

AUTOMOTIVE SUPPLIERS SUCCESS

Your strategy for success
in a changing automotive
industry.

PAUL EICHENBERG



INTRODUCTION

YOUR STRATEGY FOR SUCCESS IN A CHANGING AUTOMOTIVE INDUSTRY

2020-2030 will be the decade of vehicle electrification. Technology breakthroughs and exhausted combustion engine potential will drive the market towards electrified vehicles (EVs). In addition, significant government announcements and major OEMs have recently set new aggressive global targets for EVs, dramatically changing the outlook and forecast for the automotive industry.

What does this mean?

- Electrification is coming at an accelerated pace (and the U.S. lags in the adoption of the technology).
- This is the biggest disruption in the history of the industry – more significant to suppliers than autonomous vehicles and connected cars.
- 75% of the Top 100 suppliers will be affected and electrification has the potential to be far more devastating to smaller suppliers.
- Suppliers need to act now – potential supplier strategies and business transformation will take 8-10 years to complete.

In this paper, we'll provide an overview of the electrification disruption and its impact on the automotive industry. More importantly, we'll outline what strategic decisions are necessary to not only survive but thrive in this changing environment.

FIGURE 1 - THREE PLANNING PHASES

Organizations typically use three planning horizons for developing strategies:

	Operational Planning	Business Planning	Strategic Planning
Time Frame	12–18 months	3–5 years	8–12 years
Description	Planning focused on short-term operational budgets used to guide the activities of the day-to-day operations and functions of the organization.	Focuses on the 3-5-year growth agenda for the enterprise used to highlight significant capital investments required and other financial needs.	Long-term vision for the organization focused on investment and growth, aligning resources around “big bets” higher growth transformative opportunities.
Activities	<ul style="list-style-type: none"> • Annual sales plans/targets • Operational budgets • Detailed tasks to get done next year 	<ul style="list-style-type: none"> • 3–5 years sales/revenue plan • Financial planning • Capital planning • HR planning 	<ul style="list-style-type: none"> • Vision & Mission • Strategic Plan • Portfolio analysis • Future needs/gap analysis • Valuation analysis

ELECTRIFICATION FORECASTS ARE UNDERSTATED

ELECTRIFICATION TECHNOLOGIES WILL AFFECT ALMOST ALL VEHICLES PRODUCED BY 2030. RECENT ANNOUNCEMENTS IN EUROPE AND ASIA RAISE THE FORECAST FOR PURE BATTERY ELECTRIC VEHICLES TO 22 MILLION BY 2030 AND WILL LEAD TO 90% OF VEHICLES BEING ELECTRIFIED.

Though vehicle electrification is already impacting the industry and is gearing up rapidly, we'll be focusing on the longer-term implications which affect **business planning** and **strategic planning**.

ELECTRIFICATION FORECASTS ARE UNDERSTATED

Since the beginning of 2017, the trend towards the adoption of zero emission vehicles has started to accelerate around the globe.

FIGURE 2 - ADOPTION OF BEV BY REGION

Country	Date	Policy
Canada (Quebec)	January 2017	Quebec legislation approves a new law that requires automakers to sell a minimum number of electric, plug-in hybrid and hydrogen vehicles. Starting with the 2018 model year, 3.5% of all auto sales in the province will have to be from those types of vehicles. That threshold will rise to 15.5% for 2025 models.
EU	February 2017	EU just announced that all new and renovated homes must have EV chargers by 2019.
Norway	February 2017	Norway becomes the first nation to ban the internal combustion engine and intends to only allow the sale of electric vehicles by 2025.
India	June 2017	India is one of the world's most polluted countries. Its energy department states that it has set the "ambitious" target to stop selling gas-powered vehicles in an attempt to clean up its air. Thus, in an effort to support the Paris Climate Accord, India is making a bold vow to start selling only electric cars by 2030 and ban ICE vehicles.
France	July 2017	France joins Norway as France's new President Macron announces ICE ban by 2040. In this announcement, the government's intent is to end the sale of new petrol/diesel vehicles by 2040 to help meet the Paris Climate Accord.
UK	July 2017	UK's environmental secretary Gove announces ICE ban by 2040. The secretary states, "There is no alternative to embracing new technology."
Scotland	September 2017	Scotland plans to end petrol and diesel car sales by 2032, eight years ahead of the UK's deadline.
China	September 2017	Xin Guobin, China's vice-minister of industry and information technology, told a forum of automakers held in Tianjin that the government would ban the production and sale of fossil fuel cars. Although no timetable has been formally announced, most Chinese automotive insiders, including BYD Chairman Wang Chuanfu, believe this ban will take place starting in 2030.

