



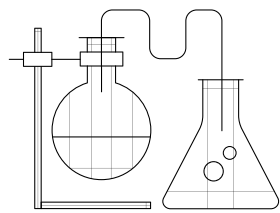
**Global climate roadmap:**  
Reducing our emissions  
& growing our supplies  
to the green transition

13 October 2021

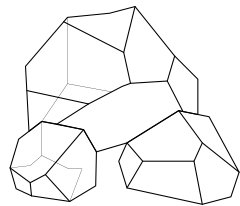


# We are Elkem

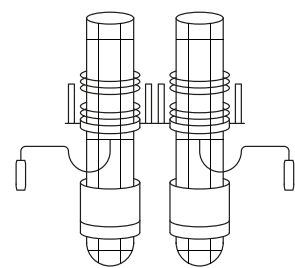
## Advanced material solutions shaping a better and more sustainable future



Silicones



Silicon Products



Carbon Solutions





# Elkem: Part of the solution

Elkem aims to be a part of the solution to combat climate change. Our mission is to provide advanced material solutions shaping a better and more sustainable future. We have a clear corporate strategy to strengthen our competitive positions through specialisation and growth. With this climate roadmap, we further detail our ambitions to reduce our emissions towards net zero – while growing the business.

Elkem endorses the aim of the Paris agreement of limiting global warming to well below two degrees and we will contribute by reducing our emissions. Elkem has a good starting point, with 83% of our electricity already coming from renewables. We aim to reduce our global fossil CO<sub>2</sub> emissions by 28% from 2020-31 while growing the business. This implies reducing our average product carbon footprint by 39%. Our long-term goal is net zero by 2050.

We expect sustainability to drive increasing demand for the advanced materials with low carbon footprint that Elkem provides, including silicones, silicon and carbon solutions. These are essential for greener solutions like electric vehicles, renewable energy and better buildings. We aim to grow our business 5-10% per year and grow our supplies to the green transition.

What happens to the materials we produce after they leave our plants also matters to the climate. That is why we also step up on circular economy, to enable more recycling – both within our value chain and with our customers.

Environment, Social & Governance (ESG) issues are increasingly important for our stakeholders. We are proud to perform well on ESG ratings like CDP's A list on climate. Our performance on this roadmap, however, should be measured on how we deliver on reducing our emissions while growing our supplies to the green transition.

Helge Aasen  
CEO (interim)



2020 renewable electricity

**83%**

Yearly revenue growth target

**5-10%**

CO<sub>2</sub> reductions by 2031

**39%**

Avg. product footprint (fossil CO<sub>2</sub> scope 1-3)

CO<sub>2</sub> emissions by 2050

**Net zero**

UN Global Compact



Elkem is a signatory to the UN Global Compact

UN SDGs



We are committed to developing our business in line with the UN Sustainable Development Goals



# Our climate ambitions





# Elkem has a strong position to contribute on climate and continuous improvement is in our DNA

**Founded on  
renewable energy**



Elkem was founded to create value from hydropower in Norway. We have since expanded to other hydropower producers, incl. Canada, Iceland, Malaysia & Paraguay

**Our solutions are essential for  
a more sustainable future**



Elkem provides advanced materials essential to the green transition: Silicon metal included on EU 2020 list of critical raw materials

**We are recognised as  
a climate leader**



**CLIMATE**

Elkem was recognised by CDP for climate transparency and actions, ranking among top 5% of all companies rated in 2020

Our climate ambitions

# Elkem is committed to reduce emissions and contribute in line with Paris agreement aim of well below 2°C warming

We aim to contribute to a better climate through three key levers:



## Reducing our emissions

Achieving fully climate neutral production throughout our value chain

- **By 2031:** Reducing absolute emissions\* by **28%** from 2020-2031 while growing the business – delivering **39%** improvement in product footprint\*\*
- **By 2050:** Achieving fully carbon neutral production (zero fossil emissions) globally



## Supplying to the transition

Providing the advanced material solutions required to enable the green transition

