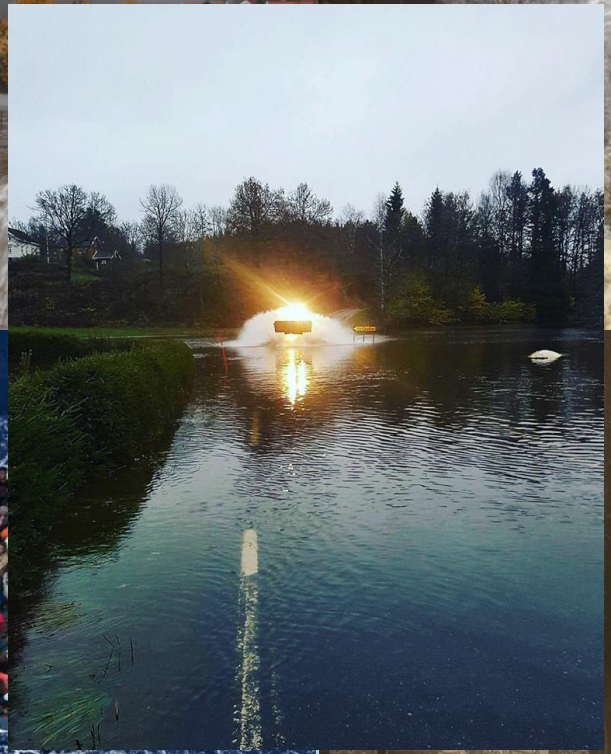
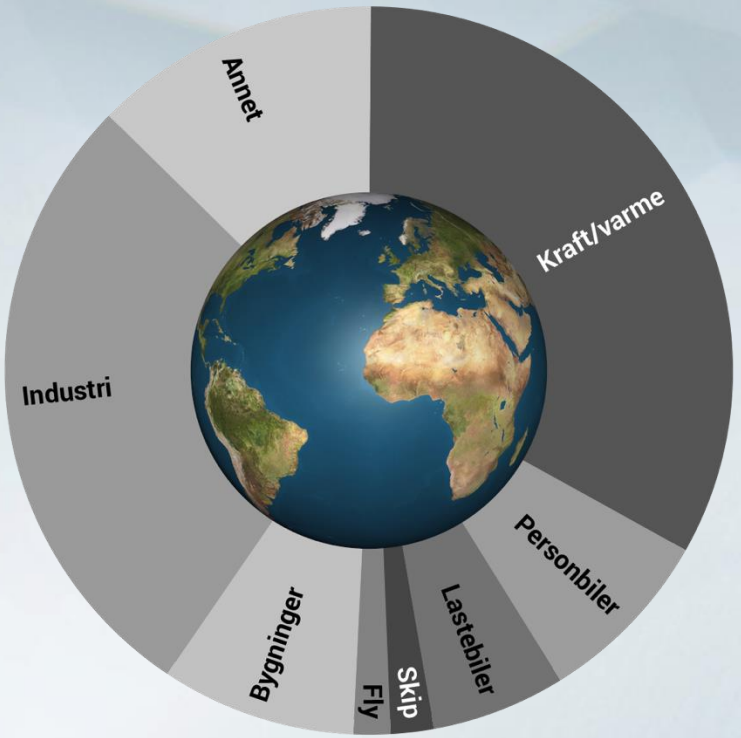
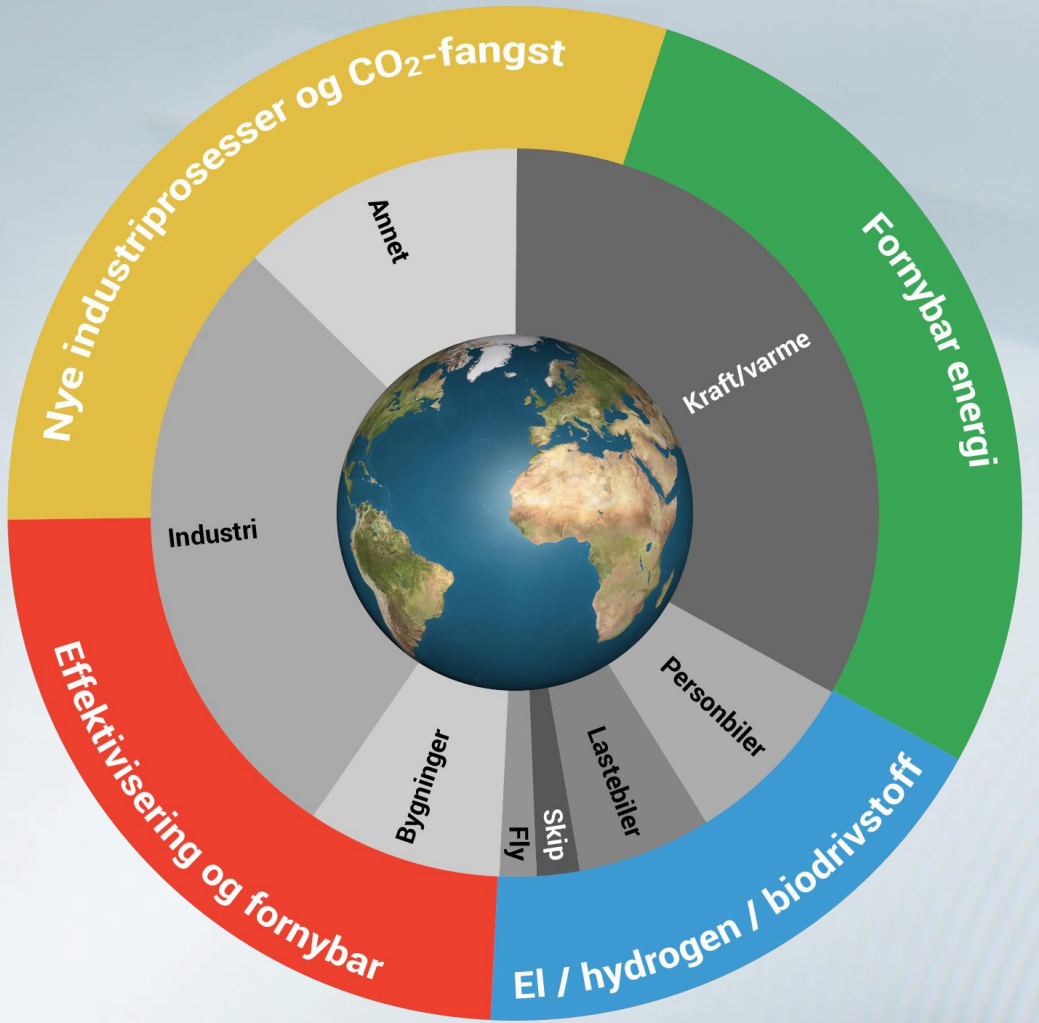
Skogens rolle i klimaarbeidet

