



INVESTOR NEWSLETTER

Martinrea's Position in
an Electric Future

March 2021

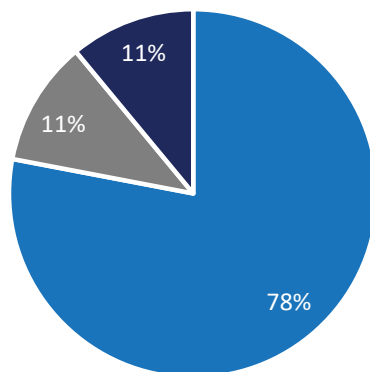
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THE TRANSITION TO ELECTRIC VEHICLES IS REAL

Production of battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) is expected to increase in the coming years, as governments enforce stricter limits on carbon emissions and automakers introduce a wide range of new models. IHS Markit projects that PHEVs and BEVs will account for 51% of global light vehicle production in 2025, up from 28% in 2020. Asia and Europe are expected to remain the world leaders in both PHEV and BEV, accounting for 59% of total light vehicle production in Asia and 56% in Europe in 2025 (up from 28% and 20% respectively in 2020). While electric vehicle penetration in North America is likely to lag Asia and Europe for some time, OEMs are now making major investments in electrification, and PHEVs and BEVs are expected to make up 30% of North American light vehicle production in 2025 (up from 14% in 2020).

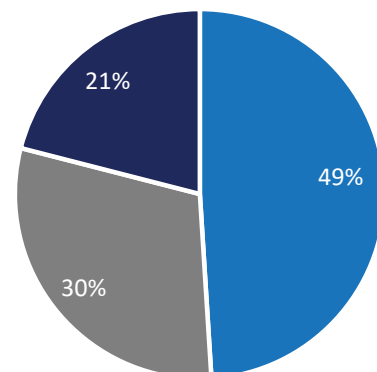
Global Vehicle Mix - 2020



■ ICE ■ PHEV ■ BEV

Source: IHS Markit

Forecasted Global Vehicle Mix - 2025



■ ICE ■ PHEV ■ BEV

GOVERNMENT REGULATIONS AND INCENTIVES ARE DRIVING THE SHIFT

Government regulations and incentives are resulting in an accelerating pace of electric vehicle adoption across much of the globe. In the European Union, WLTP (world harmonized light-duty vehicles test procedure) regulations adopted in 2017 require automakers to reduce average fleet CO₂ emissions to 95g/km in 2020 (vs. 120g/km in 2018), or face penalties for non-compliance. Additionally, several countries have passed or proposed legislation banning the sale of internal combustion engine (ICE) vehicles by a certain date between 2030 and 2040.

In the US, the Trump administration finalized the roll-back of Obama-era corporate average fuel economy (CAFE) standards in early 2020. This resulted in a lowering of fuel efficiency targets from 54.5 miles per gallon by 2025, or roughly a 5% annual improvement, to a less stringent 1.5% annual improvement through 2026. California opted to stick to the original framework via a waiver, which the Trump administration attempted to revoke. This set up a legal battle which divided automakers into those who supported California's authority to set its own emission targets, and those who felt emissions policy should fall under federal jurisdiction and therefore supported the administration. Under the new Biden administration, which recently announced that the US would rejoin the Paris Climate Accord, it appears likely that these regulations will once again be tightened. Recently, the automaker group challenging California's authority abandoned their legal efforts, saying they are aligned with the Biden administration's goals and want to work with it to develop new rules.

In North America, several jurisdictions are also moving to impose bans on the sale of ICE-powered vehicles by a certain date. In September 2020, California passed an executive order requiring the sale of all new passenger vehicles to be zero-emission by 2035. In Canada, Quebec has committed to ban the sale of ICE-powered vehicles by 2035, and British Columbia has committed to do the same by 2040.

In addition to stricter regulations, generous incentive packages for the purchase of electric vehicles in Europe, Asia, North America and other jurisdictions are helping to lower the cost of EVs to the customer, thereby supporting demand. Government incentives are also available to automakers for EV production across much of the developed world.

We have provided tables below highlighting our view of regulations and incentives by geographic region that are accelerating the global shift to electric vehicles. We note these are not exhaustive lists and are subject to change.

