

Cleantech *for* Nordics

Q3 2023: QUARTERLY BRIEFING

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INTRODUCTION

The nearly EUR 5 billion raised by Nordic cleantech growth companies during Q1-Q3 is actually already more than the total investments for the entire previous year. Notably, two mega-rounds in Northvolt and H2 Green Steel significantly contributed to this achievement, standing out as two remarkable outliers. Despite the economic downturn and increased competition from rising interest rates, deals are still being closed. See the latest dealflow updates and discover the newest developments in Nordic cleantech investments in this brief. To enrich your understanding of the current investment landscape, we've also provided a summary of one of our panel discussions, which delves into the realm of scale-up investing.

We are also very happy to see much needed investments and deals in energy storage, contributing to increased grid flexibility—an area where we advocate for increased knowledge and engagement. We've included some key insights into the trends shaping energy storage and flexibility. At the EU level, we are now seeing the launch of the carbon border adjustment mechanism, a big potential impact-making piece of policy. We are keen to follow how this may shape the future investment landscape moving forward.

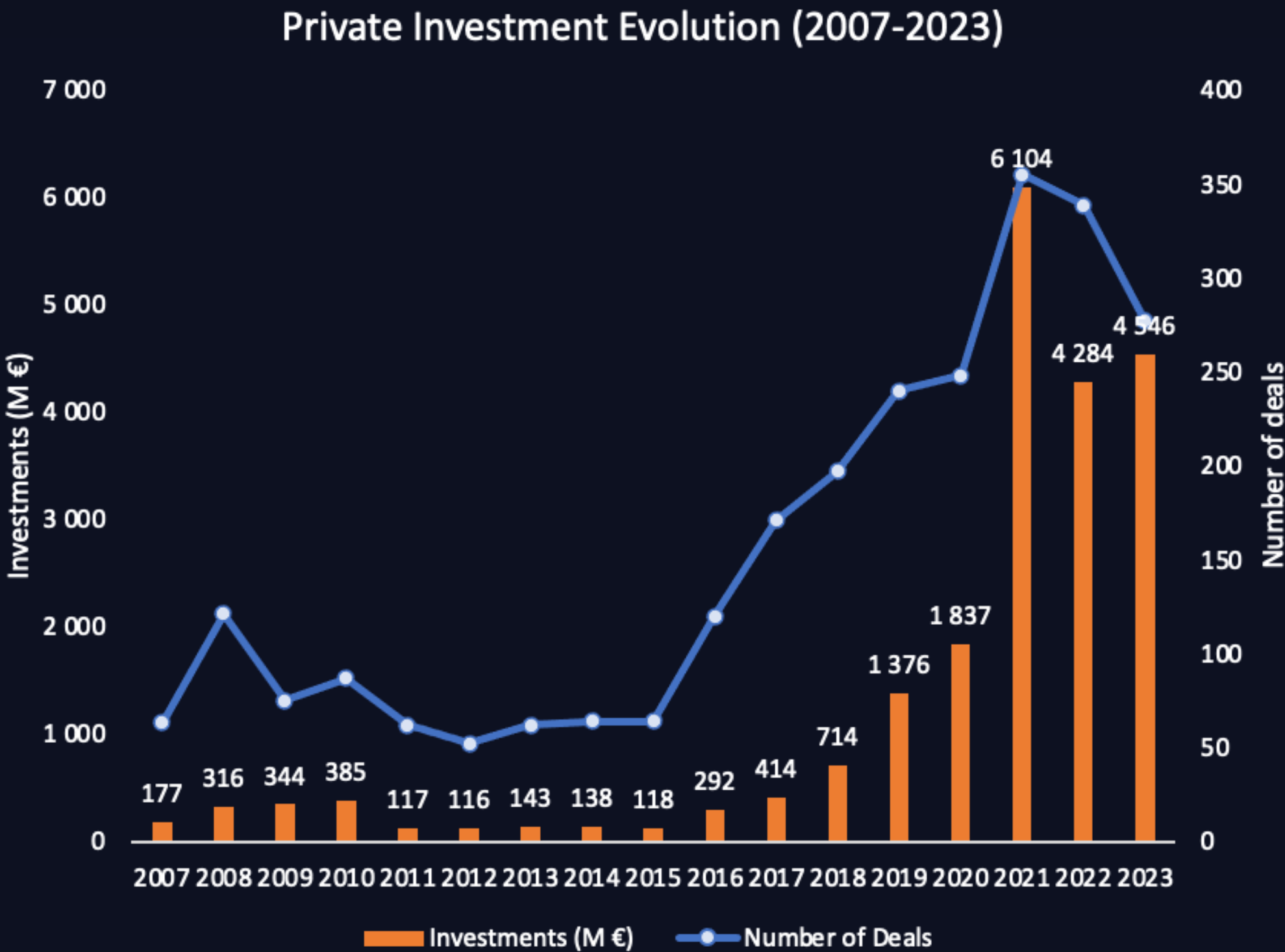
We hope this brief will provide you with some insight into the current investment and policy scene of cleantech in the Nordics. Given that this is our first quarterly brief, please don't hesitate to provide any feedback on it to us! Enjoy!