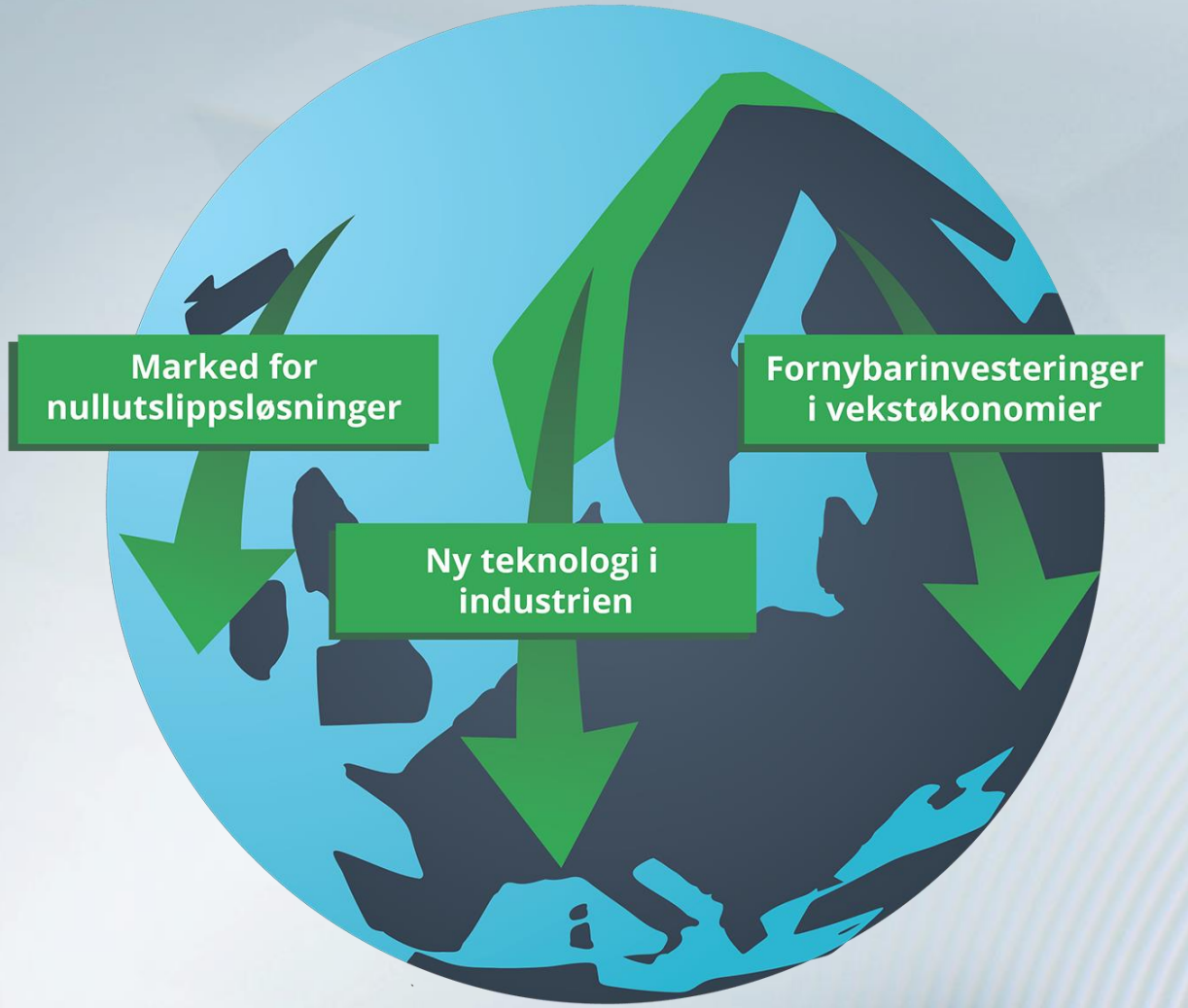
Frå plante til planke, Stavanger, 19.09.2018

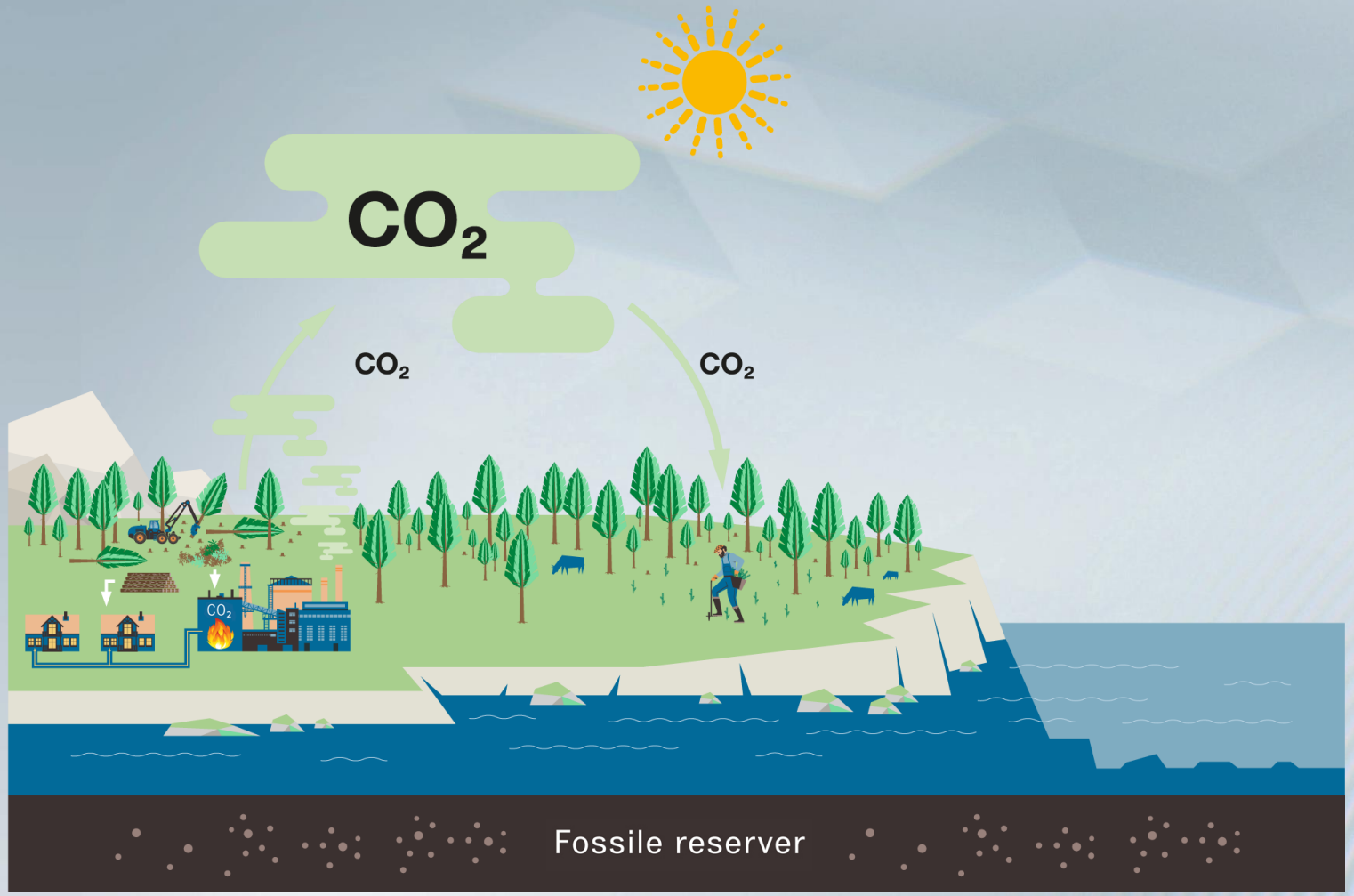
Kåre Gunnar Fløystad - @kgfloystad



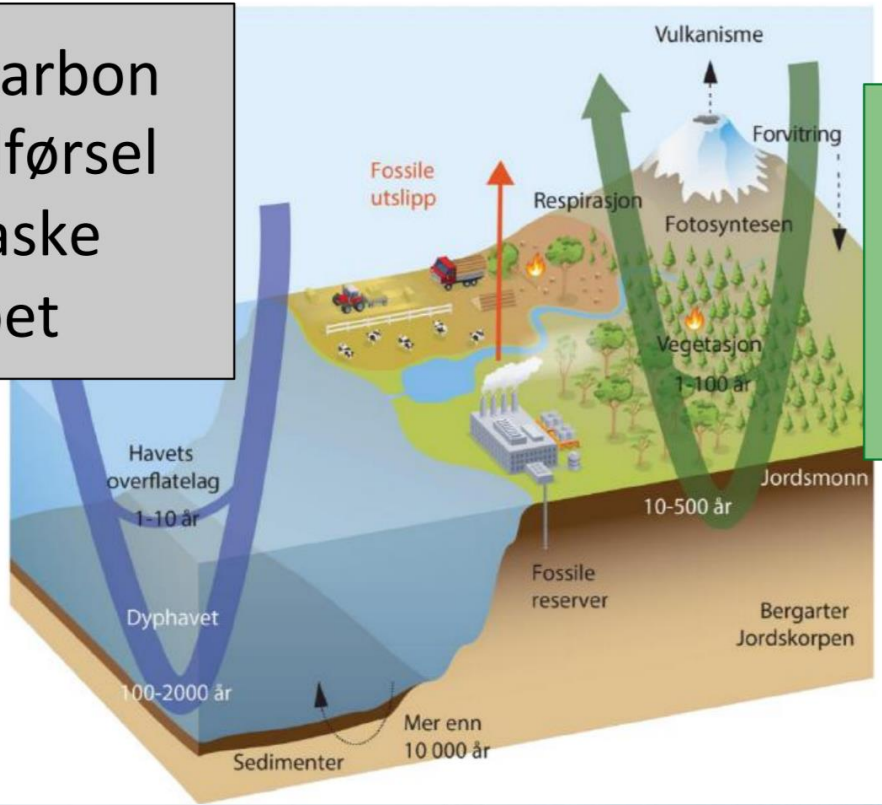

Annet
Kraft/varme
Industri
Personbiler
Bygninger
Lastebiler
Fly
Skip


Nye industriprosesser og CO_2-fangst
Fornybar energi
El / hydrogen / biodrivstoff
Effektivisering og fornybar
Annet
Kraft/varme
Industri
Personbiler
Lastebiler
Skip
Fly
Bygninger


