

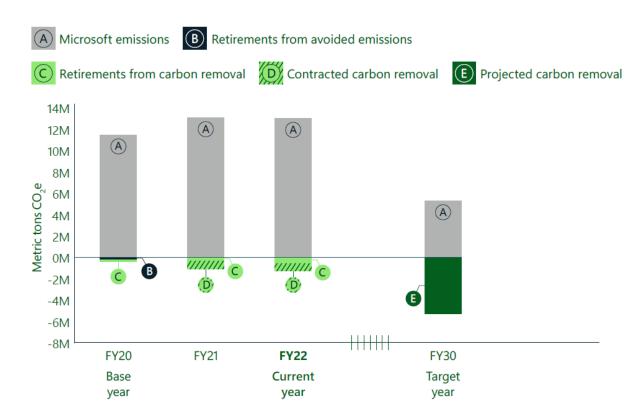
Agenda

- Corporate demand for carbon credits and climate finance gap
- Mangrove restoration projects financing



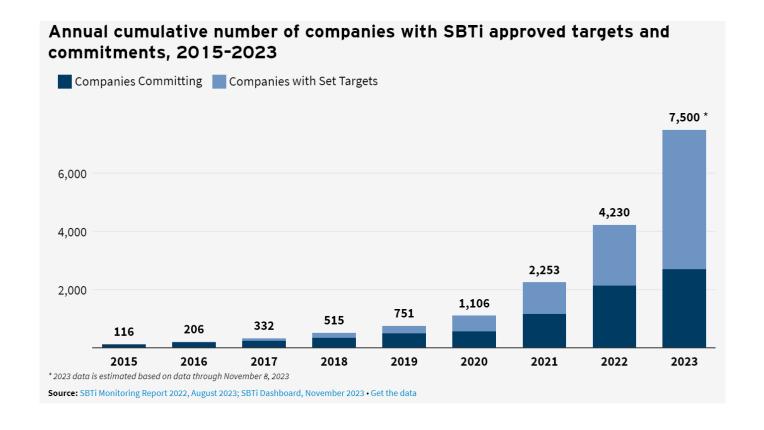
Corporate climate action

- Climate information disclosures: TCFD, IFRS S2, CSRD, SEC rule, etc.
- Climate goals ("Net Zero by ...") validated by Science Based Targets initiative (SBTi)



Corporate climate action

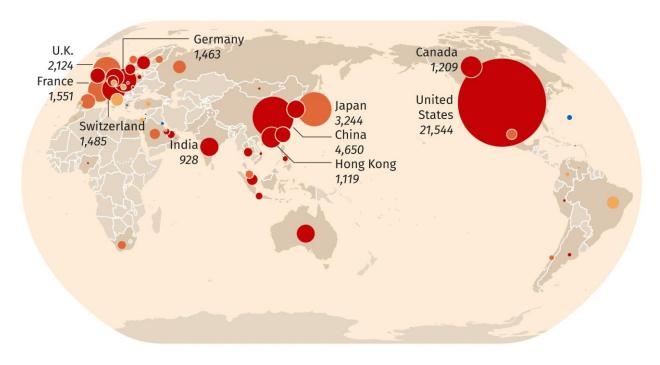
- 23k report emissions to CDP, 8.4k committed to SBTi, 4.3k validated Net Zero
- >50% Forbes 2000 companies with 66% revenue pledged Net Zero



Forbes 2000

- \$232T assets, \$50T revenue, \$4T profits, \$74T market cap
- **50%** of the global economy
- 66% of global equity

What is the level and structure of carbon credits demand for top global companies?



Market cap (2017), bln\$

Data

Dataset on GHG Emissions of Forbes 2000 companies (Robert Höglund) https://docs.google.com/spreadsheets/d/19MQbZbrCu4HpAWe6NU92CioYQ7KE8FvD9vl-r9qSjJg/edit#gid=1986052149

- Covers Top 250 companies from Forbes 2000
- Manually collected emission data from 2020-2022 reports
- 209 companies have Scope 1+2
- 163 companies have Scope 1+2+3

Coverage

- 163 of 2000 companies (8%)
- Revenue \$14.5T of \$50T (28%)
- Profit \$1.7T of \$4.5T (37%)
- Assets \$73T of \$232T (32%)

