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SWISS
AIR

CO_2

- Buildings
- Transportation
- Electricity
- Agriculture

The Importance of Taking Action to Reduce Carbon Emissions

- Climate change impacts: rising sea levels, melting ice caps, severe weather events.
- Reduce carbon dioxide emissions to mitigate climate change.
- Transition to renewable energy sources: wind, solar, hydropower.
- Energy-efficient practices, electric vehicles also reduce carbon emissions.
- Action needed to ensure a sustainable future.

SWISS AIR PROJECT

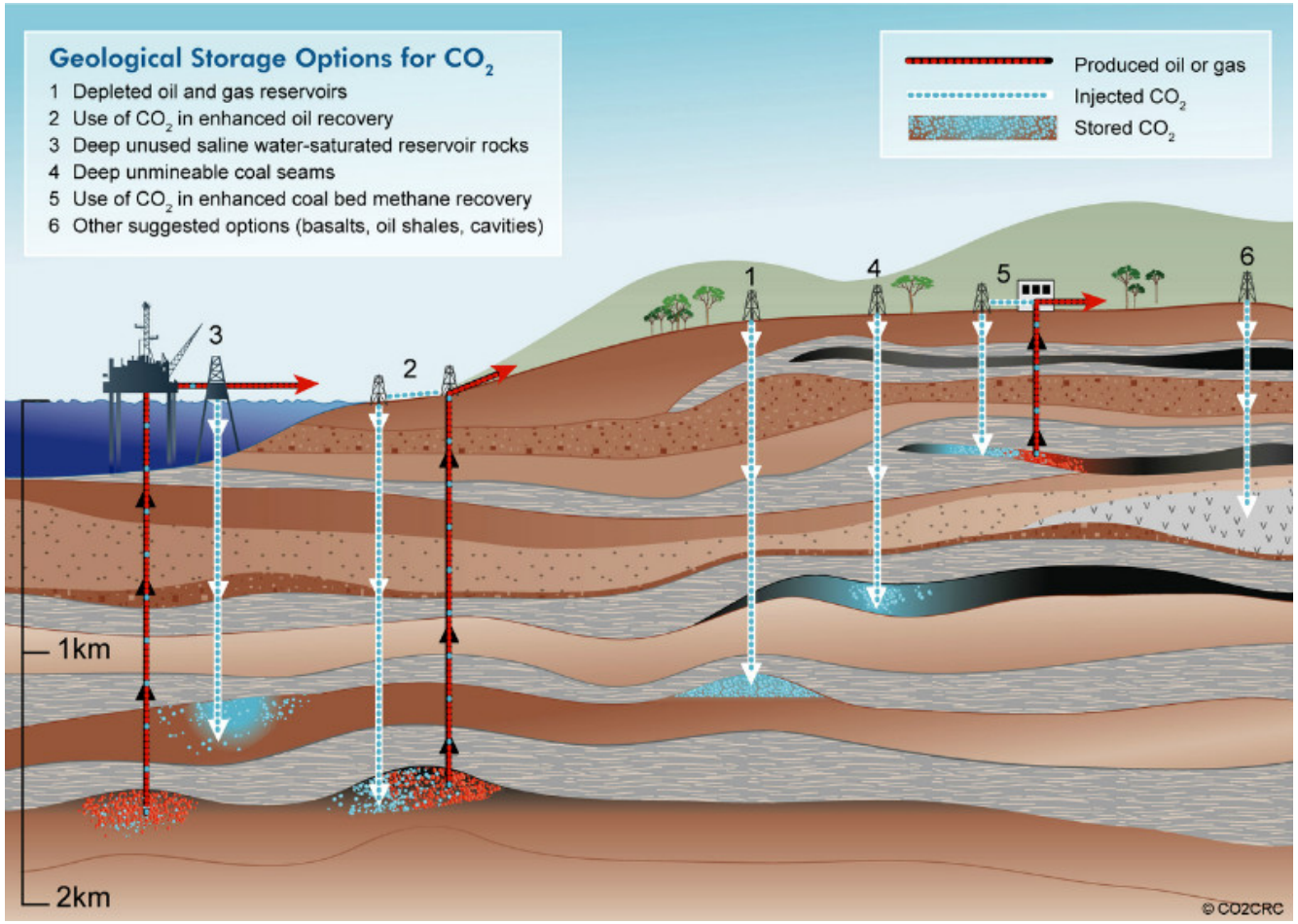
- Giant fans are sucking in fresh air from the Swiss Alps and Iceland's frozen interior, capturing the carbon dioxide and turning it into fizzy drinks or burying it deep underground.

