

Golden equity themes for 2020s



Golden years ahead for innovation in medical technology, e-vehicles, internet-of-things

COVID-19 has helped remove many obstacles and break down the walls holding back innovation. This is exemplified by the dramatically shorter time it took to develop the COVID-19 vaccine compared to earlier vaccines. Policymakers have accelerated plans to use innovation as a tool to meet their climate change commitments and companies have used the global work-from-home experiment to embrace new technologies and spur innovative work practices.

INNOVATION IN MEDICAL TECHNOLOGY

- COVID-19 is driving a bonfire of regulations that had slowed innovation in the medical profession.
- For example, COVID-19 has necessitated the removal of the restriction on US medical professionals crossing State lines to practice medicine.
- The number of e-consultations relative to in-person has surged over the past year, with a dramatic reduction in the total time spent per consultation.

INNOVATION IN E-VEHICLES

- Governments have started to become more granular in the timing
 of the end of sales of internal combustion engine autos, with the UK
 committing to ending their sale by 2030.
- Lithium battery pack prices have dropped 90% over the past 20 years and are expected to fall a further 50% by 2025.
- Semiconductor chip content of a new energy vehicle is 3x that of an internal combustion engine vehicle.

INTERNET-OF-THINGS

- Internet-of-things is likely to transform manufacturing and supply chains.
- Innovations include the ability to create virtual factories to assist in maintenance and reduce downtimes.
- Widespread adoption of sensors using 5G technology will likely facilitate better supply chain management to boost productivity.

What is the theme?

COVID-19 has accelerated investment in innovation as companies adapt. Examples include a surge in penetration of medical e-consultations relative to physical doctor visits and the installation of sensors to reduce down-time in factories. Governments are using the disruption caused by COVID-19 to accelerate decarbonisation of their economies, including plans to end sales of vehicles with internal combustion engines.

Why now?

The next wave of innovation is expected to be driven by permanent changes brought about by COVID-19 in medical technology and internet-of-things and breakthroughs in e-vehicles battery and engine technologies.

Investment implications

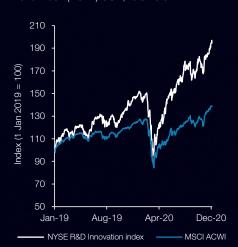
To gain exposure to this theme, we highlight equity investment opportunities that focus on medical-, 5G- and e-vehicle technology-related innovation.

Risks

Rising investment costs could slow the adoption of innovative technologies.

Innovation theme has outperformed MSCI All Country World dramatically in 2020

NYSE R&D innovation index & MSCI all country world index (ACWI) USD, total return



Source: Standard Chartered, NYSE, MSCI & Bloomberg

COVID-19 boosts innovation in medical technology



e-consultations in China as a share of total has surged

e-consultations in China as a percentage of total



Source: China National Health Commission, Standard Chartered

DIGITAL REVOLUTION IN HEALTHCARE

The medical technology (Med-tech) theme has received a significant innovation boost from COVID-19 and its impact is likely to remain long after the vaccine kills the disease. E-consultations, electronic monitoring of patients and the technology behind the mRNA vaccine have benefited from accelerated regulatory clearance that brought forward their adoption. In the case of e-consultations, it is estimated to have brought forward widespread adoption by five years.

AGEING SOCIETY

The number of people aged over 65 is forecast to reach 1 billion by 2030 and 1.5 billion by 2050. Increases in life expectancy will be accompanied by increased demand for healthcare services, which already account for 10% of GDP in OECD countries. If public health systems are to fulfil patient expectations without bankrupting governments, innovation is key to holding down costs.

Specific examples of innovations we identified include:

- Time spent waiting for an e-consultation with a doctor is 75% shorter than an in-person consultation in the US.
- US specialists anticipate approval for robotic surgery involving a patient and a surgeon based in two different locations. This innovation is due to COVID-19 reforms of digital patient records and State line limitations on where doctors practice.
- mRNA technology is now proven to work. It is viewed as safer than gene therapy, avoids genomic integration problems and can be used to treat cancer, infectious and rare diseases.

REDIRECTING RESOURCES

Electronic monitoring of blood sugar and cholesterol, via a chip embedded under your skin, is expected to drive down the costs of treating diseases linked to these factors. It will enable limited resources to be redirected towards more urgent healthcare needs.

