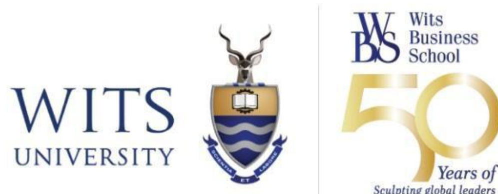
THE VOLKSWAGEN AG 2019 CASE STUDY PACK

(5 Scenarios For You To Resolve For The Board)

Researched, Designed and Developed by:

Based on a case that was originally researched and developed by the Wits Business School Case Centre:



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NB: This pack contains the ONLY 5 scenarios to be solved and included in your report. Before you proceed, please ensure you have read and understood the pre-seen containing the background case study, **Volkswagen South Africa: VW up! Marketing (courtesy of the Wits University Business School Case Center)** as well as the Volkswagen Group 2017 Annual Report).

1. INTRODUCTION

The CFO (Chief Financial Officer) is an international, annual multi-stage business strategy and leadership-focused case study competition organised by The CharterQuest Institute South Africa. It challenges university students around the world (with a junior version for secondary schools in Africa) to prove they can compete at the highest level: by solving a set of complex integrated finance, operational and strategic problems that beset a real-world global business in the emerging markets.

CharterQuest is a global institute with local and international students, at the forefront of grooming financially qualified business leaders of tomorrow, working alongside global professional bodies such as: the South African Institute of Chartered Accountants (SAICA), the Association of Chartered Certified Accountants (ACCA), the Chartered Institute of Management Accountants (CIMA) and the CFA Institute; underpinned by 3 core values:

- **Rectitude**: Always act ethically and muster the courage to do what is right.
- **Exceptionalism**: Aim for exceptional standards for our employees and customers.
- **Determination**: Observe teamwork in our relentless pursuit of stakeholder promises.

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2. ASSESSMENT CRITERIA

We seek to highlight the centrality of teamwork, creativity, presentation skills, business acumen as well as the value of taking a holistic and strategic approach to management. The CharterQuest Competency Framework for *grooming financially qualified business leaders* will guide the report marking as below:

PROBLEM SOLVING ACUMEN	Finance & Technical	Diversity, Business, Entrepreneurial	Ethics & People	Presentation (incl. Question & Answers)	Innovation & Integration	Decisiveness & Leadership	Total
Strategic analysis *(Prioritisation & focus)*	5%	10%					**15%**
Strategic choice (*Impact & options evaluation)*	10%	10%	10%	10%	5%		**45%**
Strategic implementation *(Recommendation & Actions)*			5%	10%	5%	20%	**40%**
	15%	20%	15%	20%	10%	20%	**100%**

For best practice interpretation and application of the above marking grid, it is crucial that teams and mentors access samples of good reports, examiner's comments and also watch our *'Master Class Videos'* 1 of 2 Scene 1 of 3, 2 of 3 and 3 of 3 in our Case Study Resources section.

3. SUBMISSION FORMAT AND RULES

In addition to the standard Competition Rules, your final report should be in English Language, not more than 15 pages (or 4000 words, inclusive of appendices) and must not contain any text, sound or images that we, in our sole opinion, find vulgar, offensive or inappropriate for public viewing. Reports with attachments must be submitted ONLY by the team leader as a single document/file in pdf/acrobat and no more than 5MB, through the same CFO account you used to register. **Submission deadline is 30 April, 2019 at 11:59 pm S.A Time, without any exceptions**. You will receive an automatic message to confirm that upload was successful. Once you submit, no communication is allowed until we announce. The submitted report should be the original work of the team members alone and should not contain internal information from any other organisation. You may be disqualified and other penalties applied in case of any violations.