Correction: Please note that in a previous version of this brief, an error occurred in which we incorrectly reported the value of Northvolt's investment. This has now been corrected.

4 546 M EUR

Investments during Q1-Q3 in 2023, totalled 4,546 M EUR, and have already surpassed the total amounts invested during 2022.

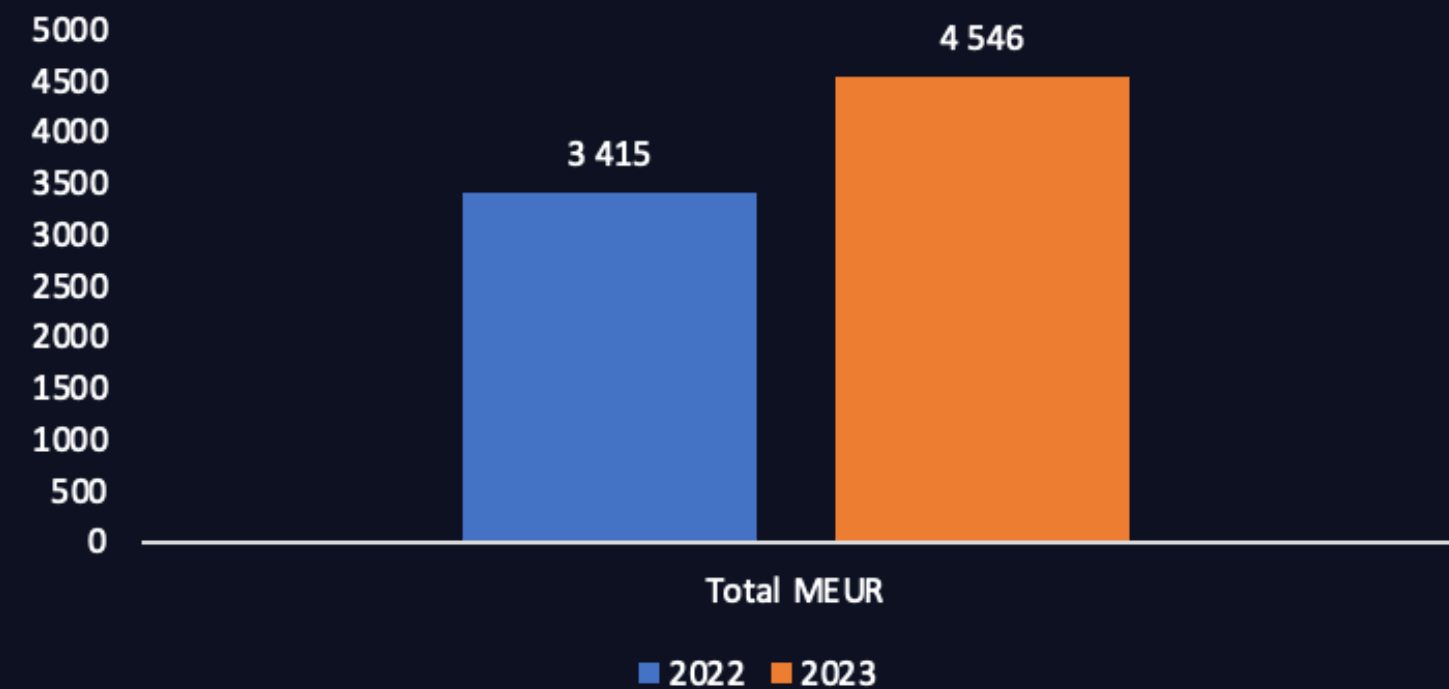
Two extreme outliers. H2 Green Steel and Northvolt are responsible for two mega-investments, accounting for more than half of invested amounts up until now.



