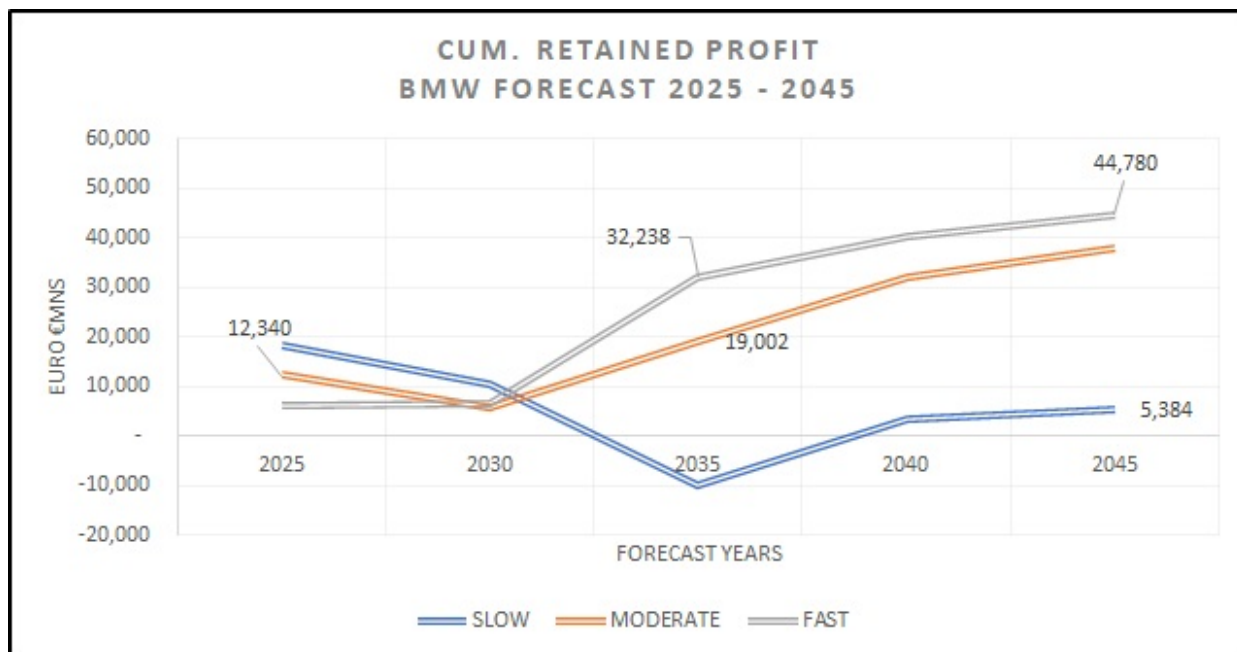


Will your franchise win in the NEV wars? Part 4: BMW

This post is the fourth of a new series reviewing the financial resilience of seven major auto makers and their ability to make profits during the transition from conventional to electric vehicles. The auto-makers reviewed are Daimler, BMW, Volkswagen, PSA, Ford, General Motors and Toyota. The first post asked where they might get the money to fund the transition to new energy vehicles (NEV's). The second gave the financial results for each firm under three scenarios based on the speed of adoption of NEV's: SLOW, MODERATE and FAST. The rest of the posts look at the outlook for each firm individually taking into account its publicly stated strategy for the transition. This post assesses BMW. Click on images or tables to enlarge.



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Financial Forecast for reasons similar to Daimler: moderate operating leverage and high operating profit margins. Their 2018 operating leverage was just a little higher than their rival, and their margins a little lower, but enough to push them into second place. In Financial Resilience they ranked #4. Between 2013 - 2018, BMW matched Daimler for CapEx spending (€35BN vs. €39BN), had better Free Cash Flow (€-15BN vs. €-45BN) and, in 2018, could pay its interest bill 25 times over. On top of that, long-term investors, could enjoy the 300%+ hike in the share price since 2007. Their financial resilience is relatively strong.

OEM KPI SCORES	FORD	TOYOTA	GM	VW	DAIMLER	BMW	PSA
REVENUE & GROWTH	47%	53%	40%	77%	73%	60%	73%
PROFITABILITY	31%	66%	63%	40%	28%	49%	89%
CASH FLOW	80%	67%	47%	73%	60%	47%	53%
LIQUIDITY AND DEBT	28%	72%	60%	52%	92%	76%	48%
OPERATING EFFICIENCY	53%	83%	60%	65%	60%	55%	65%
SHAREHOLDER RETURN	40%	72%	60%	36%	62%	72%	63%
FINANCIAL RESILIENCE	46%	69%	55%	57%	63%	60%	65%

