Norwegian mapping of critical and strategical raw materials in industrial sidestreams

Stine Skagestad

Established 2007
76 Members medlemmer:
- Process industry
- Tech
- R&D

Ca 56 mrd turnover
Ca 13 700 employes (5000 in Agder)

Cluster Management Excellence GOLD

NCE Norwegian Centres of Expertise

We work to strengthen a thriving industry and create value.
In respect of planetary boundaries and strive for companies to make a positive contribution back to society and nature.

Intelligent & Sustainable Industry –

Competetiveness

Green and Circular Value Chains

Develope new industry

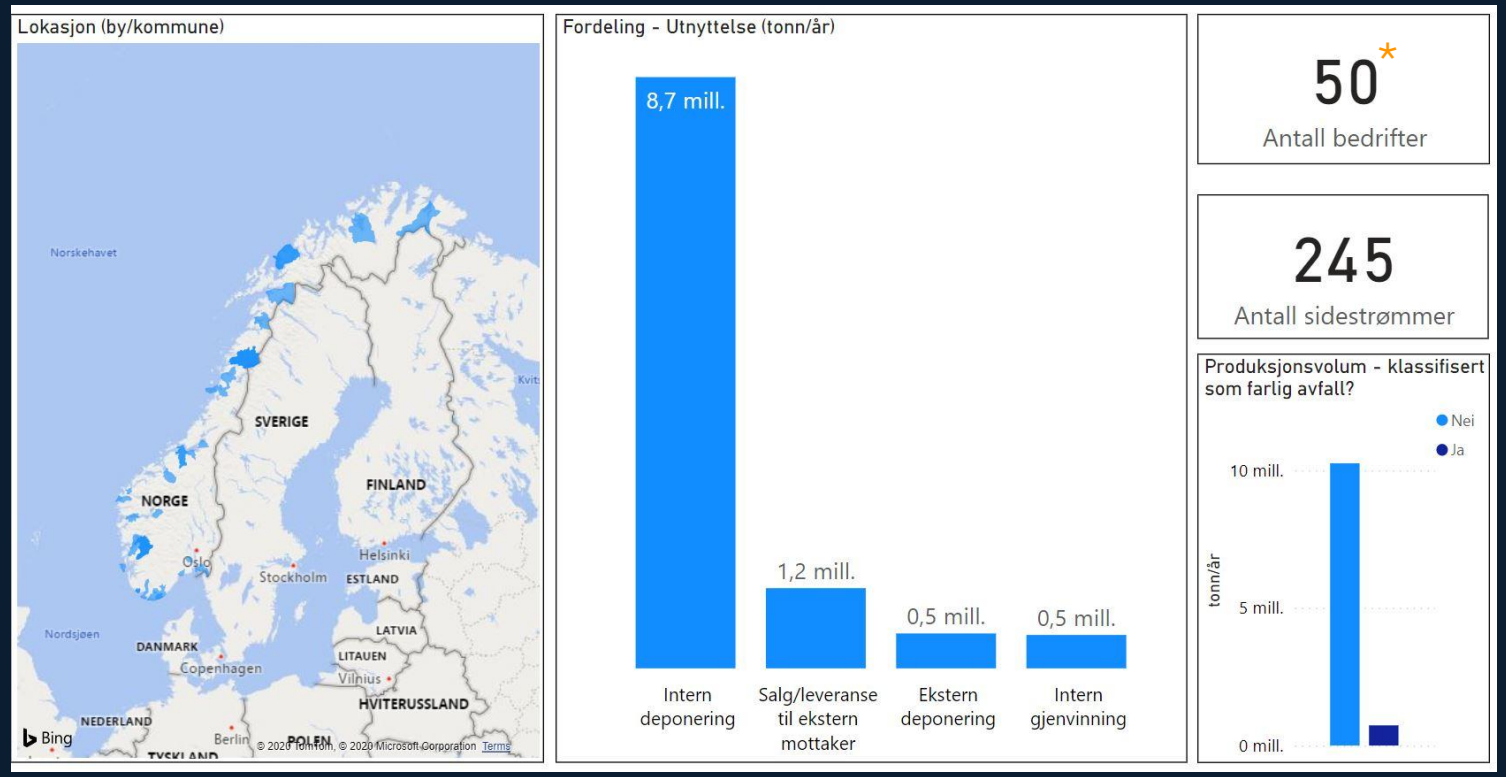
X-Factor

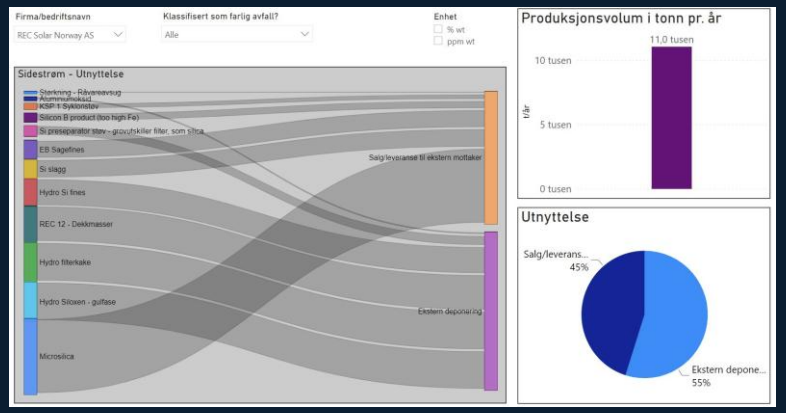
Search for opportunities

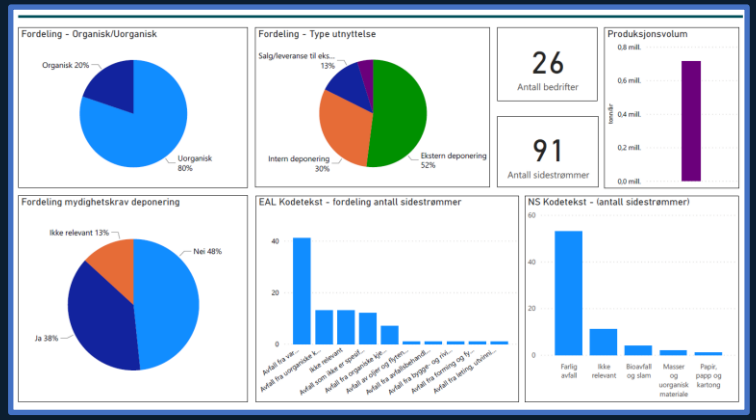
Mapping of industrial sidestreams from Norwegian process industries

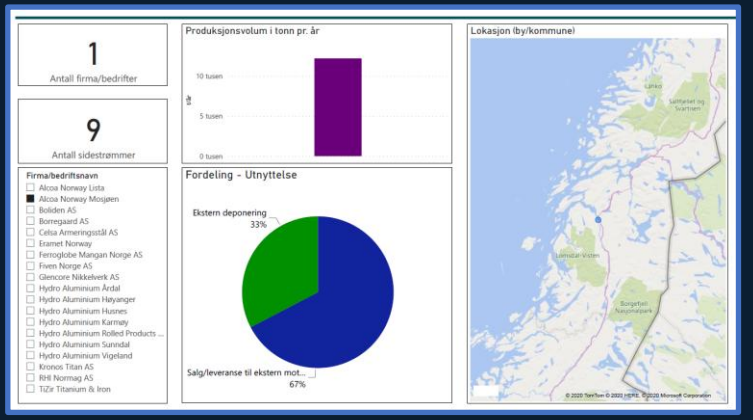
Vedtak RNB (19/6):
«Det bevilges med dette et tilskudd på 8 mill. kroner for inneværende år til Eydeklyngen. Midlene skal brukes til å gjennomføre en materialstrømsanalyse i norsk prosessindustri for å kartlegge muligheter for økt ressursutnyttelse og reduserte mengder farlig uorganisk avfall fra prosessindustrien.»

