
VOLKSWAGEN EMISSION SCANDAL: REPUTATION RECOVERY AND RECALL STRATEGY¹

Rachna Shah, Gaganpreet Singh, and Sandeep Puri wrote this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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We have totally screwed up.

Michael Horn, chief executive offer, Volkswagen USA²

The trust-shattering exposure of the Volkswagen Group (VW) emission scandal on September 18, 2015, left Matthias Müller, VW's newly appointed chief executive officer (CEO), with a daunting management challenge—reputation recovery. Müller's task was to draw the German multinational automotive manufacturing company out of the abyss of one of the worst reputation crises it had faced since its inception in 1937. The matter came to the fore when the United States Environmental Protection Agency (EPA) slapped a legal notice on VW for violation of the Clean Air Act.³ The EPA accused VW of manipulating nitrogen oxide emissions tests to ensure its EA 189 diesel engines, built during fiscal years 2009–2015, met EPA standards. The EPA claimed that VW used a “defeat device,” programming its engines to control emissions during laboratory testing and driving so that they remained within permissible limits. However, during actual on-the-road driving, the nitrogen oxide emissions were as much as 40 times higher.⁴

No sooner had VW admitted to the intentional fraud charges than its stock plummeted 20 per cent⁵ and its market value declined by US\$26.8 billion.⁶ This downturn forced VW to recall 11 million affected cars worldwide. VW also faced a penalty of approximately \$18.0 billion from the EPA.⁷ An additional \$7.3 billion was required to fix all affected cars.⁸ This full-blown crisis hit VW across the board, severely denting its market share, brand image, internal/external stakeholders' trust, and supply chain operations.

The consequences of the unethical conduct included investigations from over a dozen countries and lawsuits from many customers. It was imperative that the company have a fresh start to overcome this bleak scenario. Müller needed to meticulously reconceptualize the VW brand identity and devise an appropriate recall strategy, along with its key elements. Should he break down the recall strategy into distinct phases, with unique objectives for each phase? Should the strategy be different for different stakeholders and address their specific concerns? Finally, could different stakeholders be more relevant during different phases, and should the recall strategy be designed with this difference in mind?

THE SCANDAL

In 2005, VW CEO Wolfgang Bernhard wanted to reaffirm VW's position in the world's most competitive market—the United States. He believed that diesel engines were the gateway to compete with VW's Japanese rival, Toyota Motor Corporation, and to capture the U.S. market, which had stricter environmental standards. Rudolf Krebs, an experienced engineer from Audi whose prototype had worked well in South Africa, recommended the additional use of AdBlue in the planned engine, which was later named EA 189. When Bernhard left and Krebs was transferred to another position, Martin Winterkorn became CEO in 2007. After taking office, Winterkorn instructed Ulrich Hackenberg and Wolfgang Hatz, key Audi team members, to expedite the engine development.⁹

In 2007, VW introduced the diesel engine EA 189, which efficiently met tighter emissions controls and better fuel efficiency standards. EA 189 became an effective differentiator, which increased VW's U.S. market share. The increased clean diesel sales volume in the United States, which rose from 43,869 in 2009 to 98,500 in 2014, reflected the high customer acknowledgment.¹⁰ VW positioned the innovation with the “clean diesel” mantra.¹¹ Its aggressive promotion campaign claimed the following:

This ain't your daddy's diesel. Stinky, smoky, and sluggish. Those old diesel realities no longer apply. Enter TDI Clean Diesel. Ultra-low-sulfur fuel, direct injection technology, and extreme efficiency. We've ushered in a new era of diesel.¹²

In addition, VW insisted “diesel cars are fun, quiet, efficient and, most critically, they are clean.”¹³ According to iSpot.tv, VW spent \$77 million to endorse its clean diesel cars, which accounted for about 45 per cent of its total television advertising budget of \$165 million.¹⁴ The technology was also showcased at various car shows.