THE DIGITAL
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The European Union is leading the campaign to reduce CO₂ emissions to a targeted 95 grams per kilometer by the year 2021, followed by another major push to a target of 81 g/km in 2025 and then will target 67 g/km by 2030. Achieving these targets will only be achieved by heavy reliance on vehicle electrification technologies. In Europe, by 2030, stand-alone ICE will be eliminated as mild hybrids, PHEVs and EVs emerge in the market.

In order to meet the 2020 legislation, ICE and driveline optimization have been the primary area of focus. However, starting in 2021 as the industry shifts toward the next target, electrification will become the primary driver as the cost of ICE optimization raises to the point where electrification becomes a more cost-effective alternative. Current industry forecasts don't consider technology breakthroughs or the (stand-alone) exhausted combustion engine potential which will drive the market toward electrified vehicles. Take rates will be higher than industry prognosticators forecast today.

This is supported by growing evidence that vehicle electrification development will increase faster than originally thought. Some of the reasons for this include:

1. Accelerating global legislation to ban gas- and diesel-vehicles
2. New OEM strategies
3. Cost of compliance is raising the cost of the ICE (internal combustion engine).
4. Cost of batteries will decrease as range increases.
5. The cost differential between EV/ICE powertrain is disappearing.
6. Consumer preference for EV performance

WHAT CAN THE INDUSTRY EXPECT FROM ELECTRIFICATION?

In an industry that has traditionally operated on lengthy product development cycles, this represents a significant shift toward greater degrees of electrification and is expected to have a profound impact on the structure of the auto industry in years to come.

While the electrification of the auto industry won't happen overnight, the technology advances leading to higher reliability, driving range and economies of scale will have tremendous effects on the entire structure of the industry in the years ahead, signaling the end of the industry's mechanical age and the beginning of a digital transformation. This will lead to some serious disruptions for automotive companies and their suppliers going forward.

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STRATEGIES

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Four of the most significant issues to expect include:

1. **SCALE IS CRITICAL IN THE ELECTRIFIED WORLD AND THE FUTURE OF AUTOMOTIVE.**

Electronic systems scale differently than mechanical components. Considering this will drive significant changes to the industry. OEMs will use this concept to drive competitiveness through large-scale electrification strategy, such as in Volkswagen's strategy to build 2-3 million electric vehicles by 2025 on its MEB platform to achieve scale across its entire car group.

