VELKOMMEN TIL BÆREKRAFT PÅ BUNNLINJEN

BUSINESS ON THE ROCK

Ingvild Størdal

BUSINESS ON THE ROCK

SpareBank 1 REGNSKAPSHUSET

Hvordan komme i gang med grønn omstilling?

Business on the rock, Nesaksla 2023-08-03

Ingvild Størdal
PhD, Miljøkjemi og toksikologi

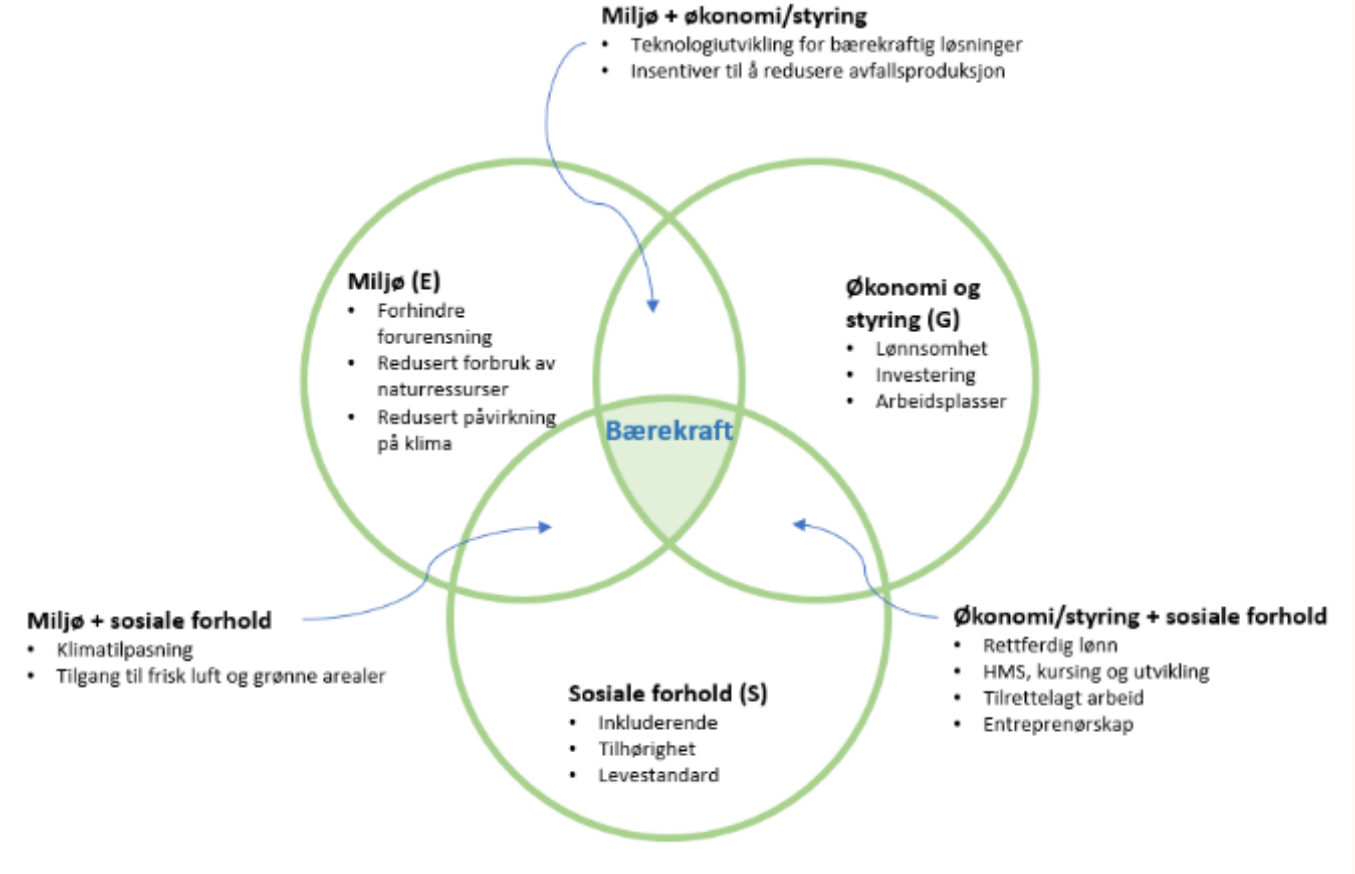
Leder Bærekraftsrapportering og rådgivning
SpareBank 1 Regnskapshuset SMN AS

Bærekraft og det grønne skiftet

Bærekraftig utvikling ble definert i 1987 av Gro Harlem Brundtland og Brundtlandkommisjonen:

«Bærekraftig utvikling er en utvikling som tilfredsstiller dagens behov uten å ødelegge fremtidige generasjoners muligheter til å tilfredsstille sine behov.»

Videre:
«Bærekraftig utvikling betyr grenser, ikke absolutte grenser, men grenser definert av teknologien som er tilgjengelig i dag, hvordan sosiale strukturer påvirker utnyttelse av naturressurser i ulike land og av biosfæren sin kapasitet til å absorbere effektene av menneskelig aktivitet.»

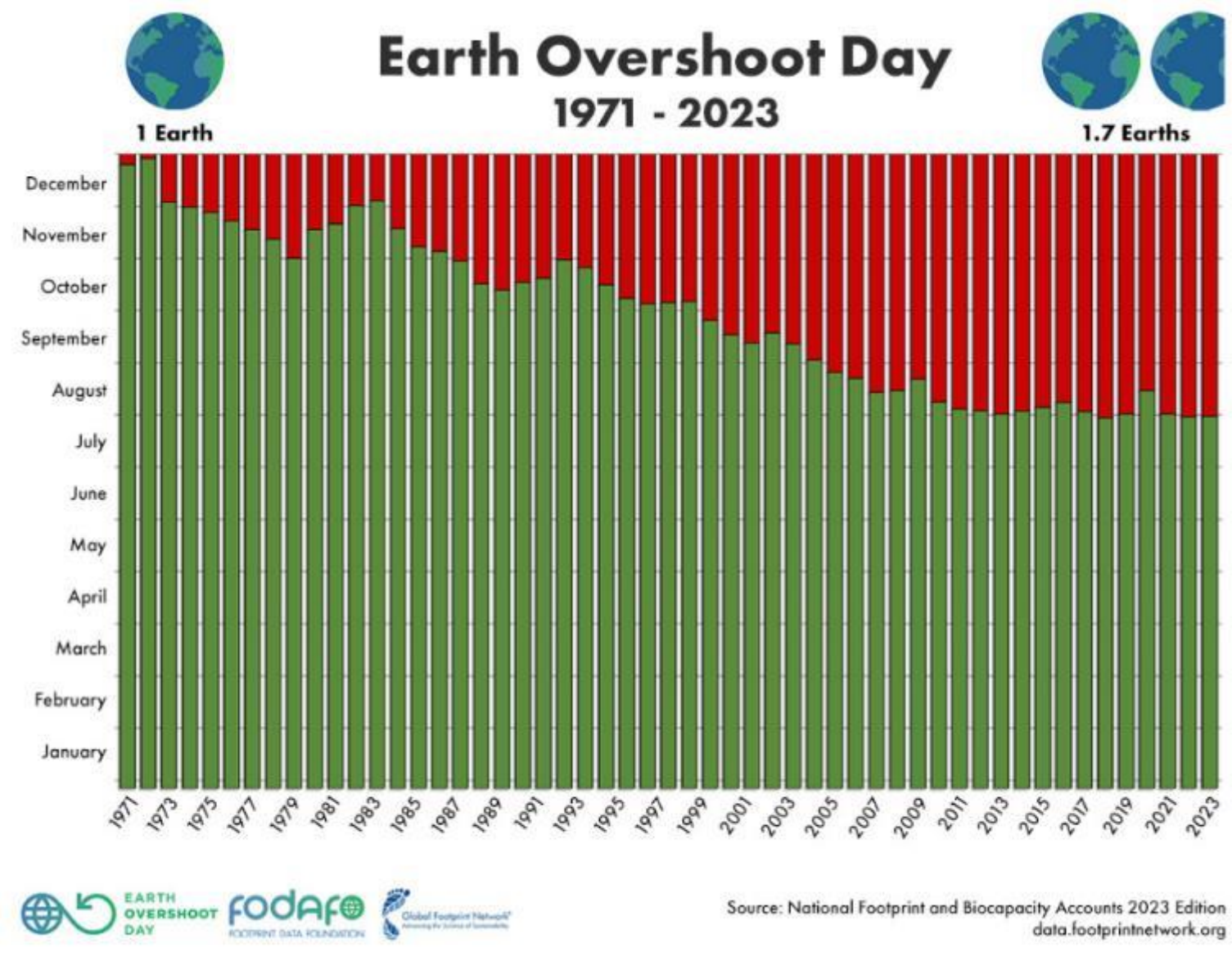


WHO, 1987. Our Common Future

SpareBank 1 REGNSKAPSHUSET

Globalt overforbruk siden 70-tallet

2023: 2. august



https://www.overshootday.org/

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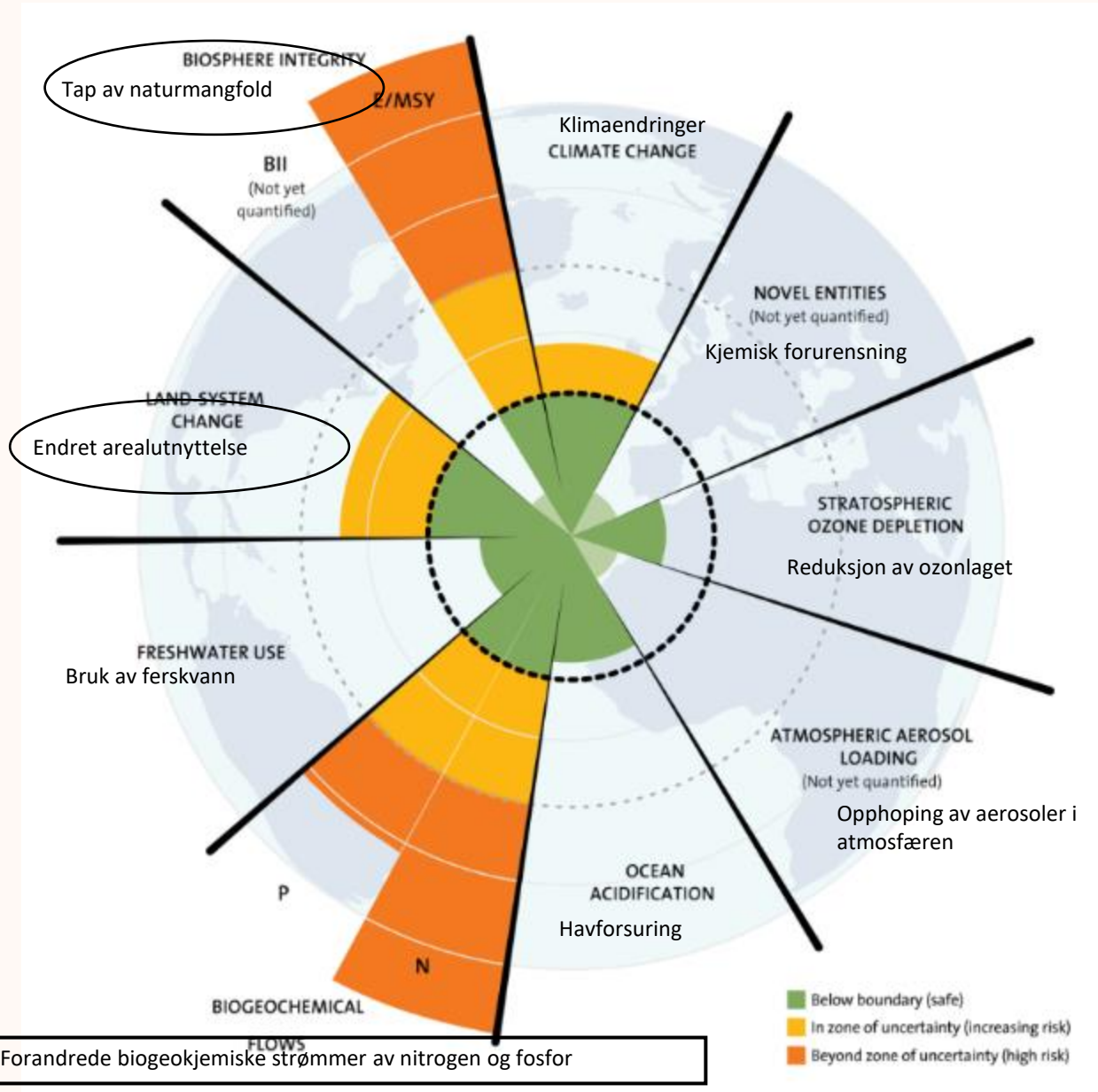
Jordas bæreevne er overskredet



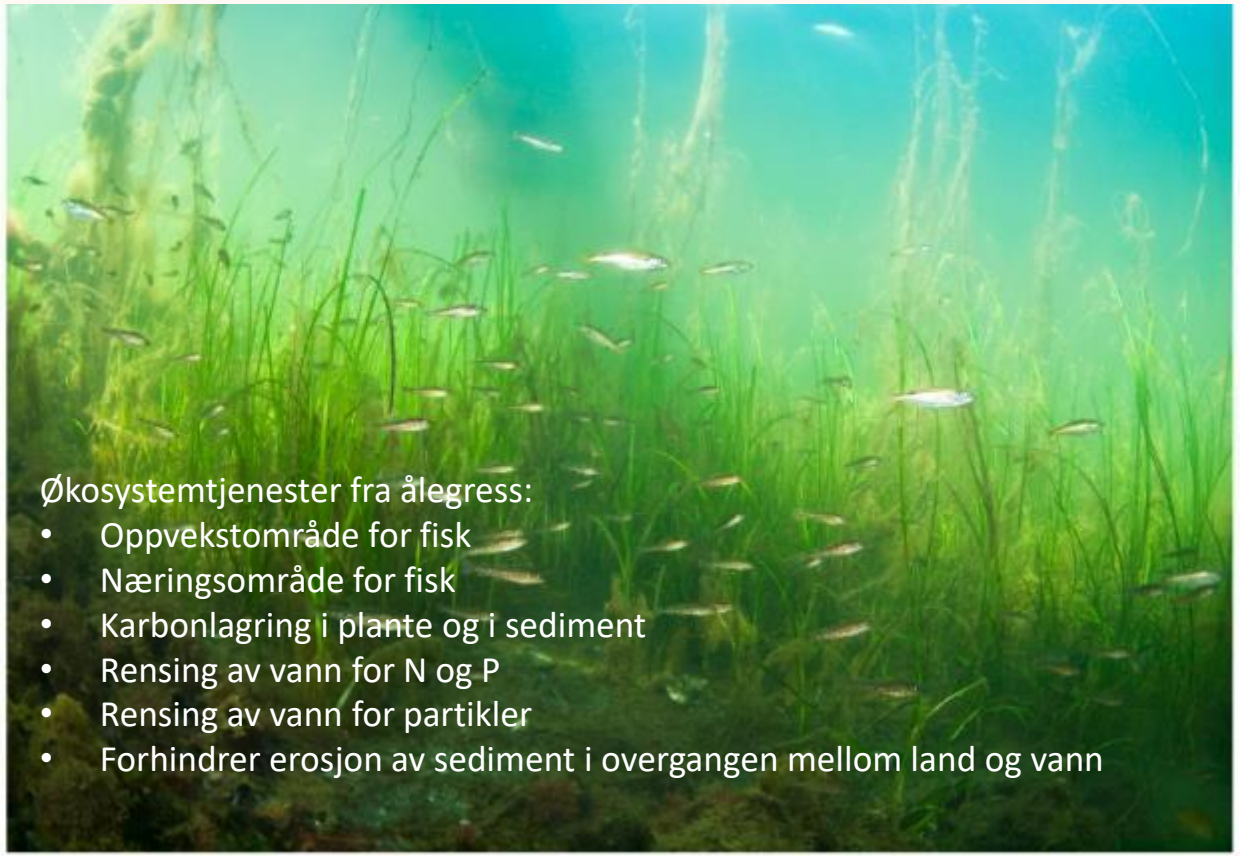
Rockström, J., W. Steffen, K. Noone, Å. Persson, et.al. 2009. Planetary boundaries: exploring the safe operating space for humanity. *Ecology and Society* 14(2): 32

SpareBank 1 REGNSKAPSHUSET

Tap av naturmangfold påvirker økonomi

- 5-8% av global jordbruksproduksjon er avhengig av pollinatorer
- Økosystemtjenesten som pollinatorer leverer er verdt 235-577 milliarder US dollar
- I Norge antar man at pollinatorerne sitt arbeid verdt omtrent 900 millioner NOK i året

Seljetre er ei viktig matkjelde for pollinatorar tidleg om våren. Foto: Steffan Jo



Økosystemtjenester fra ålegress:

- Oppvekstområde for fisk
- Næringsområde for fisk
- Karbonlagring i plante og i sediment
- Rensing av vann for N og P
- Rensing av vann for partikler
- Forhindrer erosjon av sediment i overgangen mellom land og vann

Ålegrasenger er viktige oppvekst- og næringsområder for bl.a. torskeyngel. Foto: Jonas Thormar / HI

Landbruks- og matdepartementet, 2018. Nasjonal pollinatorstrategi.
https://www.hi.no/hi/temasider/arter/alegras

SpareBank 1 REGNSKAPSHUSET

Omstilling av næringsliv og samfunn skal gjøre Norge til et lavutslippsland innen 2050

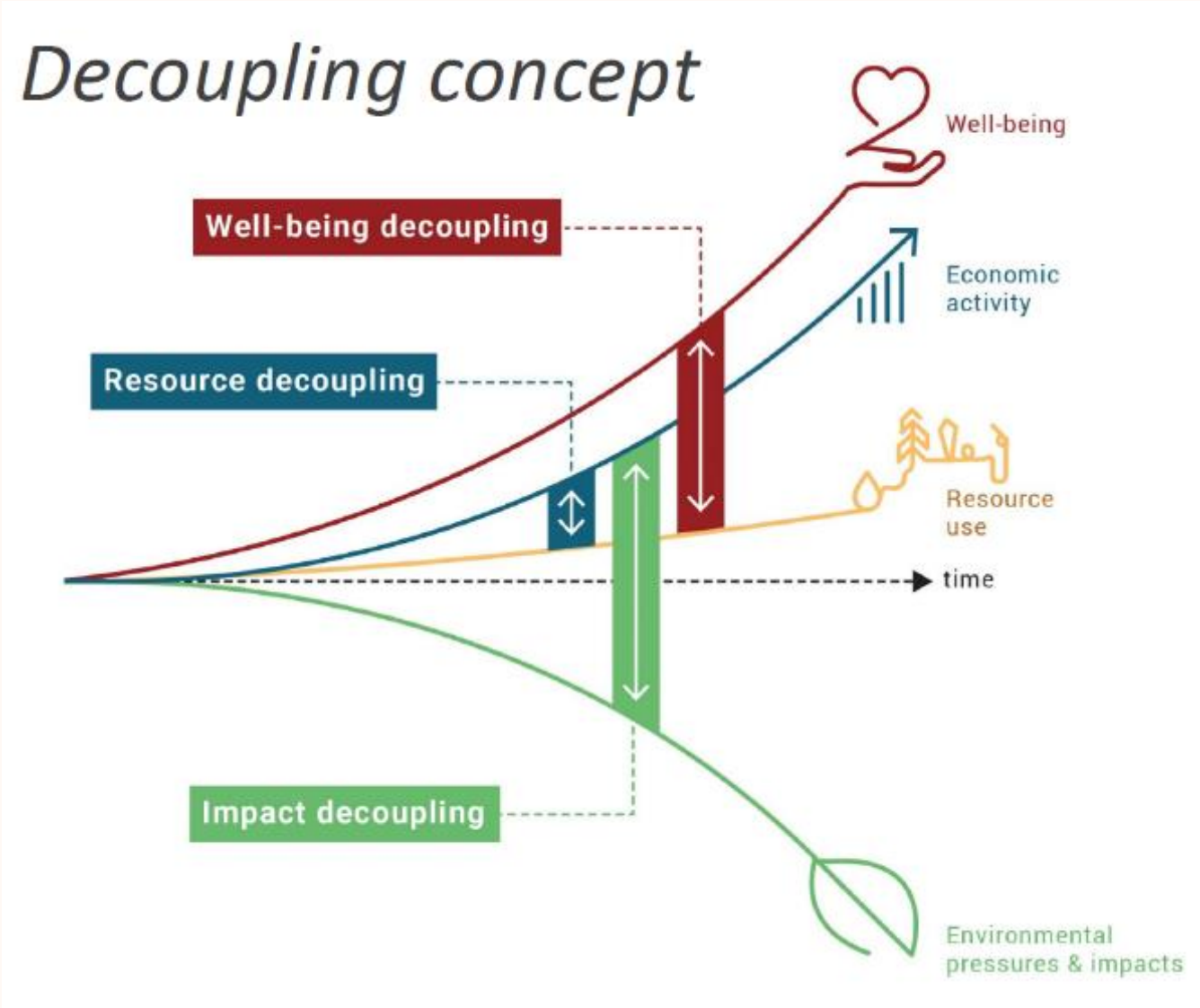
Klimaloven

Sammenlignet med referanseår 1990 skal klimagassutslippene reduseres med:

- 50-55% reduksjon innen 2030
- 90% reduksjon innen 2050

Uttak og prosessering av nytt råstoff står for:

- 50% av klimagassen
- 90% av tap av biodiversitet
- 90% av vannstress



Circular Economy, utopia or promising new business model? An evaluation of Circular Economy efficiency against environmental challenges

SpareBank 1 REGNSKAPSHUSET

Omstilling tvinges frem av reguleringer, lover, forskrifter og standarder

Internasjonale målsetninger og reguleringer

- EUs Green Deal
  - «Fit for 55»
  - EUs taksonomi
- Bærekraftsdirektivet, CSRD
- Parisavtalen
- FNs bærekraftsmål
- Øvrige rammeverk og standarder:
  - Global Reporting Initative
  - Task Force on Climate-related Financial Disclosures
  - Task Force on Nature-related Financial Disclosures
  - European Sustainability Reporting Standards
  - Greenhouse Gas Protocol
- Transparency Acts

Innføres i Norsk lov og gir **nye rammebetingelser** for virksomheter

- Klimaloven
- Åpenhetsloven

- Myndighetene innfører lovgivning for grønn omstilling
  - EU-direktiver

- Finansinstitusjoner måler seg på grønn omstilling
  - Grønn utlånsandel
  - EU-taksonomi
  - Forsikringer

- Bransjen anser det som høy risiko å låne ut til, investere eller forsikre «grå bygg» eller «grå anlegg».

I tillegg innføres sektorspesifikke krav

- Etterlevelse av taksonomikrav

- Klima og miljø implementeres som krav i offentlige anbud og kontrakter

Og krav til virksomheter i kunde-leverandør relasjonen

- Kunder kan kreve dokumentasjon eller forpliktelse på bærekraftsinitiativer
  - Et eksempel er SBT (Science Based Targets Initiative)

- Kravene videreføres til leverandører
  - Krav til miljødeklarasjoner (EPD) for byggevarer
  - Krav om utslippsfri byggeplass
  - Krav til ombruk og materialgjenvinning

SpareBank 1 REGNSKAPSHUSET

Det grønne skiftet fører med seg nye krav for norsk næringsliv – bærekraft blir license to operate.

Myndighetene og finansinstitusjonene stiller nye krav til handling og rapportering for å nå sine mål.

Norske bedrifter vil måtte forholde seg til krav direkte, eller via kunder og andre interessenter.

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Hvordan begynner man?

1) **Bærekraft inn som punkt på agendaen i styret og ledelsen**

2) **Start med å forstå det store bildet**
   - Hvordan påvirkes dere av kommende reguleringer?
   - Hvilke krav stiller interessenter (kunder, samarbeidspartnere, leverandører, ansatte og potensielle ansatte) i dag
   - Hvordan vil disse kravene være i fremtiden?

3) **Sett et ambisjonsnivå** for rapportering og implementering av bærekraft
   - Hva gjør andre selskap i din bransje?

4) **Implementer** rapportering og **kvantifiser** målbare størrelser
   - Kvantifiser, fastsett og overvåk utvikling i nøkkeltall over tid

5) **Operasjonaliser** og **forbedre**
   - Samarbeid og partnerskap for å redusere klimafotavtrykk og skape grønn vekst
   - Hvordan kan dere utvide eller omstille deres drift til å bli mer bærekraftig?

Det som måles og registreres blir det fokus på!

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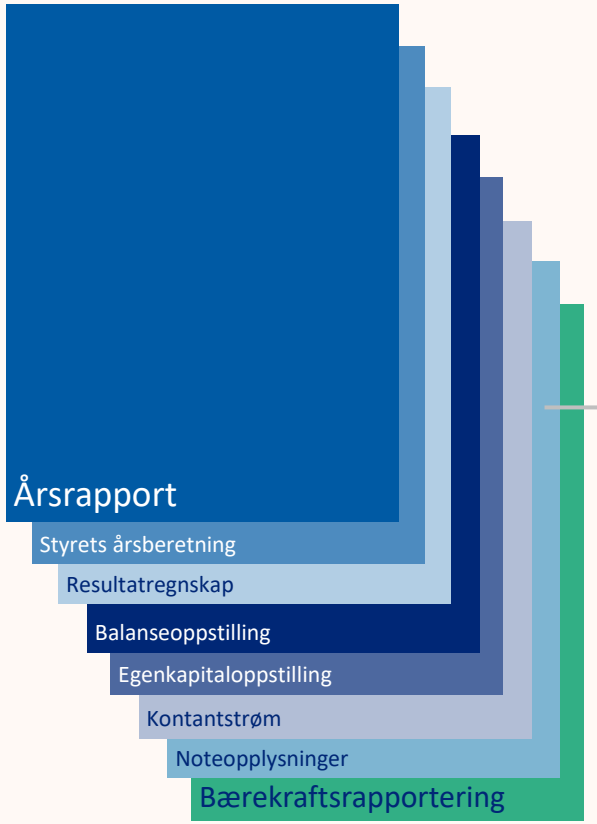
Bærekraft integreres i årsrapporten, og vil være en sentral del av virksomhetsstyringen



Det lovpålagte

- Åpenhetsloven
- Regnskapsloven § 3-3c

Klimaregnskap

- Oversikt over tCO_2e-utslipp
- Historisk sammenligning
- Fremtidig målsetning
- Miljømessige KPI'er

Bærekraftsrapporten

- Redegjørelse virksomhet
- Vesentlighetsanalyse
- Risikostyring
- Redegjørelse E, S og G
- Science Based Targets
- Tiltak- og fremtidsplan

SpareBank 1 REGNSKAPSHUSET


Omstilling til det grønne skiftet vil opprettholde og øke konkurransekraften

SpareBank 1 SMN-konsernet

Energi- og klimaregnskap 2022

Energi- og klimaregnskap

Endringene i klimagassutslipp kan oppsummeres i fem punkter:

1. Vi har i 2022 samlet inn primærdata på elektrisitet
2. Aktiviteten vår har i 2022 økt sammenlignet med 2021
3. Vi har i 2022 estimert utlånsporteføljen vår ihht. PCAF
4. Vi har inkludert og estimert flere regnskapskonti[6]
5. Vi har endret beregningsmetodikk

Som et steg i vår forbedring har vi i 2022 gjennomført en modellendring fra Klimakost EU28 til Klimakost FIGARO. Modellendringen fører til betydelige utslippsøkninger i Scope 3 oppstrøm, og vi har delt inn endringene i «Reelle utslippsendringer» og «Utslippsendring av modellendring»[5].

Basisåret (2019) er beregnet med like forutsetninger som rapporteringsåret for å til enhver tid muliggjøre en konsistent sammenligning.

Scope 1 = utslippskilder tilknyttet egne driftsmidler.
Scope 2 = indirekte utslipp knyttet til innkjøpt energi.
Scope 3 = indirekte utslipp fra innkjøpte varer eller tjenester

SpareBank 1 SMN-konsernet	Basisår (2019)	Fjorår (2021)	Rapporteringsår (2022)	Endring 2022 / 2021	Målsetning 2030	Endring 2022 / 2019
Scope 1 GHG-utslipp	Klimakost (FIGARO)[2]	Klimakost (EU28)[1]	Klimakost (FIGARO)[2]			
Total netto Scope 1 GHG-utslipp (tCo2e)	**0**	**0**	**0**	**0**	**0**	**0**
Scope 2 GHG-utslipp						
Netto megawatt-timer (MWh) forbrukt	5 707,10	5 650,03	5 757,74	1,91 %	2280,77	0,89 %
Total netto lokasjonsbasert Scope 2 GHG-utslipp (tCO_2e)	**776,2**	**768,40**	**783,05**	**1,91 %**	**310,18**	**0,89 %**
Total netto markedsbasert Scope 2 GHG-utslipp (tCO_2e)	**2 260,0**	**2 288,26**	**1 898,09**	**-17,05 %**	**903,19**	**-16,01 %**
Scope 3 GHG-utslipp						
Total netto Scope 3 oppstrøm GHG-utslipp (tCO_2e)	**22 127,03**	**11 294,67**	**20 145,35**	**78,36 %**	**8842,79**	**-8,96 %**
Kjøpte varer og tjenester	15 408,39	9 423,58	15 872,21	68,43 %	6157,77	3,01 %
Kapitalvarer	1 913,61	620,26	1 490,44	140,29 %	764,75	-22,11 %
Transport og distribusjon	761,80	314,51	364,19	15,80 %	304,45	-52,19 %
Avfall som følge av operasjoner	29,13	28,75	35,69	24,12 %	11,64	22,51 %
Forretningsreiser	4 014,09	907,56	2 382,82	162,55 %	1604,18	-40,64 %
Total netto Scope 3 nedstrøm GHG-utslipp (tCO_2e)	**N/A**	**1 020 051,62**	**1 076 599,37**	**5,54 %**	**N/A**	**N/A**
Finansierte utslipp	N/A	1 020 051,62	1 076 599,37	5,54 %	N/A	N/A
Jordbruk og skogbruk	N/A	478 168,46	544 194,41	13,81 %	N/A	N/A
Fiske og fangst	N/A	59 324,31	38 158,43	-35,68 %	N/A	N/A
Havbruk	N/A	14 340,68	14 842,38	3,50 %	N/A	N/A
Industri og bergverk	N/A	28 355,77	28 228,29	-0,45 %	N/A	N/A
Bygg, anlegg, kraft og vannforsyning	N/A	6 132,46	9 387,96	53,09 %	N/A	N/A
Varehandel, hotell- og restaurantvirksomhet	N/A	18 498,17	21 740,27	17,53 %	N/A	N/A
Sjøfart og offshore	N/A	157 741,22	219 144,30	38,93 %	N/A	N/A
Eiendomsdrift	N/A	5 885,08	6 411,93	8,95 %	N/A	N/A
Forretningsmessig tjenesteyting	N/A	16 465,73	16 175,59	-1,76 %	N/A	N/A
Transport og annen tjenesteytende virksomhet	N/A	192 935,52	134 548,53	-30,26 %	N/A	N/A
Offentlig forvaltning	N/A	1,86	1,25	-32,98 %	N/A	N/A
Øvrige sektorer	N/A	6 487,93	5 126,77	-20,98 %	N/A	N/A
Lønnstakere[3]	N/A	16 366,56	15 565,56	-4,89 %	N/A	N/A
Lån/leasing av fossile biler[4]	N/A	19 347,86	23 073,70	19,26 %	N/A	N/A
Totale GHG-utslipp						
Totale GHG-utslipp (lokasjonsbasert) (tco2e)	**N/A**	**1 032 114,69**	**1 097 527,78**	**6,34 %**	**N/A**	**N/A**
Totale GHG-utslipp (markedsbasert) (tco2e)	**N/A**	**1 033 634,55**	**1 098 642,81**	**6,29 %**	**N/A**	**N/A**

1. Se side 9 for forklaring av Klimakost FIGARO-modell
2. Se side 9 for forklaring av Klimakost EU28-modell
3. Klimagassutslipp på «Lønnstakere (boliglån)» er estimert basert på finansierte bygg.
4. Kun 6,8 av 12,1 mrd. av utlånsporteføljen til SpareBank 1 Finans Midt-Norge AS er inkludert. Gjelder lån/leasing til fossilbiler.
5. Se side 6 for oversikt over reelle utslippsendringer og utslippsendring av modellendring.
6. Nye utslippsberegnede konti har økt utslippet (oppstrøm) i 2022 med 2 077,38 tCO_2e.

Eksempel på resultat av bærekraft integrert i virksomhetsstyring:

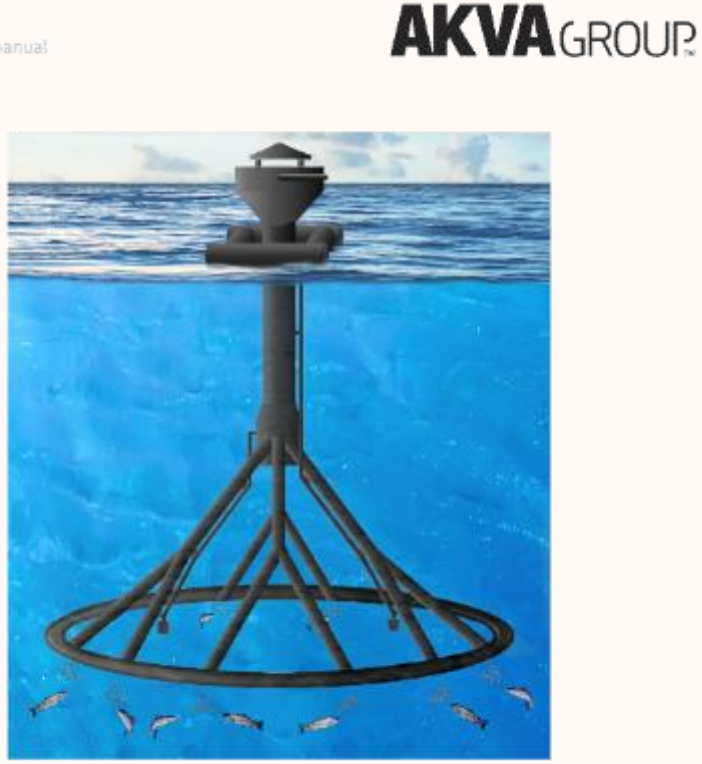
- ***Ny Fôringsteknologi. (Vannfôring)***
- Som et delprosjekt av Atlantis Subsea Farming er det utført pilottester på ny foringsteknologi.
- Potensielt resultat er opptil 50-90% mindre energiforbruk ved utfôring.
- - Flere leverandører ser nå på slike løsninger
- Prinsippet resulterer også i vesentlig reduksjon av slitasje på slanger og fôr, noe som bidrar sterkt med tanke på mikroplastfokuset i næringen.

SinkabergHansen investerer i ny type fôringsteknologi

Den skal gi store miljøeffekter og kostnadsbesparelser for selskapet.

Miljø/Energi:

- ***«Ny» Fôringsteknologi - Undervannsfôring***
- SinkabergHansen AS står bak ideen om undervannsfôring.
- Utviklet siden 2013-2014
- 30-40% reduksjon av lufttrykket som kreves ved utfôring.



Takk for meg!

