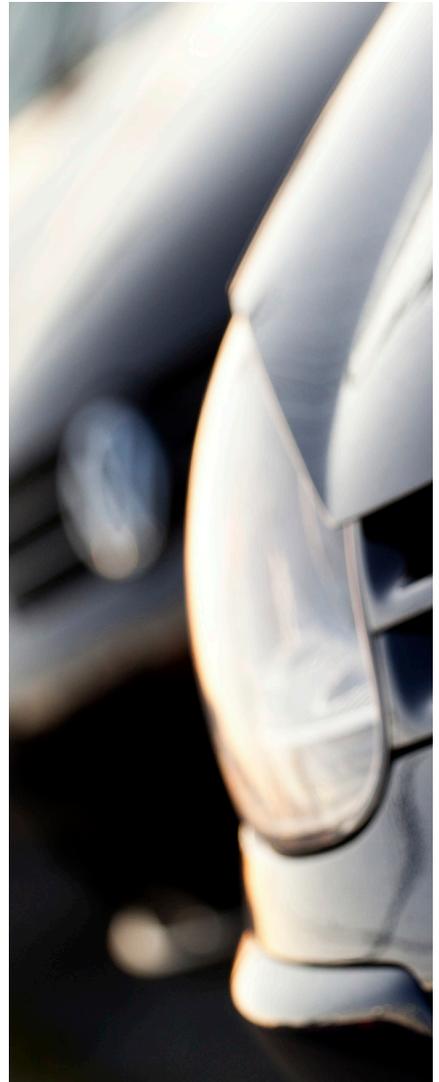


# VOLKSWAGEN

## AN EMISSIONS SCANDAL

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### Volkswagen Emissions Scandal

There are many car manufacturers in today's day and age, but few have as interesting a story as this German automaker. Volkswagen was founded in 1937 in Berlin, Germany by the Nazi trades union organization as a company to make a "peoples car." At the time, Hitler wanted to help the people and create a car that was widely accessible to families in Germany. This would have to be made at the cost of a motorbike, as not many people were able to afford vehicles (Bowler). Deming's 14 points lay out the basic beginning process of this innovative idea, starting with the improvement of their product, the automobile, and minimizing total cost for consumers. After 336,000 people subscribed to receive a car and started paying monthly dues, the war caused an abrupt halt to all production, and Volkswagen group decided to use the few cars that were produced for the German army (Bowler). From 1939-1945, Volkswagen used more than 15,000 slave laborers from the nearby concentration camps to produce automobiles in their factories (Bowler). However, this first effort to produce cars lost Deming's 14 points of quality management through the process due to constraints and radical ideas from the war. VW has a record and history of going unscathed from the law during these misbehaviors and scandals. In part, these episodes come about due to the ruthless, overwhelming company culture instilled early on. Ferdinand Piëch was named CEO of Volkswagen in 1993 and ran his company like an empire. He was an X management nightmare 'ruling' with ambition, arrogance, micromanagement and overwhelming control in just a few hands at the company (Smith). He set audacious goals to be the biggest seller of cars in the world, and upheld a culture where success was mandated at all costs – even stretching the law (Smith). This type of management was hostile and did not lead to the empowerment of his employees, but rather the fear of making a mistake. His tendencies put him right in the uncertainty phase of management understanding and attitude of Crosby's Maturity Grid, as he never cared for the whole story and operated under a "lets just do it" attitude. He is largely responsible for the ambition, drive and scale upheld at Volkswagen, but went about it through controlling management practices that most likely hindered the development of the company in the long run. In the nine years he was the CEO of

the Volkswagen group, he fired three Audi CEOs who could not live up to his expectations; and the Audi CEO who did meet his expectations followed suit as the CEO of Volkswagen, Martin Winterkorn (Smith).