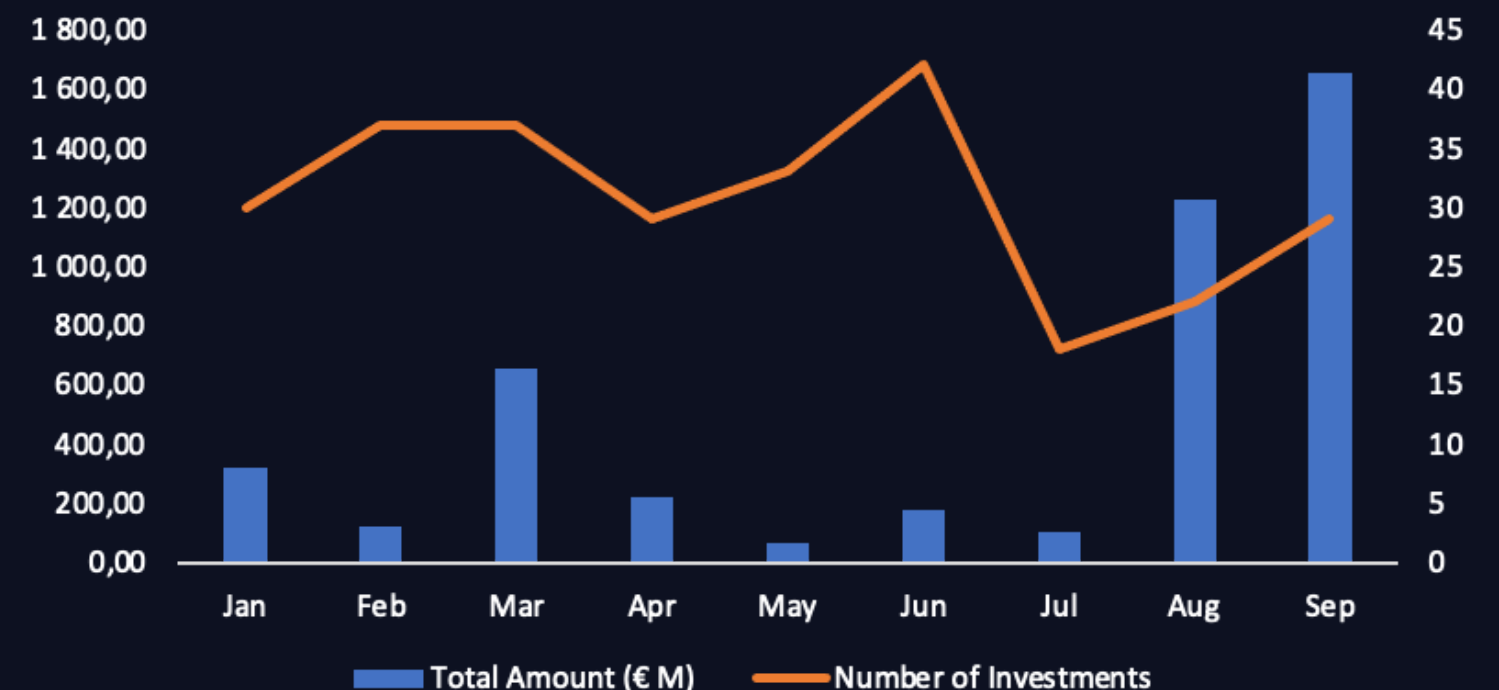
AMOUNTS AND NUMBER OF DEALS UP

- Invested amounts for the first three quarters of 2023 exceed those of the corresponding period previous year. While primarily driven by large investments in H2 Green Steel and Northvolt, the initial three quarters of 2023 have also witnessed an increase in deal activity compared to preceeding years. As of Q3, the Nordics has seen a total of 277 deals in 2023, whereas 256 deals were recorded during the same period last year.
- Looking at the first three quarters of 2023, investment activity have been relatively balanced throughout the year, with a slight reduction observed in Q3. On the other hand, Q3 demonstrates a marked spike in terms of investment value, attributed to the mega-investments secured by H2 Green Steel and Northvolt.

