

Technology Needs in the BGC Observing/Data Space

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PROPELLER

Tech Needs

- ❖ **Drivers**
 - **Climate Risk**
 - **Nature Risk**
- ❖ **Responses**
 - **Markets**
 - **Companies**

Innovation Sources

- ❖ **Government**
- ❖ **Philanthropy**

Flywheel of Business Response

Galvanizing mitigation
and adaptation



Taskforce on Nature-related
Financial Disclosures

30x30



TCFD | TASK FORCE ON
CLIMATE-RELATED
FINANCIAL
DISCLOSURES

GARP
SCR | Sustainability and Climate Risk



**WE MEAN
BUSINESS
COALITION**



Carbon Accounting Market Growth

Last Year's Estimate: \$12.73 Billion (2022)

This Year's Estimate: \$15.31 Billion (2023)

Future Estimate: \$64.39 Billion (2030)

CAGR: 22.8%



Climate Intelligence Market Map

Climate Analytics

Energy
PYTHIAS
CLIMATE CONNECT
myst.ai

Corporate
CoreLogic
Verisk
XDI
RMS

Broad Based
Cervest
JUPITER
Four Twenty Seven
TCS
terrafuse

Cities & Disaster Management
PERIMETER
ZONHAVEN
BLOOMPIZA
SENSCITY
one concourse
ClimateView

Agriculture, Land Use & Water
DAS
cropx
ec2ce
overstory
WeatherSafe
cloud agronomics
FARMLOGS
FarmLogs
See Tree
ignitia
ceres
MAINST DATA
enviroeye
AGROOP
ARABLE
regrow
STORMSENSOR
LAND LIFE COMPANY
ScoutScience
AMBIENTAL
OPT/NET
HYDRoSAT
CLIMATEAI
AGRITASK
ecto
DYNASPACE
ColomboSky
TARANIS
AGRISOURCE
AQUAOSO
Harvesting
UMITRON
Hohonu
SATTELLIGENCE
climacell
dendra
JIRA
Cybe

Financial Services
ARBOL
FUTUREPROOF
YvesBlue
SKYLINE PARTNERS
entelligent
CARBON DELTA
risQ
ARCTURUS
Delos
PARACHUTE INSURANCE
Trucost
ESG Analysis
DEMEX
riskthinkingAI
insurdata
UNDERSTORY
URGENTEM
safehub
Jumpstart
WETTERHELD
zesty.ai
BLACKSWAN
CAPE

Emissions Management

Traceability

Consumer
Powprint
zellar
giki
Enfuce
ecolytiq

Commercial
PERSEFONI
POINT360
CLEARTRACE
Watershed
aclima
FLINTPRO
SINAI
Emitwise
CARBON ANALYTICS
PLAN A
normative
Syvera

Offsets

Consumer
cleverly
wren
minimum
Economyz
CHOOSE
klima
YAYZY
ECOCART

Commercial
clearloop
Patch
BeZero
DODO
TAPIQ
planety
south pole
cooler
inhabit.
carbonzero
carbon
SILVIATERRA

Carbon Marketplace
pure earth
NORI
offsetra
Carbon Removal
Pachama

ESG Risk Rating and Reporting
impact
WeSustain
OneReport
RepRisk
CSRHub
Metrio
Dataraman
Greenstone
SUSTAINALYTICS
Curation
measurabl

Sustainable Supply Chain
Circular IQ
Lumi
Flock Freight
SUPPLY SHIFT
PROVENANCE
ecovadis
CONNEXUS
worldfavor
MANUFACTURE
2030



Task Force on Climate-Related Financial Disclosures (TCFD)

Average Size of Preparer and User Respondents

\$413B

average asset
size for banks and
insurance companies

\$112B

average assets
under management
for asset managers

\$11B

average annual revenue
for non-financial companies

These averages are based on a subset of the 268 respondents that identified as preparers or users. Specifically, the averages are based on the 54% of respondents that provided their companies' names and for which public information was available.

