

MAKING BATTERY PRODUCTION GREENER

ANODE GRAPHITE PRODUCTION IN NORWAY

PROSIN conference, 10 August 2020

Stian Madshus



Elkem's role in the lithium-ion battery value chain

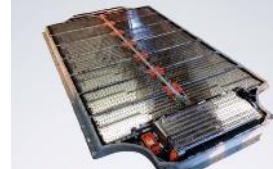


Battery cell
materials

Elkem is a
producer of
active anode
materials;
synthetic **graphite**
and **silicon**

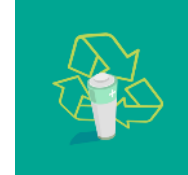


Cell
manufacturing



Battery modules
and packs,
vehicle
integration

Elkem is a
supplier of
advanced **silicone
solutions** for
battery packs,
protection of
electronics and
cable protection



Recycling and
second use

Elkem involved in
R&D projects
with partners
(LIBRES program)

Europe is waking up – extensive plans for establishing new battery cell manufacturing capacity

...but production of critical materials is **dominated by Asian players**



Battery & Fuel Cell >

May 13, 2019 - 10:11 pm

Volkswagen Board releases €1Bn for battery cell factory

The desired location for VW's battery cell production is Germany and definitely Europe.

BATTERY CELL MANUFACTURING | EUROPE | GERMANY | INVESTMENT | PRODUCTION | SALZGITTER | VOLKSWAGEN



Volkswagen's environmental board has announced the automaker's environmental and political commitment to the future of the planet.

The company's commitment to the future of the planet is a key part of its strategy.

milestone," Volkswagen CEO Herbert Diess comments.



news.cision.com / FREYR : FREYR completes NOK 130 million.

FREYR completes NOK 130 million financing for Norway's first lithium-ion battery cell facility

OSLO, NORGE, 2019-05-14 10:48 CET
On July 1st, FREYR successfully completed NOK 130 million of pre-construction financing for the first lithium-ion battery cell (LIB) facility in Norway with significant local and regional support. The proceeds will be used to complete the concept and technology selection process and enable a rapid development of the 2 GWh Fast Track battery cell manufacturing plant in Mo i Rana. FREYR will build a strong customer base in the Electric Vehicles, Stationary Storage, and Marine Application segments and further strengthen the rapidly expanding organisation.

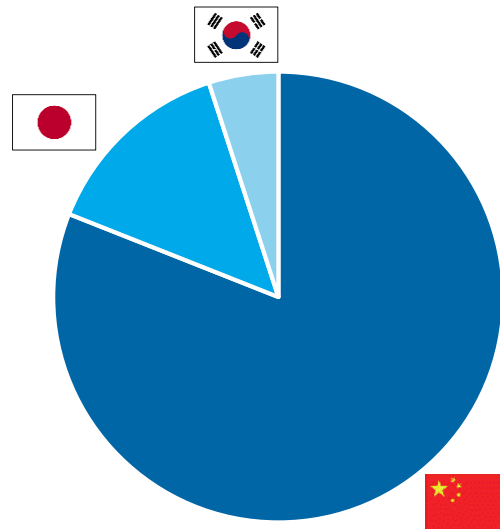


French start-up emerges from stealth mode with plan to build huge battery gigafactory by 2023

Verkor aims to build 16GWh facility in France to reduce Europe's dependence on imported lithium-ion batteries

