

## Agenda

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- **Introduction**

- Robert Andrén, Director General, Swedish Energy Agency
- Jan Larsson, CEO Business Sweden
- Nina Kopola, CEO Business Finland
- Håkon Haugli, CEO Innovation Norway

- **Presentation of the report**

- **Next step and closing**

# The Nordic Battery Value Chain

- Step 2: The feasibility of a joint Nordic value proposition to attract investments and partnerships

# This report is a second step in the overall ambition to evaluate a joint Nordic approach to strengthen the emerging battery industry in the Nordic region

**Background**

- **Collaboration** since December 2020: the Swedish Energy Agency and Business Sweden
- **Goal:** support the development of a sustainable, circular, profitable and competitive Nordic battery industry
- **Focus:** the Nordic countries who have set, or with ambitions to set, national strategies for a battery industry
- **Report:** this is the second report launched during 2021

**Objective of the report**

- To understand the gaps that need to be filled in order to build up a competitive battery industry in the Nordics
- To understand the feasibility of a joint Nordic value proposition for attracting foreign direct investments and partnerships

**Acknowledgements**



**Interviewees from Sweden, Finland and Norway\***

\*Excluding additional interviewees wishing to stay confidential

# There is a great potential for the Nordic countries to develop a strong position in the rising European battery market – but the window of opportunity is narrowing

<b>European battery industry is developing fast</b>	<ul style="list-style-type: none"><li>● Strong accelerating demand from electric vehicles and increased energy storage</li><li>● Vast investments into Europe bring competence and capital</li><li>● Ongoing race to secure investments</li><li>● Heavy EU investments for an EU clean energy transition</li></ul>
<b>The Nordic region has a favorable momentum</b>	<ul style="list-style-type: none"><li>● Strong battery industry development</li><li>● Complementary strengths in every step of the battery value chain</li><li>● Advantages in clean, affordable energy and a strong manufacturing industry</li></ul>
<b>Some gaps need to be filled to build a competitive industry</b>	<ul style="list-style-type: none"><li>● Overall need to speed up the development and strengthen market position</li><li>● Competence and critical components are required</li><li>● Foreign direct investments are needed to fill the gaps</li></ul>
<b>By joining forces, the region can take a strong position</b>	<ul style="list-style-type: none"><li>● The region needs to move fast in order to take a stronger position</li><li>● Joint promotion activities to get attention is desired by the industry</li><li>● A joint value proposition to improve attractiveness towards foreign investors</li></ul>

“ The value chain needs to become circular [...] and **batteries need to be obtained close by**. You do not want to be under China's restrictions. Covid has proved that the supply chain must be European. ”  
[Finnish company]

“ Nordic batteries have **the chance to become the Rolls-Royce of batteries**. We have the preconditions for high quality sustainable batteries and integration with digital services. ”  
[Norwegian company]

“ We need to take decisions and invest now **in order to take this position for sustainability at all**. It takes 3-4 years to establish a battery cell factory, and 10 years to set up mining. **We need to act NOW.** ”  
[Swedish company]

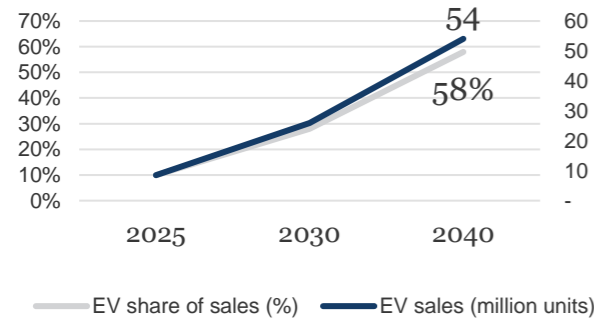
# The transition towards electrical vehicles will accelerate the demand for batteries in Europe in the next decade



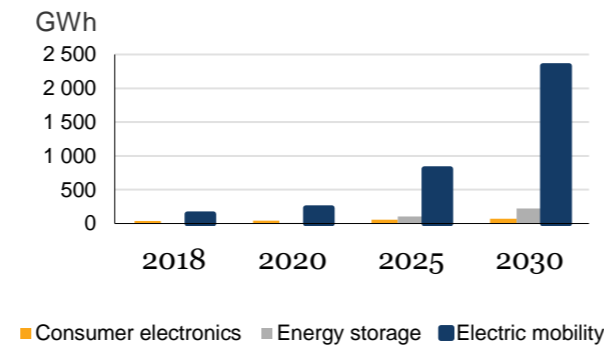
## Transition towards electric vehicles (EV)

- The global EV registrations increased by 41% in 2020 to a 4,6% share of sold passenger cars
  - Is expected to reach 58% in 2040
- The battery account for up to 35-45% of the total cost of an EV making it the single most expensive component
- Electric mobility is by far the largest application area for batteries in 2030

Prognosis of global passenger EV sales



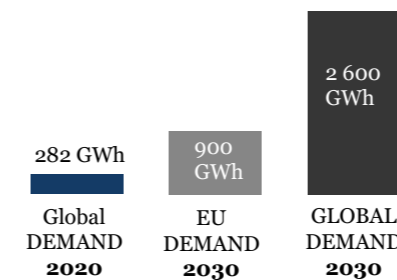
Global battery demand per application area (2019)



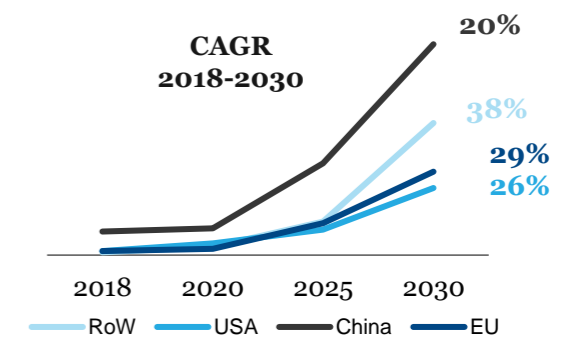
## Growth in battery demand

- The global battery demand is expected to ninefold in the next decade
- Battery demand in Europe is expected to grow at an annual rate of 29% until 2030
- Europe is still ahead of the U.S., but with the Biden administration, EV and charging infrastructure is rising

Predicted battery demand (2021)