Average Percentage of Disclosure by Industry

Industry	Percent
Energy	43%
Materials and Buildings	42%
Banking	41%
Insurance	41%
Ag., Food, and Forest Products	37%
Consumer Goods	33%
Transportation	32%
Technology and Media	15%

Average Percentage of Disclosure by Company Size

Market Capitalization	Percent
<\$3.4B	29%
\$3.4-12.2B	37%
>\$12.2B	49%



TCFD Recommendations and Supporting Recommended Disclosures

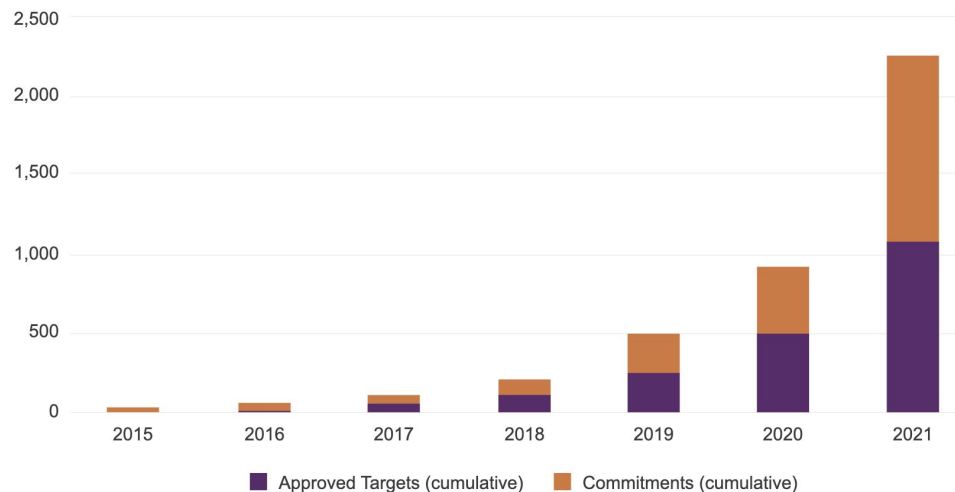
Governance	Strategy	Risk Management	Metrics and Targets
<p>Disclose the company's governance around climate-related risks and opportunities.</p>	<p>Disclose the actual and potential impacts of climate-related risks and opportunities on the company's businesses, strategy, and financial planning where such information is material.</p>	<p>Disclose how the company identifies, assesses, and manages climate-related risks.</p>	<p>Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.</p>
<p>a) Describe the board's oversight of climate-related risks and opportunities.</p>	<p>a) Describe the climate-related risks and opportunities the company has identified over the short, medium, and long term.</p>	<p>a) Describe the company's processes for identifying and assessing climate-related risks.</p>	<p>a) Disclose the metrics used by the company to assess climate-related risks and opportunities in line with its strategy and risk management process.</p>
<p>b) Describe management's role in assessing and managing climate-related risks and opportunities.</p>	<p>b) Describe the impact of climate-related risks and opportunities on the company's businesses, strategy, and financial planning.</p>	<p>b) Describe the company's processes for managing climate-related risks.</p>	<p>b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.</p>
	<p>c) Describe the resilience of the company's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</p>	<p>c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the company's overall risk management.</p>	<p>c) Describe the targets used by the company to manage climate-related risks and opportunities and performance against targets.</p>



Companies Reporting Emissions

- In 2022, **over 4000 companies** reported under TCFD (**92 out of the 100 largest public companies**)
- **~1/2 are setting interim GHG emissions reductions targets compliant with the Science Based Target Initiative (SBTi)**

Growing number of companies with GHG emissions reductions goals under SBTi



Science Based Targets Initiative (SBTi), 2022.



Decarbonization Pledges

And yet...

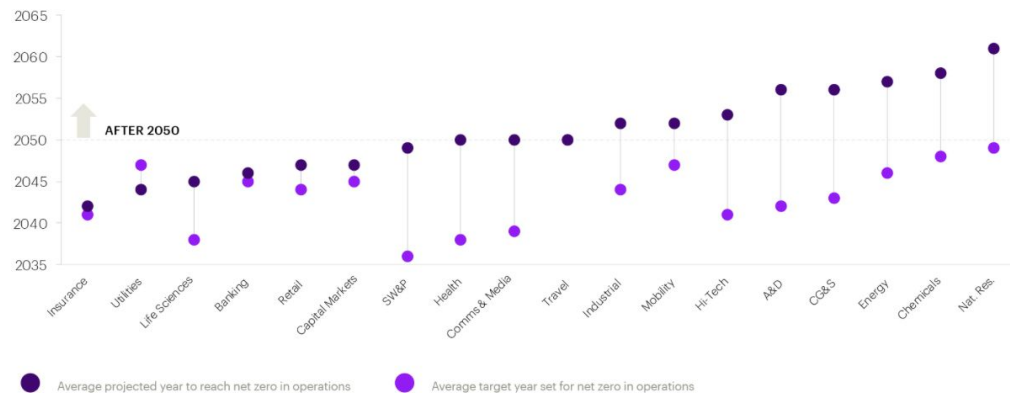
- Over **1/3 of the world's largest companies** have made net-zero pledges
- **5,200+ businesses** have pledged to reach net-zero by 2050
- ~450 banks, insurers, and investors representing over **\$1.3 trillion in assets committed** to make portfolios carbon-neutral by 2050