SpareBank 1 REGNSKAPSHUSET

Thor Kamfjord

BUSINESS ON THE ROCK

Endelig en bærekraftig fremtid med plast - enten vi vil eller ikke

Business on the Rock, 4. august 2023

Thor.Kamfjord@norner.no

Unique European Polymer Exploration Centre

Full service-portfolio in the plastics value chain from polymer to processing and end use innovations

Serving clients with research, development, testing and consulting in > 30 countries every year

Wealth & Consumption vs. Poverty

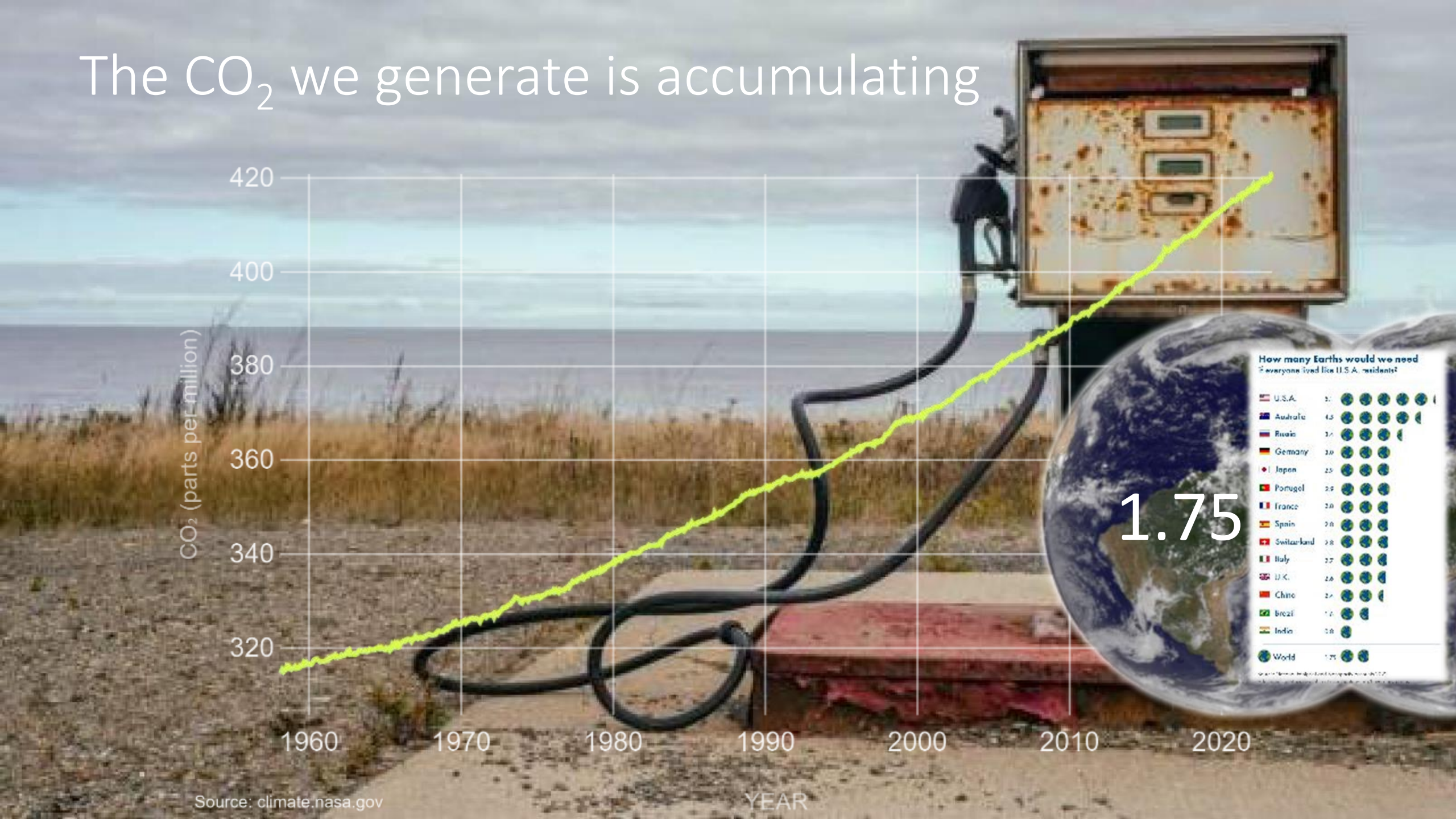
Roskildefestival 2023- last day of party 1. juli

Dette er galskap. Jeg hadde ikke sett for meg at det skulle være slik.

Dagbladet 03.07.23


Dagbladet tv
.....we need to start talking about Extended Consumer Responsibility
Dagbladet 03.07.23

The CO_2 we generate is accumulating



Europa is determined to take the lead!

"The Green Deal is Europe's ***Man on the moon moment.***"
Ursula von der Leyen, President of the European Commission

- EU-27 Number 1 Strategic Priority with two key pillars:
  - Climate-neutrality by 2050
  - Circular Economy
- Transformational roadmap with impacts on all European industries
- Circular Economy Action Plan
  - Plastics, Packaging, Construction, Automotive

EU actions are transformational

Almost 26 million tonnes

of plastic waste is generated in Europe every year

Around 80%

of marine litter is plastic

87%

of Europeans are worried about the impact of plastic products on the environment

Plastics will meet even stricter regulations

VISION = EU Green Deal + CEAP

CURRENT STATE

new record of CO_2 emissions in 2022

global consumption of materials

packaging waste generation

- Regulation on Packaging and Packaging Waste
- Regulation on the use of recycled plastics for FCMs

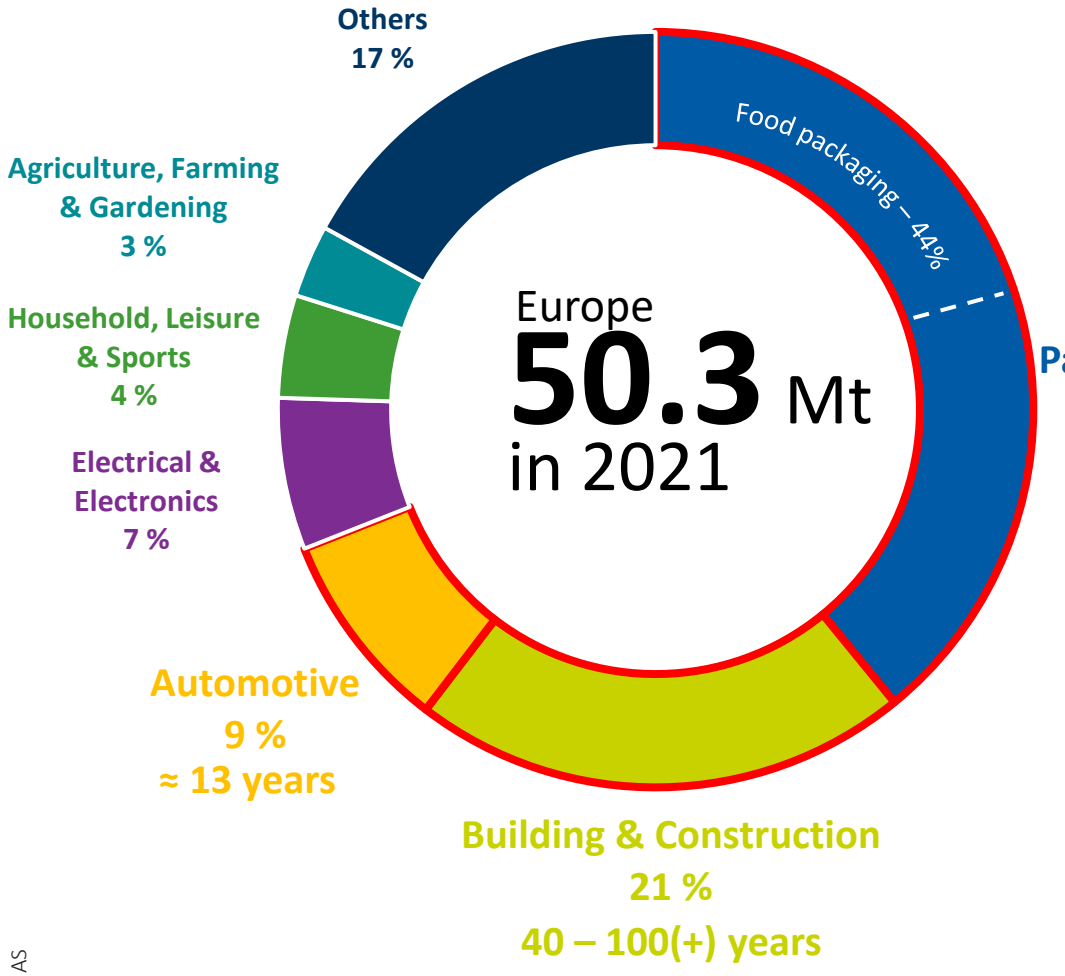
FUTURE STATE

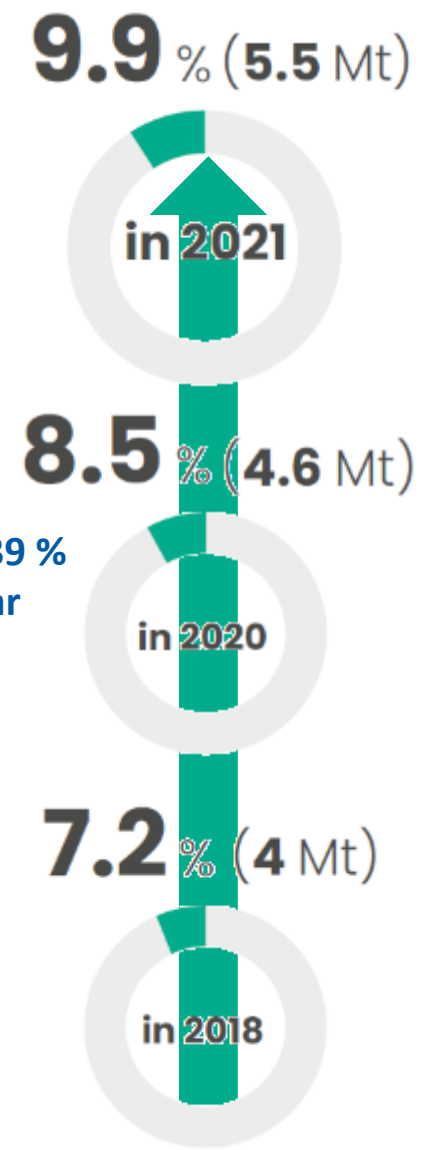
climate neutral EU by 2050

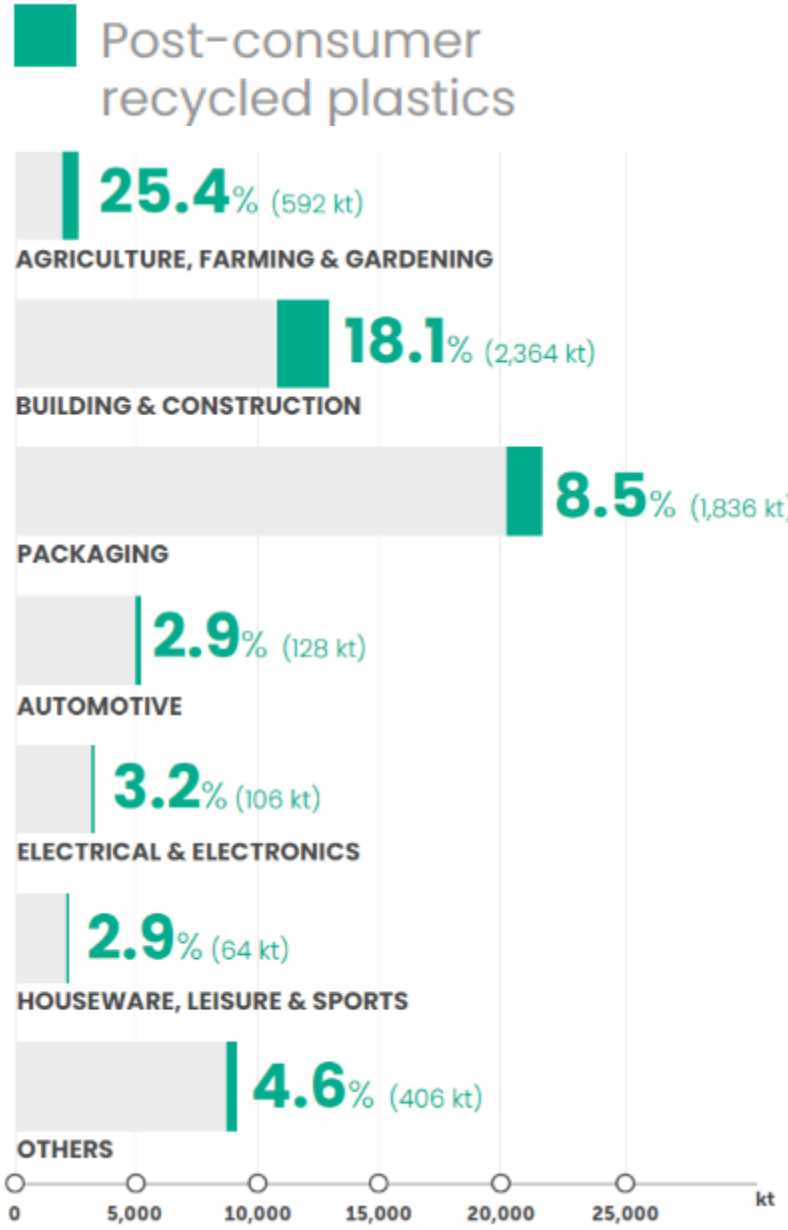
economic growth decoupled from resource use

key product value chains: packaging & plastics

The Plastics around us



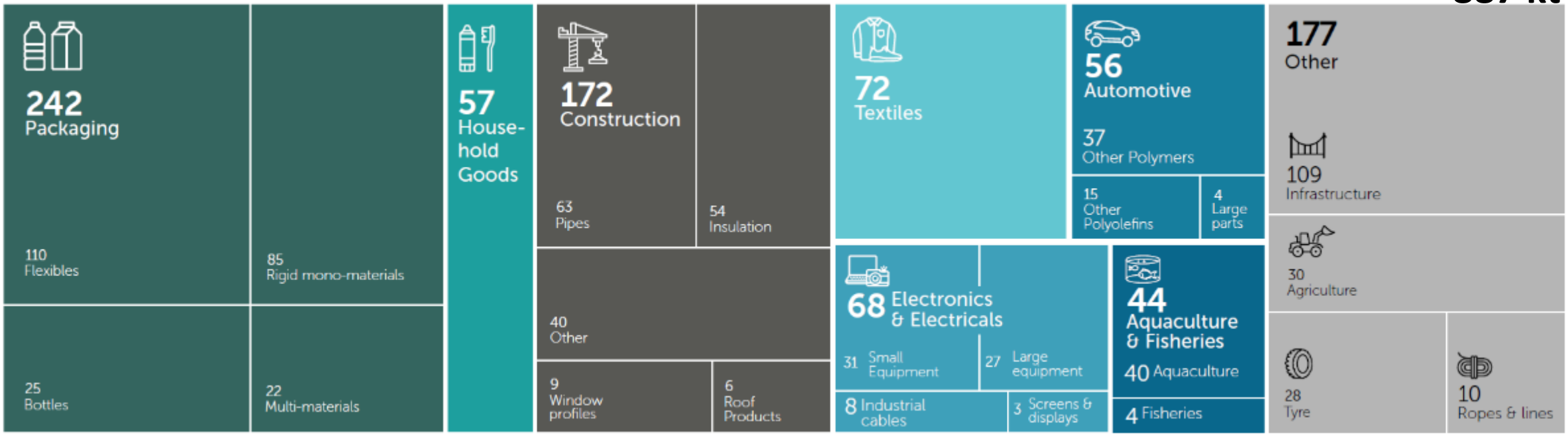




Source: Plastics Europe "Plastics the Facts 2022", Conversio Market & Strategy GmbH based on the input of the Plastics Europe Market Research Group (PEMRG)
The above data are rounded estimations.
Demand data are built on estimations of quantities bought by European converters, including imports.
Demand for recycled plastics and bio-based/bio-attributed plastics is not included. Polymers that are not used in the conversion of plastic parts and products (i.e., for textiles, adhesives, sealants, coatings, etc.) are not included.

Plastics have been a key enabler of economic growth across many sectors in Norway

887 kt



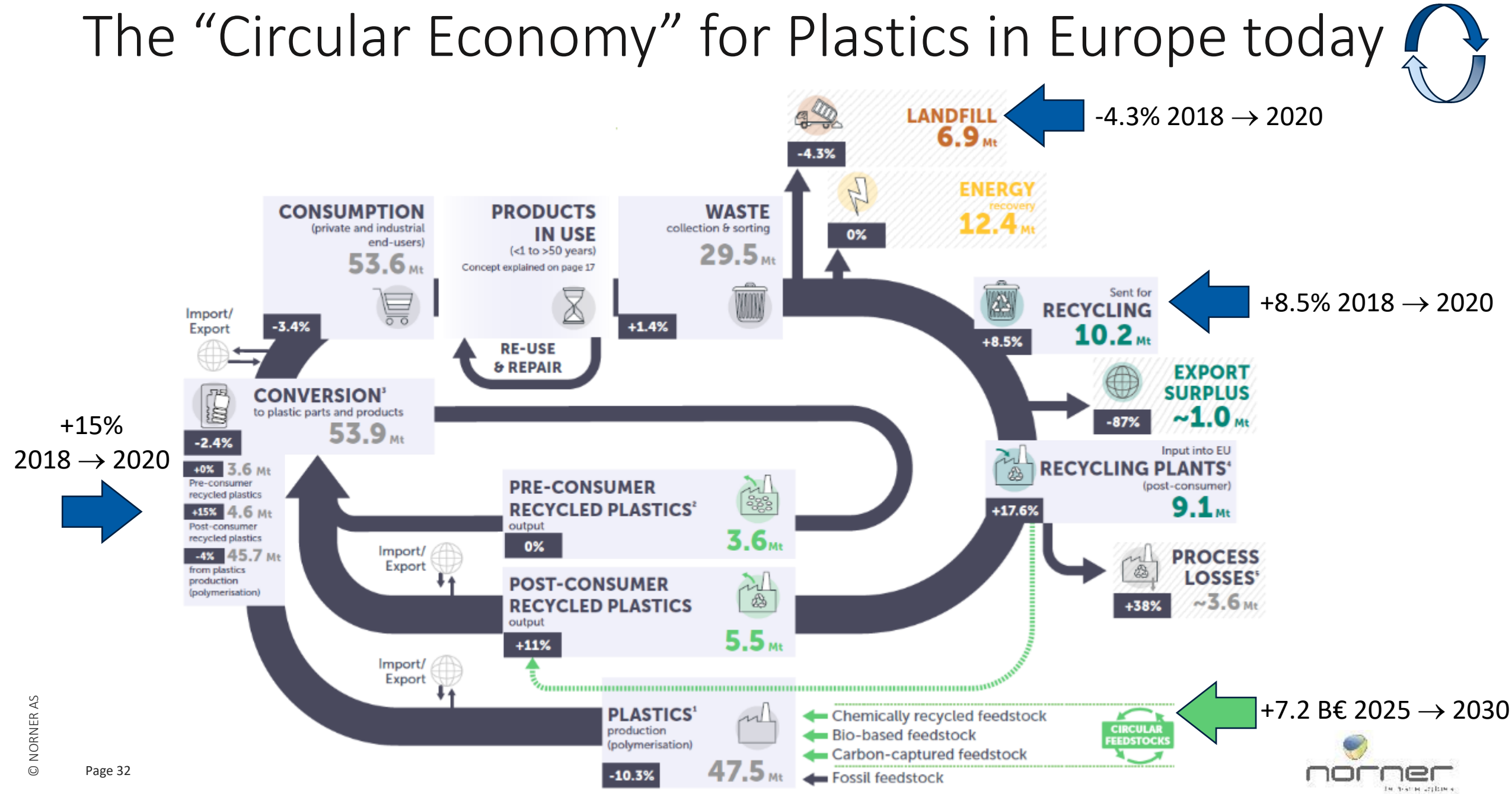
- 78 % linear: 12 kt reuse + 94 kt to mechanical recycling + 4 kt to chemical recycling
- 6 % of Norway's total annual GHG emissions: 2.8 mill. ton. CO_2 eqv.
- 2 % of the plastic waste leaks into the nature: 10 kt

Source: Systemiq Handelens Miljøfond, Mepex, "Achieving Circularity – Sythesis report, A low-emission circular plastic economy in Norway", 2023
*Note that this is the total GHG emissions associated with plastic consumption in Norway, including from production outside of Norway to meet Norwegian demand, as well as from waste management outside of Norway as a result of waste exports

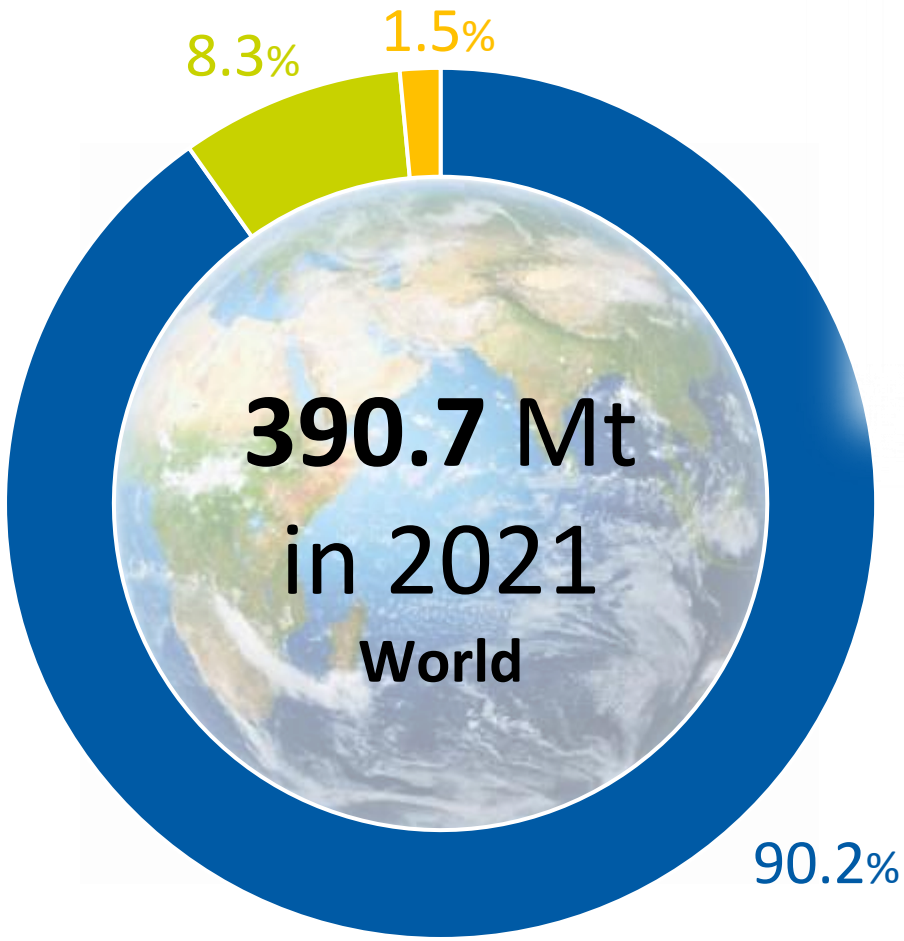
Norwegian Retailers' Environment Fund

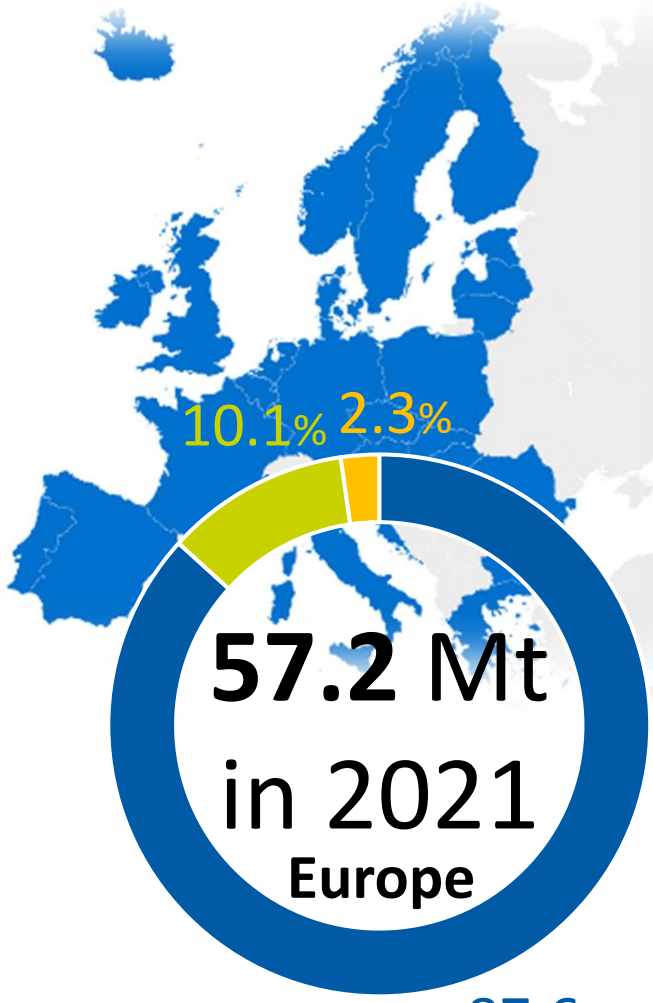
norner

The “Circular Economy” for Plastics in Europe today



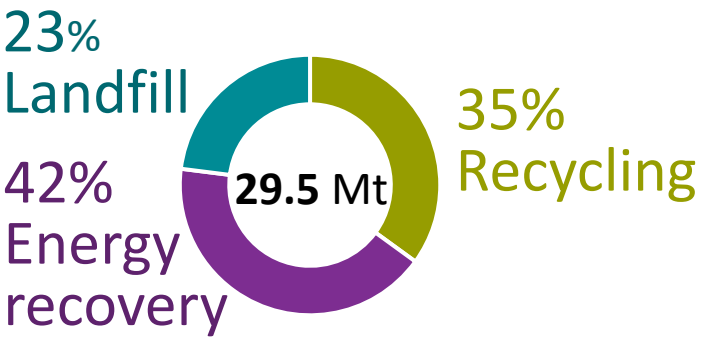
The global context



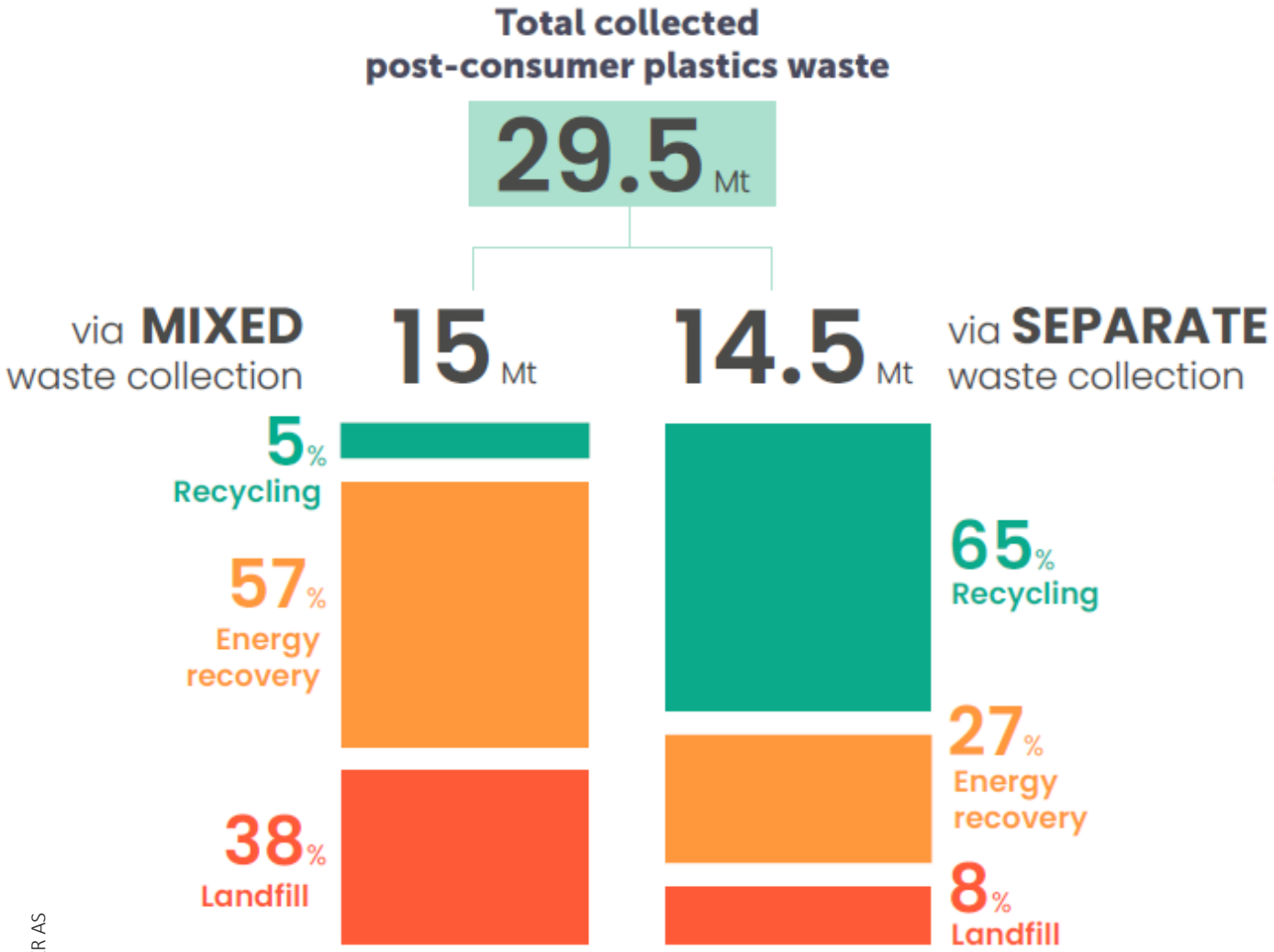


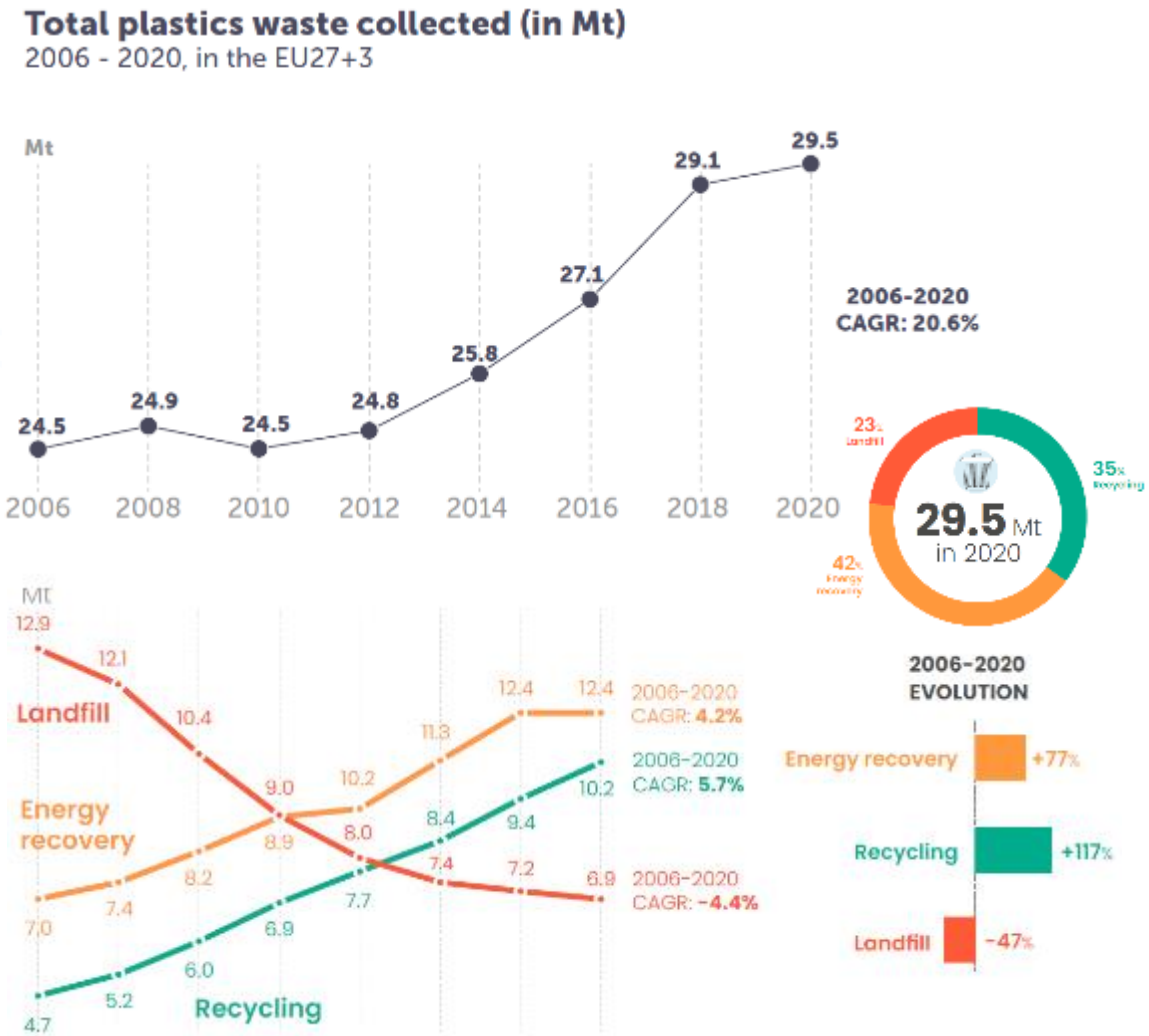
0.9 Mt
in 2021
Norway

- Fossile-based plastics
- Post-consumer recycled plastics
- Bio-based/bio-attributed plastics

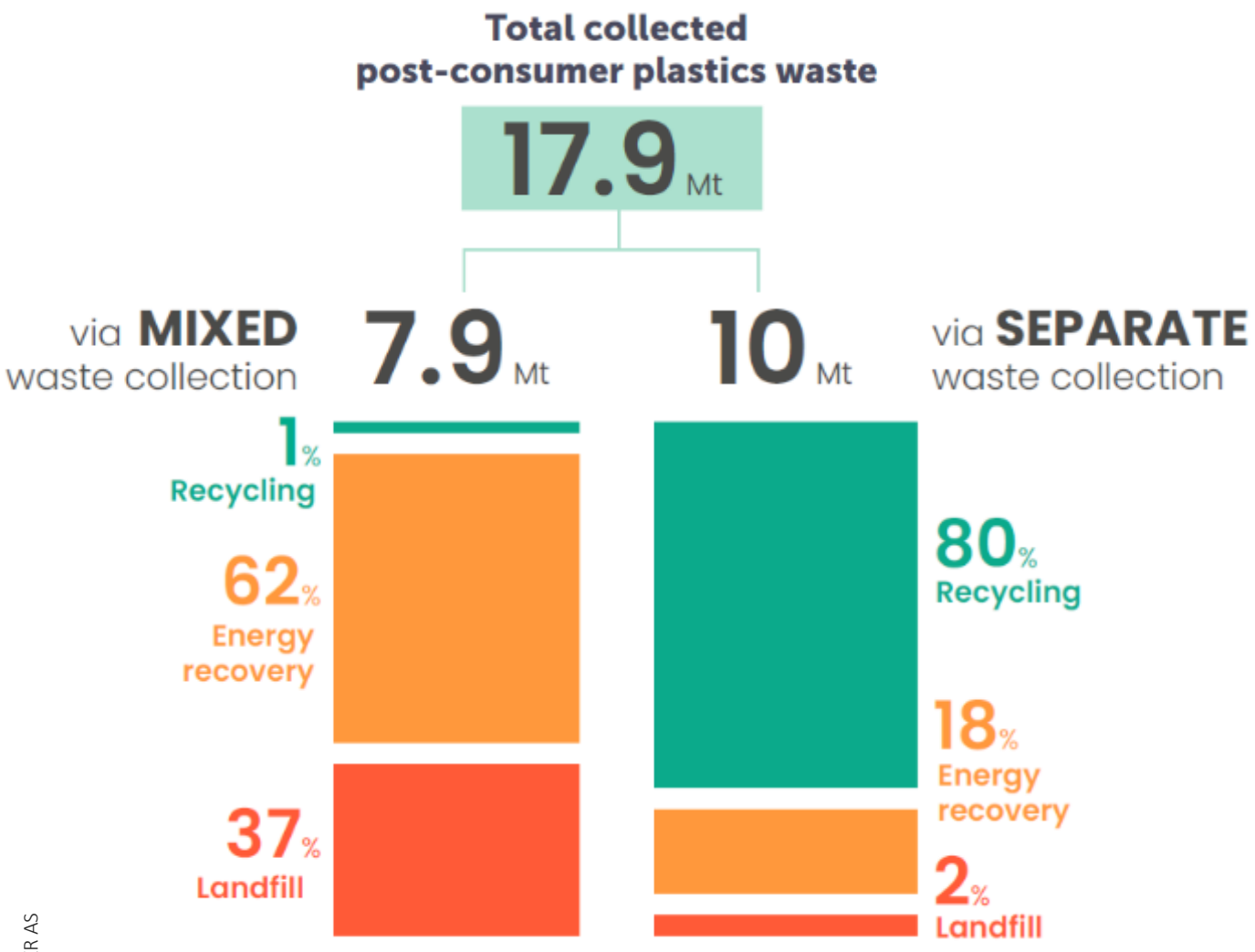


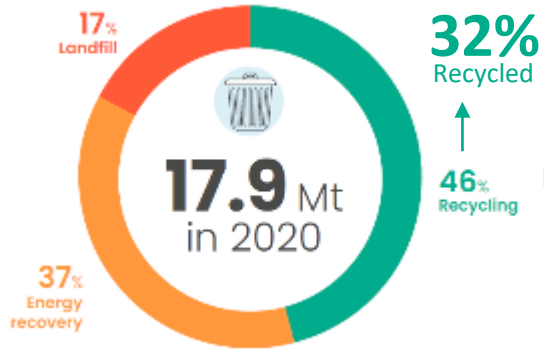
Separate collections leads to more recycling

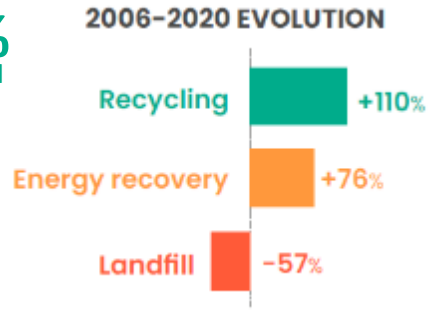


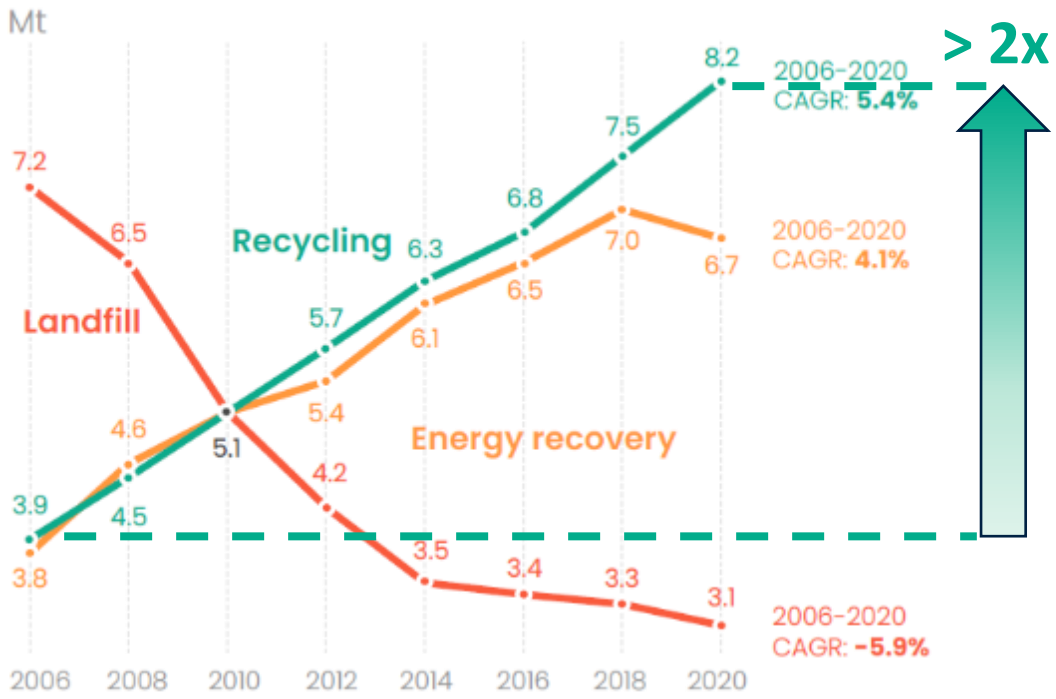


80x higher packaging recycling via separate collection









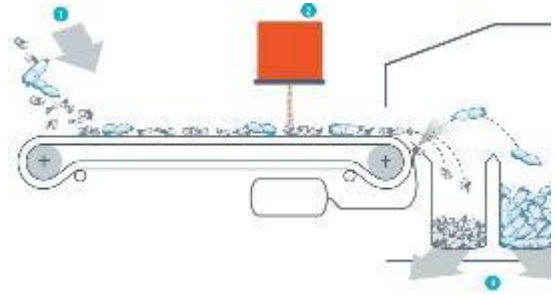
Difficult?

