Innovo Consulting

(Toronto, Canada)

VOLKSWAGEN

AKTIENGESELLSCHAFT

BOARD REPORT

SHAPING THE TRANSFORMATION TOGETHER

Daniel Bielak
Bachelor of Business Administration
(Management)

Emma Lal
Bachelor of Business Administration
(International Business)

Michael Persaud
Bachelor of Business Administration
(Finance)

Shirin Monga
Bachelor of Business Administration
(International Business)

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EXECUTIVE SUMMARY

Terms of Reference – Volkswagen AG is a German multinational automotive manufacturing company that designs, assembles, and distributes passenger and commercial vehicles, motorcycles, engines, and turbomachinery. Alongside complementary services including financing, leasing, and fleet management. VW AG has approached Innövo Consulting to prioritize, evaluate, and recommend solutions to the five strategic issues it is currently facing.

SITUATION – SWOT ANALYSIS

Strengths	Weaknesses
• Well established brand • Loyal customers • Ambitious TOGETHER – Strategy 2025 • Joint ventures with local Chinese automakers • Strong diversification strategy – widespread portfolio • MEB platform technology – mass production	• Insular corporate culture; Disconnect between senior management • Production capacity consumed by unprofitable vehicles • Negative publicity stemming from Dieselgate • Limited expertise in manufacturing EVs • Lack of clear sense of direction towards Strategy 2025
Opportunities	**Threats**
• Become the world's no.1 EV producer • Launch 50 EVs by 2025 – Securing EVBs for competitive advantage • Adhere to Paris Accord regulations; positive brand equity • Simplify structure; optimize operational efficiencies • Emerging markets – Africa (West and South Africa)	• Increasing environmental regulations • €600M flat penalty on failure to comply with Paris Accord • High risk of competitive rivalry: Tesla, Toyota • High risk of buyers' power: price sensitive • High risk of suppliers' power: quality of EVBs • Pending investor lawsuits from Dieselgate

PRIORITIZATION & FOCUS

Issues/Scenario	Organizational Impact	Urgency	Financial Benefit	Ethical Effect	Total
Strategy, Structure, and Cost Optimization	5	5	5	3	**18**
E-Mobility Strategy	3	5	5	3	**16**
Product Portfolio Rationalization	5	3	5	3	**16**
Paris Accord and Environmental Legislation	3	3	5	3	**14**
Strategic Sourcing of Cobalt in Africa	1	1	1	5	**8**

Legend: 1 = Low, 3 = Medium, 5 = High

KEY RECOMMENDATIONS

VW AG's catastrophic incident (Dieselgate) prompted the company to rethink its strategic direction. The group responded with the ambitious TOGETHER – Strategy 2025. Thus, Innövo Consulting will make recommendations considering strategic management, financial impact, risk management, and business ethics to prepare VW AG for its future. The **key priority rankings** for the five strategic issues are the following:

1. Strategy, Structure, and Cost Optimization
2. E-Mobility Strategy
3. Product Portfolio Rationalization
4. Paris Accord and Environmental Legislation
5. Strategic Sourcing of Cobalt Supplies in Africa

1. STRATEGY, STRUCTURE, AND COST OPTIMIZATION

Situation – After his recent appointment, CEO Herbert Diess alongside his executives must decide between a centralized or decentralized strategy. He must consider the Volume, Premium, and Super-Premium segments to form a sustainable organization structure. Further, the related strategy must achieve cost optimization and ensure long-term profitability for VW AG.

Objectives

✓ Develop a clear management strategy
✓ Change the organization structure to think globally and act locally
✓ Cost optimization to ensure long-term profitability

Analyses – ***Organization Structure (Consolidation of Power)***

Through analyzing the current organization structure, Innövo Consulting identified that VW AG lacks segregation of duties (Appendix 1 (a)). For example, CEO Herbert Diess holds multiple positions from being the Head of the Volume Segment to the Head of VW Brand. Furthermore, the Group's CFO Frank Witter is also leading the group's IT function. This showcases Mr. Witter's additional role deviates from his core competency, thereby decreasing the value added from the Finance and IT function. Therefore, VW AG must segregate duties (SOD) to allow for better decisions to be made since these leaders are spread too thin overseeing multiple segments. They are tied down in operations of multiple groups. Having SOD will give these leaders more time for strategic implementation.

Relevant Costs and Benefits

Innövo Consulting has conducted a simulation using cost savings for SG&A expenses, along with factoring in the probability of each occurrence. Innövo has identified the high, weighted average, and low scenarios (Appendix 2). The consultancy extrapolated figures from VW AG's Annual Report 2017 (Appendix 3) to multiply with the respective percentage of cost savings. Using these figures, VW AG can achieve savings between €656.14 million and €9,073.80 million. This results in a percentage-of-sales savings between 0.29% and 4.14%. The difference between simulated percentages and extrapolated percentages can be rationalized through the various basis of SG&A expenses.

Strategic Financial Management – Net Present Value

Innövo Consulting conducted a Net Present Value (NPV) analysis to identify the profitability of the projected category of savings. The Present Value assumes a time horizon of 2019 to 2025 using the cost of capital of 14%. The consultancy identified the high, weighted average, and low-cost savings (Appendix 4). The three levels of cost savings project a positive NPV which indicates the projected savings exceed their anticipated costs thus adding value to the firm.

