to enable higher sulfur fuels than those compliant with the SO_x limits detailed in regulation 14 of MARPOL Annex VI to be delivered to a ship that uses scrubbers or other equivalent measures of compliance, the PPR is said to have agreed that the revised bunker delivery note include a new entry for "purchaser's specified limit value" of the sulfur contents.

SO_x limits are currently 3.5 percent globally, and 0.10 percent within Emission Control Areas (ECAs).

The PPR is also said to have agreed to draft guidelines relating to onboard sampling to verify the sulfur content of fuel oil. Further, PPR 3 agreed to include a reference to MARPOL Annex VI regulation 3 on "Exceptions and Exemptions" within the section.

The changes will be submitted to the Marine Environment Protection Committee 70 (MEPC 70) in October 2016 for review and approval, says the IMO.

The amendments are said to be expected to come into force in October 2018.

80. Shipping Sector in Landmark Call for Climate Action

The International Chamber of Shipping (ICS) has called for the sector to behave like countries under the Paris climate agreement by adopting an emissions reduction pledge for the first time.

The ICS, which represents 80% of the world's merchant shipping tonnage, called on the UN's International Maritime Organization (IMO) to adopt an emissions reduction pledge "on behalf of the entire international shipping sector" and report on progress at future UN climate talks.

The IMO should adopt an 'intended nationally determined contribution' (INDC), the same type of pledge countries have adopted under the Paris Agreement, and the IMO should be accountable for meeting its pledge in the same way as countries, the ICS said.

The shipping sector was not included in the terms of the Paris Agreement, after then IMO chief Koji Sekimizu warned world leaders against passing responsibility for shipping's emissions to the climate branch of the UN. The EU had pushed for both international shipping and aviation to be included in the Paris deal but China, the US and India opposed this.

The ICS is pushing for IMO action because it is concerned that the EU could implement unilateral measures aimed at cutting shipping emissions, an official told the press. The EU will begin monitoring ships' emissions from 2018.

Although an explicit reference to shipping was taken out of the final Paris text, the ICS believes the agreement makes it clear that all sectors must make a contribution toward the overall target of keeping global warming "well below" 2°C. However, it warned that any CO₂ reduction commitment by IMO member states should be not only "ambitious" but "realistic". It will not support a binding target.

The terms of the shipping INDC should "avoid the implication that some kind of sanction might follow any reduction target not being reached", the ICS said. And shipping should not be expected to cut emissions at the same rate as developed nations, it added.

The IMO is due to discuss emissions reduction efforts in April.

81. Exposure to Air Pollution 30 Years Ago Associated With Increased Risk of Death

Exposure to air pollution more than 30 years ago may still affect an individual's mortality risk today, according to new research from Imperial College London.

The new report comes from one of the world's longest running air pollution studies, which included 368,000 people in England and Wales followed over a 38 year period. The team, from the MRC-PHE Centre for Environment and Health, estimated air pollution levels in the areas where the individuals lived in 1971, 1981, 1991 and 2001, using measurements from Britain's extensive historic air pollution monitoring networks.

Highest risks were seen for respiratory disease, such as bronchitis, emphysema and for pneumonia. Air pollution also affected mortality risk from cardiovascular diseases, such as heart disease.

Dr Anna Hansell, lead author of the study, from the MRC-PHE Centre for Environment and Health at Imperial, said: "Air pollution has well established impacts on health, especially on heart and lung disease. The novel aspects of our study are the very long follow-up time and the very detailed assessment of air pollution exposure, using air quality measurements going back to the 1970s.

"Our study found more recent exposures were more important for mortality risk than historic exposures, but we need to do more work on how air pollution affects health over a person's entire lifetime.

"We were surprised to find pollution has effects on mortality that persist over three decades after exposure."

In the study, published in the journal *Thorax*, the researchers assessed levels of black smoke and sulfur dioxide air pollution from 1971 to 1991 and PM₁₀ air pollution in 2001. Both black smoke and PM₁₀ are measures of small particles in the air. Black smoke and sulfur dioxide were produced mainly by burning fossil fuels, including coal, oil, diesel, petrol.

Today, the methods of measuring air pollution have changed. A common measure is PM₁₀, which measures very small particles that are less than 10 microns in size. This type of air pollution is

mainly produced by transport and industry with a contribution from construction activities and natural sources, for example sea salt and soil.

