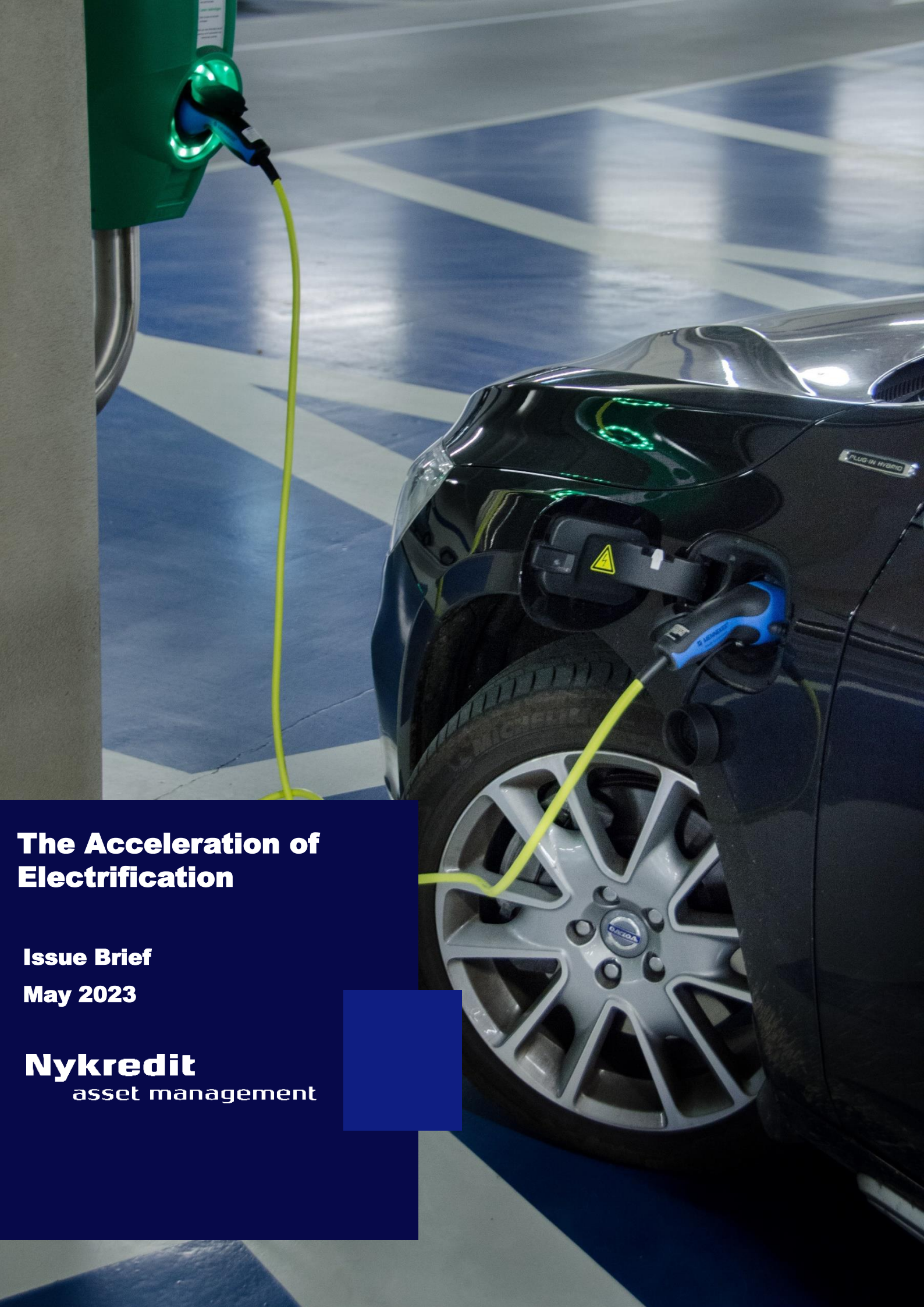

The Acceleration of Electrification

Issue Brief

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Nykredit
asset management

The Acceleration of Electrification

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Investor Takeaways

- **Electrification is a strong investment trend in Europe: It is about to take off.**
- **This issue brief explores heat pumps and electric vehicles as the twin pillars in electrifying the European economy.**
- **Electrification is the process of replacing fossil fuel-powered technologies and services with those that run on electricity from renewable sources.**
- **The future of domestic heating is going low-carbon. The total number of heat pumps in the EU is now 20 million, equivalent to 16% of the heating market.**
- **A total EU phase-out of fossil fuel boilers by 2025 would have climate benefits equivalent to taking 15 million cars off the European streets – every year.**
- **The EU Commission targets 30 million additional heat pumps installed by 2030, which is a doubling of the deployment rate, and this target is not unachievable.**
- **Electric car sales in Europe are accelerating, a trend enforced by a ban on new sales of carbon-emitting petrol and diesel cars by 2035, with a view to getting them off the continent's roads by mid-century.**
- **The brief gives examples of how three different teams, 'Nykredit Alternative Investments', 'Sparinvest Global Value' and 'Global Focus Equity' are investing into the electrification trend. Each team has their own idiosyncratic and bottom-up investment process.**

The Electrification Megatrend

The war in Ukraine has had a profound impact on the EU's energy and climate policies, particularly as it pertains to Russia's role as a major gas exporter to the region.

To avert an energy crisis, governments are pushing consumers and industries to prioritise alternatives to Russian fossil fuels, thereby accelerating the electrification trend across the European continent.

Electrification is the process of replacing fossil fuel-powered technologies and services with those that run on electricity from renewable sources. This transition has the potential to significantly reduce carbon dioxide (CO_2) emissions in several sectors, including transport and buildings, which we will explore in more depth in this issue brief.

For Climate Stabilisation, Buildings and Transport Are Key Sectors

Becoming the world's first climate-neutral continent by 2050 is currently an ambitious European goal, driving decarbonisation in all sectors.

Electrification is essential in addressing the key challenges of decarbonising the building and transport sectors. These areas represent critical components in the fight against climate change.

According to the International Energy Agency's (IEA) 2021 report, the transport sector is responsible for about 24% of global energy-related CO_2 emissions, while the building sector is responsible for about 19% of global energy-related CO_2 emissions.