Evaluation of Strategic Options

Strategic Options	Description	Pros	Cons
1. Centralized Structure	• Strategic decision-making at VW's HQ in Wolfsburg, Germany	• Reduces risk of regional managers making strategic errors • Ensures local operations support VW's mission and vision • Effective configuration of value chain activities	• Management must oversee multiple activities • Information flows top-down; pre-empting bottom-up innovations • Discourages localization initiatives in regional markets
2. Decentralized Structure	• Strategic decisions made and implemented by regional managers of	• High local responsiveness • Open and free communication • Increasing accountability of frontline employees	• VW's subsidiaries may make counterproductive decisions

	VW for their respective markets	• Faster decision-making to drive performance	• Championing local interest over global outlook • Information flows bottom-top; obstructing senior management's innovations
3. Hybrid Structure (Central + Decentral)	• Establishing specific business functions as central and decentral • Separating divisions and business functions	• Dispersing decision-making throughout the organization • Shared mission, vision, and values throughout organization • Global integration with local responsiveness for VW's growth • Balanced communication between management and employees • Leveraging human capital through teamwork	• More resources directed on people management • Increased competition for resources and rewards

Recommendation

After understanding VW AG's current position, analyzing the situation, and assessing the strategic options, Innövo Consulting recommends VW AG must pursue the third option of ***establishing a hybrid structure.***

The recommendation to pursue the hybrid strategy is largely based on the recent centralization of business functions such as R&D, information technology (IT), sales, and production while establishing decentralization in primary functions. This will ensure global integration with local responsiveness to changing market demands. Furthermore, it leverages VW AG's current financial position to deliver a competitive advantage and achieve long-term profitability.

Implementation

1. Dispersing Decision-Making Power (4 months)

To realize the full benefits of this strategy, Innövo Consulting recommends identifying specific business functions that will be centralized and decentralized (Appendix 1(b)). For example, the centralized functions can include marketing (pricing) distribution (trade discounts), human resources (salaries and wages), and procurement (direct factory overheads). Whereas, the decentralized functions entail advertising, firm infrastructure, operations (inbound and outbound logistics), and service. Furthermore, VW AG must look to hire (internally or externally) VPs' of specific segments and business functions outlined to ensure simplification and segregation of duties in the organization structure. By identifying the centralized and decentralized functions, VW AG will disperse decision-making power while saving significantly on cost. This strategic option will allow VW AG to think globally yet act locally in their operations.

2. Supervisory Board's Approval (4 months)

After identifying the business functions, VW AG management must conduct meetings with the supervisory board to get their approval towards simplifying the group structure. The management team must emphasize the importance of the cost savings realized from the hybrid strategy. Furthermore, management will continue to monitor and re-evaluate business functions on an annual basis to maximize organizational performance while reducing costs.

3. Setting the tone (8 -12 months)

The next stage will involve implementing the 'reorganization' strategy. Innövo Consulting recommends that VW AG organize a culture summit at the regional locations. For example, at the VW South Africa, the summit will be a one-day conference involving team activities, workshops, and keynote speakers to champion cultural alignment of regional offices with global objectives. It is critical to align company values in South Africa due to the emergence of an assertive middle class with high disposable income and an appetite for consumer goods.

Risk Management

Employee resistance to structural changes – The regional locations such as VW SA can appoint change champions that vary from managers to new employees, which in turn sets a positive tone and creates an atmosphere of employee engagement.

Governance risk between VW HQ and regional subsidiaries – The communication methods implemented must stress that regional offices act locally while upholding global objectives. Innövo Consulting recommends achieving this by email notifications, forums through VW AG's intranet, biweekly web meetings to share best practices, thereby creating a competitive advantage.

2. E-MOBILITY STRATEGY

Situation – VW AG aspires to be the world's no. 1 electric vehicle producer as a result of Strategy 2025. The ambitious plan involves launching 50 purely electric-powered vehicles across the group's Volume, Premium, and Super-Premium segments. The Road Map E's success is contingent on two integral aspects: Electric Vehicle Batteries (EVB) and the Modular Electric Drive Matrix (MEB). With the 5-year fixed contract with Panasonic coming to an end, VW AG must decide on a comprehensive battery strategy to accomplish their 2025 goals.

Objectives

- ✓ Decide whether to manufacture or procure batteries
- ✓ Secure adequate battery supply to fulfill projected EV demand

Analyses ***– Supply Chain Management***

Two integral aspects of the electric vehicle supply chain are batteries and the Modular Electric Drive Matrix (MEB). The modular nature allows for the batteries to be set into the vehicles and therefore, reduces costs immensely in the production process. However, VW AG must determine the best method for securing batteries. VW AG has identified seven alternatives to procure batteries. Thus, Innövo Consulting completed a decision matrix to help determine the best approach. It considered factors affecting the choices and assigned a weighted score between 1 and 3. Therefore, the consultancy concluded the best alternative is to acquire batteries.

