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A rough road ahead: Electric vehicles and semiconductors navigate geopolitics

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Introduction

Beijing's decades-long effort to position China as the world's dominant EV player has triggered a chain reaction amongst other automotive contenders in Europe, North America, and Asia.

The existential threat of rising carbon emissions and climate change has prompted an historic shift to electric vehicles (EVs). Along with that shift, the global EV sector has become a pawn in a larger geopolitical competition.

Beijing's decades-long effort to position China as the world's dominant EV player has triggered a chain reaction amongst other automotive contenders in Europe, North America, and Asia.

State and non-state actors are moving to establish self-reliant national and regional ecosystems for EV production. Global value chains are in the process of localizing and ring-fencing as policy makers look to support their own stakeholders and agendas.

This development is a manifestation of 21st century techno-nationalism: a neo-mercantilist mindset that links the technological capabilities of a state's key actors to its national security, economic prosperity, and socio-political stability. Whichever country or group of like-minded actors can control critical supply chains of strategic industries will gain economic and security-related advantages, affecting a much wider systemic competition.

EVs are increasingly susceptible to a growing list of techno-nationalist rules and regulations, including export controls and other restrictions, as well as stipulations relating to data localization, security, and privacy.

EVs are a fusion of leading-edge imbedded technology, including Artificial Intelligence (AI), software, navigation and communications platforms, thousands of microchips, and onboard sensory equipment. When viewed in the context of techno-nationalism, EVs are increasingly susceptible to a growing list of techno-nationalist rules and regulations, including export controls and other restrictions, as well as stipulations relating to data localization, security, and privacy.

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Meanwhile, the Covid-19 pandemic has exacerbated the acute global shortage in the supply of semiconductors and accelerated the geopolitical changes transforming the automotive sector.

In the first report of the EV and techno-nationalism series, we presented an overview of the global automotive sector, the historic transition away from the internal combustion engine (ICE) to an all-electric future, and the forward plans of the world's leading automotive companies. We examined the fundamental nature of EV manufacturing and why scale instead of technical complexity could be the main driver of China's rise as an EV power.

The first report also examined the supply chains of rare earths materials, minerals, and critical components relating to EVs, their strategic importance as China emerges dominant in the supply chains, and the salient government policy initiatives that subsequently emerge in different parts of the world.

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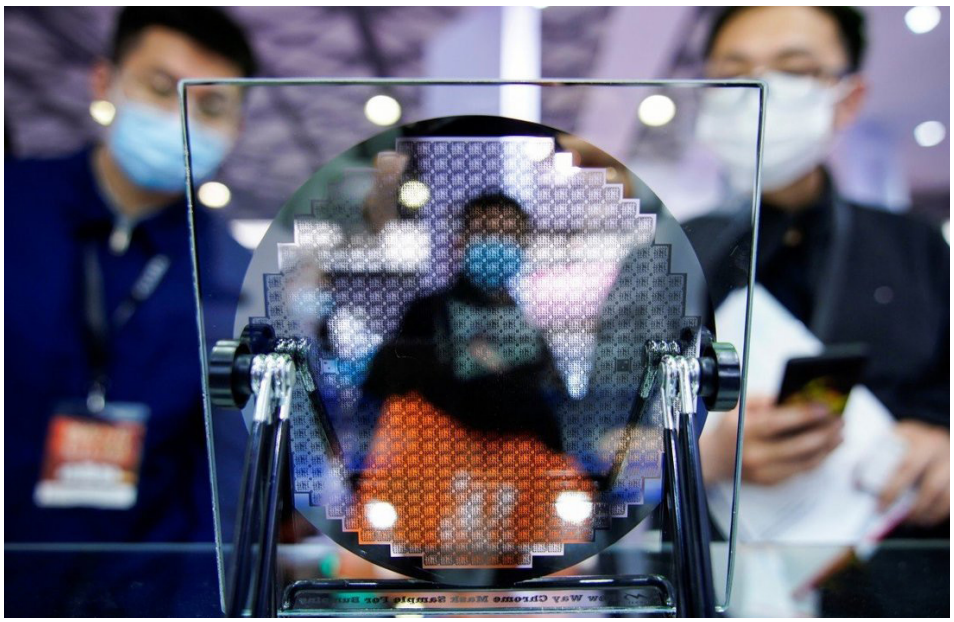
In this second paper of the series, we look at the importance of semiconductors to the EV sector. The electrification of the automotive sector is dependent on digital networks, AI, and sensory technologies. At the heart of these technologies are semiconductors. An acute semiconductor shortage in 2020 and 2021 emphasized the importance of the microchip. As such, we examine emerging trends that link semiconductors to a rapidly evolving global EV sector. Specifically, we examine:

- Emerging strategic partnerships between EV manufacturers and semiconductor companies
- The blurring of the line between high-tech and automotive products
- Challenges facing EV's "dual-use" technology for cross-border investment and collaboration
- New EV semiconductor technology: silicon carbide and gallium nitrogen microchips
- Subsidies and government initiatives impacting the semiconductor-EV nexus



An acute global shortage in the supply of semiconductors has accelerated the geopolitical changes transforming the automotive sector.