In Norway we collect 7.8 kg/inh/year

- 79% have curbside collection
- 9.8% have Optibag (coloured bags)
- 2.3% have central sorting

SIGNIFICANT DIFFERENCES IN RESULTS

- Optibag: 3.9 kg/inh./y [1]
- Kerbside collection: 7.3 kg/inh./y [2]
- Central sorting: 17.7 kg/inh./y [3]

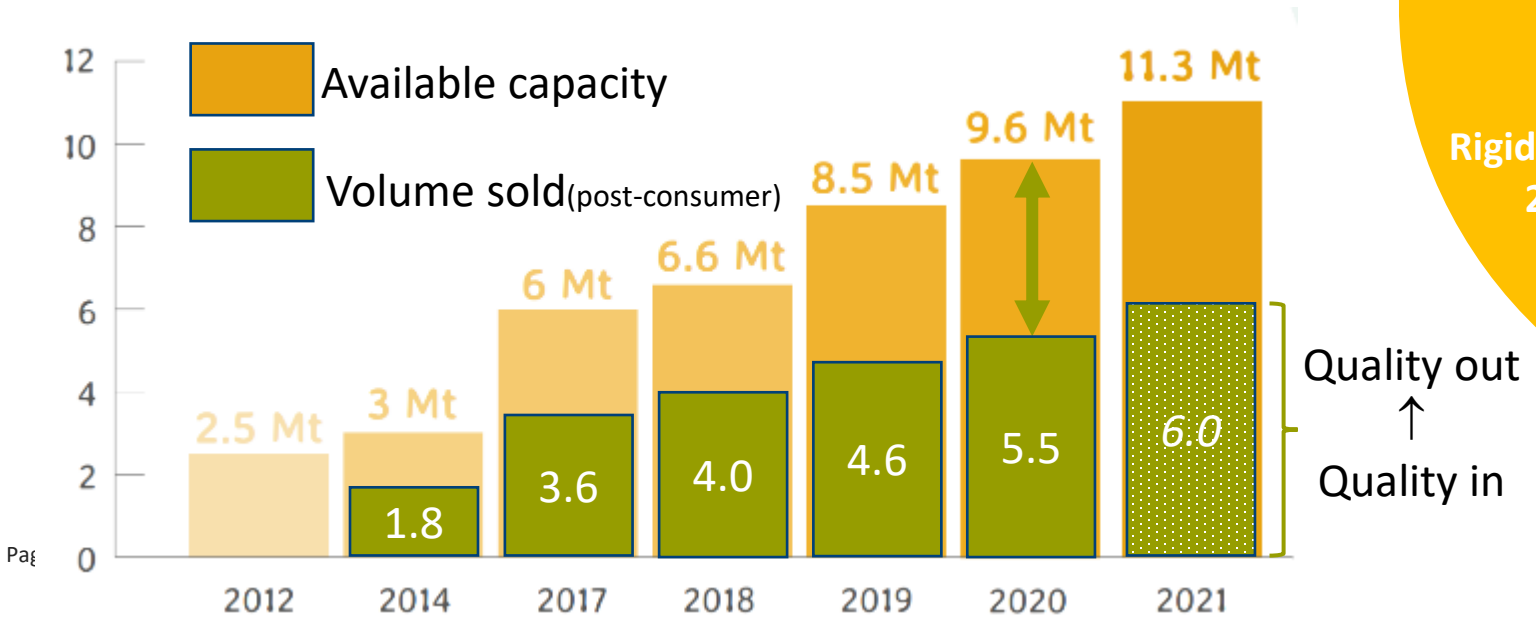


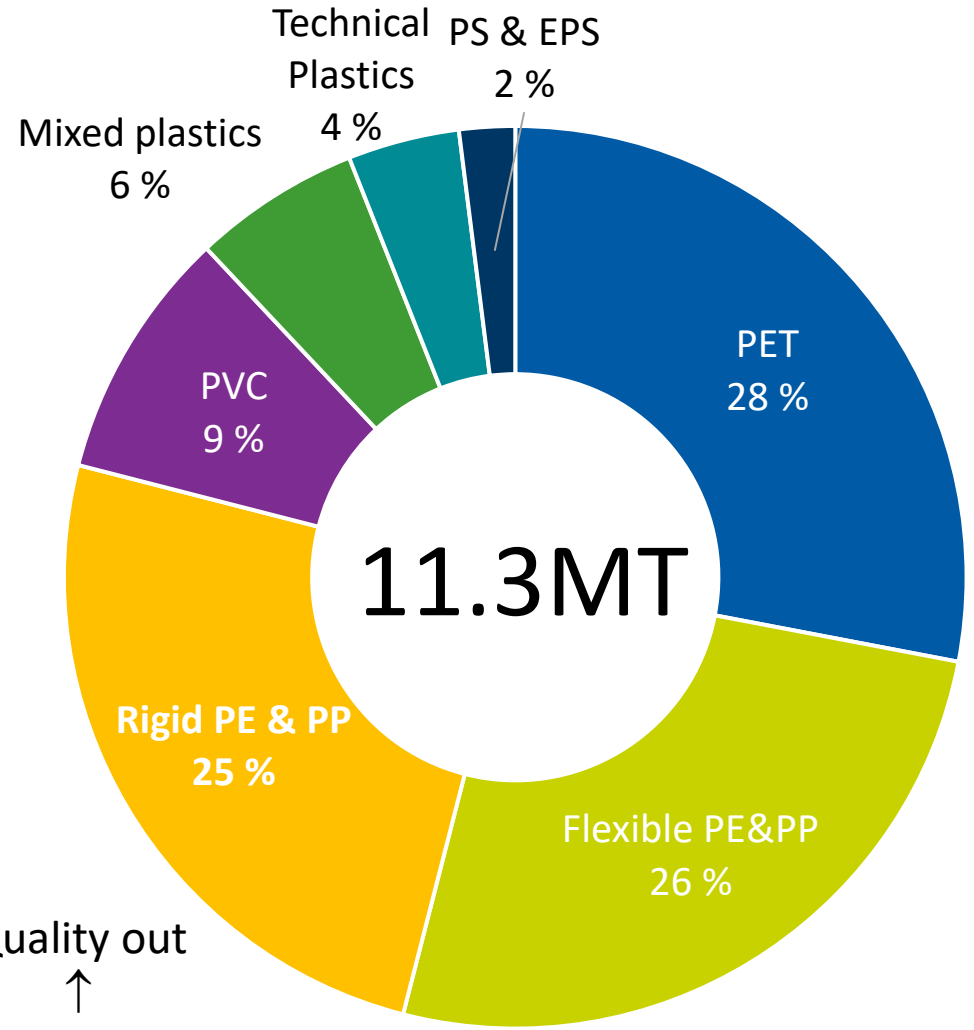
We want convenience!

Source: "Sirkulær plastemballasje i Norge – Kartlegging av verdikjeden for plastemballasje", Deloitte AS, 2019

Significant growth in capacity achieved - quality needed!

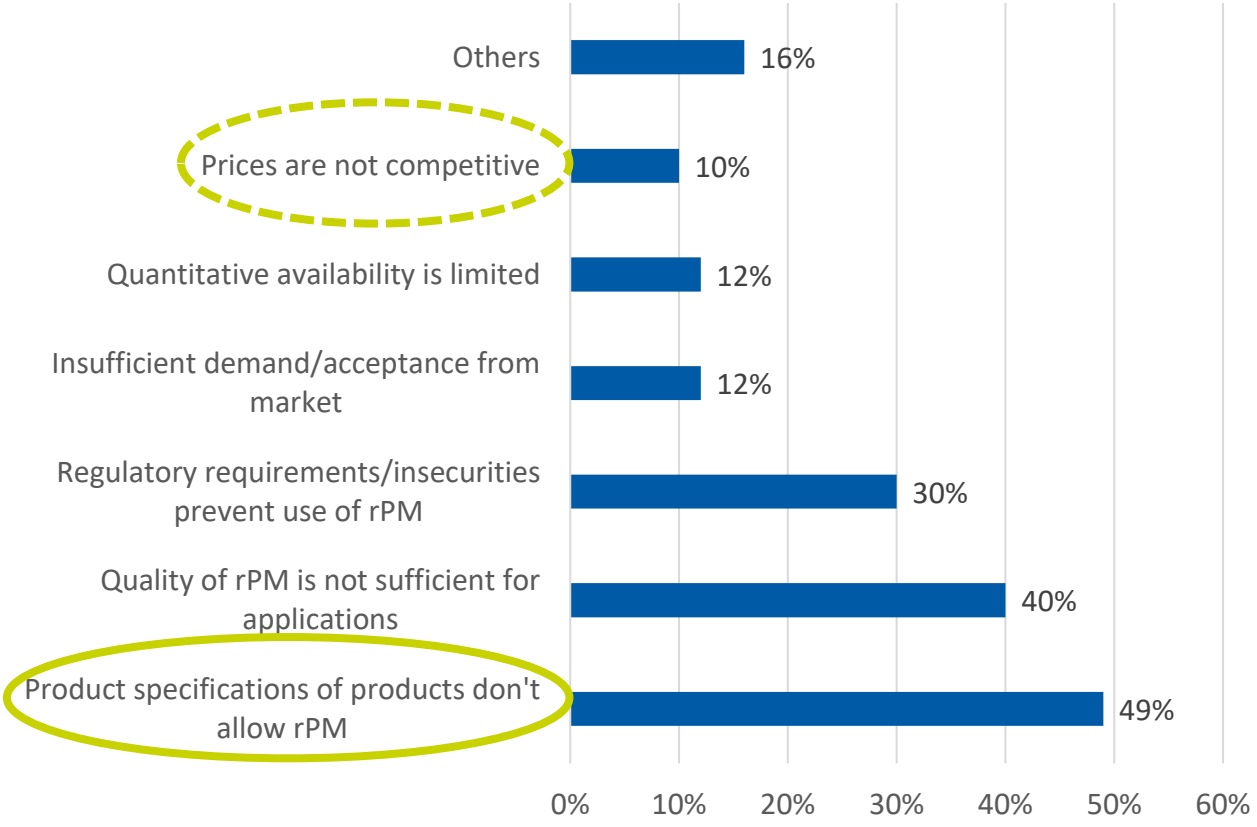
- In 2021, capacity for plastic recycling in Europe increased by 17% in comparison to 2020, reaching 11.3 million tonnes and 8.7 billion € in turnover
- Growth is mainly due to legislation and massive investments to ensure high-quality recycling and meet circular economy targets



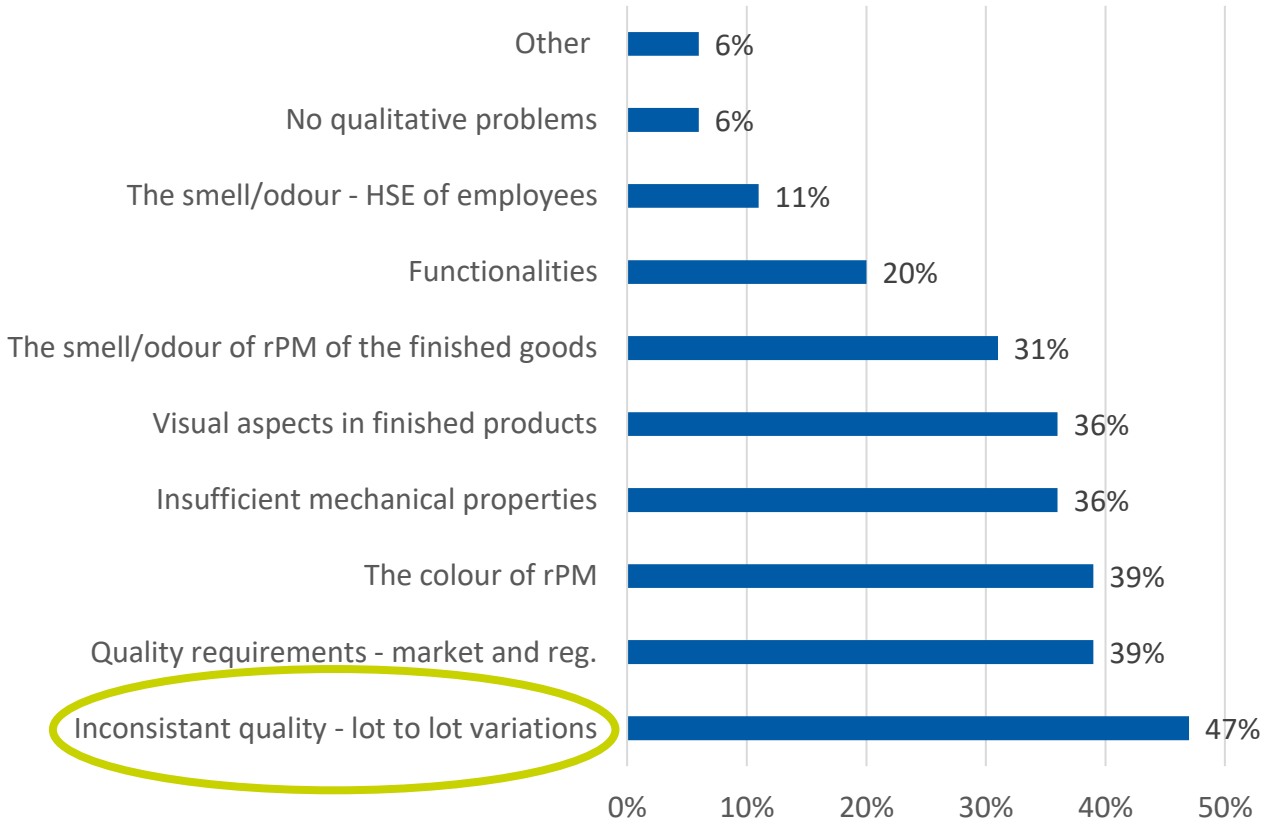


An increased use of recyclates is a significant challenge!

What are the main reasons preventing you from using recycled plastic materials?

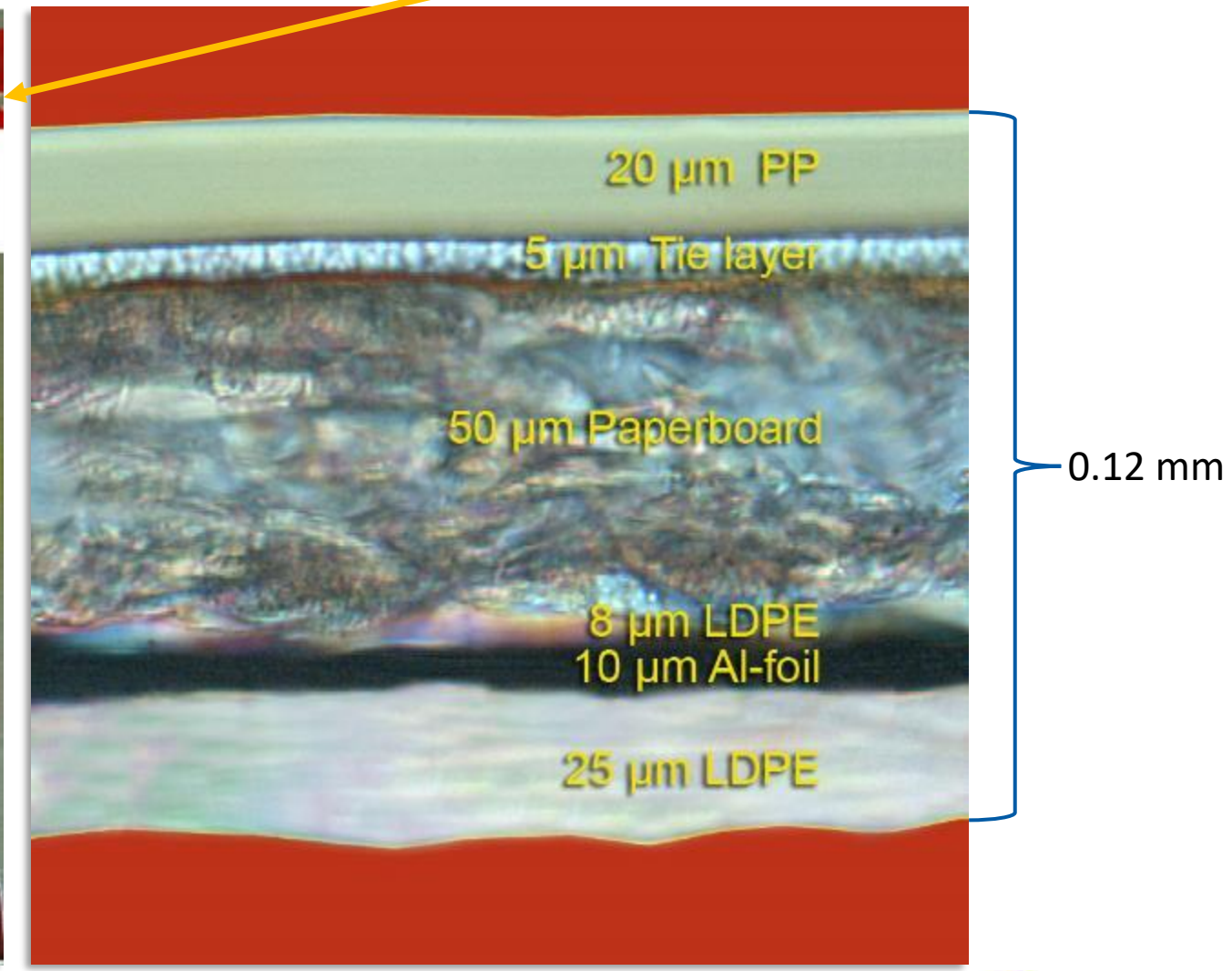


What qualitative problems prevent your company from using (more) recycled plastics materials?



Source: EuPC Recycled Plastic Materials Usage by Plastics Converters in Europe - 2019

Design for recycling, quality, environment & convenience?



Ambitious regulations are coming!

- New proposal for **P**ackaging and **P**ackaging **W**aste **R**egulation, 30 Nov. 2022
- Harmonize Extended Producer Responsibility (EPR) requirements to make them more effective across the EU
- Eco-modulation of EPR-fees on recyclability and percentage of recycled content
- Improve packaging design to promote reuse and recycling
- Increase recycled content in packaging
- Tackle excessive packaging
- Reduce packaging waste (by 15% by 2040 vs 2018)

PPWR


EUROPEAN COMMISSION

Brussels, 30.11.2022
COM(2022) 677 final

2022/0396 (COD)

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC

(Text with EEA relevance)

{SEC(2022) 425 final} - {SWD(2022) 384 final} - {SWD(2022) 385 final}

EN EN

When doing good, might still be bad….

- Tethered caps and lids are to remain attached for all beverage containers up to 3 litres from 2024
- Could require more than 50 to 200 kT of additional plastic to produce beverage bottles

+ 58 - 318 million kg CO2 eqv.

+ 244 million

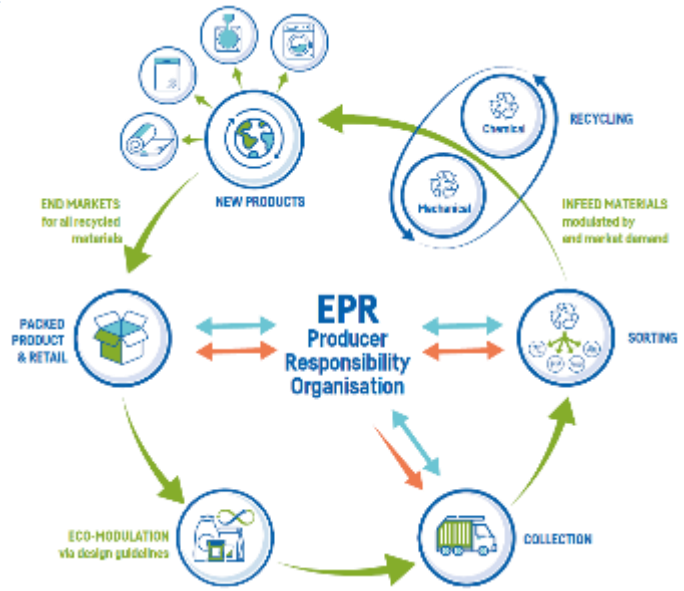
+ €2.7 - €8.7 billion cost (1350 bottling lines) for 3% of EU marine litter

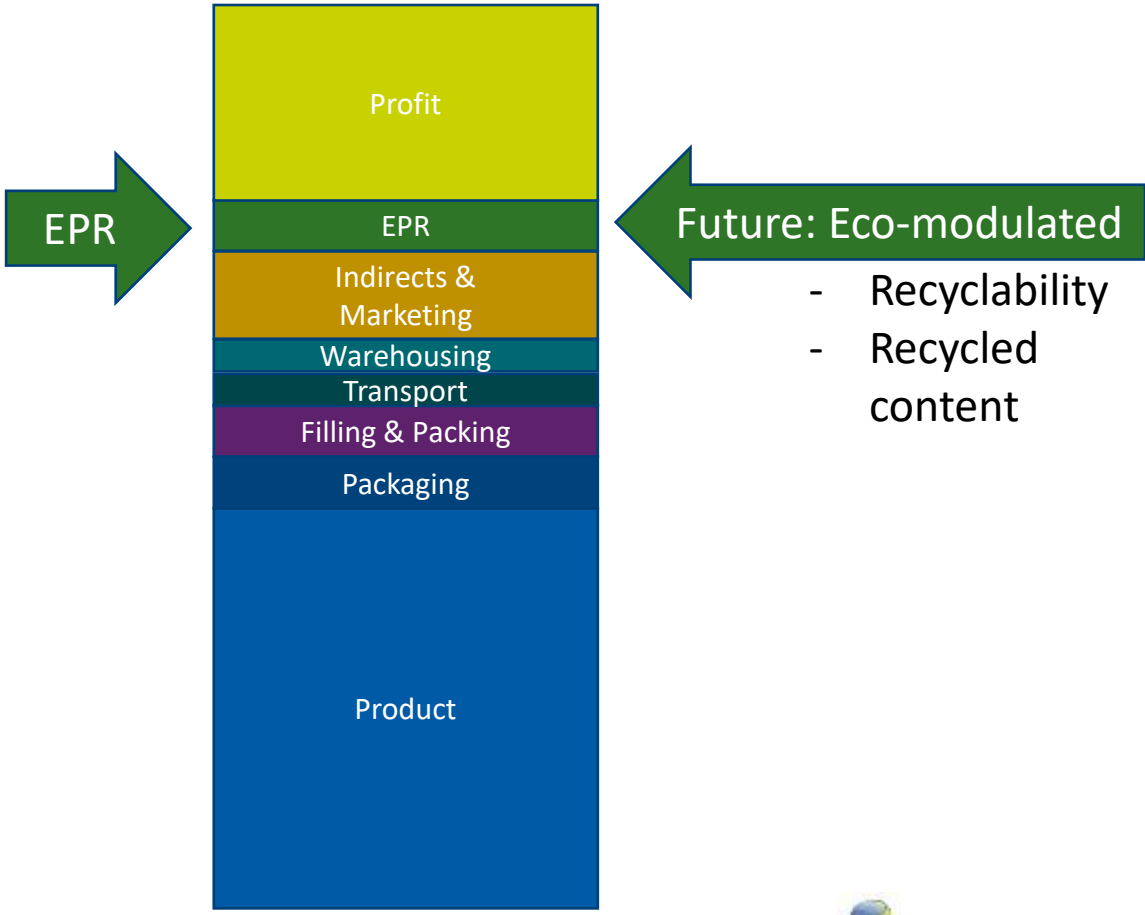
Source: Unesda (European Soft Drink Industry) & European Federation of Bottles Waters (EFBW), PWC report (2018)

Future EPR fees will be eco-modulated

- Companies placing packaging (producers) on to the market pay a contribution per pack to the “EPR system” that pays for it to be collected, sorted and recycled
- The EPR contribution is:
  - Weight based & material specific
  - Set by the EPR system in the country
  - An integrated part of the product cost

The cost to enable circularity





Indicative Product Cost Make-up

EPR is an efficient tool for life cycle responsibility

- Design of the packaging
- Choice of materials
- Manufacture for easy emptying, repair, dismantling, separation
- Usage by the consumer
- End-of-life management
- Uptake of recycled content
- **Clean up of littering?**

Business.gov.nl

Rijkswaterstaat
Ministerie van Infrastructuur en Waterstaat

Home > Running your business > Environmental impact > Waste

Contribute to cleaning up plastic litter

This information is provided by Netherlands Chamber of Commerce, KVK | Rijkswaterstaat

Do you produce disposable plastic products? From 1 January 2023, you must contribute financially to help clean up litter. You should also encourage consumers to dispose of plastic waste correctly, and not to litter. This is called Extended Producer Responsibility (EPR).

SUP Directive

- Tobacco products with filters
- Single-person food packaging
- Disposable cups
- Bags and wrappers
- Lightweight plastic carrier bags
- Beverage packaging
- Balloons
- Wet wipes

- Producers pay a flat fee for each single-use plastic product they place on the market
- The price varies per product
- Every four years, the government conducts research into the costs incurred to clean up litter and determines the contribution of producers based on the composition of the litter and the number of products that have been placed on the market
- First payment: 2024!

Cost of collection and clean-up to be covered by EPR!

1. Packaging, “take-away”, beverage < 3 l, cups with lids, plastic bags (05.01.23)
2. Wet-wipes and balloons (31.12.24),
3. Tobacco products with filters (05.01.23)

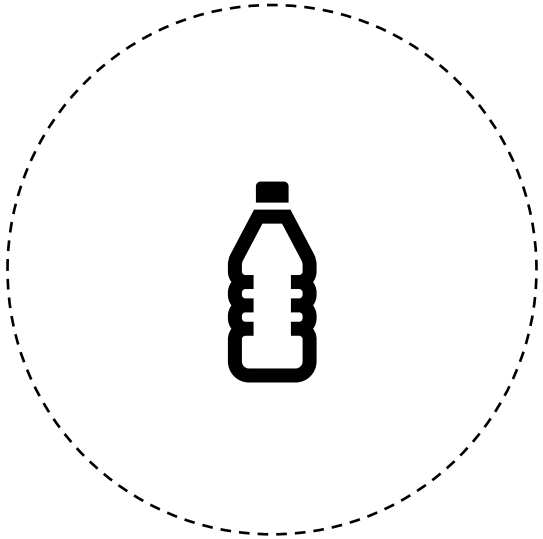
- Stimulate for re-use solutions and reduction
- Innovation – replacement to non-plastics
- Reduce cost through “new” collection (e.g.ash trays)

i. Information and behavior campaigns
ii. Clean-up, transport, disposal
iii. Collection and disposal from publish waste bins
iv. Data collection and reporting

Source: Miljødirektoratet, juli 2023, Høringsnotat: forskriftsforslag for produsentansvarfor visse engangsprodukter av plast

PPWR – **Recycled content** targets

Product Group	2030	2040
Contact sensitive packaging	30% PET 10% other than PET	50%
SUP Beverage bottles	30%	65%
Non-contact Sensitive/ Other Packaging	35%	65%



Recycled Content targets

By 2026, implementing act with methodology for calculation and verification of the Recycled Content.

By 2030, eco-modulation of EPR fees based on % Recycled Content

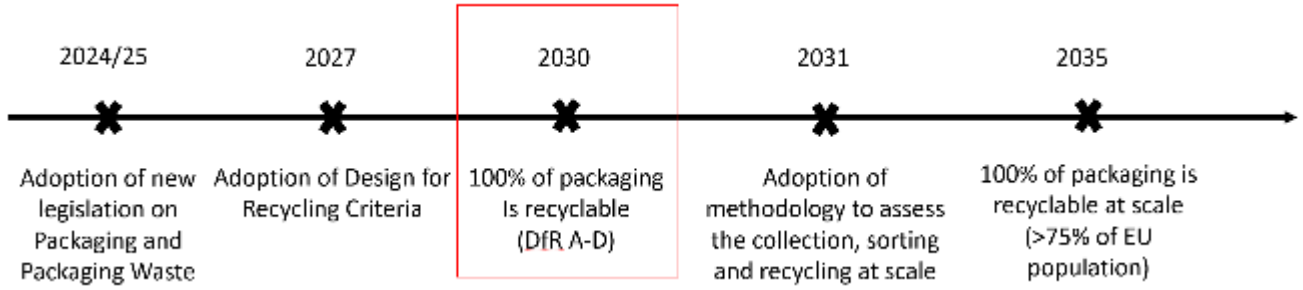
PPWR – **Re-use and refill** targets

Sector	Pack Type	Packaging groups and products // Obligated economic operator	Target for 2030	Target for 2040
Food and beverage - HORECA	Primary-B2C	Beverage (cold & hot) filled into a container at the point of sale for take-away, to be sold in packaging with a stem for reuse or refill = final distributor	20%	80%
	Primary-B2C	Food for take-away, to be sold in packaging with a system for reuse or refill = final distributor	10%	40%
Food and beverage - retail	Primary-B2C	Alcoholic beverage Other than Wine, aromatized Wine products, fruit Wine and spirits, and products based on wine, spirits or other fermented beverages mixed with non-alcoholic beverages, to be sold in packaging within a system for re-use or refill = manufacturer and final distributor	10%	25%
	Primary-B2C	Wine Other than sparkling Wine to be sold in packaging within a system for re-use or refill = manufacturer and final distributor	5%	15%
	Primary-B2C	Non-alcoholic beverages, such as water, soft drinks, juices, to be sold in packaging within system for re-use or refill = manufacturer and final distributor	10%	25%
Commercial and industrial	Tertiary-B2B	Large household appliances e.g, washing machines or fridges, to be sold in reusable packaging = ec. operator	90%	90%
	Tertiary-B2B	Goods sold using pallets, plastic crates, plastic foldable boxes, pails and drums for the conveyance or packaging ff the goods, to be sold in reusable packaging = ec. Operator using transport packaging	30%	90%
	Tertiary-B2B	Non-food goods sold via e-commerce using packaging for transport and delivery, to be sold in reusable packaging = ec. Operator using transport packaging	10%	50%
	Tertiary-B2B	Pellet wrappings and straps for stabilization and protection of goods during transport, to be sold in reusable packaging =ec. operator using transport packaging	10%	30%
	Tertiary-B2B	Grouped packaging boxes (exc. Cardboard) e.g. pack of larger quantities of packaging units used, = ec. operator using transport packaging	10%	25%

PPWR: Full recyclability of packaging by 2030

- EU countries required to ensure that EPR schemes are established for all packaging
- From 2035 the packaging will need to be effectively collected, sorted and recycled to be considered as '**recycled at scale' (>75% of EU population)**
- All packaging items have to undergo a **recyclability assessment** to assure they meet the design for recycling criteria

- As from 2030 only packaging scoring grades A→ D can be placed on the market.
  - Exception for innovative packaging (max 5 years), for certain packaging of pharmaceuticals and medical devices (max up to 2035)
- **EPR fees to be based on the performance grades A to D**
- The recycling performance in practice ('at scale') will be verified as of 2035 by means of a methodology to be developed subsequently to the DfR criteria



Grade	Score of compliance with DfR criteria of a unit of packaging *
A	95%
B	90%
C	80%
D	70%
E	Less than 70%

* in terms of weight of the unit of packaging

≈

RecyClass ABCDEF RECYCLABILITY

A little help
makes
a big difference.