Total investments Q1-Q3

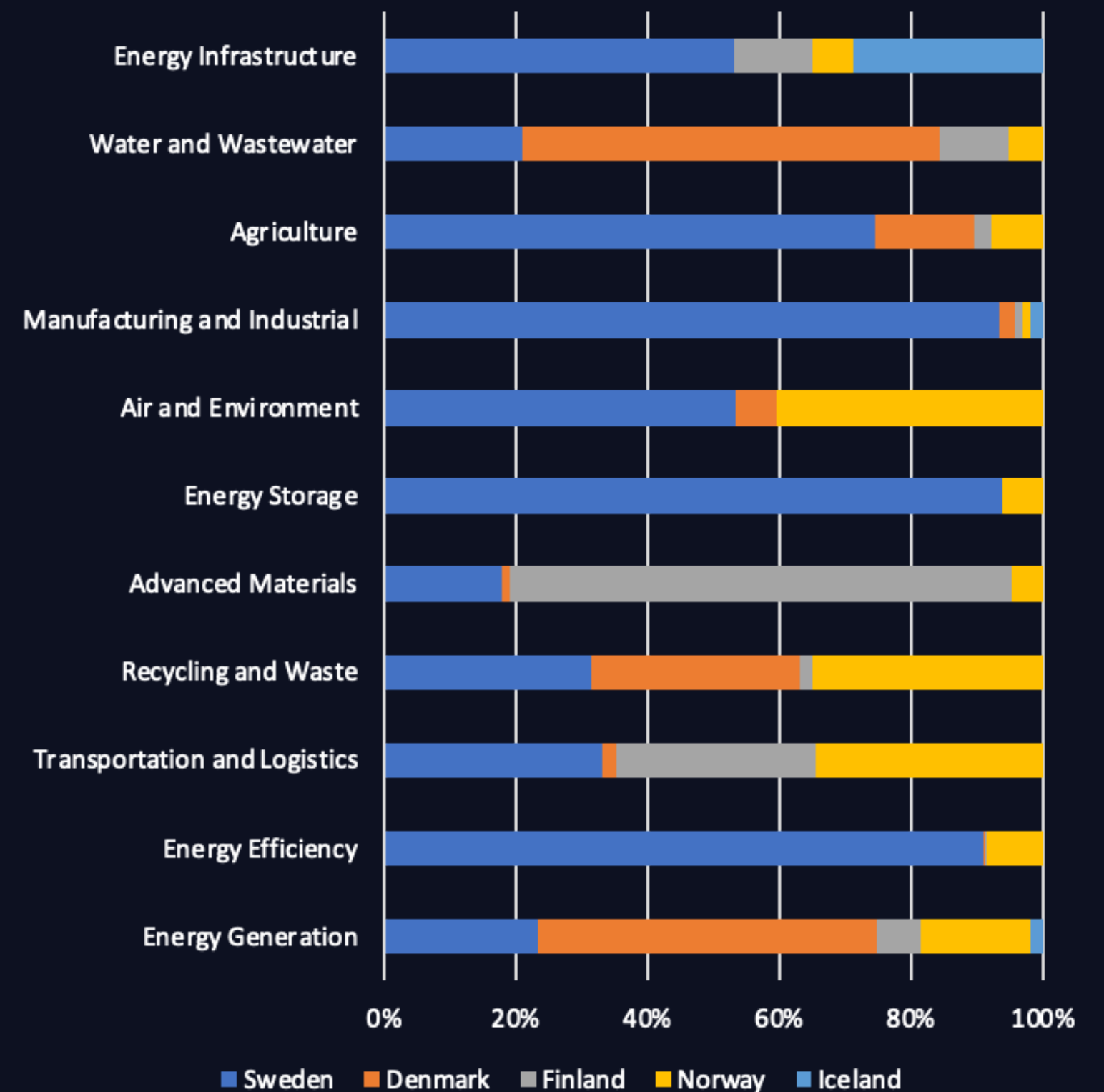


Investments Q1-Q3



- Sweden maintains its position as a frontrunner of investment activity among its Nordic peers, securing nearly half of all deals. Norway comes in second, with Denmark and Finland not far behind.
- There is slight variability among industry segments represented between companies in the different countries. When looking at value invested in companies, Sweden is particularly strong within agriculture, manufacturing and industrial, energy storage, and energy efficiency—accounting for over half of the value invested within the sector. Likewise, Denmark stands out in energy generation as well as water and wastewater, and Finland is prominent within advanced materials.
- Considering the size of the country, it is worth noting that Icelandic companies have acquired a third of investments within energy infrastructure.
- When examining the origin of investment, Sweden stands for roughly half in terms of deals.

Deals by segment and by country (% of value)



EXPLORING THE IMPERATIVE FOR SCALE-UP INVESTMENTS IN CLEANTECH

INSIGHTS FROM THE INVESTORS

A session on scale-up investing took place at Cleantech Capital Day in Copenhagen. A who's who in cleantech growth investing was moderated by Stefan Söderling of Swedens Almi Invest Greentech, and the panel consisted of Ingvild Meland of Nysnø Climate Investments, Adam Kostyál of Nasdaq, Yair Reem of Extantia, Irene Gálvez of European Investment Bank, and Mario Fernandez of Breakthrough Energy. The following were the key takeaways:

Urgent need for scale-up. While Nordic cleantech investments in Q1-Q3 have already exceeded 2022 levels, the challenge lies in scaling innovations beyond early-stage success into globally implemented superstars. The IEA highlights that 80% of technologies required to meet the 2030 emission reduction goals already exist. However, these technologies are not being sufficiently scaled, and there is especially a gap in investments directed towards hardware solutions.

Bridging the funding gap. There is a funding gap in cleantech investments. The first obstacle arises when transitioning from research to early commercialization, and the second, more formidable, challenge lies in progressing beyond First-Of-A-Kind (FOAK) to large-scale production—a very capital-intensive feat. Research grants and venture capital alone can't provide sufficient funds, and infrastructure investors are hesitant to take on the risk associated with FOAK ventures. It is thus critical to de-risk these investments and mitigate the funding gap through various means, such as blended financing, offtake agreements, seeking customer investments, regional initiatives, and dedicated public funding.

