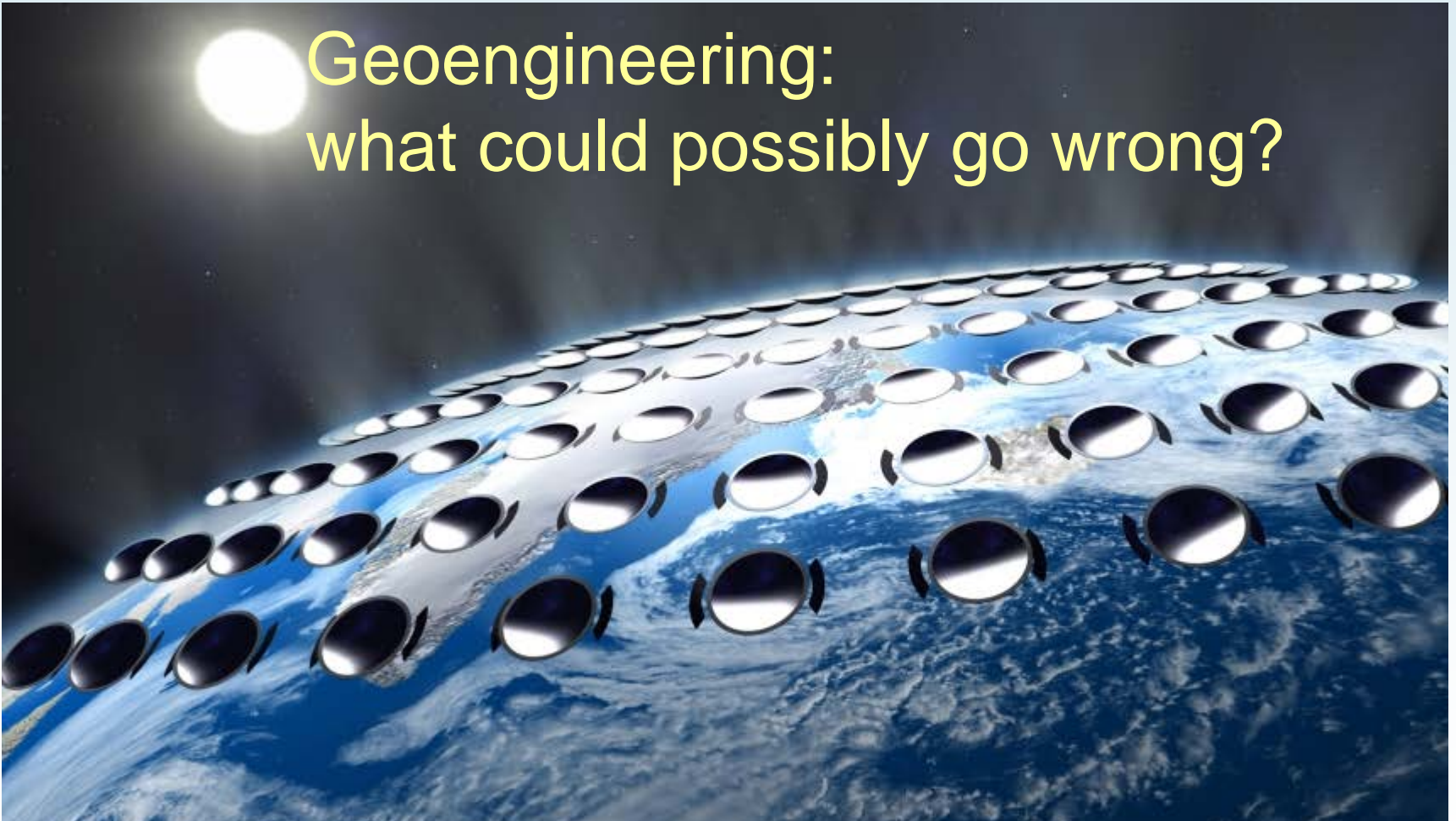


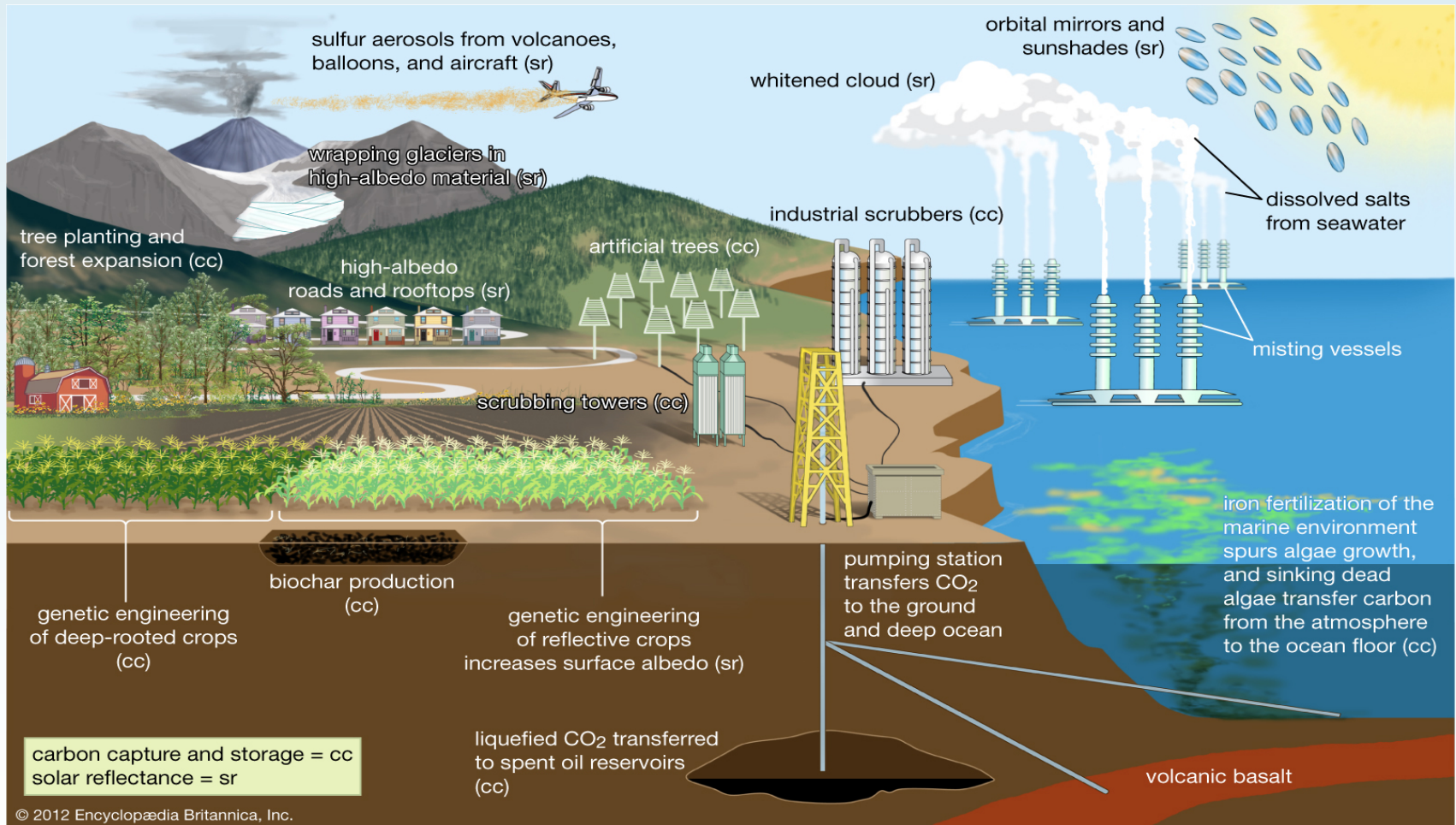
HACKING THE EARTH



Geoengineering:
what could possibly go wrong?



What is geoengineering?



RS defines geoengineering as the 'deliberate intervention in the climate system to counteract man-made global warming'

Three ways of tinkering



SOLAR RADIATION MANAGEMENT

- Space mirrors/reflective spheres
- Cloud brightening
- Artificial volcanic eruption

EARTH RADIATION MANAGEMENT

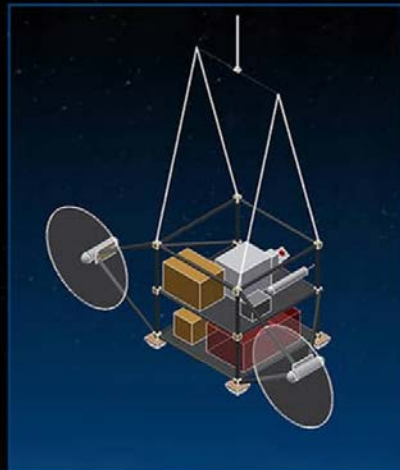
- Cirrus cloud thinning

CARBON REMOVAL

- Biochar formation and burial
- Industrial carbon capture and storage
- Locking up carbon by chemical reaction

State of play

Cloud brightening over the Great Barrier Reef (Australian govt. funded. Southern Cross University et al.).
Spraying sea water into atmosphere at low levels.



ScoPEX - Stratospheric Controlled Perturbation Experiment (Harvard University et al.). Spraying of water, ground chalk and sulphur into stratosphere.

Mimicking a volcano

- ⊖ Popular plan is to mimic cooling effect of major eruption
- ⊖ Pump ~ 20 megatonnes of SO_2 into stratosphere and maintain this level to bring down global temperature
- ⊖ Impacts on crop yields, regional precipitation and efficiency of solar power generation
- ⊖ Past eruptions have had devastating impact on weather patterns, including monsoon
- ⊖ One of riskiest schemes



Pinatubo 1991

Trees versus 'trees'



