



Rationale for battery investments

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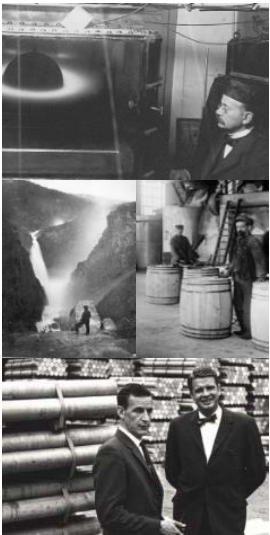
Oslo, 04th June 2019

Hydro: The global and complete aluminium company

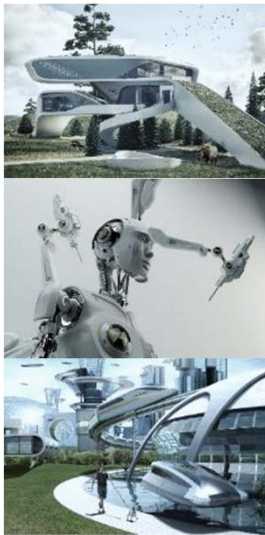


Our purpose: “...create a more viable society by innovative and efficient use of natural resources and products”

More than 110 years of industrial development and responsibility



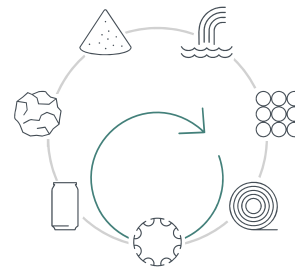
Aluminium – metal of the future



Hydropower – infinitely recyclable energy



Engaged in the entire value chain – R&D, innovation and tailor-made solutions



Global reach, local presence

35,000 employees

150 locations

40 countries

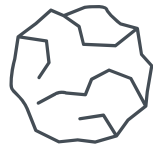
Involved and engaged



MEMBER OF
Dow Jones Sustainability Indices
In Collaboration with RobecoSAM



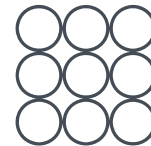
Energy is a key differentiator in the aluminium industry



