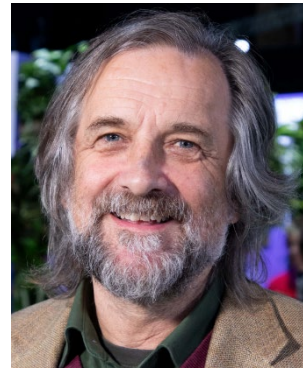


Sustainable Financing of Negative Emissions with a CO₂ Emitter Liability*



Anders Lyngfelt, Mathias Fridahl
and Stuart Haszeldine



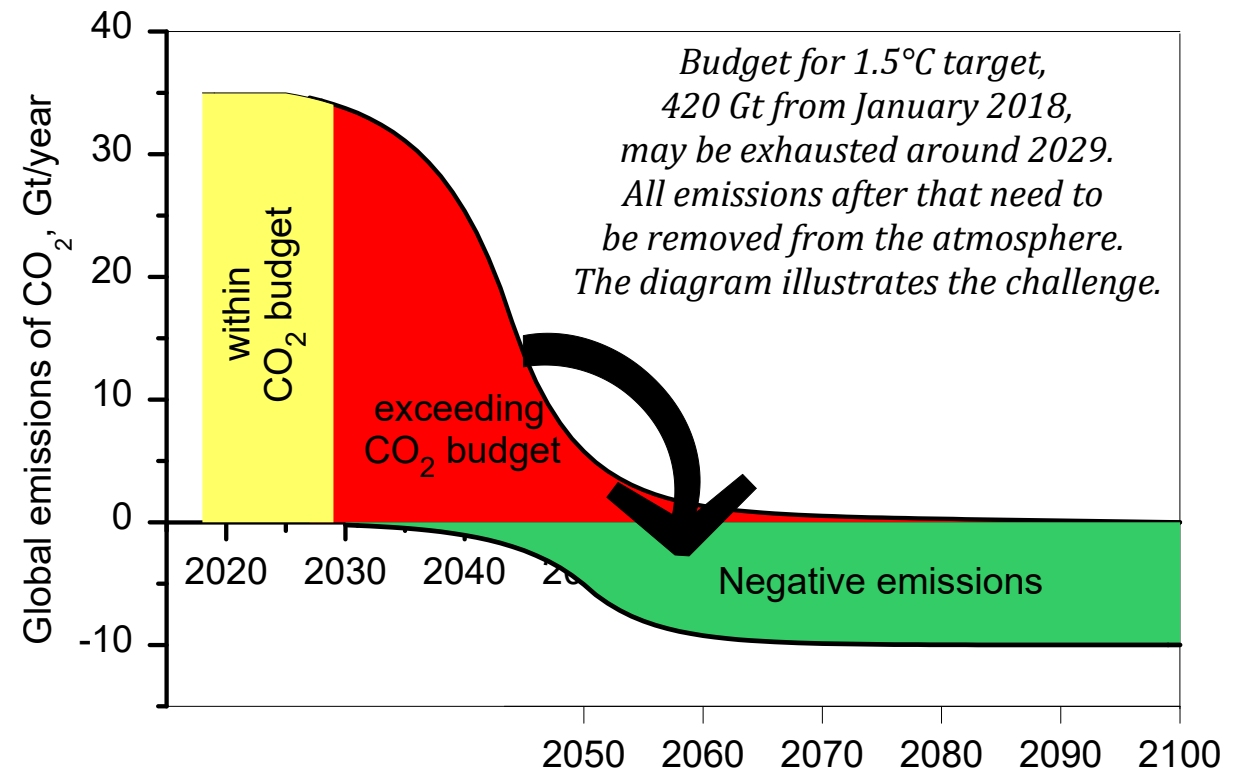
American University, Washington, D.C., May 23, 2024

in the Webinar Series:

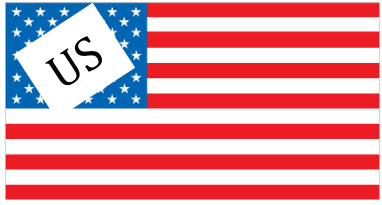
Scrubbing the Skies – The Role of Carbon Dioxide Removal in Combating Climate Change