- **Grow supplies of advanced materials to green markets** such as better buildings, electric vehicles and renewable energy
- **Build new business in green markets** such as battery materials, biomass and energy recovery



## Enabling circular economies

Enabling more circular activities in our operations, products and markets

- **Increase recycling** in our own operations
- **Increase recycling** with our customers
- **Develop the eco-design of innovative products**

# Our climate roadmap is a global commitment from our 6,800 people




Top 3 Elkem locations  
by number of employees:

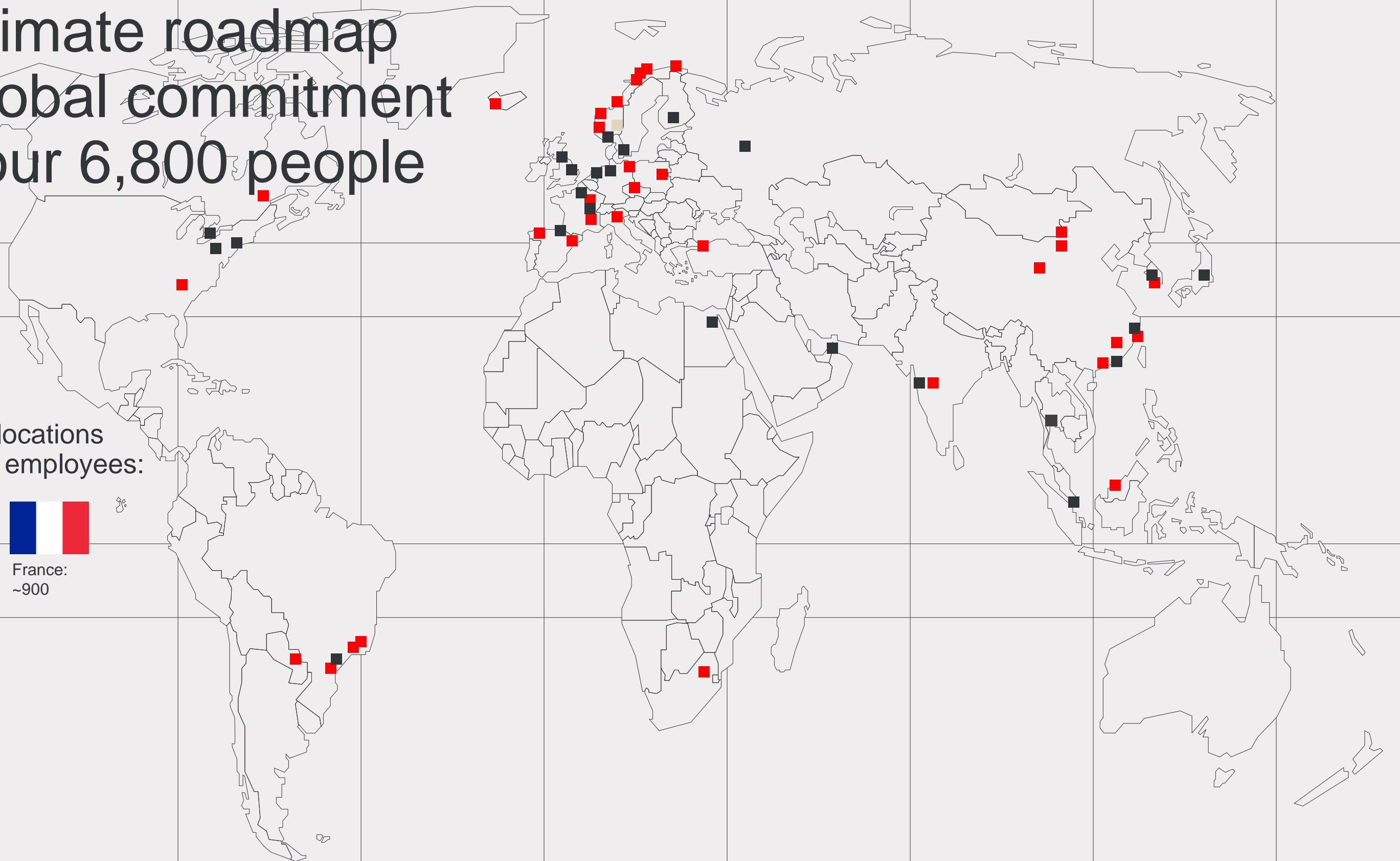


China  
~3100

Norway:  
~1500

France:  
~900

-  Production site
-  Sales office
-  HQ





# Our climate actions

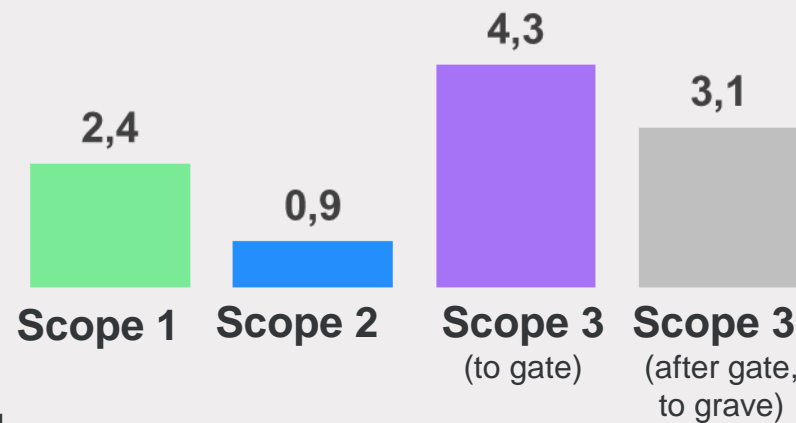




Our climate actions