Marked for nullutslippsløsninger
Fornybarinvesteringer i vekstøkonomier
Ny teknologi i industrien

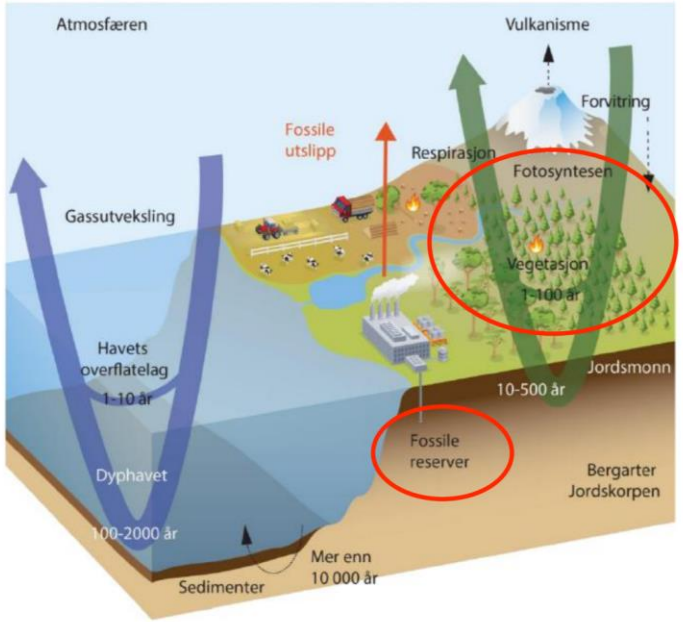

CO_2
CO_2
CO_2
CO_2
Fossile reserver

Fossilt karbon gir en tilførsel til det raske kretsløpet



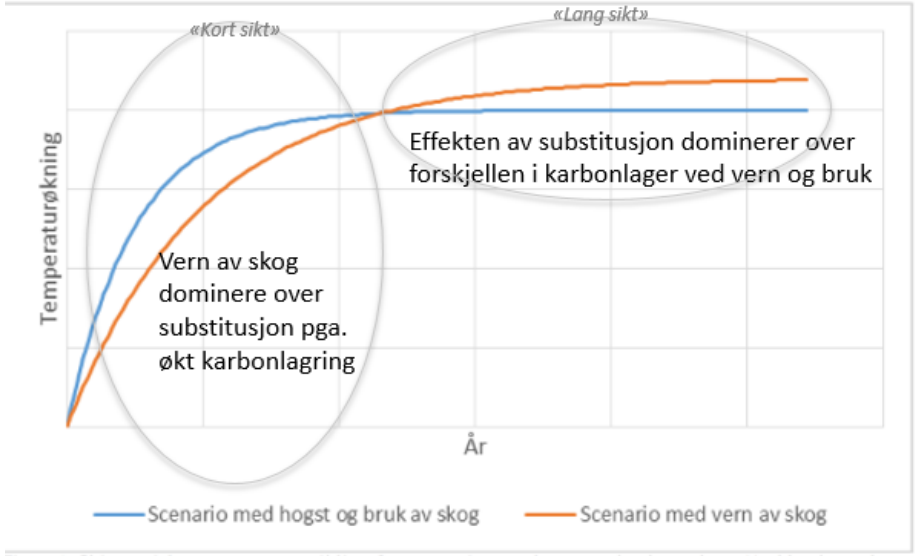
Biogent karbon innebærer en reallokering innenfor det raske kretsløpet