Power BI

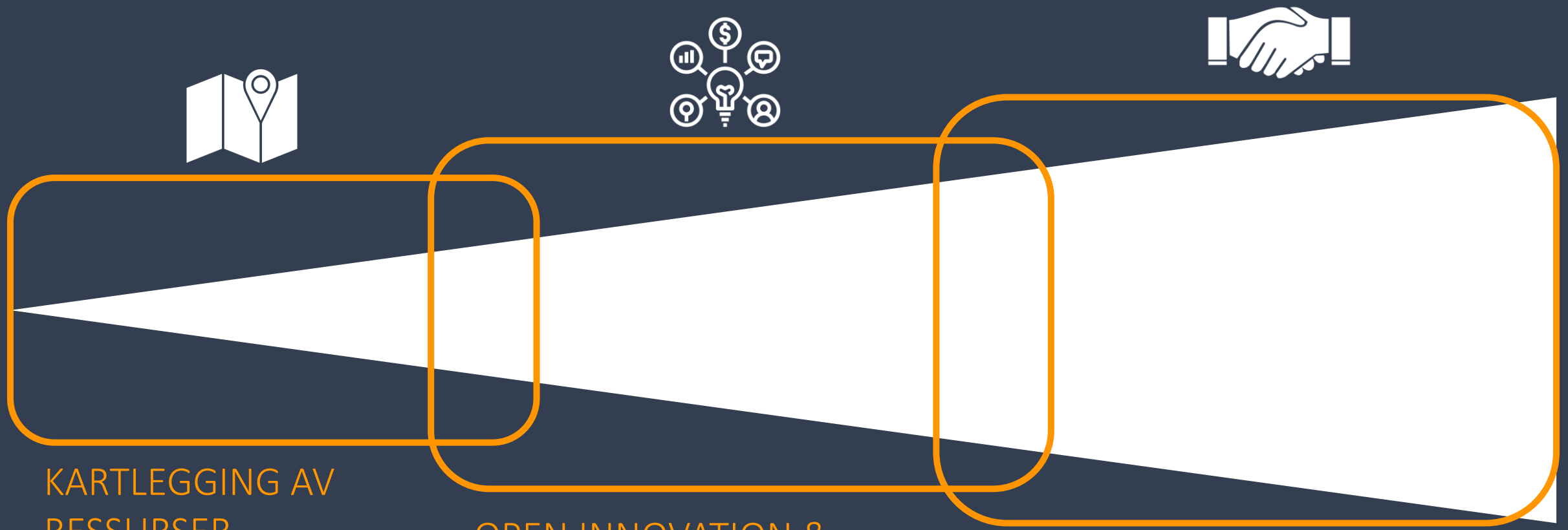

Lokasjon (by/kommune)
Norskehavet
SVERIGE
NORGE
FINLAND
Oslo
Stockholm
Helsinki
ESTLAND
LATVIA
LITAUEN
Vilnius
Nordsjøen
DANMARK
Copenhagen
HVITERUSSLAND
NEDERLAND
Berlin
POLEN
Bing
© 2020 TomTom, © 2020 Microsoft Corporation Terms
Fordeling - Utnyttelse (tonn/år)
8,7 mill.
1,2 mill.
0,5 mill.
0,5 mill.
Intern deponering
Salg/leveranse til ekstern mottaker
Ekstern deponering
Intern gjenvinning
50*
Antall bedrifter
245
Antall sidestrømmer
Produksjonsvolum - klassifisert som farlig avfall?
Nei
Ja
10 mill.
5 mill.
0 mill.
tonn/år


Firma/bedriftsnavn
REC Solar Norway AS
Klassifisert som farlig avfall?
Alle
Enhet
% wt
ppm wt
Sidestrøm - Utnyttelse
Produksjonsvolum i tonn pr. år
11,0 tusen
10 tusen
5 tusen
0 tusen
Utnyttelse
Salg/leverans...
45%
Ekstern depone...
55%


Fordeling - Organisk/Uorganisk
Organisk 20%
Uorganisk 80%
Fordeling - Type utnyttelse
Intern deponering 30%
Ekstern deponering 52%
26
Antall bedrifter
91
Antall sidestrømmer
Produksjonsvolum
Fordeling mydighetskrav deponering
Ikke relevant 13%
Nei 48%
Ja 38%
EAL Kodetekst - fordeling antall sidestrømmer
NS Kodetekst - (antall sidestrømmer)


1
Antall firma/bedrifter
9
Antall sidestrømmer
Produksjonsvolum i tonn pr. år
Lokasjon (by/kommune)
Firma/bedriftsnavn
Fordeling - Utnyttelse
Ekstern deponering 33%
Salg/leveranse til ekstern mot...
67%

WASTE TO VALUE



KARTLEGGING AV RESSURSER

OPEN INNOVATION & PROOF OF CONCEPT

IMPLEMENTERING

How to utilize the data in the database?