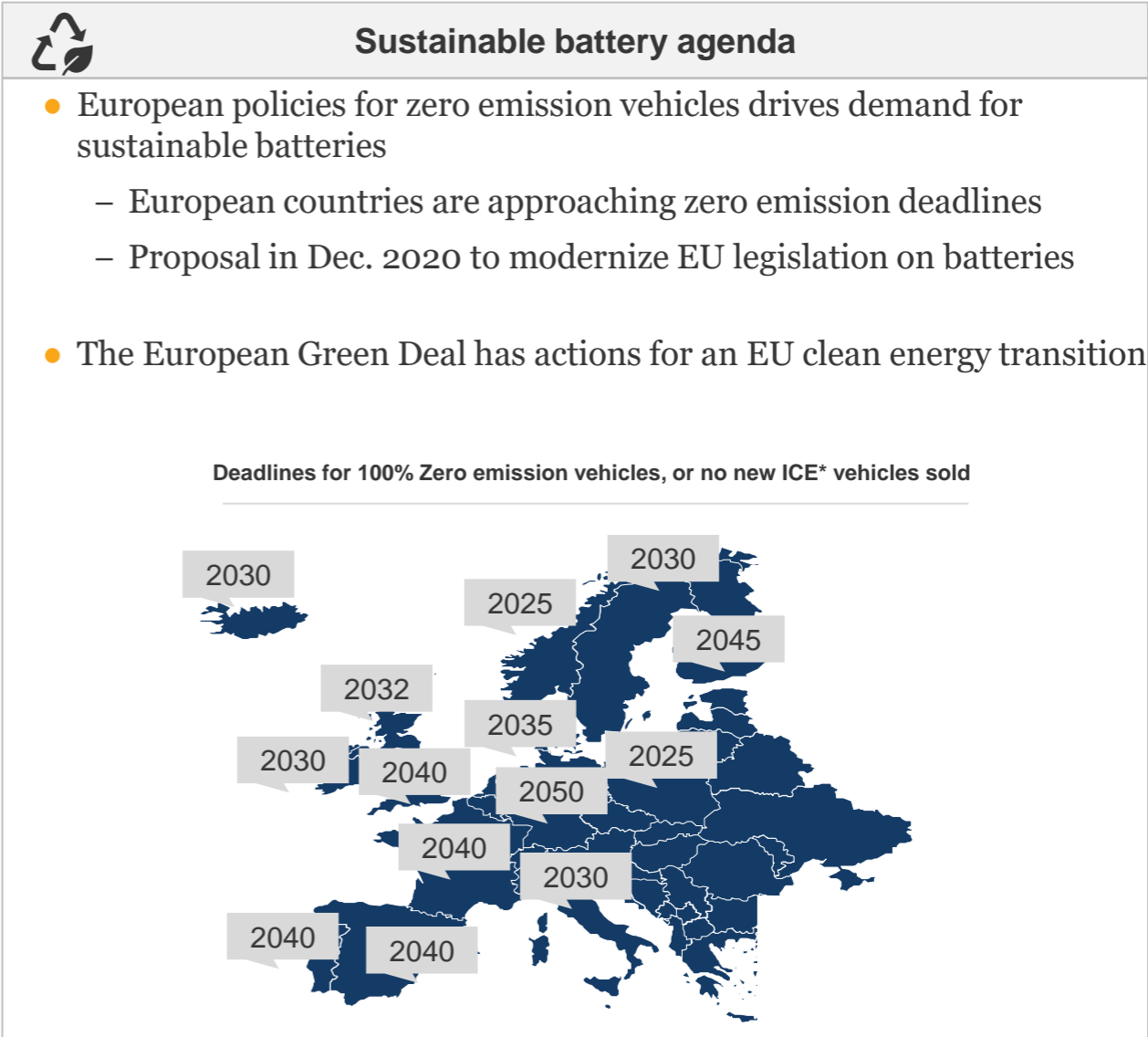
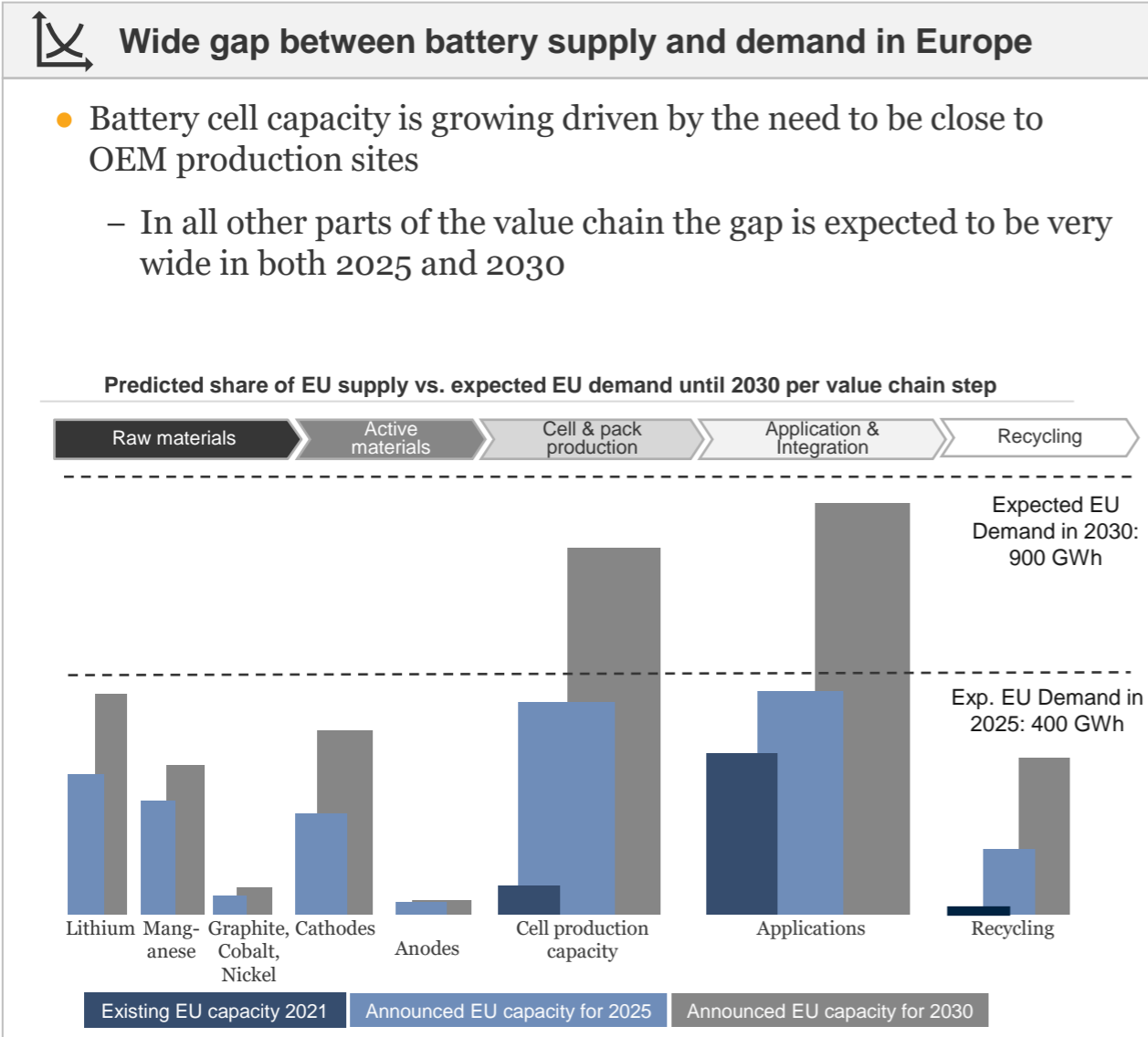
Growth of battery demand per region (2019)