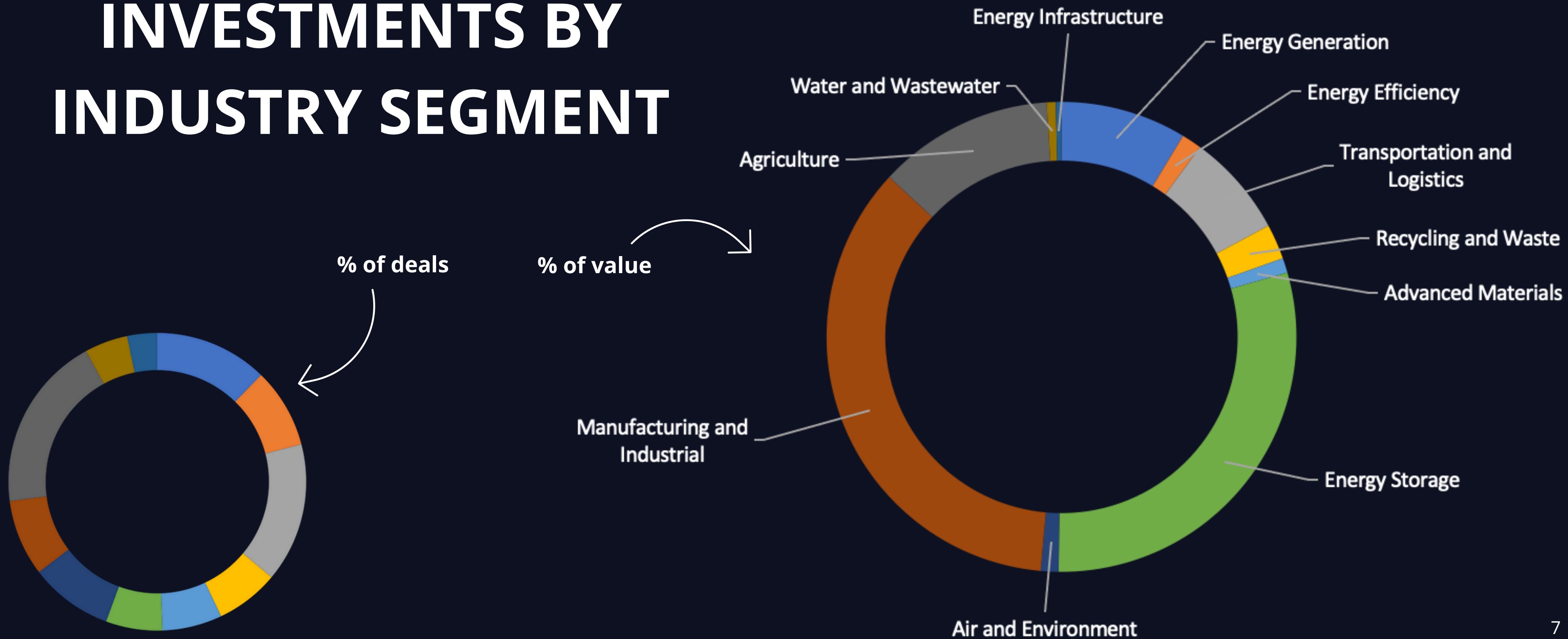
Offtake agreements and market demand. H2 Green Steel and Northvolt are leading cleantech scale-ups in the Nordics and have each secured investments of approximately

1,500 MEUR this year. One of the secrets to success may be that both companies secured offtake agreements for their products, establishing essential market demand and long-term contracts, which enabled larger tickets from investors. Undoubtedly, ensuring demand throughout the value chain is crucial when deploying a new technology into the market. As summarized by Adam Kostyál, Nasdaq, these two companies have successfully managed to establish need, demand, and understand the market. Thus, the remaining question is how this model can be copied and moved down to earlier stages of investment characterized by greater risk.

European call to action. In the race for scale-up capital, Europe finds itself falling behind the United States. While Europe excels in early-stage innovation, which is especially promising in the Nordics, the region lags behind the U.S. in terms of capital deployment and large scale-up funds. This reality is perhaps amplified further by the U.S. Inflation Reduction Act (IRA) which offers favorable tax credits and incentives for cleantech industries. While Europe maintains strengths in many areas with clear directives, extensive know-how, and a broad ecosystem of funds and programs accelerating the sector forward, the IRA is a call to further action.

Unlocking growth. Ingvild Meland emphasized that political instruments can be key in propelling cleantech growth, forwarding measures such as making loans and guarantees more available for early-stage companies, providing soft funding, and introducing tax incentives to facilitate large-scale projects. Considering the impact of the IRA, such tools may be crucial in accelerating the development of cleantech in the Nordics.

INVESTMENTS BY INDUSTRY SEGMENT



ENERGY STORAGE - OR SHOULD WE CALL IT FLEXIBILITY?

Looking at cumulative data from the first three quarters, four of the top ten investments were in energy storage. This trend highlights the pivotal role of enhanced flexibility in the energy system, positioning energy storage as a crucial strategy to address the increasing amount of renewables entering the grid.