Today, Volkswagen is facing more issues than ever seen by a car company before. Volkswagen has been a top competitor in US car sales for years, but was looking for a way to break into the market trend for clean, efficient vehicles that the consumers are so heavily searching for. Diesel engines are an alternative to hybrid and electric vehicles, and Volkswagen marketed heavily that their diesel engines were eco-friendly (Atiyeh). In one of their consumer facing advertising commercials, they showcased the “green police” stopping a long line of smog smuggling cars, but waved through one of VWs Audi division diesel cars with a smile, emphasizing that the VW group had created a truly clean car. (Smith). However, in September 2015, the Environmental Protection Agency found that “many VW cars being sold in America had a ‘defeat device’ – or software – in diesel engines that

could detect when they were being tested, changing the performance accordingly to improve results” (Hotten). This shows they knew exactly what the VOC was and what features it would take to get there, but chose to turn a blind eye to quality in search of profit. This cheating software is reported to have affected about 11 million cars worldwide (Tabuchi). The emissions software on the “defeat devices” allows the cars to sense the unique parameters of an emissions drive cycle set by the Environmental Protection Agency and switches between two distinct operating modes (Atiyeh). *See figure 1.* The California Air Resources Board then conducted their own test on two VW models equipped with a 2-liter turbocharged 4-cylinder diesel engines, and found that some cars emitted almost 40 times the permitted levels of nitrogen dioxide (Gates).

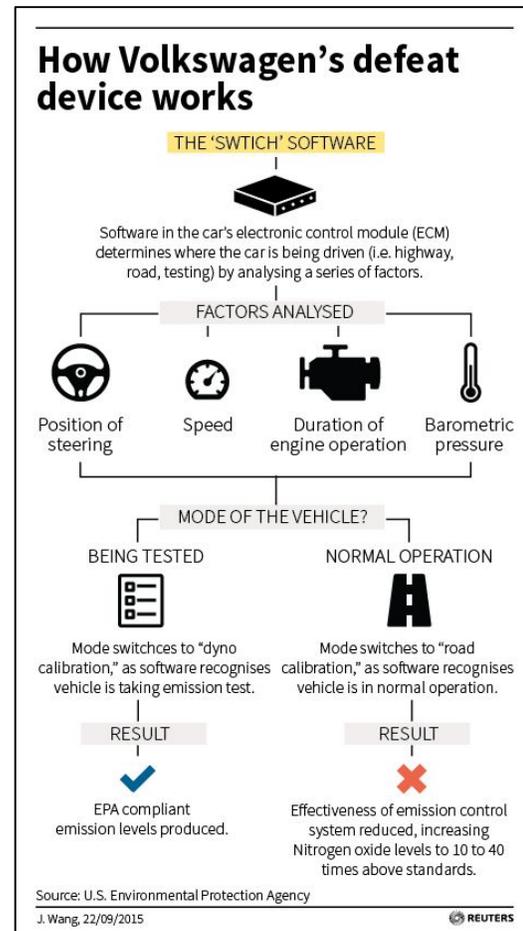


Figure 1

See figure 2. Volkswagen clearly underwent quality planning although they chose to cut corners. As Juran put it, VW went through the quality planning stages from determining who their customers were, determining the needs of their customer, developing product features which respond to the customers needs, then developing the processes which are able to produce those products and ending with transferring the plans to operation. Unfortunately, they bypassed the truth for honest quality and defrauded their consumer base and sold them all the ideas they wanted to hear.