In 2012–2013, various environmental organizations raised concerns that diesel cars were not as clean as claimed. In 2013, an environmental association, DUH (Deutsche Umwelthilfe), revealed audit reports highlighting significant irregularities between the test mode and the actual driving mode in Germany. The reason for VW's exceptional diesel performance was unveiled when the International Council on Clean Transportation conducted similar tests in the United States and informed the EPA and the California Air Resources Board about several VW brands and models that failed the tests (see Exhibit 1).¹⁵

After a series of investigations, VW admitted that it used a defeat device to improve performance and eventually change buyers' perception regarding diesel technology. VW's acknowledgment of manipulation led to several countries launching investigations and many customers filing lawsuits. VW then started a recall in January 2016, which was expected to last until the end of the year.

PAST RECALLS IN THE U.S. AUTO INDUSTRY

Car recalls were among the most common issues in the auto industry. The recalls were mostly the consequence of design flaws and misses in the production line. Most manufacturers faced this problem, either voluntarily or imposed, at some stage in their businesses and at staggering costs. According to the National Highway Traffic Safety Administration, in 2013–2014, the recall amount in the U.S. auto industry was more than 30 per cent. The U.S. auto industry recalled 22 million vehicles and sold just over 15 million.¹⁶ Some of the most famous recalls in the United States related to Toyota's out-of-control gas pedals, 2009–2010; Ford's failure-to-park recall, 1980; the Takata seatbelt scandal, 1995; and the Ford ignition

problem, 1996.¹⁷ Although these were some of the most costly recalls to affect the U.S. auto industry, they were neither the only ones nor the last ones.

The latest VW recall would also find a place on the list of biggest and most expensive recalls; however, it was distinct. Unlike the others, this global recall was the result of intentional infringement rather than a manufacturing defect. Generally, after a manufacturing defect, the relaunch of a car did not involve a complete overhaul of the positioning strategy; neither were customer trust and market share dynamics greatly affected. However, the emissions scandal made it imperative for the VW marketing team to put something new in place.

PAST USE OF DEFEAT DEVICES IN THE AUTO INDUSTRY

VW's use of the defeat device was not the only time the device was used in the auto industry. In fact, VW had repeatedly used the device. General Motors Company, Ford Motor Company, and American Honda Motor Company had also paid heavy penalties for using the device.

VW: In 1974, VW paid \$120,000 to resolve an objection the EPA raised. The EPA's complaint maintained that VW did not reveal the existence of two devices that altered the emission control on about 25,000 cars manufactured in 1973.¹⁸

GM Cadillac: GM's first environmental-related recall occurred in 1995 following the installation of illegal devices in 470,000 Cadillac cars. The total penalty, including a hefty fine, recall cost, and cost of altering the infrastructure to offset the excess emission, was \$45 million.¹⁹

American Honda and Ford: In 1998, Honda and Ford were alleged to have used a defeat device called a "misfire monitor." The use of the emission-control mechanism led to both companies being forced to pay millions of dollars in penalty, recall, and fixing costs.²⁰

THE DISRUPTION

Suppliers

The VW scandal disrupted the value chain for most of its stakeholders. Limited or halted VW production affected the sales of first-tier suppliers of wheels, engines, fenders, and so on. In turn, these suppliers stopped the delivery from their own suppliers of spark plugs, engine blocks, and other such parts (second tier). The subsequent chain reaction continued to increase the magnitude of the disruption.

VW used the best supply chain management practices such as lean inventory levels. However, the just-in-time system, and its high dependence on single suppliers for each of its parts, intensified the speed and relative harshness of the impact on suppliers. VW's subcontracting represented about 70 per cent of the car sticker price. If the 70 per cent figures persisted, the first-tier suppliers had \$280 billion at stake. Similarly, if 70 per cent revenue of the first-tier suppliers was generated for second-tier suppliers, the total impact would be about \$476 billion, and this could be expected to increase further while moving down the supply chain. Thus, the consequences of one organization's unethical practices drastically affected the related value chains and eventually affected the entire industry.

The unexpected incident brought a sense of hesitation to the relationships among business partners and distorted their strategic business planning. One supplier acknowledged that the VW scandal had ushered in disruptive uncertainty.²¹ As VW was held accountable, it had to effectively manage the relationships with its suppliers during the crisis.