Table A: Government Regulations and Policy

Country or Region	Regulation/Policy
United States	1.5% annual improvement in fuel efficiency (measured in miles per gallon) through 2026; likely to be revisited and tightened by the new Biden administration
California	Sale of gasoline-powered passenger vehicles to be banned starting in 2035
Canada – Quebec	Sale of gasoline-powered passenger vehicles to be banned starting in 2035
Canada – British Columbia	Sale of fuel-burning passenger vehicles to be banned starting in 2040
European Union	WLTP (world harmonized light-duty vehicles test procedure) adopted in 2017 require 95g/km CO ₂ emissions in 2020
France	Sale of gasoline and diesel-powered passenger vehicles to be banned by 2040
Germany	Sale of gasoline and diesel-powered vehicles to be banned starting in 2030
United Kingdom	Sale of gasoline and diesel-powered vehicles to be banned starting in 2030 On November 17, 2020, UK Prime Minister Boris Johnson announced that this would be brought forward by 10 years (from 2040 to 2030)
Norway	Sale of gasoline and diesel-powered vehicles to be banned starting in 2025; Norway has the most ambitious plan we came across
China	By 2035, all new vehicles sold in China must be powered by “new energy”. Half of them must be electric, fuel cell or plug-in hybrid, and the remaining 50% hybrid vehicles.
India	Has set a target of 100% of vehicles operating in India should be electric by 2030 (i.e., operating, not just new vehicle sales)

Table B: Government Incentives

Country or Region	Incentives
United States	BEV and PHEV vehicles purchased new beginning in 2010 are eligible for a federal income tax credit up to US\$7,500. The tax credit is phased out for each manufacturer once they reach 200,000 in combined BEV and PHEV unit sales.
Germany	Vehicles costing less than €40,000 are eligible for a subsidy of €9,000. Vehicles costing between €40,000 and €60,000 are eligible for a €5,000 subsidy.
France	The government plans to decrease an incentive to buy electric cars from €7,000 in 2020 to €6,000 in 2021 and €5,000 in 2022. The incentive for hybrid rechargeable vehicles will be halved to €1,000 in 2021. A separate incentive for low-income households switching to electric vehicles will be capped at €3,000.
United Kingdom	Incentive of up to 35% of the cost of a new electric vehicle (up to a maximum of £3,000). Only vehicles that have been approved by the government are eligible. Vehicles must have CO2 emissions of less than 50g/km and can travel at least 112km (70 miles) without any emissions at all. Cars must cost less than £50,000 including VAT and delivery fees.
Italy	Italy temporarily increased subsidies from August 1, 2020 through the end of the year. Applies to electric and hybrid vehicles with a gross list price of up to €61,000. Purely electric vehicles subsidized at €6,000 (vs. €4,000 previously). Scrapping your old combustion engine vehicle along with the purchase qualifies for a subsidy of €10,000. Hybrids with CO2 emissions of 21-60 g/km are subsidized at €3,500 or €6,500 if an old car is simultaneously scrapped. These rates were previously €1,500 and €2,500 respectively.
Spain	Buyers receive between €400 and €4,000 for trading in older vehicles with further subsidies also offered by manufacturers and dealerships. Zero-emission electric cars come with a €4,000 subsidy from the government and €1,000 for the manufacturer, while those with higher emissions and a "C" classification from the DGT warrant just €400. The price of the vehicle must not exceed €35,000 rising to €45,000 for zero-emission cars or vehicles that are specifically adapted for people with reduced mobility.
China	China's finance ministry extended subsidies on pure electric vehicles (PEVs) that were due to expire at the end of 2020 through to 2022 in response to the COVID-19 pandemic. Under the new policy for 2021, the subsidy for PEVs with a driving range of 300-400km will be lowered to 13,000 yuan per vehicle, from 16,200 yuan in 2020, and the subsidy for PEVs with a driving range of 400km or more will drop to 18,000 yuan per vehicle this year, from 22,500 yuan last year. This represents a 20% drop from last year, with another 30% drop planned for 2022, after which the subsidies will be phased out completely.

AUTOMAKERS ARE MAKING BIG COMMITMENTS

While Tesla remains the undisputed leader in EV production, more traditional automotive OEMs are making major investments in new EV models that will launch in the coming years, and are committing to a substantial “greening” of their product portfolio. Competition in the space is heating up.

On January 28, General Motors announced that it aims to have an all-electric, zero-emission product offering by 2035, and become “carbon-neutral in its global products and operations by 2040”. While these are aspirational targets, it demonstrates the extent of GM’s commitment to electrification. The Company plans to offer 30 all-electric models globally by 2025 (two-thirds of which will launch in the US), and will invest US\$27 billion in electric and autonomous vehicles (~50% of total budgeted capex) between now and then.