Many industries are not on track to meet net zero by 2050 and need to accelerate

Even on a consensus pathway, in which projected emissions reduction speeds double over the next decade, many industries will still fail to meet net zero by 2050.

Net zero by industry

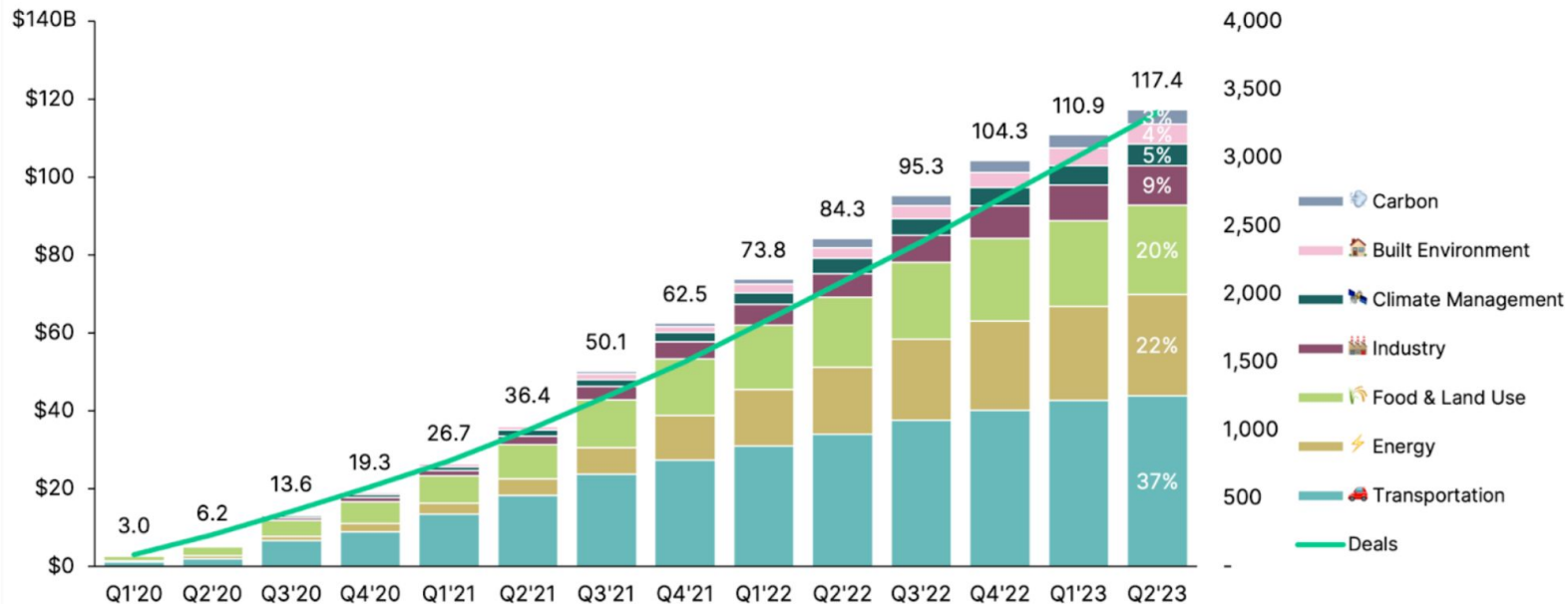
Emissions scope 1 & 2; consensus pathway scenario for average company projected year of achievement



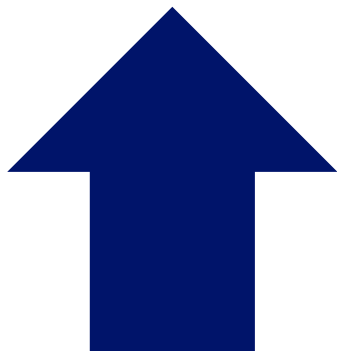
VC Spending on Climate Tech

~2,500 climate tech cos have raised \$117B of venture capital since 2020

Cumulative venture capital investment (\$B) and deal count (#) by climate tech vertical