FLEXIBLE REGULATION, EMBRACING CHANGE

Innovation in healthcare is not new. However, COVID-19 has raised the awareness of medical technology amongst investors. This is driven by more flexible regulation and a willingness of consumers to embrace changes in the provision of medical care and treatment.

Electric vehicles to ride on innovation



TECHNOLOGY INNOVATION IS THE DRIVER

Technological innovation is expected to accelerate the development of new energy vehicles (NEVs) in the 2020s. Growth of extended range electric vehicles (EREVs) is expected to be a key driver.

EREVs have an auxiliary power unit which increases its driving range, lowering its dependence on charging infrastructure. Compared to electric vehicles (EVs), EREVs reduce the need for a large capacity battery and use lightweight materials, reducing costs. This enables manufacturers to offer lower prices than EVs.

Technological improvements have led to falling battery costs. Lithium battery pack prices have dropped 90% over the past 20 years and are expected to fall a further 50% by 2025. Declining battery prices could narrow the pricing/cost gap between EV and internal combustion engine (ICE) autos, making EVs more affordable.

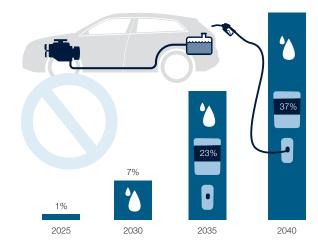
Semiconductor chip content of an EV is 3x that of an ICE car and 50% of the incremental growth in semiconductor demand over the next 10 years will likely come from NEVs. Semiconductors in NEVs are used in the inverter, battery management and on-board charging systems.

SUPPORTIVE GOVERNMENT POLICIES

EU regulations requiring reductions in $\rm CO_2$ emissions could increase NEV sales to 4x 2019 levels by 2025. More than 35% of European countries plan to ban the sale of ICE autos by 2040. The UK plans to ban the sale of ICE by 2030.

More than 35% of European countries plan to ban internal combustion engines (ICE) by 2040

Percentage of European countries with proposed ICE bans



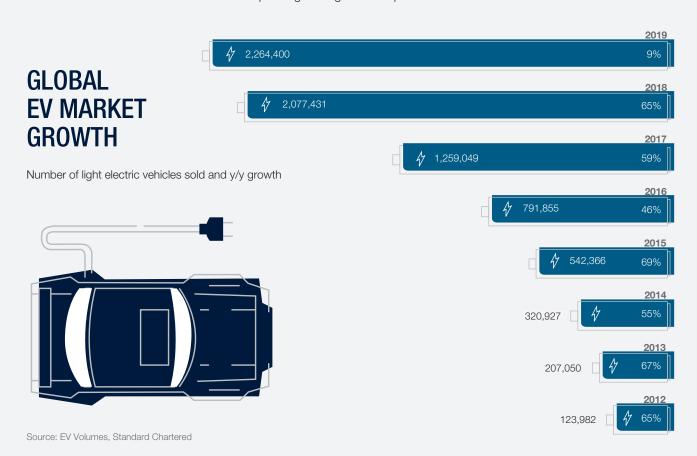
Source: Elbil, DCCAE, Government sources, Standard Chartered

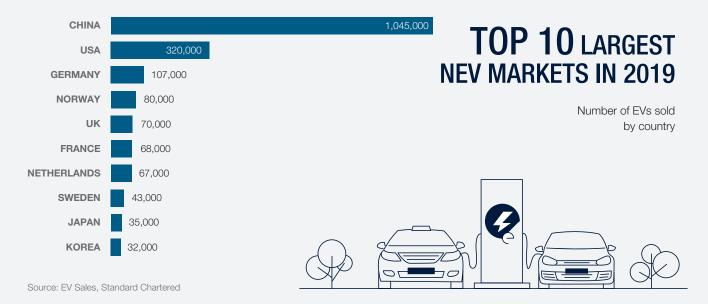
CHINA, US AND EU TO LEAD E-VEHICLE GROWTH

China is the world's largest NEV market with over 1 million unit sales in 2019. The US is the second largest market, with 320,000 units sold. Looking ahead, we see rapid growth in NEV sales driven by:

- Increasing awareness of the environmental impact of ICEs
- · Governments taking the lead on regulations
- Faster adoption of NEVs by Millennials compared to Gen X

General Motors has recently announced the rollout of GMC electric pick-up models and is committed to selling 1 million EVs in 2025. Volkswagen has launched the ID.3 electric car model and plans to produce 1.5m EVs by 2025. Growth in production could increase the economies of scale and create operating leverage for auto producers.