# We address the full range of emissions

Elkem's global fossil CO<sub>2</sub> emissions\* in 2020 (mt):



## Scope 1

- Direct emissions from production facilities
- CO<sub>2</sub> from biomass exempt (seen as carbon neutral)

## Scope 2

- Indirect emissions from purchased electricity, steam, heat and cooling.

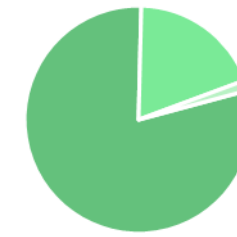
## Scope 3

- Emissions across the value chain for products produced: related to upstream activities ("to Gate") and downstream activities ("after Gate")
- "After Gate" not included in Elkem reported carbon footprint (product level), but part of total reported emissions



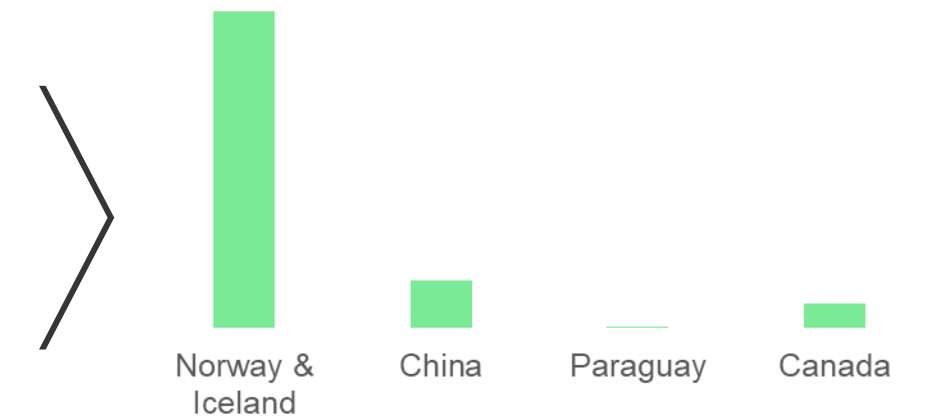
\* 0.5 mt from bio-based sources not included as these are considered climate neutral

## Scope 1: Fossil CO<sub>2</sub> by value chain



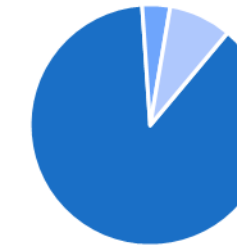
- Smelters
- Downstream
- Carbon Solutions