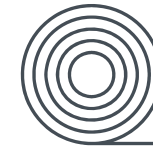
Bauxite



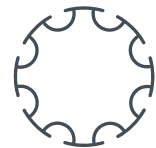
Alumina



Primary



Rolling



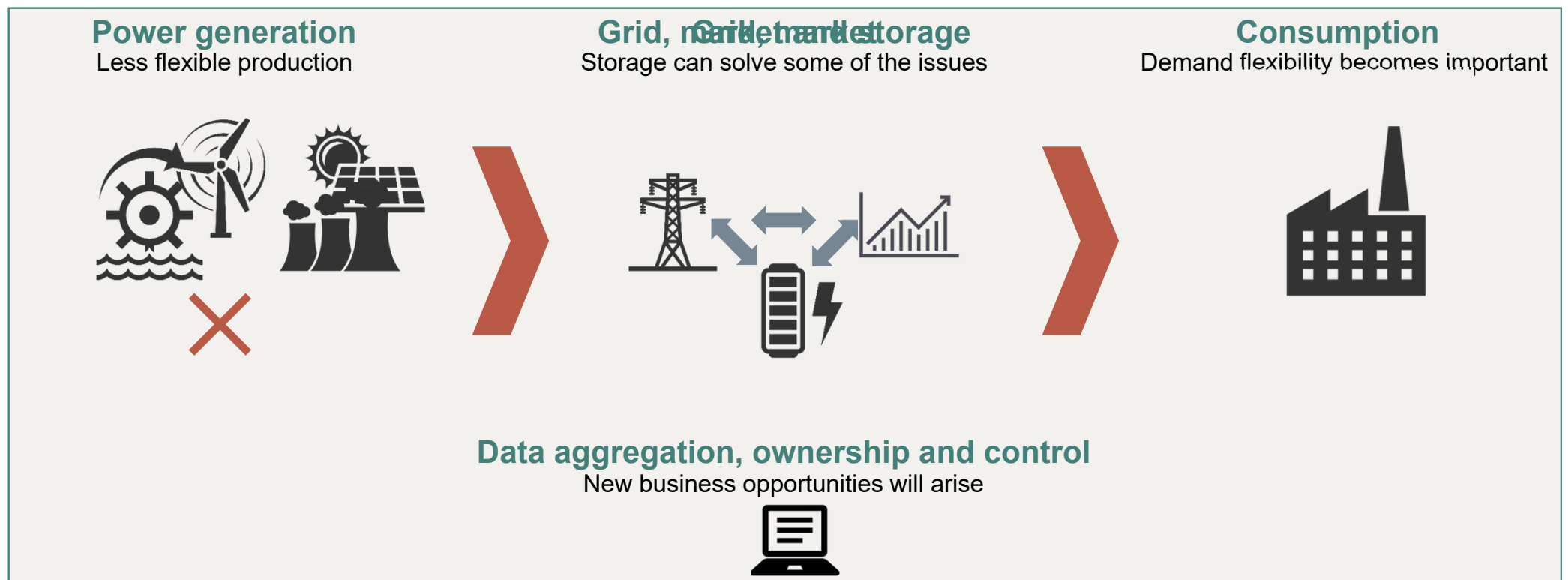
Extrusion

Energy cost*	~25%	~35%	~35%	~10%	~8%
	~50%				
Energy business area's contribution to Hydro	<ul style="list-style-type: none"> • Power sourcing 	<ul style="list-style-type: none"> • Power sourcing • Fuel switch project (LNG) • Energy mix long term, renewables, storage 	<ul style="list-style-type: none"> • Power sourcing and production • Gas sourcing 	<ul style="list-style-type: none"> • Power sourcing • Gas sourcing 	<ul style="list-style-type: none"> • Power sourcing • Gas sourcing
Market understanding. Framework advocacy. «Greener» support & energy efficiency support. Security of supply					

*Share of Business Operating Cash Cost

Batteries will play a vital role in the energy transition

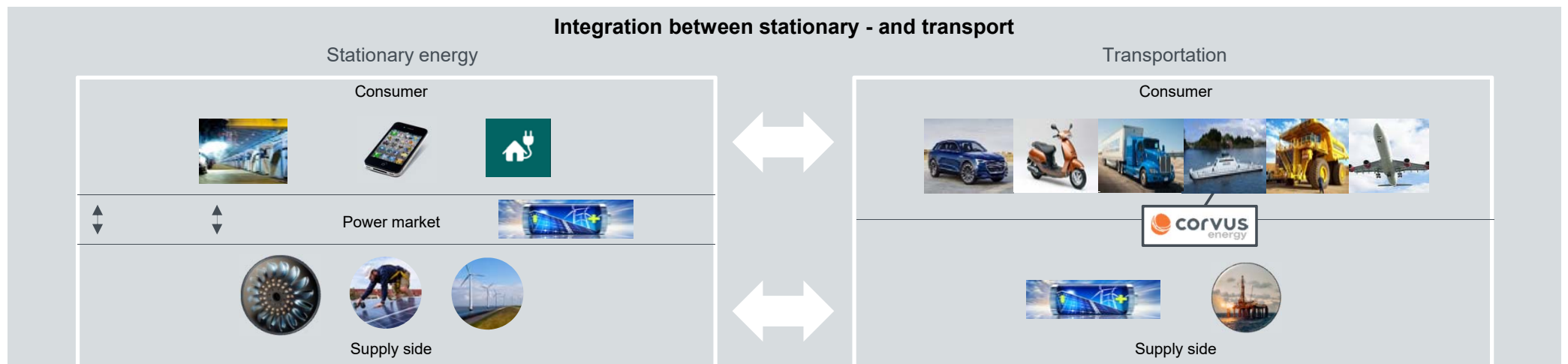
Understanding battery technology is key to understanding business impact