The VW scandal originated from manipulated engine production and emission control technology, parts of which were supplied by some of the world's most renowned suppliers such as Bosch. Bosch built key components of the diesel engines. It provided the engine control module known as EDC 17 and a basic software to control its operations. The system adjusted the vehicle's mechanism of cleaning burned-up fuel before it was expelled as exhaust. The U.S. authorities investigated the role Bosch may have played in this scandal. An inquiry was initiated to determine if Bosch knew that its technology was used to control the emissions. Bosch rejected the basis of investigation, stating that it had simply supplied the engine management systems to VW, and the onus to integrate the components into cars lay with the carmaker.²² Bosch had cautioned VW about its intent to commercialize the engine management software, which was initially supplied for vehicle testing, for production. According to German newspaper *Bild am Sonntag*, in 2007, Bosch warned VW of the illegality of using the emissions-controlling software in vehicles for sale.²³ The authorities prosecuted Bosch on the basis that "if you know that a crime is being committed and you actively facilitate part of the crime you are on the hook."²⁴

Customers

The impact of the scandal extended to VW's customers through the anticipated lost resale value, customer loyalty, and repurchase behaviour. Diesel technology had a fuel-economy advantage over petrol engines via a trade-off with the emissions discharge. It emitted 500 parts per million of sulphur. VW's clean diesel was positioned to balance the trade-off by reducing emissions by 97 per cent and improving fuel economy by 30 per cent. This encouraged buyers to pay a premium price for acquiring both a green image and fuel efficiency. The unveiling of the VW scandal caused customers to tighten their belts; the resale value of the affected cars was expected to go down by \$5,000.²⁵

At the onset, to regain consumer trust, VW initiated the "TDI Goodwill Program." It offered compensation to affected customers in the form of gift cards as a way of saying, "We're sorry and we hope you'll let us back into your lives."²⁶ One of the gift cards was a \$500 prepaid card that could be used anywhere, and the other was a \$500 card only redeemable at VW dealerships. It also assured 24-hour road assistance to the affected cars for three years.²⁷ However, a joint statement by U.S. senators Richard Blumenthal of Connecticut and Edward Markey of Massachusetts termed the \$1,000 gift "insultingly inadequate" and an attempt to conceal VW's deception.²⁸ In the statement, the senators said,

[Volkswagen] should offer every owner who wants to keep her car full compensation for the loss of resale value, fuel economy, and other damage caused by its purposeful deception. Volkswagen should cooperate fully with federal criminal and civil investigations that will provide redress for taxpayers as well as car owners—the company needs to get serious.²⁹

VW also floated loyalty discounts on the current range of VW models. All individuals with any VW model (emissions scandal affected or otherwise) with ownership of no less than 90 days were eligible for money off the price of the car or deposit contributions to the finance agreements.³⁰ It was highly likely that VW's tarnished reputation would affect customers' repurchase behaviour. Earlier recalls in the auto industry had been caused by unintentional engineering defects; a comeback after an intentional act would require a complete transformation of positioning strategy.

Dealers

For many years, U.S. dealers had been cautioning VW about its flawed segmentation, targeting, and positioning (STP) strategy. They believed that VW was offering cars unfit for the domestic market and with a price tag much higher than its competitors. About dealership challenges, Alan Brown, chairman of the Volkswagen National Dealer Advisory Council, said that dealers were struggling because of an obsolete

product cycle, overpriced product, and worsening tensions between the council and VW over the years.³¹ This recent manipulation by VW had further dented the relationship. VW dealers placed it among the biggest scams in the world. After holding a VW dealership for over two decades, New Jersey dealer Steve Kalafer thought the VW scandal was so big, considering the overwhelming sales of these products in Europe (\$300 billion) and the United States (\$15 billion), that it was worse than the scams run by Ponzi and Madoff. As a VW dealer, Kalafer felt conned. He was particularly worried about his employees, who had for years worked on VW cars and represented them proudly. Now they were subjected to questions about whether they knew about the cheating and fraud.³²

Dealers faced the first and maximum wrath of buyers, who harangued them by phone, email, and on social media, even as they demanded that the business partners buy back their cars or offer refunds. Dealers were upset to be on the receiving end of this wrath for investing millions of dollars in the falsely advertised clean diesel technology. Concerns increased after VW sales were banned until the company submitted a plan to bring the leftover inventory into compliance with state emission laws. The dealers considered the scandal their “Titanic.”³³ Managing inventory was a major challenge in the car industry, with dealers generally financing cars rather than owning them outright. The implication was that dealers paid hefty interest amounts to operate their businesses.