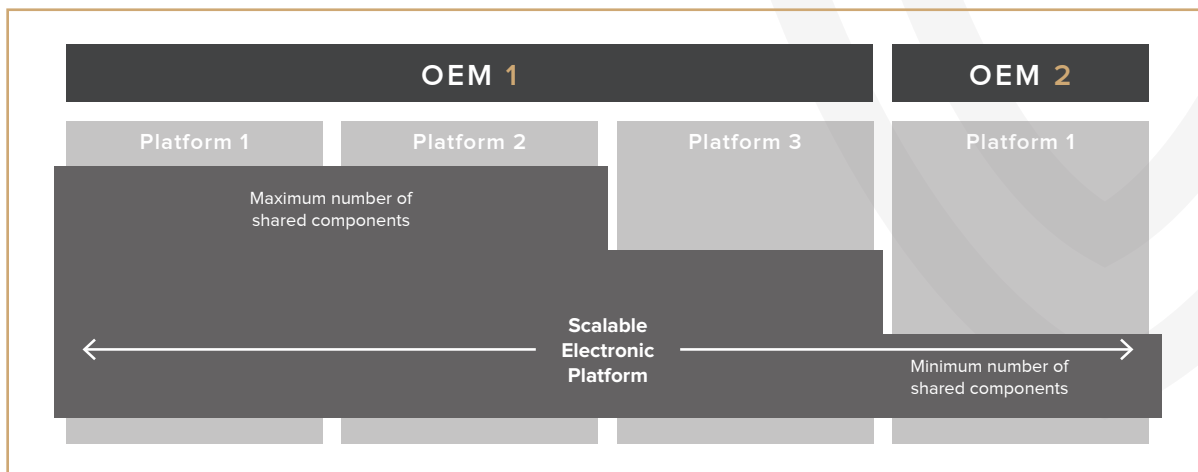
And, much like the VW example, OEMs are expected to standardize electronics architecture across vehicle platforms. This opens the potential for suppliers to leverage their hardware offerings across multiple OEMs. This also means that moving into the future, there will be limited differentiation opportunities for both OEMs and suppliers. Therefore, longer-term, **most OEMs will eventually outsource key electrical vehicle systems, including batteries, electric drive motors and power electronics.**

2. **SCALE WILL CHANGE THE STANDARD OPERATING MODEL.**

As our industry undergoes this digital transformation, the fields of electronics, electrical systems and the importance of software development will fundamentally change the auto industry's standard operating model.

For example, today's industry product development domains encompass powertrain, body, chassis, electrical, interior and exterior. As the use of electronics increases across the various domains, electrical systems become the backbone of all major automotive systems, and core to vehicle development. Due to the fact there is limited technical differentiation with these systems, scale is the main source of competitiveness. The consumer/industrial electronics operating model will be critical to those organizations that focus on vehicle electrification. Therefore, **companies such as LG, Toshiba, Bosch and Panasonic are critical partners to OEMs as they develop their electric vehicle strategies.**

FIGURE 3 - SCALE WILL LEAD TO SHARED ELECTRONICS ARCHITECTURE



Sources: Expert Interviews

WE ESTIMATE THE MARKET POTENTIAL FOR THE YEAR 2030 TO BE APPROXIMATELY \$120 BILLION FOR BATTERIES ALONE, AND \$200 BILLION FOR ALL THESE KEY HYBRID AND ELECTRIC VEHICLE COMPONENTS.

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3. NEW ENTRANTS WILL HAVE SIGNIFICANT ADVANTAGES OVER TRADITIONAL AUTOMOTIVE COMPANIES.

As electrification progresses, OEMs with the ability to achieve economies of scale with key components position themselves for a competitive advantage. These key components and systems will be coming from an entirely new group of suppliers best known today for consumer electronics.

For battery packs, companies like LG, Panasonic, Samsung, Toshiba and Hitachi all bring expertise in high volume production of Lithium-ion batteries from the consumer electronics industry. Likewise, future sources for electric drive motors and control systems include the companies that also produce large industrial motors. For electric drive motors, 60% of the unit cost comes from rare earth magnets and copper. Thus, large scale electric motor production for industrial applications is a significant advantage. Power electronics will be similar. For instance, 40% of the cost of the inverter comes from the IGBT (insulated gate bipolar transistor) and capacitors. This power semiconductor technology again favors Hitachi, Samsung, Panasonic and Mitsubishi, along with power semiconductor manufacturers like Infineon, ON Semi, Qualcomm and ST Micro. In these instances, advantages come from high volume and high levels of automation.