Ford announced on its Q4 2020 conference call that it planned to spend US\$22 billion on electrification, nearly twice what the Company had previously committed to EVs. The Company launched the all-electric Mustang Mach-E in October and will be launching an all-electric F-150 in mid-2022. Ford also plans to launch a new EV for Europe by 2023 built on Volkswagen’s Modular Electric Drive toolkit (as part of a partnership the two companies entered into in 2019).

FCA (now Stellantis) has its own plans to offer a range of all-electric or hybrid vehicles through 2025, including 10 new models in 2021. Every new model the Company launches between now and 2025 will include an electric variant.

Volkswagen Group perhaps has the most ambitious plans, as it aims to spend €35 billion in order to produce 1.5 million electric vehicles by 2025. The Company plans to launch 70 fully electric models by the end of the decade. Daimler and BMW are also making a big push into EVs, with both companies expecting electric models to account for 15%-20% of total sales over the next several years. Japanese OEMs, including Toyota, Honda and Nissan also have plans to launch a wide range of new EV models and increase the penetration of EVs in their product mix.

We expect to hear more announcements and product introductions as automotive OEMs continue to position their business for a low-carbon, electric future.

OUR BUSINESS IS WELL-POSITIONED

While the shift to EVs is real and gaining traction, the transition is expected to be gradual, and as such, ICE-powered vehicles are likely to remain relevant for many years to come. Whatever pace the transition takes, Martinrea is well-positioned to adapt as our business is largely agnostic to propulsion type – our lightweight solutions allow our OEM clients to reduce vehicle weight, which is as relevant to improving mileage per charge in an electric vehicle as it is to improving fuel economy in a traditional ICE-powered vehicle.

Taking a closer look at our Propulsion Systems Group, which accounts for approximately 30% of our consolidated sales, certain products such as engine blocks, transmission housings and fuel lines are not relevant in a pure EV world. However, what we lose on an ICE-powered vehicle can be offset by products that are unique to an EV architecture, such as battery trays and assemblies, e-motor housings and thermal management systems (e.g., battery cooling systems), among others. Our Lightweight Structures group, which accounts for the remaining 70% of sales, provides body and chassis structures, which are required regardless of how the vehicle is propelled. Overall, we estimate approximately 80% of our current products are completely agnostic to the propulsion system, while the remaining 20% would evolve into other products.

The good news is, we believe our opportunity on an EV platform, as measured by content per vehicle (CPV) is greater than on a traditional ICE platform. We estimate our total CPV opportunity on a pure battery electric vehicle could be in the range of \$2,150 - \$3,800 over time, compared to \$2,000 - \$3,300 on an ICE platform, based on current and future products.

Martinrea is well-positioned for electrification growth opportunities



INTERNAL COMBUSTION ENGINE VEHICLE (ICE)

Addressable Content Per Vehicle

\$2,000 - \$3,300

Body and chassis

Brake lines

Engine blocks

Transmission housings

Fuel lines

PLUG-IN HYBRID ELECTRIC VEHICLE (PHEV)

Addressable Content Per Vehicle

\$2,100 - \$3,400

Body and chassis

Brake lines

Engine blocks

Transmission housings

Fuel lines

Battery housings

ELECTRIC VEHICLE (EV)