Key trends to note:

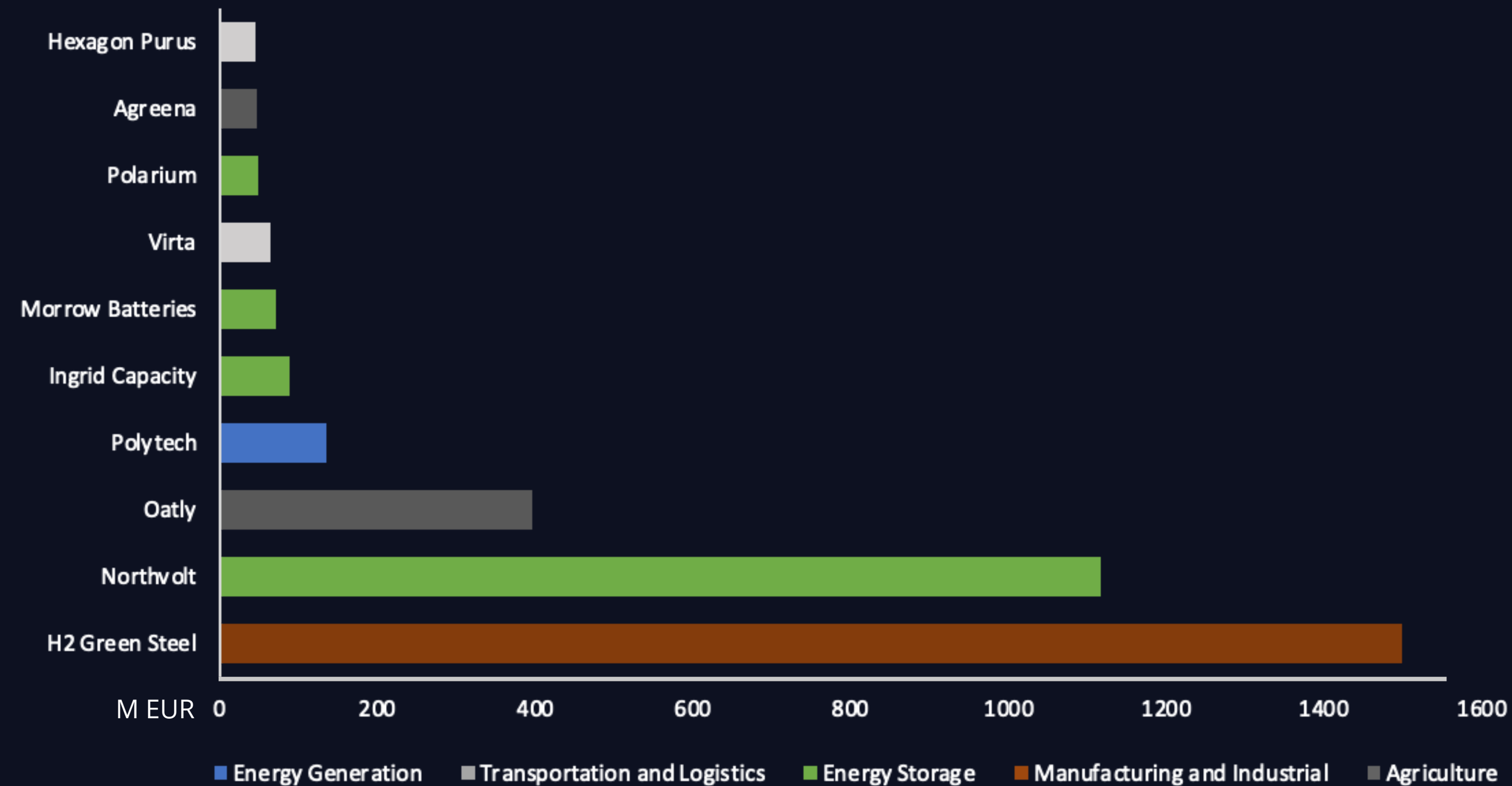
- **Rising energy demand.** The Nordic countries have all pledged to achieve net-zero carbon emissions before 2050, aligning with both EU-wide and national binding targets. The clearest trend towards achieving this is the ongoing electrification of industries and the transportation sector.
- **Growing role of solar and wind.** Anticipated further significant growth in solar and wind energy sources is expected to meet the surging power demand. While these renewable sources make substantial contributions, their intermittent nature necessitates increased flexibility in the power system. While hydropower historically has played a critical role in providing both energy and flexibility, it is reaching its maximum capacity in the Nordics and there is a need for enhanced flexibility within the overall system.
- **Challenges of growing volatility.** The future power system is characterized by escalating volatility across various aspects, including flows, balances, prices, and adequacy questions. Recent global events, notably the Russian invasion of Ukraine, underscore the importance of a flexible power system in responding to unforeseen challenges. Flexibility throughout the entire power system is identified as a crucial component in adapting to and mitigating these uncertainties.