# There is a wide gap between current production capacity and future demand

## - EU regulations for a green battery life cycle are setting the market conditions



Source: European Battery Alliance, Innovation Norway and Eyde Cluster: The Nordic Battery Scene, part 2, National governments

# Europe is mobilizing to build up competitive battery value chains – the arena is expected to be set within 3-4 years



## European battery production build-up

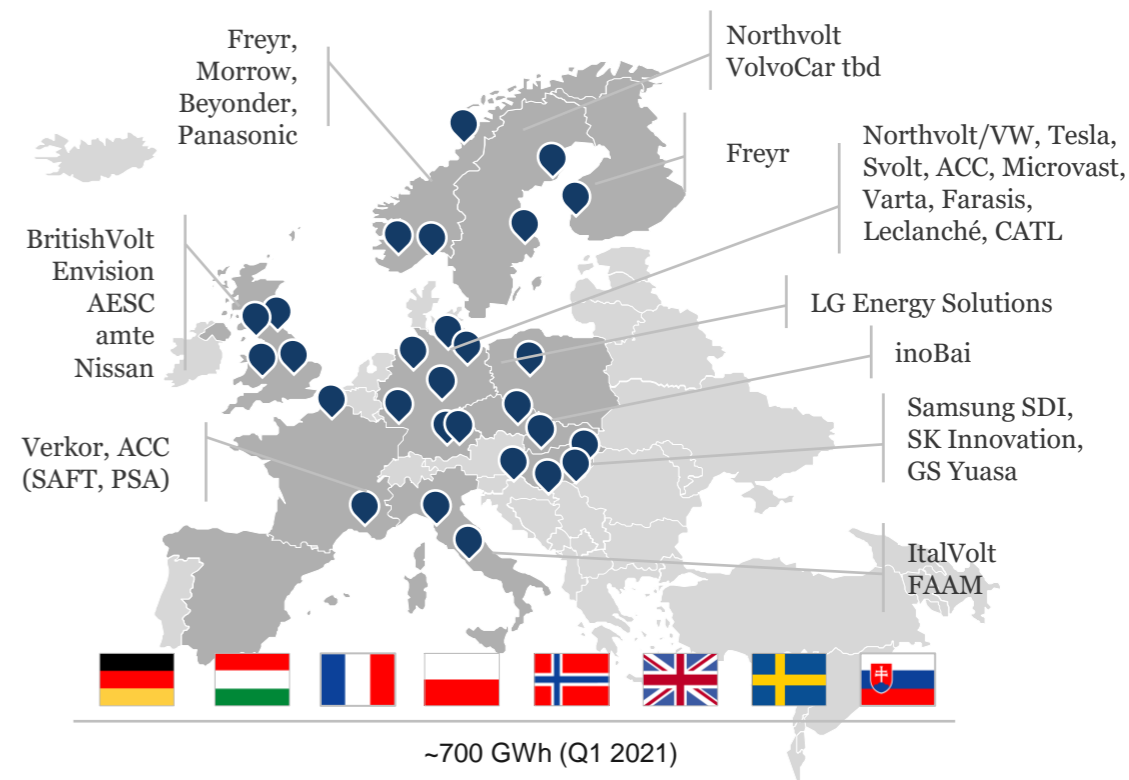
- Proximity of strategic components are crucial for European OEMs
  - Today, China, South Korea, Japan and Taiwan represent about 80-95% of the global battery production capacity
- The European share of the global battery production is expected to grow from 6% in 2020 to 16% in 2030
- Investments are happening at high speed – primarily by Asian and North American industry actors

Bloomberg NEF ranking (planned capacity)