TESCO
Every little helps

UK Packaging Preferred Materials & Formats Guidelines 2022 – Own Label and Branded.

Version: PM04
Date: 250222

Red

Not to be used as customers cannot easily recycle (UK)

Materials

Compostable/PLA & Biodegradable Plastics

Oxy/Oxo degradable Plastics

Polystyrene

PVC

PVdC

MDF

Water Soluble Plastics

Waxed & Siliconised Paper

Formats & Designs

Rigid Black Plastic

Expanded/ Foamed/Density Modified Plastics

Paper/board laminated on both sides

Complex laminates using aluminium layers for decoration

Hi/Mid-Cones

Plastic straws & cutlery

Glitter

Amber

When functional requirements mean green materials are not an option

CONTROLLED USE: CONTACT THE PACKAGING TEAM FOR APPROVAL
packaging.team@tesco.com

New materials, formats and designs

Materials

NIR Black HDPE (non food grade)*

Complex laminates**

Foiled paper

Wood

Bio sourced polymers

Formats & Designs

Beverage/Liquid Food Cartons

Composite Drums

Shrink sleeves (perforated, include messaging to remove, max ink coverage of 60%)

Spouted pouches of mixed material

Green

Preferred for UK recycling via kerbside or store

Materials

Glass

PET (Rigid)

Polyethylene

Mono flexible films

Polypropylene

Steel & Aluminium

Cardboard

Paper

Non Siliconised Glassine

Formats & Designs

Paper/board with plastic; single side lamination <10% by weight (incl. windows)***

Mono PET lidding film on PET tray perm-welded

Mono material spouted pouch

Underlined denotes 2022 additions/updates (Production for own brand products to cease by end of 2022)

* Dependant on utilising coloured (jazz) recyclate only – no natural HDPE from food sources (to be reviewed annually with processors)

** Complex laminates should only include a metallised layer where no alternatives are available

*** Easily separated in the recycling stream to maximise fibre recovery

TESCO

norner
The Polymer Explorers

EU Taxonomy

Funded by
The Research
Council of Norway

Pointbreak

www.pyroco2.eu

CarbonSmart™ EVA
Turning carbon emissions into running shoes

On
Lanzatech
Borealis
Technip Energies

Demonstrating sustainable value creation from industrial CO_2 by its thermophilic microbial conversion into acetone

€ 43mln BUDGET

60months DURATION

20 PARTNERS

SINTEF · secondcircle · DTU · ARKEMA · cnrs · KIT · CiceTech · axeLERA · Firmenich for good, naturally · NORCE

HERØYA INDUSTRIPARK · CHALMERS · BIOPROCESS TECHNOLOGY · norner · SCGC · JM Johnson Matthey · Ranido · NEXTCHEM · ecoinnovazione · Vestfold and Telemark COUNTY COUNCIL

Språk

SIRKAQ

Om prosjektet Nyheter Partnere Medieomtale Kontakt

www.sirkaq.no

116.4 MNOK – 3 years

Sirkulærøkonomi i havbruk

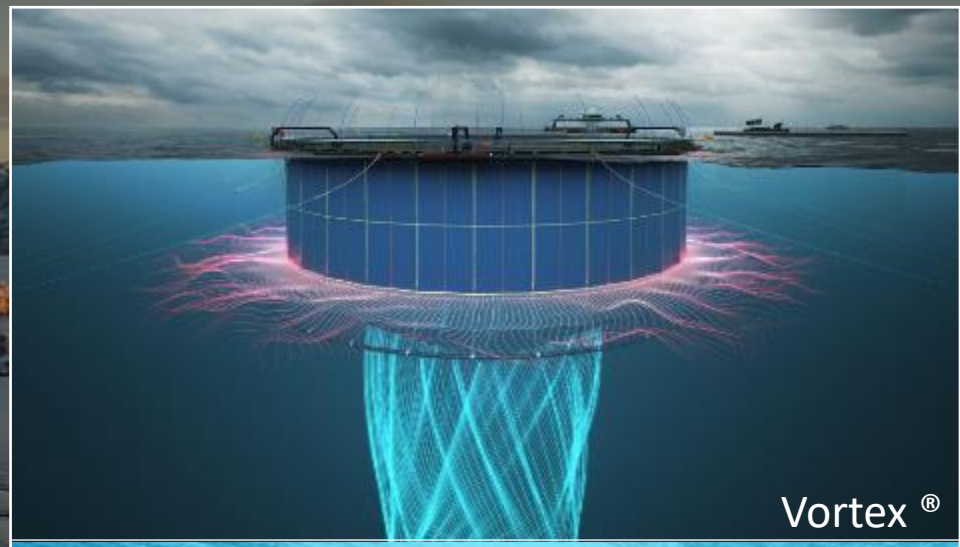
Utvikle løsninger for å gjenbruke, reparere og forlenge levetiden til plast fra oppdrettsutstyr, og bruke resirkulert materiale i nye produkter

Om prosjektet

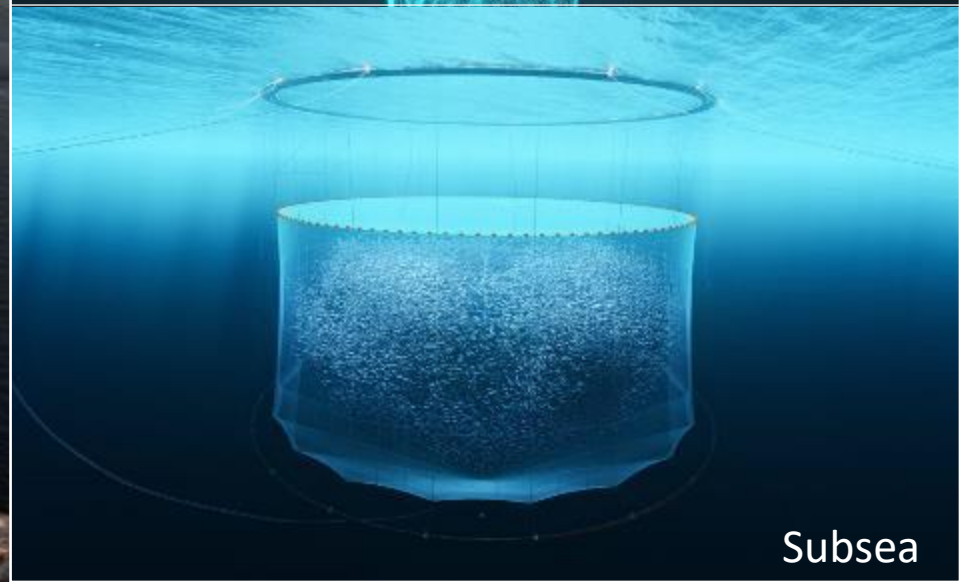
The Research Council of Norway

Innovation Norway

Siva



Vortex ®



Subsea

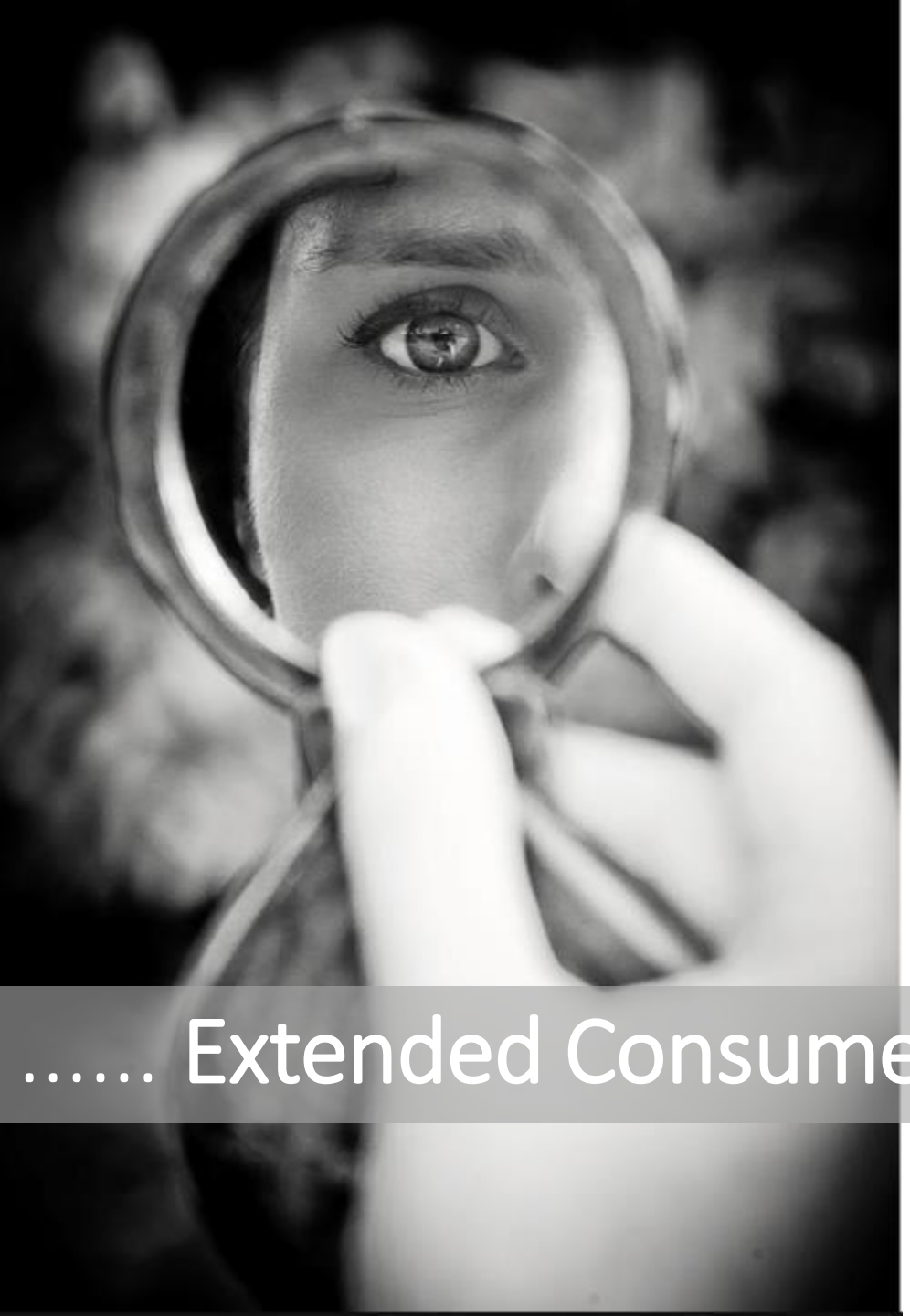
We are all in the same boat

ARE EVERYONE ON-BOARD?

CHANGE OR BE CHANGED!

Thor.Kamfjord@norner.no

LICENCE TO OPERATE



…… Extended Consumer Responsibility

A BIG PART OF THE **SOLUTION** IS FOUND IF **YOU** LOOK INTO THE **MIRROR**

Erlend Haugsbø

BUSINESS ON THE ROCK

Business on the rock 2023, Bærekraft på bunnlinjen

Erlend Haugsbø, CEO i Hyperthermics AS

Hyperthermics develops technology for increased biogas production, and for protein recovery from waste streams

Biogas Booster
Pre-treatment technology to increase biogas production from existing and new biogas plants

Protein Recovery
Bio-hydrolysis and protein production from organic waste streams, such as land-based aquaculture

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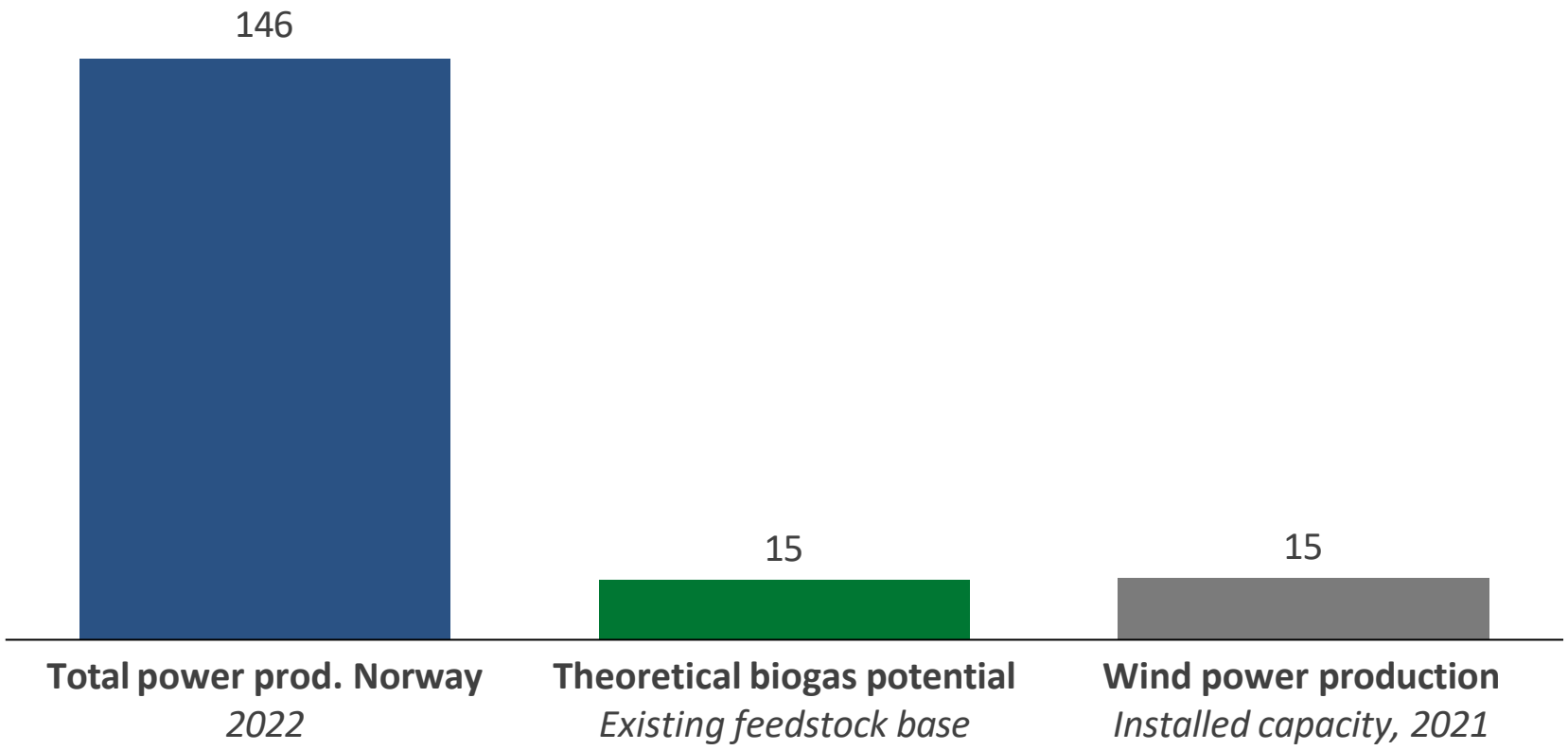
The biogas potential in Norway amounts to 10% of today's total power production…

Power production vs. energy sources in Norway, TWh



- Theoretical biogas potential in Norway amounts to more than 10% of today's total power production in Norway
- The biogas potential is similar to the energy amount produced by wind power in Norway today

Source: Statnett, Biogass Norge, Energifakta Norge

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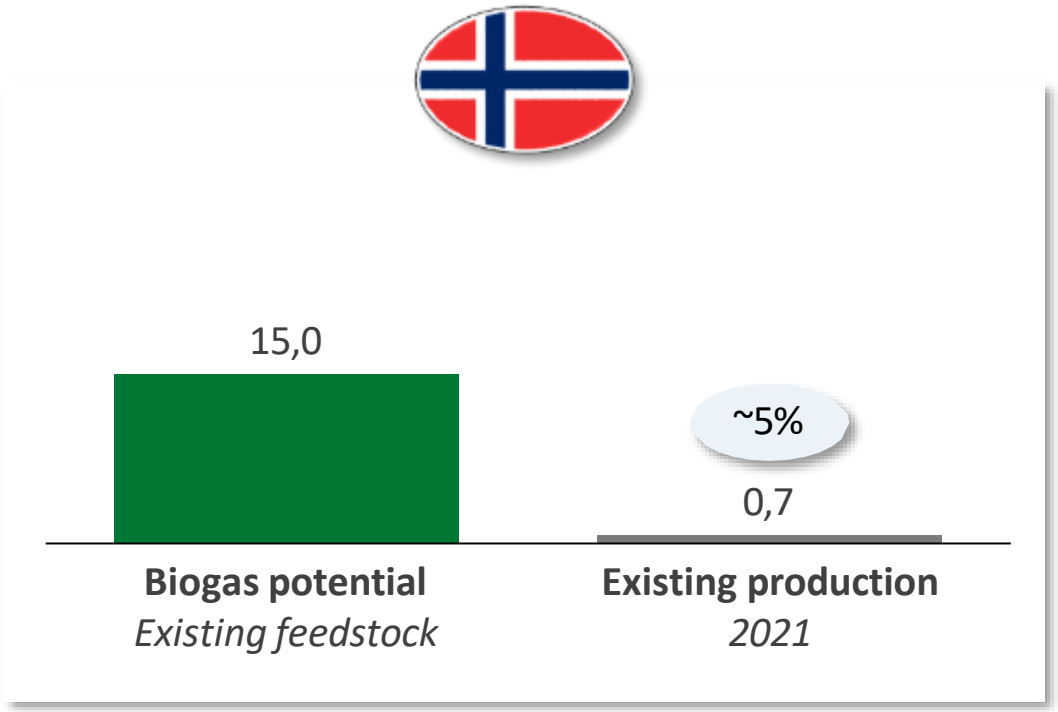
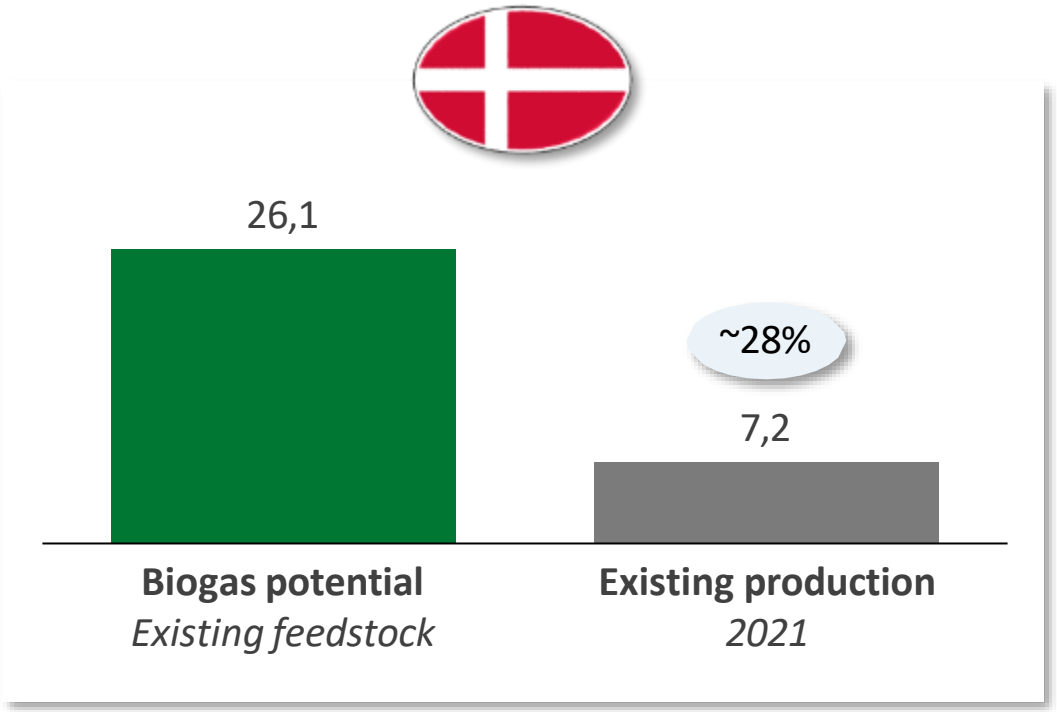
…but compared to our neighbours we lag far behind both in terms of production volume and utilization of potential

Biogas potential vs. existing production, TWh





We believe in a future with an energy mix consisting of several energy sources, but it will take time to close the gap in Norway within biogas

Source: Biogass Norge, Biogas Danmark

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We observe several challenges in Norway, all of which can contribute to explaining why we lag behind neighbours

Lack of clearly expressed **production targets** from authorities and lack of sufficient **support schemes** for development of a large biogas sector

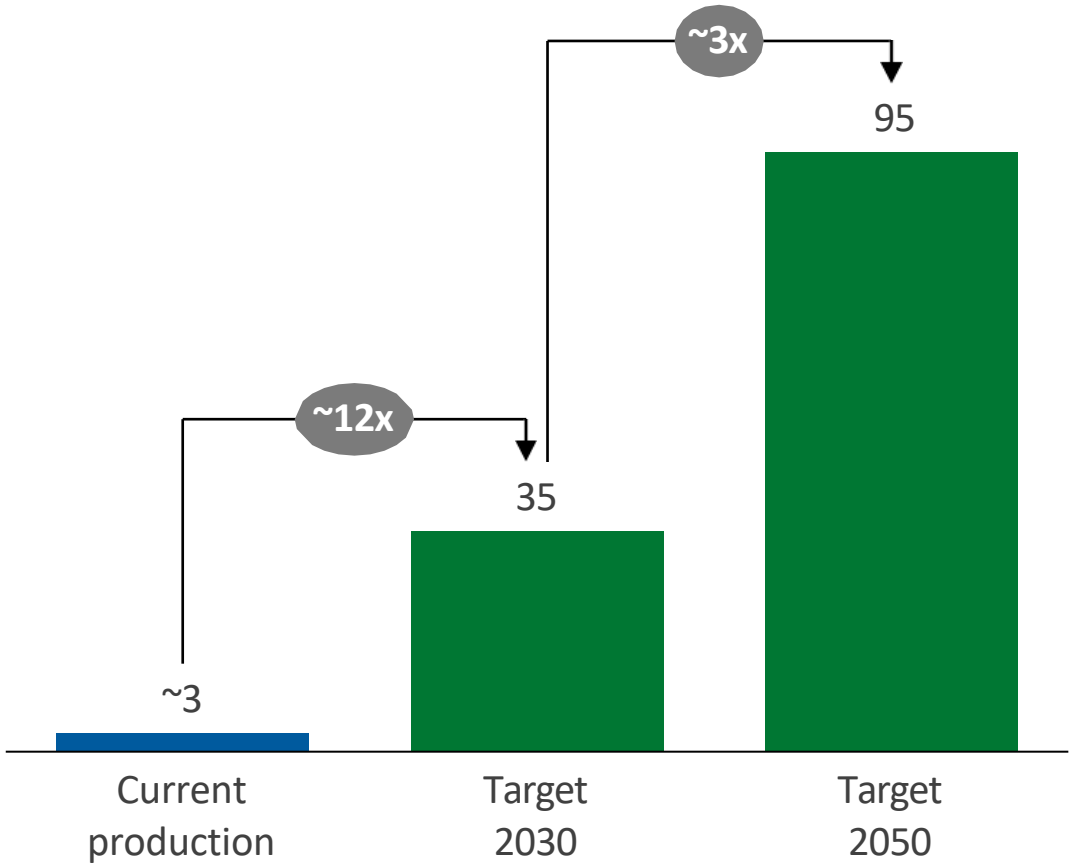
The industry is characterized by a high degree of **public players**. Few **private players** producing commercial biogas

Challenging **topography** for establishing large, industrial plants with rational collection of substrate. But opportunities do exist

Limited domestic use of gas. The sector needs to establish other sales channels, instead of just relying of existing pipeline infrastructure for offtake

When we look outside Norwegian borders, the sector is characterized by the EU's ambitious biogas targets

Production targets for biomethane in Europe, bcm (billion cubic meters)



- EU's overarching targets are to limit emissions and improve energy security within its borders
- Biogas and biomethane are mature technologies where rapid scaling is possible to contribute to targets
- Large, positive emissions effect from displacing fossile energy sources and reduced agricultural emissions
- Significant investment activity and ongoing consolidation in the sector

Source: European Biogas Association (Juli 2022)

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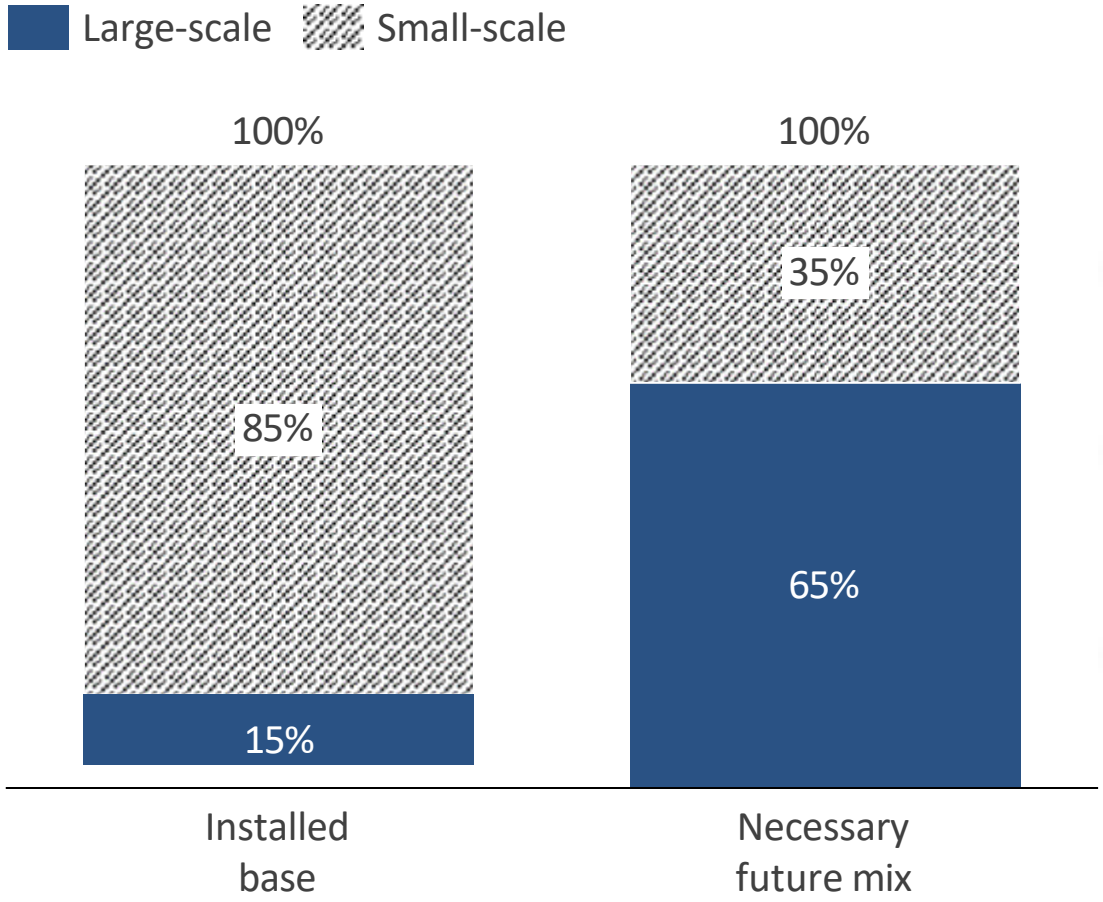
The key to unlock the growth is to think big

Biogas plants in Europe by size bracket



- The biogas sector needs to think big to ensure that this source of energy remains competitive
- Competitiveness is created through rational collection of substrate and high throughput capacity. Both factors contribute to lowering cost per KWh
- To reach EU's ambitious targets, we estimate a need to build more than 1 000 large-scale facilities over the next years. Similar needs also in the US

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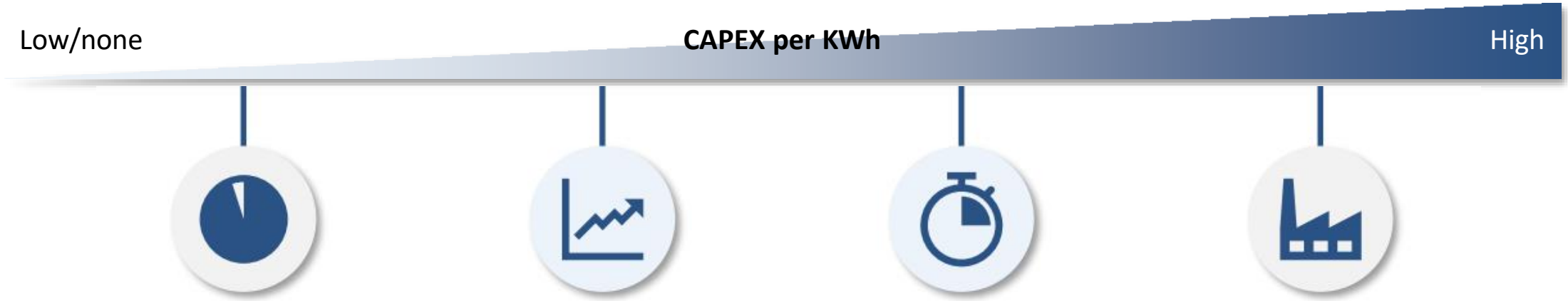
We also need to ensure maximum utilization of biogas infrastructure and the feedstock

Levers to increase biogas and biomethane production



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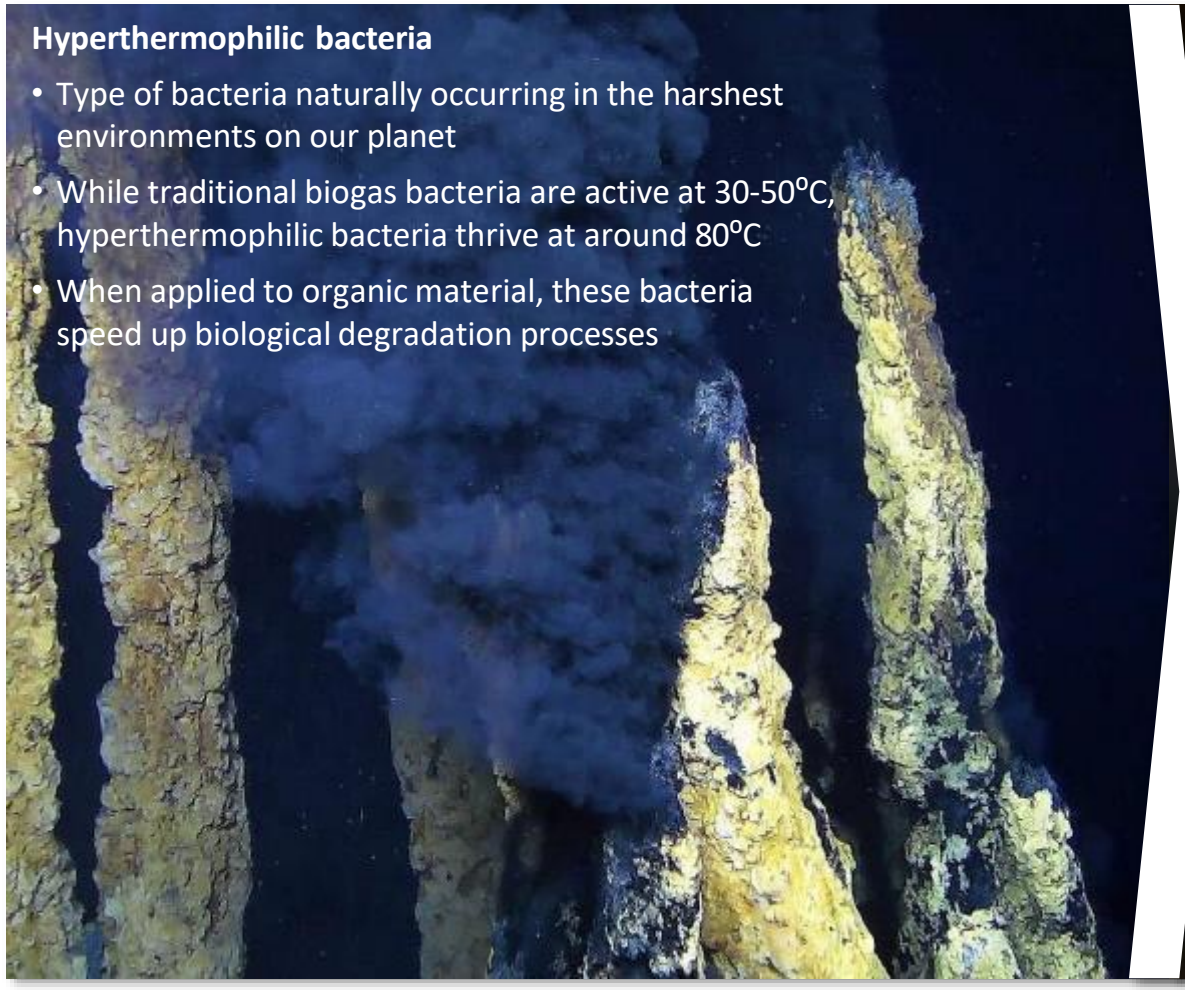
Hyperthermics' business idea is rooted in the application of hyperthermophile bacteria for industrial purposes

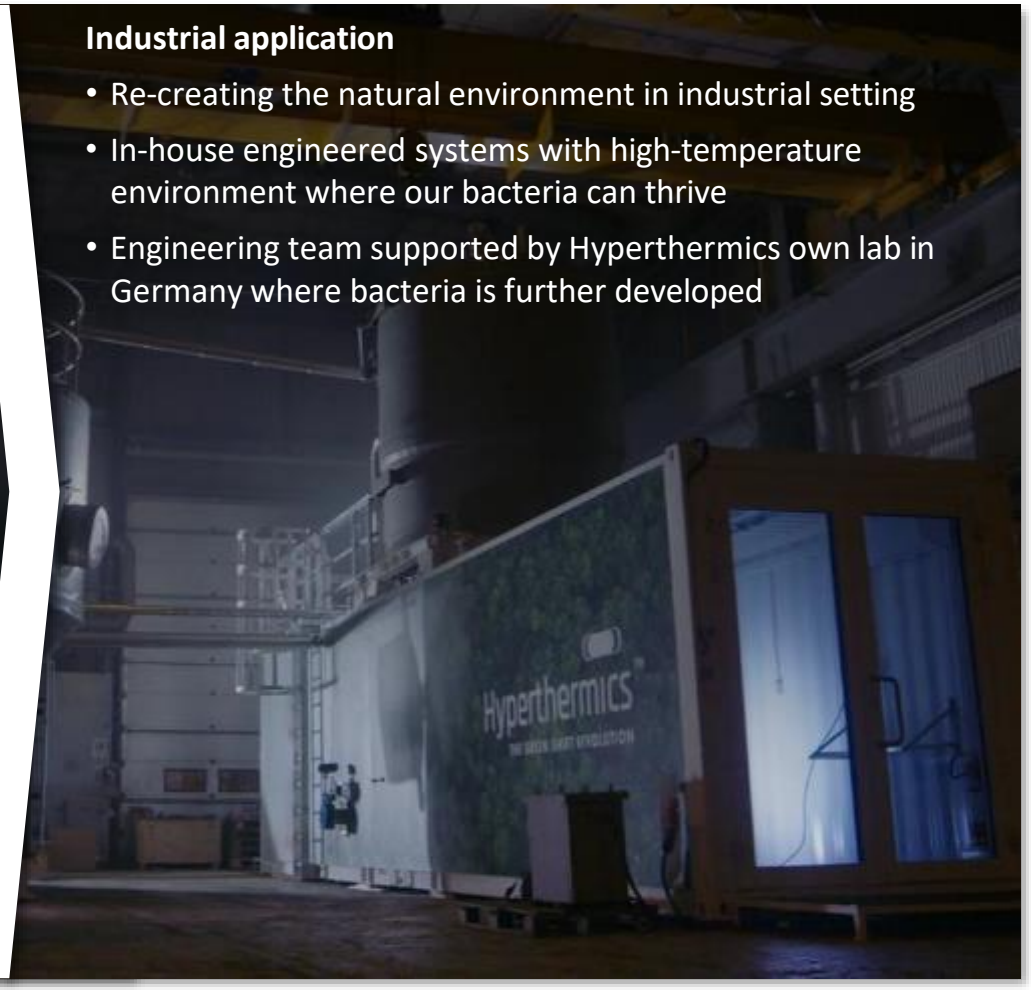
Hyperthermophilic bacteria

- Type of bacteria naturally occurring in the harshest environments on our planet
- While traditional biogas bacteria are active at 30-50^{o}C, hyperthermophilic bacteria thrive at around 80^{o}C
- When applied to organic material, these bacteria speed up biological degradation processes