BEHIND THE DATA

When looking beyond the numbers, some common themes within the investment segments can be identified.

- **Software solutions on the rise.** Many of the cleantech companies garnering investments develop software solutions. This is especially prominent within companies in air and environment, a significant portion of them focusing on software offerings such as CO2 emission calculation and reporting. The trend stands strong within other investment categories as well, such as within agriculture and transportation and logistics.
- **Agriotech is growing.** Within the agricultural sector, agriotech is advancing and vertical farming is one example of an area that is prevalent among the deals.
- **Hydrogen going strong.** Hydrogen continues to stay on the rise as an energy carrier, also within industry segments such as transportation and logistics, as well as manufacturing and industrial.

TOP 10 NORDIC INVESTMENTS (Q1-Q3)



Four out of the top 10 largest investments in Q1-Q3 were secured by companies within energy storage: Northvolt, Ingrid Capacity, Morrow Batteries, and Polarium.

TOP 10 NORDIC INVESTMENTS (Q1-Q3)

H2 GREEN STEEL

H2 Green Steel produces green steel. Powered by hydrogen, H2 Green Steel produces steel with 95% reduced CO2 emissions compared to traditional steel-making.

NORTHVOLT

Northvolt specializes in lithium-ion battery cells, manufacturing batteries with clean energy, resulting in 80% lower CO2 emissions compared to coal powered cells.

OATLY

Oatly is a food company using oats to produce alternatives to dairy products.

POLYTECH

Polytech is a wind energy company specialized in the development, design, and production of systems dedicated to improving wind turbines.

INGRID CAPACITY

Ingrid Capacity is an energy company building infrastructure for large-scale energy storage.

MORROW BATTERIES

Morrow Batteries is a battery technology company producing sustainable batteries for solutions within energy storage and mobility.

VIRTA

Virta is a digital EV charging platform and offers end-to-end charging solutions.

POLARIUM

Polarium provides energy storage and optimization solutions based on lithium-ion battery technology.

AGREENA

Agreena promotes regenerative farming by providing a soil carbon platform and financial reward scheme for farmers adopting sustainable carbon farming practices.

HEXAGON PURUS

Hexagon Purus specialize in zero-emission mobility technologies, offering type 4 high-pressure cylinders, hydrogen fuel storage and distribution systems, and complete vehicle systems with battery packs for both fuel cell electric and battery electric vehicles

SCALE-UP NEWS

- **CorPower Ocean's** wave power unit has set a new record in storm survivability on Saturday Nov 4th—withstanding waves up to 18 metres (60ft)—as Portugal's coastline was placed on Red Alert due to rough seas brought by the Domingos storm. The C4 system was monitored from the control centre in Stockholm, and showed reliable operation throughout. Since its deployment in Agucadoura, the C4 has endured storms Babet, Aline, Ciarán and Domingos, with Domingos storm conditions recorded as the historical record for northern Portugal providing a solid verification of CorPower Ocean's C4's ability to endure extreme ocean conditions. [Read more.](#)
- **Modvion.** The world's highest wind turbine tower in wood, that was just erected by Modvion (tower height: 105 meters, total height 150meters), is now equipped with its turbine, a Vestas V90-2.0MW. [Read more.](#)
- **Orbital Systems** has signed a framework agreement with Danish Pension fund Velliv, meaning that the Danish real estate company Velliv Ejendomme will install Orbital's water circulating shower in coming construction projects. Velliv has previously established a focus on circular construction and, for example, already have solar panels on many of their properties. [Read more.](#)
- **Ligna Energy** has launched the next version of their super thin supercapacitor for the IoT market. The new 2S reduces its dimensions and weight while achieving a remarkable 100% increase in overall performance compared to its predecessor. [Read more.](#)
- **CAKE.** Premium lightweight electric motorcycle maker CAKE has announced a contract with Shanghai Forever Bicycles, initiating the development towards manufacturing and distributing 130,000 bikes in accumulated sales by 2027, in China—one of the most expansive and rapidly growing markets in the world. [Read more.](#)