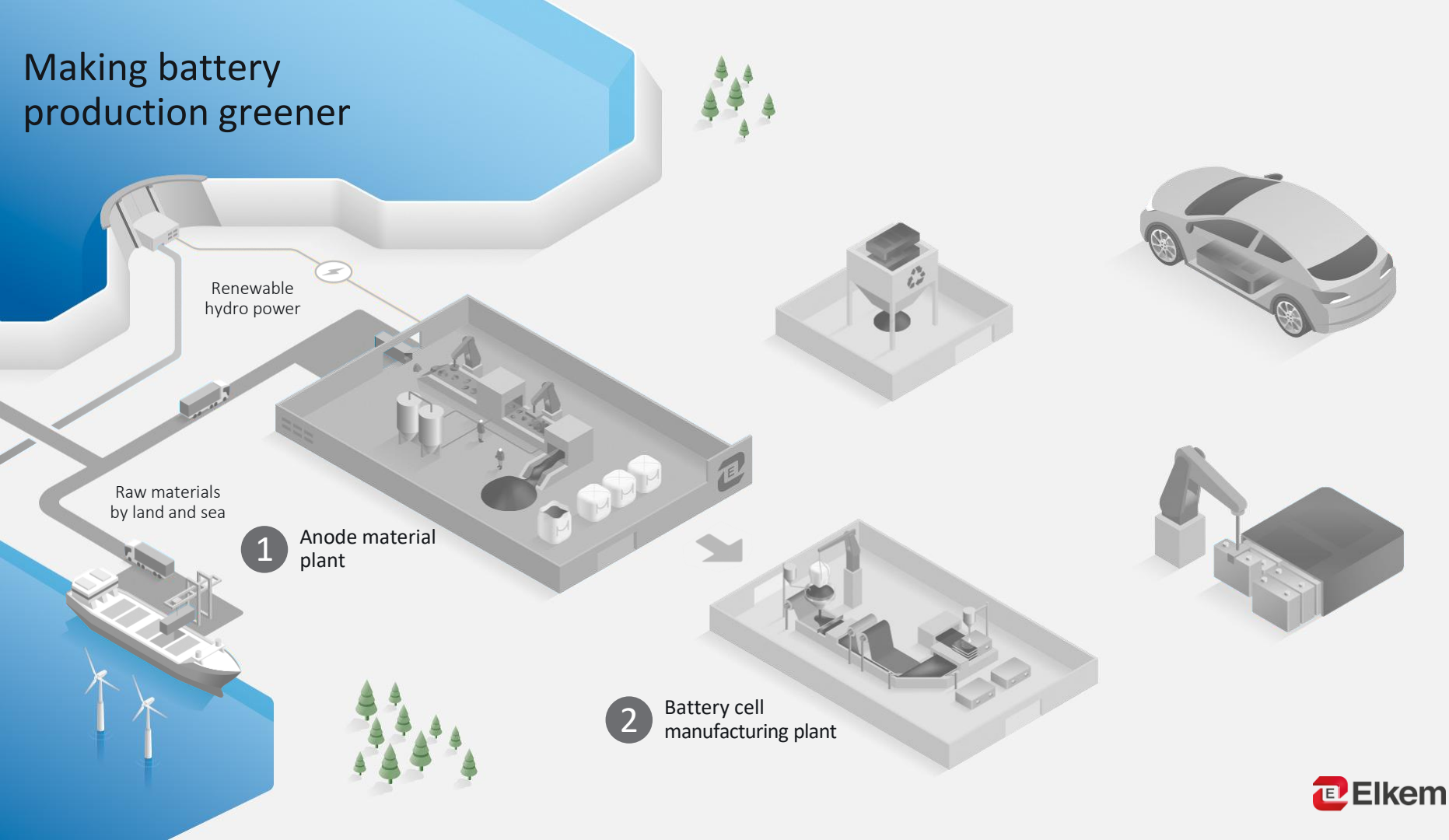
Vil bygge batterifabrikk i Agder

Det internasjonale elbilmarkedet vokser og med det øker batterimarkedet raskt. Bare hittil i år har elbilsalget økt med 90 prosent i de største europeiske landene. Et nytt, norsk selskap skal sørge for å forsyne Europa med neste generasjons bærekraftige batterier. Og samtidig bygge en ny konkurransedyktig storindustri i Norge. NHO jubler over etableringen.