## Scope 1: Fossil CO<sub>2</sub> by region – smelters



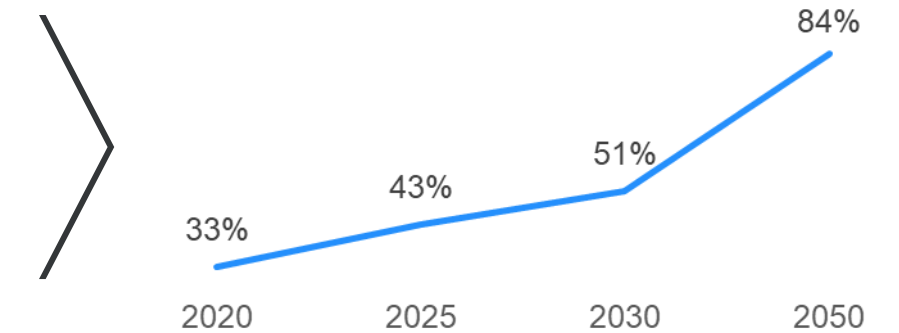
**Insight: 88% of Scope 1 emissions are from Elkem's smelters**

## Scope 2: CO<sub>2</sub> by region/source



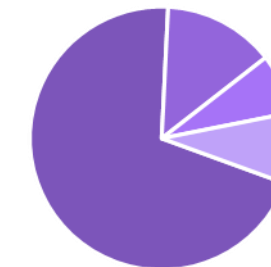
- China
- Norway
- Rest of world

## China: Share of new energy in power mix



**Insight: The shift from coal to renewables in China's power supports reductions**

## Scope 3 to Gate



- Purchased goods & services
- Capital goods
- Transport
- Other

## Scope 3 after Gate



- End of life treatment
- Use of products

**Insight: ~70% from our supply chain**

**Insight: Potential for circular economy**



Our climate actions

# Elkem's actions: Reducing our emissions



Elkem will reduce fossil CO<sub>2</sub> emissions in line with the Paris agreement: We will contribute to limiting long-term temperature increase to well below 2°C.

By 2031:

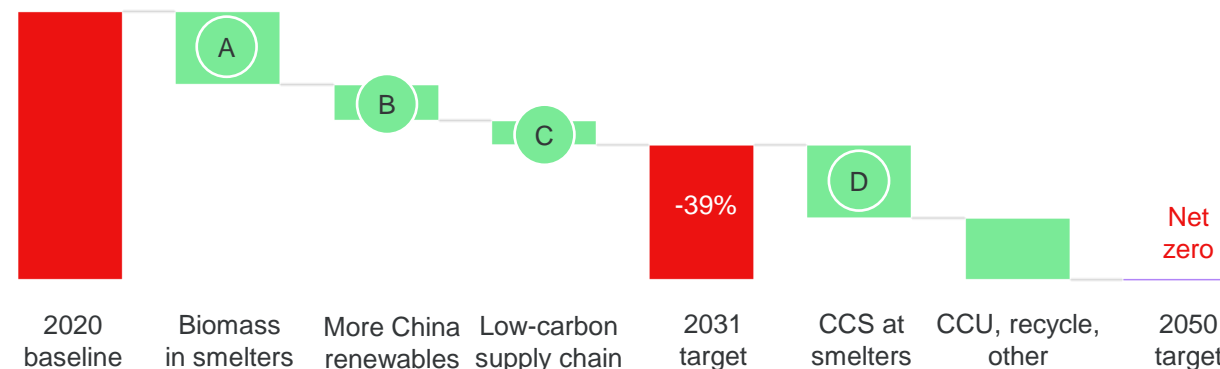
- Reducing absolute emissions\* by **28%** from 2020-2031
- Delivering **39%** improvement in product footprint\*\*

By 2050:

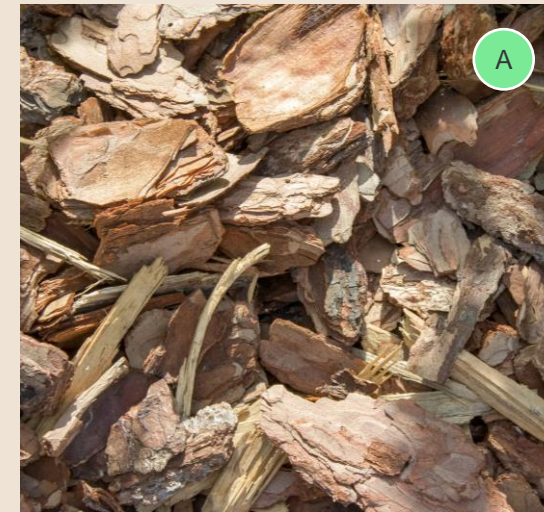
- Achieving fully carbon neutral production (zero fossil emissions) globally

## Our roadmap to climate neutral products

(Illustrative)



\* Total global fossil CO<sub>2</sub> emissions, scope 1 and 2  
 \*\* Main products average fossil CO<sub>2</sub> emissions, scope 1-3



### Changing to biomass as reduction material

Increasing share of bio-based materials from wood waste as reduction material in our smelters



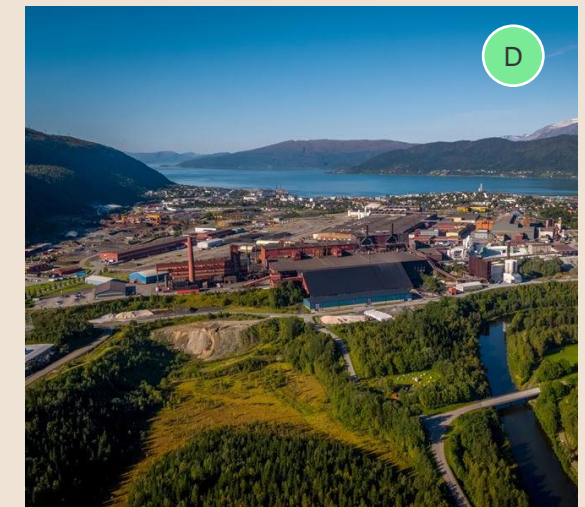
### Shifting to renewable power also in China

Future decarbonisation of China's power mix will support Elkem's low carbon transition



### Low-carbon supply chain

Actively pursue long-term sourcing of renewable-based silicon metal as well as emission-free logistics



### Exploring potential of more CCS at smelters

Exploring both Carbon Capture & Utilisation (CCU) and Carbon Capture & Storage (CCS) at our smelters



Our climate actions | Reducing our emissions

# Changing to biomass as reduction material

Elkem has a pronounced goal for using 20 % biological materials in the mix of reduction materials in the production of silicon and ferrosilicon alloys in Norway within 2021 and 50 % within 2030. We reached the 20 % goal in 2018, and now work to reach our 2030 milestone.

- To reach this goal Elkem will develop a new industrial process for bio-based materials tailor-made for silicon and ferrosilicon production processes.
- All Elkem smelters have developed CO2 road-maps for 2031, estimating the feasibility of increasing bio-share for each plant.
- Verification of furnace operations with large volumes of agglomerated biomass from potential long-term suppliers is ongoing

**>20%**  
biomass  
in 2021






**50%**  
biomass  
in 2030





Our climate actions | Reducing our emissions

# Xinghuo expansion: Improving on environment and financials

Sustainable production	Energy use	 ~57% reduction
	Raw materials use	 ~11% reduction
	Solid waste	 ~30% reduction
Attractive investment	Profitability	 +35% EBITDA margin
	Capacity expansion	 50% capacity increase



## Elkem Xinghuo – strategic expansion of a state of the art facility

- Elkem Xinghuo is the largest silicones plant in China
- China is the world's fastest-growing silicones market
- Investing NOK 3.8 billion in strategic expansion





Our climate actions

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# Elkem's actions: Supplying the transition

All the known technological solutions for the green transition require advanced materials: Silicones, silicon and carbon solutions are critical enablers.