Karbon og Tilbakebetalingstid

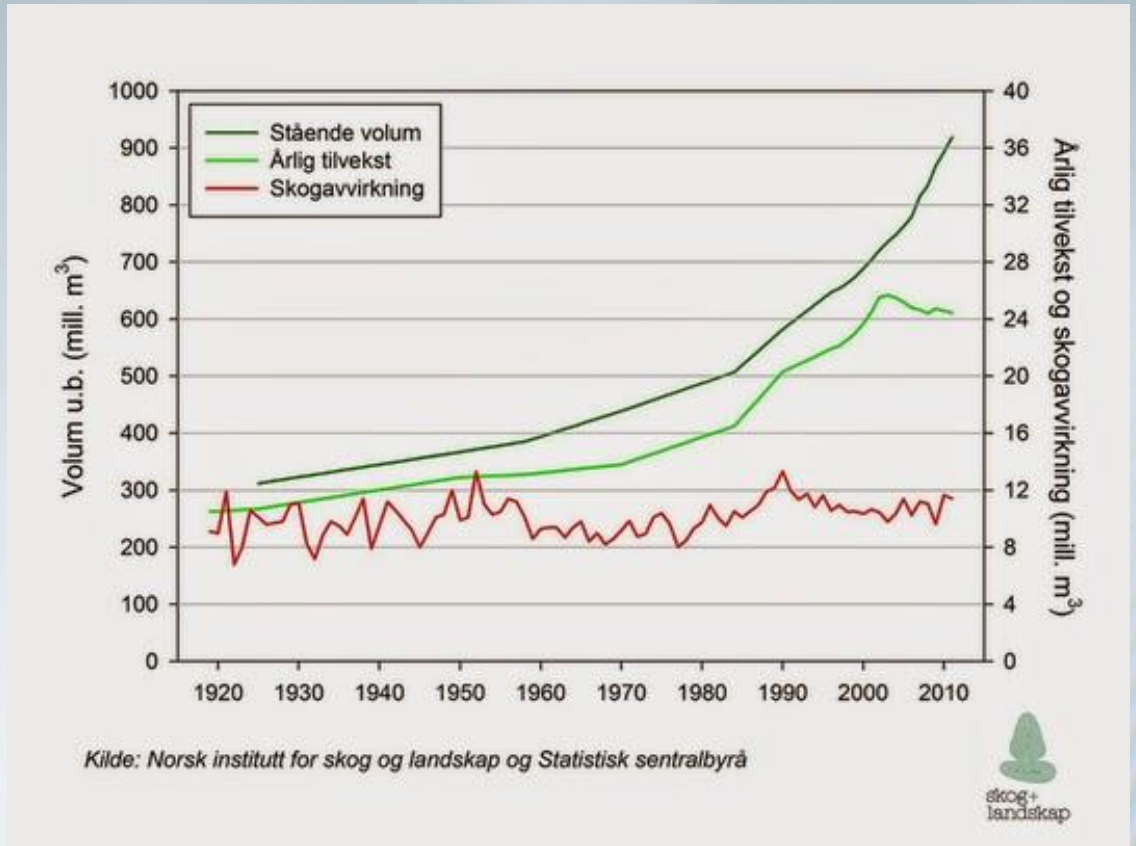


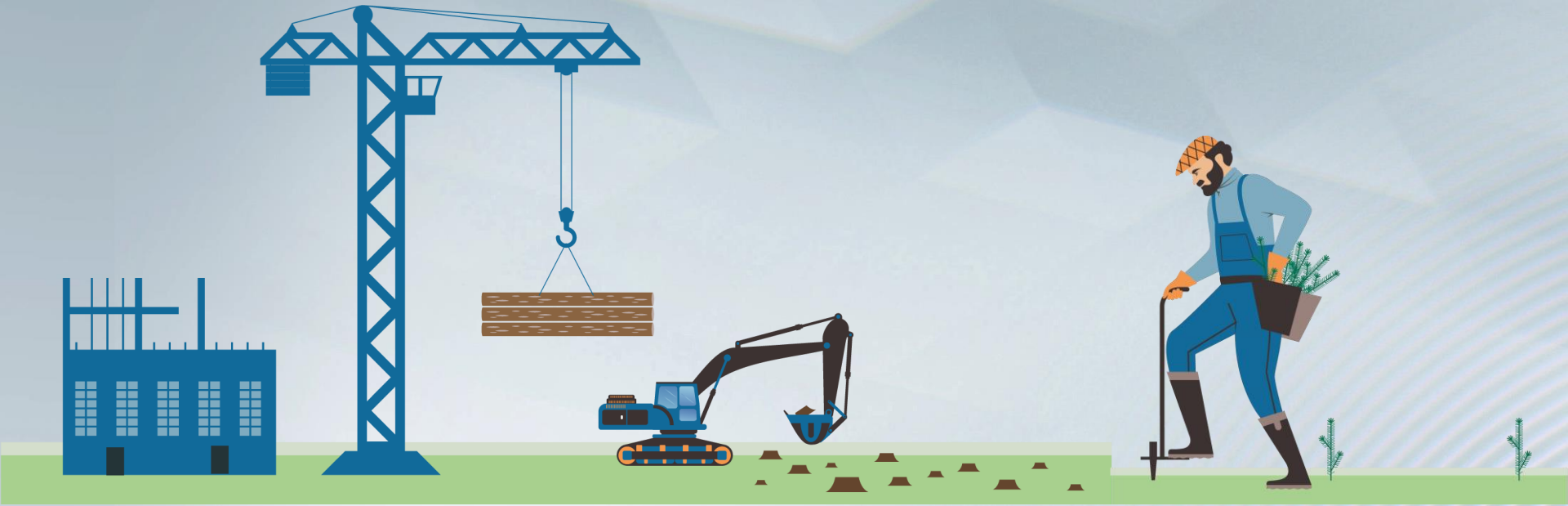
Rask omsetning

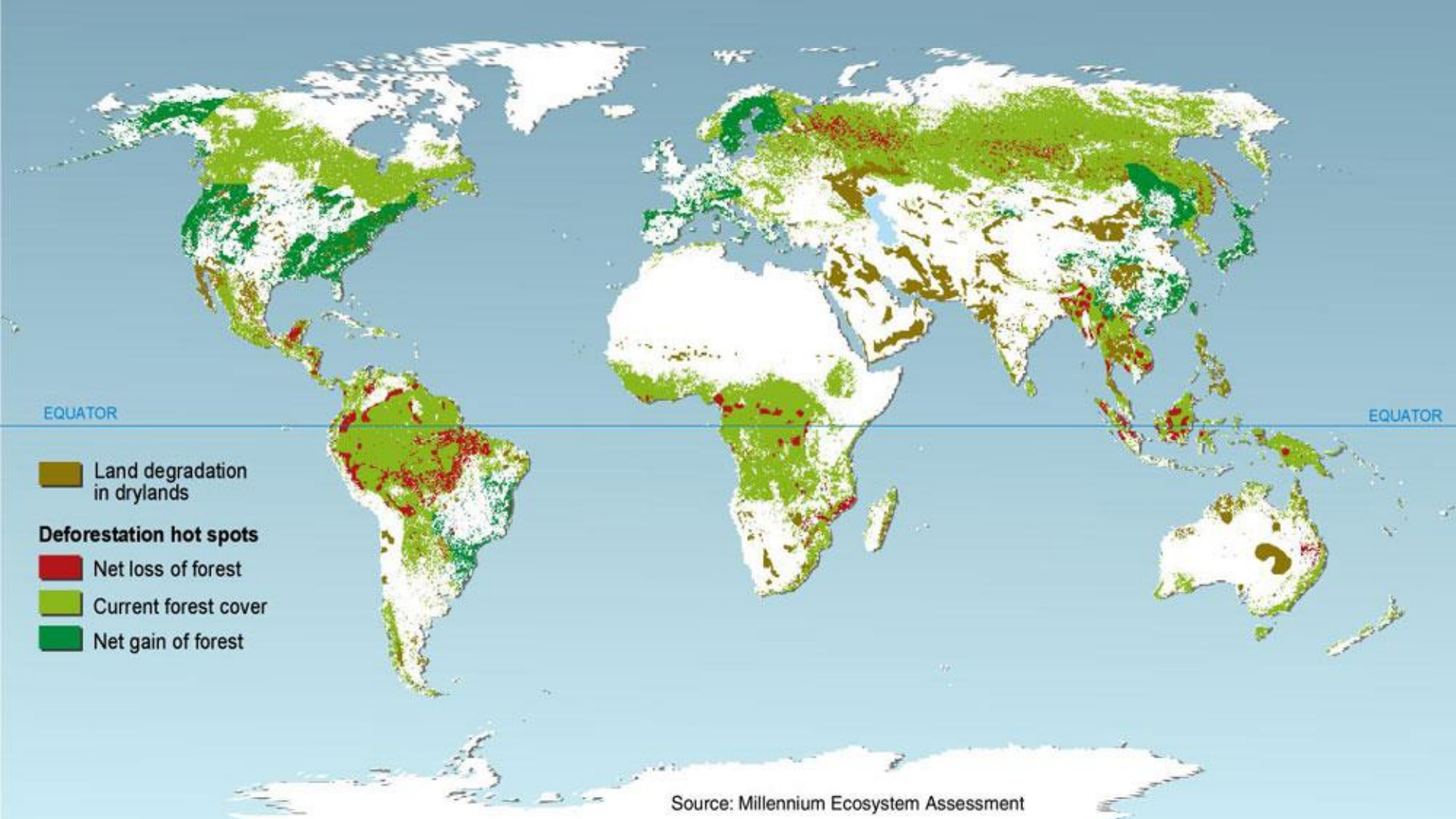
Langsom omsetning

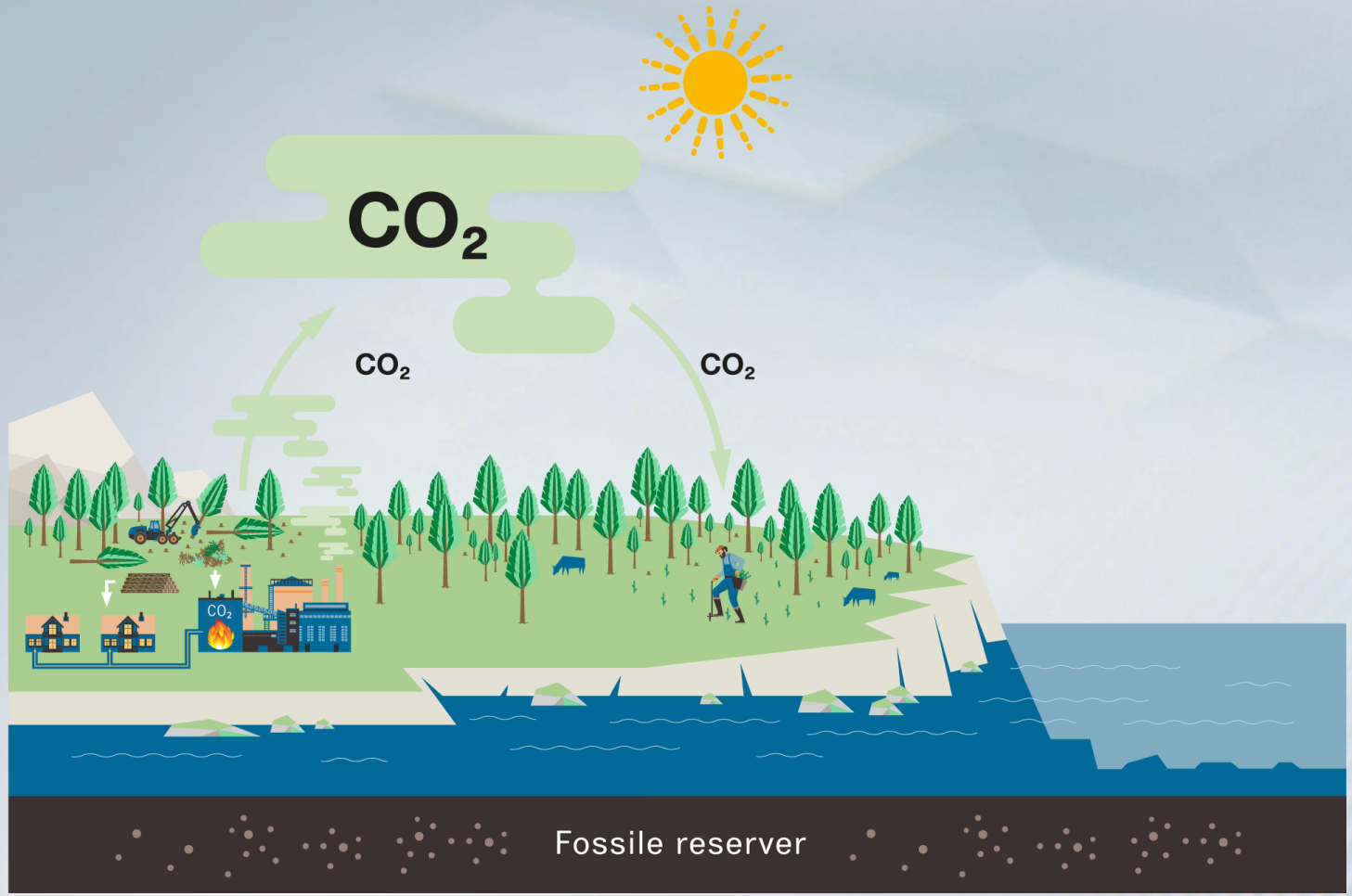


Balanse mellom tilvekst og avvirkning



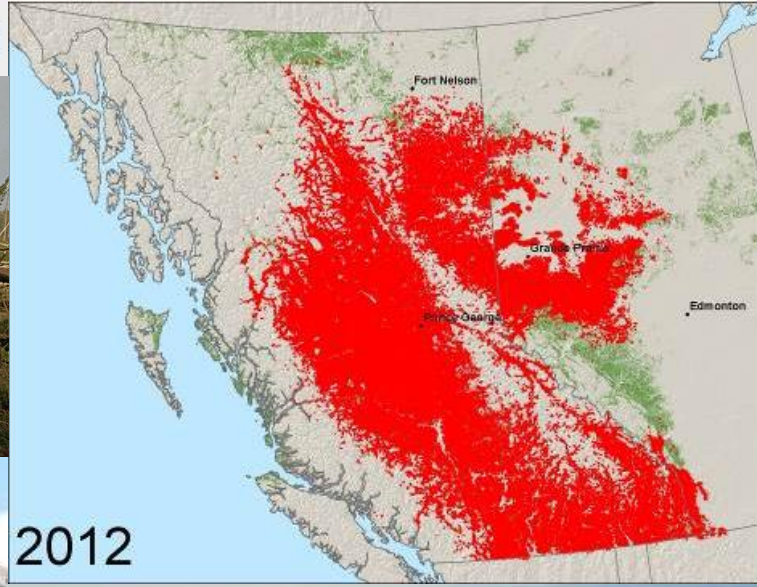



EQUATOR
EQUATOR
Land degradation in drylands
Deforestation hot spots
Net loss of forest
Current forest cover
Net gain of forest
Source: Millennium Ecosystem Assessment

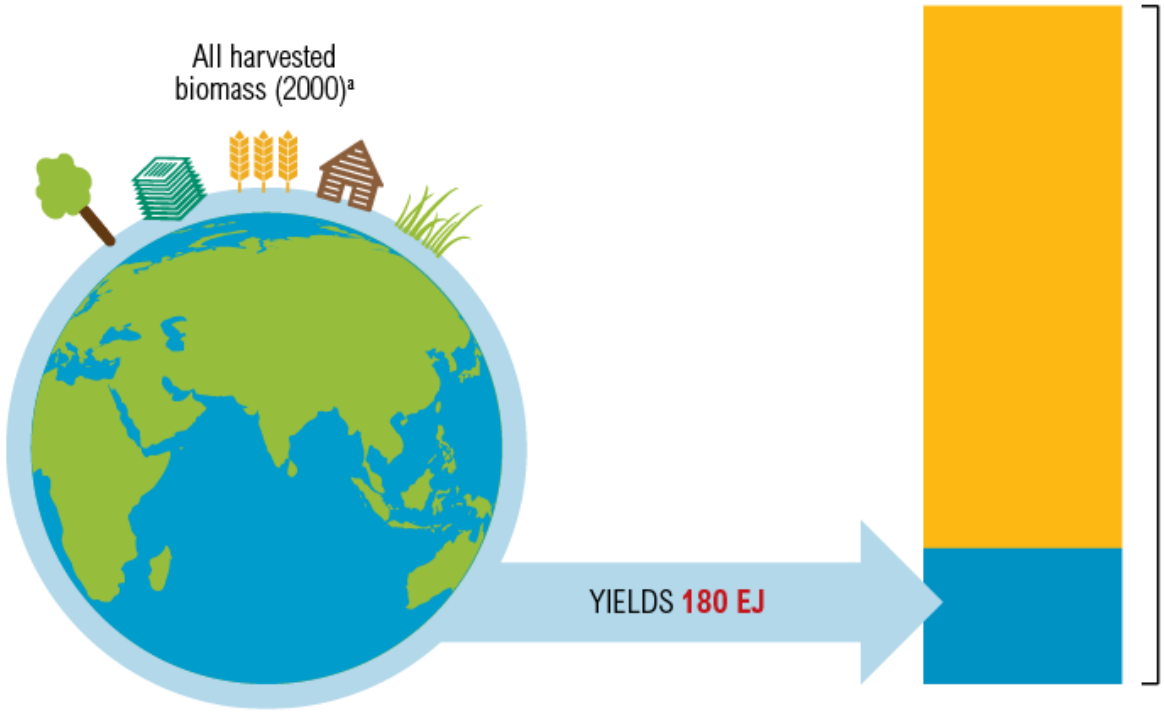

CO_2
CO_2
CO_2
CO_2
Fossile reserver

Droughts, floods, dying forests; New climate extremes for Canada in 2050

Bob Weber, THE CANADIAN PRESS
Monday, February 29, 2016 11:05:24 EST AM



Using All of the World's Harvested Biomass for Energy Would Provide Just 20 Percent of the World's Energy Needs in 2050 (Exajoules per year)



Source: Authors' calculations based on Haberl et al. (2007), IEA (2008), and JRC (2011).
Note: a. Total amount of crops, harvested residues, grass eaten by livestock, and harvested wood contained 225 EJ, but would replace only 180 EJ of fossil fuels because of conversion efficiencies from biomass to useable energy.

UBC completes structural work on tallest wooden building in the world

Builders hope the 18-storey highrise can serve as an example of the quieter, faster and more environmentally sustainable construction method.

Verdens høyeste trehus åpnet i Bergen

Sykehjem Frogn

Pris-sammenligning

	Entre 1 Stål/betong	Entr 2 Stål/betong	Entr 3 Stål/betong	AF – gruppen Massivtre
Nybygg	kr 255.301	kr 272.481	kr 226.782	kr 204.866
Øvrige poster	kr 81.192	kr 60.433	kr 54.315	kr 60.134
LCC	kr 93.697	kr 61.224	kr 122.760	kr 104.936
Sum	kr 430.190	kr 394.138	kr 404.737	kr 369.936

1 million m³ avvirket (Stammevirke)