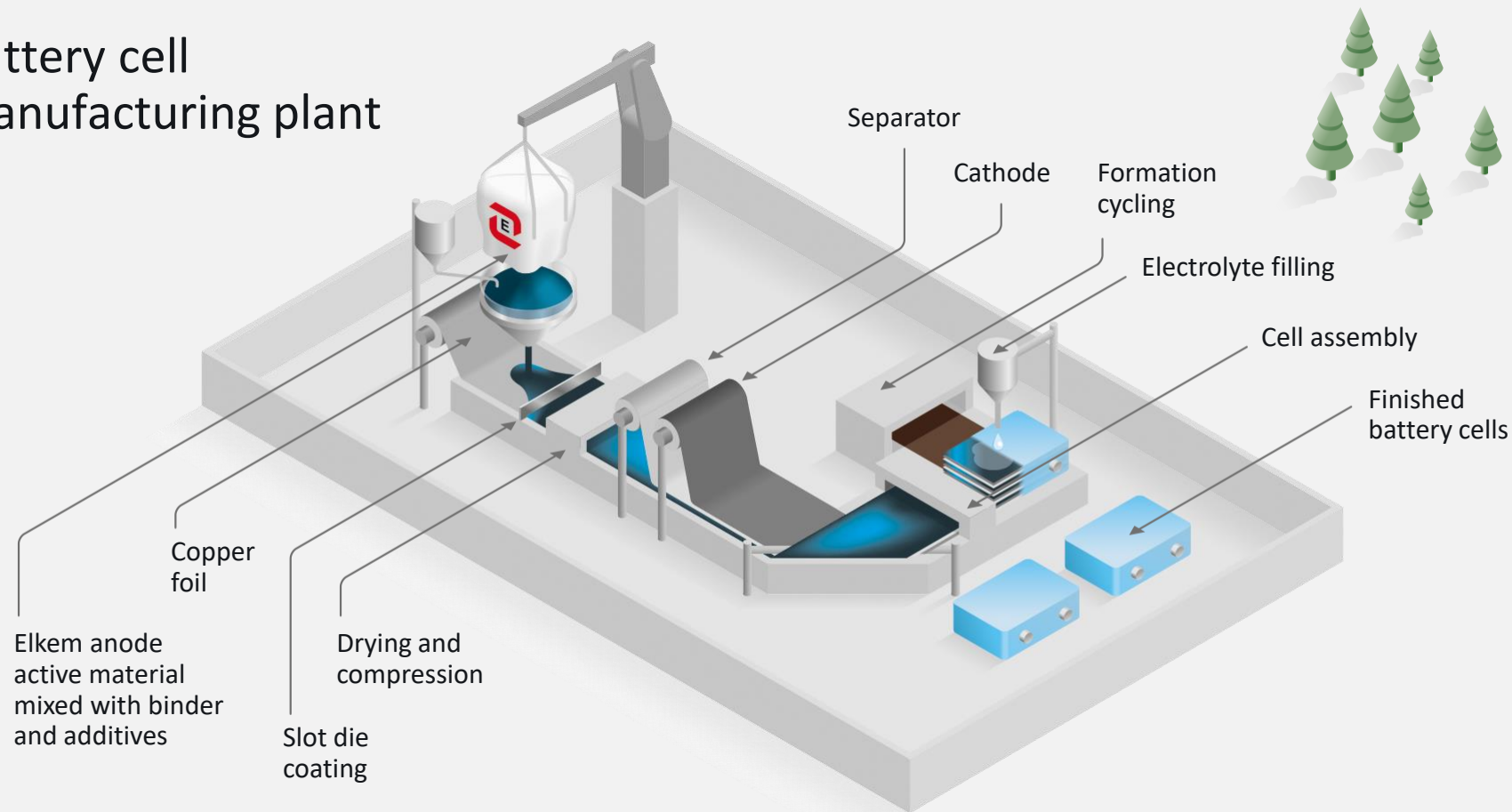


2019 anode graphite output (ICCSINO)