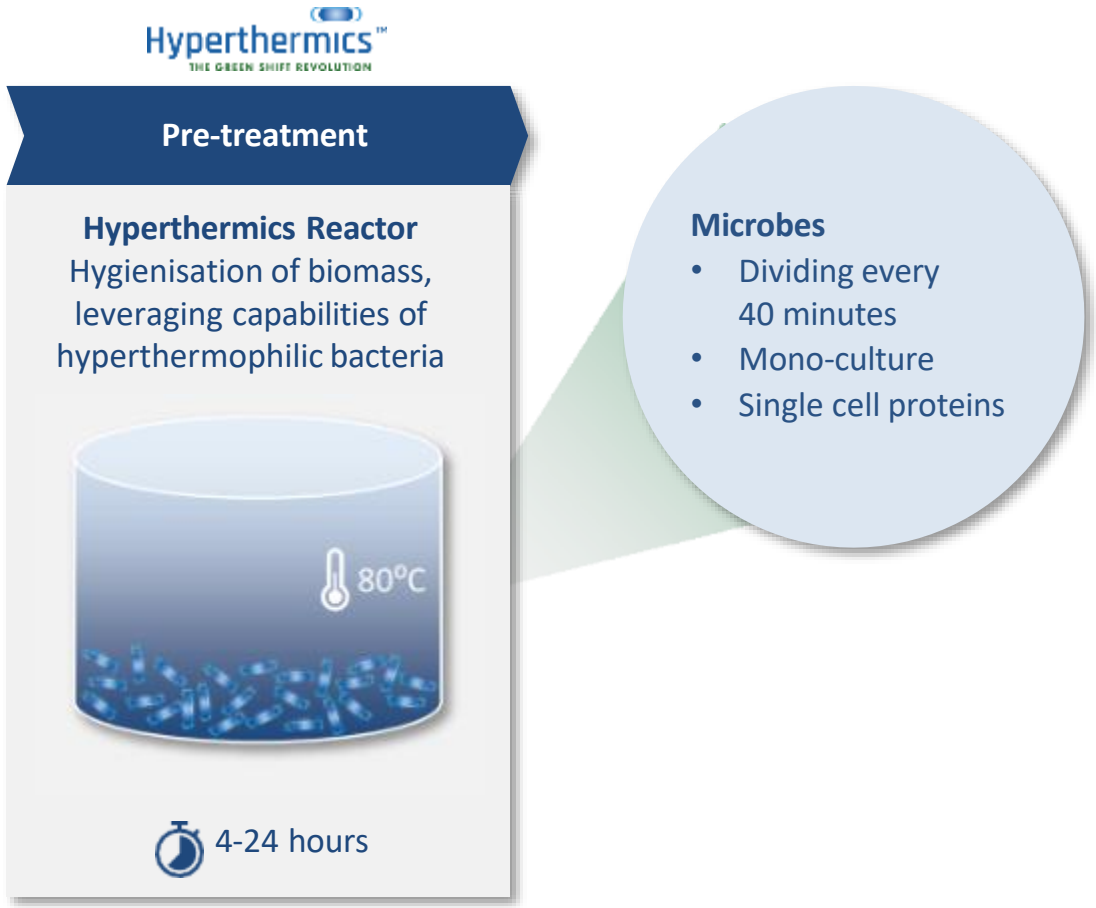


Industrial application

- Re-creating the natural environment in industrial setting
- In-house engineered systems with high-temperature environment where our bacteria can thrive
- Engineering team supported by Hyperthermics own lab in Germany where bacteria is further developed



Hyperthermics is introducing a pre-treatment stage in the biogas process to maximize yield



Hyperthermics is introducing a pre-treatment stage in the biogas process to maximize yield

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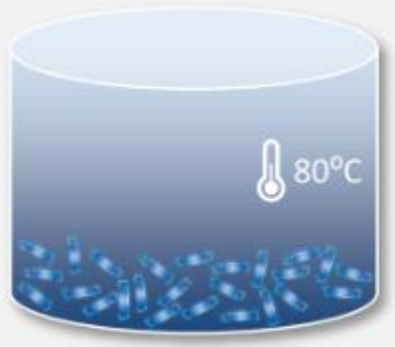
Pre-treatment

Hyperthermics Reactor
Hygienisation of biomass, leveraging capabilities of hyperthermophilic bacteria



4-24 hours

Hyperthermics Fermentation gas content:

- Up to 80% H_2
- CO_2
- Volatile fatty acids

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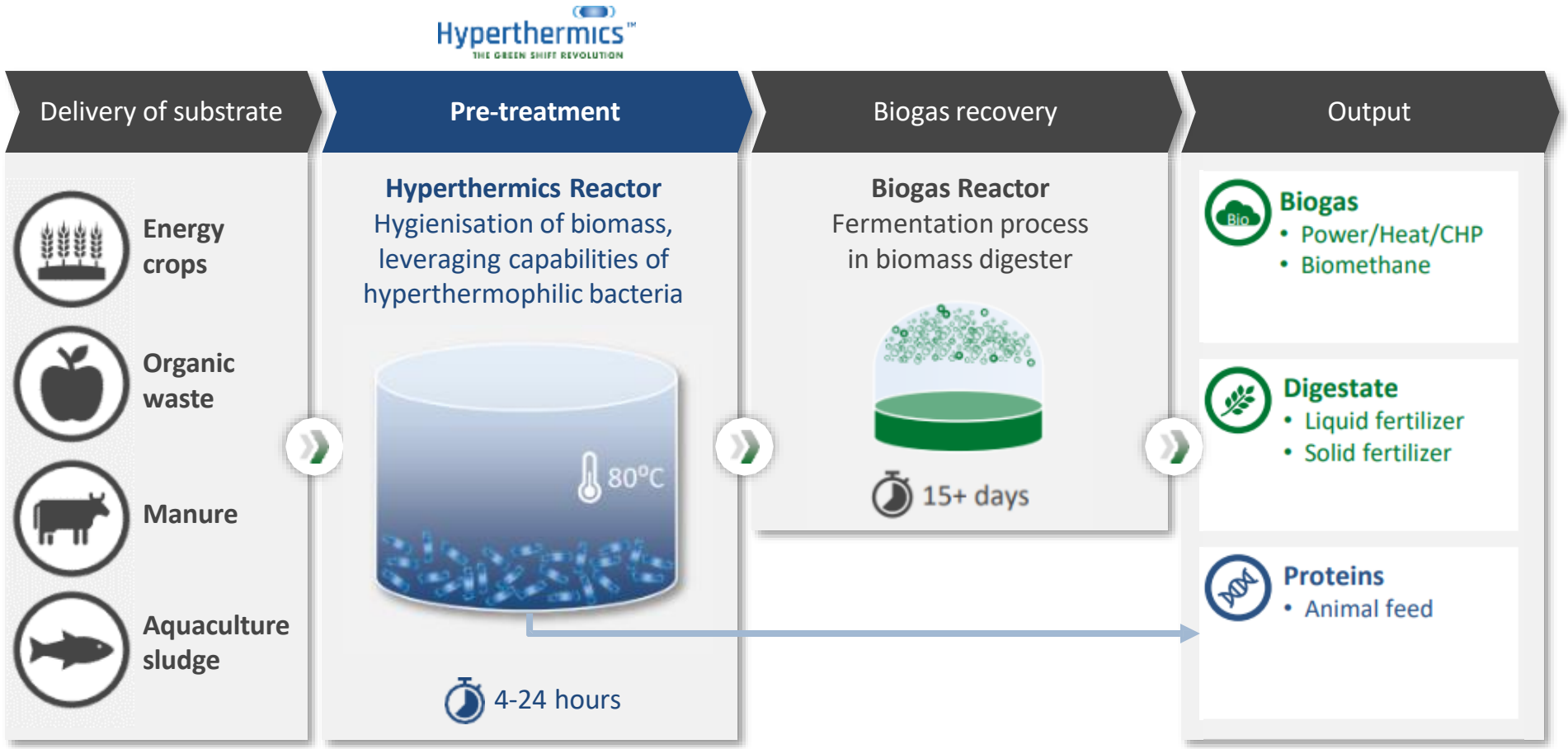
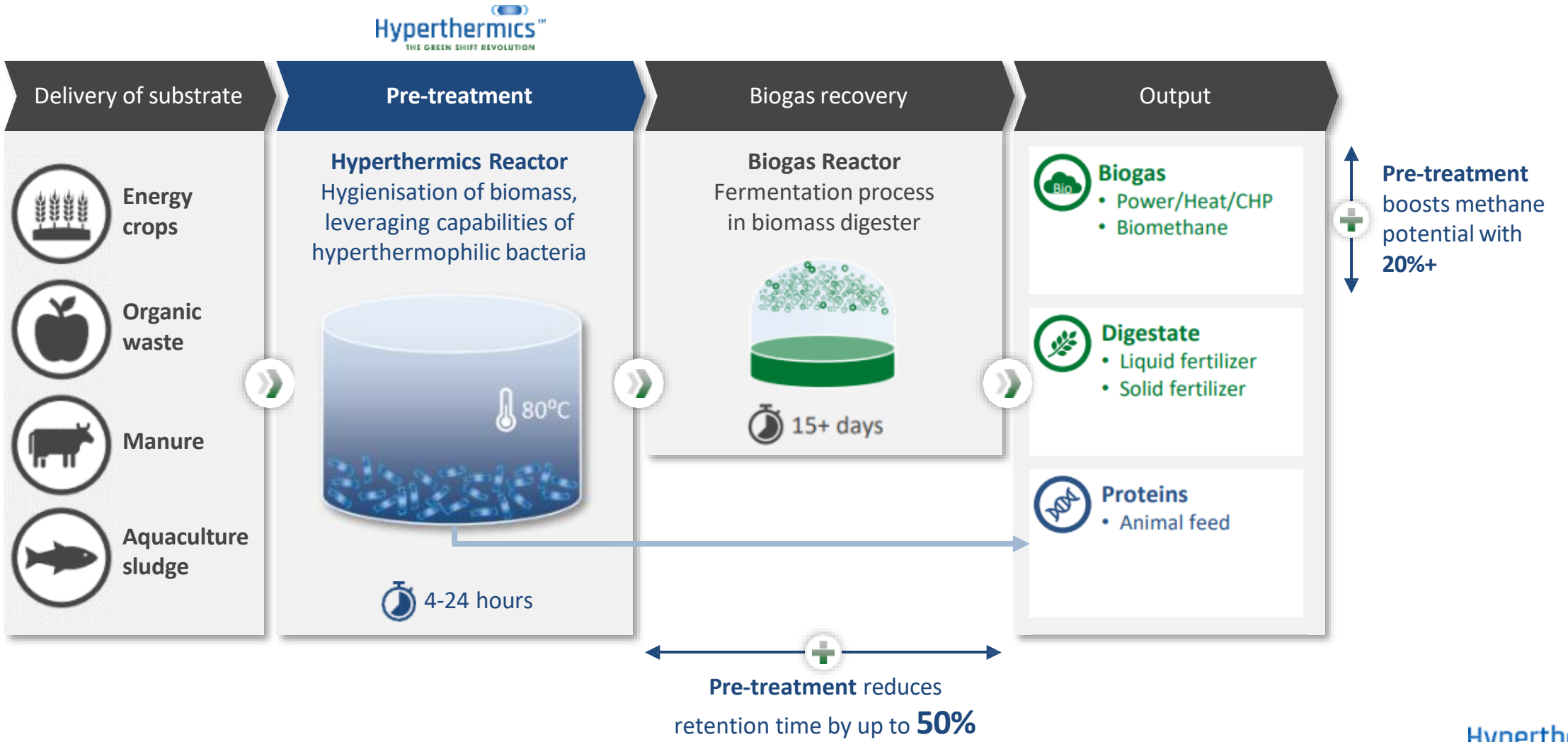
Hyperthermics is introducing a pre-treatment stage in the biogas process to maximize yield



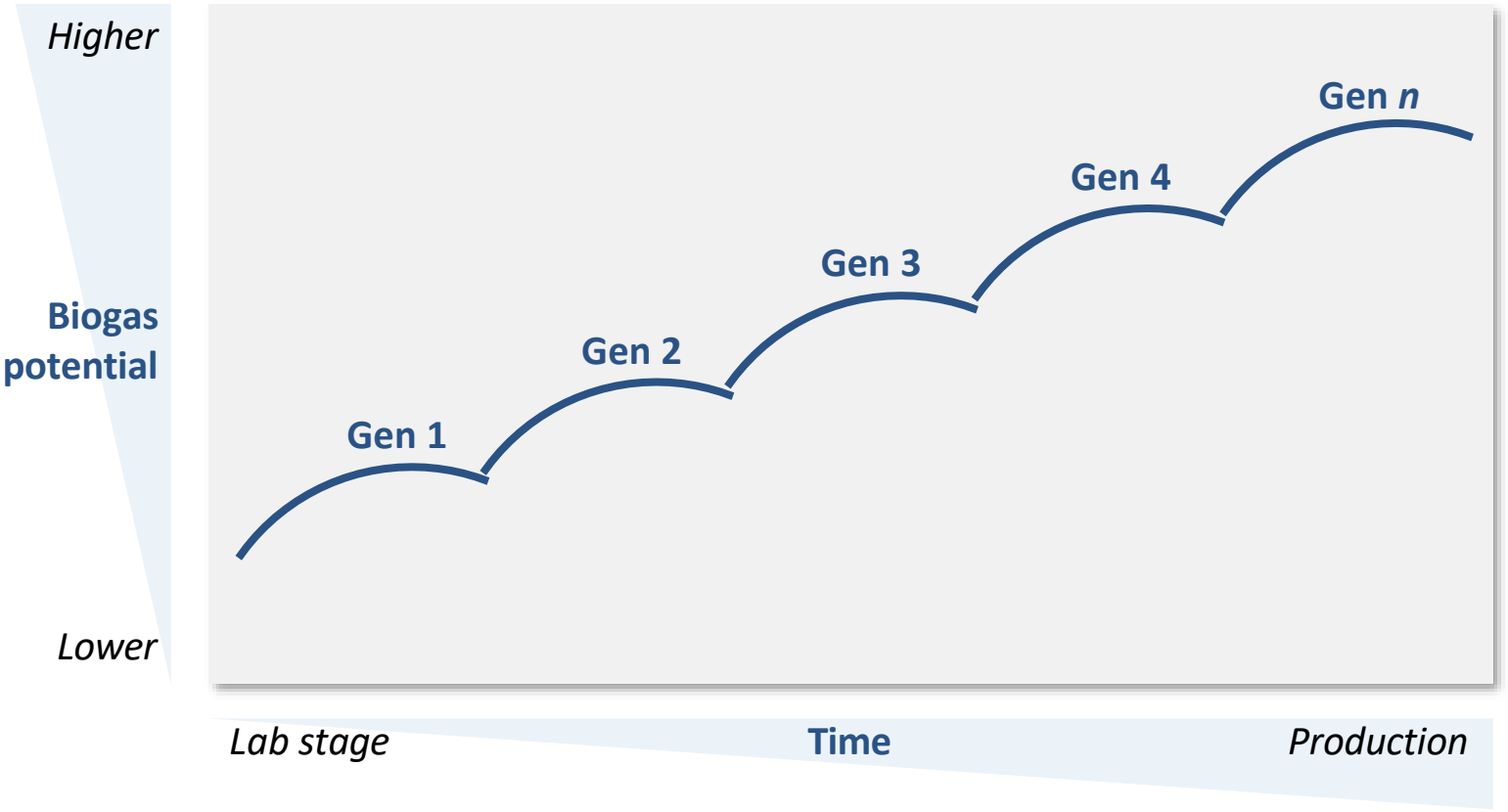
Hyperthermics
THE GREEN SHIFT REVOLUTION

Hyperthermics is introducing a pre-treatment stage in the biogas process to maximize yield



Through exposure, our live bacteria will adapt to specific substrates over time and improve performance

Adaptation of bacteria to specific substrates (illustrative)



Right bacteria strain for substrate is identified in our lab

Intensive "training" of strain for optimal performance

Further adaptation of bacteria in industrial application

Our bacteria are suited to digest the main substrate categories in the European biogas industry

Example substrate applicability for Hyperthermics process[1] (indicative)

Substrate needing adaption to provide good results	
Manure from cow/pig	
Sewage sludge	

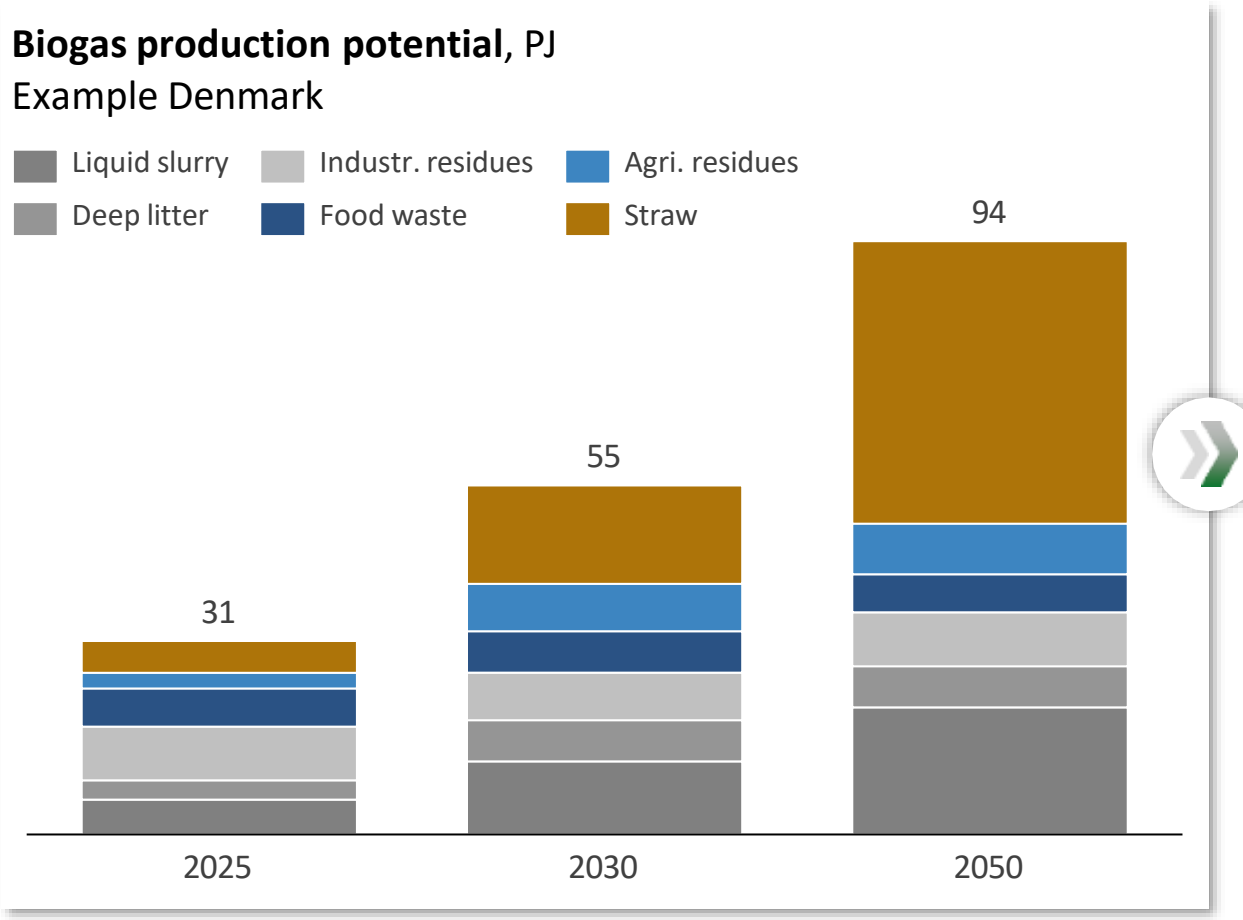
Substrate directly suited well	
Corn and grass silage	
Straw and whey	
Paper mill waste	
Wine/juice/brewery waste	
Fruits and vegetables	
Chicken manure	
Algae	

Less **Suitability of Hyperthermics technology** *High*

European biogas production by substrate group (2020)
% of total

1. Indicative only. Based on initial screening results in lab (H_2 production)

Our technology works particularly well for demanding feedstocks, such as straw

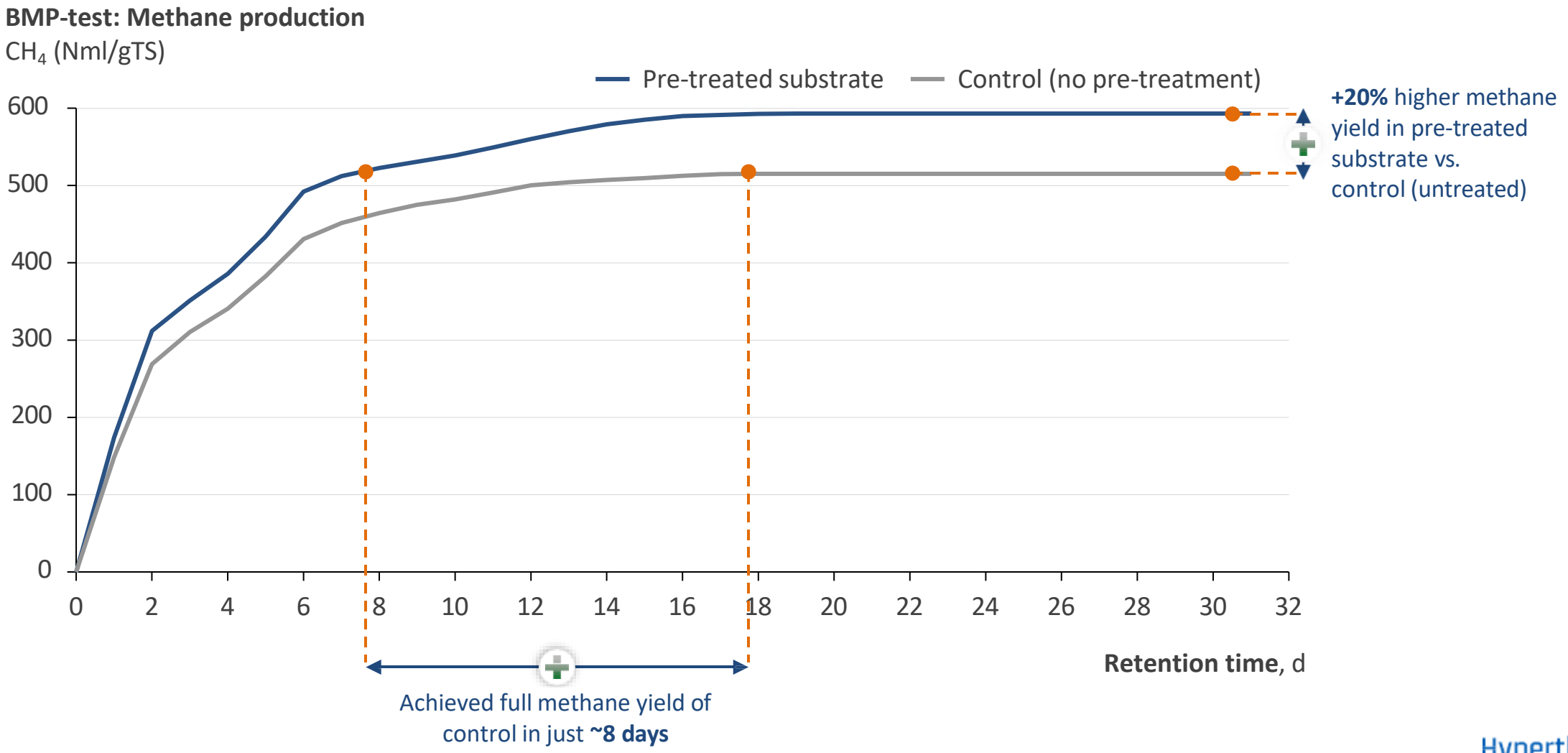


Straw is a common component in in agricultural biomass across Europe

Large, untapped potential in biogas production from straw

Hyperthermics' patented technology shows great potential in breaking down fibrous materials, and is ideal as pre-treatment for plants receiving large quantities of straw

Example: In a typical "agricultural mix" with straw content we observe a higher methane yield and fast production



Source: Hyperthermics Laboratory (Regensburg, Germany)

Hyperthermics™ THE GREEN SHIFT REVOLUTION

The test facility was completed in August 2022, and has been on-stream since

Overview

Inside view

Hyperthermics™
THE GREEN SHIFT REVOLUTION

Technology is now being verified in our Mobile Test Unit which has been installed at a customer site

The Project

- Mobile Test Unit delivered to conduct practical demonstration of lab-results at customer site in continuous mode
- Plant has been operational since August 2022

The Challenge

- General agricultural waste streams
- High content of straw, which is challenging in traditional processes

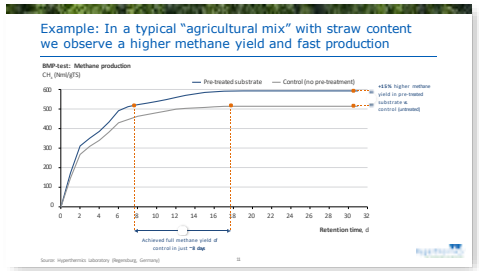
The Results

→ Technology verified

→ Increased biogas production

Next step for Hyperthermics is to apply our technology in industrial scale

Laboratory stage



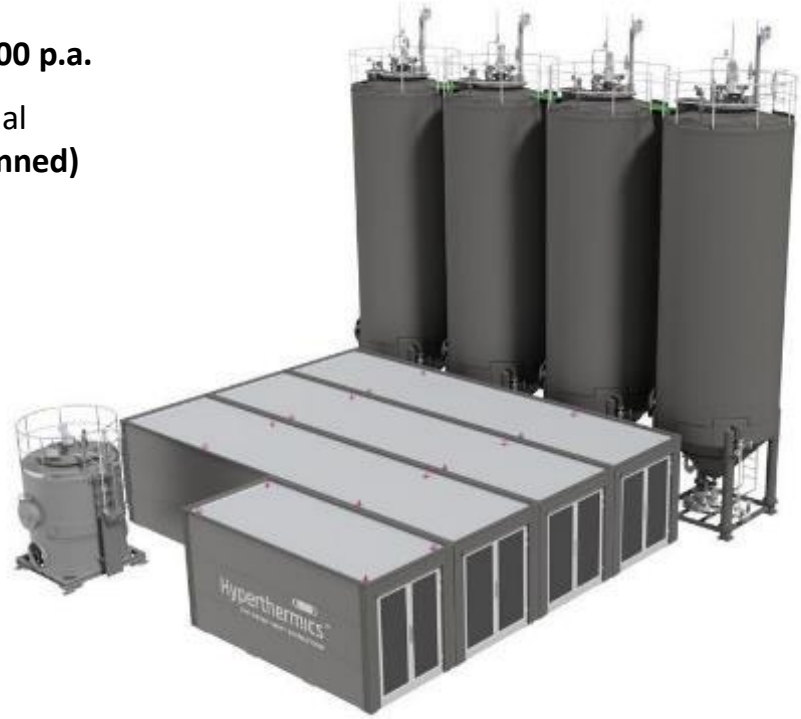
Pilot plant

Industrial scale demonstration

Capacity
MT 200 000 p.a.

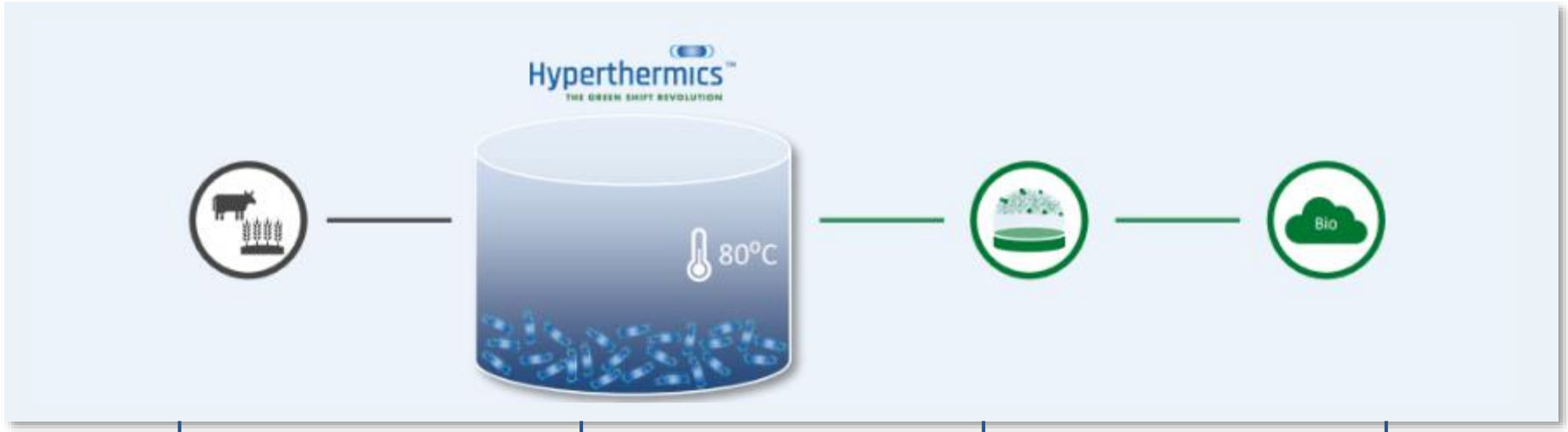
Operational
2024 (planned)

Location
Denmark



Hyperthermics™
THE GREEN SHIFT REVOLUTION

Biogas Booster pre-treatment plant with attractive economics for owners of biogas facilities



>20%
Increase in methane yield

<50%
Reduction in AD retention time

2-4yrs
Payback time on investment

0.2-0.5
OPEX (EUR) per produced Nm^3

Hyperthermics
THE GREEN SHIFT REVOLUTION

Contact information

Erlend Haugsbø
CEO
Erlend.Haugsbo@hyperthermics.com
+47 996 39 496

Erik S. Paulsen
CFO
Erik.Paulsen@hyperthermics.com
+47 40 22 70 70

Stig Amdam
Sales Manager
Stig.Amdam@hyperthermics.com
+47 975 92 087

Company headquarters
Hyperthermics AS
Vikemyra 1, 6065 Ulsteinvik
Norway

R&D
Hyperthermics GmbH
Am Biopark 13, 93053 Regensburg
Germany

Hyperthermics
THE GREEN SHIFT REVOLUTION


FOT I BAKKEN
BUSINESS ON THE ROCK

Thorbjørn Hjelden

BUSINESS ON THE ROCK

GRANDE.

Det beste for barna


GRANDE
GRANDE


NRK TV
NRK Nyheter


NORDRE ÅL SKOLE

1997

«Urent trevirke brennes i eget brennkammer ved sjøkanten»


GRANDE.
NO PLANET B
NO PLANET B
Auds

Tre år med sommerstudenter

Einar 2021

NTNU – Industriell design

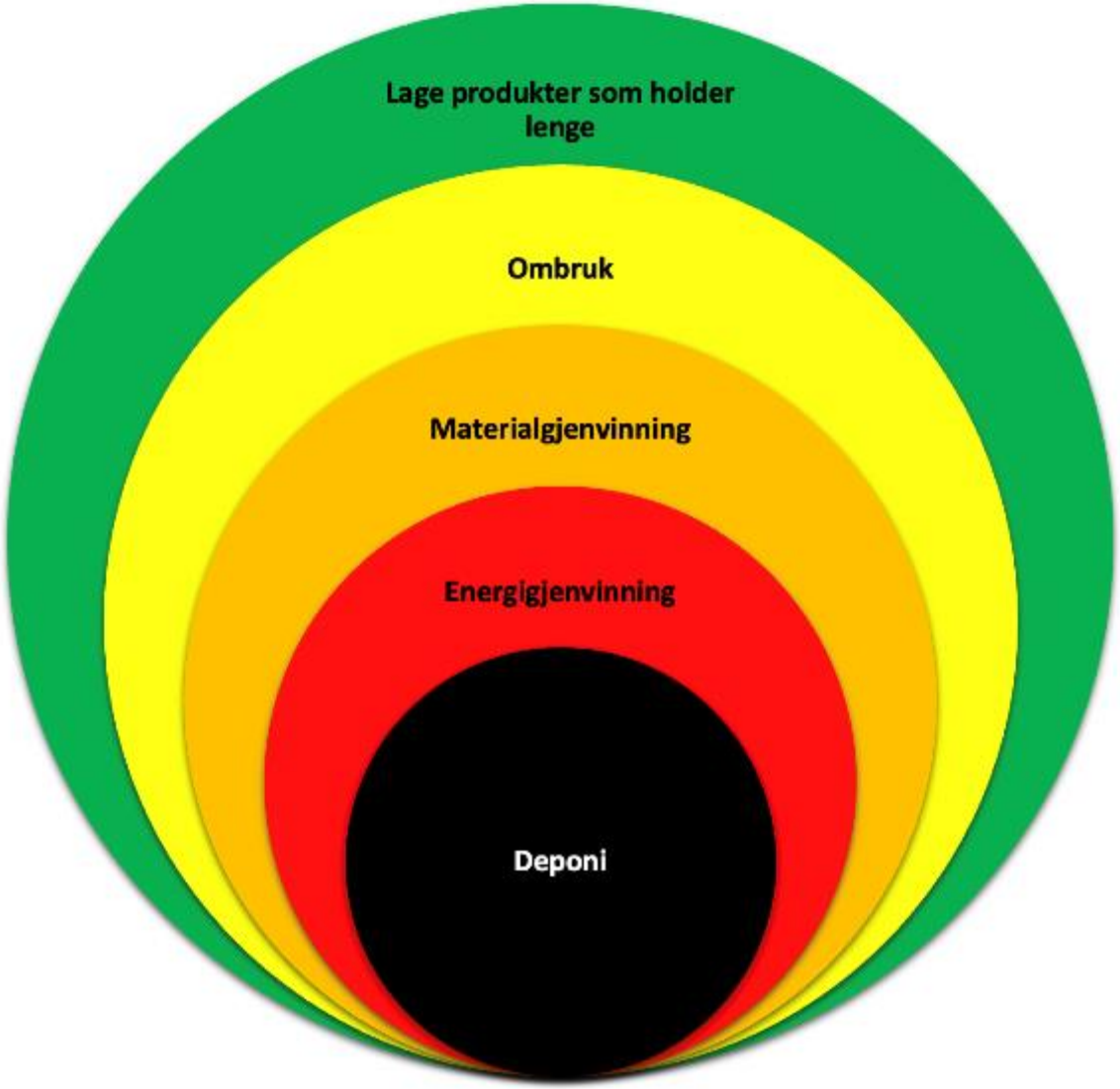
Ingvild 2022

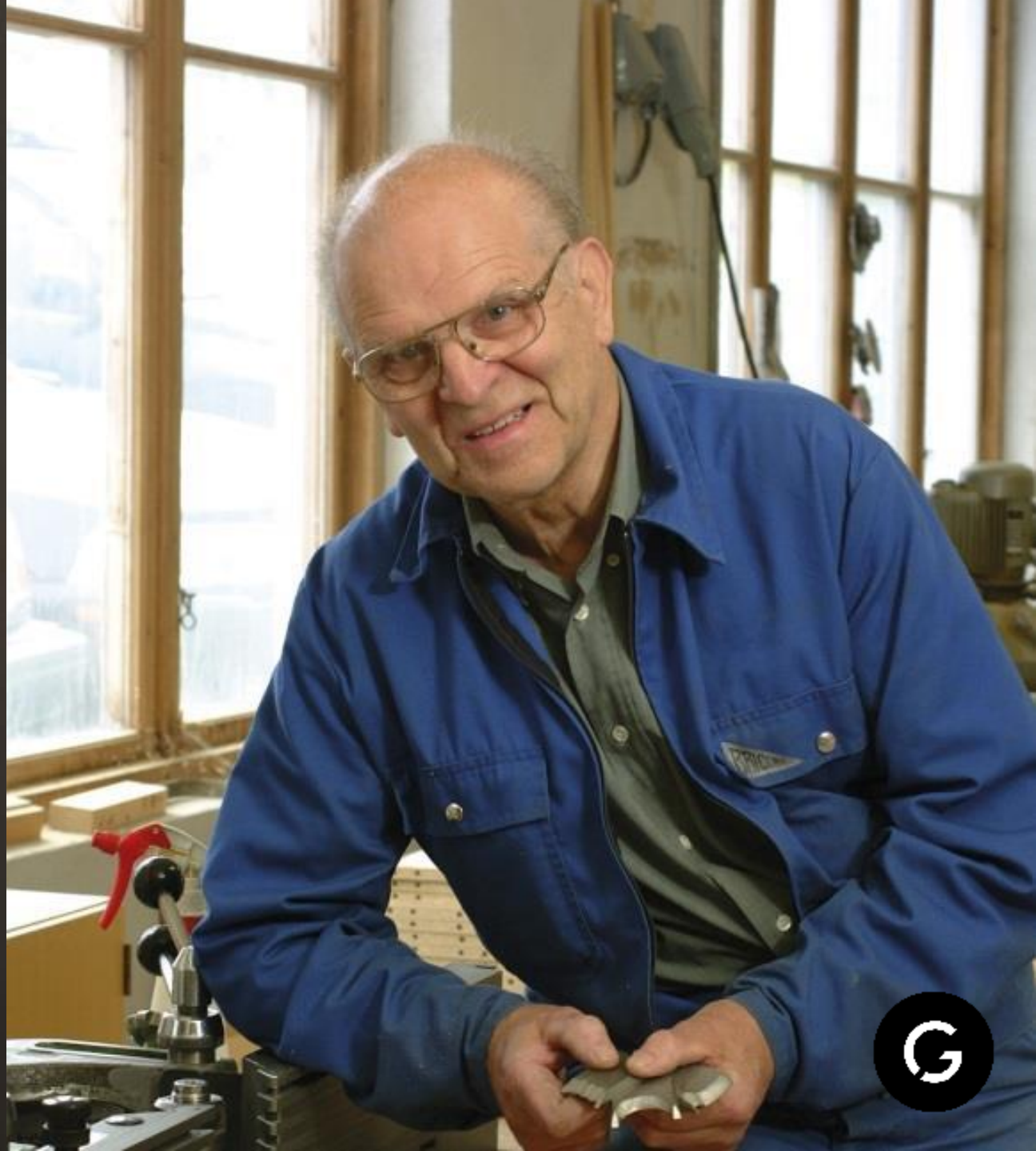
NTNU – Energi og miljø

Aksel 2023

NTNU – PU og produksjon


GRANDE


Lage produkter som holder lenge
Ombruk
Materialgjenvinning
Energigjenvinning
Deponi



GRANDE.