OEM RESILIENCE SCORES 2018

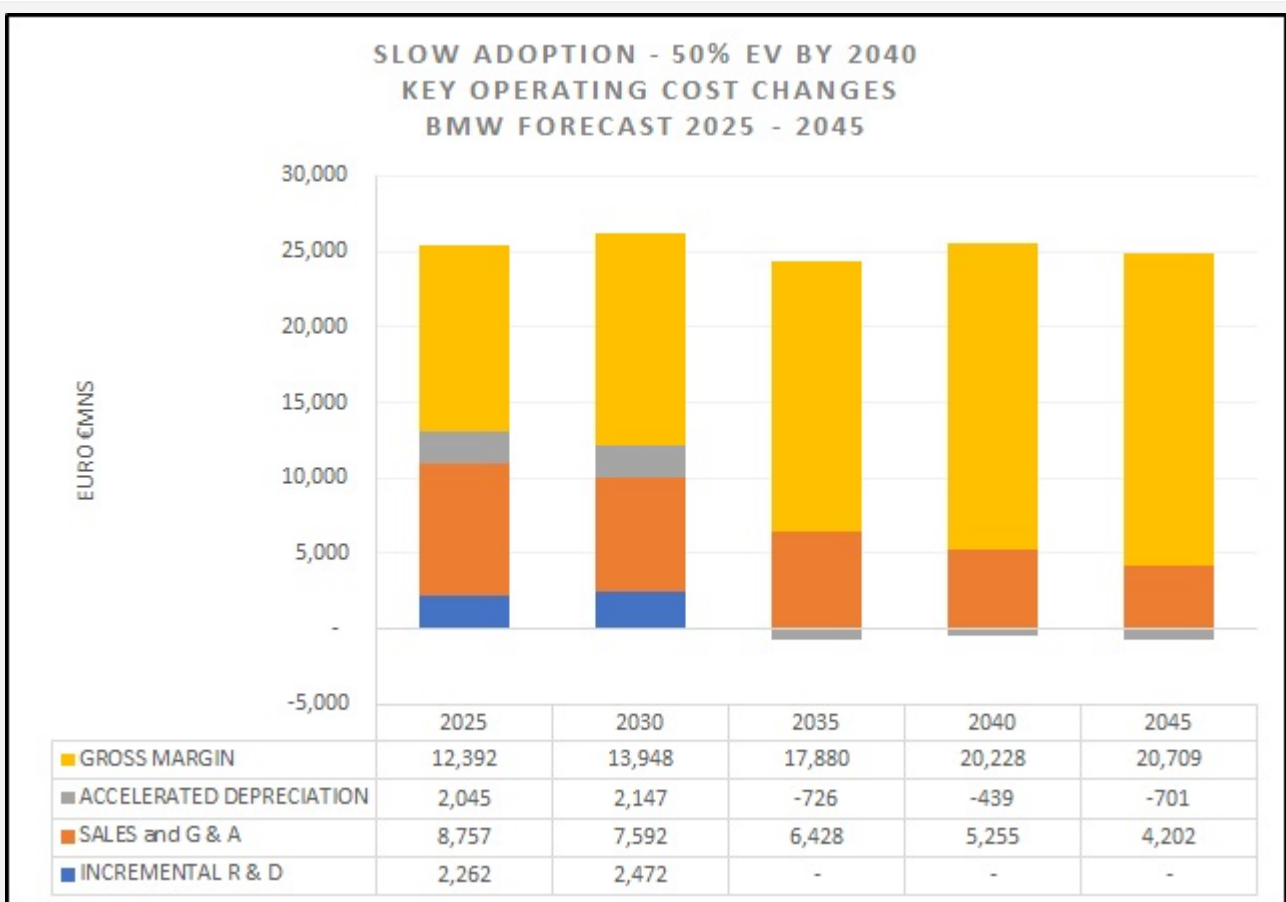
Moreover, having overtaken Daimler’s technological lead with the BMW i3 and i8, BMW outsold Daimler two-to-one in NEV’s between 2017 and 2012. Even so, it appears that BMW are not yet ready to embrace the concept of an ‘all electric’ future. Instead, BMW’s chief engineer, Klaus Fröhlich, points to different adoption rates in different localities, mostly linked to the availability of charging infrastructure. He points out that, while China’s big east coast cities may become purely electric pretty soon, western China will rely on gasoline engines for the next 15 to 20 years, due to a lack of infrastructure. He’s also sceptical on the capacity to reduce the production costs of EV’s much in the future. “It’s very simple,” says Fröhlich. “In EVs with 90 to 100kWh battery packs, the cell cost alone will be \$17,000 to \$25,000.” You can produce whole cars, only with the cost of the battery,” he says. While BMW’s engineers advance cogent reasons for slowing the transition to NEV’s, external commentators point to an alternative analysis. They point out that BMW’s i3 never failed to solve the problem of range or design and drive acceptability as a ‘BMW’ and that, despite their success, neither the i3 nor the i8 were scalable models. They also remind BMW that sales results show that BMW were unprepared for Tesla’s Model 3 arrival, which has taken sales from BMW’s 2,3,4, and 5 series.



