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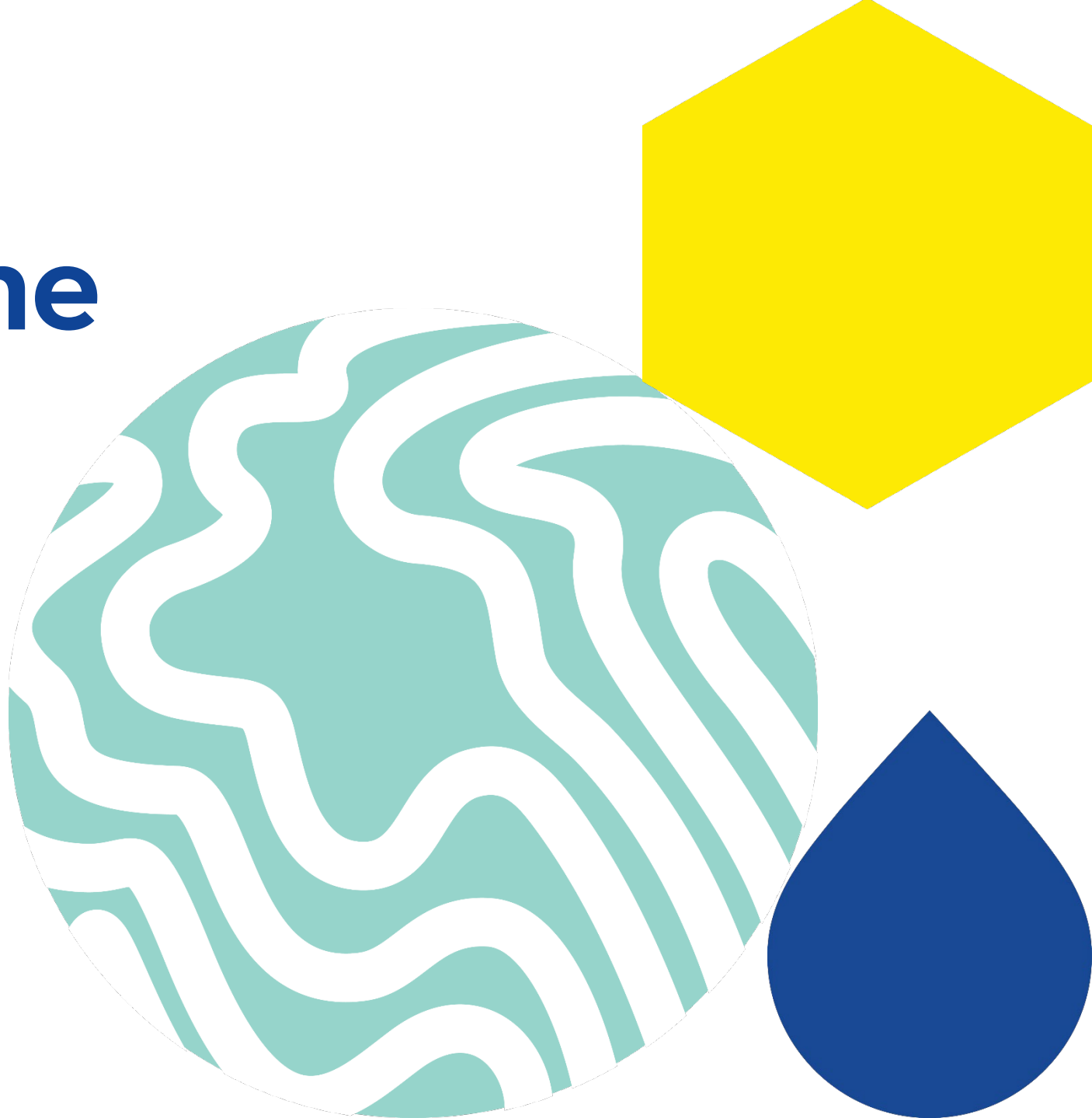
Pathway to the Transition

The Synthesis of the Finnish Way

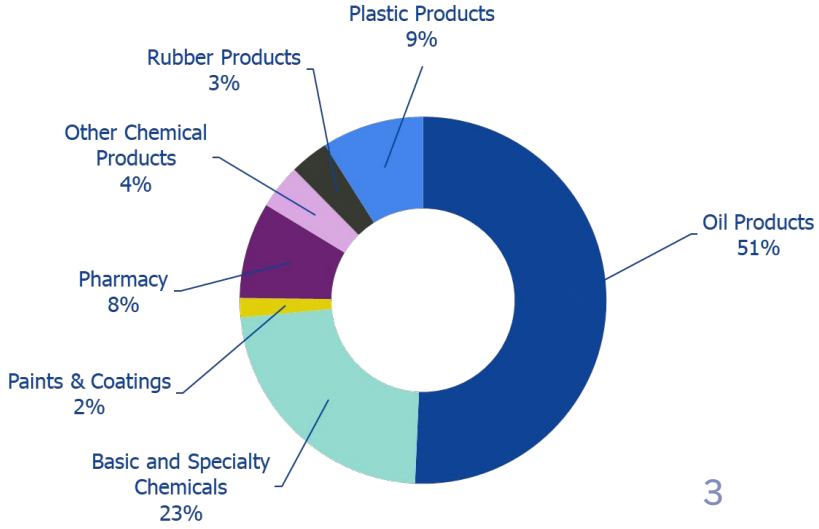



Our aim is a
Nature Positive and Climate
Neutral Chemical Industry
in Finland

The Chemical Industry in Finland

- **Second Largest Export Sector**
- Turnover 31 billion € & exports 15 billion € (2023)
- Generates an **annual value-added of nearly 8 billion € in Finland**.
- 1 billion € in value-added in the chemical industry generates an additional value-added of 0.9 billion € in other sectors.
- 10 jobs in the chemical industry generate 18 jobs elsewhere in the economy. Directly and indirectly 100 000 jobs.
- R&D investments amount to around 450 million € each year.