Generally, dealers benefited from safety recalls. When a customer approached a dealer to repair an engineering error, there was an opportunity for engineers to identify unrelated concerns and make more sales. The trade of parts and services often brought more profit than the original car sale. As a result of the scandal, the trust between the company and dealers was compromised. The situation pushed VW to establish some pricing floor and incentive programs to retain relationships with its dealers.

Culture

Müller believed that this scam was convoluted by the involvement of few employees that had hammered the company’s stock and done severe damage to its reputation. This scam forced VW to take an introspective look at its culture and corporate policies. Müller agreed that this reputation crisis offered a chance to do some organizational restructuring at VW. He felt there was a need to make the company leaner and more decentralized and to give the brands more responsibility. He believed VW needed an “evolution” and not a “revolution” to recover from the crisis. He was confident that if the company stuck to the plan, it could flourish again in “two to three years.”³⁴

By April 2016, VW’s structural changes hastened the decision-making process, reduced complexity, and increased efficiency. The board of management could now begin to focus more on the future, safeguard cross-brand synergies, and proceed to develop an overall strategy.³⁵

VOLKSWAGEN PORTFOLIO

The VW Group owned a list of successful brands such as sports car maker Lamborghini; luxury brands Bentley, Porsche, and Audi; and mass-market brands VW (passenger cars), ŠKODA, and SEAT (see Exhibit 2). The range included brands that fell into the “nice to have” category such as Bugatti and Ducati. The product variety and production for fiscal years 2014 and 2015 indicated the market demand (see Exhibit 3). VW had 120 production facilities spread across Americas, Asia, Europe, and Africa³⁶ (see Exhibit 4).

After the scandal, VW was slammed for promoting expensive projects such as the Bugatti Veyron, with many calling it “among the most superfluous things in the Volkswagen Group.” Dubbing the car an image

enhancer unsuited for the bad times the company was going through, many wondered what VW was trying to achieve by still backing the brand.³⁷

VW had been carrying underperforming brands as liabilities on its balance sheet (see Exhibit 2) for a long time. Now, the emissions scandal, which led to one of the most expensive recalls in the company's history, made it imperative to prioritize and overhaul the VW portfolio. Müller was busy drafting Strategy 2025 to focus on reviewing the current portfolio. He said the company intended to make an in-depth review of its current portfolio of over 300 models and assess how much each contributed to earnings. The immediate focus was on "cross-brand strategies, leveraging synergies and ensuring that group resources are used effectively." He also said that management would be decentralized and brands and regions would be empowered with more responsibility and independence.³⁸

This new strategic plan was a departure from Strategy 2018, which sought to make VW the world's biggest carmaker by sales volume, ahead of Toyota. Müller noted that, across the board, VW had misunderstood Strategy 2018 to be all about boosting unit sales, which meant that "a lot of things were subordinated to the desire to be 'faster, higher, and larger,' especially return on sales." He said the key was qualitative growth, not selling a few thousand more cars than the competitor.³⁹

The public explosion of the scandal had a ripple effect, which caused a major curve in VW's future direction. It would take time for Müller's leadership and a reformed plan to help VW reconcile with consumers, suppliers, and the giants of the auto industry. Considering VW's vast portfolio, what corrective measures, from an operational context, could be recommended in the new strategic plan to prevent product recalls?

THE WAY FORWARD

The scam not only put VW's reputation at stake, but it also put the entire diesel industry under scrutiny. Mike Hawes, CEO of the Society of Motor Manufacturers and Traders, agreed that the emissions scandal had damaged the reputation of the entire industry and that it was now on the industry to rebuild customer faith.⁴⁰ Andy Palmer, chief executive officer of Aston Martin, said that this scandal would make customers not only wary of all new VW cars, but that they would also doubt other car makers for some time. He predicted that the diesel engine would die a slow death. The only way the auto industry could recover was to phase out diesel engines.⁴¹

Suppliers, too, felt diesel technology had taken a big hit. According to Akshay Anand, a senior analyst at Kelley Blue Book, suppliers would do better to seek out and adopt other technologies until customer trust in diesel was regained, which could take a long time. He felt that it would depend on suppliers and how much of their production was diesel.⁴² Despite the scandal, the global auto industry's dilemma remained the same: providing greater mileage with lesser emissions—but ethically, without manipulation.