1

Owners of side streams (i.e. the 50 companies)

- can either work together with us in the Eyde cluster
- Or get their own user and access (Microsoft Power BI license required)

2

Other stakeholders (e.g. institutes, start-ups, universities…)

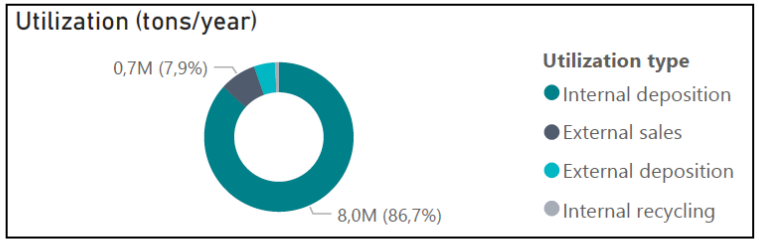
- Through collaboration with the Eyde cluster, with access determined by the companies that own the data

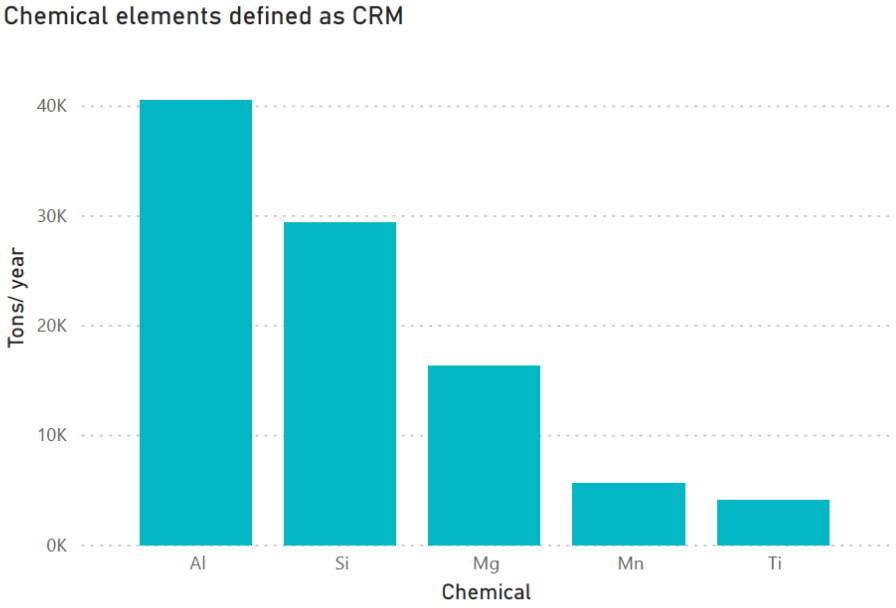
3

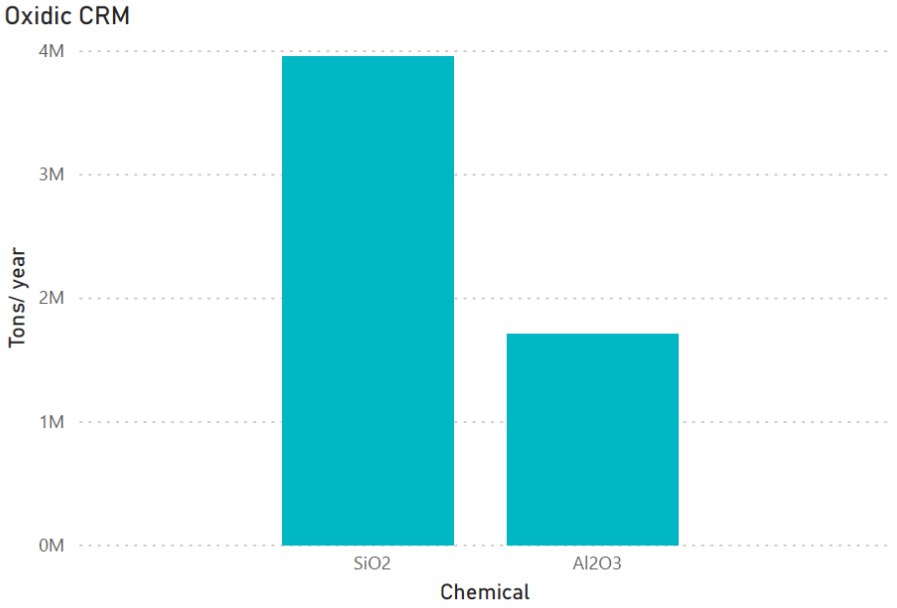
Through workshops / seminars etc. (NDAs for participants)

- Save the date: seminar and workshop planned for 20-21 October in Kristiansand

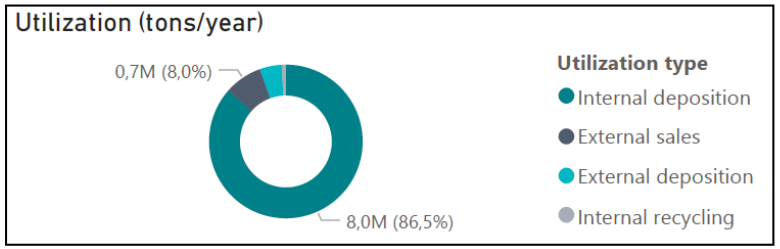
Chemical elements and oxides defined as CRM, found in Norwegian Side Streams, tons/year