Turnover in 2023



Finland offers a solid operational environment for the Transition

- General political acceptance and support for the industrial transition.
- Stable society and well-planned infrastructure.
- Clean and price-competitive electricity.
- National digital compass for Finland's digital transformation until 2030.
- Collaboration of authorities, businesses, and industry organisations in security of supply.
- Potential to produce 10 % of EU's emission-free hydrogen.

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Responsible Care
Our commitment to sustainability

The Finnish Chemical Industry is a Pathfinder

- In 2023 the European Commission published their Transition Pathway initiative for the European Chemical Industry.
- In Finland the sector has followed its own approach since 2019 led by our Association Board of Directors.
- **We are pathfinders**

Building Blocks of a Successful Transition

- The right operational environment ensures sustainable competitiveness.
- Predictability to policies, legislation and permitting.
- Financing of the transition.
- Finding a mutual European approach to packages like IRA in the US.

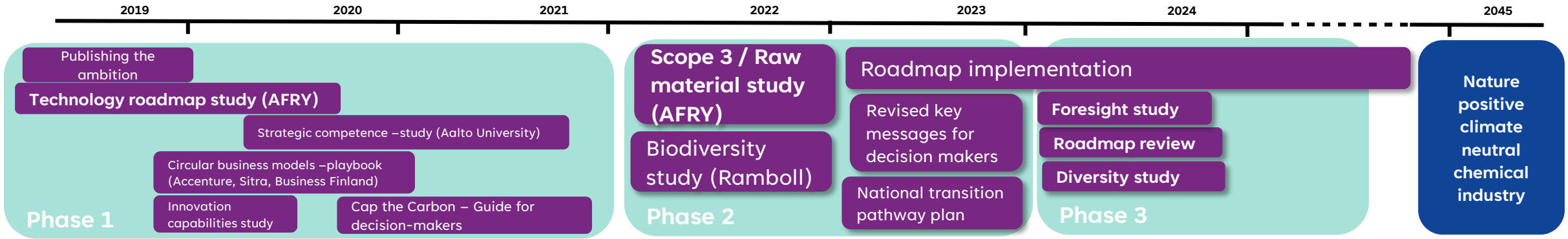
- Raw material transition & circular economy.
- Incentives & markets for new products.
- Skilled talent availability.
- Security of supply.

Relevant programs supporting the transition:

- Responsible Care: includes KPIs for climate, energy, emissions, safety and resource use, and as of 2024 biodiversity.
- The National Chemicals Programme (2022–2035): Theme 2: Safe circular economy and sustainable chemistry
- The Circular Economy Green Deal boosts society's transition to action that is in line with a circular economy
- Energy efficiency agreements and material efficiency assessment with resource efficiency organization Motiva.

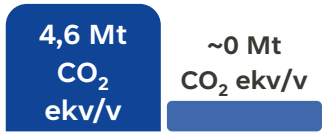
Our Transition in Finland has already begun

- Our key policy requests are based on our national Transition Pathway.
- We've followed our performance development through our Responsible Care indicators, provided by our member companies in the program since 1992.
- The chemical industry was the first sector in Finland to initiate its own Climate & Low-Carbon Roadmap work in 2019. The roadmap was revised in 2024.
- Now we add our work to the European Commission's Transition Pathway for the Chemical Industry, set in 2023.



Our Transition Pathway points the way toward reducing our footprint and increasing our handprint

We reduce our footprint by minimizing our own greenhouse gas emissions from our operations.

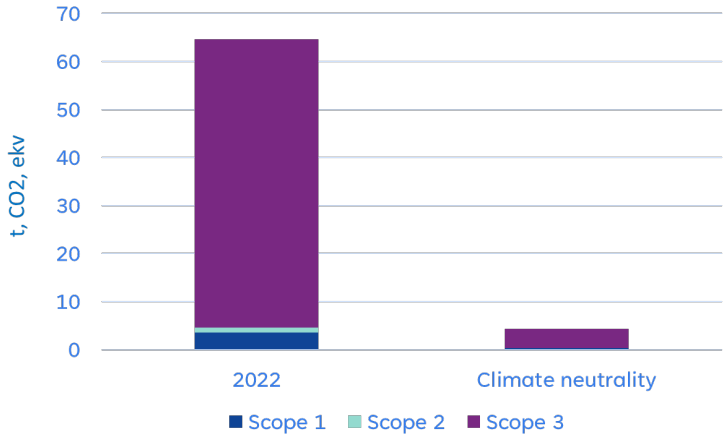


Carbon neutral chemical industry Sccope 1&2

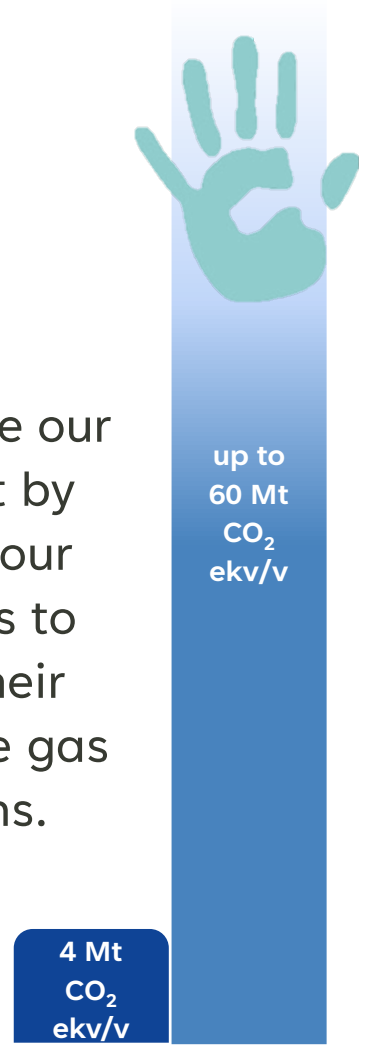
2022 2045

We aim to be Nature Positive, i.e. turn the decrease in biodiversity into strengthening biodiversity around the activities throughout the value chain. Main impact is related to supply chain greenhouse gas emissions.