To decarbonise buildings, electrification of heating, cooling, and cooking can help reduce emissions in the building sector. More efficient electrified appliances and lighting will enhance this trend.

Transport accounts for a significant proportion of global emissions. The transport sector presents a difficult challenge in terms of the availability of charging spots. Here, the electrification of vehicles, trains, busses, subways, cable cars, water taxis and ferries require the necessary charging infrastructure.

In the personal transport sector, electrification can take the form of electric vehicles (EVs), which are powered entirely by electricity.

Solar Power Production in Europe Up 50% in 2022

By electrifying consumption, new sectors can tap into the expanding pool of renewable and zero carbon energy assets.

Here, Denmark has had a long tradition of developing and using wind energy. A new record was reached in 2022, as Denmark reached 60% of electricity coming from renewable sources. More is to come; in just eight years from now, that figure will quadruple.

It is not just electricity from wind that is accelerating; solar power parks are constructed at a breathtaking pace across Europe.

A report from the industry group SolarPower Europe found that solar power in Europe increased by almost 50% in 2022. The EU installed a record 41.4 GW of solar power this year, enough to power 12.4 million homes.

Solar and wind power generation took centre stage in 2022, accounting for over a fifth (22%) of EU electricity production, thereby surpassing fossil gas (20%) for the first time, according to the European Electricity Review 2023.

How We Invest:
Nykredit Alternative Investments is investing in the electrification trend through Brookfield's infrastructure funds, which offer exposure to various electrification opportunities.

One such opportunity is an Australian smart meter business, while another involves Chinese renewable power, with a focus on solar rooftop projects and wind assets across China. In addition, the funds invest in solar operating assets in the UK, among other options.

Sparinvest Global Value is currently invested in the American company nVent Electric PLC (NYSE: NVT) – a global provider of electrical connection and protection solutions. The company supports critical power generation operations from solar and wind facilities to nuclear and natural gas sites.

Sparinvest Global Value is also invested in the company DXC Technology (NYSE: DXC), which some of world's largest energy and utility companies entrust to modernise their systems.

Heat Pumps Exploit a Renewable Ramp Up

Electrification efforts are not limited to eye-catching wind turbines; rather, a simple box mounted on the exterior of your home can also play a crucial role in combatting climate change and reducing reliance on Russian gas.

Heat pumps operate by using electricity to concentrate heat potential, making them far more energy-efficient than traditional gas-fired boilers. In fact, even if the electricity is generated from fossil fuels, heat pumps are still *half* as emissions intensive as fossil fuel boilers.