	Origional Assessment	Score	Development Alternatives						
		1 to 3	1. Make	2. Acquire	3. Partner	4. Outsource	5. Contract	6. License	7 .Reference
Factors affecting choices	A. Central to Whole project	3	2	2	2	1	1	0	-2
	B. Critical to performance	3	2	2	1	1	1	2	-2
	C. Third party capabilites	2	-2	2	2	2	2	-2	2
	D. Development Indepednace	1	-2	-2	1	1	1	1	1
	E. Internal Competency	1	2	-1	-1	1	-1	-1	0
	F. Confidentiality	2	2	1	1	-1	-1	1	-1
	G. Complmentory Availability	2	-2	-1	0	2	2	2	2
	H. Customer "ownership"	1	2	2	1	-2	-2	-1	-2
	I. Time to market pressure	3	2	1	1	-1	0	-1	0
	J. Price senstivit	3	2	2	-1	1	1	0	0
		Totals:	8	8	7	5	4	1	-2
		Weighted Average Totals:	1.047619048	1.142857143	0.7619047619	0.5714285714	0.619047619	0.190476190	-0.3333333333

Procurement Management – Development Alternatives Decision Matrix

VW AG is considering the following suppliers: S1 - Panasonic, Supplier 2 (S2), Supplier 3 (S3), & Supplier 4 (S4). The criterion for selecting a supplier has been outlined in the Tenders From 4 Suppliers table. The consultancy has identified the following factors as essential when choosing a battery supplier: quality, range, average cost/unit, battery production capacity per annum, and the nature of the contract. VW AG must consider the above criterion as EVBs' are half the cost and main differentiator for EVs.

Strategic Cost & Management Accounting – EV Production Cost Per Year Per Supplier

Based on the projected costs for each of the tenders, the Panasonic deal is the most financially feasible. Further, with a 5,000,000-battery units annum capacity, it creates a re-negotiation space for a new long-term high capacity contract.

Projected EV Battery Costs								
	2018	2019	2020	2021	2022	2023	2024	2025
Volumes in units/year	100,000	300,000	3,500,000	4,000,000	4,500,000	5,000,000	5,500,000	6,000,000
S1 Cost Per year	€195,000,000.00	€585,000,000.00	€6,825,000,000.00					
S2 Cost Per Year	€200,000,000.00							
S3 Cost Per Year	€225,000,000.00	€675,000,000.00	€7,875,000,000.00	€9,000,000,000.00	€10,125,000,000.00			
S4 Cost Per Year	€375,000,000.00	€1,125,000,000.00	€13,125,000,000.00	€15,000,000,000.00	€16,875,000,000.00			

Evaluation of Strategic Options

Innövo Consulting has developed a decision matrix outlining five decision criterion and their rankings under each supplier. The decision criterion listed are the most critical factors in choosing a battery supplier (based on Tenders From 4 Suppliers chart).

Decision Criteria	S1 – Panasonic	*S2 – Supplier 2*	S3 – Supplier 3	S4 – Supplier 4
Battery Quality	5	1	3	3
Battery Range	5	3	5	5
Financial Feasibility	5	5	3	1
Maximum Battery Capacity Per Annum	3	5	3	5
Nature & Length of Contract	3	1	5	5
Total	**21**	**15**	**19**	**19**

Legend: 1 – Low 3 – Medium 5 – High

Recommendation

Innövo Consulting recommends that ***VW AG acquire batteries through S1 - Panasonic***. This option is the most cost-effective contract over a three-year period. It provides excellent quality batteries, offers a competitive battery range, and has strategically important production facilities. This will allow VW AG to achieve their Strategy 2025 goal of launching 50 EVs on the MEB platform.

Implementation

1. ***Short Term (4 months)***

VW AG's focus will be on securing batteries from S1 – Panasonic through a 3-year contract. VW AG must assemble a negotiations team to manage the talks with Panasonic. The negotiation must focus on the ethical sourcing and reliability of the batteries. The impact of the battery securement means VW AG can execute Strategy 2025. Further, VW AG must work with Panasonic to ensure the batteries upon delivery are compatible with the MEBs.

2. ***Medium Term (12 months)***

VW AG's battery strategy must integrate Panasonic's batteries with the MEB chassis to use in the production of the I.D. vehicles: The VW I.D., Buzz, Crozz & Vizzion. Further, VW must develop a marketing campaign with Uber across key markets to introduce potential customers to the EVs. The campaign will be inspired by the VW Up! Uber campaign in South Africa. Subsequently, VW AG must collaborate with the local governments to secure rebates for their EVs. Thereby, increasing affordability for their end consumers.

3. ***Long Term (12 months)***

As the current 3-year deal with Panasonic concludes, VW AG must advertise tenders or renegotiate with Panasonic to secure a higher unit per annum and/or a long-term contract. Further, VW AG should release more EVs across all segments and brands with paired marketing campaigns. The following is an example of a 6-year EV launch per segment:

Category	2019	2020	2021	2022	2023	2024	2025	Total EV's Launched Per Segment
Volume	4	5	5	5	4	5	4	32
Premium	1	2	1	1	1	0	2	8
Super Premium	1	2	2	1	2	1	1	10
Total EV's Launched Per Year	6	9	8	7	7	6	7	50

Finally, VW AG must have a long-term outlook and consider investing into solid state battery technology. This will eliminate the need for cobalt in the EVBs. Solid state batteries lower the cost of developing EVs and largely increase the range per charge of the vehicles. These factors that could differentiate VW AG to ensure long-term sustainability.

Risk Management

Panasonic pulls out of the deal – Work with Supplier 3 to secure batteries and renegotiate the contract to include shipping costs necessary to reach the other MEB manufacturing facilities.

Panasonic may not have enough capacity to fulfill EV demands past 2023 – Utilize the annum capacity of both Panasonic and Supplier 3.

3. PRODUCT PORTFOLIO RATIONALIZATION

Situation – Currently, the VW AG management team is managing multiple brands and product lines within its portfolio. To maximize efficiencies within VW AG, the company's core business functions must be identified. The group must look towards eliminating unprofitable product lines to effectively and efficiently manage their resources.