POLICY NEWS

- Swedish government drops climate ambitions.** When the Swedish government presented its new budget at the end of September, funding for environment and climate received a cutback of SEK 259 million. Furthermore, current policies are expected to lead to a rise in emissions, resulting in Sweden falling short of its 2030 climate targets. Notably, emissions from transportation are increasing, largely attributed to tax reductions on fuel. The government acknowledged that the objective of achieving a 70% reduction in transportation emissions (compared to 2010 levels) will not be achieved with current regulation. Recent indications also suggest that the government may abandon its own climate ambitions and instead adhere to—weaker—EU regulation.
- Denmark invests in Carbon Capture and Storage (CCS).** Denmark allocates DKK 26.8 billion for a CCS project, spanning over 15 years, with the possibility to capture and store 34 Mt CO₂. The tender process will launch in 2024. It should be noted though, that while the Danish government demonstrates ambition, CCS projects thus far have not been as practically successful as technically proclaimed.
- Norway continues to invest in oil and gas.** The Norwegian Climate Committee released its proposal for how Norway can succeed with its climate ambitions—a key recommendation being to end further exploration in oil and gas. However, the Norwegian government continues to invest in oil, proclaiming that current policies, indeed, are in line with reaching the 1.5 degree target. Despite expectation of a decline in oil and gas production, Climate and Environment Minister Andreas Bjelland Eriksen emphasizes the current reliance on Norwegian fossil fuels and advocates for an effective phase-out strategy for the sector.
- Denmark boosts renewables.** Denmark plans to quadruple green electricity production from solar and onshore wind by 2030, equivalent to powering 11 million households. The government has selected 32 projects for potential energy parks with solar cells and wind turbines. To facilitate this, they aim to simplify permitting, ease land energy park construction, and increase compensation to citizens and communities affected by the energy parks.
- Norway's roadmap for green industry.** The Norwegian government introduced their latest iteration (2.0) of their roadmap for green industry. The roadmap collates NOK 15 billion for driving green transitions through capital injection and increased guarantee and loans. The money has been distributed between Nysnø, Siva, and Investinor (capital injection), Eksfin (guarantee framework), and Innovasjon Norge (loans). One billion has also been earmarked specifically for battery development.

POLICY NEWS

- **Norway explores deep sea mining of critical minerals.** Norway pursues deep sea mining in search of the critical raw minerals necessary for achieving a green transition. Dialogues have also been initiated with US producers of electric car batteries in efforts to build a market of Norwegian minerals in the US—a market which currently only holds international agreements with Japan. Criticism against the extractive endeavor is loud, however. Both from environmental organizations, but many companies have also spoken up and asserted that they will not utilize minerals procured through deep sea mining, including Volvo, Microsoft, Google, BMW, Northvolt, among others.
- **Green investments surge in Finland.** Investors commit over EUR 200 billion to green projects in Finland, with wind, solar, energy storage, and hydrogen garnering significant interest. However, despite the substantial investment plans, concrete decisions amount to only 4 billion euros, raising concerns. The surge in green investments is attributed to Finland's competitive advantages, including mostly fossil-free electricity and a stable grid.
- **Finnish government extends reduction in renewable fuel obligation.** The Finnish government plans to further reduce the distribution obligation for renewable transport fuel by 7.5 percentage points in 2023 to address increasing fuel prices. The obligation mandates a specific percentage of transport fuels to be renewable, encouraging alternative fuel use. The proposal will increase emissions, however, and critics include Riku Huttunen, Director General of the Energy Department in Finland's Ministry of Economic Affairs and Employment.
- **Rare minerals found in Finland.** Two new minerals, kukharenkoite and cordylite, were identified in a Finnish Minerals Group deposit in Finland. This marks their first discovery in the country. The discovery could support Europe's raw materials self-sufficiency and business opportunities in the rare earth elements (REE) sector, crucial for renewable energy and transport electrification.

CARBON HALTED AT BORDER...

The EU is committed to a 55% reduction in GHG emissions by 2030, compared to 1990 levels. To meet the target, the *EU Fit for 55* package was proposed, which includes a set of different proposals aimed at reducing emissions. Among these, the EU's Carbon Border Adjustment Mechanism (CBAM) is currently in focus. Starting on October 1st, the transitional phase of CBAM in the EU was launched. CBAM interacts with the EU's Emission Trading System (ETS), which is a carbon market that operates as a cap-and-trade system with emission allowances in energy-intensive industries and the power generation sector. The EU ETS is the EU's main tool for reducing GHG emissions.

CBAM aims to reduce carbon leakage outside of the EU, and under CBAM, exporters to the EU must purchase permits at costs which are equivalent to carbon prices within the EU ETS. Currently, CBAM covers iron and steel, aluminum, fertilizers, cement, electricity, and hydrogen. Payments are not introduced until 2026, but during this transitional phase, emission reporting must be conducted on trades. One of the questions moving forward, however, is how the cleantech investment landscape will be affected by the changes implemented by CBAM. Peter Hirsch provides the following insights from his perspective as head of sustainability at 2150.

CBAM will affect our portfolio only in those sectors where goods are heavily imported. Goods from specific sectors will need to meet certain standards to not incur carbon impact tariffs. This requires companies with international supply chains in those sectors to closely engage with their supply chains to ensure production will meet EU standards. CBAM has the potential to be very far reaching in its impacts on global production processes. It will also accelerate widespread adoption of carbon accounting for products. For goods that will enter the EU, CBAM creates the incentives to pursue green production methods through clear price signals. This will support businesses involved in the decarbonisation of those industries covered by CBAM.

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