Ole Heggheim

BUSINESS ON THE ROCK

WIND CATCHING

Unleashing the power of offshore wind

Veien til kommersialisering for en Banebrytende Teknologi

www.windcatching.com

Disruptiv utvikling

Wind Catching Systems AS

Selskap

- Norsk teknologiselskap grunnlagt i 2017
- Ledelse og ansatte med bakgrunn fra energi, skipsbygging og marin
- Solide eiere, 80% norsk eierskap
- Har sammen med Ny Energi AS søkt om åpning av område for testing av havvind utenfor Møre og Romsdal

Teknologiutvikling og verdikjede

- Utviklet i tett samarbeid med kjente norske leverandører
- Støtte fra Enova til norsk turbinutvikling
- Turbintesting på Mehuken
- Forprosjektering for flytende pilot gjennomføres nå
- Potensiale for betydelig lokalt innhold

MISJON

Etablere flytende havvind som en bærekraftig og konkurransedyktig energikilde ved å tilby den mest effektive teknologien

VERDIER

Energi **Pålitelighet**

Pionerånd **Enkelhet**

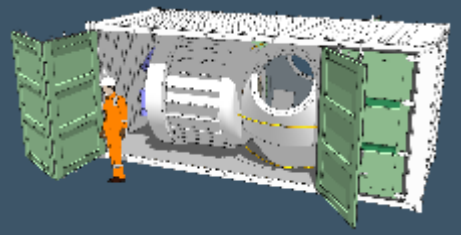
Sameksistens


WIND
CATCHING

Teknologifortrinn

Standardisering og masseproduksjon

- Tubin designet for en fleksibel leverandørkjede;
  - Mange mulige leverandører
  - Mange mulige sammenstillingssteder
- Økt lokalt innhold
- Lav kompleksitet:
  - Direkte drevet– uten gir
  - Passiv kjøling
  - Stall kontroll

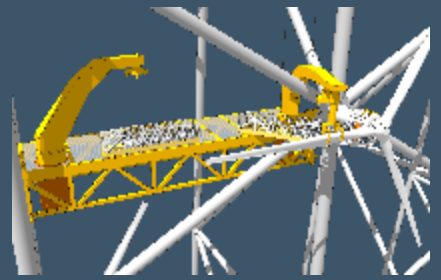


Skaleringspotensiale

- Skalering med antall turbiner ikke størrelsen på turbin
- WCS multi-rotor teknologi muliggjør skalering av installert kapasitet uten behov for å utvikle nye turbiner, båter installasjonsmetoder og infrastruktur

Enkelt vedlikeholdssystem

- Integrert turbin håndterings system - heis basert turbin installasjon
- Reparasjon, og utskifting av hele eller deler av turbinen kan gjøres ombord
- Ikke behov for å ta enheten til land
- Fjerner behovet for spesialskip med kran, bruker standard PSV skip



Effektiv utnyttelse av havareal

- Designet for å maksimere energiproduksjonen per enhet
- Effektiv arealutnyttelse; trenger bare 20% av arealet
- 5x årlig energiproduksjon sammenlignet med en konvensjonell 15 MW vindmølle

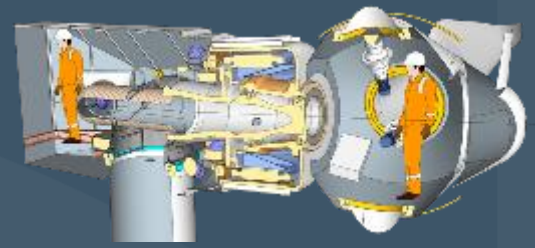
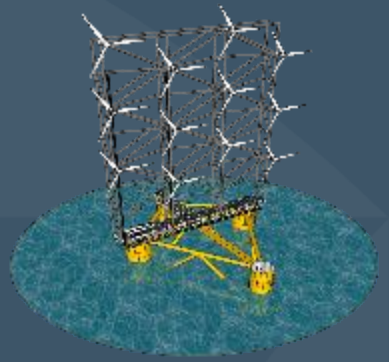
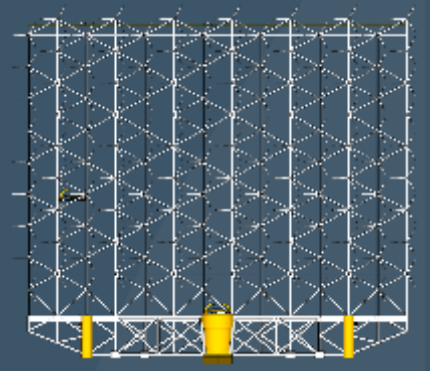
LCOE

Lavere produksjonskost for elektrisitet

WIND CATCHING

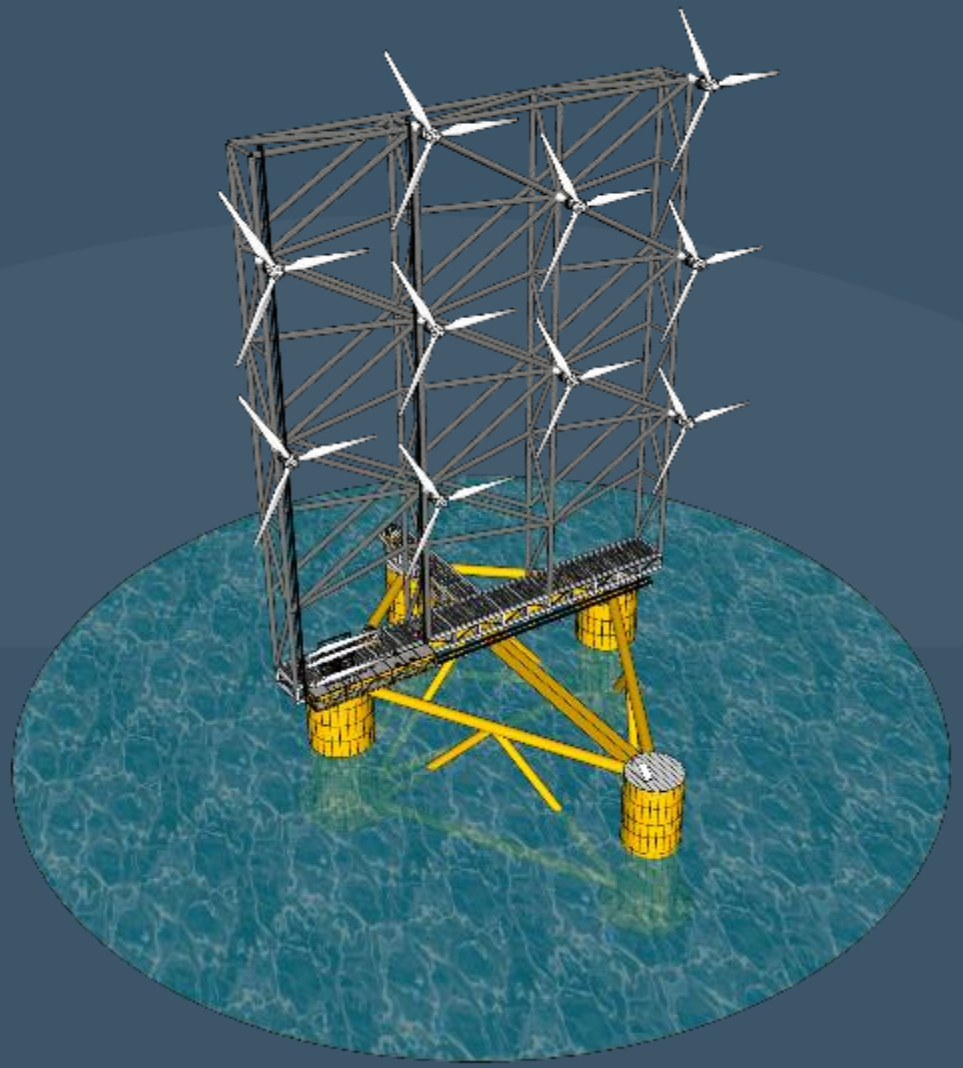
Wind Catching Systems | Windcatcher utvikling

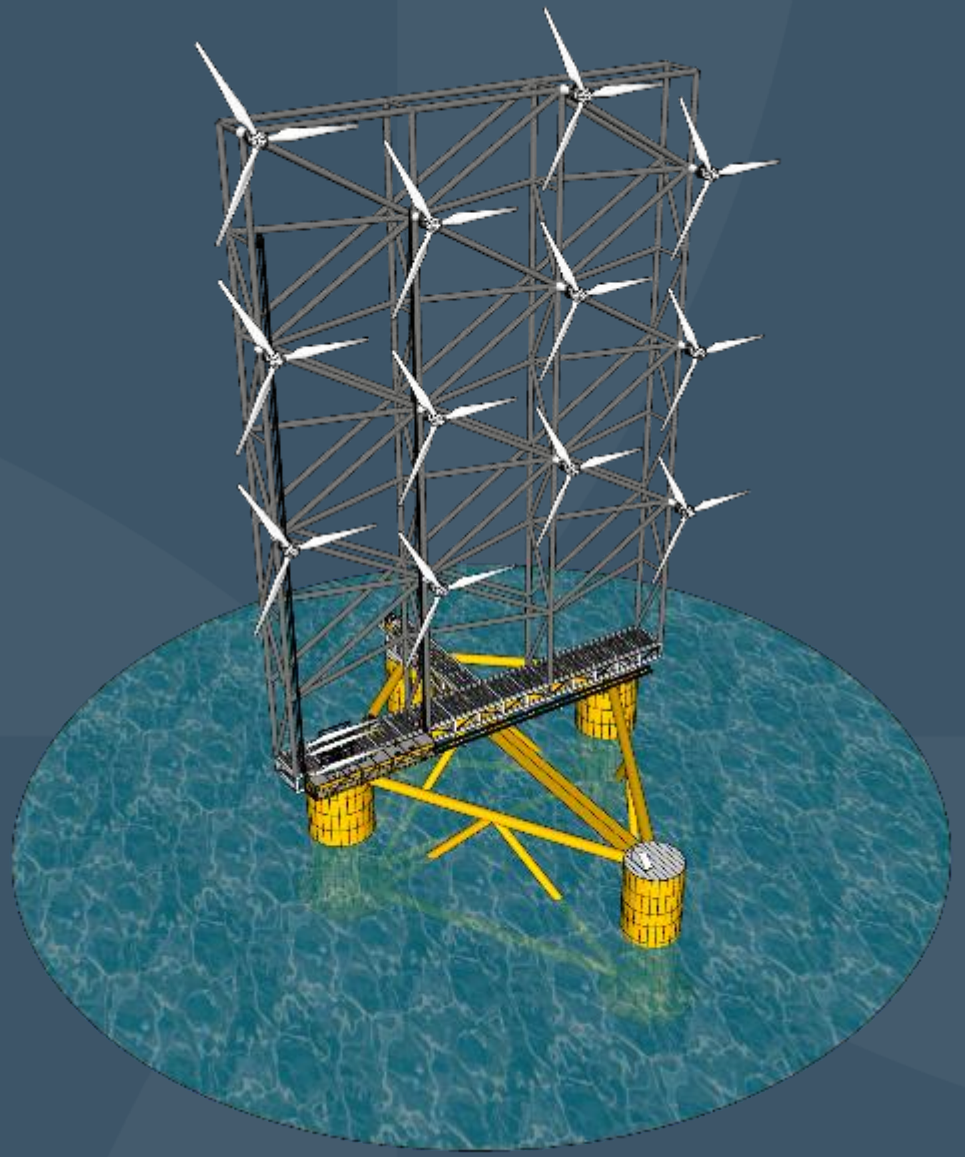
2022 – 2028 **Prosjektgjennomføring, konstruksjon og drift for kommersialisering**

	Mål		**Status**
Turbin prototyp	• Turbinutvikling • Prosjektgjennomføring • Etablere leverandørkjede		• Konsesjon Mehuken
Multi-rotor pilot	• Prosjektgjennomføring • Multi-Rotor system konfigurasjon og teste energiproduksjon • Operasjons og vedlikeholdsfilosofi		✓ Forprosjekt • Konsept • Anbudsprosjektering • Pilot partner vil bli annonsert
Kommersiell demo	• Stegvis kommersialisering til fullskala vindpark		• Søknad om åpning levert til OED

WIND CATCHING

Multi-rotor pilot | 10 - 12 MW konfigurasjon

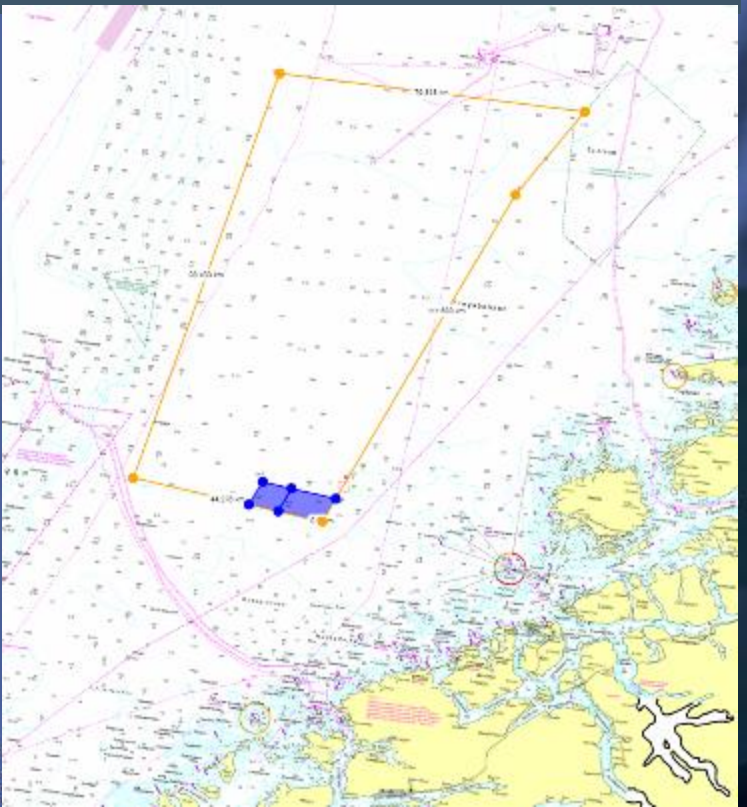




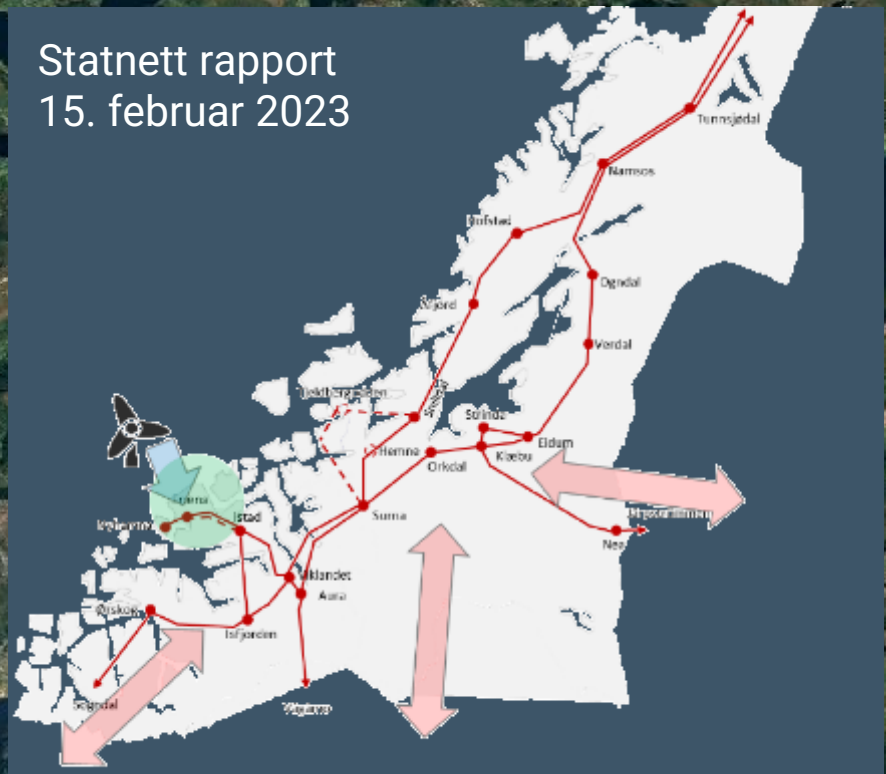
1 GW Havvindprosjekt utenfor Hustadvika/Aukra

47 km fra nærmeste kystlinje

- 60 km2 for 1 GW Windcatcher
- 40 km2 for andre formål

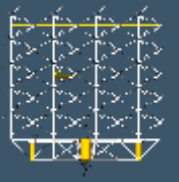
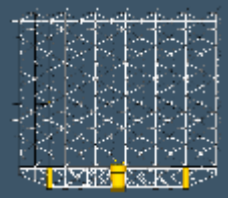
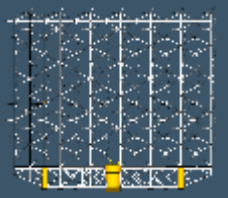
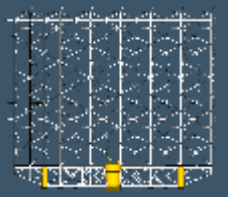


Statnett rapport
15. februar 2023



Figur 7: Målnett, Midt. Mulige nye forbindelser som ikke er utredet ennå, er angitt med brede piler. Gunstig område for tilknytning av havvind er markert med grønt.

Prosjekt og teknologiutvikling

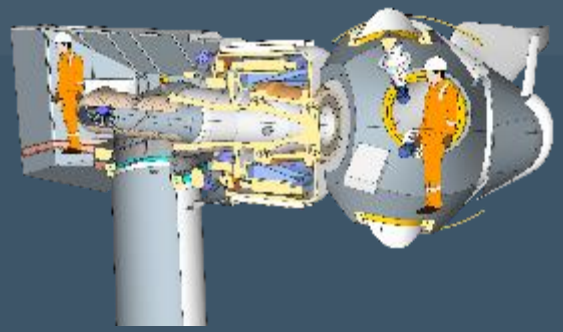
	Fase 1 – Oppskalering Total produksjon: 444 GWh	Fase 2 – Fullskala Total produksjon: 1112 GWh	Fase 3 – Kommersiell skala Total produksjon: 2782 GWh
Fase 1 **Initiell kapasitet** 3 x 40 MW = **120 MW**	3 X 	3 X 	3 X 
Fase 2 **Økt kapasitet** 2 x 126 MW = **252 MW**		2 X 	2 X 
Fase 3 **Økt kapasitet** 5 x 126 MW **630 MW**			5 X 
Totalt alle faser	**= 120 MW**	**= 372 MW**	**= 1 002 MW**

WIND CATCHING

Positive ringvirkninger

Bygge havvindindustri

- Et vindkraftprosjekt vil generere etterspørsel etter komponenter, vedlikeholdstjenester og infrastruktur
  - Turbiner, fundamenter, marine installasjoner
  - Prosjektutvikling og prosjektledelse
  - Ingeniørtjenester
  - Utstyrsleveranser
  - Logistikk, baser



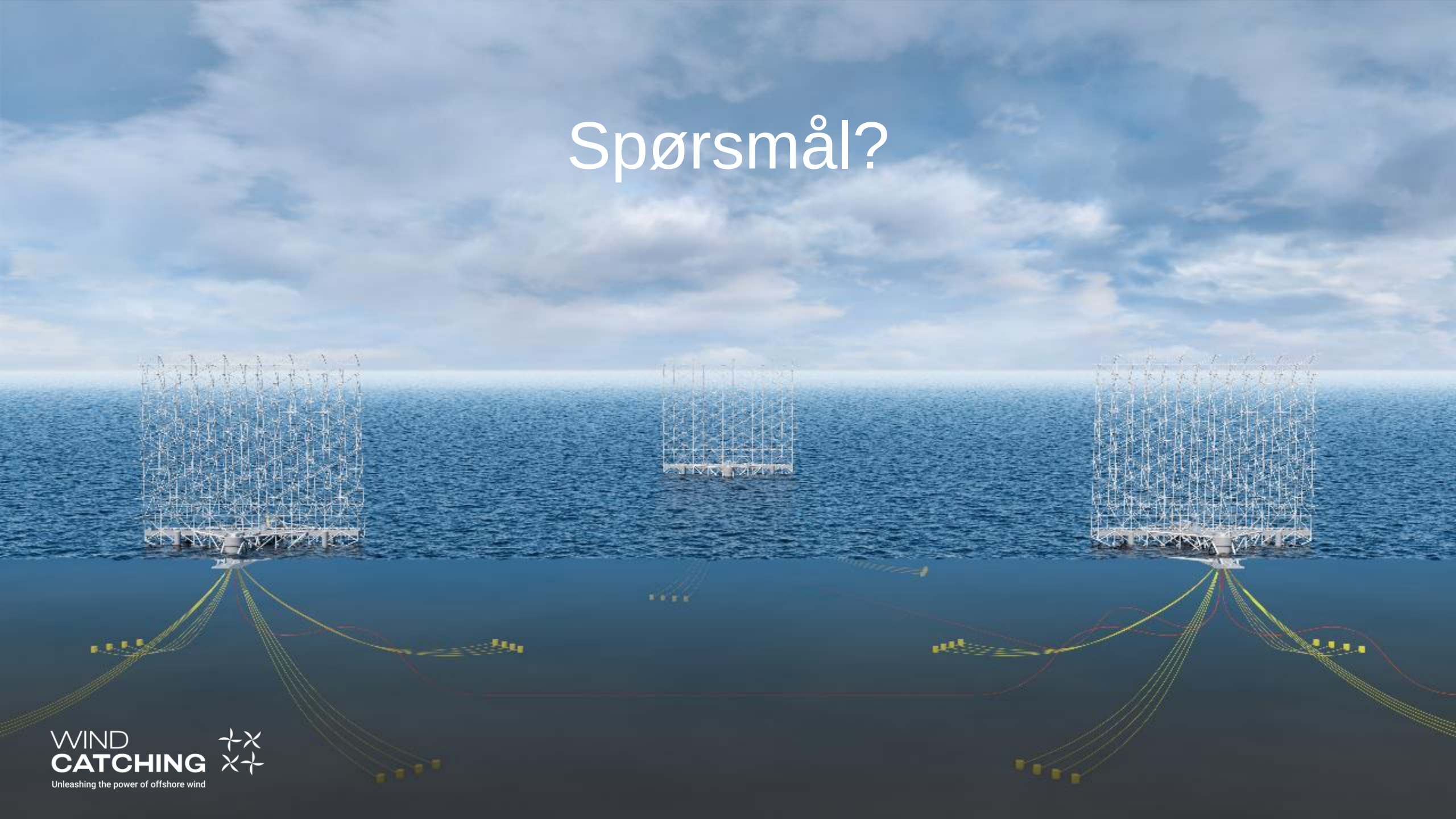
Fornybar kraft til industri

- Sikker tilgang på fornybar kraft er en nødvendighet for å sikre eksisterende og ny industri
- Kritisk for å tiltrekke seg nye kraftkrevende industriprosjekter - batteriproduksjon, lakseoppdrett på land, hydrogenproduksjon etc.
- Tilgang på fornybar kraft = konkurransekraft

Utbygging av testområde posisjonerer norske selskaper internasjonalt

WIND CATCHING

Spørsmål?



WIND CATCHING
Unleashing the power of offshore wind

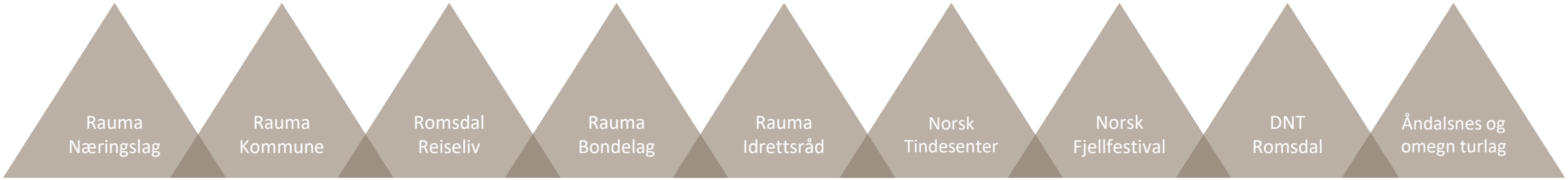
Kongeriket

VERDENS BESTE KOMMUNE FOR NATURGLADE MENNESKER

NATURGLEDE
ÅNDALSNES • ROMSDAL

Rauma kommune

Stiftelsen Romsdalstur



KONGERIKET

ROMSDAL

KONGERUTA

16 14

TIL KONGEN

HMK Garde på Kongen

DRONNINGKLYVET

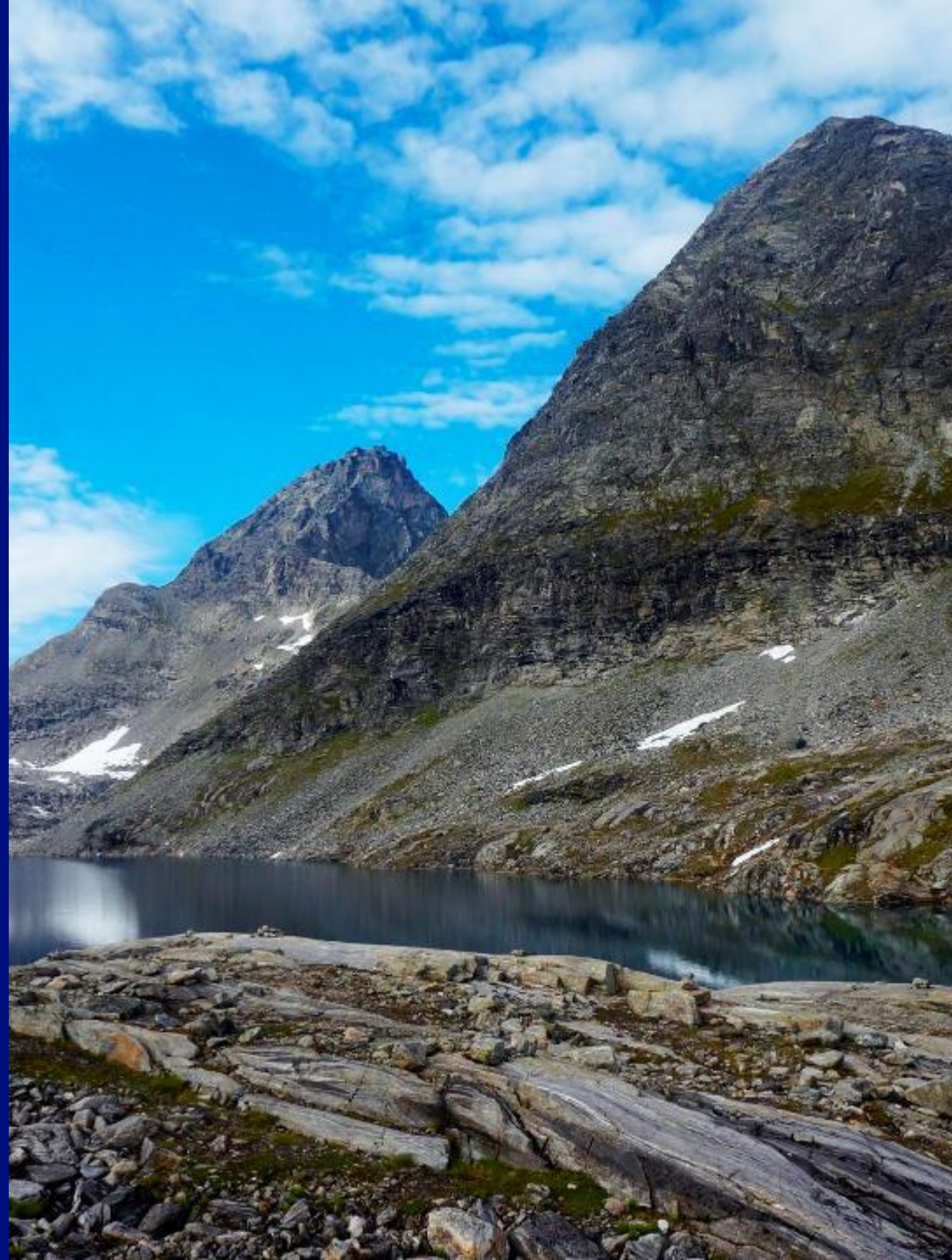
15 44

TIL DRONNINGA

BISPELEDEN

14 62

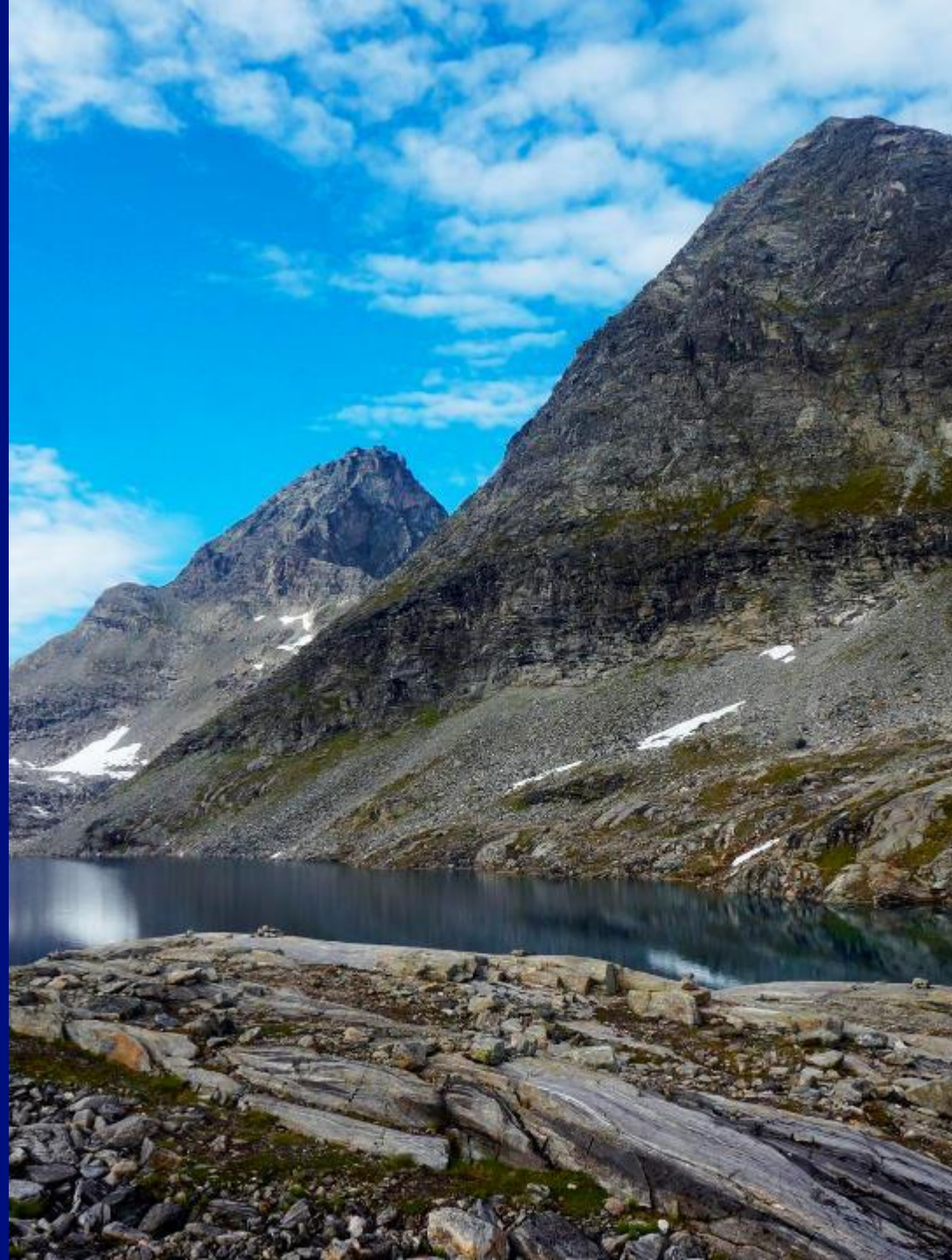
TIL BISPEN



TRÅKKET TIL

10 00

BISPEVATNET



MØRE BISKOPEMBETE

KONGERIKET

ROMSDAL

Hele kongeriket på én dag; Kongeriketraversen

Skånsom ferdsel
og merking av rutene


MAT Å FÅ
BUSINESS ON THE ROCK

Siv Remøy Vangen
Gunnar Larsen

BUSINESS ON THE ROCK

HAV group

A Sustainable future at Sea

havgruppen.no

Business on the rock 2023

Bærekraft på bunnlinja

Gunnar Larsen
CEO
HAV Group ASA

&

Siv Remøy-Vangen
Managing Director
Norwegian Electric Systems AS


Angeles Times
STUDY WARNS ABOUT STATE'S WATER
others have a new case?
FT Weekend Magazine
Discover the power to lower prices on page 6.
40 GRADER I NORGE
CRAZY DAYS!
-50 % på all iskrem fra Diplom-Is med
Gjelder man-ons
CALOR INFERNAL
Bomberos hachan por apagar un incendio en Moreno Valley en medio de temperaturas récord en todo el sur de California P. 2
SKREV BARNE-BOK
中国气象报
China Meteorological News
推动主题教育见行见效
以更高标准更实举措
气象部门拉紧防汛防台风服务链
防汛安全提供优质气象保障
去！灯火通明处
赶在轮渡停航前
THE WEEK
Climate meltdown
The historic heat wave broiling the U.S.—and the world
The GuardianWeek
Red
Are El Niño and global heating creating a perfect climate storm?
THE NEW YORKER
九州北部記録的な大雨
4人死亡 3人不明
新聞日
Da
Dagsavisen
«Umulige» stunt i snart 30 år
Forskere frykter for framtida
Veldig merkbart
The Manila Times
Trusted since 1898
Covid-19 positivity rate dips to 5.6 percent
Record heat waves hit US, Europe, Asia
THE JAPAN NEWS
경향신문