Raw material transition is the key to emission reductions.



We increase our handprint by enabling our customers to reduce their greenhouse gas emissions.



Carbon neutral chemical industry - handprint potential

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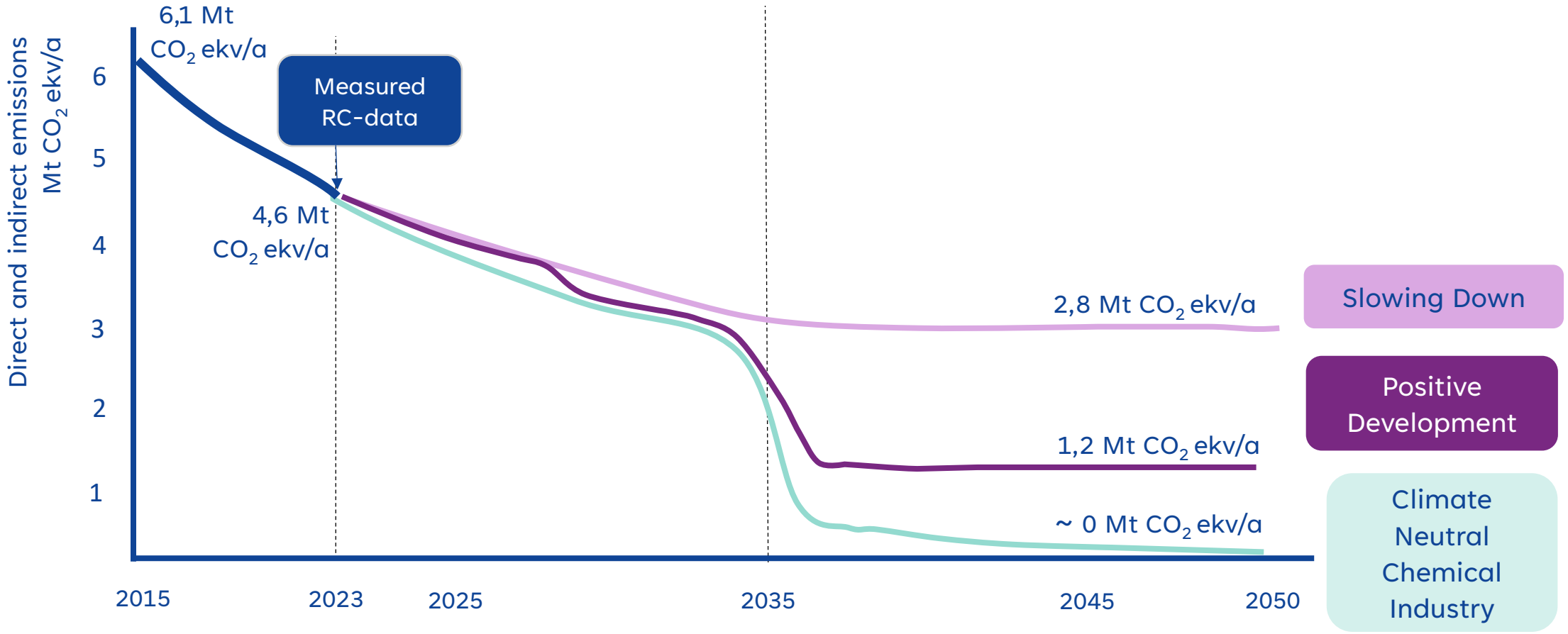
On the Pathway to Climate Neutrality: Direct process emission & indirect emission reduction scenarios



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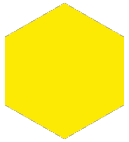
VTT

Climate neutrality requires investments



Slowing Down

- No extra investments (annual baseline investments 1 bn/a)
- 5,7 TWh electricity
- 0,2 Mt hydrogen

Positive Development

- Additional investments +6 bn eur (cum)
- 14,7 TWh electricity
- 0,2 Mt hydrogen (clean)
- Raw material transition