Size of NEW Blue Economy

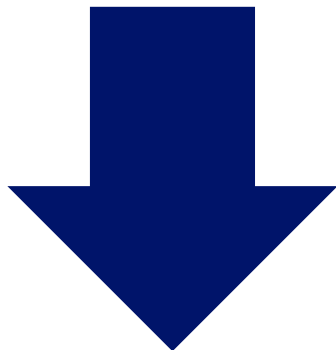


High Estimate

- **\$500B Market**

Changes in 'traditional sectors'

- Expansion of renewables
- Sustainable fisheries and aquaculture
- Transportation decarbonized and autonomous
- Coastal restoration and protection (30x30)



Low Estimate

- **\$100B Market**



Potential Annual Emissions Reductions of Ocean-Based Activities

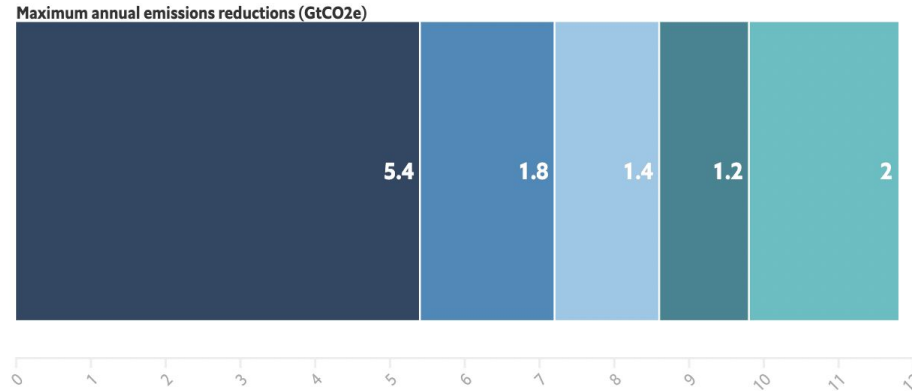
Ocean-based **renewables**: 5.4Gt CO₂e

Decarbonized **shipping**: 1.8Gt CO₂e

Blue carbon **ecosystems**: 1Gt/ CO₂

Sustainable ocean **food sources**: 1.24Gt CO₂e

Oceans can supply ~30% of needed annual emissions reductions (>>10Gt CO₂/yr)



Source: High Level Panel for a Sustainable Ocean Economy

Note: Maximum annual emissions reductions to stay under a 1.5°C change relative to pre-industrial levels

- Ocean-based renewable energy
- Ocean-based transport
- Coastal and marine ecosystems
- Fisheries, aquaculture and dietary shifts
- Carbon storage in seabed