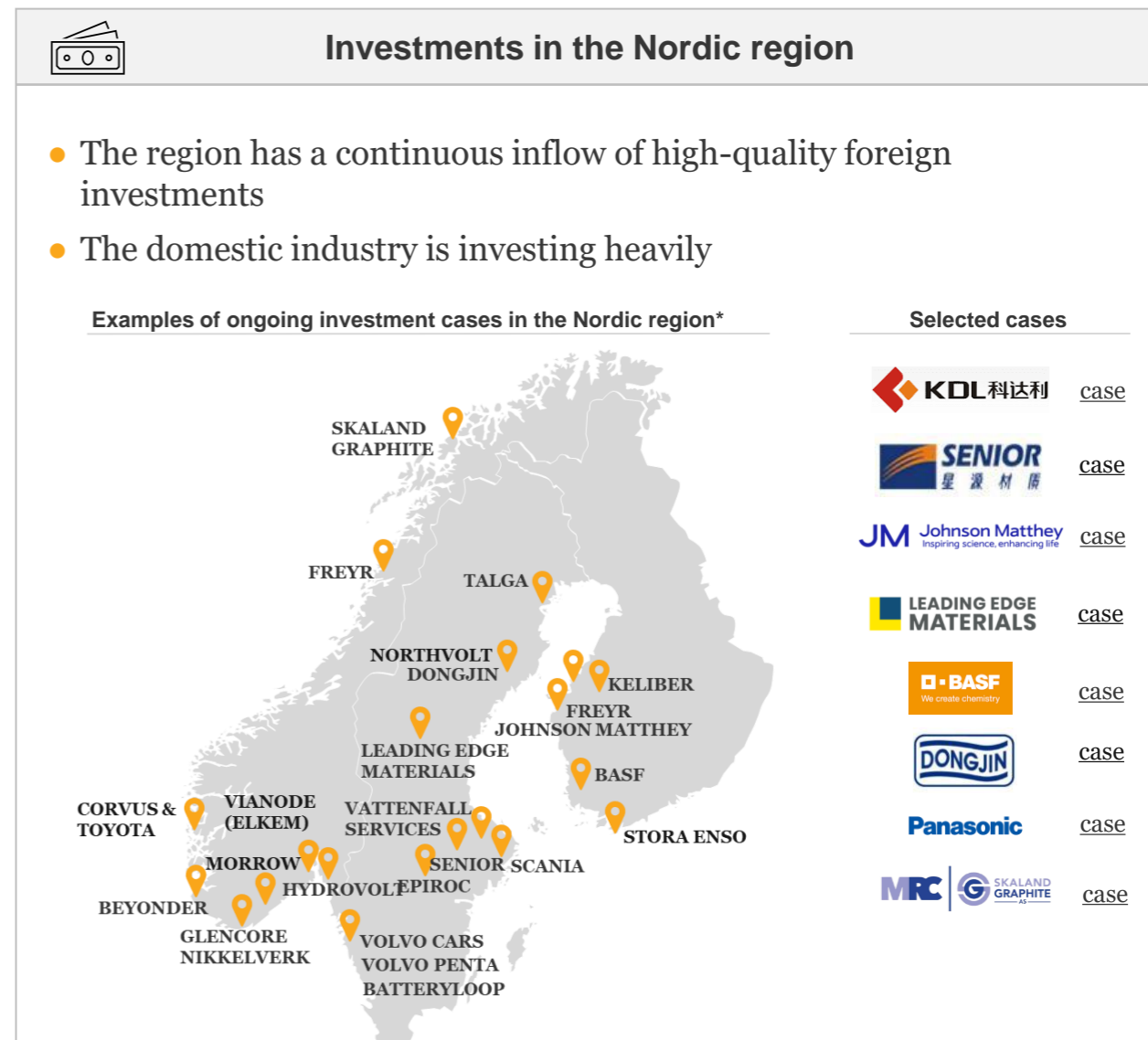
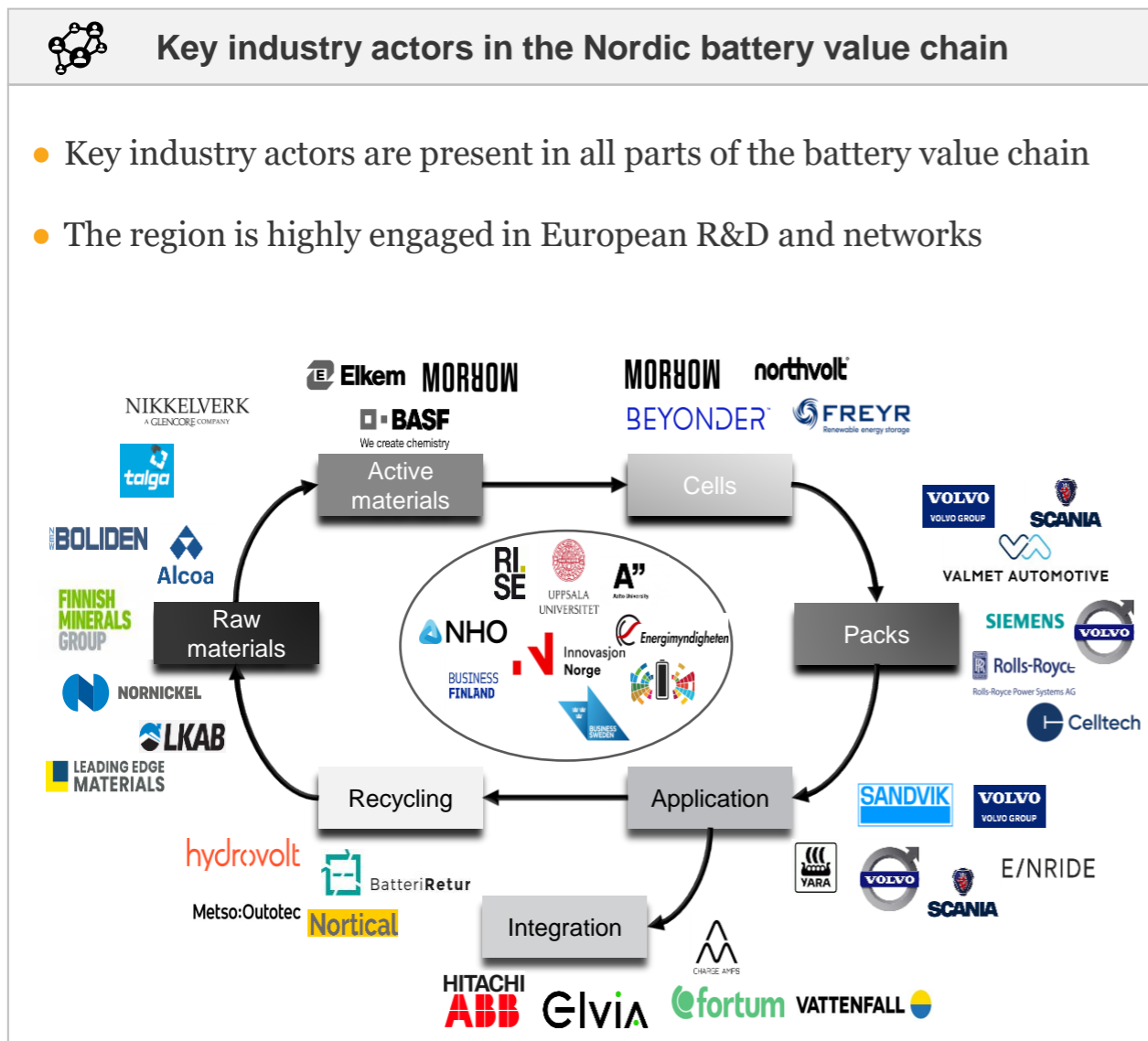
	Sweden	Finland	France	Germany	Hungary	Poland
BNEF ranking 2020	10	8	8	4	12	12
Raw mat.	22	11	17	17	22	22
Cell & component	13	13	13	6	6	5
Environment	3	5	1	12	8	11
Regulations	1	3	9	2	14	13
Demand	8	13	5	2	15	14