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EXHIBIT 1: LIST OF AFFECTED VW BRANDS AND MODELS

2009–2015 Volkswagen Jetta 2.0L TDI
 2009–2015 Audi Q7 3.0L V-6 TDI
 2009–2016 Volkswagen Touareg 3.0L V-6 TDI
 2010–2015 Volkswagen Golf 2.0L TDI
 2010–2015 Audi A3 2.0L TDI
 2012–2015 Volkswagen Beetle 2.0L TDI
 2012–2015 Volkswagen Passat 2.0L TDI
 2013–2016 Porsche Cayenne Diesel 3.0L V-6
 2014–2016 Audi A6 3.0L V-6 TDI
 2014–2016 Audi A7 3.0L V-6 TDI
 2014–2016 Audi A8/A8L 3.0L V-6 TDI
 2014–2016 Audi Q5 3.0L V-6 TDI

Source: Clifford Atiyeh, "Everything You Need to Know about the VW Diesel-Emissions Scandal," *Car and Driver*, January 11, 2017, accessed February 23, 2017, <http://blog.caranddriver.com/everything-you-need-to-know-about-the-vw-diesel-emissions-scandal/>.

EXHIBIT 2: OPERATING AND BUSINESS PERFORMANCE FIGURES FOR MAJOR VW CAR BRANDS

	Vehicles Sales (in 000s)		Sales Revenue (in € Million)		Sales to Third Parties (in 000s)		Operating Result (in € Million)	
	2015	2014	2015	2014	2015	2014	2015	2014
VW Passenger Cars	4,424	4,583	106,240	99,764	70,939	68,396	2,102	2,476
Audi	1,529	1,444	58,420	53,787	37,605	36,105	5,134	5,150
ŠKODA	800	796	12,486	11,758	6,128	6,144	915	817
SEAT	544	501	8,572	7,699	3,570	3,412	-10	-127
Bentley	11	11	1,936	1,746	1,379	1,175	110	170
Porsche	219	187	21,533	17,205	19,633	15,727	3,404	2,718

Source: Adapted from Volkswagen *Annual Report 2015*, accessed October 11, 2016, <http://annualreport2015.volkswagenag.com/>.

EXHIBIT 3: VARIETY AND PRODUCTION OF VW CAR BRANDS

Brand	Production (Years)		Brand	Production (Years)	
	2015	2014		2015	2014
VW Passenger Cars			Audi		
Golf	1,095,553	1,011,124	A3	370,144	351,526
Jetta/Sagitar	844,907	926,277	A4	318,788	328,465
Polo	754,546	753,754	A6	293,960	307,693
Passat/Magotan	724,018	747,583	Q5	267,861	260,853
Tiguan	501,712	515,349	Q3	205,445	200,097
Lavida	462,748	481,740	A1	116,250	115,377
Santana	279,583	295,485	Q7	82,340	61,012
Bora	202,964	226,006	A5	79,133	88,545
Gol	192,841	300,629	TT	35,510	17,621
up!	172,345	217,278	A7	29,158	27,709
Touran	120,507	126,567	A8	27,065	39,557
Lamando	103,573	3,080	R8	2,074	2,169
Fox	85,161	106,991	Q2	67	–
Saveiro	75,397	96,420	Total	1,827,795	1,800,624
Beetle	64,035	91,464			
Touareg	59,190	63,741	Lamborghini	2015	2014
CC	56,796	85,591	Huracán Coupé	2,559	1,540
Sharan	53,423	49,498	Aventador Coupé	666	456
Suran	24,691	23,332	Aventador Roadster	413	654
Scirocco	16,251	23,573	Huracan Roadster	69	–
Eos	4,559	6,567		3,707	2,650
Phaeton	2,924	4,061			
XL1	59	106			
Total	5,897,783	6,156,216	Total Audi Brand	1,831,502	1,803,274