Massive growth of the EV market

The share of EVs in overall global car sales is expected to increase from a paltry 4% in 2020 to about 70% of new car sales in 2040.

In the first paper, the historic tipping point facing the global automotive industry is described in detail. The share of EVs in overall global car sales is expected to increase from a paltry 4% in 2020 to about 70% of new car sales in 2040.[1] Indeed, with its long-term commercial viability all but assured, the EV represents the next great hope in the battle against global warming.

This watershed moment comes on a wave of new government policies which in turn have led to a seismic shift in corporate strategy. Spurred on by government action that includes both punitive measures aimed at carbon emitters and financial incentives aimed at encouraging new production, the world's largest automakers are transitioning their legacy ICE operations to EV production. From Mercedes-Benz in Germany to General Motors in the US and Nissan in Japan, companies around the world are spending billions to go electric, some as soon as 2030.

As with many other industries, all eyes are on China, which accounts for approximately 40% of worldwide EV sales in 2020 and still has massive growth potential. In 2021, foreign EV makers were manufacturing and selling their most advanced EVs in China and for the China market. However, they are cognizant of the rapidly growing assortment of state-backed local competitors, and of Beijing's inclusion of EVs and autonomous vehicles (AVs) in their Made-in-China 2025 program, an initiative outlining the industries that China seeks to dominate.

Unlike the production of leading-edge semiconductors, which have extremely high barriers to entry for microchip laggards such as China, EV technology is far less complex, which plays well into Beijing's techno-nationalist master plan.

Unlike the production of leading-edge semiconductors, which have extremely high barriers to entry for microchip laggards such as China, EV technology is far less complex, which plays well into Beijing's techno-nationalist master plan. To help a national champion emerge from a pack of local players and challenge Tesla and other foreign EV brands, Beijing's central planners follow a familiar script. That is, obtain and acquire key technology and expertise (especially by acquiring top talent currently working with foreign brands in China), and then funnel large amounts of money into local champions.

The desired result is twofold. First, it achieves huge production capacity and massive economies of scale that drive down prices. Once pricing levels are driven through the floor, foreign for-profit firms are eventually forced out of the market.

This process involves using government subsidies, tax breaks, land grants and other incentives to keep Chinese firms in business for the long haul, and leverage dominance in China's massive market to expand overseas. This formula worked exceptionally well with telecommunications champion Huawei. That is, until the US and others retaliated with a barrage of restrictions and export controls, along with unified efforts to strip Huawei technology from local networks.

To meet the challenges of competing with China's state-backed EV sector, other producers will need to partner with their governments. This is necessary to overcome Beijing's virtual monopoly in EV value chains and its advantages in scale manufacturing.

Automobile companies are the new "Big Tech"

Modern automobiles cannot run without semiconductors, often referred to as "microchips" or "chips". Even vehicles with an internal combustion engine (ICE) require microchips for everything from fuel injection and transmission systems, to braking, traction control, and power locks.

In fact, a modern ICE powered vehicle requires about 1,400 semiconductors, while a hybrid electric vehicle (HEV) may use up to 3,500.[2]

The importance of semiconductors to the automotive industry has been revealed by the acute chip shortage in 2020 and 2021. As we detailed in a previous Hinrich Foundation series on semiconductors, a combination of factors – including the Covid-19 pandemic and the stock-piling of microchips to hedge against geopolitically motivated restrictive measures by the US – contributed to the shortage.

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The 2020-21 microchip shortage will last well into 2022. As production delays and lost sales opportunities pile up, the shortage is expected to cost the automotive sector about US$200 billion.[3] However, the chip shortage has revealed other important truths.

The blurring of automotive and technology companies

Semiconductor companies and car companies are forming increasingly close strategic partnerships. For good reason: In 2027, the estimated value of the automotive chip market may exceed US$85 billion, compared to US$27 billion in 2021.[4]

The chip shortage taught car companies a key lesson. When it comes to obtaining access to semiconductors, they needed to disintermediate middleman suppliers from value chains. Today EV makers are working directly with chip suppliers.

Semiconductor companies Infineon Technologies, NXP, Nvidia, STMicroelectronics, and Intel are devoting more and more production capacity to the automotive sector. Startups such as Rivian, which has raised close to US$10 billion[5] from Amazon and Ford, will sell electric trucks and related services directly to online customers.

Car companies are becoming de facto technology companies, while semiconductor and other tech firms are rolling out new automotive products and service offerings.