4. DISCLAIMER AND WARNING

The case study is based on the Volkswagen AG (VW AG) and attempts to simulate the strategic decisions its Group CFO and the Board faced (or potentially faces). While the facts cited are intended to re-create the general circumstances that exist or once existed, this case study has been adapted for the purpose of **The CFO Case Study Competition 2019** and now provides a hypothetical situation. Apart from the background case study and the 2017 Annual Report we provided separately, all data presented in these scenarios are for illustrative purposes only and do not necessarily represent current or historical events or projections from any of the companies cited therein. *Whilst you are encouraged to research publicly available information about VW AG and familiarize yourself with the industry, you are ONLY allowed to apply this in your analysis (or include this in your report) if any of the data so gleaned from public sources do not contradict the background case study and/or any information presented in these scenarios.* Any discussion with the staff, associates or competitors of any real-life companies comparable to the case company is strictly prohibited and is cause for disqualification. You are not allowed to discuss the case with anyone other than your mentor (who must be formally registered on 'The CFO' portal).

5. THE REQUIREMENT

Throwback -and assume today is 15 April 2018!

The Volkswagen AG (herein called VW AG) Board of Directors meets next week. Your task is to identify and define the main problem (s) in each scenario, prioritize and evaluate these, including the embedded ethical dilemmas –where applicable, and provide strategic advice. You are accordingly required to produce and present such report directly to the VW AG Board of Directors.

NOTE:

Your report should focus on the following 5 separate yet highly interconnected scenarios. These have been broadly defined -and deliberately so, to allow a considerable degree of good judgment in deciding the core matters your report must address. A separate tutorial article has been published on our website blog; you may find it helpful. It's FREE! Click to Read!

UPDATED CONTEXT TO THE 5 CASE SCENARIOS

Much of the current context and strategy of VW AG is defined by one catastrophic incident the group faced 3 years ago. In 2015, the U.S. Environmental Protection Agency (EPA) announced in a “Notice of Violation”, that tests on the diesel engines of some VW AG cars in the USA had revealed irregularities in relation to nitrogen oxide (NO_x) and carbon dioxide (CO_2) emissions. Regulators in multiple countries began to investigate the group and the value of its stock price fell by a third in the days immediately after the news. VW AG admitted to these irregularities, the Group CEO, Martin Winterkorn resigned and a new CEO, Matthias Mueller, formerly head of Porsche, was appointed to stabilize the group and prepare it for a new future (TOGETHER – Strategy 2025). To date, over €27 billion has been spent on refit and recall campaigns as well as court settlements. The scandal has come to be named "Dieselgate’’, but often referred to as the ‘diesel issue’ in VW AG’s official publications, including its Annual Reports. This scandal amongst others, has continued to define the ever-growing international consensus around the future of fuel and diesel combustion engine cars.

On April 10, 2018, VW AG announced sweeping changes to its group management structure, terminating the services of its CEO, Mathias Muller, and appointing Dr. Herbert Diess, a previous BMW executive who had joined in 2015 -just before the diesel issue, to oversee VW AG’s biggest unit, Volkswagen (VW). The key drivers of the leadership change include: (1) The need for a clean break from the ‘’diesel issue’’ warranted a new CEO who was not tainted by it; and (2) The transformation necessary to deliver on Strategy 2025 needed to progress at a faster pace in order to hit cost reduction targets, and deliver the minimum 6.75% operating margin required to fund the ever-growing ‘’diesel issue’’ costs and the relevant ‘’Strategy 2025’’ initiatives.

In terms of these sweeping changes, VW AG’s multi-brand empire will now be bundled into 6 divisions comprising its 12 key brands: (1) the '**volume**' segment will include its namesake VW brand, Czech division – Skoda, Spanish unit – Seat, and ‘’VW commercial vehicles;’’ (2) the **'premium'** segment will hold Audi at its core, and (3) **'super-premium'** will include sports car brands: Porsche, Bentley, Bugatti and Lamborghini. VW AG will furthermore, (4) carve out a **trucks and buses division** that includes the MAN and Scania heavy-truck brands; (5) **MAN Turbo and Renk units** would be put into a further division, whilst; (6) **China** will be singled out as a division (comprising all 12 brands).