0,5 millioner m³ sagtømmer

0,5 millioner m³ massevirke / energivirke

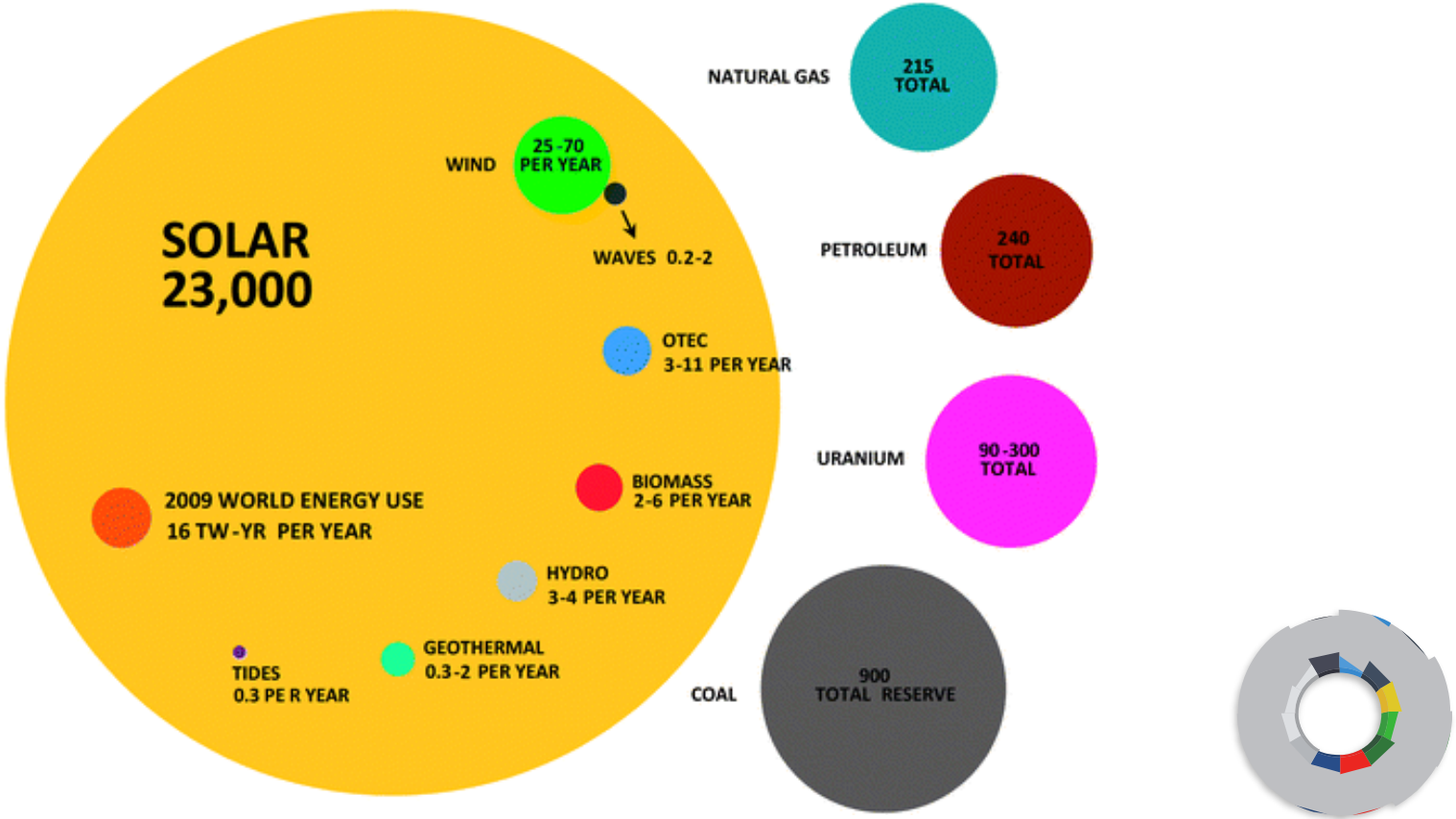
0,25 millioner m³ skurutbytte

0,25 millioner m³ energivirke

0,20 millioner m³ til produkter

0,05 millioner m³ til energivirke

Skogen skal ikke løse alt alene



Easy ⟵ complexity to decarbonise ⟶ Hard

Transport

Battery EV

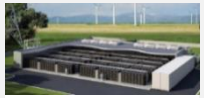
Electrolyser + Fuel Cell Truck

Fuel Cell Train

Cruise Line + Liquid Hydrogen

Power

Air Condition -> Solar



Grid battery

Hydropower as battery

Smart Cities

Clean Back Up/Base Load

Industry

Light Industry -> Solar/Wind

Heavy Industry -> Hydrogen

Process industry -> BioChar

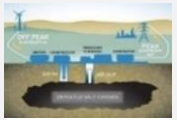
Post Combustion CCS

Chemicals

Heat

Heat Pumps

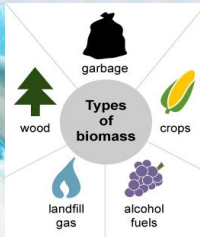
Solar Capture



Short term storage

Seasonal Swing

Long term storage



Multiple technologies to address the challenge

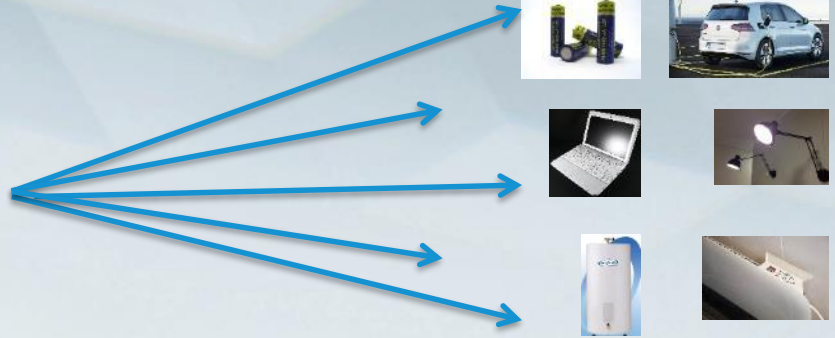
Fornybar energi billigere enn fossil energi

40 øre

15 øre

15 øre

Strøm kan brukes til så mangt…



… biomasse også

Easy

complexity to decarbonise

Hard

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Electrolyser + Fuel Cell Truck

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Cruise Line + Liquid Hydrogen

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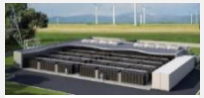
Air Condition -> Solar



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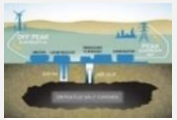

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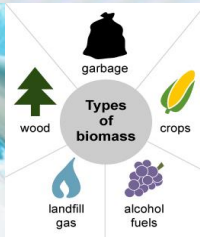
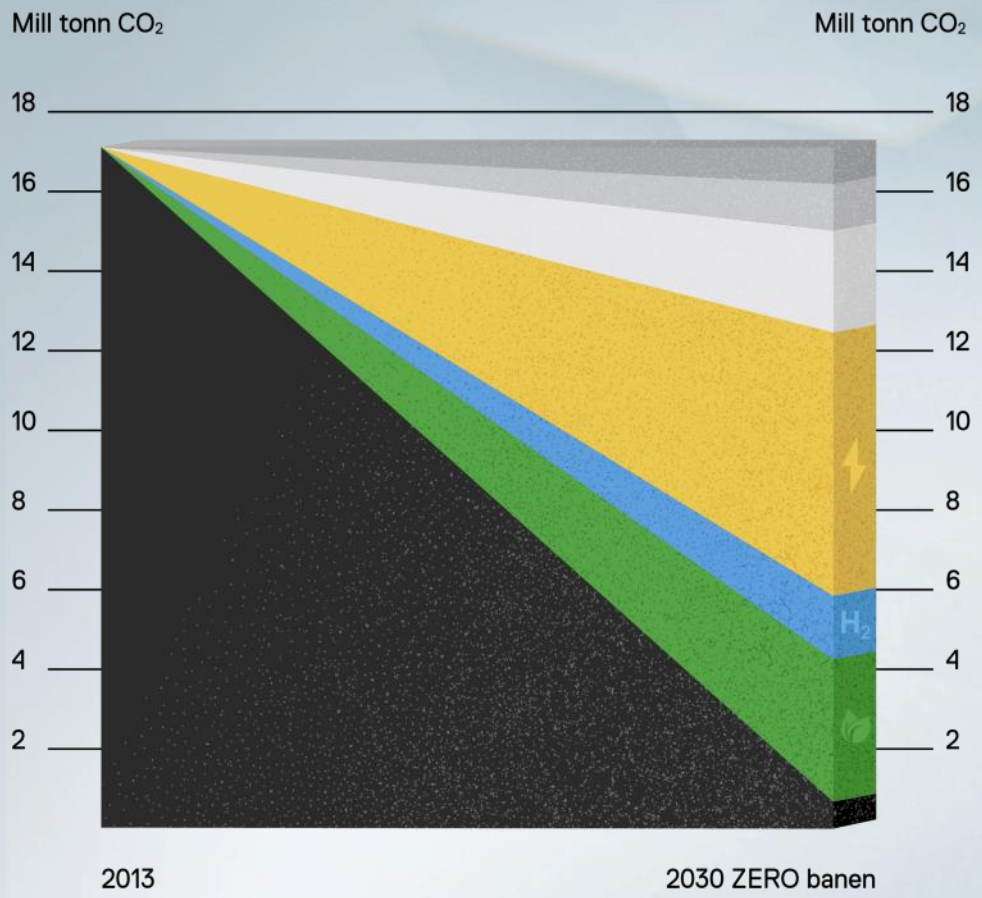