Objectives

- ✓ Reduce the price of the Volume range in key emerging markets
- ✓ Identify which car models are loss-making and cease production

Analyses – ***Financial Accounting & Reporting***

Net Profit Margin – As per Appendix 5, the net profit margin for VW AG's three segments for 2017 are the following: Volume (11.92%), Premium (13.89%), and Super Premium (18.04%). The Volume segment is the lowest contributor to the company's bottom line and the Super Premium segment is the largest contributor to the company's bottom line.

EBITDA – As per Appendix 6, the EBITDA from 2015 to 2017 increased from 7.5% to 11.3% due to the large increase in sales in the 2016- 2017 fiscal year. VW AG can increase their profitability organically if they eliminate unprofitable models. This act will decrease their cost of sales and experience an even larger increase in revenue.

Cost and Management Accounting

Operating Margin – VW AG desires each brand to produce an operating margin of 6.75%. Per Appendix 7, the current brands do not meet the projected target: VW Passenger cars, SEAT, Bentley, MAN Commercial Vehicles, and MAN Power Engineering. However, per Appendix 8, while the sales for some of these brands are increasing, VW AG has cash tied up in their COGS and SG&A. This presents an opportunity for VW AG to further improve their operating margin. VW AG is not managing their assets efficiently, which directly impedes their operating margin goals.

Moreover, VW AG must consider the cost savings realized by ceasing production of unprofitable models. Per Appendix 7A-C, if the unprofitable brands were to increase their operating margin to 6.75% by eliminating unprofitable models, VW AG can realize cost savings of €3,059.06 million. Innövo Consulting has calculated the estimated cost savings assuming revenue remains constant and the operating margin experiences an increase due to eliminating unprofitable models. The cost savings realized can directly support the company's Strategy 2025 goal.

Strategic Management – Confidence Intervals

The confidence intervals demonstrate the width and volatility of a category's market share. This provides numerical evidence of the uncertainty of a product's future performance at a 95% confidence level. Per Appendix 9 (a & b), through calculating the standard deviation and confidence intervals, the following models available in the South African market are extremely volatile: Golf Cab, CC, and Touran.

Evaluation of Strategic Options

Strategic Options	Description	Pros	Cons
1. Spin Off	• Create an independent company through the sale of equity in a specific brand	• Create capacity for E-Mobility • Earn proceeds from equitization of brands	• Increased risk due to loss of diversification • Economies of scale decrease • Legal costs • Potential damage to brand image
2. Cease Production of Unprofitable Vehicles	• VW AG must analyze unprofitable models and cease production	• Create capacity for E-Mobility • Reducing production will decrease VW AG's COGS and SG&A; reduces prices for end consumers in emerging markets	• Loss of jobs due to decrease in production • Potential loss of brand loyalty • May cause discomfort among senior management

Recommendation

VW AG must implement strategic option two - ***evaluate and cease production of unprofitable vehicle models*** by analyzing the impact each car model has within the VW AG portfolio. As noted above, this option will improve the company's overall profit margin and create capacity for their E-Mobility initiative.

Implementation

1. Short Term (4 months)

To sharpen the brand's positioning, VW AG must audit their brands and performance in each respective region and cease production of unprofitable models. Innövo Consulting recommends that the company begin with their VW Passenger car brand due to their significant loss contributions to the overall portfolio. Taking into consideration the confidence intervals (Appendix 9) and the geometric returns (Appendix 10) for VW Passenger cars available in South Africa, VW AG must stop producing the following vehicles: Golf Cab, Golf Sportsvan, Passat, CC, Beetle, Touran, and Touareg starting in August 2018. VW AG must also provide job assistance to employees that have lost their jobs due to the company's restructuring. Innövo Consulting has prepared an outline in Appendix 11 that VW AG can use as a guideline when executing the employee dismissal process.

2. Medium Term (8 months)

Starting in August 2018, the company must cease production of unprofitable vehicle models but continue to sell the remaining vehicles. Innövo Consulting recommends that the VW AG complete a balanced scorecard to evaluate the changes the company has made internally and how that has impacted their external operations (Appendix 12).

3. Long Term (24 months)

Subsequent to ceasing production, VW AG must evaluate all brands using updated data to eliminate unprofitable models. The company must continue to evaluate the improvement of marketing and brand positioning based on changing customer demands.

Risk Management

Customers are resistant to changes – VW AG must communicate their objectives with their customers through a press release. The company must explain the reason for these changes (unprofitable models effecting their bottom line and the need to create capacity for their new electric vehicles) to mitigate any emotions or potential damage to the VW AG brand.

Resentment among senior management team due to segment restructuring – To mitigate this risk, it is important that the group's CEO communicate how the unprofitable brands are harming the VW AG portfolio. Furthermore, the group's future direction must be stressed in this conversation, such as the E-Mobility initiatives.

4. PARIS ACCORD AND ENVIRONMENTAL LEGISLATION

Situation – A new wave of emission standards are to be launched on January 1st, 2019, which require all road engines to be lower than 99gCO2 km^{-1}. If not adhered to by any automobile in the company's portfolio; the company will incur a €600 million flat penalty for the year.

Objectives

- ✓ Minimize the negative financial impact of penalties without compromising funds for E-Mobility R&D
- ✓ Identify which capital project (if any) to invest to comply with the Paris Accord's new regulations
- ✓ Identify funding method for capital project's initial cost without negatively impacting VW AG's current financial position

Analyses – *Strategic Financial Management*

Net Present Valuation

Option 2: Initial Cost of €11,750M provides the most value added to the firm with €4,474.34M

Capital Project	Option 1: Initial Cost of €19,500M	Option 2: Initial Cost of €11,750M	Option 3: No Further Action
NPV (€)	(€3,275.65M)	€4,474.34M	€3,590.39M

Real Option Analysis – Option 1 and 2 both will both lead to an increase in expected sales by 2025 in the amount of €2,613.67M. A major implication is this analysis does not consider the timing of cash flows (Appendix 13).