Heat Pumps – for Urban And Rural Areas

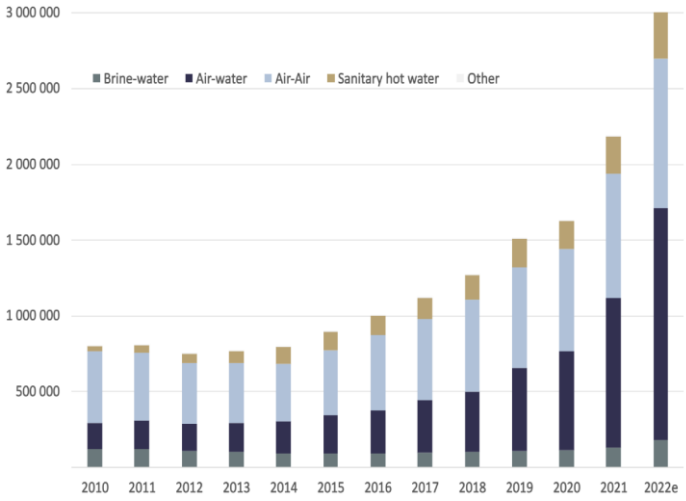
As more people transition away from fossil fuels, natural gas stoves are phased out in favour of heat pumps. Experts stress the climate benefits, particularly in rural areas:

"Heat pumps are the most efficient way to ensure green pollution-free heating of the future. Both in district heating systems, and as individual heat pumps in homes outside district heating areas," says Kaare Press-Kristensen, PhD, Senior Advisor on Air Quality & Climate in Green Transition Denmark.

In 2022, the European Heat Pump Market Set a New Record

In 2022, the European heat pump market set a record with 3 million units sold across 16 markets, according to new estimates from the European Heat Pump Association, as is shown in the figure below.

Sales increased by almost 38% in 2022, surpassing the previous year's rise of 34%. Heat pumps currently provide heating to about 16% of Europe's residential and commercial buildings, with a total of 20 million connected heating and hot water heat pumps in use.



30 Million New Heat Pumps by 2030 Across Europe

The European Commission wants 30 million additional heat pumps installed by 2030 on top of the existing stock. With the 2022 sales in mind, that target does not seem unrealistic.

Increased incentives for heat pumps are proposed in the European Commission's plan, RePowerEU.

The EU aims to double the current deployment rate of heat pumps in the coming years. In the proposed EU strategy for Energy Systems Integration, the Commission foresees 40% of all residential and 65% of all commercial buildings being heated with electricity by 2030, which is a bold prediction.

If successful, such a heat pump investment programme could save the EU 35 billion cubic metres (bcm) in gas consumption per year. Recall that the gap we need to close is the 150 bcm of Russian gas that was exported to the EU in 2021. So, heat pumps will take us far, but they are not a silver bullet.

Germany Leads the Heat Pump Uptake

Heat pump sales in Europe are growing the fastest in Poland, Germany and the Netherlands. Germany leads the electrification trend by rolling out heat pumps. The government aims to install 500,000 heat pumps annually until 2024, with the target rising to 800,000 per year thereafter.

New German legislation mandates that every new heating system in new or existing buildings must run on at least 65% renewable energy by 2024.

The potential is great; around 23 million out of 27 million homes in England, Scotland and Wales are still connected to the gas network or using a boiler.

Electrification is still to penetrate the UK market, but more heat pumps could support the government's strong climate plans.

What Is Nykredit Doing?

As Denmark's largest mortgage provider, Nykredit offers clients discounts on heat pumps from two suppliers and a DKK 10,000 cash contribution from the subsidiary Totalkredit when gas- or oil-fired boilers are replaced with heat pumps. The use of this scheme has been very strong since the launch.

How We Invest:
Nykredit Global Focus Equity is invested in *Daikin Industries (T-JP: 6367)*, a leading Japanese heat pump manufacturer, with an impressive energy efficiency rating of A++. Daikin has some of the most efficient models on the market with low-noise features. Daikin stands to benefit from the electrification trend in both urban and rural areas.

Now, heat pumps are one pillar of electrification, the other pillar is the uptake of electric cars across Europe, to which we turn next.