>50% Forbes 2000 companies with 66% revenue pledged Net Zero

Scaling multiple = 1 / 0.33 * 0.66 ~ 2

Carbon Footprint

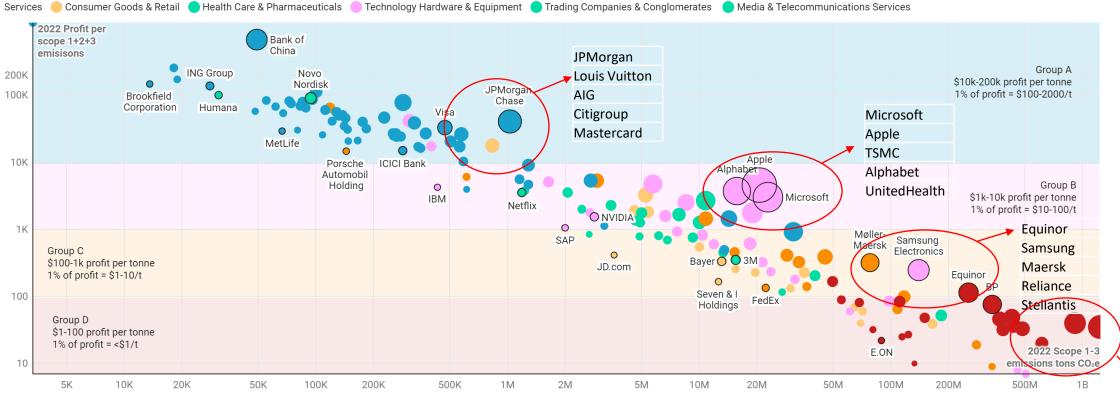
- Scope 1+2 of 0.97 GtCO2
- Scope 1+2+3 of 10.2 GtCO2
- Profit per 1 tonne Scope 1+2+3 = \$165
- 1% Profit per 1 tonne Scope 1+2+3 = \$1.65

Profit per Tonne Scope 1+2+3

Profit per tonne Scope 1-3 versus Total emissions

Profits divided by GHG emissions in all scopes.

Banking Chemicals Insurance Materials Utilities Automotives Construction Transportation Oil & Gas Operations Food, Drink & Tobacco Diversified Financials IT Software &



Count 184 companies, from the top of Forbes 2000 companies. 2022 data. USD

Petrobras Rio Tinto AIRBUS Vale

Shell

Grouping

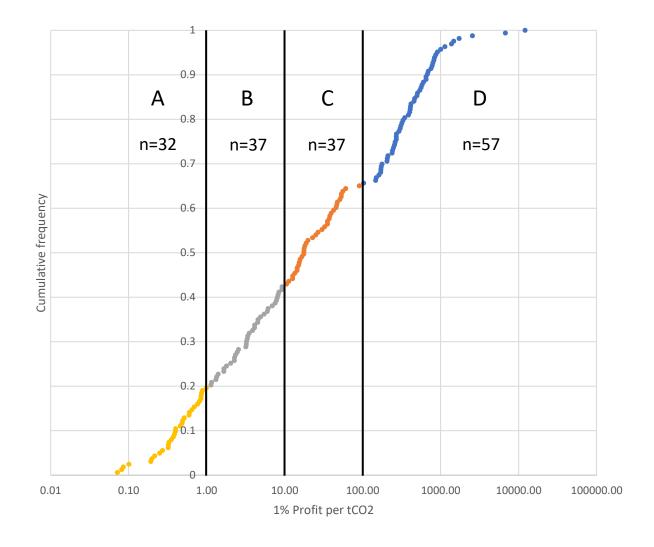
- Exponential distribution
 - linear in log scale
- 4 groups:
 - 1% profit per tonne S1+2+3:

A: >\$100

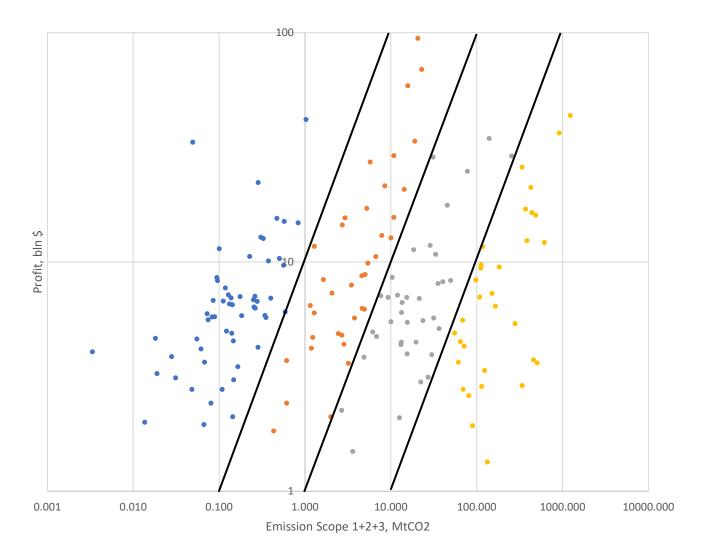
B: \$10-100

C: \$1-10

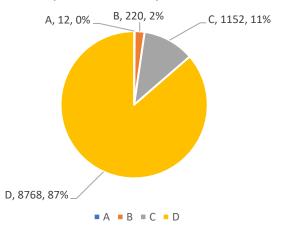
D: <\$1



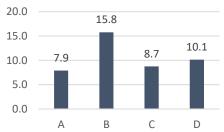
Groups stats



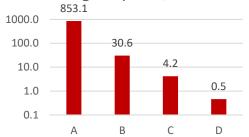
Group carbon footprint, MtCO2



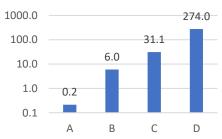
Average profit, bln\$



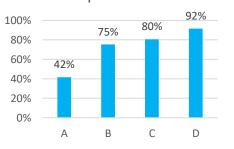
W.avg 1% profit/tCO2



Avg footprint, MtCO2



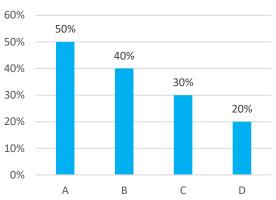
Scope 3 Share



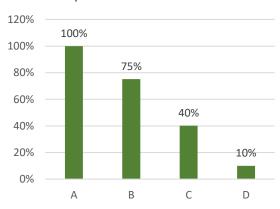
Assumptions

- Profit YoY growth = 4%
- Profit allocation for compensation = 1%
- Scope 1+2+3 reduction target by 2030:
 - Group A 50%
 - Group B 40%
 - Group C 30%
 - Group D 20%
- Compensation of residual emissions in 2030:
 - Group A 100%
 - Group B 75% (100% of Scope 3)
 - Group C 40% (50% of Scope 3)
 - Group D 10%





Compensation level in 2030



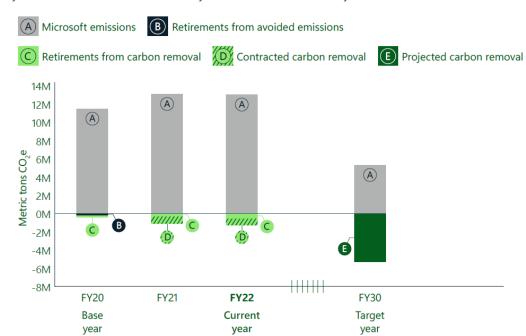
Microsoft

- Scope 1+2+3 = 13 MtCO2
- Profit = 69 bln \$
- Profit per 1 tCO2 = \$5310
- 1% profit per 1 tCO2 = \$53.1
- Reduction target by 2030 = 50%
- Residual emission = 6.24 MtCO2
- Profit in 2030 = 69 * 1.048 = 91 bln \$
- 1% profit per 1 tCO2 in 2030 = \$146

Carbon Table 1

Tracking our yearly progress toward carbon negative by 2030

In FY22, we procured 1.44 million metric tons and retired 514,156 metric tons of carbon removal as part of our effort toward achieving our annual carbon commitment to be carbon neutral. Carbon removal contracted each year includes credits retired in the same year and to be retired in future years.



Microsoft

	2022	2030
Profit, bln \$	69	91
Scope1+2	0.52	0.00
Scope3	12.48	6.24
Scope1+2+3	13.00	6.24
Compensation	0.514	6.24
Compensation, %	4.0%	100%
1% profit per tCO2	53	146

Durable CDR		
price	400	400
share	9%	29%
volume, mt	0.045	1.83
budget, m\$	18	732
NbS removals		
price	20	40
share	91%	71%
volume, mt	0.469	4.4
budget, m\$	9	176