In addition to taking up the task of Group CEO, Herbert Diess will retain his role as head of the VW brand. Under the new structure, he will lead the **volume segment**, which will also take on group-wide responsibilities for Research & Development (R&D), and vehicle connectivity. Rupert Stadler, the current Head of Audi will head-up the new **premium division**, and oversee group-wide sales. Oliver Blume, the current Head of Porsche will lead the **super-premium** division and oversee group production; Frank Witter, Group Chief Financial Officer (CFO) will also lead group Information Technology (IT). All four will comprise the new Management Board, accountable to the Supervisory Board. *‘’The new structure streamlines group management, systematically leverages synergies in the individual operating units, and speeds up decision-*

making," the company has said. One person with knowledge of the structure said, *''it promotes the "divide and conquer" style of management seen at BMW, rather than the "command and control" structure that Mathias Mueller had been trying to change since taking over from Martin Winterkom.''* Others have called it a kind of *''think global, act local"* and *"create a lean but activist center''* type of mentality being pushed.

The Board Chairman, Hans Dieter Pötsch, in announcing the changes, stated, *"We remain focused on aligning the company and its brands with future needs, to safeguard its position as world's number 1 car producer -in sales volumes, innovativeness and profitability; and to be instrumental in shaping tomorrow's personal mobility with the strength of our Group brands. In re-aligning the VW brand, Herbert Diess has demonstrated to impressive effect, the speed and rigor with which he can implement radical transformation processes. Such is the essence of our Strategy 2025 and the decisive years that are now to follow.*

The following equally-weighted Key Performance Areas (KPA's) have accordingly been prioritised: ***KPA 1:*** *Deliver on the industry's largest electric-car push while keeping a lid on spending;* ***KPA 2:*** *Pave the way for a potential initial public offering of the truck division, along with other structural moves to decentralize the group's sprawling stable of 12 brands;* ***KPA 3:*** *Open up the group's insular corporate culture and getting away from a rigid decision-making process that slows the company down and impacting profitability. Also contend with powerful constituencies, including a unionized workforce that has gotten in the way of change in the past;* ***KPA 4:*** *Boost software development capabilities and expand in mobility services (part of Moia brand); and* ***KPA 5****: Manage remaining fallout from the ''diesel issue'', as thousands of investor lawsuits are still pending and prosecutors continue to look into the roots of the scandal.''*

5 CASE SCENARIOS *(Your Task/For ACTION)*

ISSUE/SCENARIO: STRATEGY AND COST OPTIMISATION

Shortly after his appointment, the new CEO, in a sweeping move seen by many executives as an attempt to consolidate power, has suggested that VW AG could significantly reduce cost of sales, selling and administrative costs if certain functional units are centralized under his authority at Head Quarters (HQ) (over and above the group R/D, IT, sales and production that supervisory board had recently centralised). The Charter Quest Institute has compiled the following data relating to the anticipated savings:

Cost classification/category	Expected Savings	Functions & Source of savings
Cost of sales	1.5%	Procurement, direct factory overheads.
Admin expenses	2%	Human Resources including Salaries and Wages.
Selling costs	2.5%	Marketing, Distribution, Pricing and Trade Discounts.

Despite accepting the categorisation of the 3 new segments, the board has given the new CEO lattitude to reconsider the best approach to deliver on long-term profitability. In their first Management Board strategy meeting, a debate has ensued between the top 4 executives, excerpts follow:

Herbert Diess: *''Team, I am just wondering why the overall premium strategy that helped us succeed at BMW is not the best one for VW AG too? With increasing competitition, I worry that longer-term, we will find ourself stuck in no man's land, trying to produce every kind of car for everyone, including and between the extremes of the highest quality cars such as Porsche on the one end and low cost ones in the volume category such as VW Beetles, Polo Classic, to name a few.''*