- Elkem aims to continue growing our supplies of advanced materials to global markets by 5-10% per year
- 19% of our products are already EU classified as having positive environmental impact – we expect this to grow
- Elkem products already contribute to >1 million EVs around the world, representing 1 in 7 EVs sold globally
- Silicones can on average help save 9x the amount of emissions required in production\*
- Elkem produces silicon using 83% renewable electricity, with an aim towards CO<sub>2</sub> neutrality



## Better buildings

Our products contribute to optimising material use (i.e. reducing the need for cement) and protecting buildings



## Renewable energy

Silicones are used in 90% of solar panels and silicone lubricants are essential to wind turbines



## Electric vehicles

EVs require 4x more silicone solutions compared to internal combustion engine vehicles



## Digital communications

We put the «silicon» in Silicon Valley: Providing key materials that drive the digital revolution



Our climate actions | Supplying the transition

# Enabling the electric mobility revolution for cleaner transport

**4x more**  
silicone products  
in EVs compared  
to ICEVs

**~50%**  
annual growth  
expected for EVs

**15%**  
anode graphite  
in battery cell

Silicone can be sprayed or coated on dry fabric, or soaked into fabric. It can also be calendared and applied to material in very thin sheets.

Silicon is used in semiconductor devices and in protective compounds in automotive electronics.

Silicones' coating and sealing for airbags.

Silicon and ferrosilicon is input in production of aluminium and steel for structural parts, body, hood, trunk, doors and engine bloc.

Silicone is used in Insulated Gate Bipolar Transistor's (IGBT) for power electronics, for example in an EV engine.

Silicon is used to coat IR reflective auto glass.

In the manufacturing process, silicone-based release agents are used to get the tire out of its mold and to protect the bladder.

Silicone is used in high speed/voltage charging cable.

Gaskets, hoses, cable coating and seals are made with silicones because they help to resist the extreme temperatures, and it increases their durability and stability.

Elkem products are found in batteries as active anode materials; synthetic graphite, silicon/graphite composites and silicon for battery production.

Silicone is used in battery module protection, as foam below the battery pack.

Silicone is used in the potting and sealing of pack cells.

Silicone is used as heat flow management and thermal insulation of the battery pack.

Silicone is used as heat flow management and thermal insulation of the battery pack.

Silicon for ceramic brake discs.

Silicon and ferrosilicon is used in electric steels in EV motors.

Silicon is used in the brazing flux for aluminium heat exchanger, evaporator and condenser.