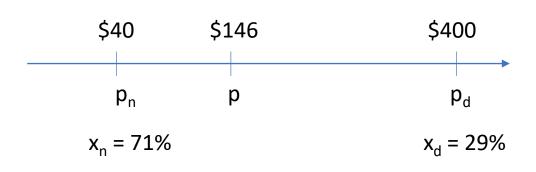
$$x_d = (p - p_n) / (p_d - p_n)$$

 x_d - share of durable CDR

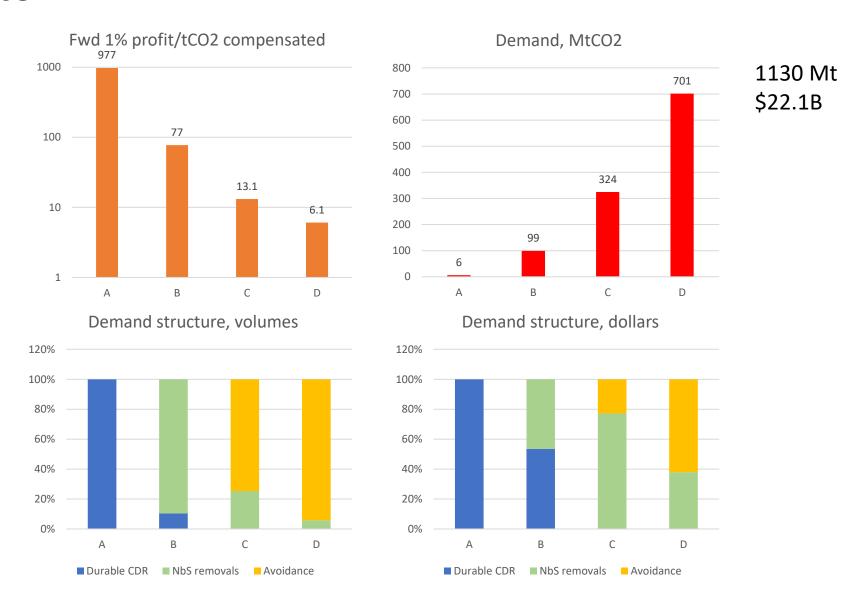
p - 1% profit / tCO2

P_d - price of durable CDR

P_n - price of NbS removals

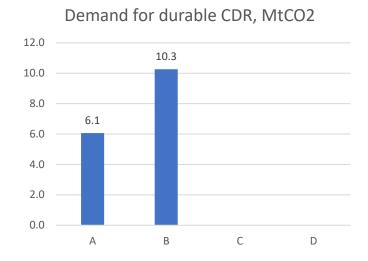


Results

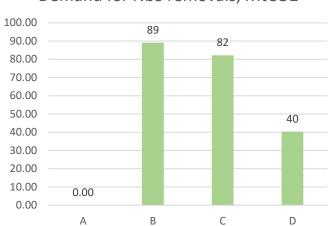


Results



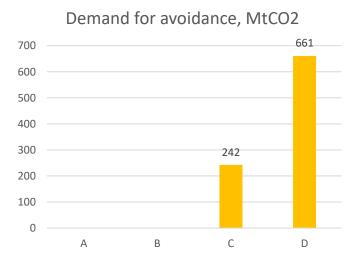


Demand for NbS removals, MtCO2

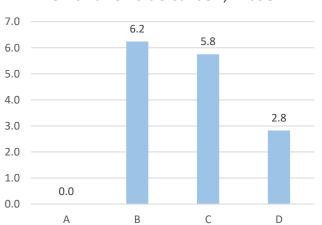


212 Mt \$8.4B





Demand for blue carbon, MtCO2

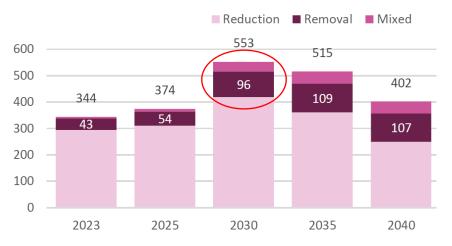


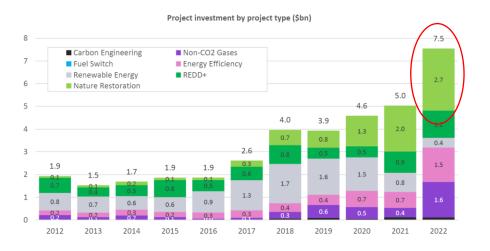
14.8 Mt \$0.7B

Climate finance gap

- 160 of Top 250 companies => scaling ~2x to Forbes 2000 committed to Net Zero:
 - Projected demand for NbS removals 424 MtCO2, durable CDR 32 MtCO2, Blue carbon 30 MtCO2 in 2030
- Total projected demand exceeds supply:
 - Projected supply in 2030 NbS removals ~110
 MtCO2, Durable CDR ~15 MtCO2, Blue carbon ~13
 MtCO2
- Investments to nature restoration needs to increase significantly to meet projected demand (~\$3B in 2022)