BMW Carbon-Fibre Platform

BMW have set out on a distinctive strategic path, termed by them ‘Number One > Next’. They plan to offer conventional, PHEV and BEV vehicles. They will use the same version of their modular CLAR platform (Clustered Architecture), combining steel, aluminium, and carbon fibre for rear-wheel drive or all-wheel drive setups. it was first seen in the G11 7 Series in 2015 and it can house conventional, plug-in hybrid and fully electric drivetrains and has a 48-volt electrical system. For front-wheel drive models, such as MINI, a similarly specialist platform, named FAAR, has also been developed. But, by 2030, BMW plan that only 15% of

their product offer will be fully electric while a further 10% will be hybrid. Battery production and battery raw material also figure in BMW's strategy. They have agreed a €4BN contract with China's Contemporary Amperex Technology Co. Limited (CATL) to supply battery cells. In addition they have set up a joint venture with NorthVolt and Umicore to develop and secure supplies of battery-making materials, such as cobalt.



BMW evolution of selected costs under SLOW forecast

Their strategic path is most closely akin to the SLOW , or at best, the MODERATE forecast scenario. In this scenario there is a higher risk of losses for them - or at least, lower retained profits, over the forecast period.

BMW have already shown that they can make commercially successful electric vehicles. There are almost 500,000 BMW PHEV/BEV units on roads today. In their strategy BMW is taking a distinctive approach based on market maturity. Wieland Bruch, BMW's communications manager for electro-mobility points out, "Because the 70-plus BMW markets are at different stages of readiness for EVs, all new BMW platforms from 2021 will be built to accommodate a combustion engine, plug-in hybrid, or pure electric power train."

In short, BMW plan to adopt a geographically differentiated EV strategy. In the US, they see pure electric mainly in the west coast and parts of the east coast, while the rest of the U.S. will continue with conventional gasoline engines and PHEV. In Europe PHEV's will be their main low-emission offer. And, as they point out, there are no charging stations in Russia, the Middle East and Africa.

BMW i. FROM "BORN ELECTRIC" TO "ONE PLATFORM SERVES ALL".

2013

"Born electric"



FROM
2021 ON

One platform
fits all powertrain
derivatives...



➤ Combustion engine

➤ Plug-In-Hybrid

➤ Pure electric

BMW CLAR Platform Concept

Can BMW Win The NEV Wars?

There are four 'must-have' elements for a conventional auto-maker who want a central role with new energy vehicles: First, the senior management must be committed and aligned with the strategy. Second, they need the money to fund the technology and the transition. Third, the OEM requires control of battery and fuel cell production and technology. Otherwise, much of the potential profit is in the hands of the cell or battery supplier. Finally, a dedicated NEV platform is required. It costs more but, without it, the vehicles produced are, at best, an acceptable compromise. For a manufacturer aiming at the mass-market, two additional factors are critical: the know-how to build low cost vehicles and access to a volume NEV market. Where are BMW on each of these?

Financially they're as resilient as Daimler. Technically, they've already proven their ability to offer a compelling EV product, the BMW i3 - at least up until the Tesla 3 arrived en-masse. However, the forecast shows that the poorest financial route to take is the SLOW adoption path. Maybe their 'wait and see' approach is just for public consumption, while, behind the scenes, they're continuing work on alternatives, such as hydrogen fuel cells. If, or when, fuel cell costs match EV costs, fleets, trucks and vans have an incentive to switch to that technology first. There is a much lower payload penalty and the operating costs could be lower even than EV's. Add in the fact that hydrogen charging stations bolt onto or replace existing petrol stations, the infrastructure cost could be a lot lower than EV, but with the same benefits. Those reasons alone could see Africa, Eastern Europe, the Middle East, India, the US and South-east Asia deciding to 'wait and see', rather than jumping fast into EV's for the next decade. But, why would that be BMW's cunning plan? They do not make trucks. They may just consider that betting the farm on an -all-electric future too risky a technological gamble.

Meanwhile BMW are hedging their bets. Many observers consider solid state batteries as the

next major battery development. In 2017 BMW invested 'heavily, they say, in a US start-up named Solid Power, working with this technology. They also **announced** collaboration with Jaguar Land-Rover on next generation electric drive units in 2019. In parallel with these developments, there are mixed signals coming from BMW senior executives. The BMW M Product manager expressed concerns about the weight of batteries in 2019 while the former CEO, Harald Krueger - now replaced by Oliver Zipse - explained that BMW planned to **invest** record amounts in EV and Autonomous technology. Clearly, the senior management are waiting to see the market develop before they make irrevocable decisions. The next decade will tell us whether they were 'future-proofing' the business or edging towards their own 'Kodak moment'.