*Lyngfelt, A., Fridahl, M., and Haszeldine, S., FinanceForFuture: Enforcing a CO₂ emitter liability using Atmospheric CO₂ Removal Deposits (ACORDs) to finance future negative emissions, *Energy Research & Social Science* **107** (2024) 103356

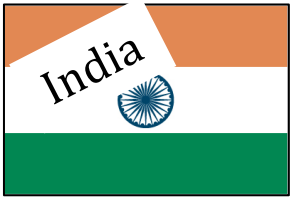
- Global carbon budget for +1.5°C likely spent around 2029
- To meet max 1.5°C, *all CO₂ emissions after 2029 must be removed from the atmosphere.*
- Leaves our children with a **climate debt**, to remove perhaps 800 Gt CO₂, or 100 t/capita (>10.000 €/capita) globally.
- **No realistic mechanism for financing** of future negative emissions in place or proposed.
- Who will take the responsibility to remove these negative emission?



How can the climate debt be shared between countries?



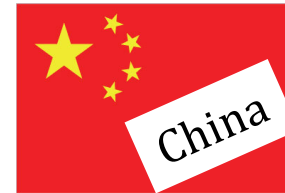
The rich: Guilty!
But no intention to remove
their historical emissions.



The poor :
No moral obligation, no interest,
no money.



We only exported
a lot of oil.



Our emissions have only
been big a few decades.
It's not up to us!

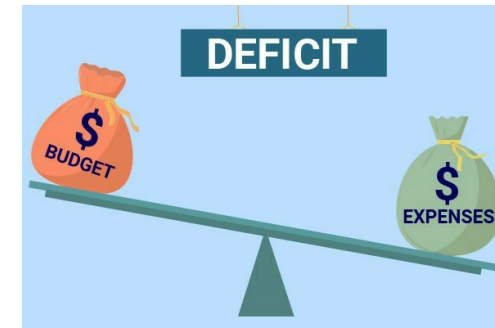
We're cold and
don't care!

Impossible to agree on model to share?

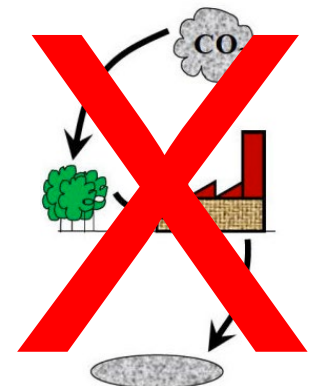
The taxpayers?

Which Ministry of Finance will give priority to negative emissions?

Priorities:



Negative emissions

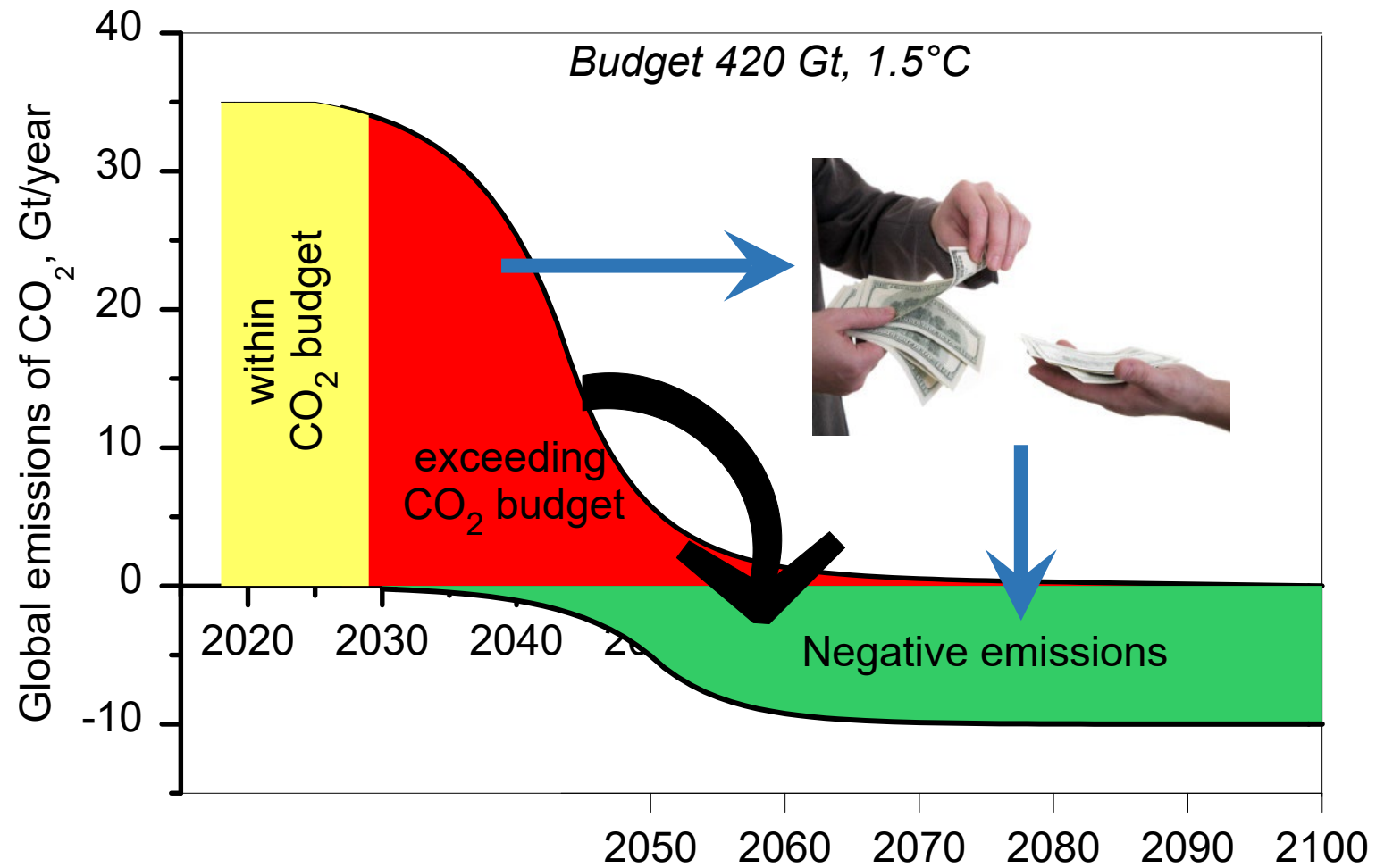


Will we leave our children and grandchildren
with a problem that is insoluble?

A possible solution is a CO₂ recovery liability
making emitters responsible for removing their emissions from the atmosphere

It would be simple, reasonable, comprehensible, fair, rational, sustainable,
which should facilitate acceptance.