An example to consider is GM's Chevy Bolt battery electric vehicle. To achieve industry leading levels for lithium-ion battery packs, GM partnered with LG. LG leveraged its expertise from the consumer electronics into a position to produce not only the battery pack, but also electric drive motors and power electronics. Many industry insiders have been shocked by the amount of the critical electric vehicle system that has been outsourced to LG. However, when you consider how critical scale is for a competitive advantage, one can see why this is another example of the eventual industry shift.

The market potential for these new entrants to our industry is expected to be enormous as electrification takes root and grows. We estimate the market potential for the year 2030 to be approximately \$120 billion for batteries alone, and \$200 billion for all these key hybrid and electric vehicle components.

This market size creates a very attractive opportunity for these consumer and industrial electronics companies.

4. HUMAN RESOURCE CHALLENGE: A SHIFT IN COMPETENCIES

Electrification will also bring with it a dramatic shift in required engineering skill sets. With traditional technologies such as mechanical and materials engineering being reduced in importance, the industry will shift to a new set of soon-in-demand competencies – chemical engineering for advanced battery development, and electrical and software engineering for propulsion and other electronic systems. This shift will create significant challenges for existing automotive companies, but arises as an opportunity for new entrants which can quickly attract and deploy these new, necessary engineering resources. New entrants, like those from consumer and industrial electronics, which can quickly deploy resources, have a significant advantage when you consider the following:

- Flexibility – has existing electronics “backbone” or operating model
- Scale to leverage – serves multiple industries currently
- Competencies – deployable workforce of electrical talent
- Speed – Experience in fast-paced consumer electronics
- Financial – Greater financial flexibility from investors which allows them to move quickly and take greater risks.

Most suppliers lack electronics and software competencies to compete for these new products.

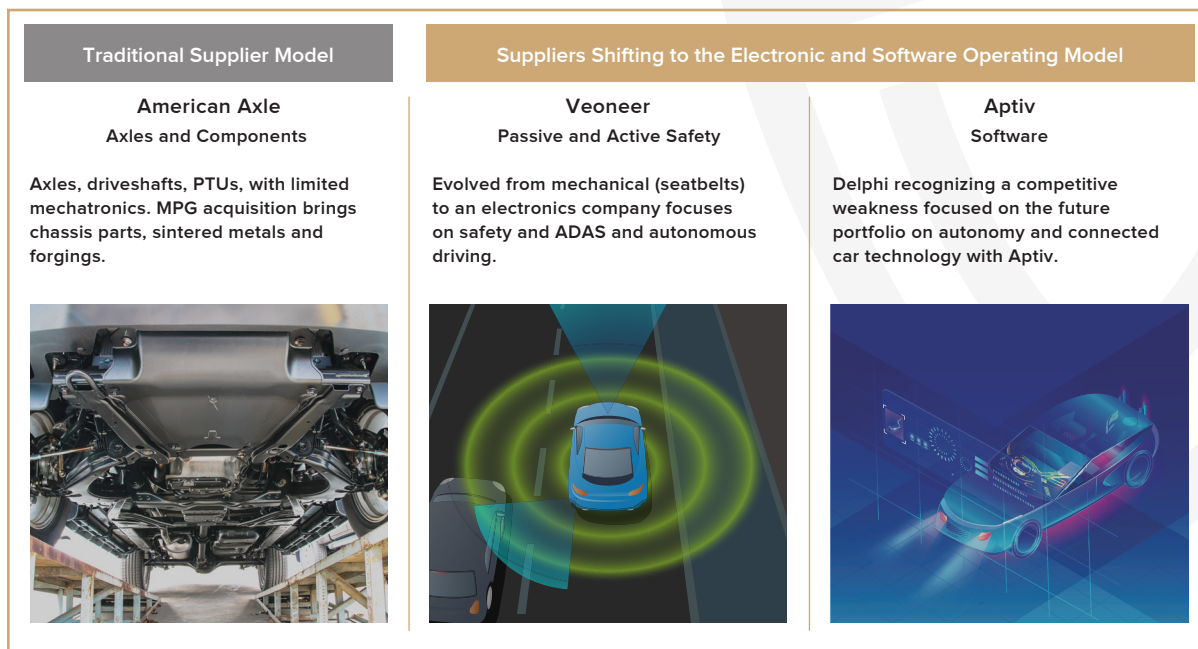
FEW SUPPLIERS WILL BE ABLE TO MAKE THE TRANSITION