Brand	Years		Brand	Years		Brand	Years		Brand	Years	
	2015	2014		2015	2014		2015	2014		2015	2014
ŠKODA			SEAT			Bentley			Porsche		
Octavia	425,629	397,433	Leon	169,455	157,087	Continental GT Coupé	3,997	3,442	Macan	86,016	59,363
Fabia	195,349	162,954	Ibiza	160,451	153,633	Flying Spur	3,660	4,556	Cayenne	79,700	66,005
Rapid	189,187	228,175	Altea/ Toledo	32,729	35,683	Continental GT Cabriolet	2,216	2,151	911 Coupé/ Cabriolet	31,373	31,590
Yeti	89,890	107,084	Alhambra	27,925	22,612	Mulsanne	919	884	Boxster/ Cayman	21,978	23,211
Superb	84,550	82,079	Mii	24,516	25,845	Bentayga	96	–	Panamera	15,055	22,383
Citigo	41,280	41,974	Total	415,076	394,860	Total	10,888	11,033	Spyder	375	545
Roomster	11,166	29,983							Total	2,34,497	203,097
Total	1,037,051	1,049,682									

Source: Adapted from Volkswagen *Annual Report 2015*, accessed October 8, 2016, <http://annualreport2015.volkswagenag.com/>.

EXHIBIT 4: VW PRODUCTION FACILITIES

Africa	Product	Europe	Product
Uitenhage	Volkswagen Polo, Polo Vivo, and Polo Vivo Sedan	Bratislava	Volkswagen Touareg, Up!, and E-Up! ŠKODA Citigo Audi Q7
Asia	Product	Crewe	Bentley Mulsanne, Flying Spur, Continental GT Coupe, Continental GT Cabriolet, Bentayga
Aurangabad	Volkswagen Jetta ŠKODA Octavia, Superb, and Yeti Audi A3, A4, A6, Q3, Q5, and Q7	Dresden	Volkswagen Phaeton Bentley Flying Spur
Changsha	Volkswagen New Lavida and Touran	Emden	Volkswagen Passat and CC
Changchun	Volkswagen Bora, CC, and Magotan Audi A4, A6, Q3, and Q5	Győr	Audi A3 Cabriolet, A3 Sedan, TT Coupe, TT Roadster
Chengdu	Volkswagen Jetta and Sagitar	Ingolstadt	Audi A3, A3 Sportback, A4, A4 Avant, A4 Allroad, AA5, A5 Sportback, and Q5
Foshan	Volkswagen Golf and Golf Sportsvan Audi A3 Sedan and A3 Sportback	Kaluga	Volkswagen Polo Vivo Sedan and Tiguan ŠKODA Rapid
Nanjing	Volkswagen New Lavida and Passat ŠKODA Superb	Kvasiny	ŠKODA Yeti, Superb, and Superb Combi
Ningbo	Volkswagen Lamando ŠKODA Superb and Octavia	Leipzig	Porsche Cayenne, Panamera, and Macan
Pune	Volkswagen Polo ŠKODA Rapid	Martorell	SEAT Ibiza, Ibiza SC, Ibiza ST, Leon SC, Leon 5TDR, Leon ST, Altea, and Altea XL Audi Q3 and A1
Shanghai (Anting)	Volkswagen Polo, New Lavida, Gran Lavida, Tiguan and Touran ŠKODA Fabia, Octavia, and Yeti	Neckarsulm	Audi A4, A5 Cabriolet, A6, A6 Avant, A6 Allroad, A7, A8, R8 Coupe, R8 Spyder
Urumqi	Volkswagen Santana	Osnabrück	Volkswagen XL1 and Golf Cabriolet Porsche Cayenne and Cayman
North America	Product	Palmela	Volkswagen Scirocco and Sharan SEAT Alhambra
Chattanooga	Volkswagen Passat NAR	Pamplona	Volkswagen Polo
Puebla	Volkswagen Jetta, Beetle, Beetle Cabriolet, Golf, and Gol	Sant'Agata Bolognese	Lamborghini Huracan Coupe, Huracan Roadster, Aventador Coupe, Aventador Roadster
South America	Product	Stuttgart-Zuffenhausen	Porsche 911, 911 Cabriolet, Boxster, and Spyder
Anchieta	Volkswagen Gol	Wolfsburg	Volkswagen Golf, Golf Sportsvan, E-Golf, Touran, and Tiguan
Sao Jose dos Pinhais	Volkswagen Fox, Suran, and Golf Audi A3 Limousine	Zwickau	Volkswagen Golf, Golf Estate, and Passat Estate
Pacheco	Volkswagen Suran		
Taubaté	Volkswagen Up! And Gol,		