Corporate Finance

Financial Ratios – Innövo Consulting conducted liquidity and solvency ratios using figures from VW AG's Annual Report. The consultancy discovered VW AG can cover any potential fines using its current operations without the need for external funding (Appendix 14).

Corporate Social Responsibility

Subsequent to Dieselgate, VW AG's stock experienced a decrease of €143.65 per share in value from April 5-September 27, 2015. Hence, VW AG has proactively taken steps to become a socially responsible company leading to an increase stock value to €169.70 on April 15, 2018.

Capital Project Evaluation

Internal Rate of Return – The selected project must have an internal rate of return greater than VW AG's required cost of capital of 14%. Therefore, Option 2 would be the only acceptable project with internal rate of return of 22.4% (Appendix 15).

Payback Period - Option 2 provides the lowest applicable payback period. This option will still lead to a fine to be incurred by the Paris Accord (Appendix 16).

Strategic Management – Business Ethics

Ethisphere recognizes the world's most ethical companies, tracking an Ethics Premium. The Ethics Premium tracks the stock prices of these companies, which are compared to a Large Cap Index. The companies listed outperformed the large cap sector over three years by 4.88%, showcasing how business ethics can drive the bottom line.

Evaluation of Strategic Option

Strategic Options	Financial Impact	Operational Impact	Risks
1. Produce new emission efficient engines and	• Initial cost of €19,500M	• MEB technology used to accommodate for the new and future environmental legislation	• Duration of R&D timeline is unpredictable

implement MEB Technology (R&D, Design, Test & Replace)	• Value added of (€3,275.65M) • Financed through debt and equity issuance	• Will require 8 months to build and commission	• Potential operational issues for brand new engines and technology • Interest rate and market risk for debt and equity issuance, including dilution of shareholders control
2. Modify current engines and implement MEB technology	• Initial cost of €11,750M • Provides €4,474.34M in value added to the firm • Will be financed through issuance of debt and equity	• MEB technology will accommodate for any changes to meet environmental legislation • 8-months needed to construct	• Future adjustments to non-adhering models may take longer; Fines will continue • Operational risks for new MEB technology
3. No further action	• No initial cost • Provides €3,590.39 M in value added to the firm	• VW AG will incur fines continuously until vehicles are adjusted	• Tightening of future legislation can cause fines to become larger

Recommendation

Innövo Consulting recommends option 2 should be undertaken **– *Adjusting current engines and initiation of the Modular Electric Drive Matrix (MEB) technology platforms.*** This recommendation is backed by a strong value-added through the Net Present Value Analysis. The MEB platform allows for cost optimization and aiding to achieve Strategy 2025. It's initial cost of €11,750M will funded by the current capital structure at 61.6:38.4.

Implementation

1. Short-Term (Present-1 year)

The initial cost of €11,750M can be funded through a debt issuance of €7,238,000 at current market rates and equity issuance of €4,512,000 & pay fine of €600M for Paris Accord using working capital.

2. Medium-Term (1-2 years)

VW AG must begin project integration by initiating an adjustment of engines and construction of MEB technology platforms. Once completed, continuously test and measure quality and efficiency of processes. From there, begin production of innovative models using the MEB technology platform and updated engines. Finally, identify and initiate new alternatives to decrease the amount of emissions for incompliant vehicles in VW AG's portfolio.

3. Long Term (3-5 years)

To ensure sustainability VW AG must measure and adjust MEB's as necessary. Therefore, the consultancy recommends VW AG conduct a balance scorecard to measure the consistency of both efficiency and quality produced by MEB technology platform. Following, continue to make Paris Accord legislations the standard for VW AG, along with continued new launched of new Electric Vehicles to VW AG's portfolio.

Risk Management

Interest Rate Risk –Hedged with the use of derivative instruments (futures, and interest rate options)
Market Risk – Risk reduced through transparency with shareholders and public with the use of press releases
Operational Risk – Mitigated with continuous testing and identification of potential issues

5. STRATEGIC SOURCING OF COBALT SUPPLIES IN AFRICA

Situation – VW AG had advertised for a tender of €50-billion to secure 55,000 metric tons with a YOY growth of 25% for 10 years. However, this procurement objective is no longer of urgency to VW AG as the firm recommends acquiring batteries from Panasonic in E-Mobility. This has dramatically decreased the importance of this scenario.

Objectives

- ✓ Demonstrate the impracticality of manufacturing batteries
- ✓ Ensure a strategic and ethical supply chain

Analyses – ***Supply Chain Management***

The lithium-ion EV batteries require the stabilizing mineral cobalt. However, cobalt is extremely costly to acquire due to high competition and a finite supply. VW AG's tender provided €50 billion to secure 55,000 metric tons, growing by 25% per year over the next 10 years. However, the 55,000 metric tons equates to 50% of the total capacity of the DRC's mines. This translates into a deficit of cobalt within 4 years (Appendix 17). Therefore, it is not worth manufacturing batteries as there will be a supply shortage in 4 years.

Value Chain Analysis

Porter's Value Chain is used to identify whether the primary and support activities are restricting VW AG's ability to increase its profit margins. Initially, inbound logistics and procurement activities were hindering VW AG's ability to drive their profit margins. However, this no longer a concern due to the E-Mobility Strategy.