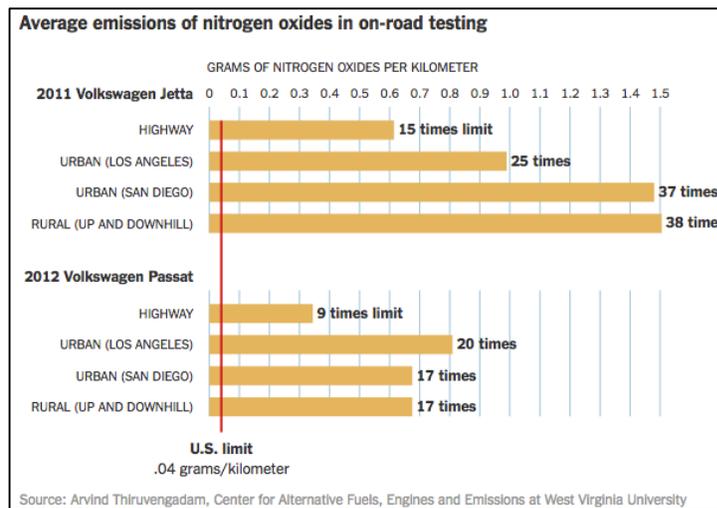


Figure 2

Unlike most consumers think, the existence of a testing mode isn't actually a red flag, as most newer vehicles have a similar setting (Linkov). The concern is that the VW diesel models in question had their testing modes to perform and report differently during the EPA tests to meet emissions targets that differ from their performance in the real world (Linkov). Performed correctly, these tests are an accurate method to assess legal compliance and provide a fair comparison to consumers (Atiyeh). Not only is this the largest civil settlement in automaker history and the largest false advertisement case the Federal Trade Commission has ever seen, they are also facing criminal charges (Domonoske). "The US justice department is reported to have found evidence of Volkswagen acting criminally in connection with the emissions cheating scandal" (Neate). Quality assurance and control and a stronger sense of management responsibility are factors that would have saved VW billions.

Volkswagen started an effort to more aggressively capture a bigger share of the US market. With a company culture that was confident, cutthroat and controlling, failure to create a

competitive vehicle was not an option. While their early press releases and campaigns clearly met and exceeded the voice of the consumer, it was all too good to be true. Volkswagen knew that it needed to reach the basic dissatisfiers for its customer with a diesel vehicle that competed with hybrid and electric cars on being environmentally savvy. They also understood that customers wanted satisfiers like decent fuel economy, power, and other basic car luxuries that Volkswagen and Audi could offer. The delighters and excitors that really prompted sales to explode were the high fuel economy, low emissions, eco-consciousness, and comparative resale value with other diesel cars on the market (Bartlett). The Federal Trade Commission brought a federal case against Volkswagen Group of America to get compensation for the consumers who were deceived due to the automaker's clean diesel advertising (Bartlett).

One employee, an engineer named James Liang, has pleaded guilty to conspiring to defraud regulators and car owners (Tabuchi). Liang was a prominent and respected engineer who started working in Volkswagen's diesel development department in 1983, before moving to California in 2006 to start work on a new diesel engine for US vehicles (Penn). The United States has stricter emissions standards than Europe, and the team realized that to meet the new rules, they would have to make a costly change and compromise on mileage and design (Tabuchi). Although Crosby states that quality is free, rather than take the risk and design an engine that would adhere to the strict US standards while also delivering solid road performance, they created the software for the defeat devices that would trick the tests (Penn). When Liang and other engineers met with regulators, they misrepresented the cars and lied by saying the cars were fully compliant with federal and state laws (Tabuchi). According to his plea agreement, they "hid the existence of the defeat device from regulators" from the US EPA (Penn). VW has admitted to deliberately cheating on US diesel emissions tests for several years and will now pay \$14.7 billion to settle with three federal agencies for excessive diesel emissions; "the highest ever paid by a company for violations under the Clean Air Act" (Atiyeh).

As we have learned in the management of quality, managers are responsible for 90% of the outcomes. Since the break of this scandal, there have been changes in upper management. Step seven of Deming's 14 points states that "to lead well, the manager must know and understand what the employee does." The CEO, Winterkorn, resigned as a direct result of the scandal and was replaced by Matthias Mueller, the former boss of Porsche (Hotten). When scandals as detrimental as this occur and are the subject of heavy media coverage and customer