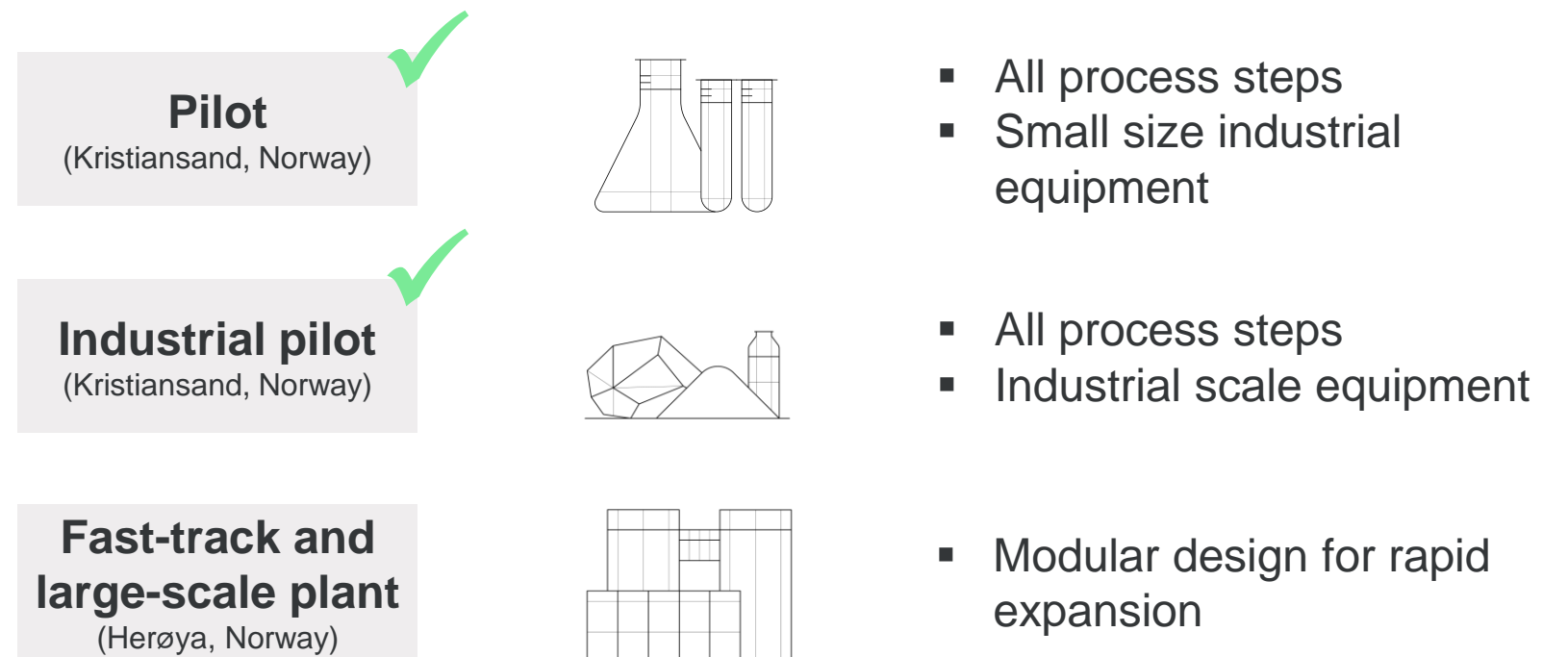
Our climate actions | Supplying the transition

# Vianode: Advanced battery materials

Established by Elkem – a new company dedicated to strategic growth opportunities for advanced battery materials

- Aiming to become a leading provider of anode materials' solutions to the fast growing battery industry with production of synthetic graphite
- Reducing emissions by ~94% to near zero and making better battery materials with:
  - Highly innovative clean processing technology and renewable power mix
  - Advancing research on silicon-graphite composites for higher energy density
  - Collaborative efforts to develop effective and efficient battery materials recycling

**Vianode: Empowering a greener life!**





Our climate actions

# Elkem's actions: Enabling circularity

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Elkem is working closely with customers and researchers across all the four R's of a circular economy: Reduce, Reuse, Recycle and Renewable.

- **Reduce:** Develop the eco-design of innovative products by developing lighter and high-performance materials or using low-energy processes
- **Reuse:** Rubber formulators provide reprocessing solutions to Elkem customers globally..
- **Recycle:** In our operations, by using recycled raw materials, by collecting raw material dust to reintroduce them and also by valuing by-products (i.e. Microsilica). With customers, by joining forces to collect end-of-life products to recycle them chemically or mechanically.
- **Renewable:** Using more biosourced raw materials, such as C13-15 Alkane derived through fermentation and hydrogenation of sustainably sourced sugarcane.



## Eco-design

80% of a product's environmental impact is determined at the design stage. Eco-design reduces the amount of material and energy used.



## Reprocessing

«Mix&Fix» centres set up to analyse customer samples and see if they are reusable or can be reprocessed



## Chemical recycling

Elkem is part of REPOS, a project to recover and recycle silicones in all physical forms: Reducing footprint up to 65%



## Eco-forward silicones

We develop personal care products with sustainable and eco-friendly raw materials – like PURESIL™ ORG 01





# Our climate asks



# Just as our stakeholders depend on Elkem to succeed on climate, we in Elkem depends on our stakeholders

**We need customer demand for greener solutions**



We invite all of our customers to work together with Elkem in both improving current solutions and developing new

**We need attractive framework conditions**



To succeed, we require attractive framework conditions – including access to competitive and sustainable electricity and biomass

**We need world-class competence and innovation**



We need talent and expertise to drive R&D and innovation providing new green solutions for the future



Delivering your  
potential







Delivering your potential