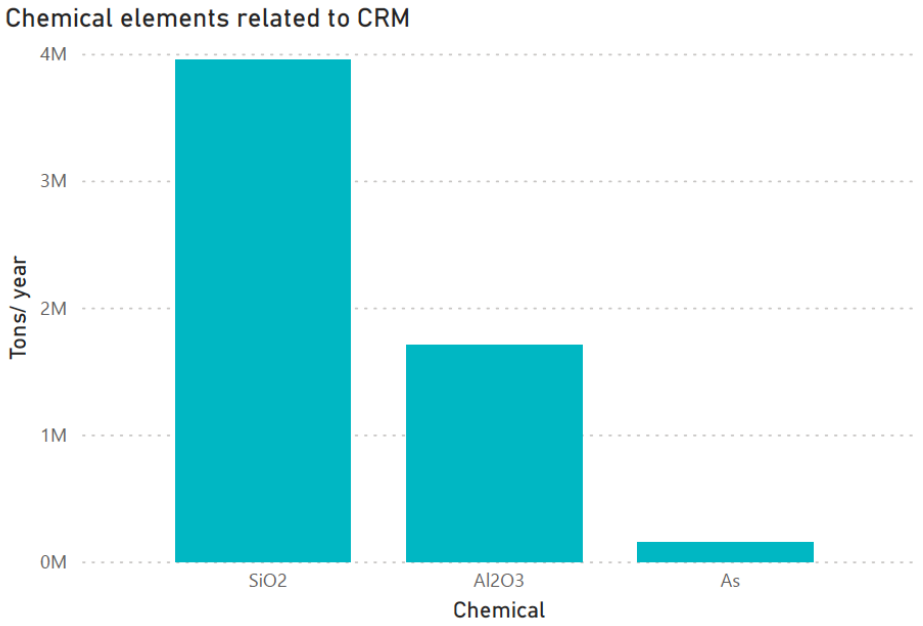


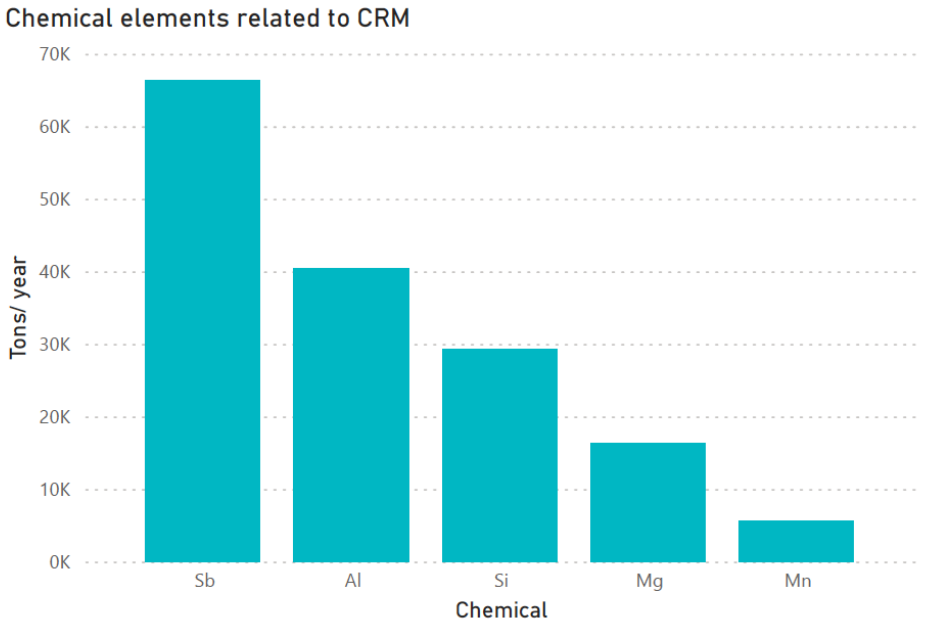