\*Excl Norway, the index is based on activities in 2020 only

Examples of announced Gigafactory investments in Europe



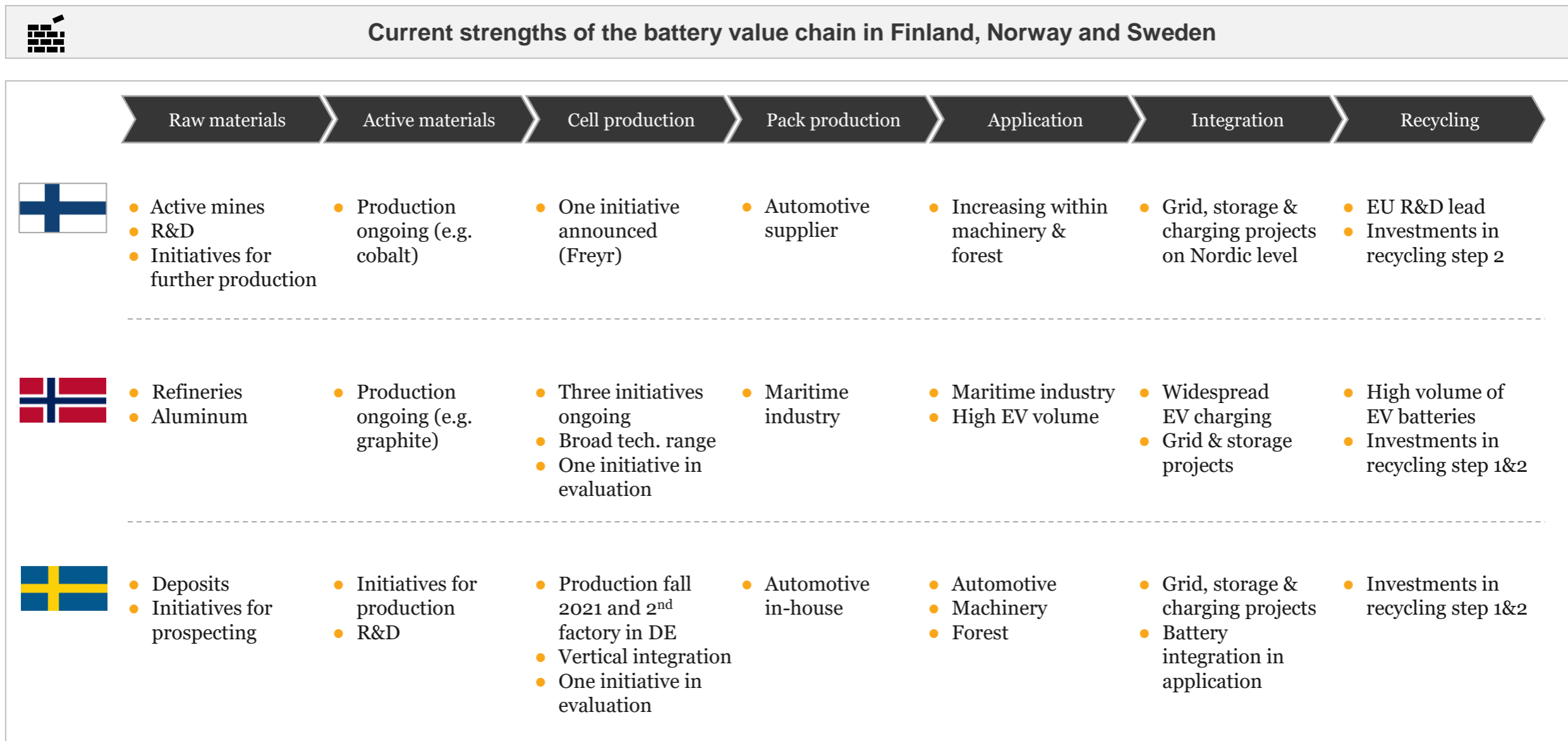
# The Nordic region has a favorable momentum with key actors in all parts of the value chain and a continuous inflow of foreign investments



\*Foreign and domestic investments

Source: Business Sweden interviews and analysis, Business Sweden report "the Nordic battery value chain" January 2021, company homepages

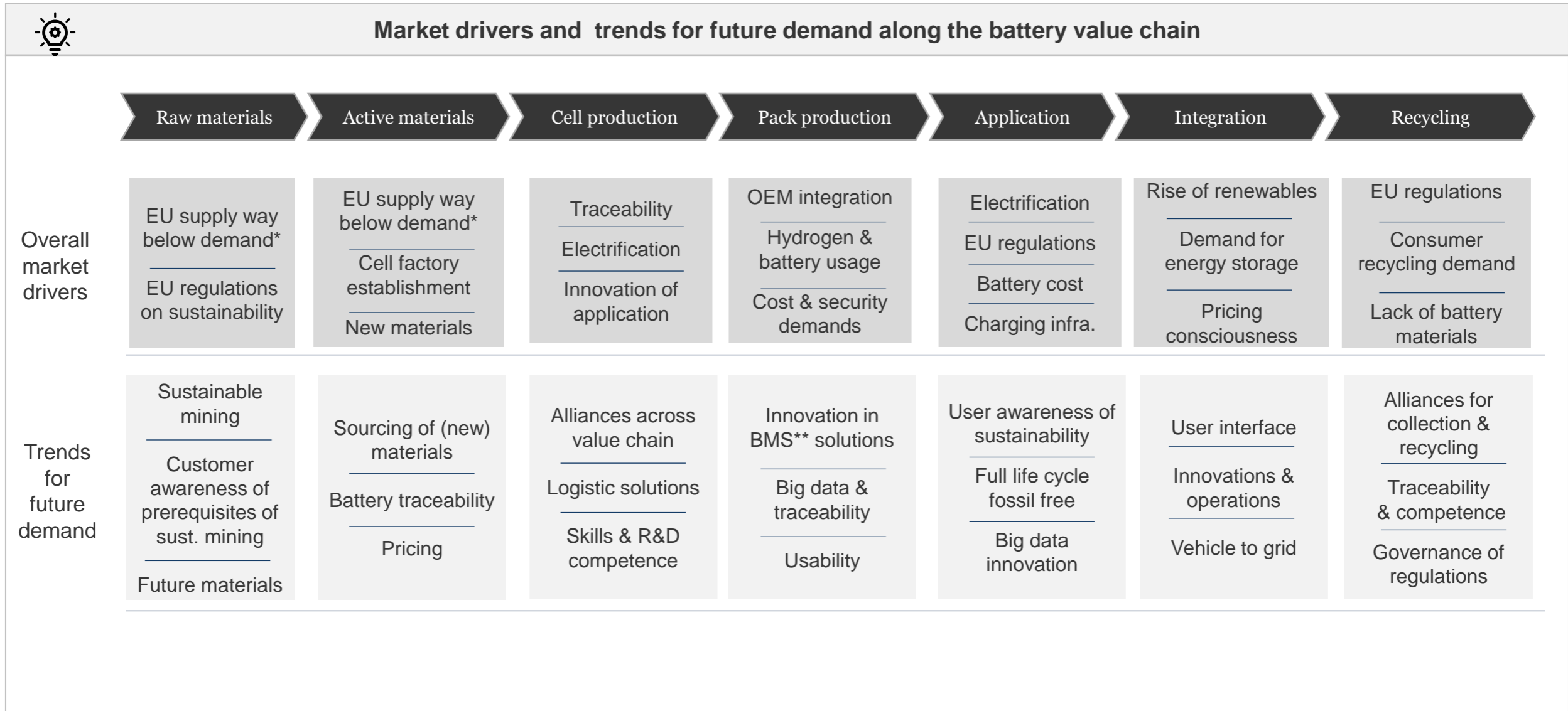
# Finland, Norway and Sweden have complementary strengths in every step of the battery value chain