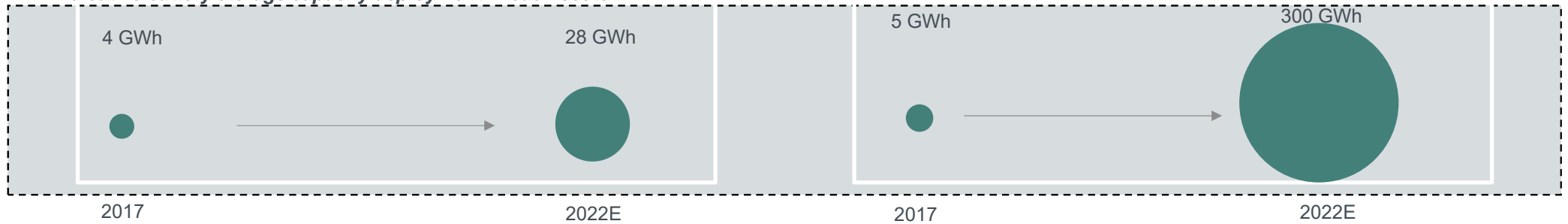
Electrification of transport will affect stationary storage deployment



Corvus is a global leading battery system supplier for marine applications



*Indicative battery storage capacity deployment in each sector**

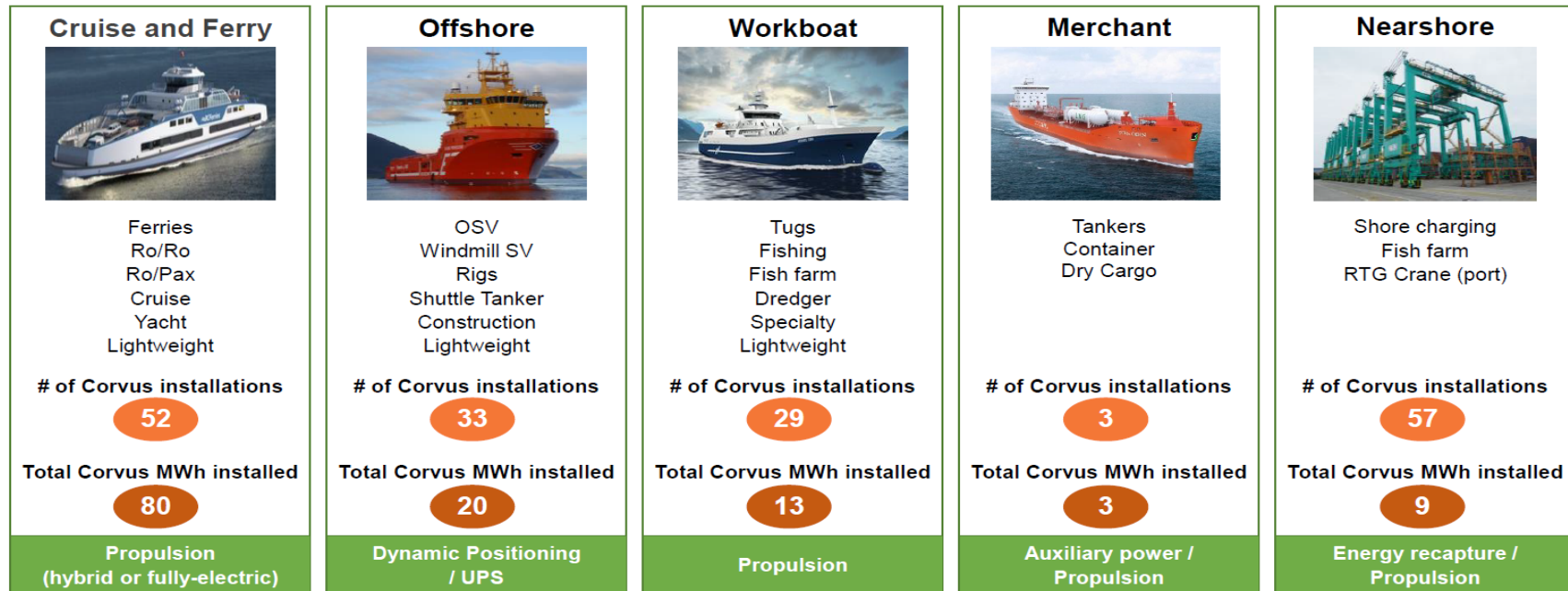


Source; BNEF McKinsey

Corvus has established the market for a broad range of user cases within marine