Car companies are becoming de facto technology companies, while semiconductor and other tech firms are rolling out new automotive products and service offerings. In late 2021, Qualcomm initiated a US$4.6 billion bid for a Swedish auto-technology company called Veoneer Inc.[6]

Similarly, in 2017, Intel subsidiary Cyclopes Holdings paid an Israeli technology firm US$15 billion for its Mobileye autonomous vehicles technology. Three years later, Intel spent an additional US$900 million for Moovit, a self-driving app. The US chip giant plans to roll out this mobility-as-a servce (MaaS) offering in Germany first, as part of a Robo-taxi service.[7]

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The trend begs the question: Will other large tech companies such as Apple or Google become 21st century automobile producers? This looks more and more likely. For example, Apple's Taiwanese contract manufacturer Foxconn has already announced the rollout of its own prototype EVs (an SUV, a sedan, and a bus) made by Foxtron – the name given to a strategic partnership between Foxconn and Taiwanese automaker Yulon Motor Ltd.

Might Taiwan-based TSMC, the worlds' leading semiconductor fabricator, also make a play on the EV market?

The challenges of "dual-use" EV technologies

The imbedding of leading-edge hardware and software in modern electric vehicles combines 5G and 6G technologies for connectivity and communications on the Internet of Things (IoT), infotainment, driver assistance, and navigation, as well as self-driving applications.

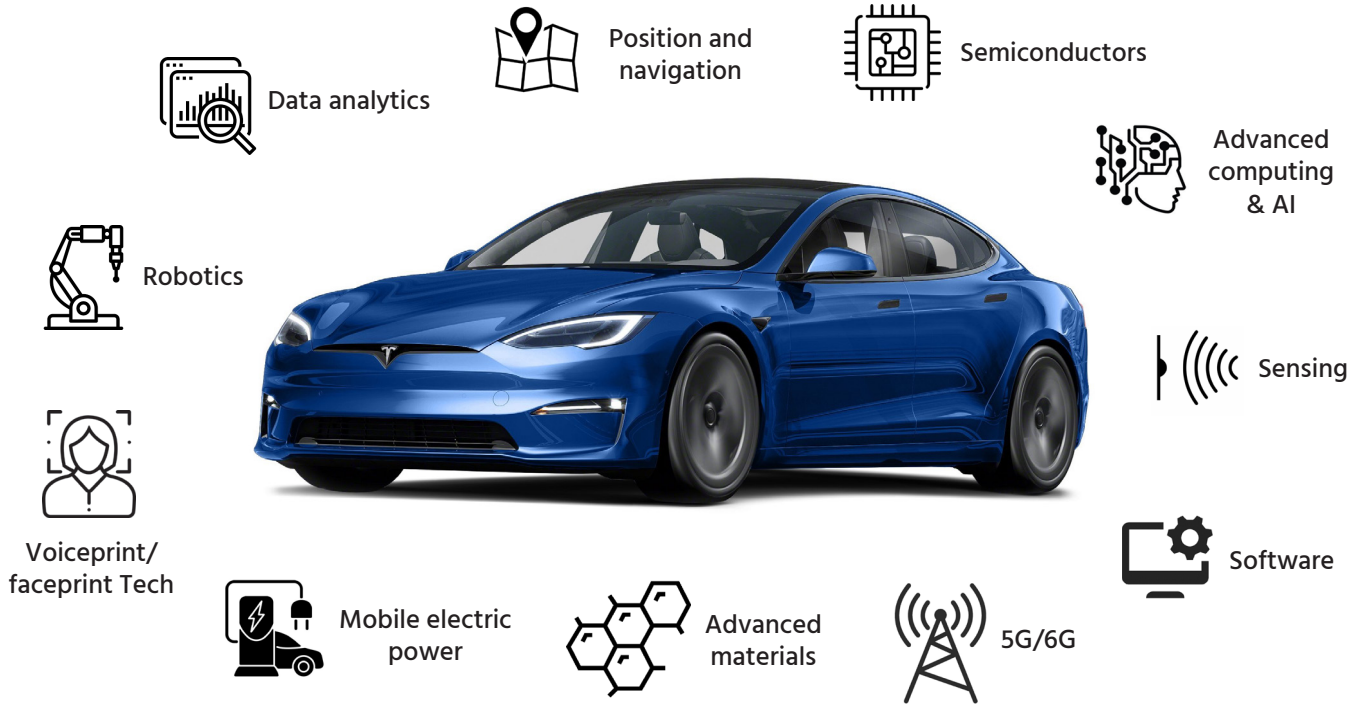
Much of the increasingly sophisticated technology that make up EVs is "dual-use" – that is, having both commercial and possible military applications, and potentially subject to export controls.

Intel CEO Pat Gilsinger has called the modern EV "a computer with tires." Yet much of the increasingly sophisticated technology that make up EVs is "dual-use." That means it has both commercial and possible military applications – and potentially subject to export controls and other restrictions.

Hence, the EV sector is at risk of facing scenarios of supply chain "weaponization", similar to those that have haunted the semiconductor sector.