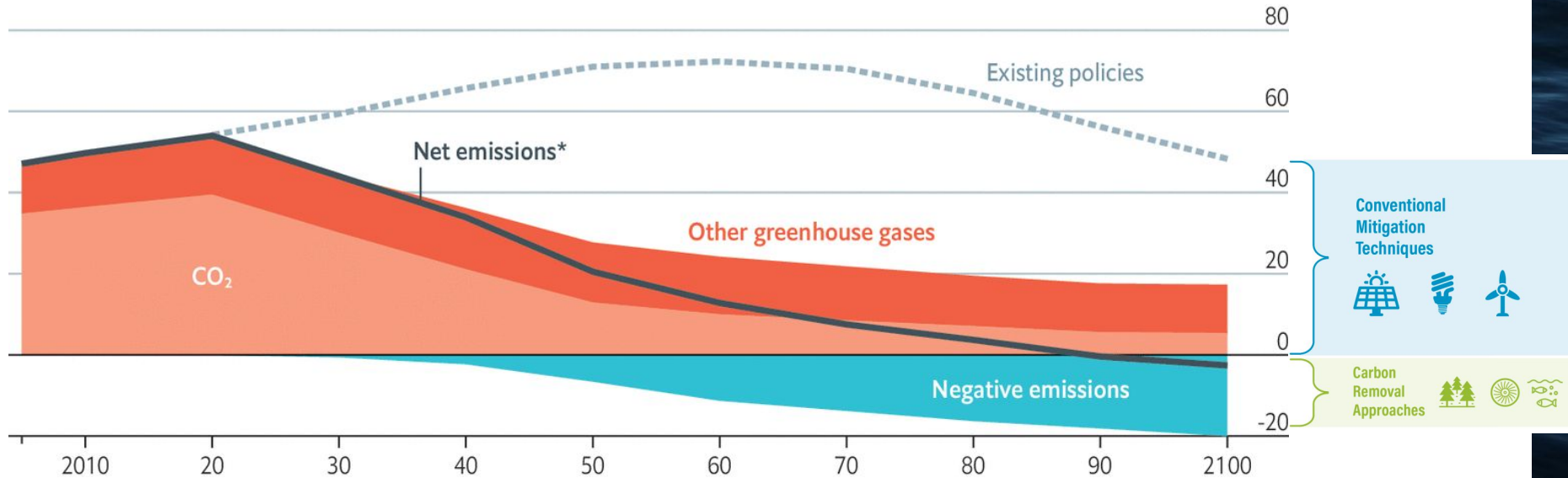


Beyond Net-Zero

The latest IPCC report specifies annual removal of **gigatons of CO₂/yr** starting as soon as 2030