Rupert Stadler: *''Herbert, I appreciate that you see our future in favour of the segments Oliver and I lead, but there is a historical context that cannot be ignored. Three german brands have really displayed German auto engineering on the world stage: Mercedes-Benz, BMW and ourselves -the VW AG. Historically, BMW was founded in 1916, arguably in 1923, when it started actually producing cars. They were focussed on the premium (luxury) segment right from then. As you know, their cheapest priced cars (the Mini) could be about 40% priced higher than our cheapest! In fact, you could argue that some of their lower end cars, if such exists, will be in our premium category, right up there with Audi; as they don't have a volume segment, they direcly compete with my segment. Mercedes-Benz on the other hand, was born under a lucky star: the current trademark comprising a three-pointed star in a laurel wreath was created in 1925 – in time for the merger between Daimler-Motoren-Gesellschaft (DMG) and Benz & Cie., which together became Daimler-Benz AG, in summer 1926. They also pursued a premium-focused strategy right from then. I am sure you appreciate all this; I mean, as a previous BMW executive, you once competed directly against us as well as them (Mercedes-Benz). Our history however, is very different. We came much latter - in 1939, to cater for the segment that BMW and Mercedes-Benz had failed to cater for, what we today call the volume segment. In fact, Volkswagen means the 'people's car,' even Adolf Hitler called in the Austrian automotive engineer Ferdinand Porsche to help build it for the masses. Recall, in 1938, at a Nazi rally, the Hitler declared: 'It is for the broad masses that this car has been built. Its purpose is to answer their transportation needs, and it is intended to give them joy.' So, any attempt to ditch that volume segment today will mean we have lost that overriding founding purpose -and hence our identity.''*

Oliver Blume: *''Rupert, I appreciate the history lessons but my segment is designed to be so extraordinarily unique that if we were to heed your history lessons only, it should not be part of WA AG in the first place. Although my products are branded with an identity separate from the VW brand, you cannot deny in an internet or google age, it is very visible that my brands are part of the VW brand. You see, when I look at my rivals in this segment, I see Rolls-Royce (owned by BMW); Ferrari and Maserratti (Owned by Alfa Romeo that is in turn owned by Fiat). These owners have either focused on a premium and super premium type segments, or set up their super premium brands through such a complex ownership structure, far away from their other relatively less-premium brands, to reinforce the perception of their exclusivity. My point is that our own comparable brands - Porsche, Bentley, Bugatti and Lamborghini, although with their own separate brand identity, are still relatively more associated with the VW brand -and by extension, 'this' historical culture of the 'people's car'. This negates my exclusivity positioning, big time! My division may sell far fewer cars but my margins are a lot better; so, I will support Hebert's contention that we ditch the volume segment completely. Rupert, I am amazed that as head of premium segment, you would not support such a move but rather focus on history?*

Frank Whiter: *''Since the main issue is how to enhance our profitability longer-term, I'll have to crunch the above cost optimisation projections and consider other numbers elsewhere to help input to this debate overall.''*

Herbert Diess: *''Look, team, there is no question that our initial success as WV AG was in the low cost or volume market segment - and yes, we were succesful; but over the years, we have improved quality immeasurably and are now recognised as being a leader in quality, and our brand reputation has improved with significant effort in marketing. The problem though is that we still continue to produce a large volume of cars targeting the volume segment and most are dragging our operating margings below the our 6.75% target. As far as I am concerned, we need to be clear where we stand if we are to suceed long term. And this cannot be in all 3 segments.''*

ISSUE/SCENARIO: STRATEGIC SOURCING OF COBALT IN AFRICA

VW AG had advertised a tender for the strategic supply of cobalt worth €50 billion to the chagrin of Tesla, Toyota, BMW -and not surprisingly, the global mobile phone manufacturing industry. It was looking to secure from a single or multiple suppliers, an estimated 55,000 metric tons, growing by 25% per year over the next 10 years (2017 production was 110,000 metric tons). This would require negotiations with mining giants operating in the

Democratic Republic of Congo (DRC), including Gencore, Vale, China Molybdenum and Gecamines. This initiative, though managed from HQ, had seen the responsibility for its coordination entrusted to Peter Brehme, Head of Volkawagen South Africa, who also oversees the rest of Africa.

''The success of South Africa's automotive industry is closely linked to Africa's fortunes'', said Brehme, who also doubles as the African Association of Automotive Manufacturers (AAAM) chairperson. *"The AAAM is pushing for 5 production centres on the continent, as part of a pan-African automotive deal: South Africa, Nigeria, Rwanda, Kenya and Ethiopia. We have to connect these markets, creating a pie big enough for everyone"* says Brehme. Earlier in 2017, as part of its Africa expansion strategy, VW entered Rwanda, launching a new 'integrated mobility concept and electric vehicle assembly plant' in Kigali. This occurred following the signing of a memorandum of understanding between Rwanda's President Paul Kagame and VW CEO Dr. Herbert Diess.