GREEN IS GOOD

Why what's good for investors no longer needs to be bad for society

HAV group

Enabling the green transition at sea

A sustainable future at sea

www.havgroup.no

International provider of green technology and services for maritime industries

Vision: A sustainable future at sea

Comprises four subsidiaries with several decades of combined industry experience

Special expertise in guiding the marine and maritime industries towards zero emissions

Four subsidiaries with a leading position within their respective segments

Ship design

Supplier of innovative **ship design,** pioneering the design and construction of zero and low-emission vessels

Energy design and smart control systems

Supplier of **sustainable energy systems**, electric propulsion, automation, and NavCom systems for a wide range of vessels for the global maritime market

Hydrogen-based energy systems

Supplier of **zero-emission** hydrogen-based **energy systems** for vessels

Water treatment systems

Supplier of **ballast water treatment systems** and process water treatment systems for aquaculture and maritime use

NAVgroup

Norwegian Electric Systems

The role of a systemintegrator

#businessontherock2023

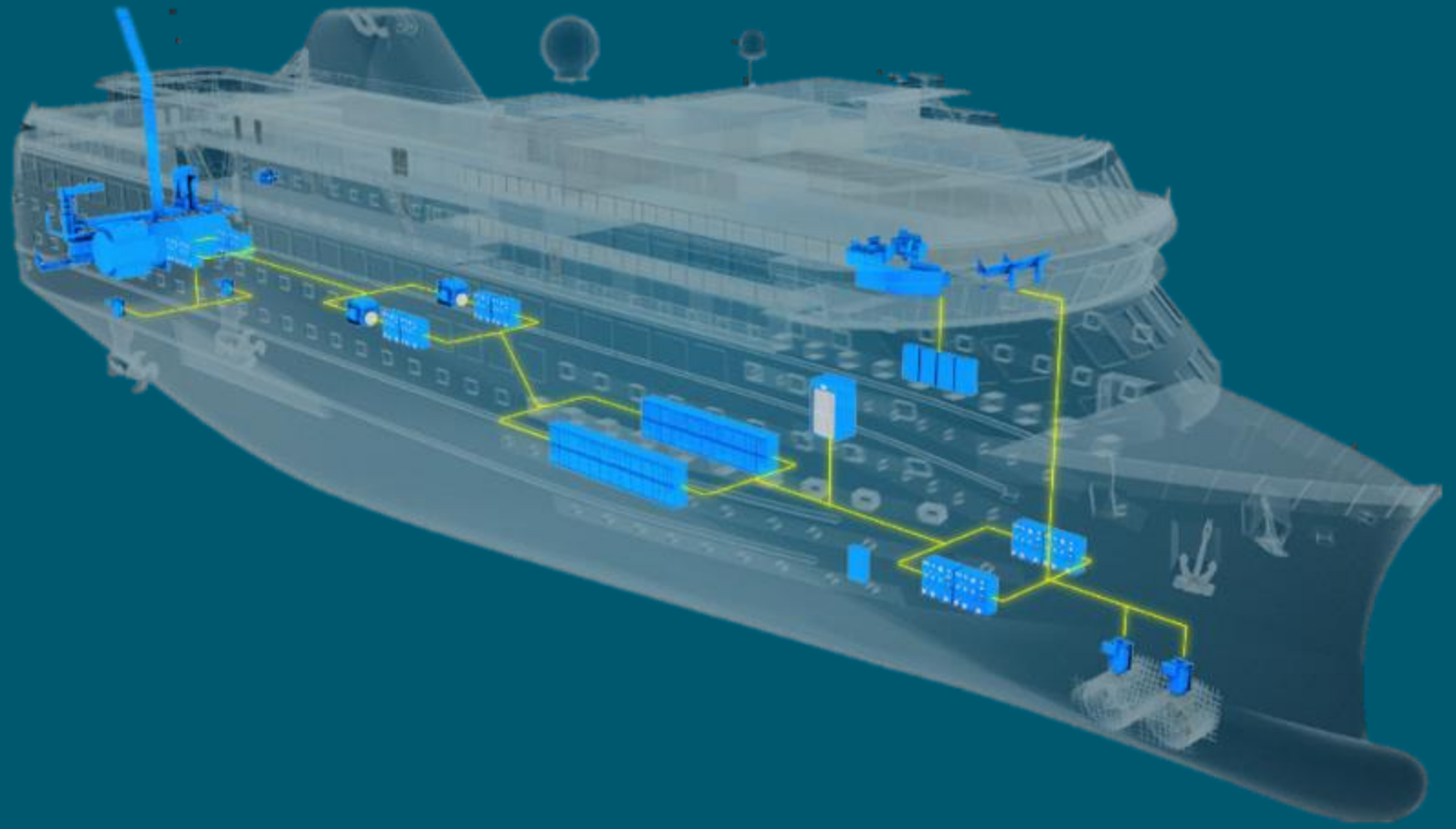
SWATH – GC Rieber Shipping

Recent deliveries

norwegian
electric systems
part of HAV group

Havila Kystruten

Recent deliveries



First passenger ship in the world to sail emission free on fully electric battery operation

Have delivered a complete power system including a propulsion power system and power generators.

Delivered and installed a 6000KW battery package that enables the vessel to sail upto 10 hrs emission free

Have delivered a complete and integrated navigation system with the Raven INS Bridge solutions

norwegian electric systems
part of HAV group

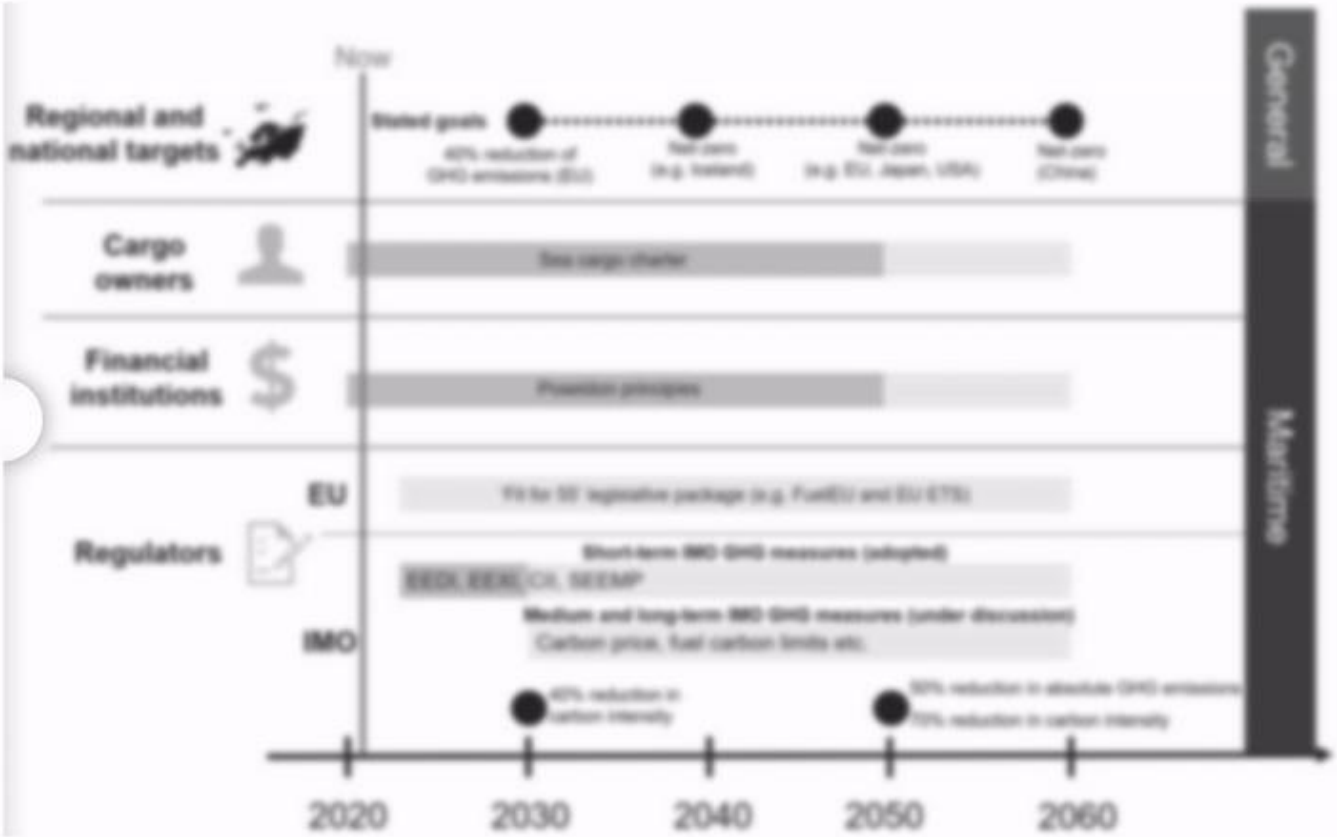
SC Connector

Recent deliveries

norwegian
electric systems
part of HAV group

Rules and Regulations

Drivers accelerating the change towards zero

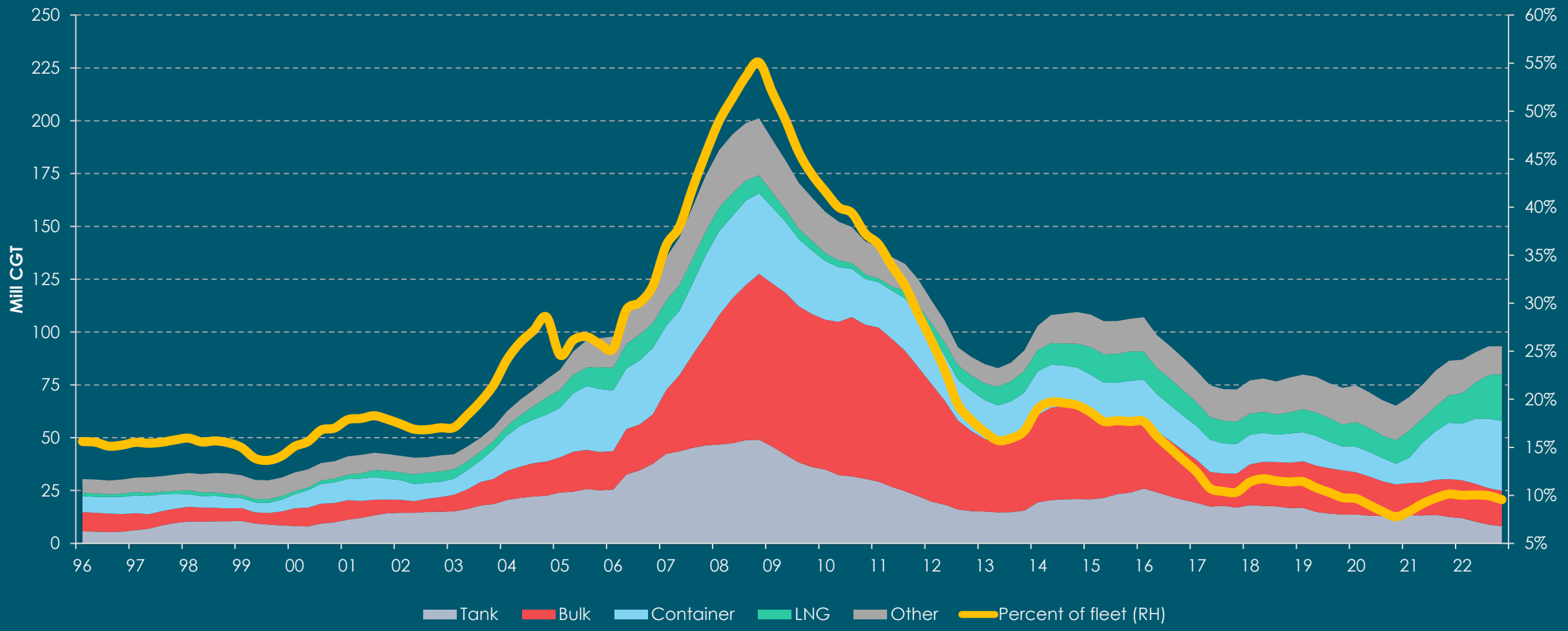


norwegian electric systems
part of HAV group

Source: Maritime Bergen, Course to Zero

Orderbook for the global merchant fleet at historically low level (% of fleet)

Currently represents 9.6 pct of world fleet at the start of Oct 2022



norwegian electric systems
part of HAV group

Source: Clarksons Research – in million compensated gross tons (CGT)

«Den som ikke gjør noe, vet som regel hvordan alt skulle ha vært løst.
Den som prøver, må regne med noen feilvurderinger»


Do more of what we do!
Level Playingfield
Support scheme & zero-emission requirements
Contract of Difference

One-stop-shop

- HAV Group possesses the technologies and products that enable the green transition at sea
- Leading competence within ship design and energy optimalization for maximizing profitability and sustainability
- Lifecycle Optimization: Maximal vessel efficiency, from bridge to propeller, from concept to operation

Anita Krohn Traaseth
Hilde Widerøe Wibe

BUSINESS ON THE ROCK

Per Olav Myrstad

BUSINESS ON THE ROCK


FOT I BAKKEN
BUSINESS ON THE ROCK

Matts Johansen

BUSINESS ON THE ROCK

Aker BioMarine – *Innovations, sustainability commitments and spearheading the solution*

QRILL AQUA / AKER BIOMARINE

Why krill?

Marine Proteins

Clean

Antioxidant Astaxanthin

Marine Choline

No Plastic

Phospholipid Omega-3s

Here and now

KRILL HARVESTING

>65%

of total global krill catch

INGREDIENT PRODUCTION

55 000

metric tons of products

RESEARCH & DEVELOPMENT

~200

published studies

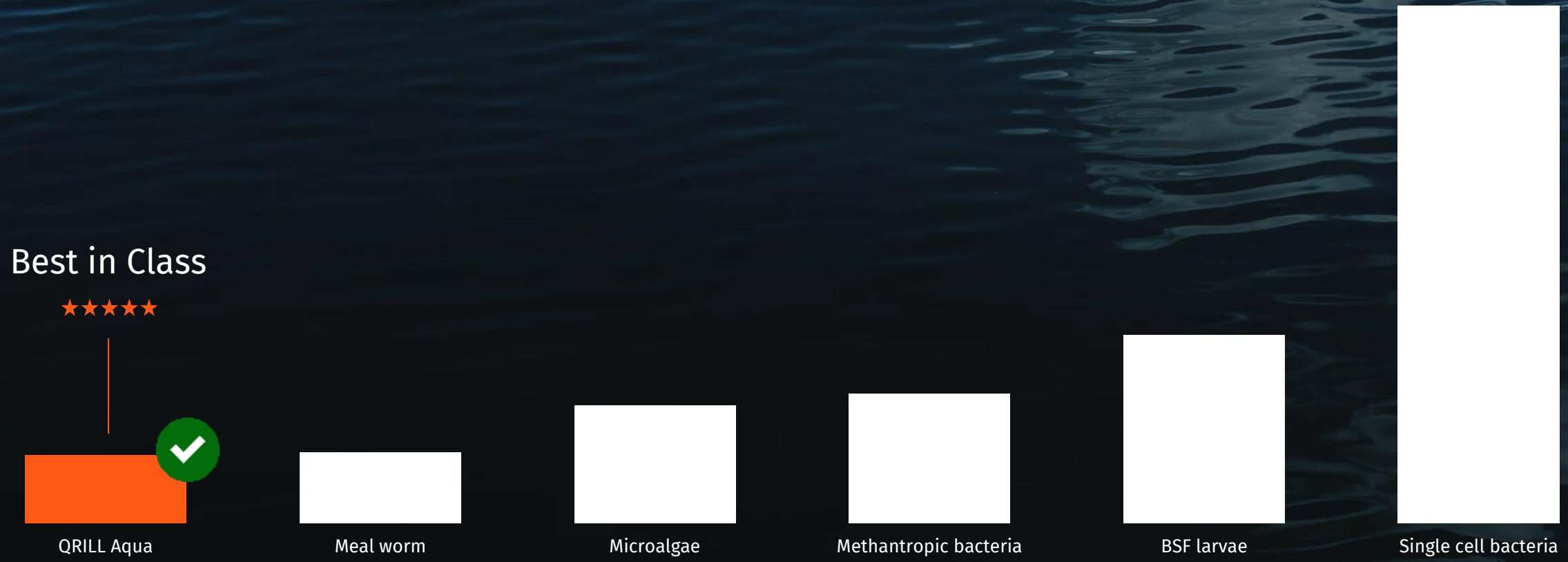
CONSUMER BRANDS

>13m

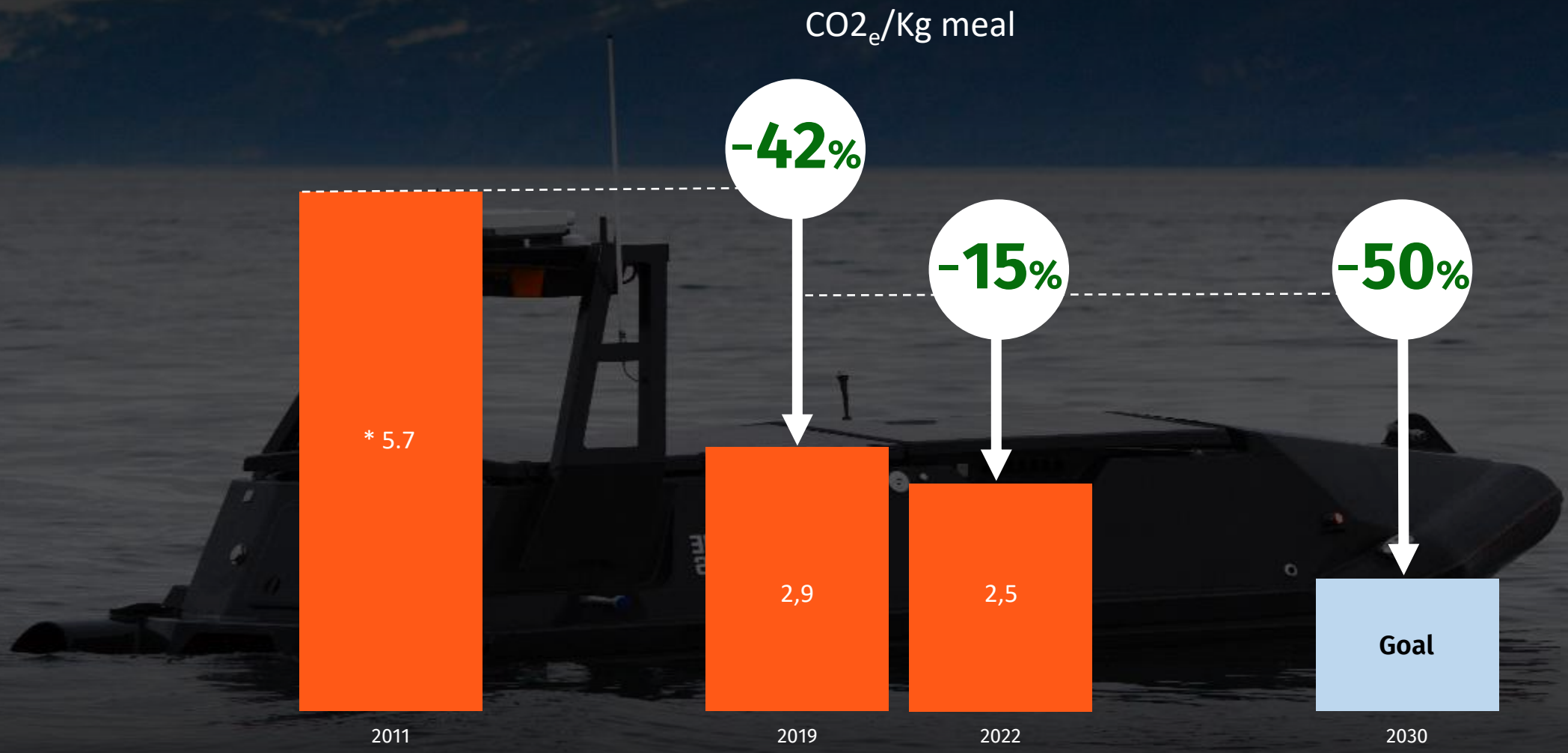
individual units sold to US consumers the last year

Greenhouse Gas Intensity

(CO_2e per unit meal)



Continuously reducing our CO_2 footprint



* Estimated in 2011


HUB Ocean
Centre for the Fourth Industrial Revolution
WORLD
ECONOMIC
FORUM


QRILL AQUA
AKER BIOMARINE

QRILL AQUA / AKER BIOMARINE

AION

84%
Reduction in CO_2

50%
Reduction in costs

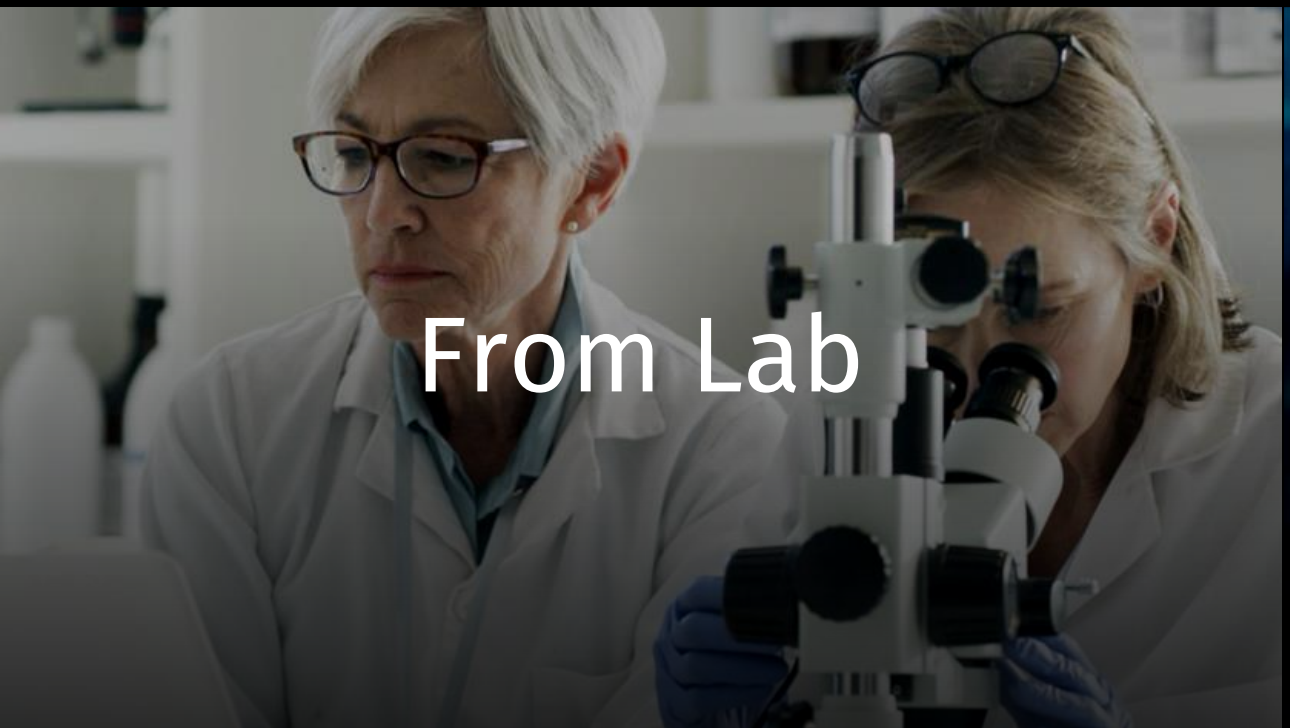
QRILL AQUA / AKER BIOMARINE

Product Development Revolution

COGNITE

Innovation Norway

AKER BIOMARINE



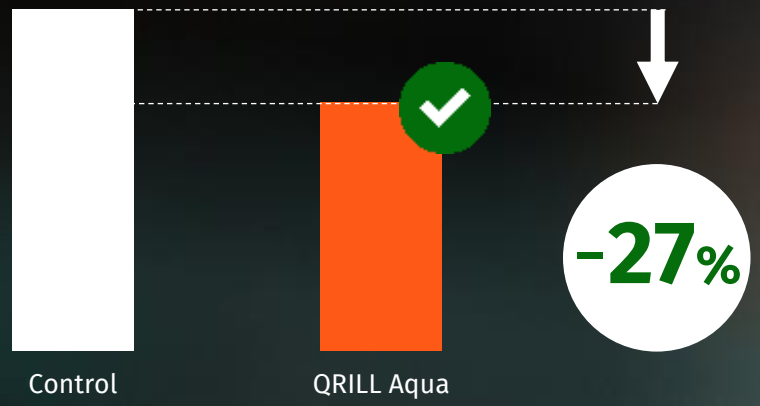
12x
Wagyu beef

5x
Premium Chicken

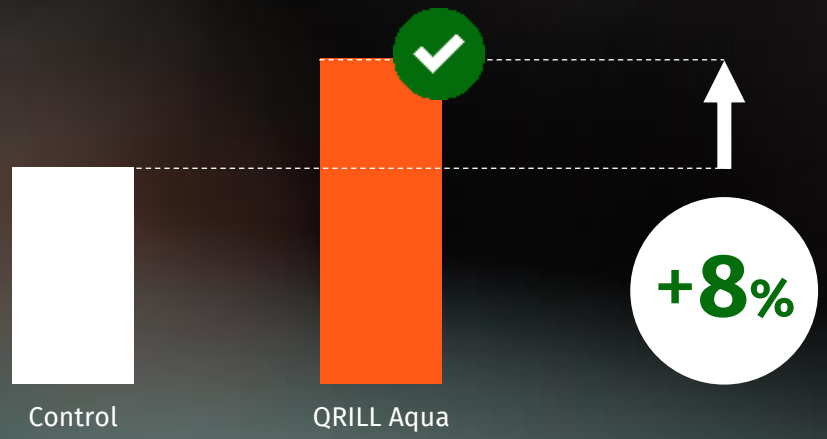
2x
Premium Salmon

QRILL AQUA / AKER BIOMARINE

Fillet Gaping



Fillet Firmness



Source: Kaur et al., 2022 Aquaculture Nutrition

«Impressing!»

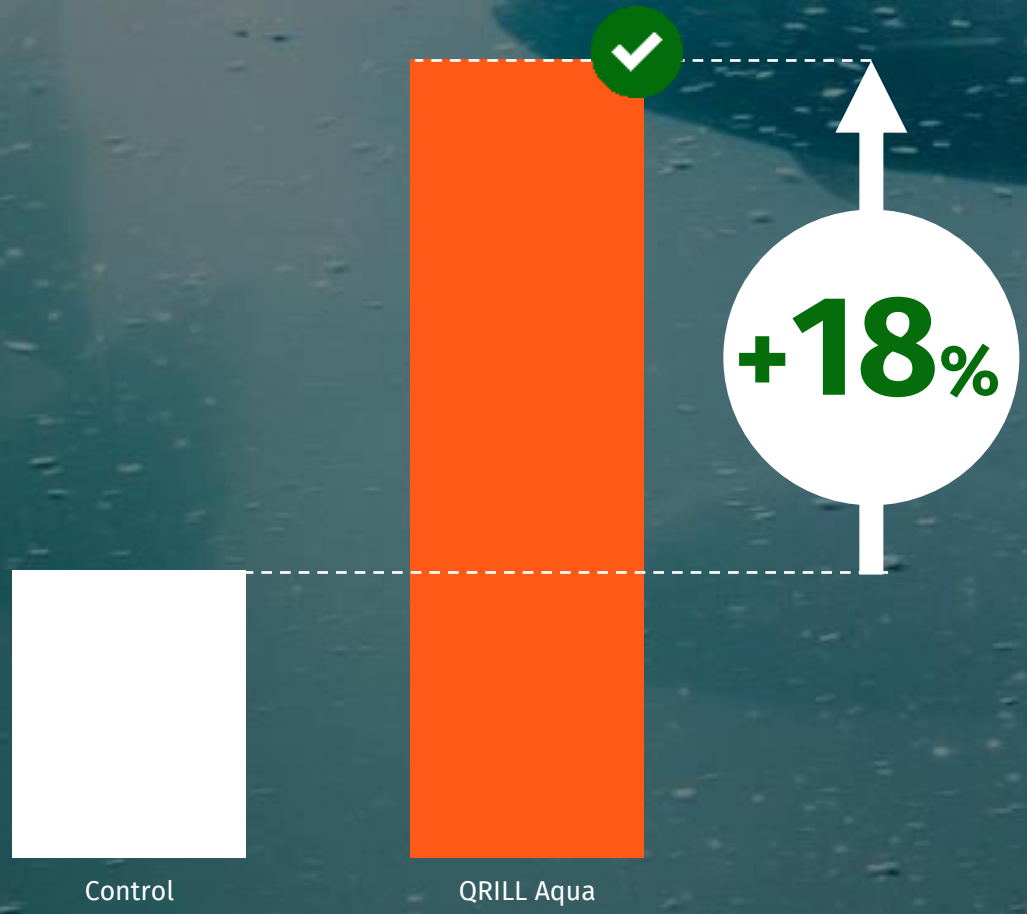
«The best farmed salmon we have tasted»

«The texture is similar to wild salmon»

Arne Brimi

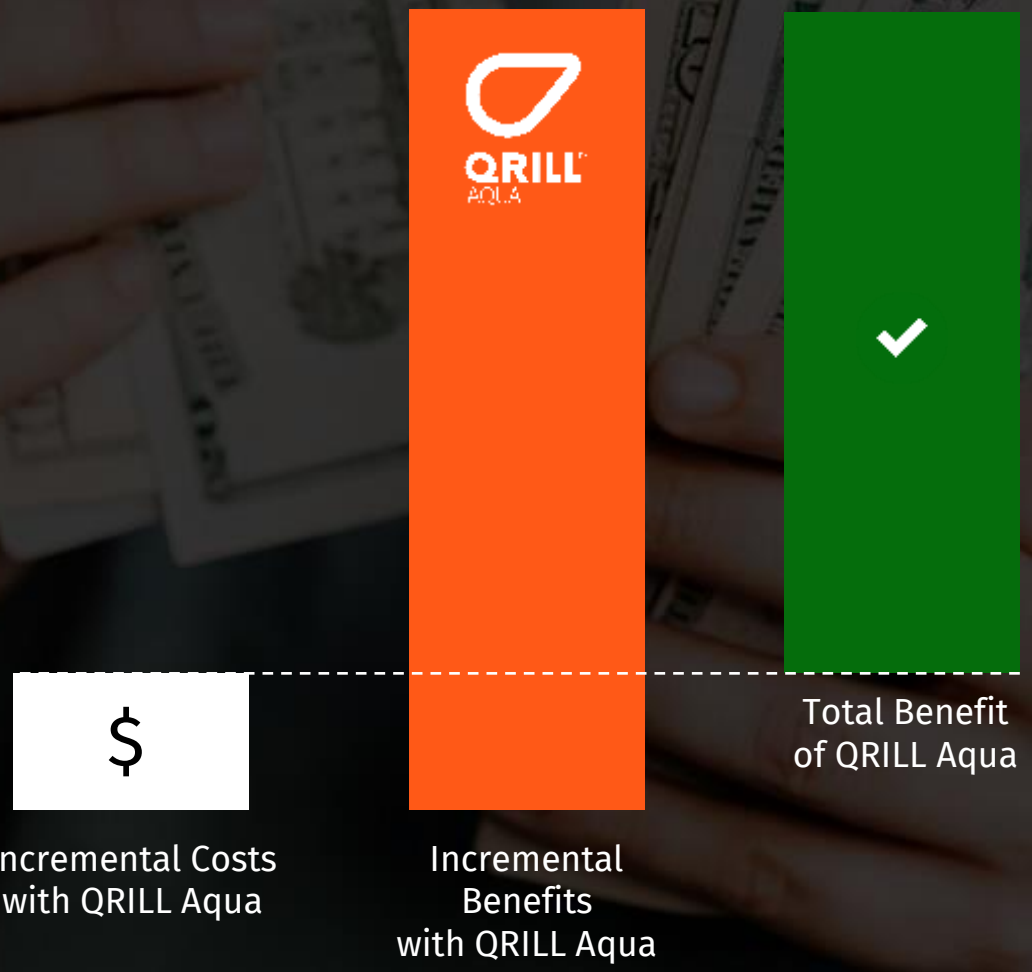
QRILL AQUA / AKER BIOMARINE

Final Body Weight



Source: Kaur et al., 2022 Aquaculture Nutrition

ROI with QRILL

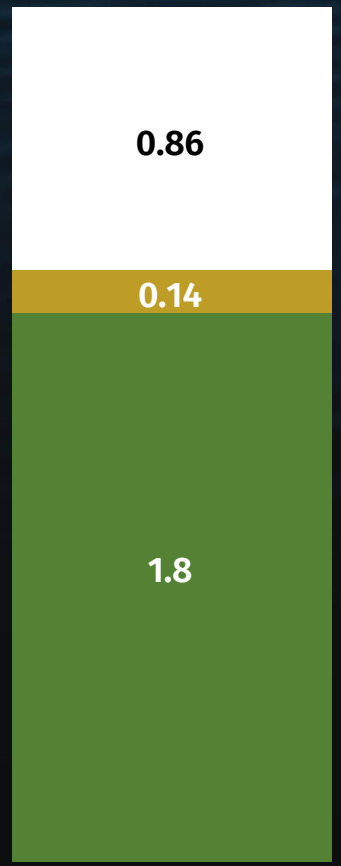


6-7.5x

Return on the investment

Source: Industry data and Aker BioMarine science

Future feed requirements



Feed gap

Novel ingredients

Current volume

Reference: NCE Seafood innovation

Current scenario

Significant

Sustainability potential

Fungi
Tunicates

Bacteria
Mussels

Microalgae
Insects
Macroalgae

Antarctic krill

Grass
Mesopelagic fish

Phototrophic microalgae
Calanus

Agricultural by-products

Small

Technological maturity

Commercial scale

Global demand of more sustainable food

Speed up the development of novel ingredients

Accelerate time to market


QRILL AQUA
AKER BIOMARINE
Thank you!
Join our journey to a greener future.

Thank you!