Strategies for Achieving Switzerland's Net-Zero Target:

- Switzerland has a net-zero target by 2050 that requires significant reduction in greenhouse gas emissions.
- Reduction of CO2 emissions is necessary to achieve net-zero target.
- Additional technologies are needed to capture or remove CO2.
- Permanent storage of captured CO2 is necessary.
- Not all greenhouse gas emissions are avoidable.

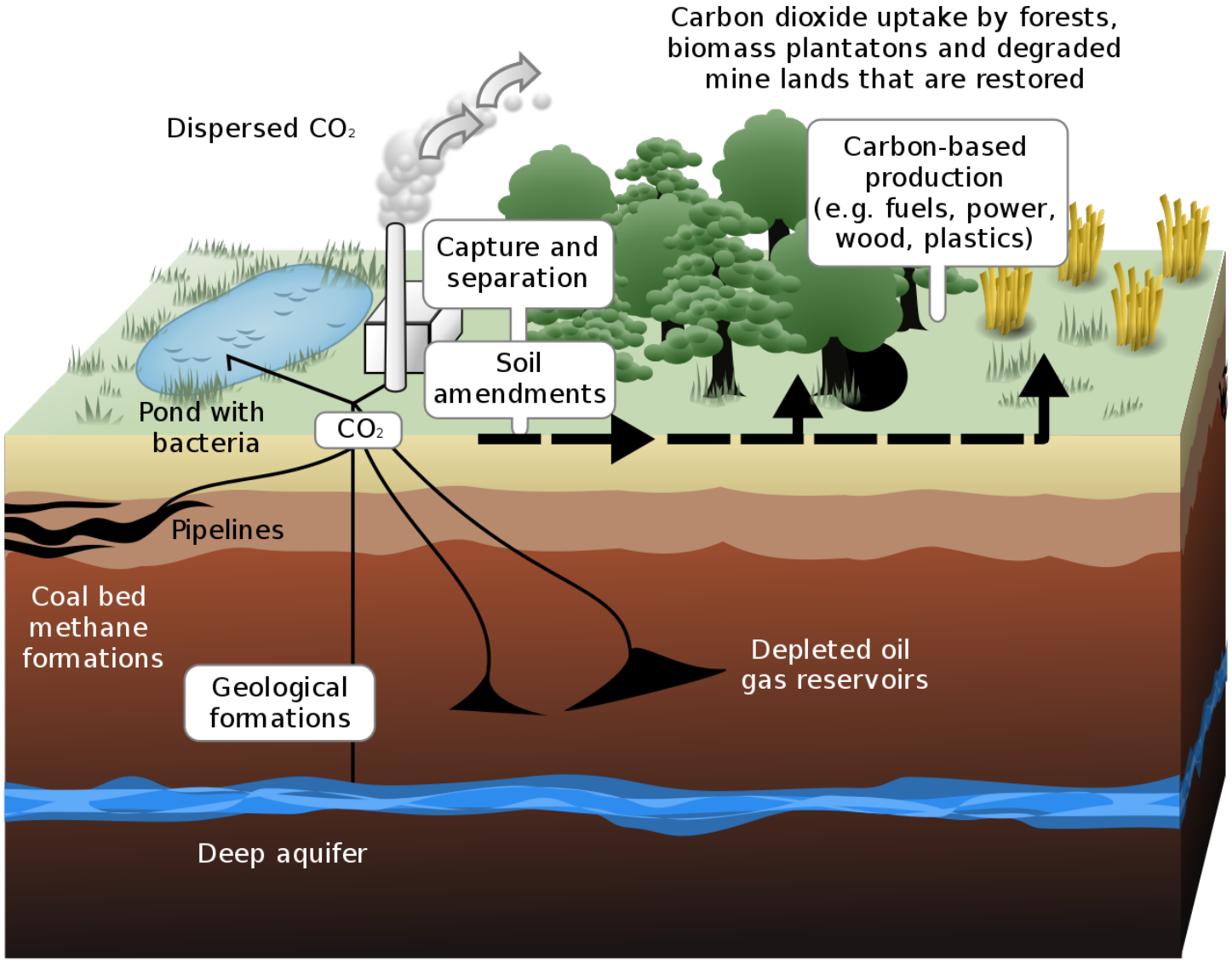
Direct Air Carbon Capture and Storage (DACCS)