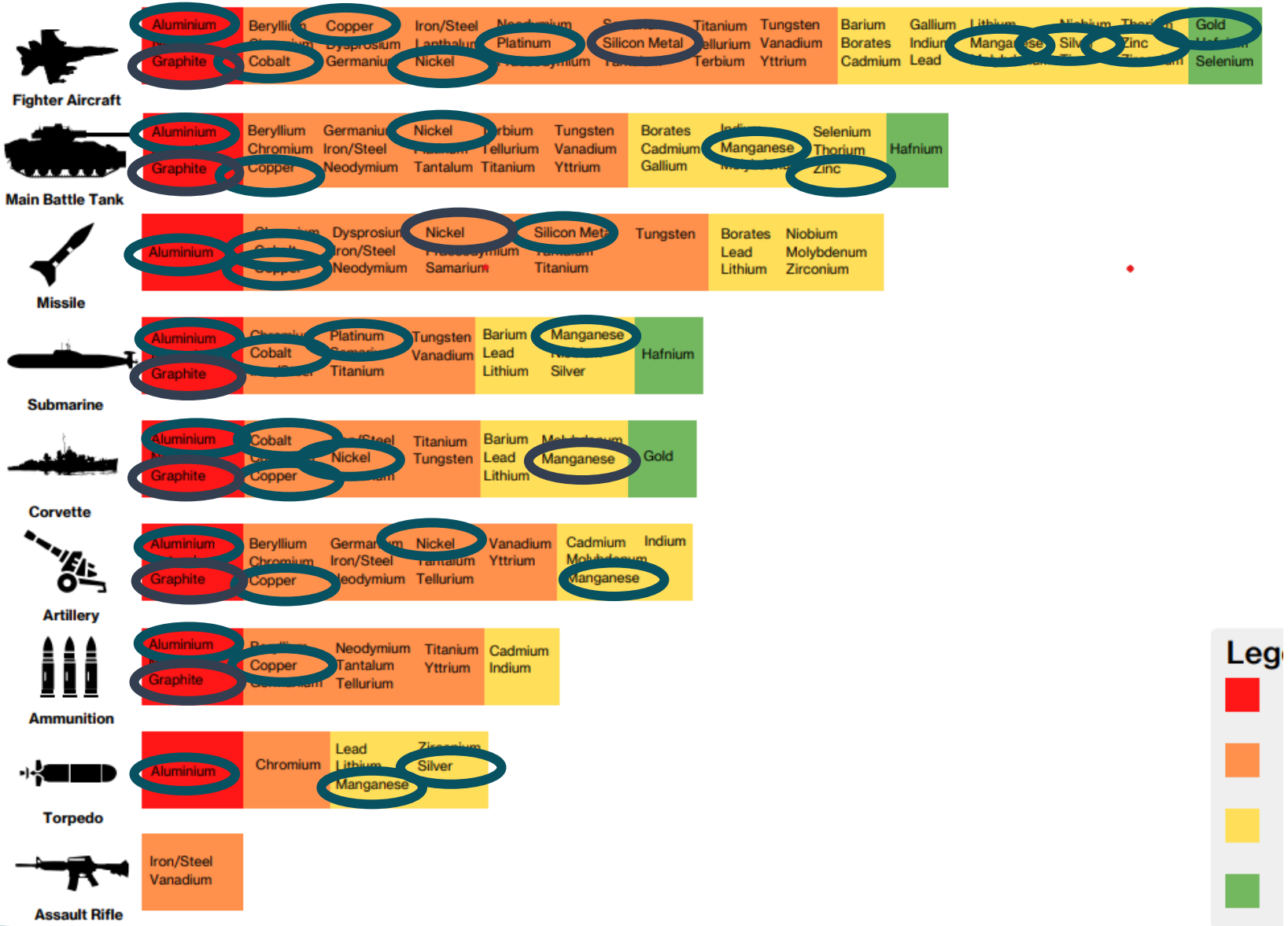
Elements related to CRM, found in Norwegian Side Streams, tons/year