Store klimaambisjoner i Jeløya-plattformen og NTP

- Halvering av klimagassutslipp fra transport innen 2030



- Redusert transportmengde
- Overgang til mer miljøvennlig transportform
- Forbedring av kjøretøy
- Maksimal elektrifisering av transport
- Innfasing av hydrogen som drivstoff
- Bærekraftig biodrivstoff erstatter resterende fossilt
- Totalt klimagassutslipp fra transportsektoren

Mulighet for elektrifisering

Luftfart

Sjøfart

Tunge kjøretøy

Skinnegående trafikk

Lette kjøretøy

Behov for flytende drivstoff

Easy ← complexity to decarbonise → Hard

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Cruise Line + Liquid Hydrogen

Power

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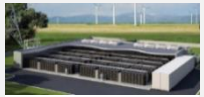

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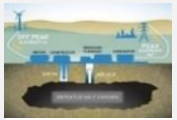


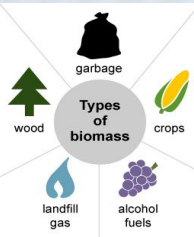
Short term storage

Seaso

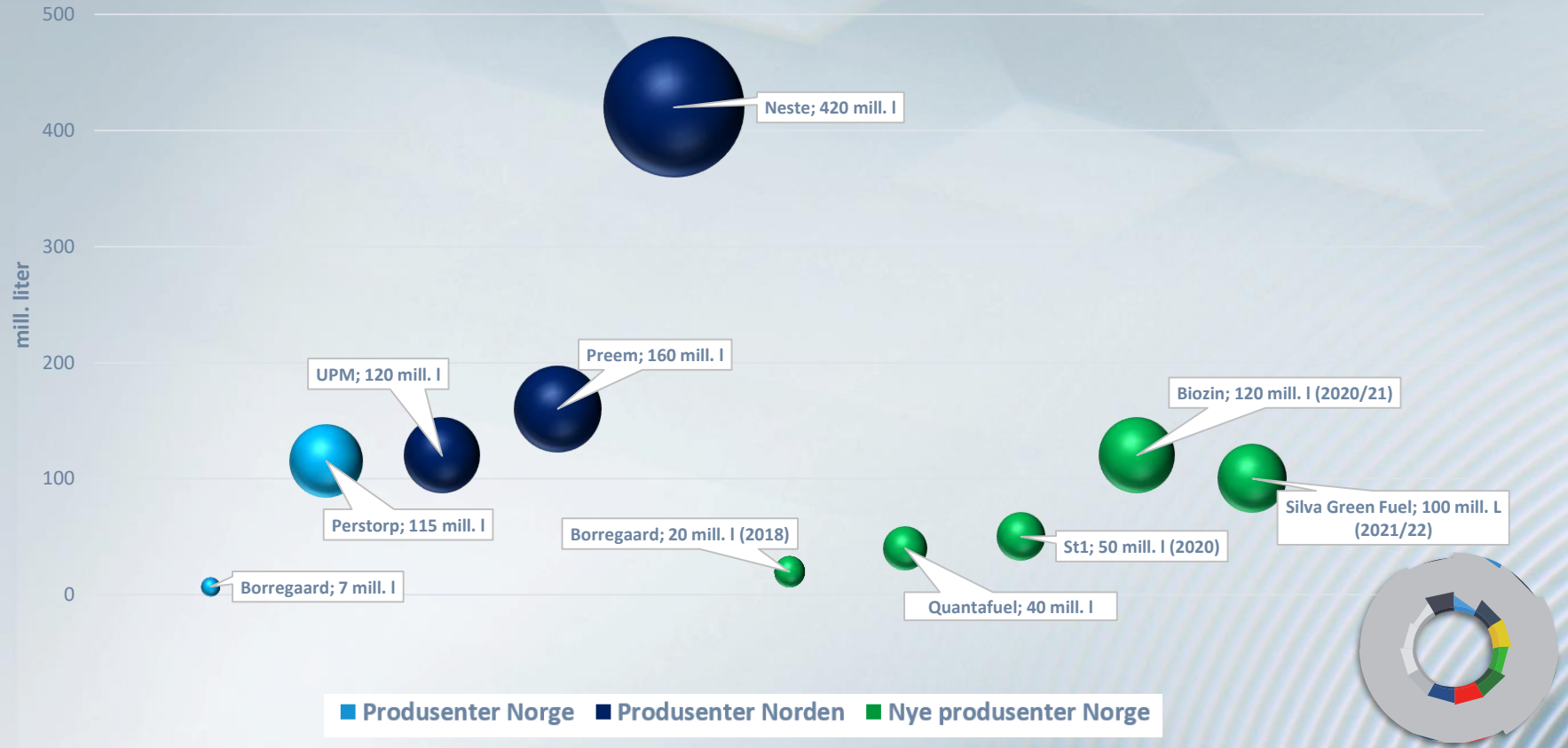
Swing

Long term storage

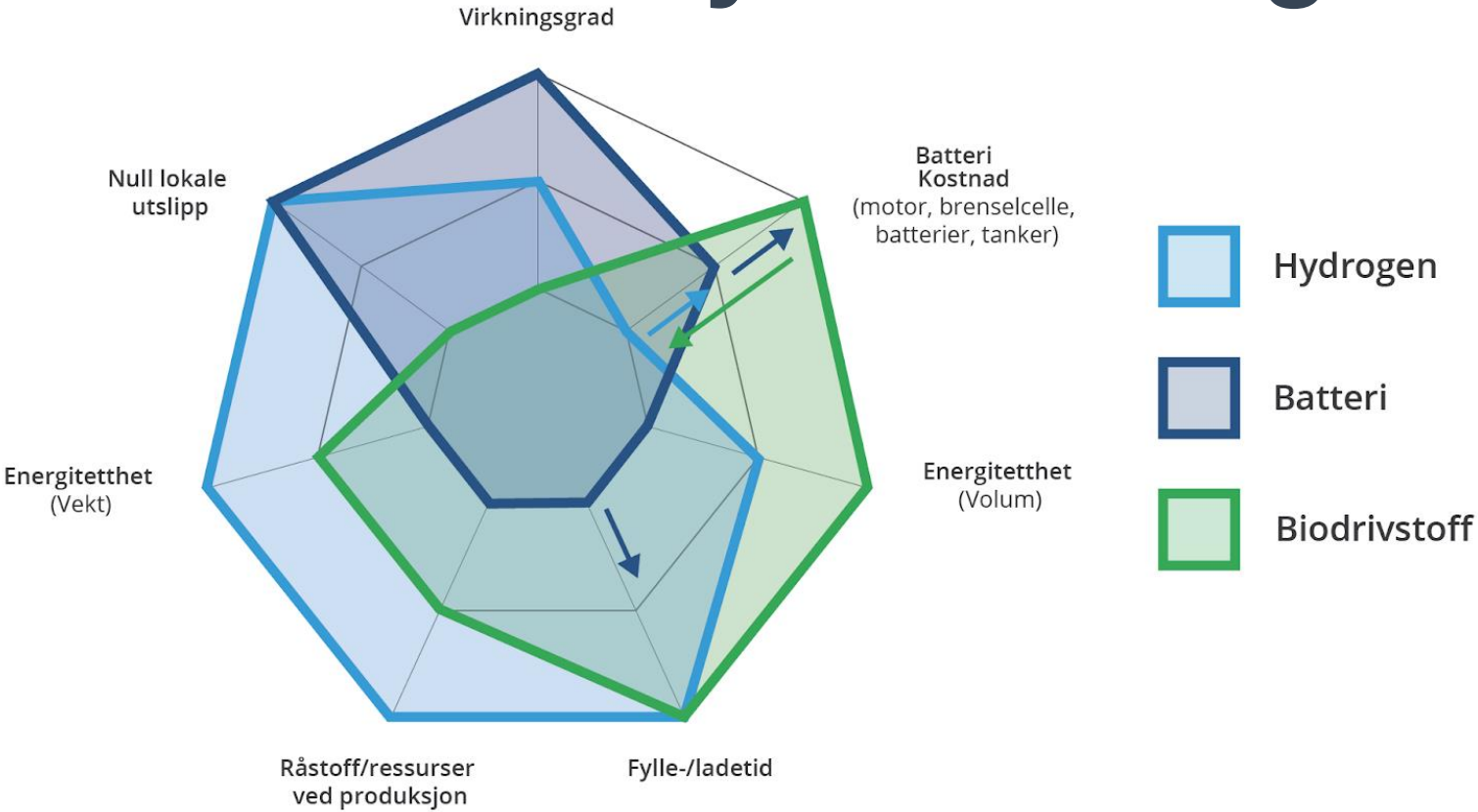
Multiple technologies to address the challenge



