Tesla Investor Day

Signs that the company is all grown up?

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On March 1, Tesla hosted its Investor Day, where it presented 'Master Plan 3', the sequel to Master Plan outings in 2006 and 2016. While earlier plans were greeted enthusiastically by investors, the third met with a muted response from the markets with the stock falling by 6%.

The lack of excitement from the markets following Investor Day probably boils down to the old automotive mantra of product, product, product. Investors have already bought into the vision - it's why market cap runs ahead of, and far in excess of - any standard valuation models. That is fine up to a point. But the industry and its watchers have a constant thirst for the new - and by new we mean vehicles, not new technology or processes, unless they can be seen to significantly shift the needle - that Investor Day did not provide.

While Wall Street was not enamored, Master Plan 3 perhaps signifies that Tesla is maturing as a company - less big picture razzmatazz but more operational nitty gritty, This apparent maturity was met with a positive reaction by Wall Street analysts, perhaps aware that legacy OEMs are upping their electrification game and that it's time for Tesla to double down on its hard won competitive and operational advantages.

For a view on developments presented at Investor Day we talked to subject matter experts within S&P Global Mobility's Supply Chain and Technology practice.

Michael Southcott

Assistant Manager, Automotive Propulsion Component Research, Supply Chain & Technology

When Tesla first announced their latest motor development back in 2021 of carbon wrapping on the rotor, Elon musk teased on social media that there were more secrets to uncover within the design. The 2023 investor day announcement seems to suggest at least one of these secrets is the removal of rare earth materials from permanent magnet motors.

A topic that engineers worldwide are currently grappling with, the rare earth material supply chain is a hot topic within the industry. With a single pinch point in the supply chain (current estimates are well over 90% from China), OEMs and suppliers have explored many solutions such as induction motors, Tesla themselves a key driver here, and externally excited motors.

The peak efficiency of the permanent magnet, however, has seen an overall reluctance to shift away from the technology. With this recent announcement, have Tesla finally cracked the code and discovered a cost effective & efficient magnet-based motor that can replace rare earth materials? Time will tell - the battery, and in particular the cost / materials associated, is key to the overall vehicle. If Tesla can keep motor efficiency without the price being too much of an increase with this solution, then they may well begin to revolutionize the automotive market again.

Jie Yang

Senior Analyst, Thermal & Propulsion Research, Supply Chain & Technology

Like others my main takeaway from the Tesla investor day is that Tesla is now focusing on increasing production volume and cutting costs. There really wasn't too much technical or design innovation happening in the thermal domain.

That said, it appears that Tesla is working on a more integrated thermal/heat pump system. From what I could figure out from the renderings they showed it looks like it will be much more compact than their current solution.

What's more, the manufacturing process for the heat pump is now fully automated. According to Tesla this is a 99% reduction in labor. Automating the process will save time and money. Optimizing components and systems in this way when a product is deep into its lifecycle is a natural progression. Value management is rigorously applied at most manufacturing companies, but Tesla seems to have taken a step further with the full automation of the manufacturing process.

From appearance it seems that Tesla will be able to deploy the new heat pump design across its range with few changes. The design looks clean and has most of the components bolted into one piece. It does, however, still employ the same octovalve – the key to flowing fluids to parts of the system that either require cooling or heating.

By taking such a deep dive into the heat pump system Tesla probably has one eye on the future. Tesla's declared its intention to enter the stationary heat pump market and the changes made could be seen as the groundwork for that move.

Richard Dixon

Senior Principal Analyst, E/E, Supply Chain & Technology

Tesla's march towards greater levels of vertical integration was epitomized by the announcement that their next generation controllers will be 100% designed in-house. That's compared with 61% for the Model Y and a forecast 85% for the forthcoming Cybertruck.

On this trajectory, Tesla is showing once again that it's unencumbered by legacy sunk costs in the way that other OEMs are. For the established OEMs there's a requirement to reuse as much legacy hardware and controllers from previous platforms and models. It's one way that they can write down previous investments by improving the ROI on the initial investment. However, it's a more financial led view of vehicle development as opposed to Tesla's engineering led view.