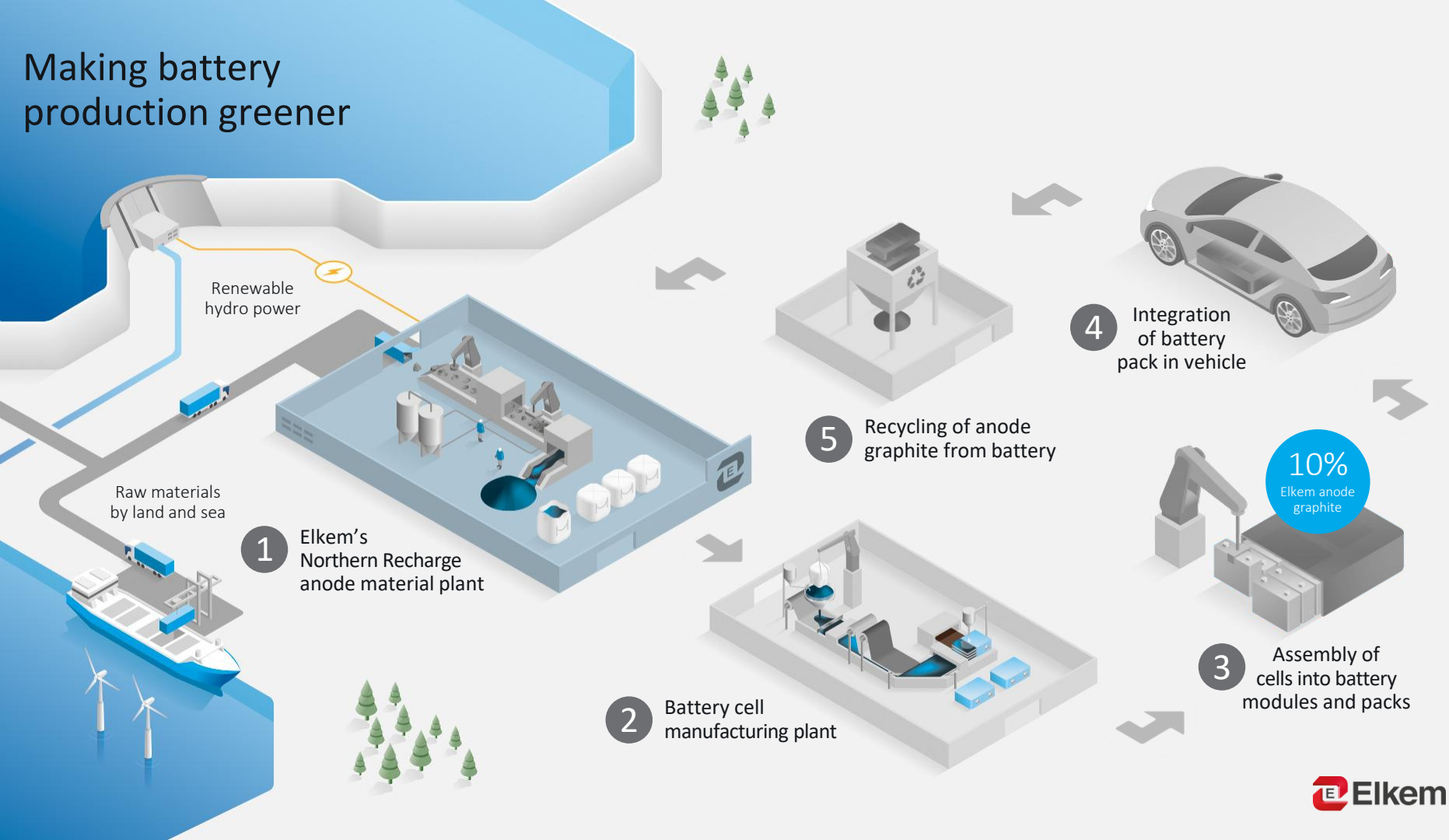
Making battery production greener




Battery cell manufacturing plant



Making battery production greener



From pilot to industrial production

	Pilot	Industrial Pilot*	Industrial Plant
			
Capacity	1 ton per year	200 tons per year	Phase 1: Large scale Phase 2: To be decided
Status	In full operation	Under construction, operational 2020	In planning. Phase 1 SOP: 2023 Phase 2 SOP: To be decided
Description	All process steps. Small size industrial equipment.	All process steps. Industrial scale equipment.	Modular design for rapid expansion
Location	Kristiansand, Norway	Kristiansand, Norway	To be announced, Norway

*Project supported by Innovation Norway

DELIVERING YOUR POTENTIAL