- DACCS avoids carbon transport infrastructure and reduces the industrial footprint.
- DACCS reduces atmospheric CO2 and can help limit warming to 1.5ºC.
- DACCS directly mitigates CO2 emissions.
- Cost of DACCS sets a ceiling on mitigating climate change.
- DACCS useful for offsets in hard-to-decarbonize sectors.



Carbon sequestration

- Carbon sequestration stores atmospheric CO2 in a carbon pool.
- This can occur naturally or be enhanced with technology, such as carbon capture and storage projects.
- Carbon capture and storage projects aim to reduce CO2 emissions.
- Carbon sequestration helps mitigate climate change by reducing atmospheric CO2 concentration.
- Carbon sequestration can benefit ecosystems and agriculture by improving soil health and crop productivity.



Direct Air Carbon Capture and Storage (DACCS)

- DACCS technology captures carbon dioxide directly from the air.

Direct Air Carbon Capture and Storage (DACCS)

- It converts it into useful products or stores it underground.
- It is considered a promising solution to reduce carbon emissions and combat climate change.

Potential Impact

- DACCS has the potential to significantly reduce carbon emissions and combat climate change
- However, it is just one piece of the puzzle and should be part of a broader strategy that includes energy efficiency, renewable energy, and other low-carbon technologies.

Promising Advancements and Limitations of DACCS for Combating Climate Change

- DACCS is a promising technology for reducing carbon emissions and combating climate change.
- It has advantages and limitations, and its deployment depends on research and development, policy support, and societal demand.
- With collaboration and innovation, DACCS can be part of a comprehensive strategy to achieve a sustainable and low-carbon future.

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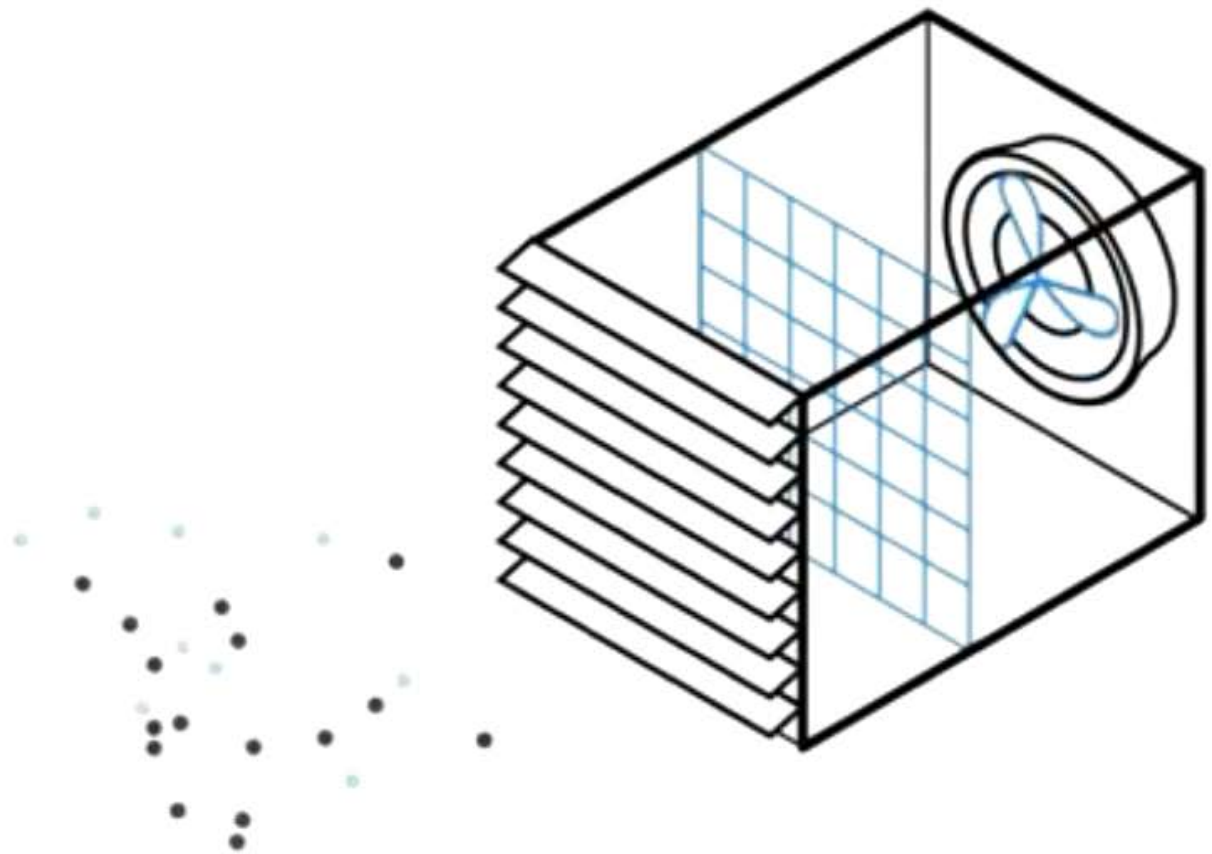
Negative Factors