Experts believe Rwanda was strategically selected, not only for its political stability, economic prosperity and attractive incentives, but for its geographical proximity to DRC; most cobalt from artisanal miners in the DRC is siphoned through Rwanda before being shipped to China or other world markets. Three months ago, the strategic supply talks collapsed. A cobalt sector spokesman is quoted as saying, *'You simply can't meet their minimum quantity or maximum price per unit requirement, let alone the 10-year fixed price requirement. Only artisanal miners can meet this, but certainly not the volume requirement. They obviously have a much lower low-cost base as they do not comply with the many laws and standards we are held to.''*

In a recent national TV interview in Rwanda, in response to reports that VW AG was using its Kigali office to negotiate direct cobalt suppliers from artisanal mining operators in the DRC, a local VW official is quoted as saying, *'We see it as pan-African to support their livelihood. Cobalt is not a 'conflict mineral' and we are not breaking any laws in Rwanda, so this will continue as we need to secure our supply needs*.'

ISSUE/SCENARIO: E-MOBILITY STRATEGY

E-mobility, also called Road Map E, is a sub-component and bedrock of the VW AG's 'Strategy 2025' - an ambitious plan to build and sell a minimum of 3 million all-electric cars per year and leapfrog Tesla to become the world's no. 1 e-car (electric vehicle) producer, whilst retaining its edge over Toyota as the world's number 1 car producer. By 2025, it plans to have 50 purely electric-powered vehicles models across all three categories. The strategy is based on the modular electric drive matrix (MEB), a technology platform developed specifically for electric vehicles (although it can accommodate diesel engine replacements). Production of the Volkswagen I.D., the world's first series vehicle based on the MEB, will begin in Zwickau (Germany) at the end of 2019 as a pilot, whilst similar MEBs are to be constructed in the USA and China. Last month saw the dawning of a new era at Audi, too, when the carmaker unveiled the e-tron, its first electric series-produced vehicle. The e-tron will offer Audi fans and customers a combination of driving pleasure and everyday usability.

Half the cost and the main source of differentiation of e-cars is the Electric Vehicle Battery (EVB), a component that VW AG must manufacture or procure from outside suppliers. Its e-mobility strategy, which was first

initiated in 2013 but fast tracked after the ‘diesel issue’ erupted, was to commence as a pilot phase (at its Wolfsburg plant in Germany only) up to the end of 2018, before ramping-up from 2019 at all geographical regions. The Board, May 4, 2013 had appointed Panasonic on a fixed 5-year sole supplier contract for EVBs, but subsequently concluded after a strategic scenario planning exercise, that the future potential of e-cars was very limited, betting its investments rather in fuel and diesel efficient combustion engine technology. As a result, it relegated e-mobility -in part, by placing far fewer EVB orders than it had initially committed to under the supply agreement; yet, it often was reluctant to pay the requisite higher per unit prices. Panasonic would partly as a result, go into an arrangement to manufacture EVB for Tesla.

The CharterQuest Institute has compiled the following data pertinent data:

1.1 **Updated EV Production**

	2018	2019	2020	2021	2022	2023	2024	2025
Volumes in million units/year	0.1	0.3	3.5	4	4.5	5	5.5	6

1.2 **Tenders From 4 Suppliers (S1 to S4) (supply commencement date: July 2018)**