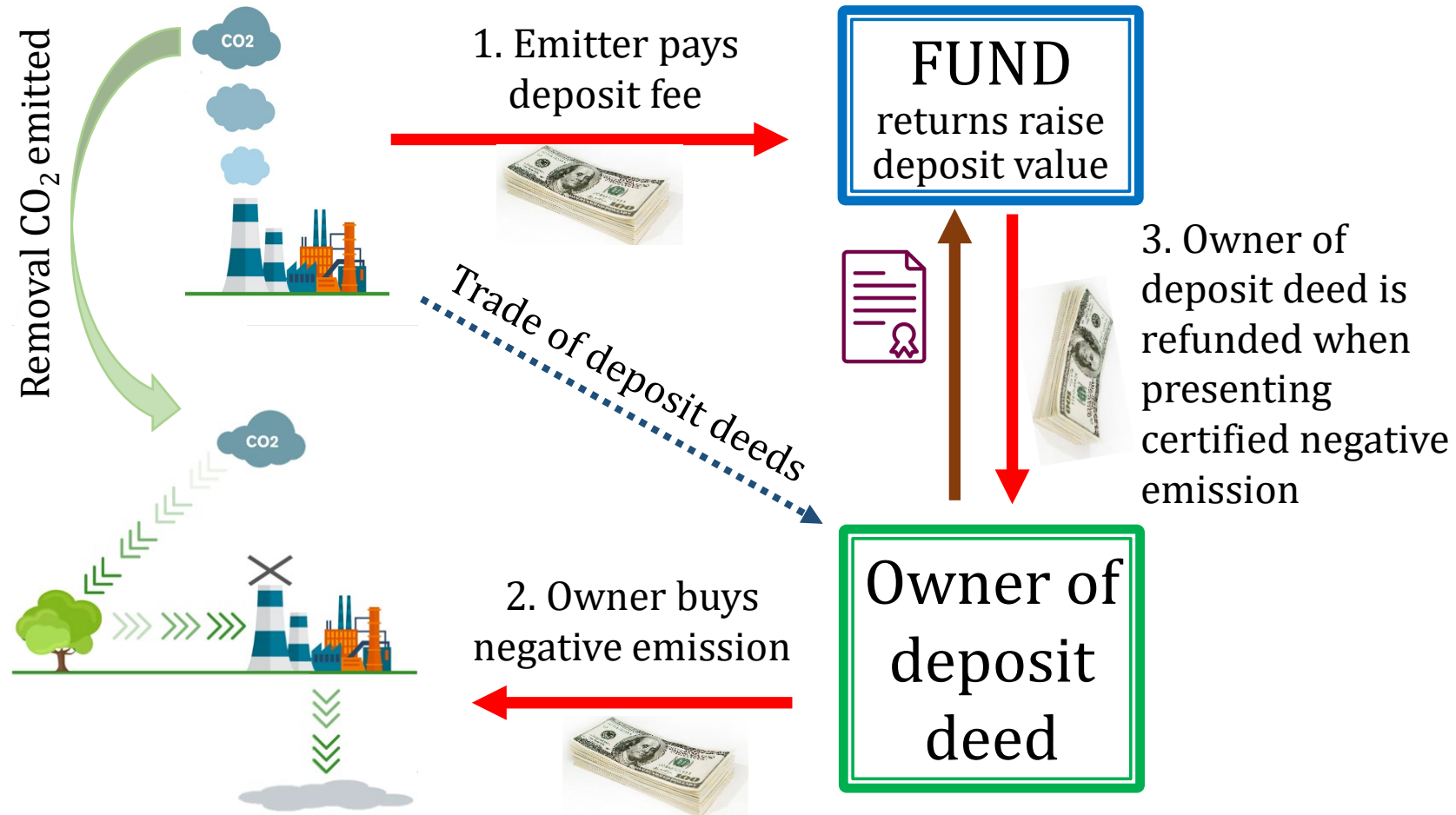
It would also give a good incentive for not emitting CO₂



But, how do we save the money safely?

Public funds built from e.g. CO₂ taxes
could be appropriated from governments in financial need.

A CO₂ Emitter Liability can be operationalized by **Atmospheric CO₂ Removal Deposits (ACORDs)**



Owner of deposits is motivated to make long-term contracts with operators of negative emission plants.

Long-term contracts will secure investments in Negative Emission Technologies.

ACORDs creates a market that promotes technology development and reduces costs

Likely cost of negative emissions $\approx 0.15 \text{ €/kg CO}_2$

Carbon dioxide intensity in global economy: $0.2 \text{ kg CO}_2/\text{€}$

*Thus: a CO_2 tax/cost of 0.15 €/kg corresponds to **3% of global economy***

But, the cost to avoid CO_2 emission is often lower than 0.15 €/kg .

Thus: Cost well below 3% of GDP.

Overcompensation:

Emitter must buy deposits in excess of the actual emissions, e.g removal of 1.5 tonne of CO₂ for every tonne emitted.

Why:

- To reach tougher climate goals
- Failure to introduce ACORDs in time
- Rich countries must take a greater share of negative emissions
- Overcompensation gives higher price, which also promotes lowering of fossil emissions
- To compensate for less safe carbon removal options, e.g. nature-based.