Technology optimization, safety and cost: Key enablers for marine industry

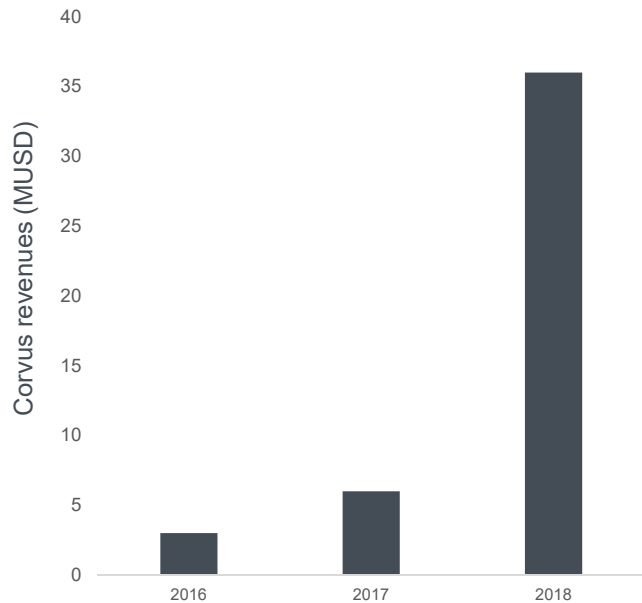
Market segmentation



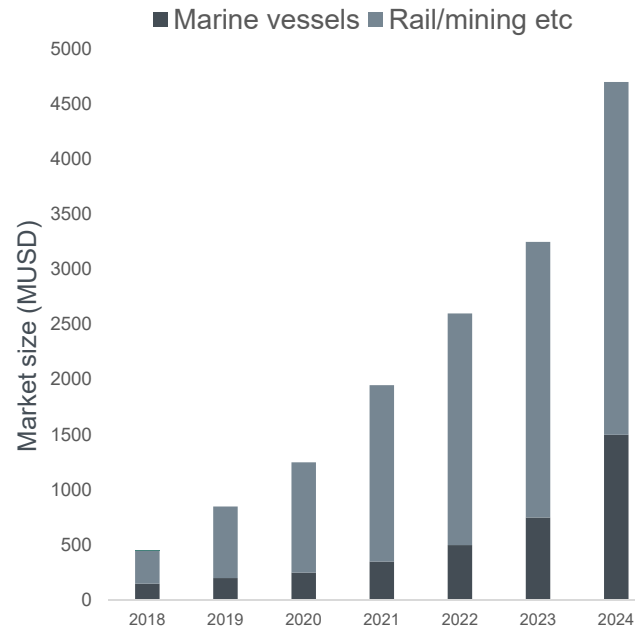
Strong growth in marine electrification for Corvus

Good potential stepping stone to further expand business - Corvus well positioned

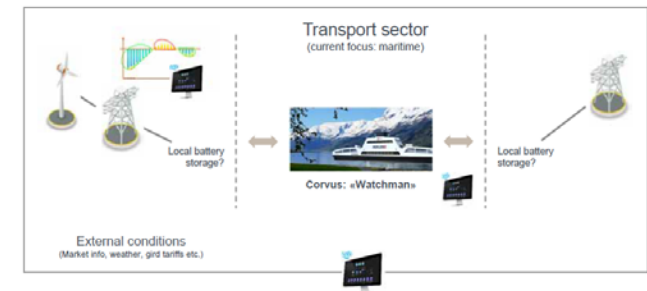
Strong growth in Corvus over the last 3 years