	S1 -Panasonic	Supplier 2 (S2)	Supplier 3 (S3)	Supplier 4 (S4)
Location of Plant	Japan, Germany, USA, China	Germany, USA, China	Germany	China & US
Length and nature of contract	Was 5 years with no break clause; Now 3 years (6-month rolling) with break clauses and with JIT	6 months (short-term) with no contract break clause	5 years (6-month rolling) with break clauses.	5 years (long-term) with JIT but no break clause.
Quality of production (from sample tests)	Excellent	Reasonable	Very good	Very good
Maximum capacity per annum (million units)	Was 25; Now 5	15	5	10
Average cost per unit (= as quoted to VW AG) in € *(all subject to same minimum order quantities and same inflation rate)*	Was 400 (invoiced in €); Now €390 (to be invoiced in US$)	400 (to be invoiced in €)	450 (to be invoiced in €)	500 (to be invoiced in US$)
Shipping and transport cost per unit €	5.0	5.0	5.0	7.5
Battery range before recharging is required (per km)	125	110	125	125
Battery lifespan (per km)	160,000	160,000	160,000	160,000
Battery lifespan (years)	8	8	8	8

Notes:

- JIT = Just-in-Time (JIT) inventory management system (all costs included in per unit charge)
- Competitor benchmarking reveals the most popular e-car has a battery range of 120 km and lifespan of 160,00km. Tesla has an electric car with an electric battery with the longest range (240 km) before recharging. It is produced by Panasonic, exclusively for Tesla at its Nevada Gigafactory! It is thought that this gives Tesla its single biggest competitive edge over VW AG in the e-car market!

ISSUE/SCENARIO: PRODUCT PORTFOLIO RATIONALISATION

VW AG's supervisory board wants to further re-organise the way passenger car brands, trucks and buses are grouped, in a bid to further increase its development and engineering synergies and improve its competitiveness. The deliberations come as rival carmakers and suppliers, including Fiat and Daimler work on ways to slim down and divest non-core assets. This has been triggered in part by the prospect of a 'no deal' Brexit and global trading concerns arising from tariff wars between the US, China and other trading partners.

Analysts at Goldman Sachs say there is €160 billion worth of "hidden value" in the European autos sector that could be unlocked through portfolio simplifications. Automotive analyst Frank Schwope at NordLB said a revamp could also prove to be a fresh trigger for deciding what VW AG's core businesses are. *"Under the new leadership with Dr. Hebert Diess at the helm, there is an urgent need for slimming down, something the previous CEO did not appear to be pursuing with the required pace. The group has simply become too complex, firms like Ducati and Renk have only limited value for group business and would be much better placed at different owners,"* Schwope, who has a 'buy' rating on VW AG said.

Given that the 2018 1st quarter results were amongst the main drivers - so soon after publishing its 2017 financials (March 2018) - in the Board's decision to replace the previous CEO, Dr. Hebert Diess had asked for a compilation of the 1st quarter management accounts using the newly-established 3 categories as the basis to develop a set of strategy proposals, 2 of which include: (1) Reduce the price of volume range in key emerging markets; (2) Identify which car models are loss-making and cease production.

The CharterQuest Institute has compiled the following data:

Brand categories (ranges)	Volume	Premium	Super-premium	TOTAL
Units produced and sold (million cars)	2,015	549	186	2,75
Sales value (€ millions)	23,273	16,871	20,533	60,677.00
Total Gross Margin (€ millions)	3,490.95	1,269.10	8,623.86	13,383.91
Direct Factory Overheads (€ millions)	3,550.45	637.73	890.57	5,078.75
Gross Profit (€ millions)	(59.50)	631.37	7,733.29	8,305.16

ISSUE/SCENARIO: PARIS ACCORD AND ENVIRONMENTAL LEGISLATION

In November 2017, as part of its strategic review, the board noted the US withdrawal from the 2015 Paris Agreement on Climate Change Mitigation - and its commitment nonetheless, to abide by the four-year exit transition process (in terms of this, it will abide by all enacted regulations up to November 4, 2020). The withdrawal by the federal government however, did not prevent a number of states from forming the Climate Change Alliance to further the ends of the agreement within the US. The first wave of regulatory standards on car emissions as prompted by the Paris Agreement was enacted in participating countries in 2016.