International Business Law

Violating international business law and the domestic laws in which VW AG operates can have serious implications. It is important that the firm leverages ethical imperialism in its work practices even when development is outsourced. Siphoning cobalt through Rwanda is an unethical business practice. Per UNICEF, about 40,000 children work up to 24 hours in cobalt mines earning less than €1.80/day in the DRC. Furthermore, the act of siphoning is illegal. Hence, the Head of VW South Africa, Peter Brehme and VW AG must uphold German business practices across international borders. Further, they must ensure Panasonic's supply chain meets their ethical standards.

Strategic Management – Hofstede's + Doing Business in West Africa

Innövo Consulting utilized Hofstede's Cultural Dimensions to evaluate the similarities and differences in Germany and South Africa's cultures (Appendix 18). As evident, the long-term orientation difference is quite large as South Africa's culture promotes short-term orientation in contrast with the German culture. Further, the World Bank ranks emerging economies in West Africa as having a higher ease of doing business such as Rwanda (41), Kenya (80), Botswana (81), and South Africa (82). This shows how VW AG can position itself in these countries to ensure an ethical and sustainable supply chain.

Recommendation

Innövo Consulting recommends VW AG ***to disregard securing a supply of cobalt from the DRC***. Rather, VW AG must ensure their ethical standards are maintained throughout global operations. This will ensure the success of AAAM as the E-Mobility strategy launches in the region.

Implementation

1. ***Short Term (1 year)***

Upon signing the contract with Panasonic, VW AG must leverage their facilities in Rwanda to set up a cross-company ethics and compliance team. This will ensure the work conducted complies with German standards. Further, VW AG develop a Supplier Business Practice Policy for consistency in the supply chain.

2. ***Medium Term (1 year)***

VW AG must conduct ethics and compliance audits at other regional subsidiaries to ensure consistency among global operations.

3. ***Long Term (1 year)***

After the ethical sourcing of Cobalt, VW AG must ensure ethical sourcing of all raw materials in their supply chain.

Risk Management

Suppliers fail to comply with ethical standards – Ethics and compliance teams conduct audits of potential suppliers' facilities.

Subsidiaries not adhering to ethical conduct – Send an ethics team from HQ to enforce compliance.

ETHICAL CONSIDERATIONS

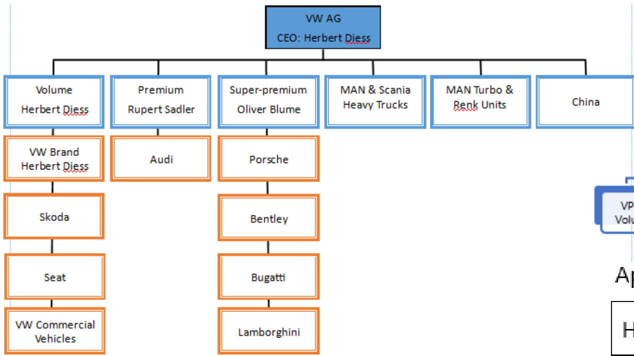
Factor	Analysis	Recommended Action
1. Job loss due to the rationalization of product lines	By reducing the number of models available within a brand, VW AG will no longer need a certain number of employees working on the production line.	VW AG must take the necessary steps to ensure it will not be faced with wrongful termination lawsuits. The criterion for terminating an employee's contract must be based on job performance, and not factors such as age or gender. VW AG must support its terminated employees by investing in outplacement consultants. These consultants assist employees in finding a job and aid their professional skills development. Where possible, VW AG must try to save as jobs through cross-training and evaluating an employee's skill set then trying to transfer them to a different position.
2. Siphoning of cobalt	The demand for cobalt has lead companies, such as VW AG, to use artisanal miners to secure the resources. However, these artisanal miners use child labour in order to keep their prices low. The use of child labour does not comply with the ethical standards of VW AG.	It is vital for VW AG to mitigate these considerations by building a sustainable and ethical supply chain. VW can do this by leveraging its facilities in Rwanda to set up a cross-company ethics and compliance team with Panasonic. This will ensure the work conducted complies with German standards. Following, developing a Supplier Business Practice Policy for consistency in the supply chain. Lastly, having the head of VW South Africa, Peter Brehme take ownership towards upholding German business practices across international borders.
3. Consolidation of power by VW AG CEO Herbert Diess	Herbert Diess is the CEO while maintaining his position as the head of the Volume segment and VW brand. This creates a direct conflict of interest.	Hence, VW AG must consider ethical egoism when one person is given power in multiple business functions. This situation causes the individual to act in their department's interest by directing resources. Therefore, it is vital to segregate duties by hiring (internally or externally) VPs' for the required segments. This disperses decision - making power as VW AG's employees have a fiduciary duty to manage their stakeholder expectations responsibility.

CONCLUSION

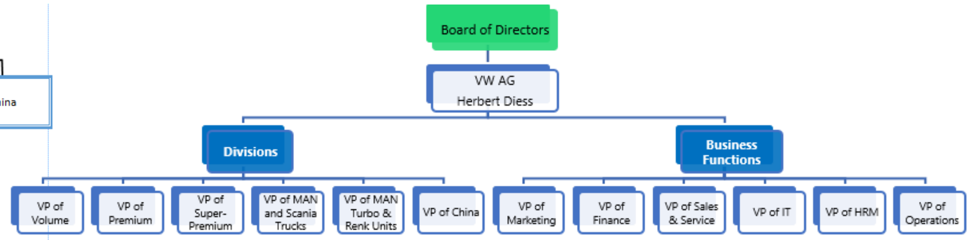
Innövo Consulting has conducted a strategic evaluation of VW AG's current position and has provided recommendations to reach their Strategy 2025. The consultancy has created an implementation plan to tackle VW AG's current issues within their operating activities while maximizing financial benefits. Innövo Consulting has recommended solutions that are innovative in nature and integrative in execution. These solutions reflect VW AG's values and commitment to ethical business practices. The consultancy is confident should VW AG follows this plan, it will achieve its goals and become a sustainable company by never letting a good crisis go to waste.