Climate Neutral Chemical Industry

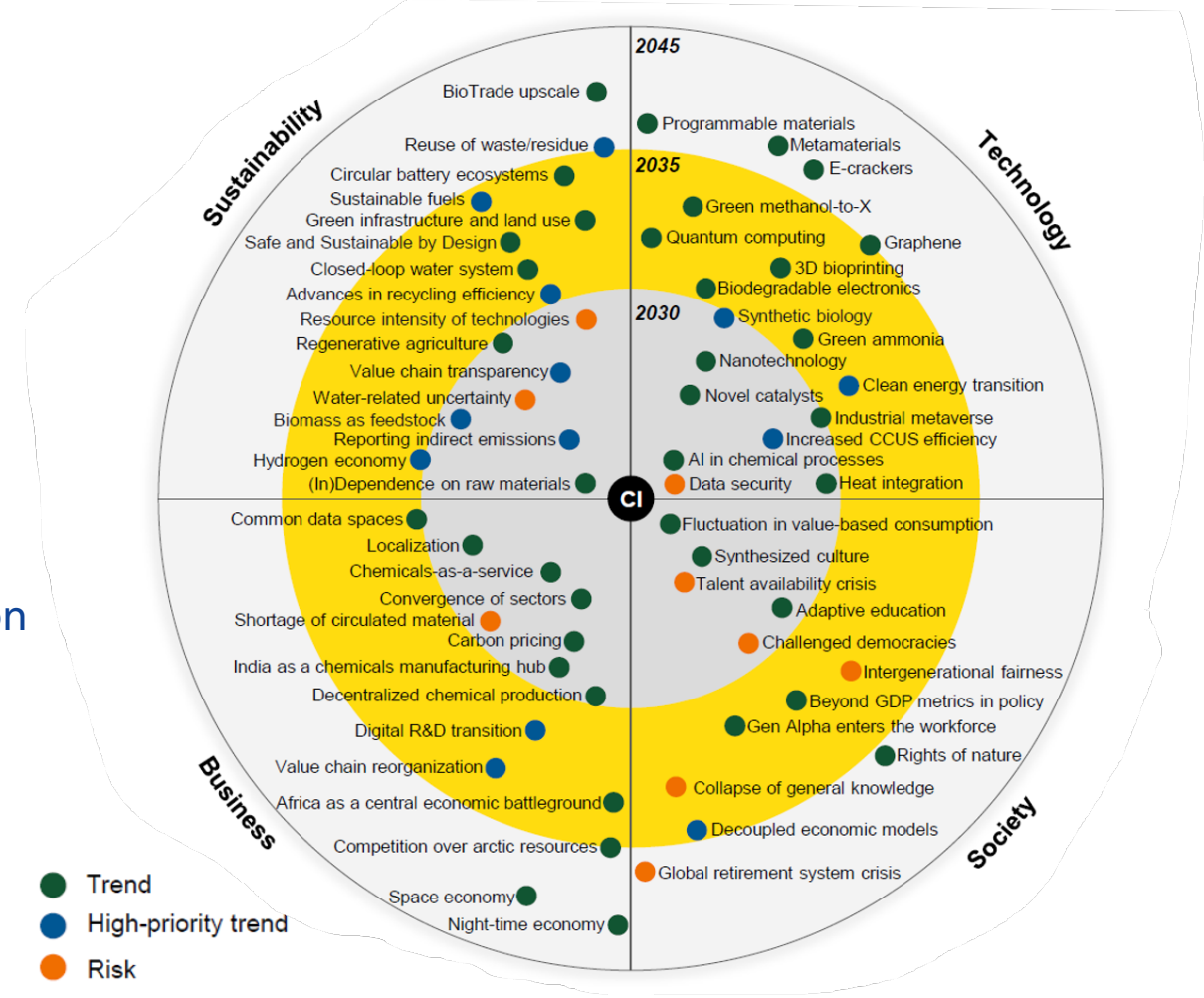
- Additional investments +8 bn eur (cum)
- 19,2 TWh electricity
- 0,2 Mt hydrogen (clean)
- Raw material transition

Trends shaping the Chemical Industry's future

Multiple factors contribute to the chemical industry's future and to map them out, we conducted a Foresight study together with VTT in 2024.

Future Insight Through Strategic Foresight study (VTT, 2024) aimed to identify the building blocks of a desirable future for Finnish chemical companies.

The study used VTT's Future Radar tool to scan the horizon for the industry, identifying trends, high-priority trends and risks in the upcoming decades within four areas: sustainability, technology, society and business.



The **placement** of a trend is an estimation of its mainstream adoption.

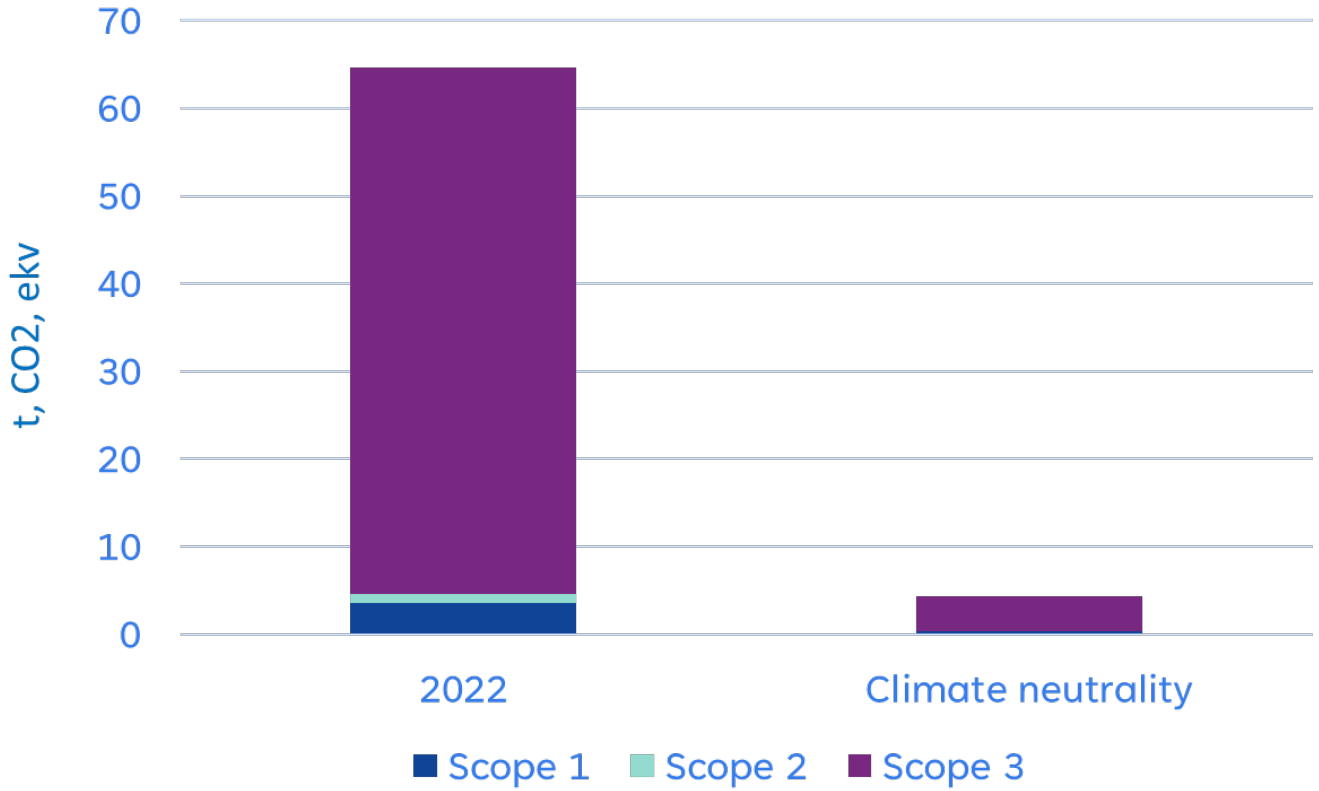
The **priority** is based on the assessment of a trend's impact and probability for the chemical industry.