Produksjon av flytende biodrivstoff

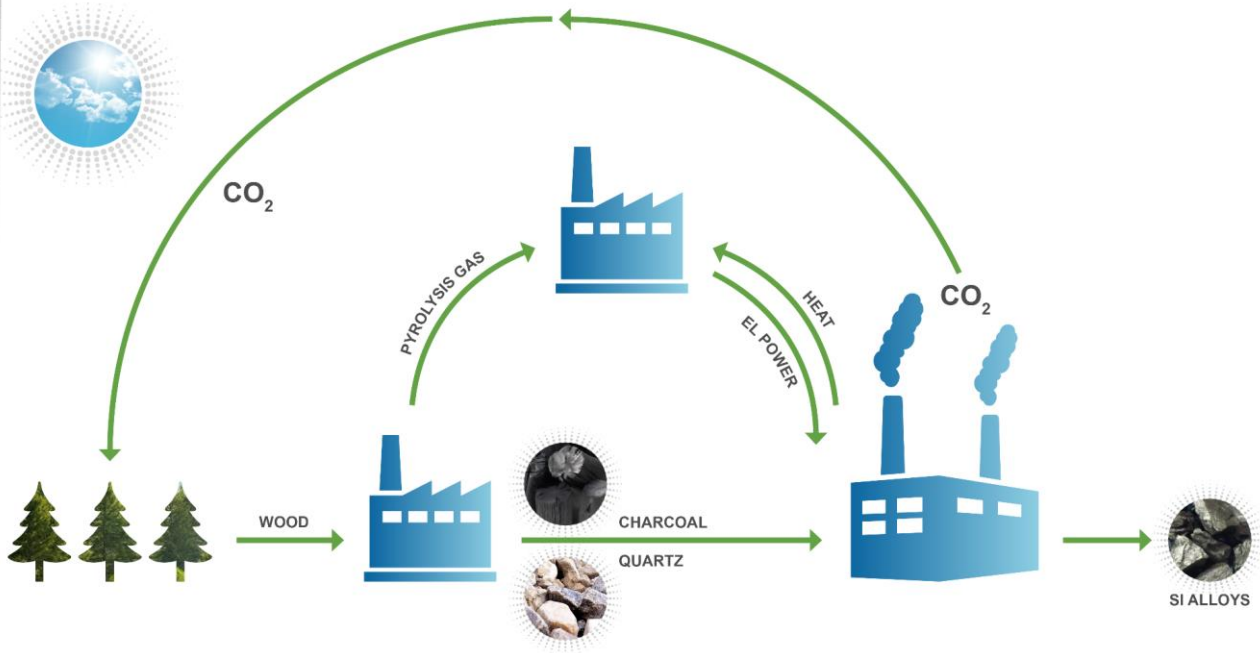


Alle fornybare trengs



Preems potential till 2030 – om politik - teknik och råvaror säkras

Carbon neutral metal production



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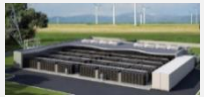

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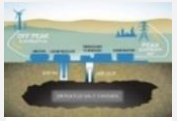
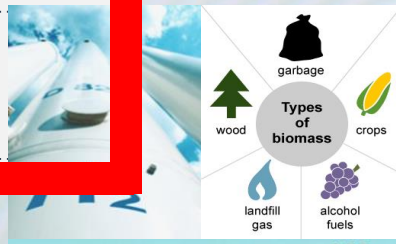


Short term storage

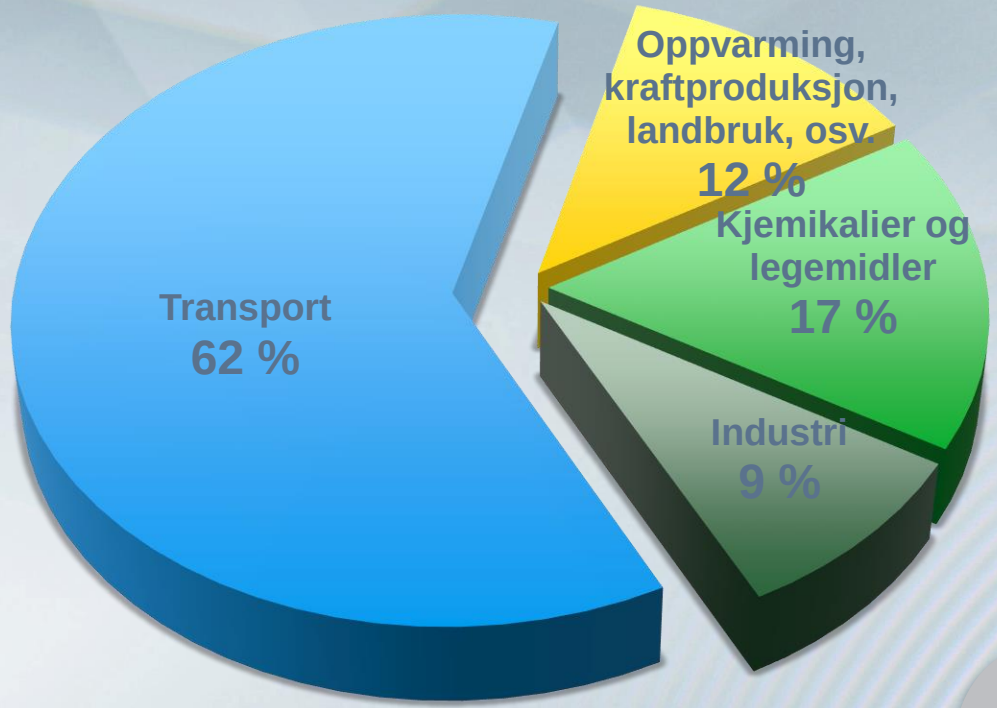
Seasonal wing

Long term storage

Multiple technologies to address the challenge

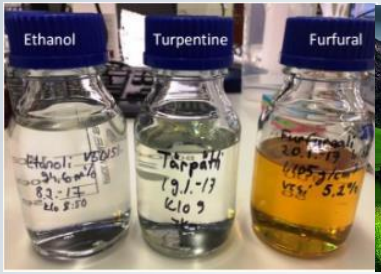



Varme og kraftproduksjon
Personbiler og mindre kjøretøy
Tungtransport og maskiner
Skipsfart
Luftfart
Industri og andre formål

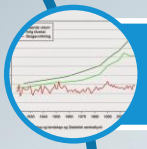

Transport
62 %
Oppvarming, kraftproduksjon, landbruk, osv.
12 %
Kjemikalier og legemidler
17 %
Industri
9 %

Bioøkonomi

– alt som kan lages av olje kan lages av tre



Biomasse trengs for å erstatte fossilt karbon



Bærekraftig skogbruk

Tidsperspektiv er vesentlig for analyser

Skog som karbonlager er ikke like stabilt som fossile lager

Verden trenger mer biomasse, - og bedre bruk av biomasse

ZERO KONFERANSEN

7.-8. november 2018

“If you always do what you always did, you will always get what you always got.”

Albert Einstein

kare.gunnar.floystad@zero.no