Supply risk for critical raw materials in military applications



No deep sea exploration or mining for Eramet

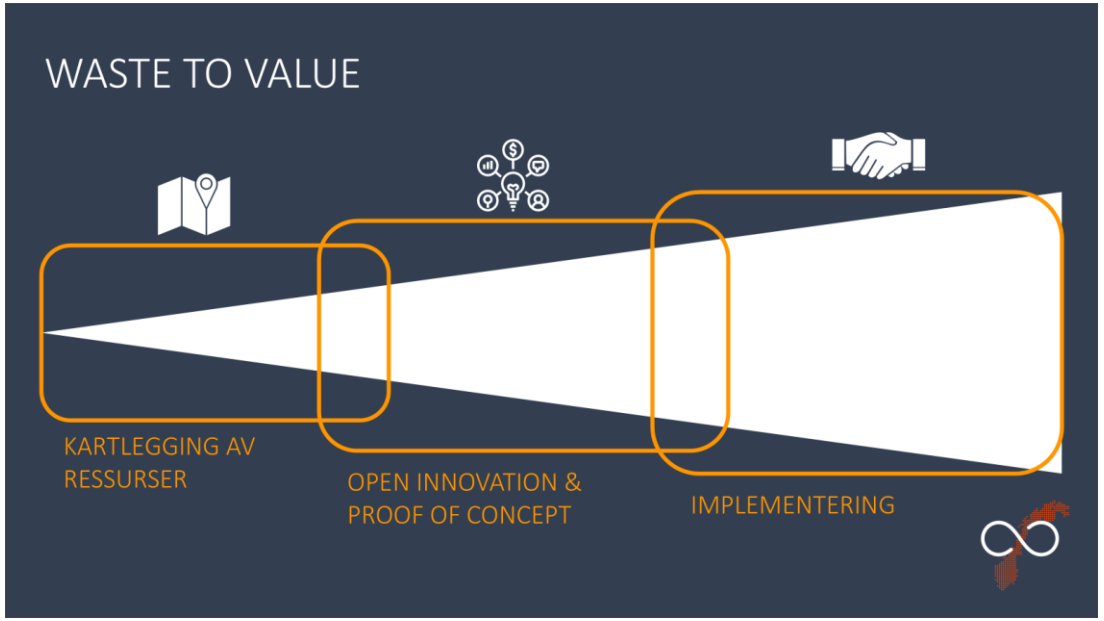
Metals found on land are also found on the ocean floor, and in significant quantities. But should they be extracted when little is known about marine ecosystems and the consequences of seabed mining are not yet fully understood? For Eramet, the answer is no.

#Biodiversity #Environment #Responsible mining #Virginie de Chassey

Ambition: International industrial centre for material utilization

Purpose:

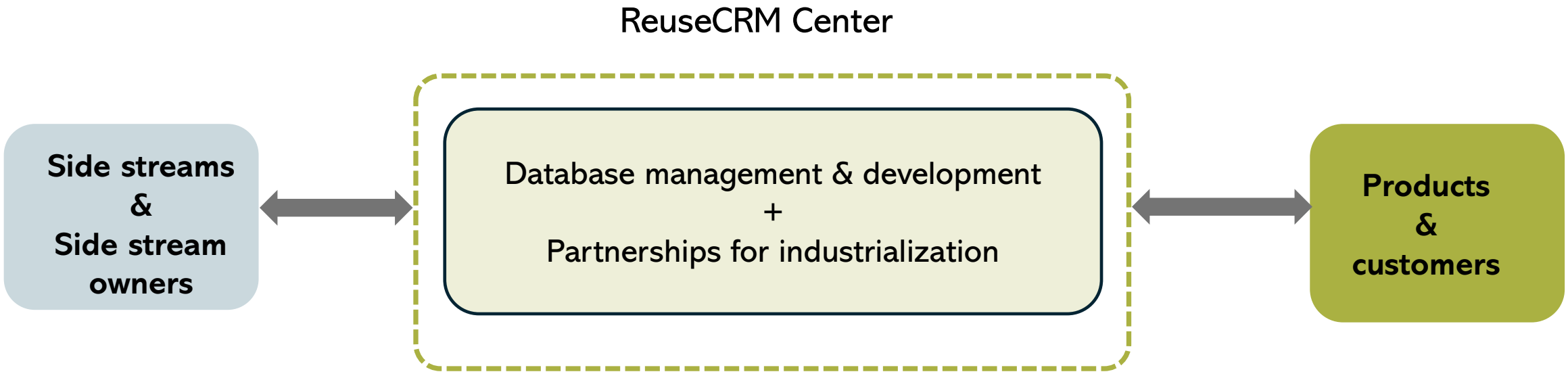
- To extract at least 50% of critical and strategic raw materials that are in the open
- To accelerate business development where recycled materials are involved
- To increase general knowledge about materials as a limited resource