In the study, risks from pollution exposures were reported in units of 10 micrograms per cubic meter of air. Researchers compared these levels of exposure with data on disease and deaths. The study suggests that for every additional unit of pollution that people were exposed to in 1971, the risk of mortality in 2002 to 2009 increases by two per cent.

The researchers also looked at more recent exposure and found a 24 per cent increase in mortality risk in 2002 to 2009 for each additional unit of pollution people were exposed to in 2001.

Dr Rebecca Ghosh, co-author of the study from the School of Public Health at Imperial, said "Putting this in context, an individual who lived in a higher polluted area in 1971 had a 14 per cent higher risk of dying in 2002 to 2009 than someone who had lived in a lower polluted area. An individual living in a higher polluted area in 2001 also had an increased risk of mortality of 14 per cent compared to someone in a low pollution area.

"However, although there are similar sizes of risk from exposure in 1971 and 2001, there are much lower exposure levels. For instance, comparing highest and lowest polluted areas in 1971, there was a 52 micrograms difference in black smoke per cubic meter of air, but in 2001 the comparable difference was 6 micrograms per cubic meter of air of PM10.

Dr John Gulliver, co-author and Senior Lecturer at the MRC-PHE Centre for Environment and Health at Imperial, said: "Levels of all types of air pollution in the UK have reduced dramatically since the start of our study period, with levels of black smoke currently estimated to be about 20 per cent of what they were in the 1970s."

82. Arctic Thaw Opens Shipping Waterways, Risks to Environment

The Arctic is thawing even faster than lawmakers can formulate new rules to prevent the environmental threat of heavy fuel oil pollution from ships plying an increasingly popular trade route. Average Arctic temperatures are rising twice as fast as elsewhere in the world and the polar ice cap's permanent cover is shrinking at a rate of around 10 percent per decade. By the end of this century, summers in the Arctic could be free of ice.

As the ice melts, traffic of ships carrying cargoes of gas, coal and diesel through the region has increased. Russia, in particular, is keen to expand shipping through the Arctic given its rich natural resources and efforts to cut costs. It aims to cut journey times between Europe and Asia by 30 to 40 percent.

"It is time for regulators to wake up and realize that the Arctic is melting away right in front of us," said Whit Sheard of the Circumpolar Conservation Union (CCU) green group.

"Common sense regulations, integrated ocean planning, and explicit protections are all needed before the resources of the region are targeted for exploitation or before it becomes a major shipping route."

While there is a non-binding agreement in place between Arctic states aimed at Arctic environmental protection, campaigners say there has been no progress on regulating the use of heavy fuel oil (HFO), which is banned in the Antarctic region owing to its toxicity and the polluting emissions it generates.

Regulations for the Antarctic came into effect in 2011 after being adopted by the United Nations' shipping agency the International Maritime Organization (IMO). It was arguably an easier sell as less commercial cargo ships such as oil tankers operate in the Antarctic, where fishing boats, cruise ships and yachts predominate.

Any effort to tackle the issue is likely to take some time even after last year's climate deal in Paris, which commits nations to curb emissions. The Paris deal did not set specific targets for commercial shipping, leaving the IMO to take up the charge.

HFO was not the top focus of an Arctic Council meeting on environmental protection earlier this month, leading campaigners to seek more action. They plan to raise the issue at the IMO's next marine environmental protection committee session in April.

Julie Gourley, senior Arctic official at the U.S. State Department, said Washington, which has the rotating chair of the Council, was "presently studying" the risks associated with HFO and continued to engage with Council partners to find solutions for Arctic issues.

According to a 2009 study by the intergovernmental Arctic Council, the release of oil into the Arctic's marine environment "either through accidental release, or illegal discharge, is the most significant threat from shipping activity".

Last year, the U.S., Russia and other Arctic nations signed an agreement to bar their fishing fleets from seas around the North Pole.

Under the Polar Code, which was adopted by the IMO, ships trading in Polar Regions will have to comply with environmental provisions from January 2017. The code imposed prohibitions on the carriage of oil or oily mixtures from any ship into the sea and prevented pollution from garbage and noxious liquid substances. But it only "encouraged" ships not to use or carry HFO in the Arctic.