APPENDICES

Appendix 1(a): VW AG's Current Organization Structure



Appendix 1(b): VW AG's Recommended Structure



Appendix 2: Percentages of Cost Savings

High	Weighted Average	Low
14.00%	6.00%	1.45%

Appendix 3: Actual Cost Savings (in 1000s of €) using the VW Annual Report 2017

High (Amount & Percentage)	Weighted Average (Amount & Percentage)	Low (Amount & Percentage)
9,073.80 M	3,554.93 M	656.14 M
4.14%	1.60%	0.29%

Appendix 4: Total Net Present Value of Cost Savings Categories

High	Weighted Average	Low
38,911.22 M	15,244.62 M	2,813.72 M

Table 4: NPV Calculations in 1000's of €

Appendix 5 – Net Profit Margin (Net Profit after taxes/sales)

Volume	Premium	Super Premium
= 11,638/ 97,610 x 100 = 11.92%	= 11.638/ 83,790 x 100 = 13.89%	= 11,638/ 64,500 x 100 = 18.04%

Appendix 6 – EBITDA

EBITDA	2015	2016	2017
= (Operating result + operating expenses)/ Revenue	7.5%	8.11%	11.3%

Appendix 7 – Operating Margins

Brands	**Operating margin 2017**	**Operating margin 2016**	**Operating margin 2015**
VW Passenger cars	4.127%	1.769%	1.978%
Audi	8.412%	8.169%	9.545%
Skoda	9.728%	8.734%	7.328%
Seat	1.930%	1.720%	(-0.116%)
Bentley	2.984%	5.514%	5.681%
Porsche	18.469%	18.025%	15.816%
VW Commercial Vehicles	7.162%	4.091%	3.694%
Scania	10.078%	9.484%	9.800%
MAN Commercial Vehicles	3.265%	2.298%	2.021%
Man Power Engineering	5.878%	5.399%	N/A

Appendix 7A

Operating Margins at 6.75%			
Brand	Sales Revenue	Operating Margin	Operating Results
VW Passenger	€9,892.00	6.75%	€5,398.58
Seat	€79,979.00	6.75%	€667.71
Bentley	€1,843.00	6.75%	€124.40
Man Commercial Vehicles	€11,087.00	6.75%	€748.37
Man Power Vehicles	€3,283.00	6.75%	€221.60
			€7,160.67

Appendix 7B

Operating Margins from 2017			
Brand	Sales Revenue	Operating Margin	Operating Results
VW Passenger	€9,892.00	4.127%	€3,300.73
Seat	€79,979.00	1.930%	€190.92
Bentley	€1,843.00	2.984%	€55.00
Man Commercial Vehicles	€11,087.00	3.265%	€361.99
Man Power Vehicles	€3,283.00	5.878%	€192.97
			€4,101.61

Appendix 7C

Brand	Net Operating Results
VW Passenger	€2,097.85
Seat	€476.79
Bentley	€69.40
Man Commercial Vehic	€386.38
Man Power Vehicles	€28.63
Total	€3,059.06

Appendix 8 – Percentage Change (YOY Growth - Sales Revenue)

Vehicle	**2016-2017**	**2015-2016**
VW Passenger Car	-24%	-0.55
AUDI	1.37%	1.54%
SKODA	20.82%	9.76%
Seat	11.22%	3.76%
Bentley	-9.26%	4.91%
Porshe Automotive	4.65%	3.65%
VW Commercial Vehicles	7%	7.53%
Scania	13%	7.86%
MAN Commercial Vehicles	11%	0.47%
Man Power Engineering	N/A	N/A
VW China	N/A	N/A

Appendix 9 (a): Standard Deviation and Mean

Category Share	Average (%)	Standard Dev.
up!	8.5	1.26549
Vivo Hatch	19.6	1.67
Vivo Sedan	33.1	2.16
Polo Hatch	17.2	1.5769
Polo Sedan	10.2	4.208
Golf Cab	5	3.15
Golf 6 + 7	21.4	2.44
Golf Sportsvan	1.6	0.6337
Jetta	9.5	1.903
Scirocco	7.4	2.7856
Passat	2.2	1.039
CC	0.4	0.258
Beetle	6.4	3.314
Touran	14.4	16.86
Tiguan	6	0.9958
Touareg	3.7	1.16