By putting engineering considerations front and center and entrusting its own engineers with the design of the controllers, Tesla puts itself in a much better position to rethink completely the design and 'virtualize' the functions. This allows them to go much deeper into the consolidation of the electronics. This is most clear when one benchmarks Tesla's wiring harness reduction with typical zonal architectures. Here, Tesla's able to reduce harness lengths by 50%, whereas other OEMs trying the same achieve only a 20% reduction. In a Feb 2023 investor call, Ford CEO Jim Farley laid bare the issues their approach brought with the Mach=E development, "We didn't know that our wiring harness for Mach-E was 1.6km longer than it needed to be…70 pounds heavier and that that's [cost an extra] US$300 per battery."

The irony of the engineering led approach, of course, is that this puts Tesla in a position of comparable financial strength. It's one of the factors that allows them to cut prices on their vehicles (as has been well documented recently) and put the squeeze on legacy OEMs.

Dr Matthew Beecham

Senior Analyst, x-Domain, Supply Chain & Technology

Although Tesla's annual investor day, held at its gigafactory in Austin, Texas was long on vision, it fell short on details, skipping information on its next-generation platform and skirting around release dates for some highly anticipated products.

Instead, more executives than on previous such occasions took to the stage to deliver some key messages as part of Tesla's latest 'master plan' for a more sustainable planet as well as share detail around refining lithium and selling charging subscriptions, itself drawing attention to the company's ability to buy cheap electricity, leveraging its utility storage and software products.

Tesla also hinted at new lower-priced vehicle launches but would not be drawn on specs or timelines and promised more details to come. A big news story focused on its plans to build a gigafactory in Monterrey, Mexico to build its next-gen vehicle but this announcement was technically made just ahead of the day itself.

In some respects, much of what was presented has already been made public, making the event sound more like a history lesson than a business forecast. In other 'news', Tesla revealed a little more detail about its humanoid robot, the Optimus. True to form, Elon Musk believes that the company's robot business could be end up being bigger than its car business. No news is good news.

The event did, however, supply some insight about certain elements of its business, including its reduced reliance on suppliers. We were reminded of the company's vertical-integration goal and how it is removing its reliance on a sprawling automotive supply chain. Tesla leaders also used the day to repeatedly denounce the established methods of vehicle manufacturing in favor of vertical integration and in-house design and development from software to seating and from mining the materials to producing the batteries. It has long since preferred to build its own parts (e.g., its controllers are now to be 100 per cent designed in-house) so that it can make them better, cheaper and lighter. Continuing the sourcing theme, we learned how they plan to ultimately produce their own motors without rare earths, which are typically currently sourced mostly from China.

While Tesla's investor meeting has always been important, it appears that the company has come of age.

Edwin Pope

Principal Analyst, Lightweighting, Supply Chain & Technology

The most impactful portions for lightweighting which came from the Tesla Investor Day from a lightweighting and manufacturing perspective were on two sides of the extreme ends of the spectrum. One is aggressive and departs from the traditional OEM crowd as many might expect from Tesla. The other changes to manufacturing honestly look a bit more like "business as usual" for a mature automaker.

The change that I consider shot across the bows of all OEM and Tier 1 suppliers was the announcement of a full vehicle 48V architecture. I'd estimate that Tesla saves 20kg of weight in the Cybertrucks, if not more, through the 48V architecture switch. To facilitate the change, a modern power distribution module as seen in motorsports will be required. This change reduces component count, allows for more precise monitoring and "fuse points" with easier resetting of circuits than traditional fuse and relay systems.

The changes I believe are more mundane than other announcements are the traditionally unsung portion of most manufacturing: staged parallel processes and production plant floor space savings. Almost every modern production plant in the world uses staged production processes, both within their plants and within their supplier base. Most 'components' which arrive at assembly plants beyond the fasteners, glue and paint of vehicles have some form of assembly process before installation. Overall, the change in processes indicates a more mature business model which focuses on the core competencies of manufacturing to ensure a higher throughput at lower cost.

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