When Washington used restrictions to choke off vital manufacturing equipment to Huawei's chip manufacturers – namely, TSMC – it effectively shut down Huawei's 5G enabled products and services. China's flagship telecom equipment company was forced to drop 5G from its latest line of P50 smart phones and settled for

Figure 1 – Embedded 'dual use' technologies in EV and EV manufacturing



Source: Author's compilation, infographic by Hinrich Foundation

To preempt disruptions to supply chains, suppliers and service providers may be prompted to decouple from high-risk suppliers and reinforce regionalized ring-fencing in the EV sector.

less advanced 4G chips.[8] Forced to focus on new ventures, Huawei turned to the automotive sector, partly because automobiles have used "trailing edge" chips that are not subject to controls – for the time being.

As EVs become more technically sophisticated, they will require increased amounts of "leading edge" chips. This raises the possibility of another Huawei-like scenario in the automotive sector. EV chips are already at the 7-nanometer threshold for Tesla and the next generation of vehicles.

To preempt disruptions to supply chains, suppliers and service providers may be prompted to decouple from high-risk suppliers and reinforce regionalized ring-fencing in the EV sector.

Cross-border microchip innovation

Strategic decoupling is affecting partnerships between investors and tech startups.

In an earlier Hinrich Foundation report, we discussed innovation mercantilism as it applied to the US-China technology race and its impact on cross border R&D collaboration in the private sector, academia, and government controlled institutions. Additionally, strategic decoupling is affecting partnerships between investors and tech startups.

Tech startups are vital to the semiconductor-EV symbiotic relationship. For example, Intel's Mobileye autonomous taxis will be built by China's EV maker NIO, a rising player. In 2020, NIO received US$1 billion from Chinese state-backed investors, including Hefei City Construction and Investment Holding Group and Anhui Provincial Emerging Industry Investment Company.[9] The juxtaposition of Intel's brand with China's giant investment organizations presents an odd sort of incongruity.

Clearly, Intel has China's huge EV market in its sights. Yet techno-nationalist pressures could place constraints on future collaboration with NIO, particularly as state-backed companies are seen as closely linked to Beijing's military-civil fusion strategy.

CASE STUDY

Kneron: a study in opportunities and geopolitical challenges

Startup Kneron makes chips that empower devices to apply sophisticated AI applications without connecting to the cloud, which enhances data privacy and security.

One telling example of geopolitical spillover into the EV tech sector involves the rise of Kneron, an innovative semiconductor startup. Kneron makes chips that empower devices with artificial intelligence capabilities, primarily through "edge computing." Utilizing a neural processing unit that enables sophisticated AI applications without connecting to the cloud, this technology enhances data privacy and security. For operating EVs in high-risk environments, the technology could be a game changer.

Kneron argues that its "system on a chip" is more energy efficient than chips made by its giant competitors Intel and Google. It can also process 4K still images and videos at high resolution and perform leading edge audio recognition.

Foreign venture capital in a geopolitical context

Based in San Diego and operating an R&D center in Taiwan, Kneron has received more than US$100 million[10] in funding from some of the world's leading investors, including Sequoia, Qualcomm, Alibaba, Sparklabs Taipei, and Horizons Ventures,

owned by Hong Kong-based tycoon Li-Ka Shing. Other big names include Delta Electronics, a Taiwanese supplier to Tesla and Apple, and Foxconn, which invested an undisclosed amount of money.[11]

In a world free of geopolitical tension and techno-nationalism, Kneron's pipeline of funding would validate all the positive dynamics of open, unrestricted trade.

These names are significant because they represent some of the biggest players in tech venture capital as well as a highly diverse international collection of investors. In a world free of geopolitical tension and techno-nationalism, Kneron's pipeline of funding would validate all the positive dynamics of open, unrestricted trade.

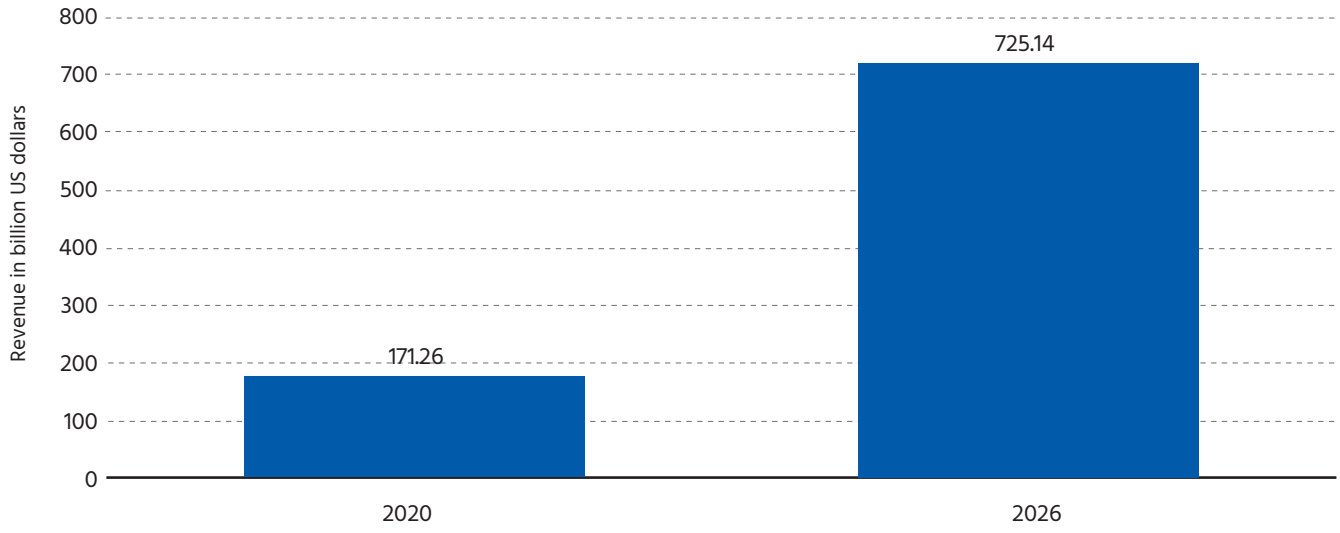
However, under the present geopolitical environment, Kneron and its investors may face considerable challenges.