Matts Johansen

CEO Aker BioMarine

(+47) 916 30 120
matts.johansen@akerbiomarine.com

Trond Håkon Schaug-Pettersen

BUSINESS ON THE ROCK

BUSINESS ON THE ROCK

BÆREKRAFT PÅ BUNNLINJEN

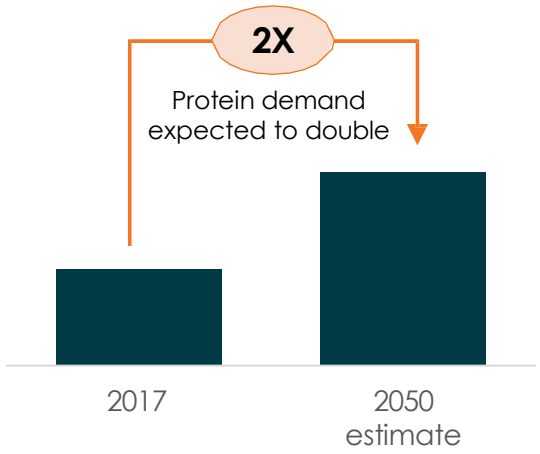
4. August 2023

SALMON EVOLUTION
extending the ocean potential

Land-based salmon farming is a response to long-term salmon demand growth, supply constraints & environmental challenges

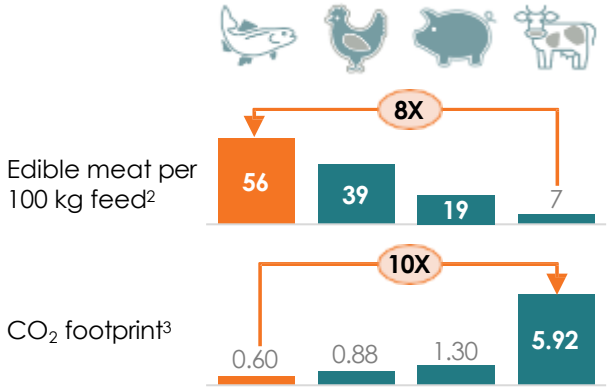
Protein demand is ever-increasing…

Protein demand forecast 2050[1]



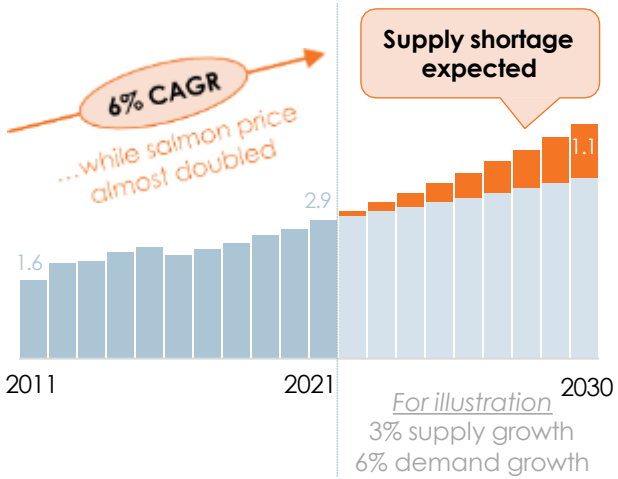
…and salmon is the most sustainable option

Comparison of animal protein sources



Traditional supply can't keep up with demand…

Salmon harvest 2011-2021[4] and future supply-demand scenario



…and faces environmental issues

Environmental challenges of traditional salmon farming

- × Limited geographically by water temperature
- × Transport to market driving CO_2 emissions
- × Escape issues
- × Sea lice issues
- × Local sea pollution

Future demand growth for salmon is highly robust and land-based farming is needed to bridge the supply gap in a sustainable way

1) Source: United Nations
2) Source: Mowi Industry Handbook 2021
3) Source: Global Salmon Initiative (CO_2 equivalents per kg of meat)
4) Source: Kontali (Atlantic salmon harvest globally in million tonnes whole fish equivalents, WFE)

SALMON EVOLUTION

Land-based farming solves the growth challenges of the salmon industry

ESG challenges of traditional salmon farming

1 Untreated fish waste

Nature of traditional salmon net pens imply issues with discharge of untreated sewage, diseases and parasites into coastal waters

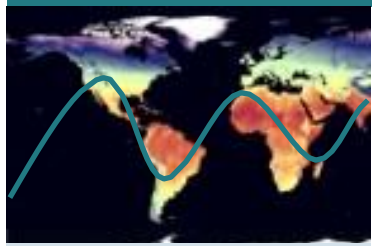
2 CO^2 footprint

Potential to significantly reduce CO^2 footprint with land-based farming closer to consumer markets[1]

3 Diseases, parasites and sea lice

Diseases, parasites and sea lice are key issues of traditional farming causing considerable damage commercially

4 Varying climate



Varying climate and increasing water temperatures can potentially cause stressed and less healthy fish

5 Mortality

Losses in production is known to be a key challenge for sea-based salmon farmers

6 Escapes

Escapes in sea-based salmon farming are expensive and potentially damaging to wildlife

1) According to The Freshwater Institute and SINTEF, comparing land-based salmon delivered fresh to the market in local U.S. markets, compared to salmon farmed in open net pens in Norway delivered to the U.S. by air freight

ESG = Environmental, social and governance

Source: Company

SALMON EVOLUTION AT A GLANCE

Company overview

- Established in 2017
- Based in Hustadvika, strategically located in the salmon farming cluster on the west coast of Norway
- Listed on Oslo Stock Exchange in 2021
- Highly experienced and complementary management team
- ~70 FTEs across Management & Administration, Operations, Projects, Technology and Sales & Marketing
- First mover with Hybrid flow-through system (HFS) – setting Salmon Evolution apart from other land-based salmon farming players

Operational value chain

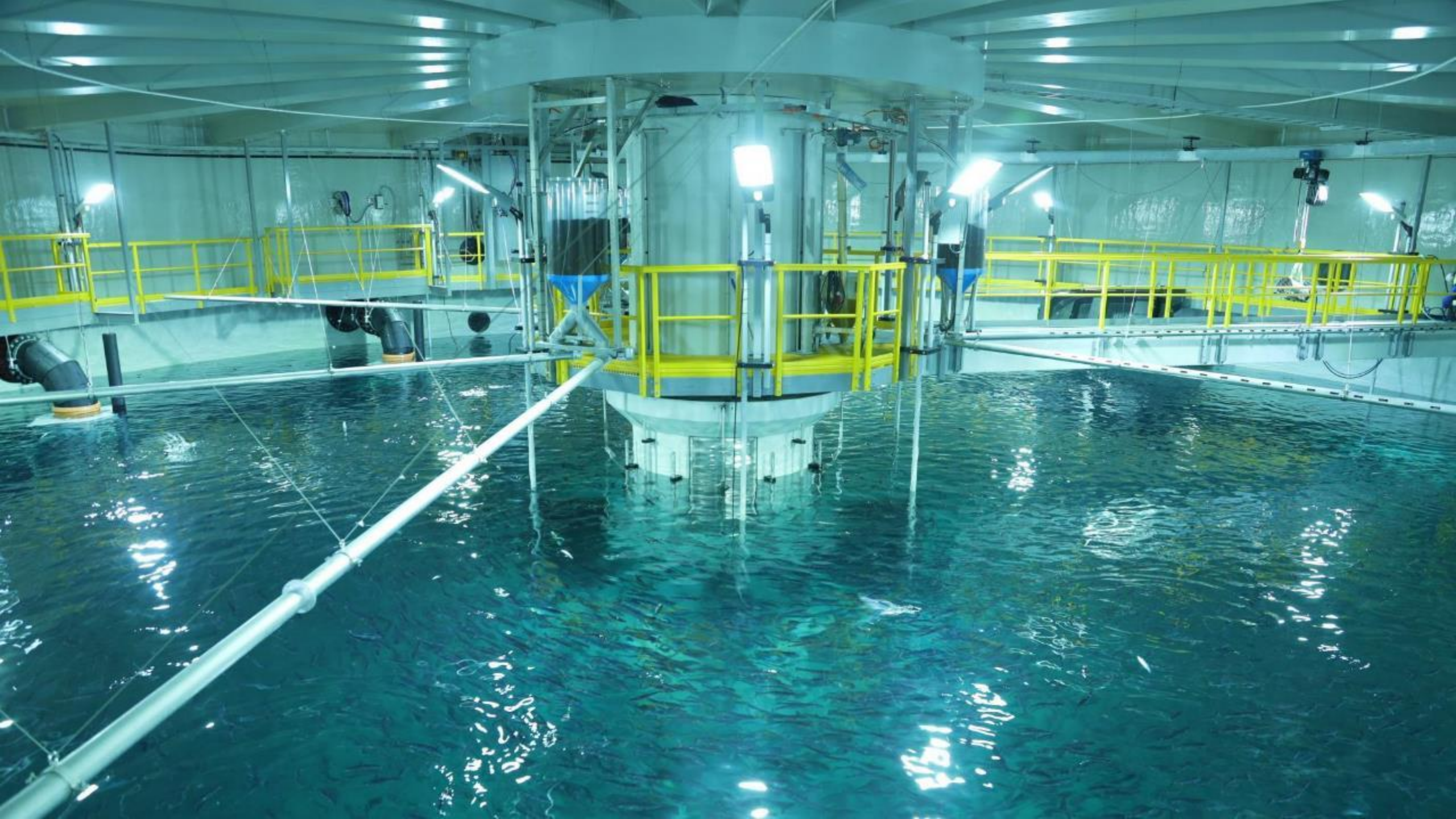
- Focusing own efforts where we are competitive and can create most value
- Securing key inputs through strategic partnerships with world-leading suppliers

Salmon farming facilities

Construction timeline	2020	2021	2022	2023	2024	2025	2026	2027	2028	Annual capacity (kt)
Phase 1		Completed								8
Phase 2										8
Phase 3										16
Phase 1										8
Phase 2										8
North America										32
Further expansion										20
Total grow-out capacity										**100**

Production figures in thousand tonnes (kt) HOG (head-on-gutted) weight for grow out capacity and number of fish for smolt capacity

INDRE HARØY FACILITY




SALMON
EVOLUTION
extending the ocean potential

SALMON EVOLUTION IS AIMING TO BE THE GLOBAL LEADER IN LAND-BASED SALMON FARMING

Salmon Evolution in a nutshell

1 Biology is our most important consideration

Our technology captures the benefits of both land-based and sea-based farming

2 Born in Norway – the cradle of salmon farming

There is much to learn, even though we have decades of experience

3 International expansion with strong local partners

We don't go solo on our first projects overseas

4 First-mover aiming for technology leadership

Developing superior cost position & opportunities to capitalize on technology

5 Premium position based on quality & ESG

Committed to quality & sustainability

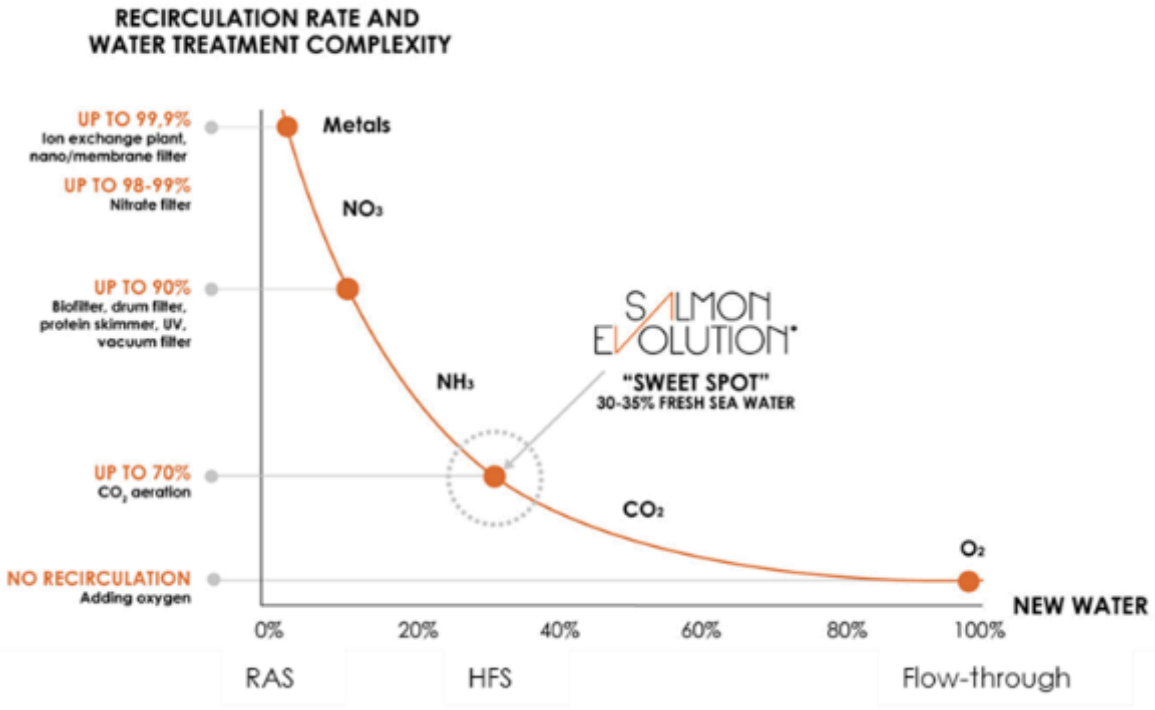
Conservative approach in a disruptive industry

Long-term competitive advantage & profitability

SALMON EVOLUTION

BIOLOGY IS OUR NUMBER ONE PRIORITY

1 We have found the sweet-spot: Hybrid flow-through system (HFS)[1]



2 Minimizing risk: Each tank is a separate biozone

RAS
Recirculating aquaculture system

Biofilter shared by several tanks – causing cross-contamination risk

No biofilter – each tank a separate biological zone, eliminating cross-contamination

Fresh seawater is our primary form of water treatment, complemented by standard CO_2 stripping and oxygenation – no need for complex systems that significantly increase biological risk

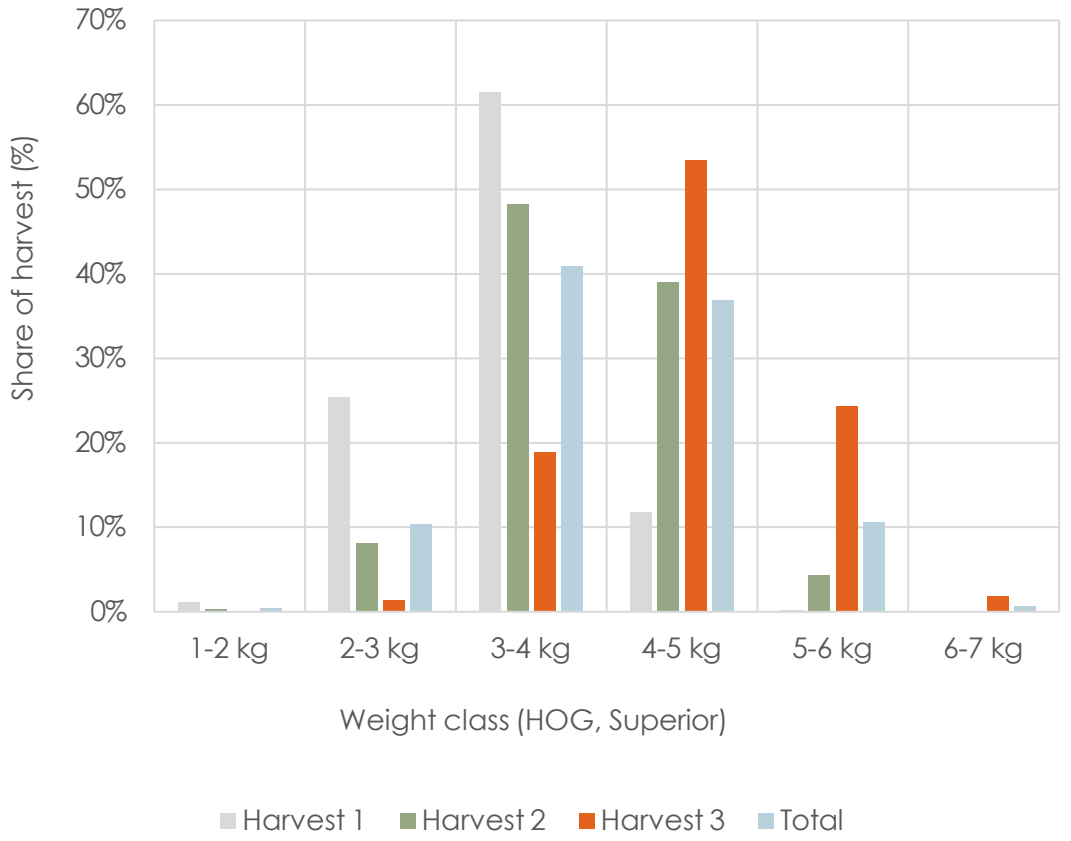
1. Source: Company (for illustrative purposes)

PROOF OF CONCEPT DEMONSTRATED AFTER 16 MONTHS OF PRODUCTION

Key takeaways

- Strong biological performance in general with excellent growth, low mortality and good quality
- Producing at industrial densities as per production plan
- <1 year production cycle from 130g to ~6 kg enabled by stable and ideal temperature all year round
- Target mortality of 3-5% within reach – batch 1 ended at 5.8% and 4.0% excluding first 30 days
- Strong product quality with superior share of 96% and 93% for batch 1 and 2, respectively
- Excellent harvesting results with tight weight distribution enabling strong price realization and lower costs
- Facility and systems constantly optimized and finetuned
- Importance of biosecurity

Batch 1 harvest weight distribution (HOG)

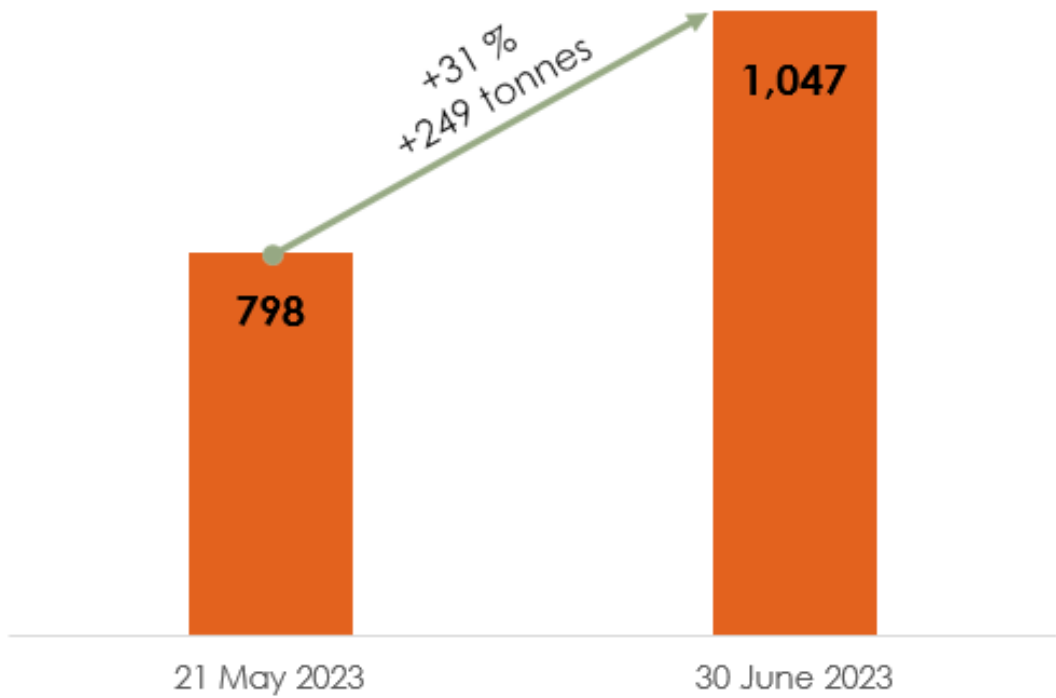


BIOMASS PRODUCTION BACK ON TRACK FOLLOWING AGD EVENT IN MAY

Comments

- Standing biomass of 1,047 tonnes per Q2, up from 798 tonnes per 21 May
- Good appetite and normal mortality levels across all fish groups post successful freshwater treatment
- Freshwater treatment has proven highly effective against AGD
- On-site freshwater production capabilities installed and operative
  - Ensures minimal response time if needed
  - Enables Salmon Evolution to have freshwater treatments as a precautionary and integrated part of fish transfer processes
- Vast amount of operational know-how gained. Invaluable input to Indre Harøy phase 2 and international expansion projects

Group biomass (tonnes, LW)

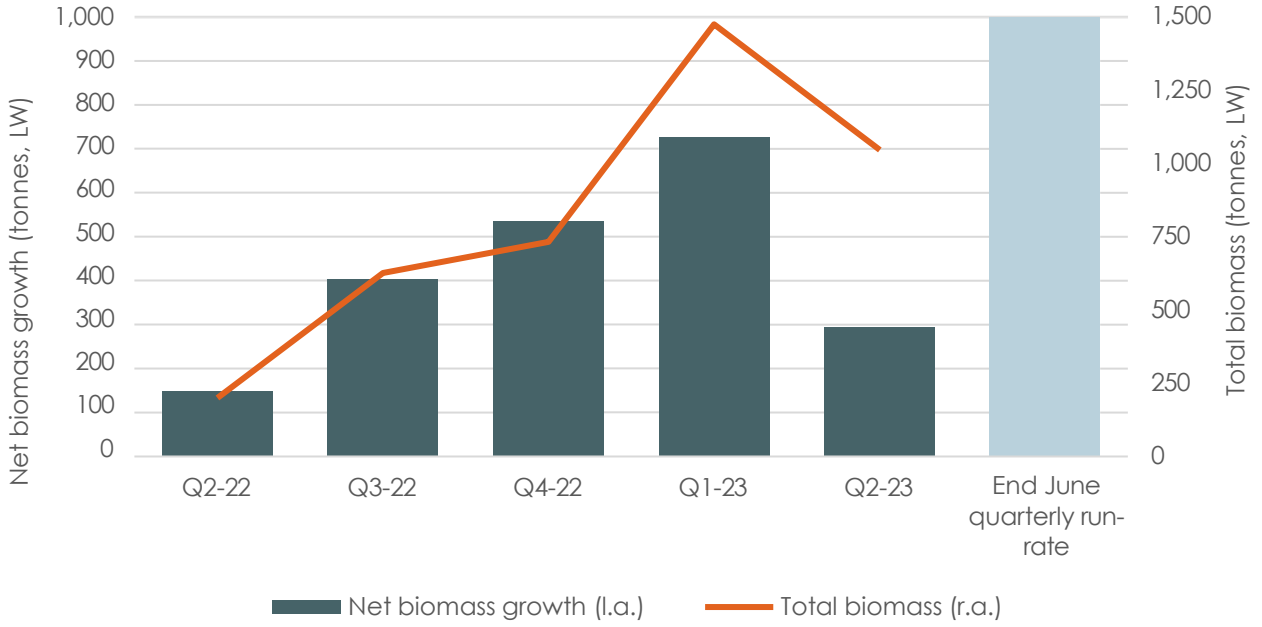


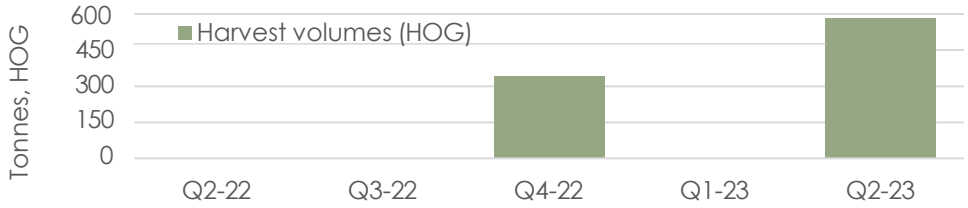
STRONG BIOLOGICAL PERFORMANCE

Comments

- Quarterly biomass growth run rate of around 1,000 tonnes based on daily feeding levels ultimo June – newly stocked batches to add further growth momentum over the coming months
- Exceptional performance for batch 5, average weight already above 1.1 kg, up from 650 grams per 21 May
- Batch 6 and 7 stocked end of May and end of June, respectively
- Batch 2 fully harvested in May
  - ~600 tonnes HOG with 93 % superior share and tight weight concentration
  - Average price of NOK 95/kg[2)] HOG
- Annual steady state production volumes of 7,900 tonnes HOG expected during Q4 2023

Net biomass growth[1)] (LW) and harvest volumes (HOG)

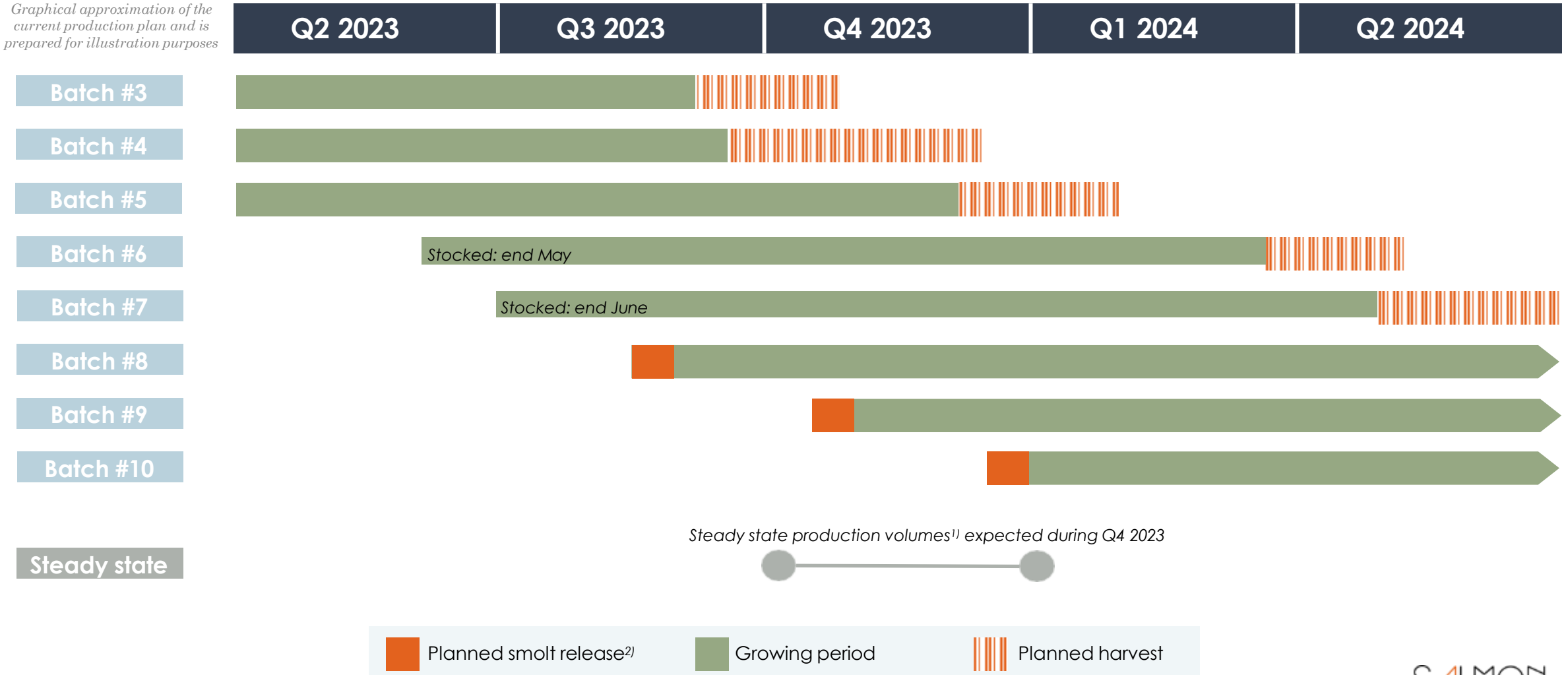




1) Net biomass growth includes mortality and culling 2) Calculated on a back to farm basis and adjusted for transport cost to Norway border (Nasdaq equivalent)

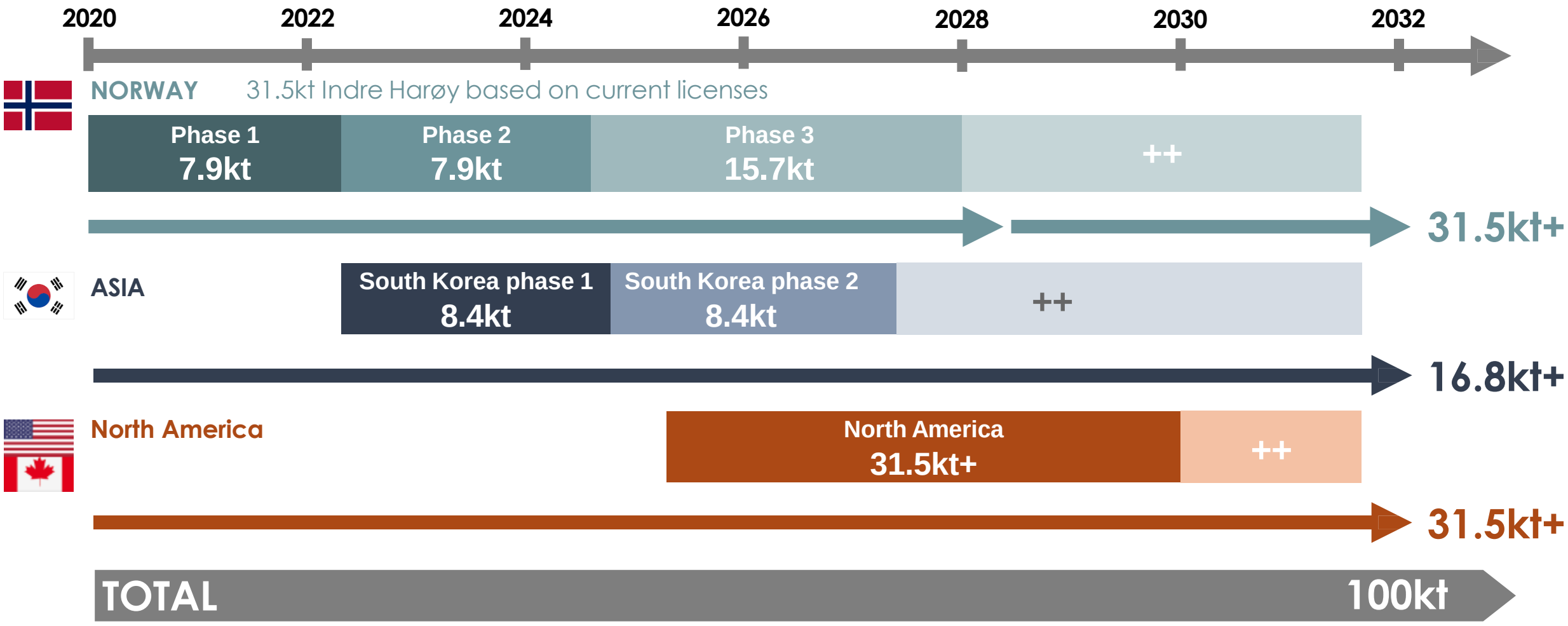
THREE MORE SMOLT RELEASES PLANNED FOR REST OF 2023

Graphical approximation of the current production plan and is prepared for illustration purposes



1) Steady state production is defined as an annualized production of 7,900 tonnes HOG 2) In-house sourcing of smolt

ROADMAP TO 100,000 TONNES HOG



SUMMARY

- Biomass production back on track, strong biological performance
- Good appetite and normal mortality levels
- Significant harvest volumes planned for second half 2023
- Annual steady state production volumes of 7,900 tonnes HOG expected during Q4 2023
- Indre Harøy phase 2 preparations ongoing and preparing for construction start
- Robustness and flexibility of the hybrid flow-through technology fully demonstrated
- Unique platform for overseas expansion and global scaling

SALMON EVOLUTION

OPPSUMMERING

RR og Nordveggen

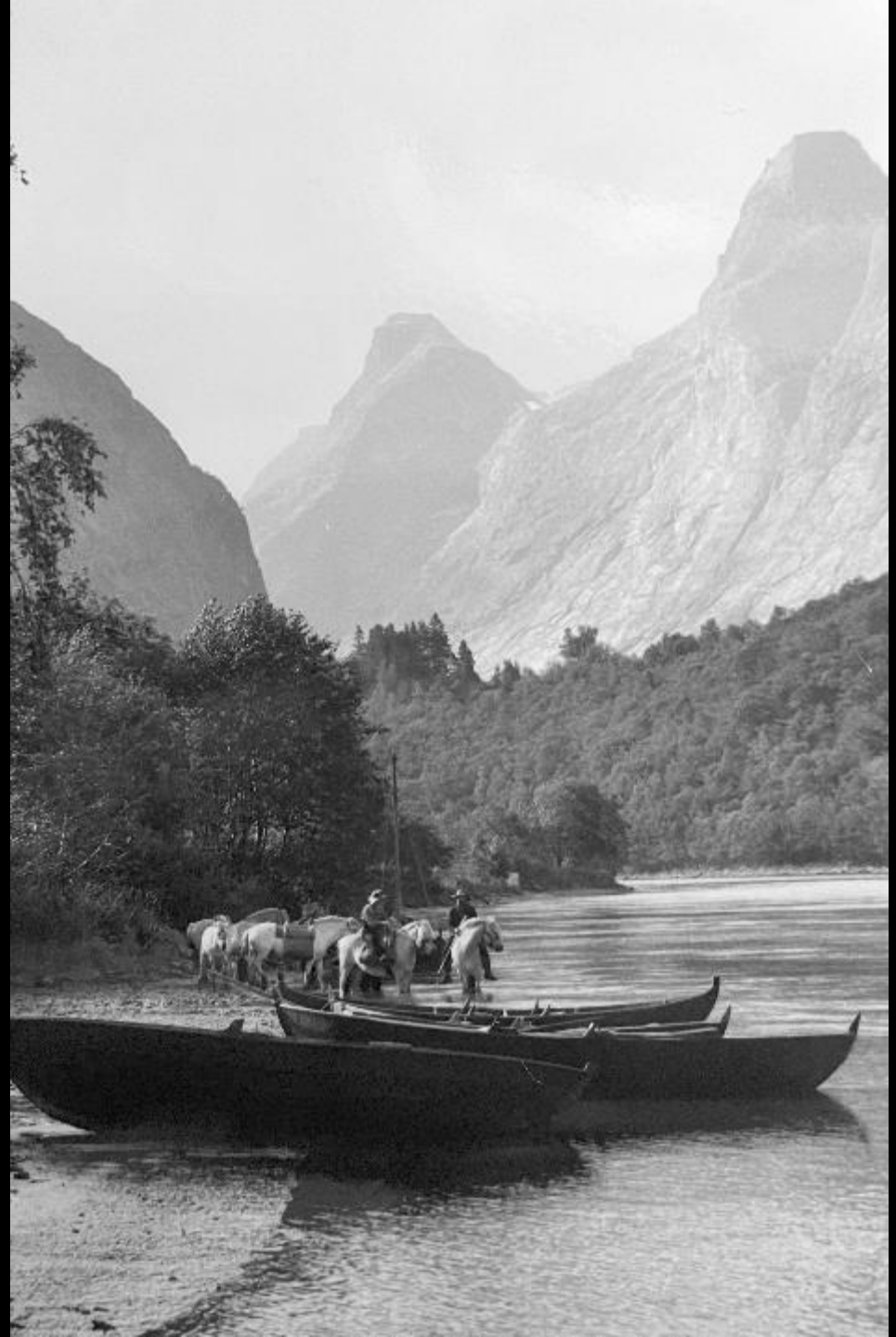

RAUMA ROCK
SpareBank 1
Ringnes
BUSINESS ON THE ROCK


MULDVARPEN
D-A-D

Verdenslansering

RAUMAROCK


64
64
64
64
Isfjorden
Åndalsnes
EGGEN
Klungnes
Veblungsnes
ÅNDALSNES
LEIRPLASS
Romsdalsfjorden
E136
Dalsbygda
Brønnsletta
Devold
E136
63
E136
E136
Innfjorden
63
Trollveggen




Devold


BRENNEVINS.
grova

BRENNEVINS.

GROVA

Der kysten møter innlandet, ligger gården Devold – omkranset av Romsdalens majestetiske fjell. Her møttes folk i gamledager til marked – «Det største der er». I elveskogen rundt Devold trives den skjøre og syrlige skogsplanta Gauksyre.

Ole Devold Anne Bjørg Devold


BRENNEVINS-
grova
Jevold
GIN
MED SKOGSPLANTA GAUKSYRE
Mikrodestilleri
43,4% Vol / 500 ml


BRÄNNVINS-
grova
Nevold
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Mikrodestillteri
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