

Carbon Capture and Storage conference
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Carbon Capture and Storage: socio-economic remarks

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Outline

1. CCS: a climate change mitigation option
2. Economics: 30-60 € / tCO₂ avoided
3. Risks: Manageable
4. Regulation & acceptance: to build

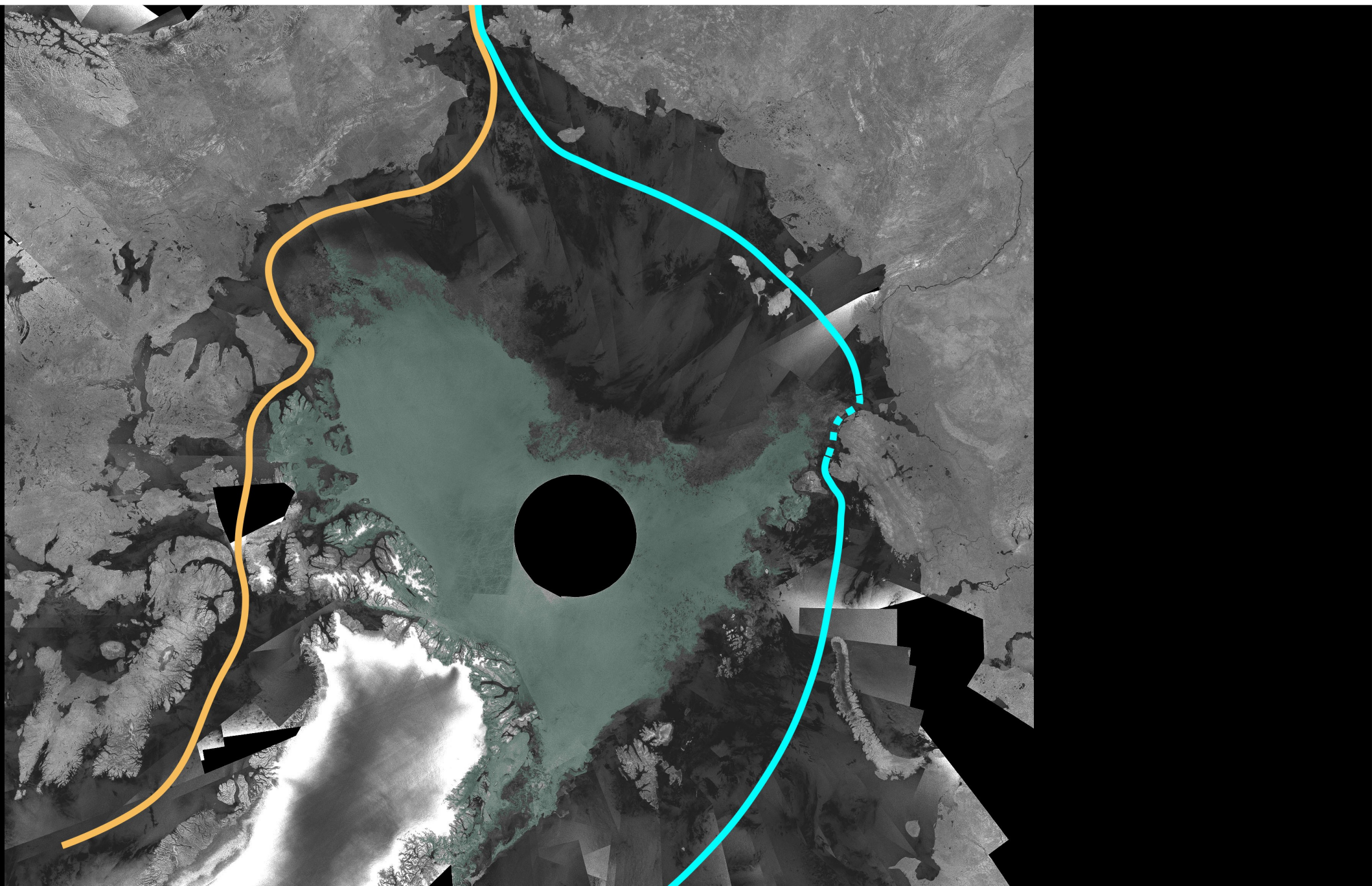
1. CCS is a climate change mitigation option