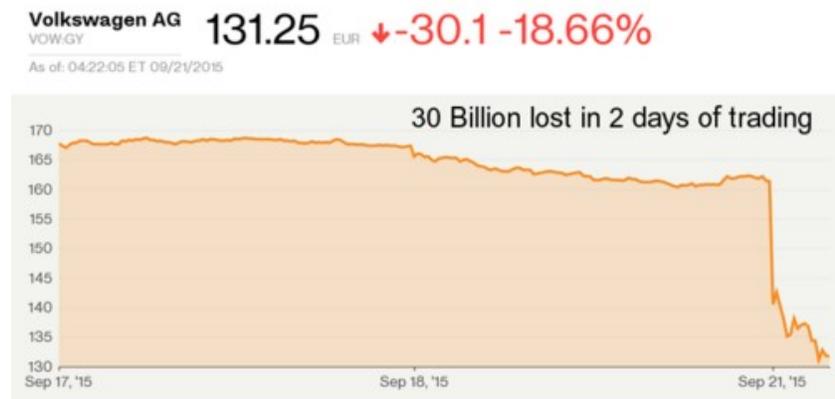
complaints, it is either the role of the CEO to offer an immediate course of action to remedy customer dissatisfaction or to resign power and control. After his resignation, VW launched an internal inquiry to uncover how far the lies were integrated. Muller stated “my most urgent task is to win back trust for the Volkswagen Group – by leaving no stone unturned” (Hotten). It's still unclear who knew what and when, although VW must have had a chain of management command that approved fitting defeat devices to its engines. It would be hard to believe that such a successful company did not have safeguards in place to alert management of the errors early on. Three state attorney generals have claimed that Volkswagens fraud reached deep into the boardroom, and there is speculation that the replacement CEO, Mueller, also knew of the inadequate pollution control systems (Tabuchi). The Justice Department is trying to build a larger criminal case, and pursue charges against other high level executives at the carmaker (Tabuchi). Christian Klingler, a management board member and head of sales and marketing is leaving the company, there have been layoff announcements, and further leadership adjustments are in the works for the VW hierarchy (Gates). Although the Justice Department has outlined a vast conspiracy that stretches back more than a decade, as of September 2016 Volkswagen has maintained that the deception was limited to a small group of people and that top management was not aware of the cheating software (Tabuchi).

As Crosby stated, quality does not cost a thing, but the price of non conformance can be enormous. This emissions scandal caused Volkswagen to post its first quarterly loss in 15 years (Hotten). In court proceedings, U.S. District Court Judge Charles Breyer approved the final \$14.7 billion settlement on October 25 (Atiyeh). When a product is created, certain product and service expectations must be met. In Juran’s Fitness for Use, products and services are ranked in terms of whether or not the performance satisfied its claims. Had Volkswagen completed a product and service fitness for use metric, they would have found the defeat device product and the service test that returned false results. However since they did not complete this quality assurance test, expectations were falsely met and they must now take back their faulty products and offer repercussions for disgruntled consumers. VW will undergo a buyback program for all owners of the 2-liter TDI that is projected to cost upwards of \$10 billion (Neate). Owners who do not sell their cars back to Volkswagen will receive between \$5,100 and \$10,000 to compensate for diminished resale value, plus a free emission fix (Atiyeh). Volkswagen was also ordered to spend \$2 billion on the construction of infrastructure to charge electric vehicles and develop

zero-emission ride-sharing across the country, as well as another \$2.7 billion to be spent on helping the state replace old buses (Neate). If that wasn't enough, there are still pending criminal charges as well as smaller civil suits between VW and car dealerships.

In addition to court rulings, VW needs to be concerned with their company image and reputation as shares have fallen by about a third since the scandal broke. *See figure 3.*

Volkswagen, Audi, and Porsche dealers can't sell any new diesels, and additional certified pre-owned diesels are also under stop-sale orders (Atiyeh). The company recognizes it made a mistake and will have to do some damage control where the consumers opinions are involved. Additional civil penalties, a criminal settlement, and further state-level fines have not been determined but could add billions more.



*Figure 3*

As Crosby said, “the process of quality is not complex, but anything can be made incomprehensible if one gets involved in the wrong stuff.” If Piech had not instilled such a stringent company culture that made employees fearful of making mistakes or not completing requirements per their managers’ order, VW may have found a creative solution for a clean energy car that did not trick their consumers. Had the initial engineering team accepted that the US regulations were more severe than the EU and that solving the problem was worth the initial cost of getting it done right the first time, VW could have saved billions. Had more quality management practices been implemented into this process, the scandal would not have reached the scale that it did in the US. Volkswagen went against Crosby’s guidelines and stopped trying to get better when they started getting away with the defeat device. Conformance measures, process control and quality management practices put into effect to truly create a clean energy vehicle would have saved Volkswagen billions of dollars offsetting the price of nonconformance, and would have left their progressing reputation in tact.

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