Market for HEV battery systems will be multi billion market by 2024*



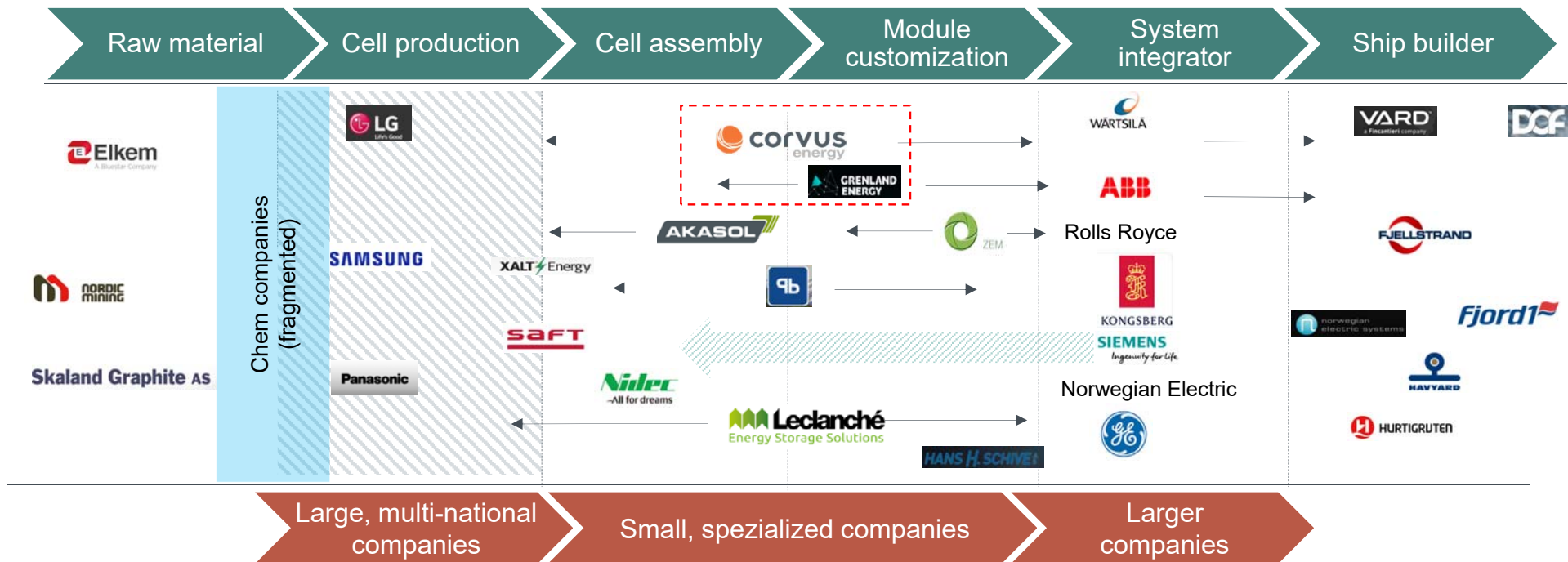
Sector coupling increasingly important as industry grow



HEV- Heavy Electric Vehicles (Marine, mining and rail)
 Source; Navigant- *Non-Automotive Transportation Markets for Advanced Batteries (2017)* .

The marine battery value chain is under development

Norway is taking lead and is well-positioned to continue to drive development



Strategic rationale for Hydro's Corvus investment

For Hydro Corvus investment is driven by our need for deeper learning about a strong market that will be increasingly important to us



Strong trend in Li-Ion battery market



High growth potential



Synergies to Hydro's core competencies, and DNA



Value chain is not defined



Norway is taking a leading role in maritime- and offshore electrification



Future synergies into new segments
- Marine applications amongst the most advanced battery systems



Hydro

We are aluminium