Except for countries in Africa with relatively less rigorous environmental regimes, a new wave of emission regulations in the West as well as in China and Asian countries, is planned to kick-in from 1 January 2019 to

December 2023 before being tightened again in 2024. These regulations will require road engines to be lower than 99gCO_2 km^{-1} (the current average across all VW AG car ranges is 125gCO_2 km^{-1}) or else the manufacturer will be fined. The fine, a flat penalty of €600 million will be levied across all cars within a company's portfolio, even if only one model in any range (or category) is above the limit. This fine will remain flat for 5 years and then grow by 1% in perpetuity. VW AG has few cars in the volume range that are below this threshold, the vast majority however, are in the higher end ranges (premium and super premium category). Whilst getting some of the cars down in the volume category to this 99gCO_2 km^{-1} threshold will not be difficult, a challenge arises for the higher-end cars -as typically, they have more powerful emission-producing engines.

The Engineering Director (ED) has suggested that meeting the new standards will require a huge amount of R & D, to design, test and replace (refit) brand new engines. This requires a capital cost of €19,500 million in the current financial year. It will be mainly used to build new modular electric drive matrix (MEB) technology platforms that can accommodate any changes required to meet current and future tightening of environmental legislation beyond 2023, as well as to manufacture electric vehicle engines. The platforms will require 8 months to build and commission, in time for the engine replacements to commence. The Net Present Value of this investment, arising mainly from sales outside of the USA (note that despite withdrawal from the Paris Accord - the USA is expected to impose even stricter emission standards) is expected to be in the region of -€2,000 million.

Alternatively, the current range of engines could be modified at a capital cost of €11,750 million, still in the current financial year (also needing 8 months to build and commission). This will largely be used to build new modular electric drive matrix (MEB) technology platforms that can accommodate any changes required to meet current and future tightening of environmental legislation beyond 2023. Whilst this will make the cars more attractive to customers, some of the more powerful models would still be over the threshold. VW AG will therefore, still incur the fines; however, a similar net profit to sales impact as above can be achieved by granting trade discounts to boost sales through car dealers in a number of African countries, where the minimum required emissions standards still lag behind (currently, these standards are at 150gCO_2 km^{-1} and anticipated to remain so for the foreseeable future). The Net Present value of this has been estimated to be in the region of €2,200 million.

VW AG could choose to not take any action. Despite this, it can still achieve an increase in net profits of €500 million in 2019, growing by 1.02 % every to 2023 before also dropping to a 1% growth in perpetuity. This takes into account the trade discounts to incentivize EU-based car dealers who have confirmed their orders to buy and export to the US, bypassing any more rigorous emission standards that may come into force. Should this fail, VW AG will export through car dealers in a number of African countries described above. The Net Present value of this has been estimated to be in the region of €1,000 million.

In all the cases, the projected increase in net profits does not take into account potential cannibalisation due to the e-mobility (Road Map E) component of Strategy 2025.

APPENDIX 1:

Forecast Income Statement for the year Ending December 31, 2018 (figures in € millions)

(Compiled December 2017)	**2018 Forecast**	**2017 Actual**
Revenue	**245,900**	230,682
Cost of sales	(198,500)	(188,140)
Gross profit	**47,400**	**42,542**
Distribution Expenses	(23,442)	(22,710)
Administrative Expenses	(9,600)	(8,254)
Other operating income	14,500	14,500
Other operating expenses	(12,252)	(12,259)
Operating results	**16,606**	**13,819**
Net interest and other financial effect	94	94
Earnings before Tax	**16,700**	**13,913**
Net tax	2,731	(2,275)
Earnings after tax	**13,969**	**11,638**

The above forecast was prepared using the following volume and price assumptions (ignore all other VW business segment/activities that do not fit into these three range).

Car/Product Categories/Ranges	**Volume**	**Premium**	**Super-premium**	**TOTAL**
Units sold (cars)	8,600,000	1,900,000	600,000	11,100,000
Average price (€)	11,350	44,100	107,500	
Sales value (€ million)	97,610	83,790	64,500	245,900
Average Gross Margin (%)	10%	30%	40%	
Total Gross Margin (€ m)	9,761	25,137	25,800	60,698
Direct Factory Overheads (€ m)	6,800	3,037	3,461	13,298
Gross Profit (€ m)	2,961	22,100	22,339	47,400

==The END=================================