Future Megatrends challenging the Chemical Sector

The Foresight study identified four megatrends the industry should focus on:

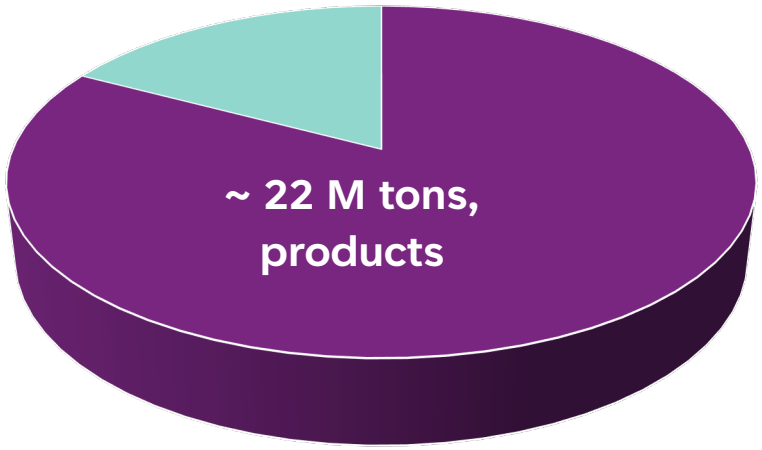
Key Transition Enablers: Raw material transition & Circular Economy

- Transition from fossil to renewable raw materials and energy reduces estimated Scope 3 emissions significantly.
- Impacts related to biodiversity and land use must be carefully evaluated due to increasing share of renewable raw materials.



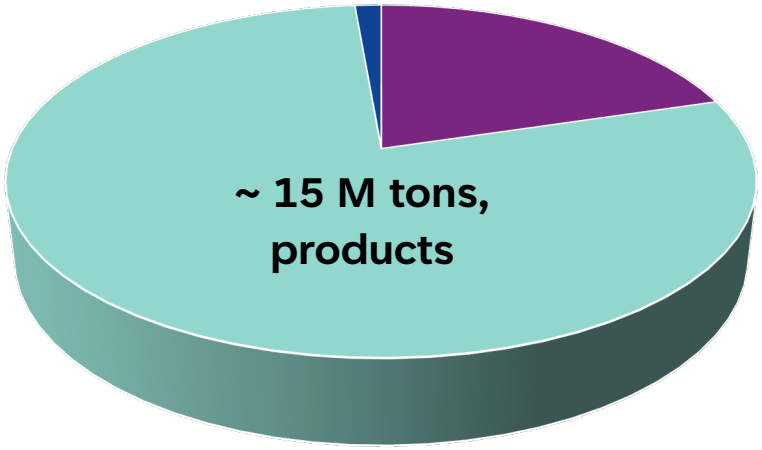
Our vision of the Raw material transition