Kneron's first potential friction point is its association with Chinese tech giant Alibaba, the world's largest e-commerce and fintech company. Beijing's ongoing crackdown on China's technology firms has brought Alibaba under the firm control of the Chinese Communist Party and placed their overseas business operations and investments under tight constraints.

Because its technologies fall under the definition of "dual-use" and Alibaba is a major investor, Kneron could find itself the subject of future investigations by the Committee on Foreign Investment in the US (CFIUS), which actively reviews and blocks acquisitions by Chinese actors and investments in US entities deemed to be of strategic value to the state. As Sino-US relations continue to fray, even previously approved transactions could be revisited.

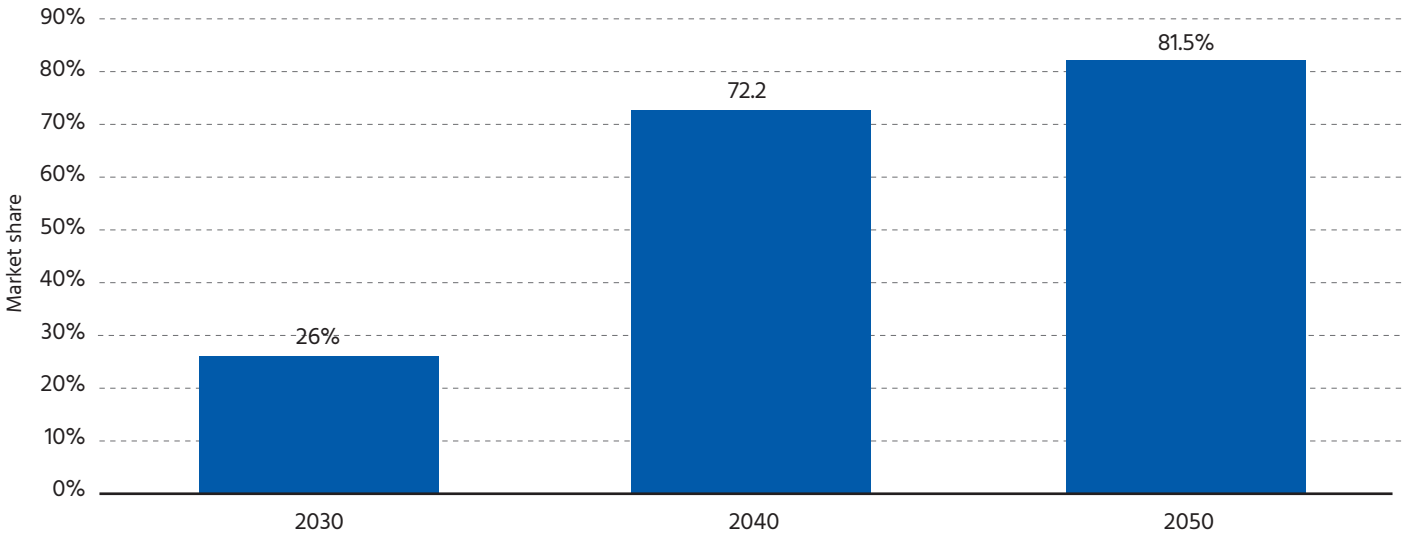
On the other side of the world, increased strictures placed on Alibaba by Beijing's central planners could also land it on the US restricted entity list, with adverse results for related companies like Kneron.

Figure 2 – Size of global market for EVs in 2019 and 2027



Note: Worldwide; 2021
Source: Mordor Intelligence; ID 271537

Figure 3 – EVs as percentage of global car sales, 2030-2050



Note: Worldwide; as of 2020
Source: Morgan Stanley; ID 1202364

Given the geopolitical and strategic priorities of the EV sector and the scale advantages held by the automotive and semiconductor giants – who increasingly receive government support – open sourcing practices may face an ironic predicament.