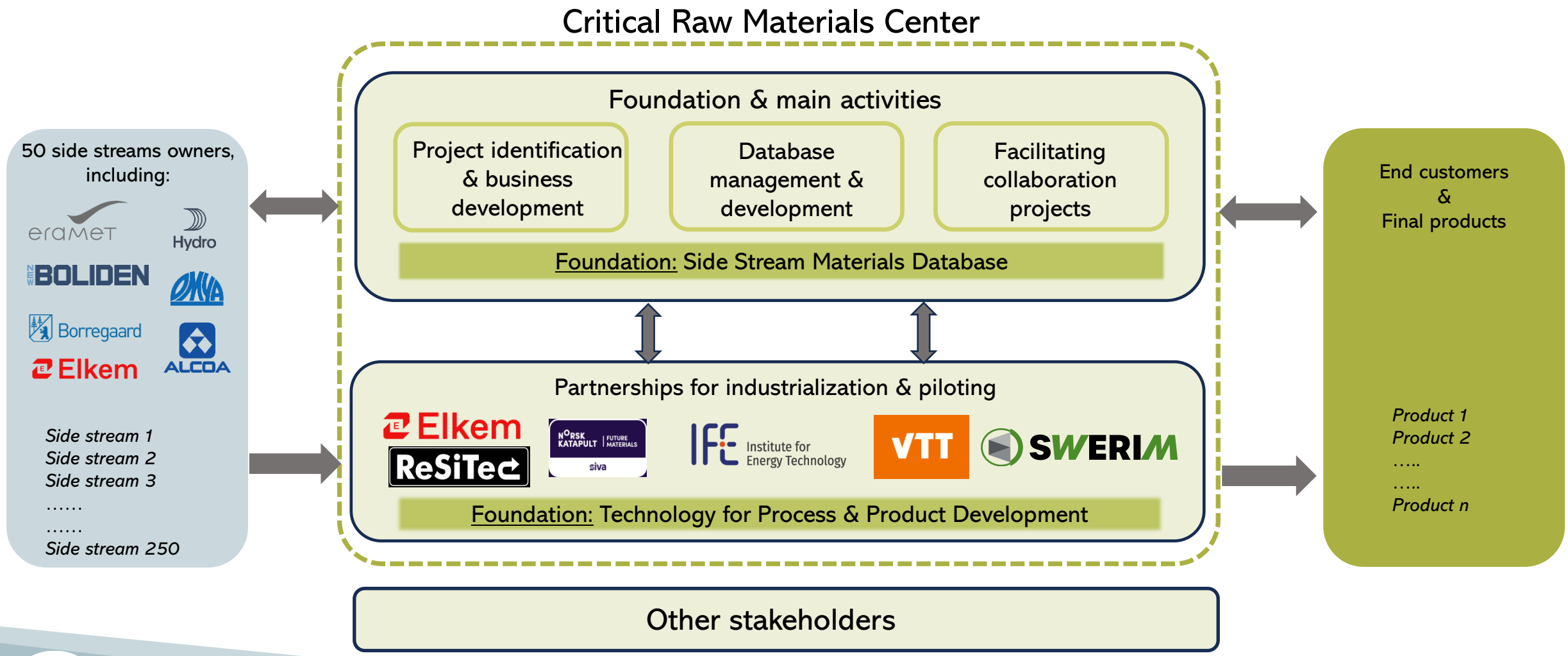
From mapping to utilization

Our ambition:

Establish a center for industrialization of critical and strategic materials base on utilization of side-streams from the mining and process industry.



From waste to value



Regional Black Mass Recycling

C Carbon 12.011 | Co Cobalt 58.933 | Ni Nickel 58.693
Li Lithium 6.94 | P Phosphorus 30.973 | Mn Manganese 54.938

Black mass

Transportation

Tailor made black mass process at Fiskaa site

Li Lithium 6.94 | P Phosphorus 30.973 | Mn Manganese 54.938 | C Carbon 12.011 | Ni Nickel 58.693

MORROW

Mn Manganese 54.938 | Co Cobalt 58.933 | Ni Nickel 58.693 | P Phosphorus 30.973 | C Carbon 12.011

eraMET

NIKKELVERK A GLENCORE COMPANY

YARA

Vianode

Utilization of industrial waste from Si/FeSi

Fiskaa Verk in 1968 – “The Fiskaa smoke”

Øresund Bridge
contains 20.000 tons of Microsilika

Elkem awarded NOK 33 million from Innovation Norway for development of recycled low-emission products for automotive and construction industry

FeSi-slagg as cement replacement

Slag after remelting can replace up to 40% of the cement in concrete

Recycled silicon

Silicon from recycled sources in the value chain for solar cells and electronics

Elkem

Eramet – Utilization of Slag from SiMn production

Foto: Tor Arild Hopland

Can we create “gold” out of the sidestreams?

Workshop in Kristiansand, Norway October 21.-22.

For more information:
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