Source: Business Sweden interviews and analysis



# Market drivers clarify future opportunities for digitalization, traceability & new materials driven by regulations & electrification

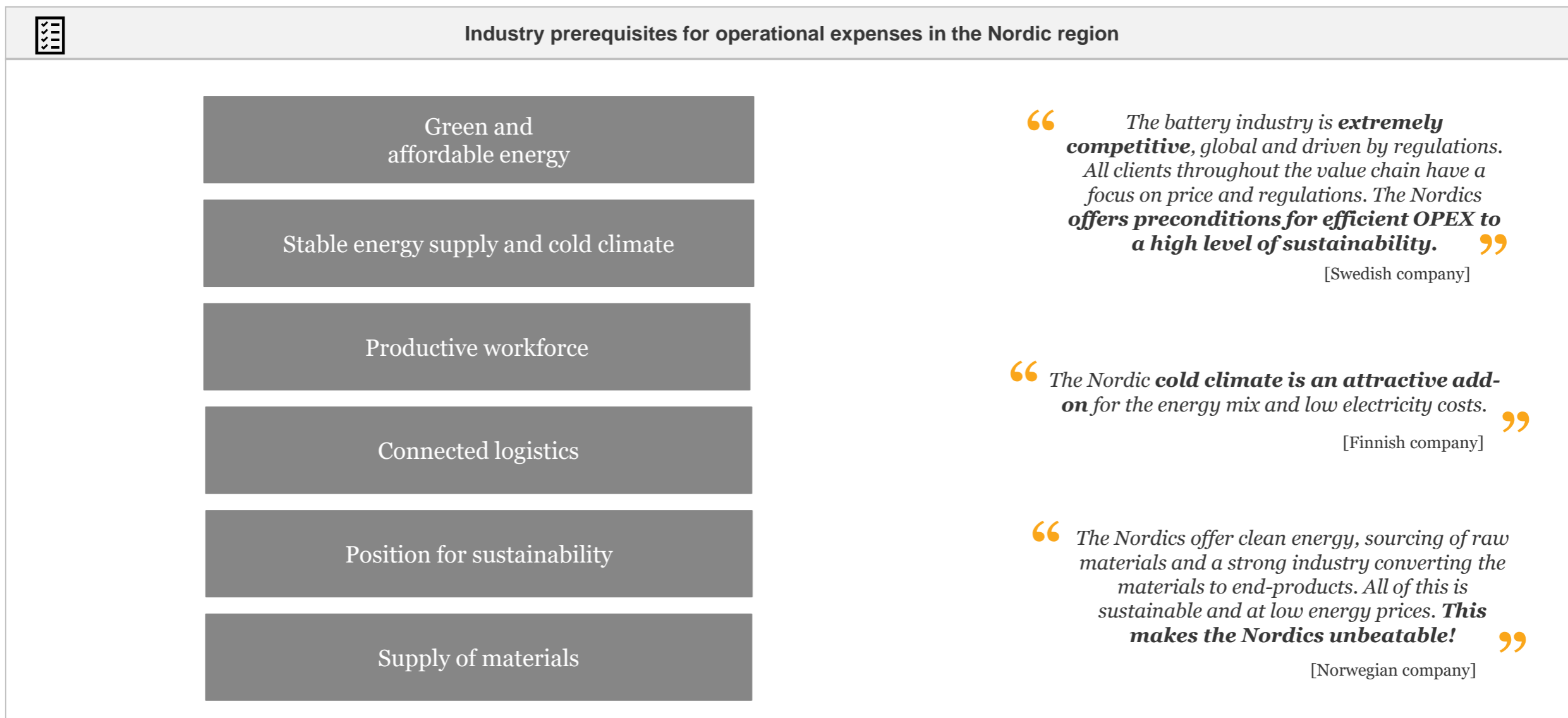


\*Estimates from the European Battery Alliance comparing supply and demand 2025 and 2030

\*\*BMS = Battery Management Systems

Source: Business Sweden interviews and analysis

# The Nordic region has the basis for a cost efficient and sustainable battery industry



# The industry highlight engagements in setting EU regulations, as well as to reduce risk and attract FDI to strengthen the value chain