An EV software and hardware open platform

Taiwanese company Foxconn supports Kneron's work on an open-sourced platform for EV-related software and hardware. This approach follows the model of the open-sourced O-Ran network, established in 2018 to develop standardized software and specs for 5G and 6G wireless technology. O-Ran was examined in a previous Hinrich Foundation publication on techno-nationalism and the US-China innovation race.

Open-sourced collaboration in EV and semiconductor-related technologies could level the playing field for a multitude of smaller niche players that make specialized software and hardware. In turn, this could yield a wide range of quality products and services that accelerates overall progress in EV tech.

For Kneron and similar companies, open sourcing parts of the EV-semiconductor innovation process could extend inoculation from the effects of export controls and restrictions, if these dual-use technologies become ubiquitous. However, given the geopolitical and strategic priorities of the EV sector and the scale advantages held by the automotive and semiconductor giants – who increasingly receive government support – open sourcing practices may face an ironic predicament. It might become ring-fenced inside ever larger controlled environments.

Silicon carbide and gallium nitrogen chips

The shortage of silicon-based microchips has accelerated the search for alternatives to the conventional silicon chip.

The shortage of silicon-based microchips has accelerated the search for alternatives to the conventional silicon chip. Two contenders have emerged for EVs: silicon carbide and gallium nitride.

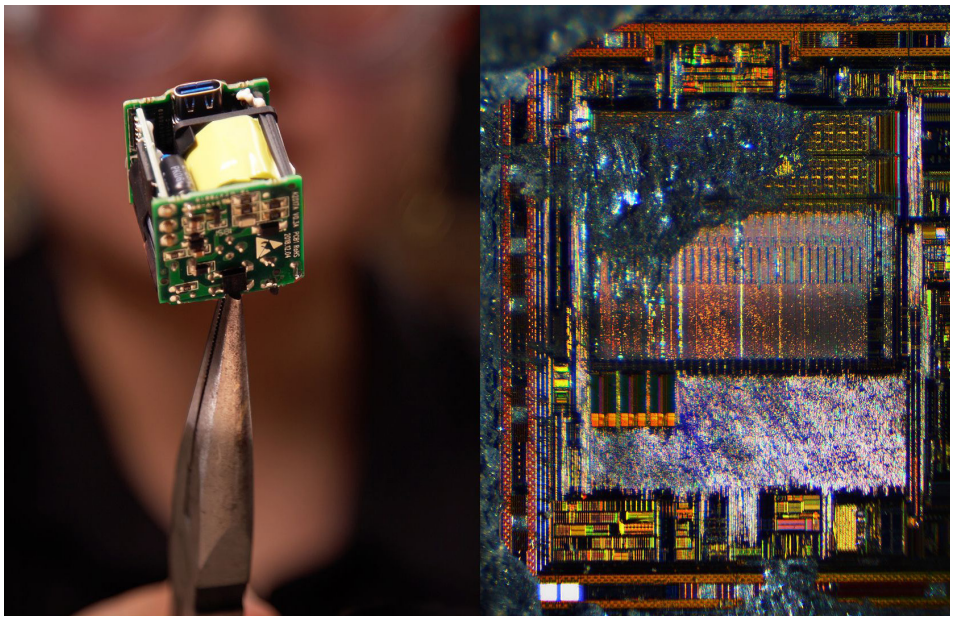
Silicon carbide chips experience less "leakage" and can increase battery power as well as reduce charging time.[12] Despite the extra costs involved, Tesla is an early adopter of these chips. Its arrangements with semiconductor companies such as STMicroelectronics NV have paid off handsomely: Tesla was not hit by the shortage of silicon-based chips as badly as others car makers.

Other manufacturers have also moved to silicon carbide chips, such as General Motors (GM) for its Ultium battery platform and Toyota for its Mirai model.

Gallium nitrogen chips are even more energy efficient than silicon carbide. Through partnerships, semiconductor companies such as Infineon Technologies AG will look to capture more market share in the EV space, expanding the blurring lines between automobile and technology companies.[13]

From a techno-nationalist perspective, these promising technologies present to governments attractive opportunities for public-private partnerships.

The strategic nature of the EV sector may prompt governments to protect the production of silicon carbide and gallium nitride chip supply within local ecosystems and control the sector for strategic stakeholders. Subsequently, governments may move to block transfers to strategic competitors. From a techno-nationalist perspective, these promising technologies present to governments attractive opportunities for public-private partnerships.



Gallium nitride are far more efficient than their silicon counterparts, and they lose less energy on top of surviving higher temperatures (Source: The Verge).

Connected cars and national security risks

EVs are an assortment of digital connections that produce large quantities of data and meta-data. A multitude of cameras and sensors within a car, for example, can capture and record real-time imagery. Simultaneously, a vehicle sends and receives data from external sources and logs onto networks, apps, and platforms in the cloud. GPS and navigation systems capture and transmit other location data, including proximity to other devices, objects, and other vehicles.

Security agencies have come to regard data generated by EVs as a rich source of intelligence, both as a tool for spying and as a cyber security vulnerability.