Addressable Content Per Vehicle

\$2,150 - \$3,800

Body and chassis

Brake lines

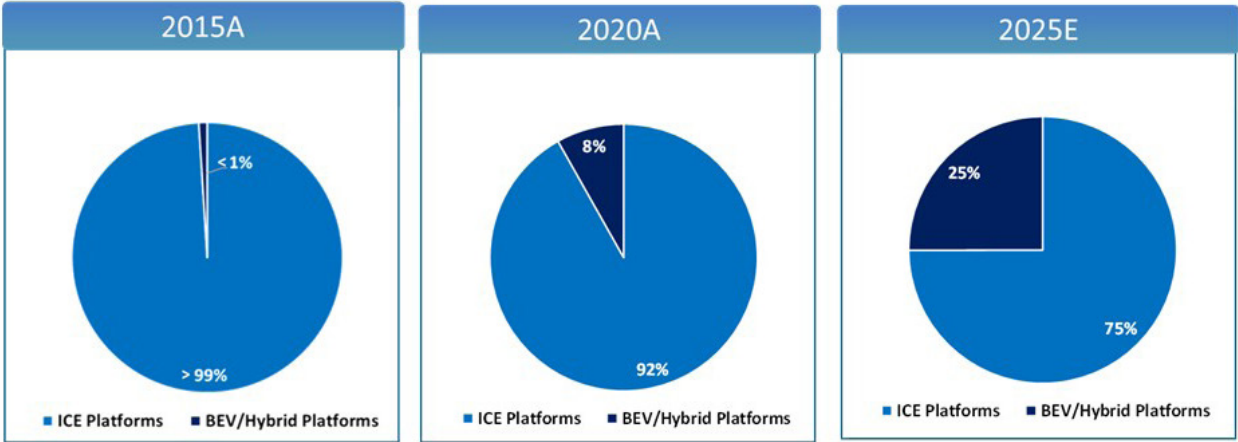
Battery tray assemblies

Electric motor housings

Thermal management systems








MARTINREA HAS BEEN WINNING ITS FAIR SHARE OF BUSINESS ON EV PLATFORMS

Today, electrified platforms (BEV and hybrid) account for approximately 8% of our book of business, compared to a negligible amount five years ago. We see this increasing to 25% by 2025.



The expected shift is broadly in line with IHS Markit assumptions regarding EV adoption rates in various regions. Asia is leading the transition, followed by Europe, with North America moving more gradually, though we expect this may accelerate based on recent customer announcements.

We have won a material amount of new business on electric and hybrid platforms, and we expect this to accelerate in the months and years ahead. Key programs on pure EVs awarded to date include business on the Daimler EVA II, Geely PMA I, Ford Mach-E, GM EV Hummer, and Audi Premium Platinum Electric (PPE) platforms . We have also won other EV business with companies such as Tesla, Lucid, and Samsung. We believe we are well-positioned to win an increasing amount of EV business as the transition to electric evolves.

	Daimler EVA2	Body and chassis structures	SOP: 2022
	Ford Mach E	Aluminum front and rear subframes	SOP: 2020
	Geely PMA 1	Aluminum rear subframes	SOP: 2021
	GM EV Hummer	Body and chassis structures	SOP: 2022
	Audi PPE	Body and chassis structures	SOP: 2023
	Tesla Model Y	Brake lines	SOP: 2022
	Samsung	Aluminum battery Tray	SOP: 2020

BATTERIES PRESENT AN OPPORTUNITY FOR NANOXPLORE, IN WHICH WE HOLD A 22.2% EQUITY INTEREST

If automakers are to meet their ambitious targets on electrification, substantial investment in battery manufacturing capacity and charging infrastructure will be required over the next decade. Battery performance (mileage per charge) and cost per kWh will need to improve substantially in order to get to the point where EVs can truly be seen as a viable alternative to the internal combustion engine. Additionally, the supply of key battery making materials such as lithium and cobalt – which are already in short supply – will need to be addressed through some combination of increased mining capacity or technological developments that allow for the use of alternative resources.

Battery producers and auto manufacturers with in-house battery manufacturing capabilities are devoting substantial effort to improving battery technology in order to extend driving range and lower cost. Progress is being made. In September, 2020 Tesla held a “Battery Day” where it estimated the Company would achieve a 56% reduction in cost per kWh over a three-year period, to be achieved through cell design, enhanced anode and cathode materials, and improved integration of battery cells into the vehicle. Emerging technologies such as solid-state batteries represent a potential break-through and step-change in battery life over Li-ion batteries if they can be successfully commercialized. They also have the potential to reduce or eliminate the use of cobalt, which is mined primarily in the Democratic Republic of Congo – a politically unstable region with a history of human rights abuses.

Governments across the world are also taking action to encourage investment aimed at developing or expanding production of batteries and key battery making materials. In Canada, the Federal Government is investing heavily in electrification and is targeting 100% of all new vehicle sales to be zero-emission by 2040 as part of its ultimate goal for Canada to be carbon-neutral by 2050. The Feds, along with the Government of Ontario have provided a portion of the financing for over \$4 billion in investments Ford, FCA (now Stellantis) and General Motors have recently announced to produce electric vehicles in Canada. Additionally, the Canadian Government is working to develop a Canadian battery strategy, a key element of which includes building critical mineral value chains to support battery production in Canada.

NanoXplore has a unique opportunity to benefit from increased production of Li-ion batteries, as graphene can be used as an additive in anodes and cathodes to materially improve cycle life and charging time. Additionally, the location of its key manufacturing facility – in Canada (near Montreal, QC) and close to the key mining regions in Quebec and Northern Ontario leaves the Company well-positioned to capitalize on opportunities that come from the build-out of a made-in-Canada battery industry. Martinrea would also participate in these opportunities through our 22.2% equity stake in NanoXplore.

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