Electric Car Sales Are Accelerating

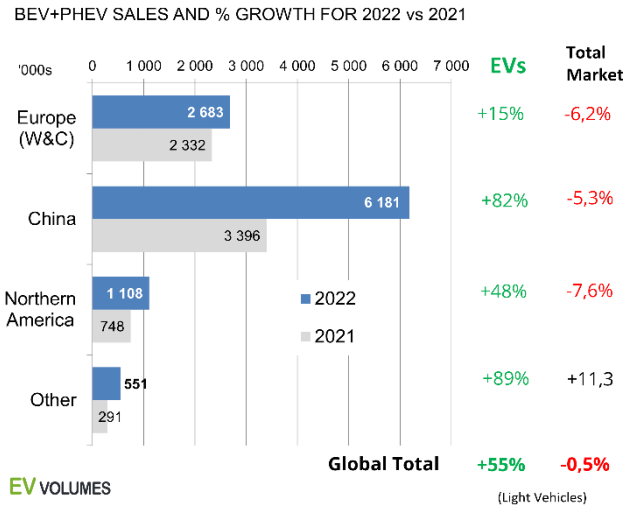
In February, the European Parliament gave its final approval to a ban on new sales of carbon-emitting petrol and diesel cars by 2035, with a view to getting them off the continent's roads by mid-century. The UK has gone even further by banning new diesel and petrol car sales by 2030.

The EU's target for zero CO2 emissions for new passenger cars and light commercial vehicles by 203 sets the global benchmark. Intermediate emissions reduction targets for 2030 are set at 55% for cars and 50% for vans.

Already, electric car sales in Europe are accelerating. Fully battery electric vehicles accounted for 12.1% of the 9.1 million units sold in EU markets in 2022, according to figures from the European Automobile Manufacturers' Association (ACEA). That compares to a share of 9.1% in 2021 and of just 1.9% in 2019.

Electric cars, both new and used, are becoming increasingly popular in Denmark. In fact, Statistics Denmark reported a 69% increase in the number of EVs on Danish roads in 2022. Despite Denmark's growing adoption of electric cars, Germany continues to lead the European EV market with a 28% share, followed by France at 16% and the UK at 14%.

In a global context, EV sales are expanding the fastest in China, in other parts of the world and in Northern America. According to the Global EV Outlook 2022, by 2030, the global electric vehicle stock will reach nearly 200 million vehicles and will account for about 10% of the global vehicle fleet.



Sales Cyclicity and Government Support

The sales of electric vehicles is subject to cyclical fluctuations, which are influenced by government support schemes and incentives. Recent declines in EV sales in Germany, Norway, and globally in January 2023 suggest that direct and indirect government support plays a more significant role than initially expected.

Incentives, such as tax breaks and government support schemes, have been introduced to encourage the adoption of EVs. While these incentives were initially expected to kick-start sales and let the market take over, the truth is that they do play a role in changing opinions on driving EVs. The good news is that EV manufacturers are lowering their prices, with Tesla lowering U.S. prices five times in 2023.

EU CO_2 Emissions Thresholds and Fines

In order to enforce stricter regulations on CO_2 emissions, the EU has established thresholds that must be met by EV manufacturers. Those that sell too many cars that do not meet these standards (95 kg CO_2 per kilometre for production over a year) will face fines.

How We Invest:
Our fund Global Focus Equity is invested in electrification through *Schneider Electric SE* (EPA: SU), which offers a range of electric vehicle charging station solutions. Charging infrastructure is set to develop rapidly in the coming years.

Electric cars today typically contain many microchips and semiconductors. In the past, cars did not even have a single microchip. These days, however, microchips are used for a wide range of functions in an electric car, including power steering, dashboard displays and automatic brakes.

A typical electric car contains around 3,000 microchips, which may cost just a few dollars each, but are essential for the car to function properly.

Even an electric car with a value of USD 75,000 cannot operate without these microchips. Global Focus Equity is invested in *ASML* (NASDAQ: ASML), which gives the world's leading chipmakers the power to mass produce patterns on silicon, helping to make computer chips smaller, faster and greener.

Conclusion

In Europe, we are experiencing an acceleration of the green transition away from fossil fuels. From the driveway to the living room, electrification is driving us towards a low-carbon society, and decarbonising transport and buildings, respectively, is a key challenge for the future.

Heat pumps are more climate-friendly than oil- and gas-fired boilers, as they do not produce greenhouse gas emissions. As a result, they are becoming the standard solution for heating new buildings in Europe, and they are replacing old heaters in existing buildings, especially in rural homes that are not connected to district heating.

The roll-out of electric cars has been driven in part by the declining sales of diesel and petrol cars. This trend is expected to continue, with some governments taking more drastic measures to accelerate the shift towards electric vehicles.

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