- ☹ 16 billion trees cut down every year – 476 every second.
- ☹ While we do this, geoengineers propose constructing forests of artificial trees to do the same job.
- ☹ One study suggests 10 million artificial trees needed at cost of \$20,000 each.
- ☹ Huge emissions involved in production.
- ☹ Installation worldwide, massively disruptive and ecologically damaging.

Rock dust to the rescue?



- ☹ Spreading basalt rock dust on fields proposed as means of soaking up carbon via chemical reaction
- ☹ ENHANCED ROCK WEATHERING
- ☹ Treating half of all farmland would capture just 2 billion tonnes of carbon a year ~ 1/20th of current emissions
- ☹ At scale, would require massive effort – disruptive, ecologically damaging, and potential health problems



Why we must say NO



- ☹ All 'fixes' untried and untested at planetary scale.
- ☹ Scaled up, plans are expensive, disruptive and/or risky.
- ☹ No guarantee of success; no warranty against unforeseen consequences.
- ☹ Huge legal and human rights issues.
- ☹ Building global consensus as hard as for major emissions cuts – if not more so.

.....and there's more

- ☹ Can only operate in tandem with serious emissions cuts
- ☹ Gives impression emissions cuts are not the last line of defence
- ☹ Turns heads and hearts away from cuts as science demands
- ☹ Touted as an insurance policy, but increases risk taking
- ☹ Bottom line: geoengineering is a putative backstop that solves nothing
- ☹ TACKLES THE SYMPTOMS – NOT THE CAUSE