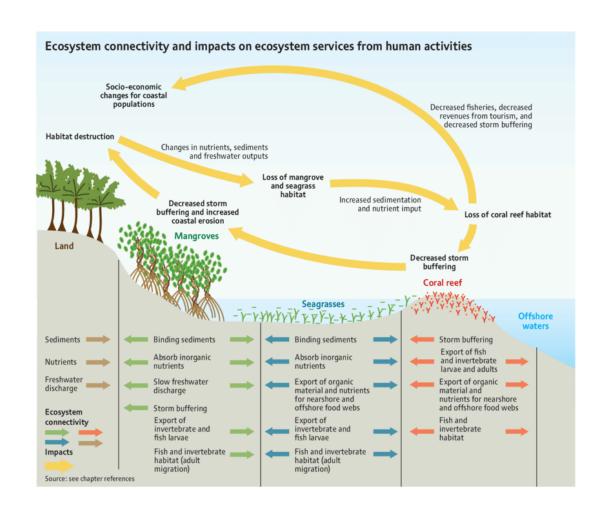
Projected issuance from registered & pipeline





Mangrove restoration

- 14 mln ha total cover
- 6 mln ha lost in the last 40 years
- 0.7-0.9 mln ha highly restorable
- 1k tC/ha carbon storage
- \$30-80k/ha/yr ecosystem services
- \$1.5k/ha direct restoration cost + overheads + opex \$20-30/ha/yr
- 75% of C storage recovers in 40 years:
 0.4-1k tCO2/ha (valued at \$12-30k)





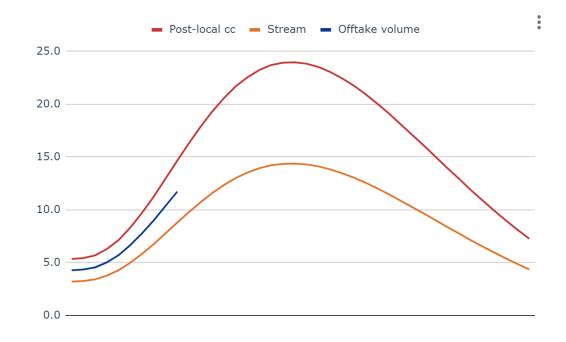


Mangrove restoration

	Up to 1 year	Up to 2 years	Up to 1 year	Up to 2 years	Up to 30 years
Stage	Pre-Feasibility	Greenfield	Financing	Execution	Monitoring
	Basic buildings & economics Stakeholders identification Degradation mapping Community consultations Legal research: land&carbo	 Team on the ground Baseline studies Ground truthing & official mapping Land&carbon rights Community training Pilot planting Draft PDD & registry 	 Marketing materials Economic model External ratings & underwriting Listing on platforms Project financing 	 Nurseries Planting Validation audit Project registration in the VCM standard Livelihood program design Project area restored 	 Monitoring Re-Planting Verification & issuance Corresponding adjustment Credits sale Livelihood program Project area protected
Funding required	\$20k	\$100-250k	\$1.5-2k per ha (e.g. \$1	15-20m for 10,000 ha)	\$30-100k per year
Source of funding	Project Developer Equity	Project Devloper Equity + Blended finance (philanthropic funding, PPP, etc.)	buyers): carbon s prepaid forward pur	stors and companies (end streaming agreements, chase agreements, green e.g. blue bonds)	Carbon revenue

Climate finance instruments

- Streaming deal
 - Allocation of carbon share to investor (25-50%)
 - Typically 15%+ IRR threshold
- Prepaid offtake
 - Offtake first 7-10 years of credits (80 to 100%)
 - Guaranteed delivery (replacement)
 - Discount to spot (20-40%)
- Offtake + loan + carbon sharing
 - Forward agreement first 7-10 years of credits
 - Bank loan (or similar instrument)
 - Sharing of the remaining part of the curve
- Prepaid offtake with profit sharing
 - Offtake for 100% of credits with a discount
 - Profit sharing of the difference



Climate finance instruments

- 1 ha unit model
- Indonesia curve, 15% buffer
- \$1500 direct cost
- \$33/t spot
- Project dev NPV @ 10%
- Prepaid offtake is best, but hardest to get
- Streaming deal is second best if consider risk of under delivery

100% delivery

	Flat spot	Px 4% spot	Baseline	Avg
Stream	\$1,603	\$2,771	\$4,025	\$2,800
Prepaid offtake	\$2,728	\$5,377	\$7,702	\$5,269
Offtake w/profit sharing	\$1,002	\$2,462	\$4,029	\$2,498
Offtake + loan + carbon sharing	\$1,634	\$2,931	\$4,400	\$2,988

80% delivery

	Flat spot	Px 4% spot	Baseline	Avg
Stream	\$1,282	\$2,217	\$3,220	\$2,240
Prepaid offtake	\$1,926	\$3,992	\$5,689	\$3,869
Offtake w/profit sharing	\$801	\$1,969	\$3,224	\$1,998
Offtake + loan + carbon sharing	\$1,110	\$2,117	\$3,184	\$2,137