Highlighted industry needs to successful build-up a strong battery industry				
Market prerequisites	<b>Regulations for sustainability</b> <ul style="list-style-type: none"> <li>Supportive EU regulatory for batteries and battery waste demanding full life cycle sustainability</li> </ul>	<b>Competence lift</b> <ul style="list-style-type: none"> <li>Investments in R&amp;D initiatives</li> <li>Education on all levels to reduce the competence gap long term</li> </ul>	<b>Access to raw materials</b> <ul style="list-style-type: none"> <li>Transparency and speed in national regulations and processes for mining</li> <li>Public debate on options for responsible mining</li> </ul>	<b>Investments in infrastructure</b> <ul style="list-style-type: none"> <li>Charging infrastructure</li> <li>Improvements in energy supply, storage and digital grids</li> </ul>
	Value chain supply & demand	<b>Lowered first-mover risk</b> <ul style="list-style-type: none"> <li>Capital, grants and guarantees to reduce first mover risks</li> <li>Clear incentives for FDI</li> </ul>	<b>Connected ecosystem</b> <ul style="list-style-type: none"> <li>Alliances with OEMs for orders and future innovations</li> <li>Collaboration between regional leaders and digital innovators</li> </ul>	<b>Accelerated market position</b> <ul style="list-style-type: none"> <li>Broad official and industry support</li> <li>A strong global brand with clear value proposition</li> </ul>
<p>“ <b>Regulations on EU level are crucial for the future market requirements. We can not miss such an opportunity, so we need to be engaged in the process.</b> ”</p> <p>[Finnish company]</p>		<p>“ We have a good storyline regarding a green battery value chain, <b>but our voices have not been heard</b> – marketing efforts are needed. ”</p> <p>[Swedish company]</p>		<p>“ If the Nordic position for sustainability was more known, we might <b>finally be able to get paid for all the investments we have done</b> to have high quality along the full production line. ”</p> <p>[Norwegian company]</p>

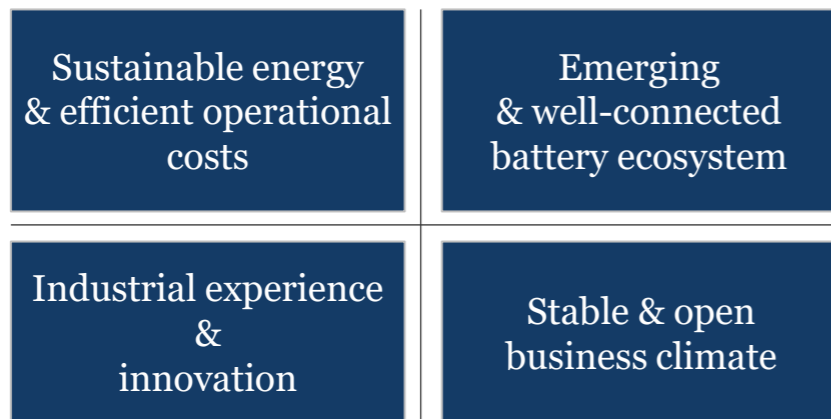
# A jointly developed value proposition would improve the attractiveness towards foreign investors



## A suggested Nordic value proposition...

- The Nordic countries share similarities and offer comparative strengths, so a combined narrative strengthen each country
- Aimed to attract foreign direct investments as well as strategic partnerships with OEMs and R&D centers

### Suggested Nordic value proposition centers around four pillars



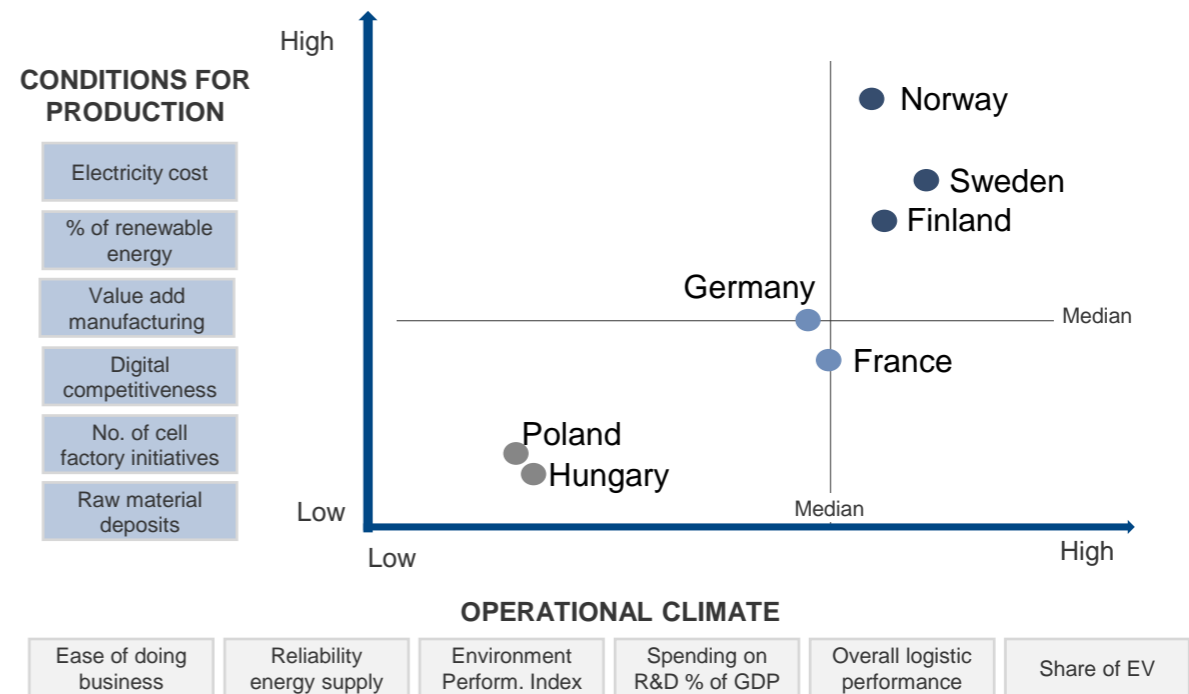
“ We must have a **clear, to the point narrative** highlighting our strengths for sustainability, profitability and strong industry tradition ”  
 [Norwegian company]



## ...compared to other European investment destinations


- An initial European comparison indicates a strong Nordic position\*
  - Deeper analysis over time with future estimates needed

### Business Sweden's Market Selection Analysis of the suggested value proposition



\*Based on latest data available for one specific year. Parameters weighted. Comparison only among stated countries.  
 Source: Business Sweden interviews and analysis, Business Sweden Market Selection Analysis

# By joining forces, the Nordics can accelerate the development of a strong position in the rising European battery market