Today, "car data security" has become linked to national security. In 2021, the Chinese Communist Party restricted military staff and employees of state-owned companies from driving or owning a Tesla.[14] Security agencies have come to regard data generated by EVs as a rich source of intelligence, both as a tool for spying and as a cyber security vulnerability.

The EV sector may face yet another round of ring-fencing and localization. In this case, data localization laws come into play. Governments require EV companies to keep data on local servers and in databanks that are physically located in the host country. For example, Tesla is building separate data security centers in China for its locally sold EVs. It must also consent, when required, to turn over this data to the Chinese authorities.

Beyond the risk of data theft is the terrifying thought of an EV hacking event that disables or turns a car into a deadly weapon. These security-related concerns should be a strong catalyst for innovation and collaboration within an expanding EV tech ecosystem.

The EV sector may face yet another round of ring-fencing. In this case, data localization laws come into play. For example, Tesla is building separate data security centers in China for its locally sold EVs.

The In-China-for-China conundrum

The incentives and punitive measures governments use to sway EV players to stay closer to home will discourage and diminish opportunities for collaboration among international stakeholders.

Foreign brands such as Tesla, Volkswagen Group, and GM enjoy large market share in China. However, given the nature of the global EV sector, the question is: What's the greater risk for foreign brands? Is it being displaced by state-backed Chinese firms as Beijing doubles down on its statist EV goals? Or is it being thwarted by government restrictions at home?

The answer reveals a paradox. Foreign firms can maintain a lead by continuing to innovate the entire EV semiconductor ecosystem. This includes software, AI, and connectivity capabilities that make an EV a "computer with tires."

This approach is rife with techno-nationalist contradictions. The incentives and punitive measures governments use to sway EV players to stay closer to home will discourage and diminish opportunities for collaboration among international stakeholders. As such, the management of an In-China-for-China strategy will become increasingly fraught.

The global EV sector has become a pawn in a larger geopolitical competition and is at the nexus of many techno-nationalist issues.

Subsidies for the EV semiconductor nexus

The EV and semiconductor nexus is also linked to a broad array of government funding initiatives, which are part and parcel of the wider techno-nationalist ethos that is reshaping global commerce.

In the first paper of this series, we examined the range of subsidies and incentives that governments are rolling out to achieve self-sufficiency and reduce upstream and midstream supply chain vulnerabilities. These efforts remain focused on rare earths materials and critical minerals; lithium-ion battery production; and critical EV components such as specialized magnets.

The EV and semiconductor nexus is also linked to a broad array of government funding initiatives, which are part and parcel of the wider techno-nationalist ethos that is reshaping global commerce. These include funding for the reshoring of semiconductor fabrication, increased R&D spending, and, by design, a focus on international partnerships aimed at achieving common cause regarding national and economic security. This involves large scale investment.

Figure 4 – Subsidies, incentives, and exemptions for 2020

Country	Incentive	Amount	Scope
Mainland China	Subsidy	US$2,000[1] - 2,750[1] on PEVs and US$1,040[1] on PHEVs	Purchase of new PEVs and PHEVs
France	Subsidy	US$7,360[2] on a PEV and US$1,230[2] on a PHEV	Purchase of new PEVs and PHEVs
	Registration tax	No registration tax in many sub-national regions	Purchase of new EVs
Germany	Subsidy	US$3,680[2]	Purchase of PEVs
	Subsidy	US$2,760[2]	Purchase of PHEVs
	Exemption from annual circulation tax	Based on CO2 emissions	For ten years
Japan	Subsidy	Up to US$3,880[3]	Purchase of new PHEVs
	Subsidy	Up to US$7,750[3]	Purchase of new PEVs
Spain	Registration tax	No registration tax	Purchase on new PEVs
US	Federal Government tax credits	Up to US$7,500	Purchase of PEVs
	Subsidy	US$1,500 - 6,000 (varies for different states)	Purchase of PEVs

1. Converted from CNY to US$ exchange rate: CNY-US$ 0.15296 as of 1st Jan 2021 (Oanda)
2. Converted from EUR to US$, exchange rate: EUR-US$ 1.22637 as of 1st Jan 2021 (Oanda)
3. Converted from JPY to US$ exchange rate: JPY-US$ 0.00969 as of 1st Jan 2021 (Oanda)

Sources: EAFO, Economic Times, Automotive News Europe, Electrive, Fastmarkets, CarandDriver, IEA

The US$1 trillion bipartisan infrastructure bill was designed to create one million new jobs in the automotive sector and add more than half a million new EV charging stations across the country.

In Europe, the US, and China, governments are stoking demand for EVs by mandating the conversion of government vehicle fleets to EVs and pushing the logistics and transportation industry to do the same.