2022



- Fossil based virgin and mineral
- Renewable & recycled
- Synthetic

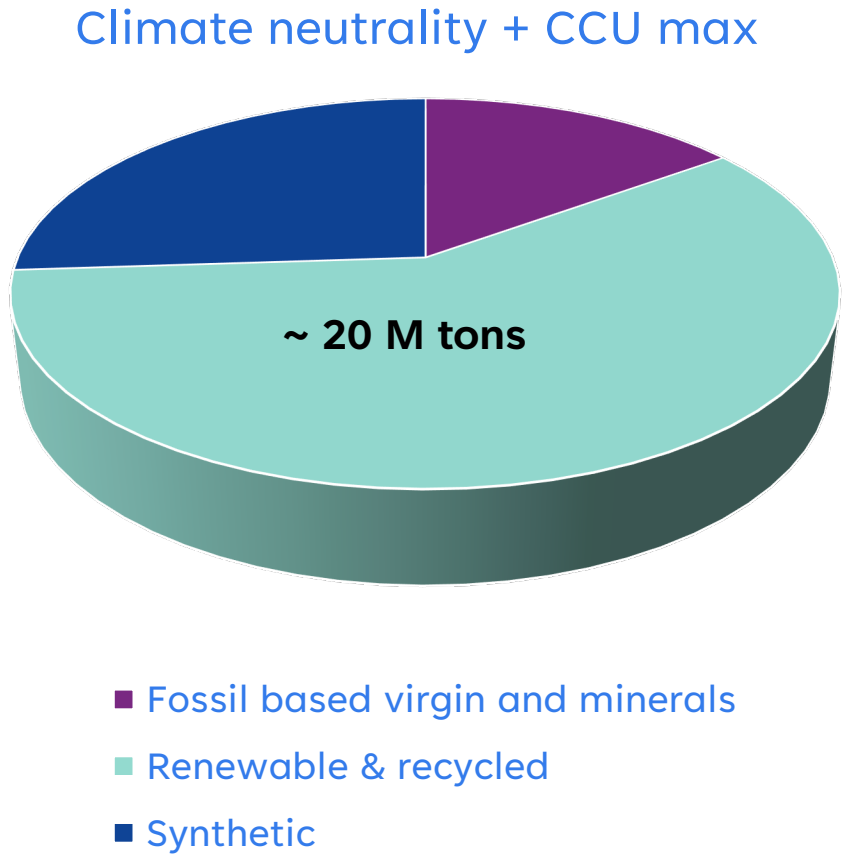
Climate Neutrality



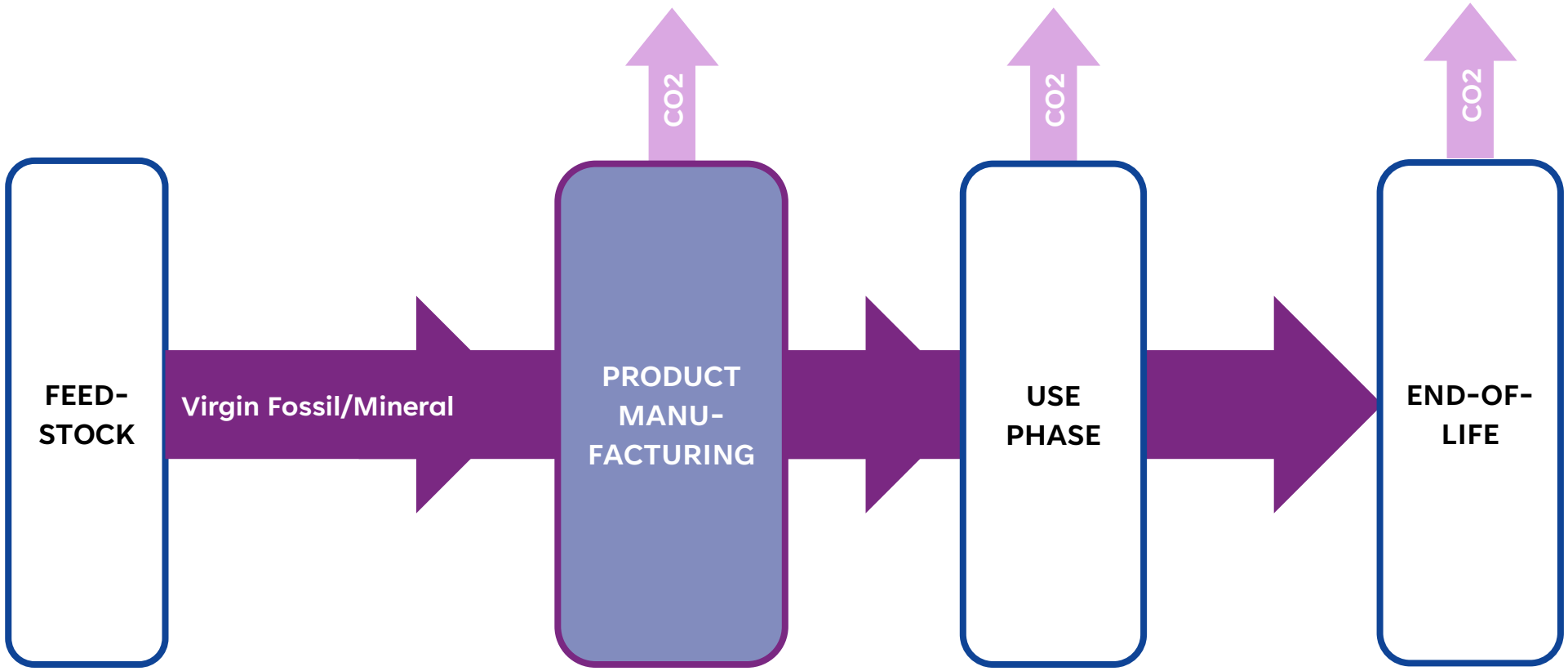
- Fossil based virgin and mineral
- Renewable & recycled
- Synthetic