 Recommended actions by the industry to accelerate the Nordic battery industry		
<b>Develop a joint Nordic value proposition to attract FDI</b>	<ul style="list-style-type: none"> <li>● Develop a joint Nordic value proposition to attract foreign direct investments for experience, competence and competitiveness</li> <li>● Manage potential collaboration barriers by securing speed and efficiency, and focus on business value</li> </ul>	<p>“                      For example: <b>recycling</b> is still <b>an open field</b>, more so than other value chain steps, where the Nordic countries have preconditions for high value add. <b>Regulations will set the conditions.</b>”                      [Finnish company]</p> <p>“                      Together in the Nordics we could <b>lift the level of R&amp;D substantially</b>. We need test centers like the ones in the UK and Germany.”                      [Norwegian company]</p> <p>“                      We need <b>vast investments throughout the entire value chain</b>. Foreign investments and competence are decisive as we accelerate our own capabilities and technology.”                      [Swedish company]</p>
<b>Positioning and creation of global alliances</b>	<ul style="list-style-type: none"> <li>● Take a global position with a strong common sustainability and profitability narrative</li> <li>● Initiate joint marketing activities, e.g setting up alliances and strengthen networks</li> </ul>	
<b>Extend Nordic collaboration</b>	<ul style="list-style-type: none"> <li>● Set up a communication platform for exchange of experiences and recruitment needs</li> <li>● Collaborate as joint Nordic R&amp;D test centers</li> <li>● Develop a common agenda for long-term competency development at all levels</li> </ul>	
<b>Acknowledge the impact of upcoming EU regulations</b>	<ul style="list-style-type: none"> <li>● Create awareness of the importance of the ongoing developments of the EU regulations on Nordic governmental level                             <ul style="list-style-type: none"> <li>– Including regulations on the battery life cycle, battery waste and transportation of battery materials</li> </ul> </li> </ul>	



# Next steps during autumn 2021: Nordic webinar series Battery Thursdays!

In collaboration:

**EUROPEAN  
BATTERY  
ALLIANCE**

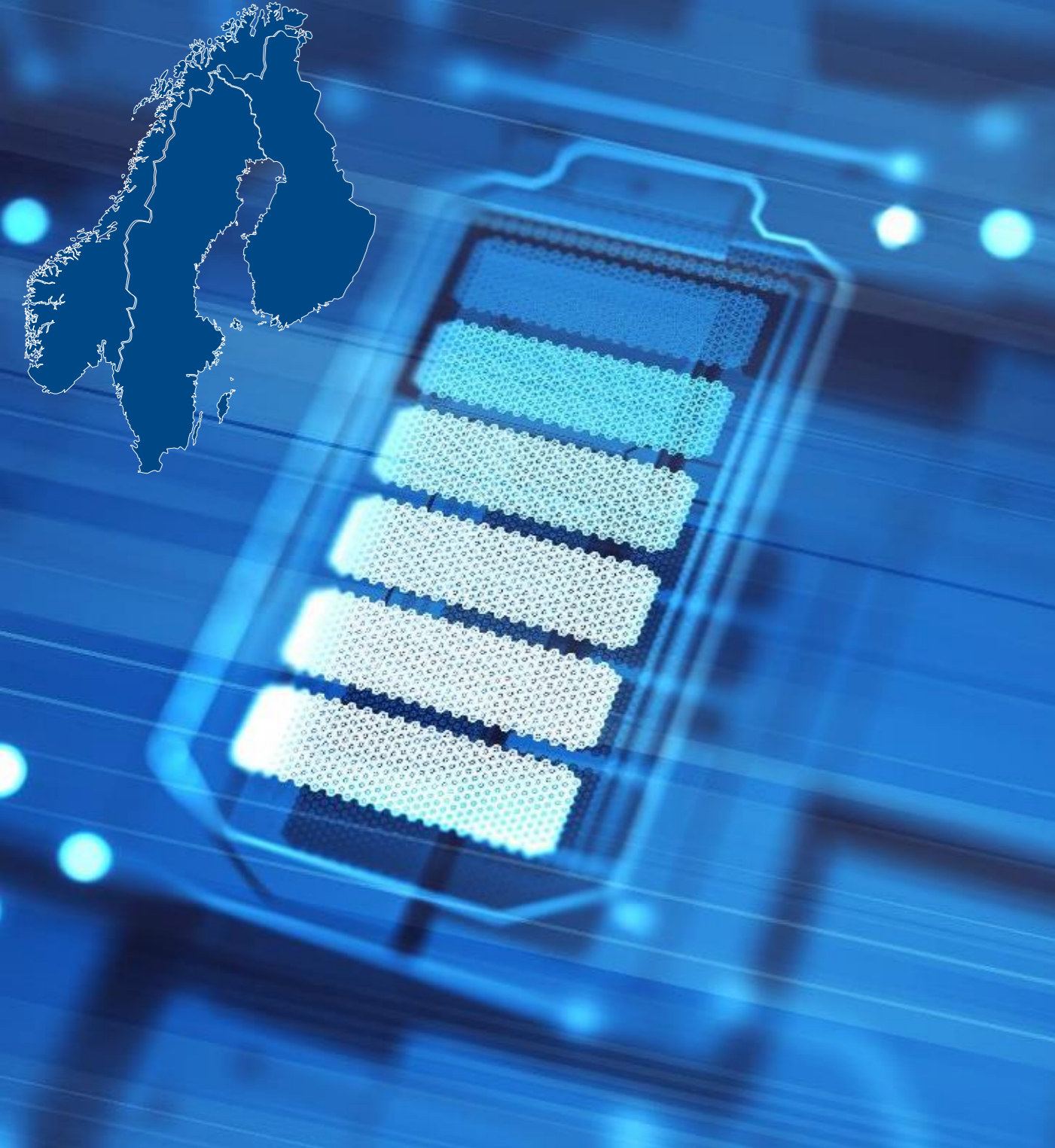
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FINLAND**







## You are welcome to contact us!

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- **Energimyndigheten**

- **Göran Stegrin**

- Business developer

- [goran.stegrin@energimyndigheten.se](mailto:goran.stegrin@energimyndigheten.se)

- **Business Sweden**

- **Robin Pettersson**

- Programme Manager, Ecosystem Smart Energy

- [robin.pettersson@business-sweden.se](mailto:robin.pettersson@business-sweden.se)

- **Jessica Olsson**

- EMEA Automotive, Transport & Energy

- BuS Management in the Nordics

- Trade Commissioner to Norway

- [jessica.olsson@business-sweden.se](mailto:jessica.olsson@business-sweden.se)