Why negative is necessary

Scenario to stay below 2°C warming, bn tonnes of CO₂ equivalent per year



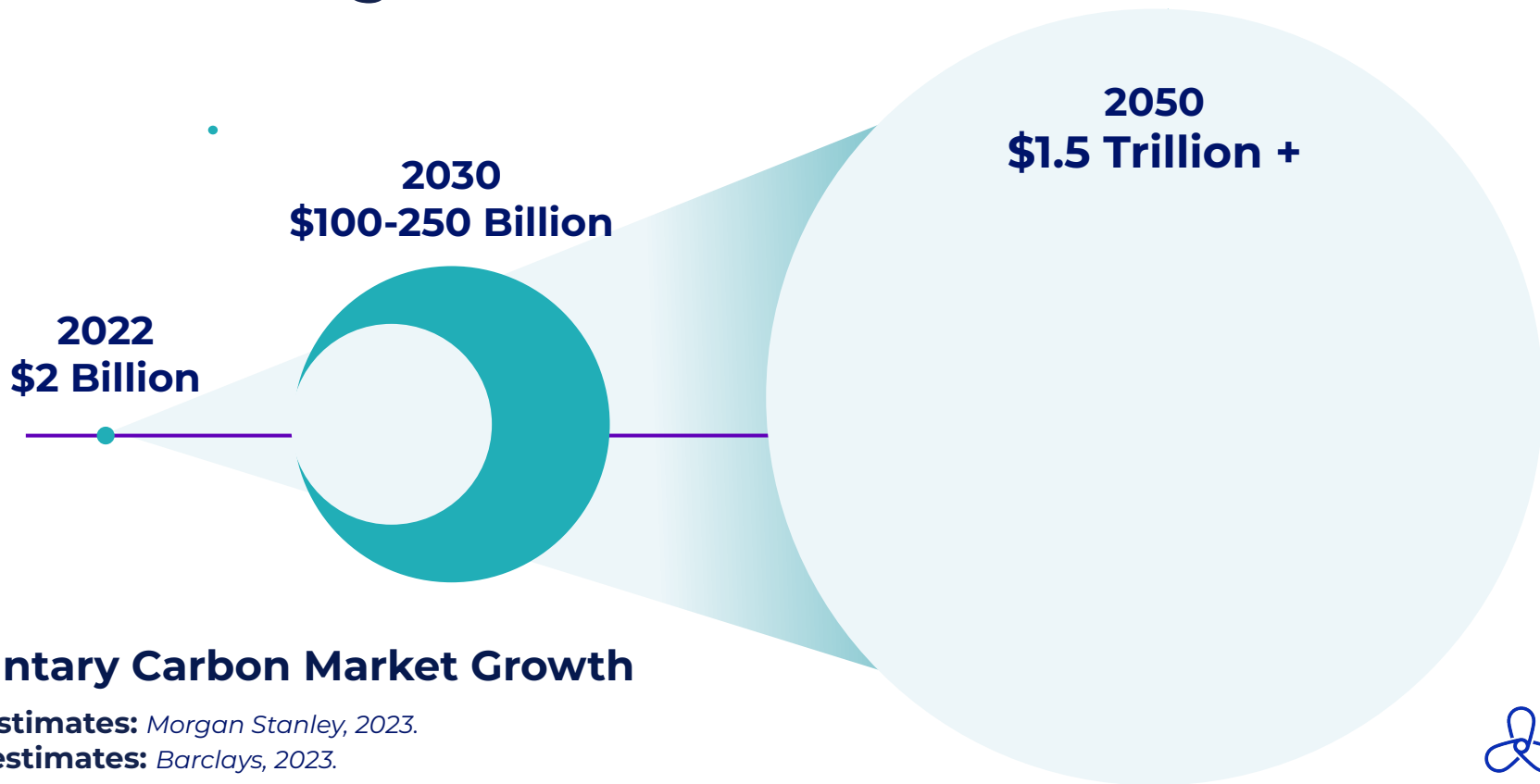
Source: UN Environment Programme

*From fossil fuels, industry and land-use changes

The Economist, 2021.



Waste Management on a Massive Scale



Voluntary Carbon Market Growth

Low estimates: *Morgan Stanley, 2023.*

High estimates: *Barclays, 2023.*



Carbon Removal Approaches

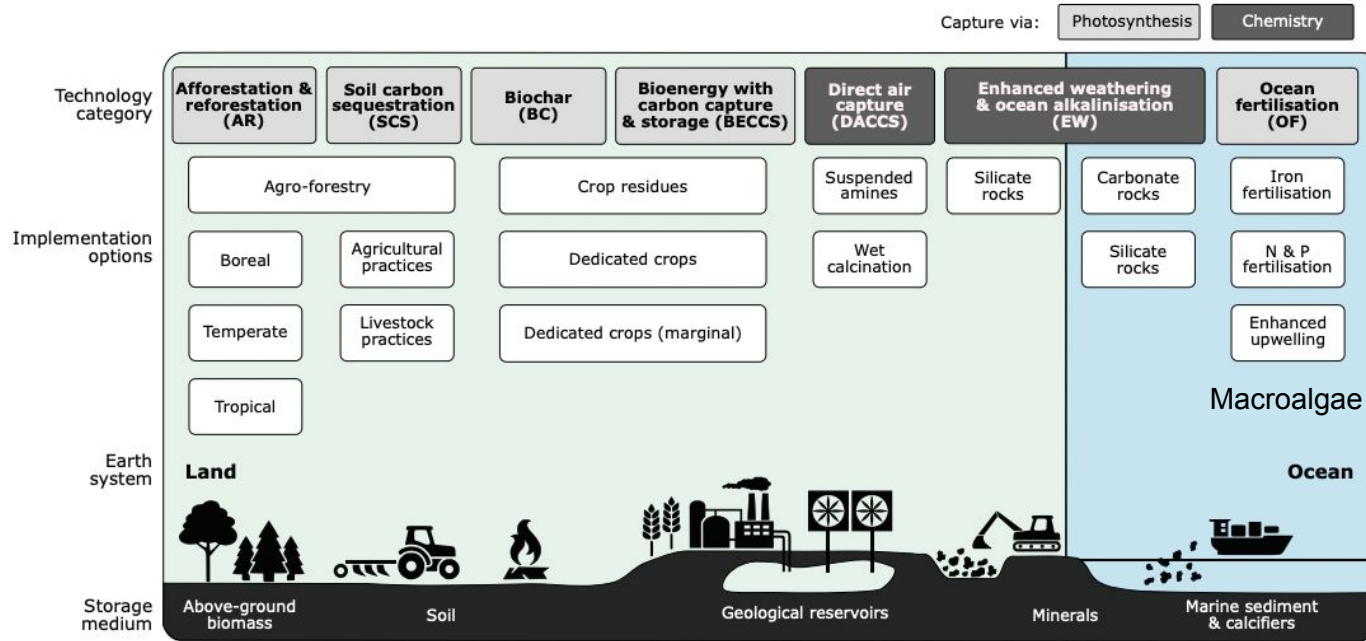
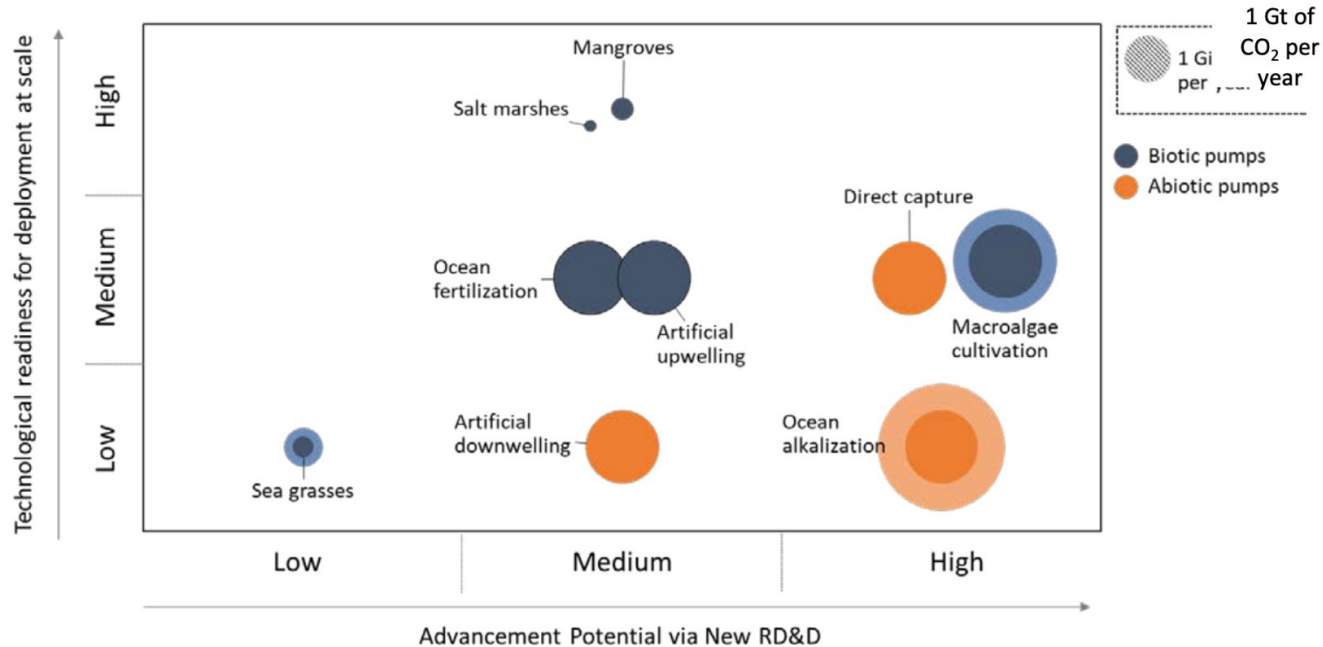