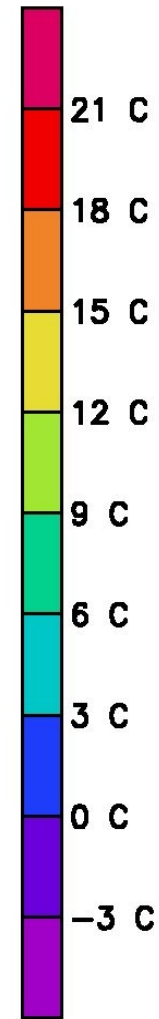
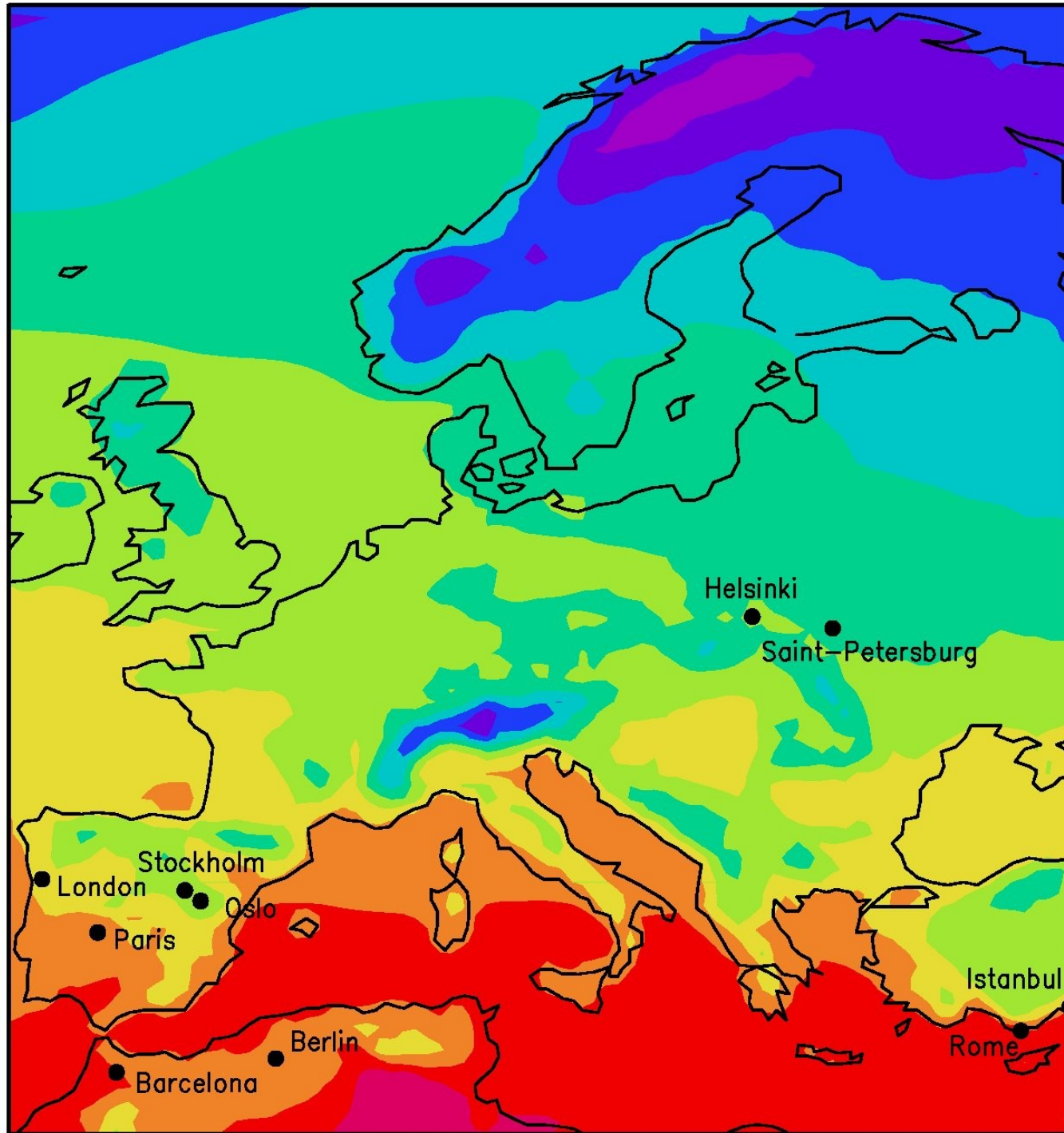
Polar bear endangered by global warming