Green growth potential with biogenic CO2 capture

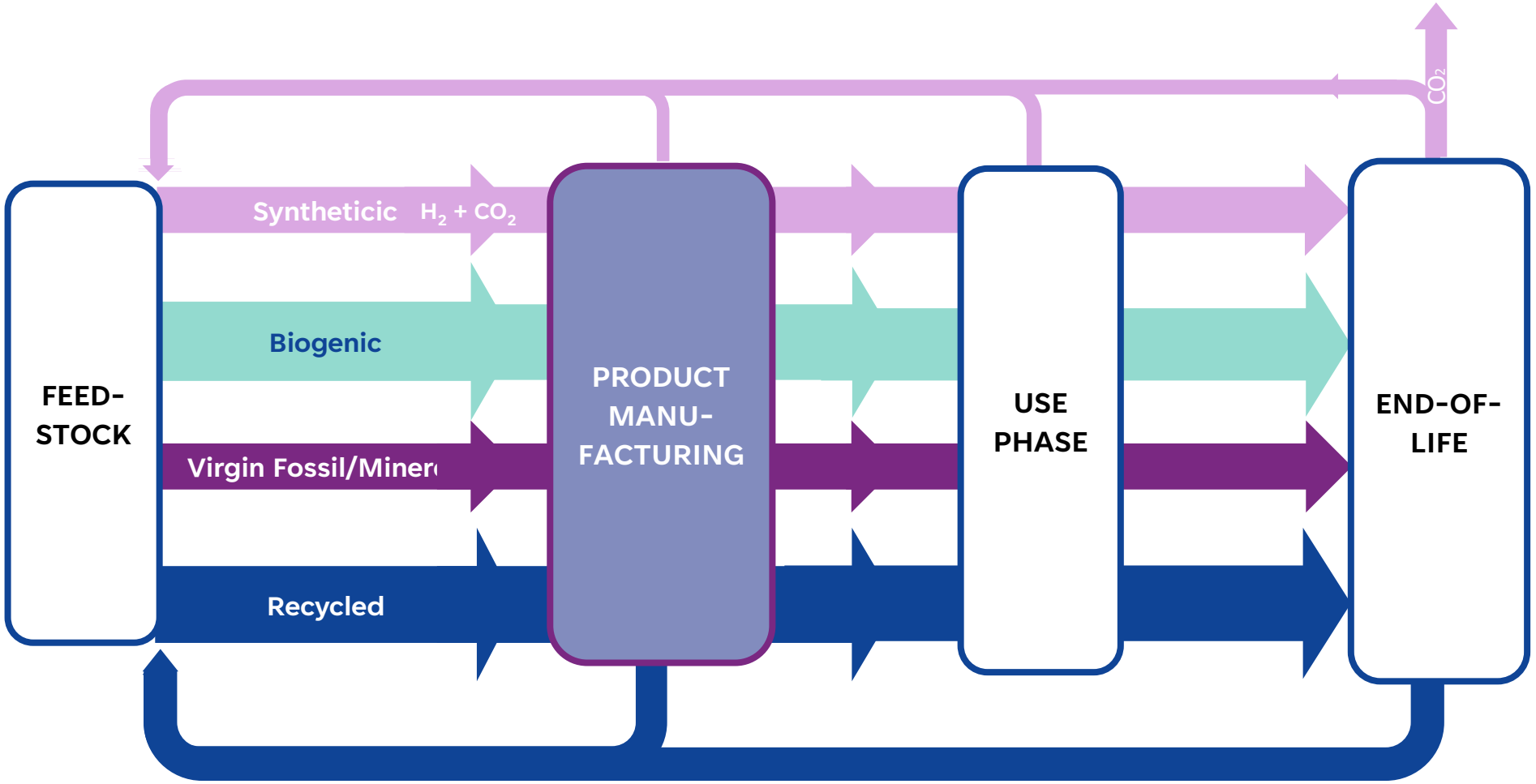
- Carbon capture from forest and energy sector could create significant new raw material base for the chemical industry.
- Refining ~20 Mt of captured biogenic CO2 to polymers, chemicals and fuels, would require
  - 100-160 TWh of electricity
  - 2-3 Mt H2
- Additional 5 M tons of new synthetic feedstock for the chemical industry.



We Must Evolve From Linear Economy...



… to Circular Economy



Digitalization as Transition accelerator

- **Digitalization is a tool to reduce CO2 footprint, not an actual goal.**
- Efficiency for circular economy solutions, supply chains & value chains.
- Regulation needed to ensure EU competitiveness vs. USA and China and decreasing dependency on them.

The Transition happens only with the Right Talent

- Multidisciplinary skills & competence needed for the digital era.
- We need active dialogue between the industry and the school system.
- Actions to tackle declining STEM skills (PISA Results, 2023)
- Re-skilling and upskilling employees and investing in talent retention are needed.
- Talent attraction actions within companies: revamping employer branding to attract younger talent passionate about sustainability.

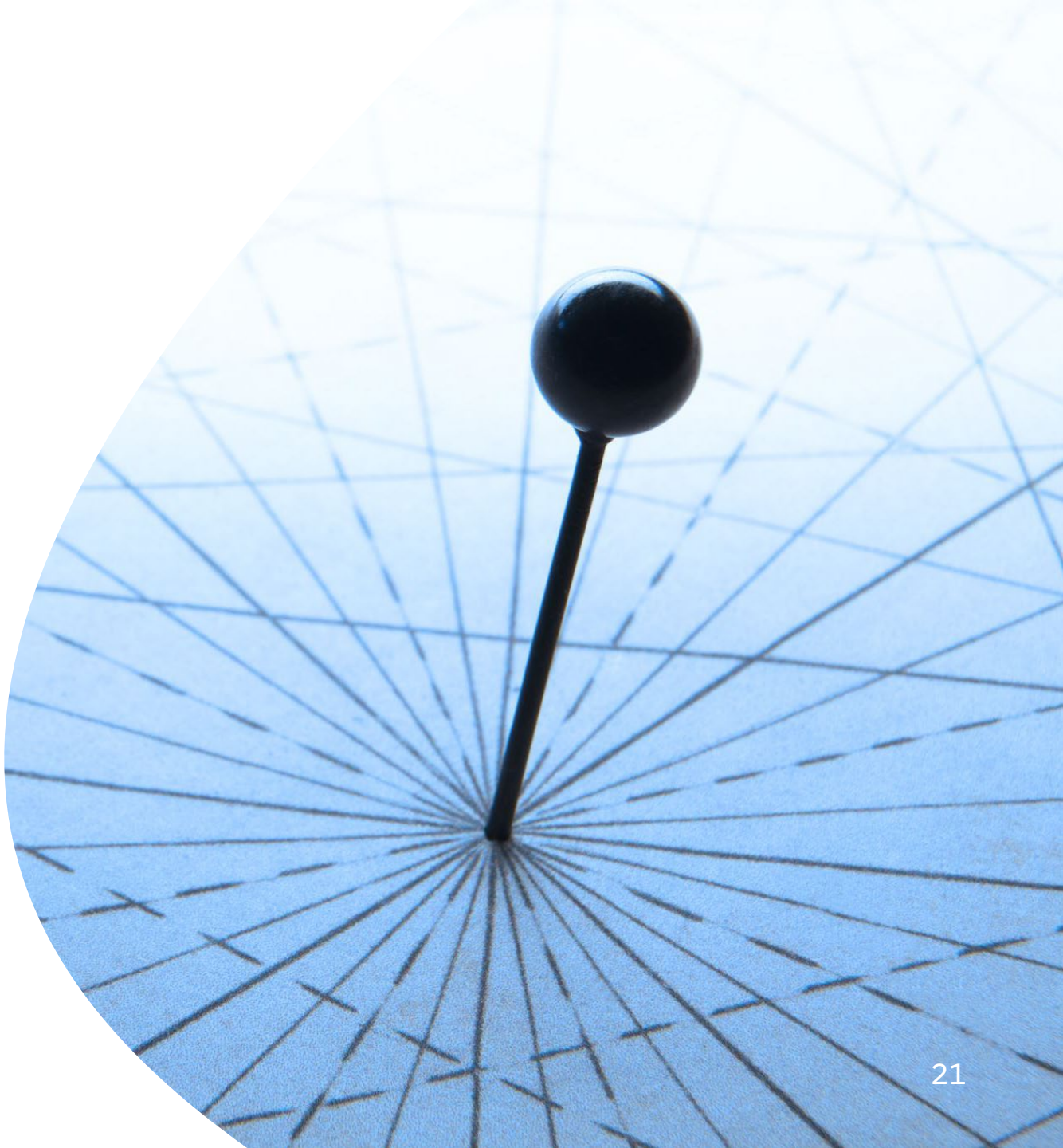
D&I is key for Talent Retention and Innovation