INNOVATION DRIVER

The spread of mobile devices with advanced sensors has dramatically enhanced data collection and transmission efficiencies. Powerful analytical tools including Artificial Intelligence (AI) and Machine Learning (ML) are bolstering the value of IoT data through predictive inferencing. Increasing speed of connectivity boosted by the 5G roll out – connecting 100x more devices per square mile at up to 100x faster speeds than 4G – is making it easier to integrate IoT devices. With 5G offering a speed of <0.001 seconds between the sending and receiving of information, real time applications such as autonomous transportation are now possible.

APPLICATION IN INDUSTRY

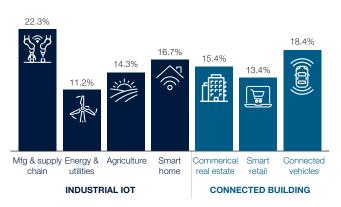
IoT will apply to many aspects of life, but we focus here on the industrial applications, where growth is expected to be the highest.

Maintenance: An average factory generates 1tb of production data points daily, but <1% of production data is analysed and acted upon in real time. Equipment downtime is costly, where one hour of downtime can cost over USD 100k. Using IoT to monitor and analyse equipment in real time, IBM helped clients reduce equipment downtime by 20% and increase maintenance productivity by 28%.

Productivity: Sensor technologies can also create digital twins or digital replicas of physical assets. Ericsson applied this to create an augmented-reality troubleshooting at its factory in Estonia showing it can boost productivity by up to 50%. Moreover, the information is shared immediately with Ericsson factories in China to share best practices and optimise productivity globally.

Manufacturing and supply chain is expected to see the highest growth in IoT in 2020-2023

Market size growth estimate for 2020-2023 CAGR

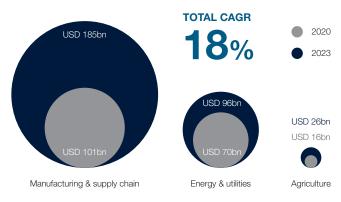


Source: PitchBook, Standard Chartered

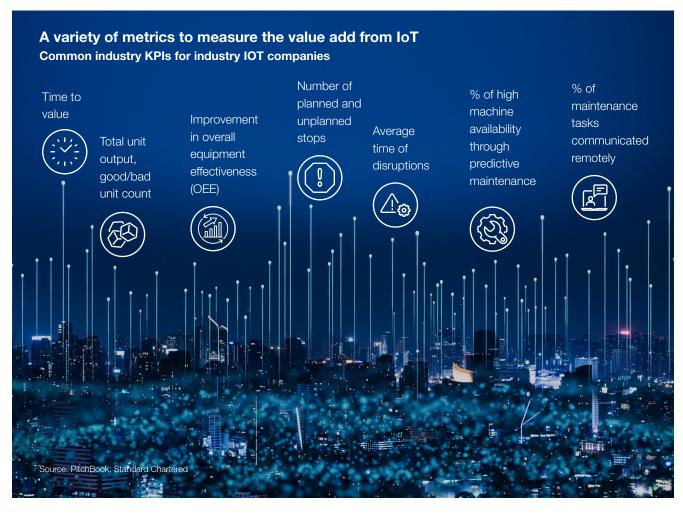
Supply chain: COVID-19 highlighted the importance of supply chain reliability. Asset tracking of inventory gives visibility to reduce bottlenecks in the supply chain. Low power sensors that enable longer distance tracking would compete with existing GPS and RFID solutions. Integrating location sensors with data on weather, traffic events and risk events can give further visibility on delays and minimise disruptions.

Manufacturing and supply chain comprises the largest component of industry IoT

Market size growth estimate for Industry IoT from 2020 to 2023



Source: PitchBook, Standard Chartered



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