- It's more efficient and cheaper to avoid CO2 emissions than to capture CO2 .
- Some environmentalists express concern that DACCS could be used as cover for the fossil fuel industry to avoid action.
- In *Michael Mann's book The New Climate War*, he acknowledges the positive potential of DACCS, but also describes bad-faith advocates of DACCS as "in-activists" who use it as an excuse to continue fossil fuel exploitation.


Thank You For Your Attention

- The Swiss clean-tech company *Climeworks* has designed a plant that captures atmospheric CO2



climeworks

Literature Study

www.elsevier.com/locate/procedia

International Carbon Conference 2018, ICC 2018, 10–14 September 2018, Reykjavik, Iceland

Creating a carbon dioxide removal solution by combining rapid mineralization of CO_2 with direct air capture

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Abstract

As a part of the EU-funded CarbFix2 project, Climeworks and Reykjavik Energy have partnered to combine direct air capture (DAC) technology with the injection of CO_2 into basalts, for permanent storage by mineralization of the injected carbon. This is the world's first DAC installation that is combined with mineral storage of CO_2. There is large potential for further optimization and substantial scale up of this joint operation. The organizations are developing an integrated CO_2 removal solution that may be expanded and applied globally. This type of solution has been recognized as a crucial component in efforts to mitigate global warming.

Selection and peer-review under responsibility of the publication committee of the International Carbon Conference 2018.

Keywords: Carbon Dioxide Removal; negative emissions technologies; CarbFix; Reykjavik Energy; Carbon Capture and Storage; CO_2 mineralization; Direct air capture; DAC; Climeworks

- Fundamentally, the Climeworks DAC design is based on an adsorption/desorption process on alkaline functionalized adsorbents.

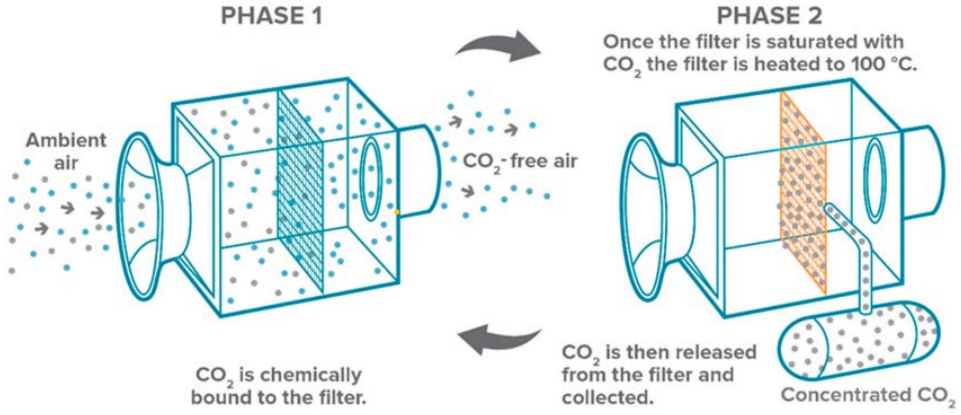

Fig. 2. Schematic illustration of Climeworks direct air capture process

Valentin Gutknecht et al. / Energy Procedia 146 (2018) 129–134