For example, China's EV infrastructure is linked to a massive US$1.4 trillion spending initiative to build out "smart city" wireless networks which connect a vast array of EVs, AVs, and other ubiquitous surveillance cameras and sensors.[15]

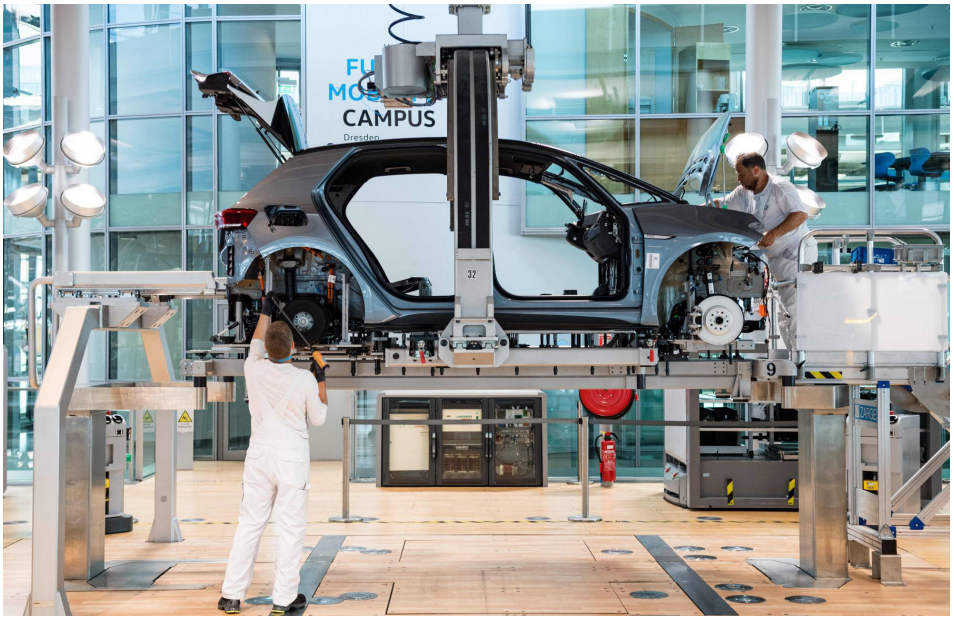
The US is pursuing subsidies, funding initiatives, and incentive programs that include a US$1 trillion bipartisan infrastructure bill designed to create one million new jobs in the automotive sector and add more than half a million EV charging stations across the country.

The bipartisan infrastructure bill, which earmarks US$7.5 billion to EV-related government investment, played a key role in the historic IPO of Rivian, the American EV startup. Its market cap soared to over US$130 billion, surpassing General Motors.

Like programs in Europe and China, generous rebates and tax credits are also offered to consumers purchasing EVs. In Europe, the US, and China, governments are stoking demand for EVs by mandating the conversion of government vehicle fleets to EVs and pushing the logistics and transportation industry to do the same.

The EU's "Green Deal" – worth nearly Euro 1.4 trillion – aims to make Europe carbon neutral by 2050. Even more than the US, European governments have emphasized the transition to EVs and are building localized manufacturing capabilities as soon as possible.

Conclusion



Going forward, strategic decoupling, reshoring, and ring-fencing in the EV sector for geopolitical purposes will align with localization efforts to curtail carbon emissions and implement climate change countermeasures.

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Geopolitical undercurrents are causing upstream supply chains in the EV sector to fragment into localized ecosystems in China, Europe, and North America.

The growing nexus between semiconductors and EVs will follow a similar pattern. Due to a pervasive blurring of the line between semiconductor and other related technologies within the EV sector, techno-nationalism will present complex challenges to global trade.

A supply shortage of semiconductors combined with ambitious industrial policies is accelerating the formation of partnerships between semiconductor and automotive companies.

These evolving partnerships will face the increasing likelihood of expanding export controls and other restrictions on dual-use technologies.

This will impact the cross-border investment and acquisition aims of venture capitalists and large technology firms as they seek new opportunities for innovation and new business, including the process of evolving state-of-the-art EV chips.

Going forward, strategic decoupling, reshoring, and ring-fencing in the EV sector for geopolitical purposes will align with localization efforts to curtail carbon emissions and implement climate change countermeasures. The likely result: more public spending on the electric vehicle sector.

Researcher bio: Alex Capri

Alex Capri is a research fellow at the Hinrich Foundation and a lecturer in the Business School and Lee Kuan Yew School of Public Policy at the National University of Singapore.

He is the author of *Techno-Nationalism: How it's reshaping trade, geopolitics, and society* (Wiley), due out in 2022.

From 2007-2012, Alex was the Partner and Regional Leader of KPMG's International Trade & Customs Practice in Asia Pacific, based in Hong Kong. Alex has over 20 years of experience in global value chains, business and international trade – both as an academic and a professional consultant.

He advises governments and businesses on matters involving trade and global value chains. Areas of focus include: IT solutions for traceable supply chains, sanctions, export controls, FTAs and trade optimization.

Alex has been a panelist and workshop leader for the World Economic Forum. He writes a column for Forbes Asia, Nikkei Asia and other publications and is a frequent guest on global television and radio networks.

He holds a MSc from the London School of Economics in International Political Economy and a BSc in International Relations from the University of Southern California.

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