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As the industry undergoes this digital transformation, many companies will struggle to transition to an electronics operating model and win long term. Some of the barricades they face include:

- Wrong vision – in which the organization lacks an understanding of how the industry and the company should evolve.
- Wrong time horizon – in which the organization believes it should focus on electrification later – when volumes and returns are higher.
- Wrong assets – in which the company's manufacturing assets are dedicated to a shrinking portfolio of products.
- Wrong organizational set-up – the company operates on a traditional organizational model with no electronics backbone, scale or platform concept.
- Wrong staff – Engineering skill sets are focused on mechanical and materials engineers versus electrical and software engineers.
- Wrong risk profile – The company's investors seek a safe return on deployed assets versus the high risk/high reward profile associated with a transition to a digital future.

FIGURE 4 - EXAMPLES OF SUPPLIER FUTURE POSITIONING



OPPORTUNITIES FOR SOME, TROUBLE FOR THE UNPREPARED

OUR GOAL IS TO HELP
YOU ADDRESS
CRITICAL STRATEGIC,
OPERATIONAL AND
SYSTEMS ISSUES,
WHILE LEVERAGING
YOUR CAPABILITIES.

The shift towards electrification will create tremendous opportunities for OEMs and suppliers that are prepared to meet the digital drive head-on. However, the disruption and introduction of an entirely new set of emerging competitors will lessen the chances of survival for traditional suppliers who fail to act – with clear vision, a winning strategy and the right technical resources.

Incumbent suppliers, without a solid electronics foundation in place today, have mainly four strategic options as they tackle this market challenge:

1. **Divestiture** – a strategy to remove some of a group's assets under its current business portfolio. Depending on the purpose of restructuring, divestitures can take several forms, such as sell-offs, spin-offs, or equity carve-out. Examples include: Honeywell, Delphi and Autoliv.
2. **Business Transformation** – a change in management strategy which has the aim to align people, process and technology initiatives of a company more closely with a new strategy and vision. Examples include: Borg Warner acquisition of Sevcom, ZF and TRW.
3. **Diversification** – a strategy to enter a new segment or industry in which the business doesn't currently operate. Expansion of the existing product line with related products is one such method adopted by many businesses. An example is Magna.
4. **Consolidation** – the act of merging two or more organizations into one. Primary focus is to create financial synergies and competitive advantage and leverage in shrinking markets. Examples include Tenneco and private equity.

Do one of these strategies make sense for your organization? A professional management consultant can help you determine which strategic option will garner the best results.

WE CAN HELP YOU DEVELOP A WINNING STRATEGY

The good news is, companies don't have to face this disruption alone. At Paul Eichenberg Strategic Consulting, we have over 25 years of experience working with Fortune 500 automotive suppliers. Our founder, Paul Eichenberg, spent eight years as the global VP of Corporate Development and Strategy for Magna Powertrain & Magna Electronics. As the Chief Strategist, Paul oversaw all strategic planning, product management, and merger and acquisition activities.

We have successfully repositioned businesses to focus on technologies for the optimization of the internal combustion engine, EV/Hybrid technologies, ADAS, and autonomous vehicles. We are industry experts that believe the best way to gain and maintain a competitive advantage is by developing an innovative strategy, which includes the most effective timing, deployment of assets, organizational model, staffing and investments. Our goal is to help you address critical strategic, operational and systems issues, while leveraging your capabilities to come out on top of this rapidly changing marketplace.

THE TIME TO ACT IS NOW.

AT PAUL EICHENBERG STRATEGIC CONSULTING, WE TURN AUTOMOTIVE TECHNOLOGY
INTO GROWTH.
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