Conclusions

Emitter is obliged to buy deposit deeds corresponding to his emissions of CO₂, to secure the future removal of these emissions.



Trading in deposit deeds creates a market that enables long-term investments and technology development.



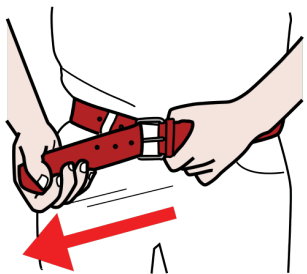
The **revenues** increase the value of the deposit deeds, thus raising the incentive to achieve negative emissions



The deposit deeds have **owners**, which means that the funds created should be protected from being used for other purposes, which is a risk if future negative emissions were instead financed by saved funds from e.g. a carbon tax.



The deposit fee will drive emission **reductions**.



The deposit system can be gradually tightened through **overcompensation**, so that whoever releases one tonne is forced to pay to remove, *e.g.*, two tonnes. This gives further emission reductions, while rich countries can begin to pay off their large historical carbon dioxide debts.



The deposit fee can, and should, be **combined** with other instruments that ensure rapid reductions in emissions.



The socio-economic cost is reasonable, a **few percent** of global GDP.



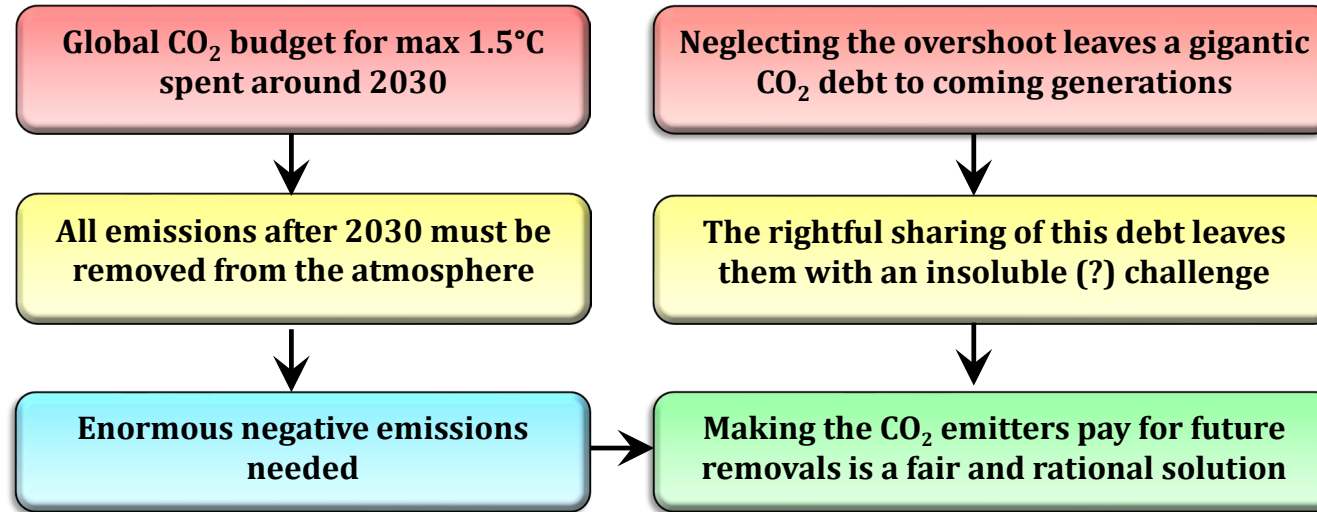
It's simple, fair, rational and puts the cost on whoever is causing the problem. Thus, it should gain **acceptance**.



The proposal can be seen as a way to reach zero emissions immediately, even if the removal of carbon dioxide from the atmosphere takes place with a delay. Thus, the proposal gives a real opportunity to meet **the 1.5°C target**.



We do not leave behind a huge carbon debt and an insoluble problem to **our grandchildren**.



Thanks!
Questions