Note: Only facilities that manufactured cars are included in the exhibit.

Source: Compiled from "Portrait & Production Plants," Volkswagen, October 4, 2016, accessed November 14, 2016, www.volkswagenag.com/content/vwcorp/content/en/the_group/production_plants.html.

ENDNOTES

- ¹ This case has been written on the basis of published sources only. Consequently, the interpretation and perspectives presented in the case are not necessarily those of Volkswagen or any of its employees.
- ² Benjamin Zhang, "VW USA Boss: 'We Have Totally Screwed Up,'" *Business Insider* (India), September 22, 2015, accessed October 26, 2015, www.businessinsider.in/VW-USA-boss-We-have-totally-screwed-up/articleshow/49064930.cms.
- ³ The Clean Air Act is a U.S. federal law drafted to protect human health and the environment from air pollution.
- ⁴ "Emissions Testing Is Broken, and Other Lessons from the VW Scandal," Environmental and Energy Study Institute, October 2, 2015, accessed October 26, 2015, www.eesi.org/articles/view/emissions-testing-is-broken-and-other-lessons-from-the-vw-scandal.
- ⁵ WIAT staff, "VW Shares Fall 20 Percent after EPA Scandal," WIAT.com, September 22, 2015, accessed October 22, 2015, <http://wiat.com/2015/09/22/vw-shares-fall-20-percent-after-epa-scandal/>.
- ⁶ Rupert Neate, "Meet John German: the Man Who Helped Expose Volkswagen's Emissions Scandal," *Guardian*, September 26, 2015, accessed October 17, 2015, www.theguardian.com/business/2015/sep/26/volkswagen-scandal-emissions-tests-john-german-research; All currency amounts are in US\$ unless otherwise specified.
- ⁷ Timothy Gardner and Bernie Woodall, "Volkswagen Could Face \$18 Billion Penalties from EPA," Reuters Business News, September 18, 2015, accessed October 12, 2015, www.reuters.com/article/2015/09/18/us-usa-volkswagen-idUSKCN0R11VK20150918.
- ⁸ Mark Thompson and Ivana Kottasova, "Volkswagen Scandal Widens," CNN Money, September 22, 2015, accessed November 11, 2015, <http://money.cnn.com/2015/09/22/news/vw-recall-diesel/>.
- ⁹ Staff report, "Bosch Warned VW about Illegal Software Use in Diesel Cars, Report Says," *Automotive News Europe*, September 27, 2015, accessed December 16, 2015, <http://europe.autonews.com/article/20150927/ANE/150929837/bosch-warned-vw-about-illegal-software-use-in-diesel-cars-report-says>.
- ¹⁰ Volkswagen, *TDI: U.S. Market Success*, March 2015, accessed December 16, 2015, http://cleandieseldelivers.com/media/Douglas-Skorupski-VWoA_DTF_March2015.pdf.
- ¹¹ Jeff S. Bartlett, "Making Sense of the Volkswagen Diesel Mess," Consumer Reports, September 28, 2015, accessed December 16, 2015, www.consumerreports.org/cro/cars/making-sense-of-the-volkswagen-diesel-mess.
- ¹² Matthew Debord, "If VW Deceived Consumers about Its Diesel Cars, Then It Has a Huge Problem," *Business Insider* (India), September 19, 2015, accessed December 26, 2015, www.businessinsider.in/If-VW-deceived-consumers-about-its-diesel-cars-then-it-has-a-huge-problem/articleshow/49027651.cms.
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