- D&I has a positive impact on overall business performance and employee engagement & retention.
- Diversity & inclusion is considered a lifeline in the future driven by the expectations from company stakeholders.
- Diverse teams produce more original and useful ideas by combining different perspectives, experiences, and cognitive styles.
- Most Finnish chemical industry companies are still in the initial or planning stages of implementing D&I related measures (D&I in the Finnish Chemical Industry, 2024).
- In Finland, lack of language skills is one of the most common barriers for improving diversity and inclusion in factory settings.

Geopolitical Tensions

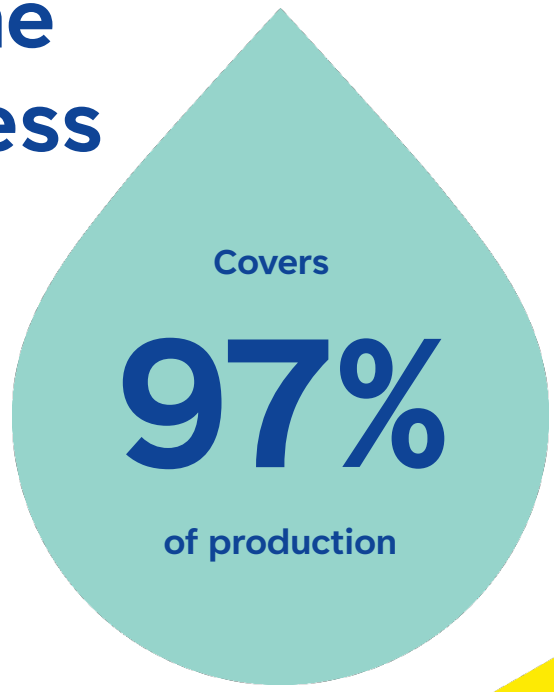
- Global development is facing challenges and opportunities due to rising geopolitical tensions.
- Tensions have pointed the urgent need for countries to diversify their energy sources and adopt renewable technologies.
- Finnish businesses can benefit from resilience strategies that drive localization.

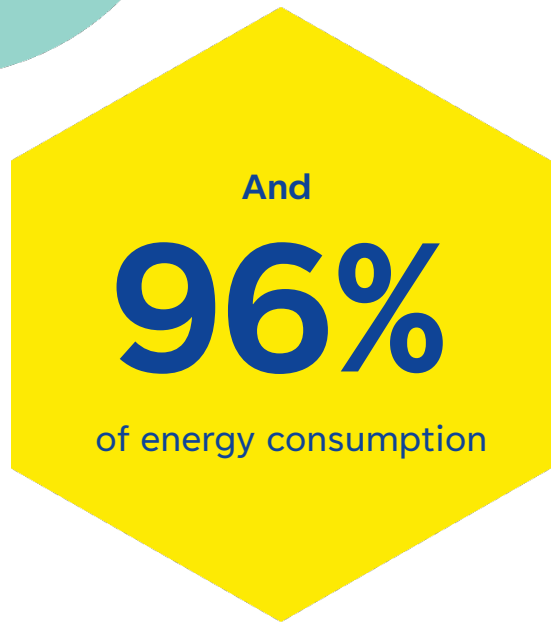
  Future developments in the energy system, hydrogen economy and changes in feedstock including critical raw materials needs to be assessed when planning and training the security of supply.



Better for People, Better for the Environment, Better for Business

- There is a multi-billion € business potential in the transition.
- It is critical for our future to be able to do business sustainably.
- The chemical industry has pioneered the transition in Finland and we believe we can inspire other sectors to follow on their pathways to climate neutrality.
- Every day responsibility work done in our member companies is key part making goals possible. We follow the performance development through our Responsible Care indicators – Nature Positive Climate Neutral Chemical Industry is one of the focus areas of our national Responsible Care.





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