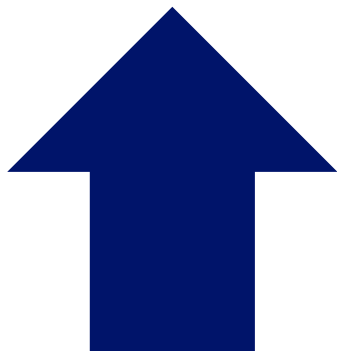
Figure 2. A taxonomy of negative emissions technologies (NETs). NETs are distinguished by approach to carbon capture, earth system and storage medium. Major implementation options are distinguished for each NET.



Promising Ocean-based Approaches to CDR



Size of Ocean Carbon MRV

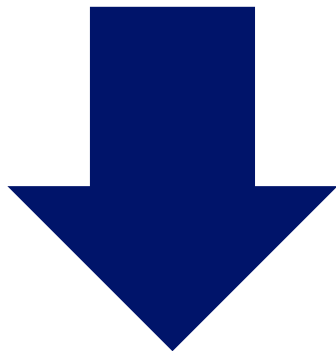


Very High Estimate

- 50 GT/yr
- \$50 tonne
- Capture 10% of value chain

Market = \$250B/yr

1 company gets 10% of market: **\$2.5B/yr**



Low Estimate

- 10 GT/yr
- \$100 tonne
- Capture 5% of value chain

Market = \$5B/yr

1 company gets 5% of market: **\$250M/yr**



Tech Needs

- ❖ **Drivers**
 - **Climate Risk Reporting**
 - **Nature Risk Reporting**
- ❖ **Responses**
 - **Markets**
 - **Companies**

Innovation Sources

- ❖ **Government**
 - **Partnerships: NOPP**
 - **Novelty: ARIA**
 - **Investing: In-Q-Tel/OSC**
- ❖ **Philanthropy**
 - **ORCA**
 - **Renaissance
Philanthropy**

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