Appendix 9(b): Confidence Interval

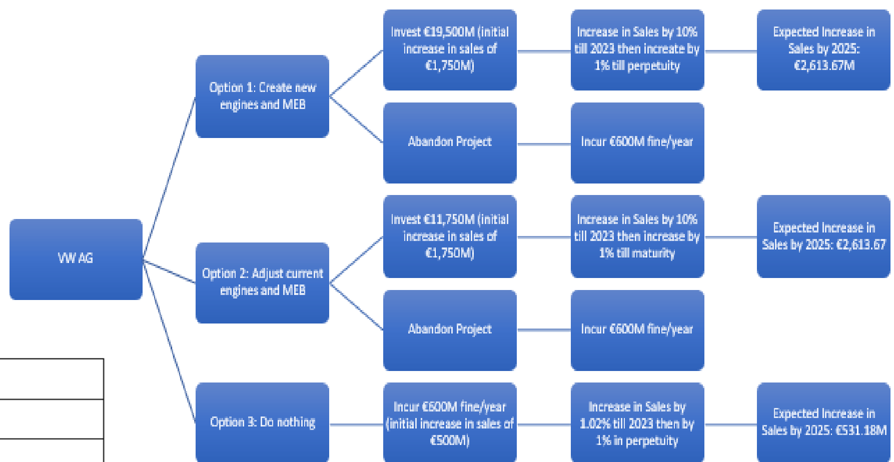
Category Share	Upper Interval	Lower Interval
Up!	10.588	6.412
Vivo Hatch	22.356	16.845
Vivo Sedan	36.664	29.536
Polo Hatch	19.802	14.598
Polo Sedan	17.143	3.257
Golf Cab	10.198	-0.198
Golf 6 + 7	25.426	17.374
Golf Sportsvan	2.645	0.555
Jetta	12.64	6.36
Scirocco	11.996	2.804
Passat	3.914	0.486
CC	0.826	-0.026
Beetle	11.868	0.932
Touran	42.219	-13.419
Tiguan	7.643	4.357
Touareg	5.614	1.786

Appendix 10 – Geometric Returns for South Africa			
Category Share	Class	Geometric Returns	Decision
Up!	A00 Hatch	8.50%	Keep
Vivo Hatch	A0 Hatch	19.60%	Keep
Vivo Sedan	A0 Sedan	33.10%	Keep
Polo Hatch	A0 Hatch	17.20%	Keep
Polo Sedan	A0 Sedan	10.20%	Keep
Golf Cab	**A Cabrio**	**5.00%**	**Drop**
Golf 6 +7	A Hatch	21.40%	Keep
Golf Sportsvan	**A Hatch**	**1.60%**	**Drop**
Jetta	A Sedan	9.50%	Keep
Scirocco	A Coupe	7.40%	Keep
Passat	**B Sedan**	**2.20%**	**Drop**
CC	**B Sedan**	**0.40%**	**Drop**
Beetle	**A Coupe**	**6.40%**	**Drop**
Touran	**A MPV**	**14.40%**	**Drop**
Tiguan*	A SUV	6.00%	Keep
Touareg	**C SUV**	**3.70%**	**Drop**

Appendix 11 – Human Resource Plan

Planning	• Must work with each division's senior management to establish the criteria for dismissing employees. This is to avoid any wrongful termination lawsuits. • VW AG must invest in outplacement consultants, who will help terminated employees gain employment quickly, while simultaneously helping them develop their skills.
Executing	• Where they can, VW AG must reassign employees within the company • VW AG must pay terminated employees severance pay. • To calculate the amount of severance, pay an employee is entitled to receive, multiply the employee's regular wages for a regular work week by the sum of: 1. the number of completed years of employment; and. 2. the number of completed months of employment divided by 12 for a year that is not completed.
Managing	• VW AG must cater to employees who remained with the company • The company must communicate that the cut was out of necessity- they should provide training to employees still with the company • VW AG must create employee engagement opportunities to foster positive feelings about the company

Appendix 13 - Real Option Analysis



Appendix 12 – Balanced Scorecard

Volkswagen AG Balanced Scorecard					
Date: April 30th, 2019	**Level of Success**				
	No Success	**Below Average**	**Average**	**Above Average**	**Excellent**
Internal Processes					
Improved Operating Efficiency			✔		
Effective Quality Control				✔	
% of competitive procurement			✔		
Financial Perspective					
Return on Capital Employed				✔	
Increase in Sales			✔		
Profit Forecast Reliability				✔	
Customer Perspective					
Pricing Index					✔
% Market Share					✔
Customer Satisfaction Index			✔		
Customer Retenion Rate				✔	

Appendix 14 - Financial Ratios

Financial Ratio	
Cash Ratio	0.118
Acid Test Ratio	0.305
Net Working Capital	€3,518M
Interest and Penalty Coverage	4.73X

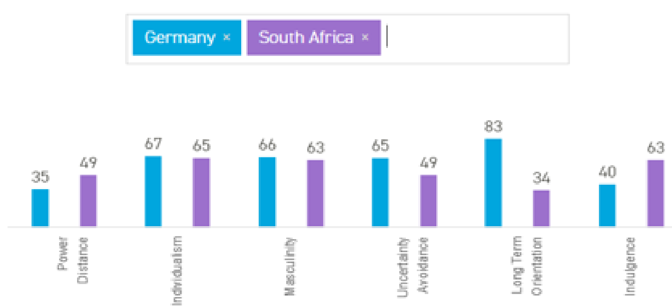
Appendix 17 – Projected Cobalt Demand (in metric tons)

Year	2018	2019	2020	2021	*2022**
Demand	55,000	68,750	85,938	107,422	134,277

Appendix 15 - IRR

Capital Project	Option 1: Initial Cost of €19,500M	Option 2: Initial Cost of €11,750M	Option 3: No Further Action
IRR (%)	9.63%	22.4%	N/A

Appendix 18 – Hofstede's Cultural Dimensions



Appendix 16 - Payback Period

Capital Project	Option 1: Initial Cost of €19,500M	Option 2: Initial Cost of €11,750M	Option 3: No Further Action
Years	8.37	5.41	N/A