Arctic ice sheet melting faster than expected

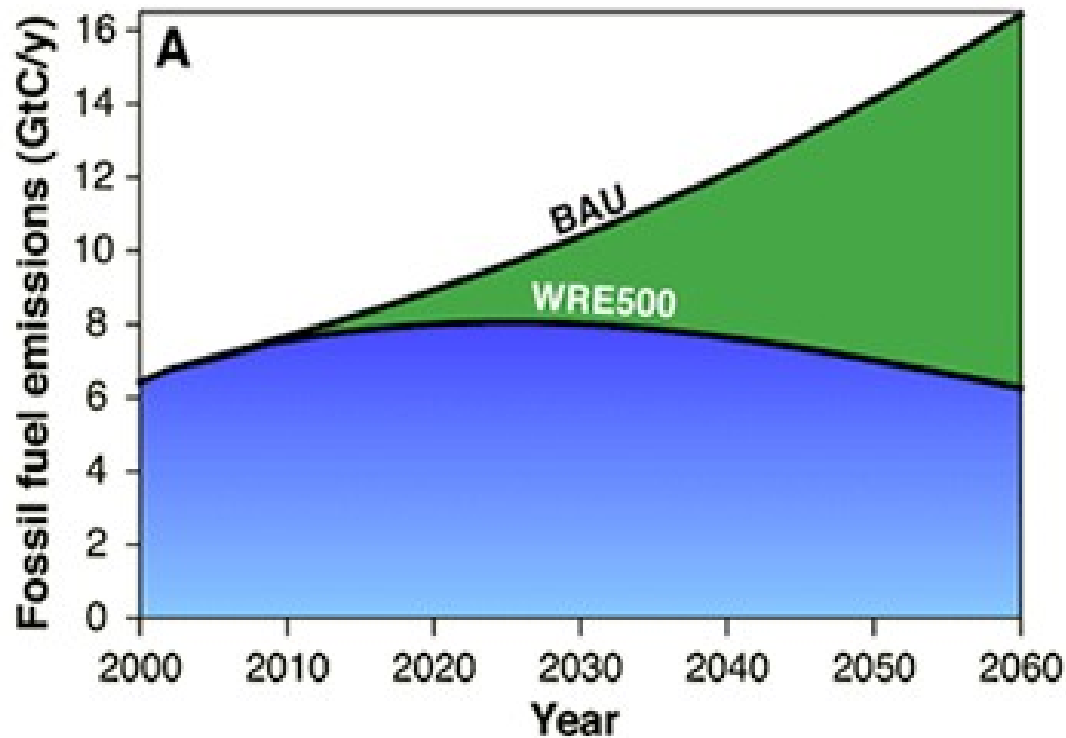
NorthWest passage now open, September 2007 (Source: ESA)



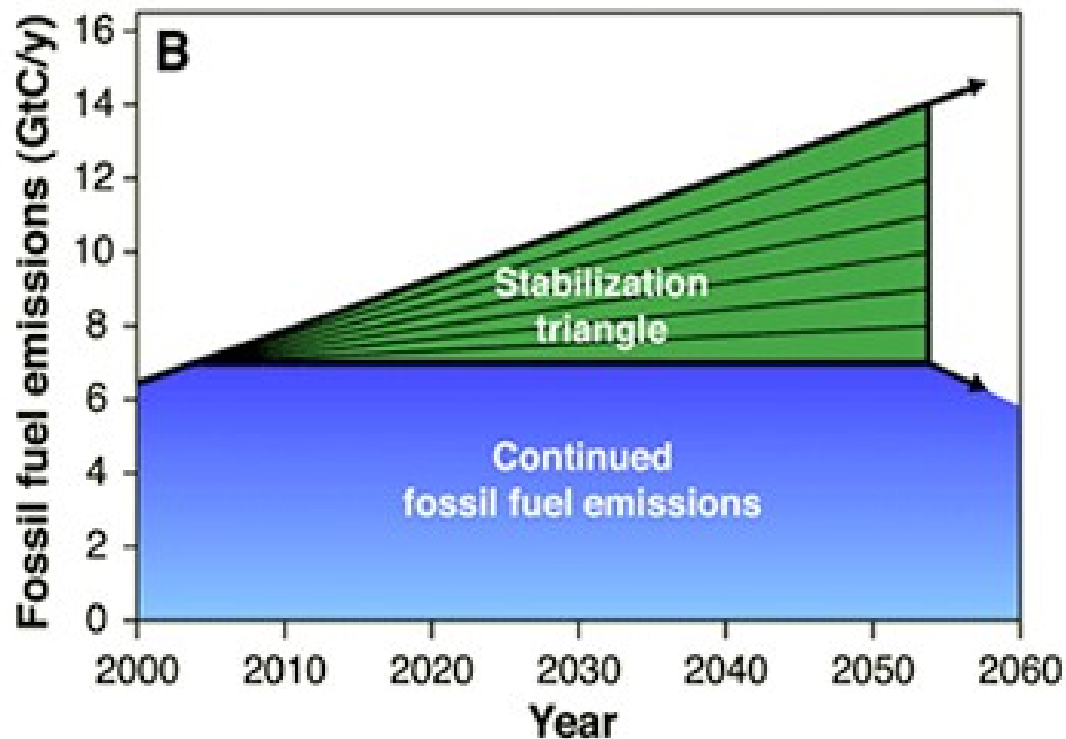
The climate in 2100 ?



Hadley Center
simulation,
Emissions scenario A2

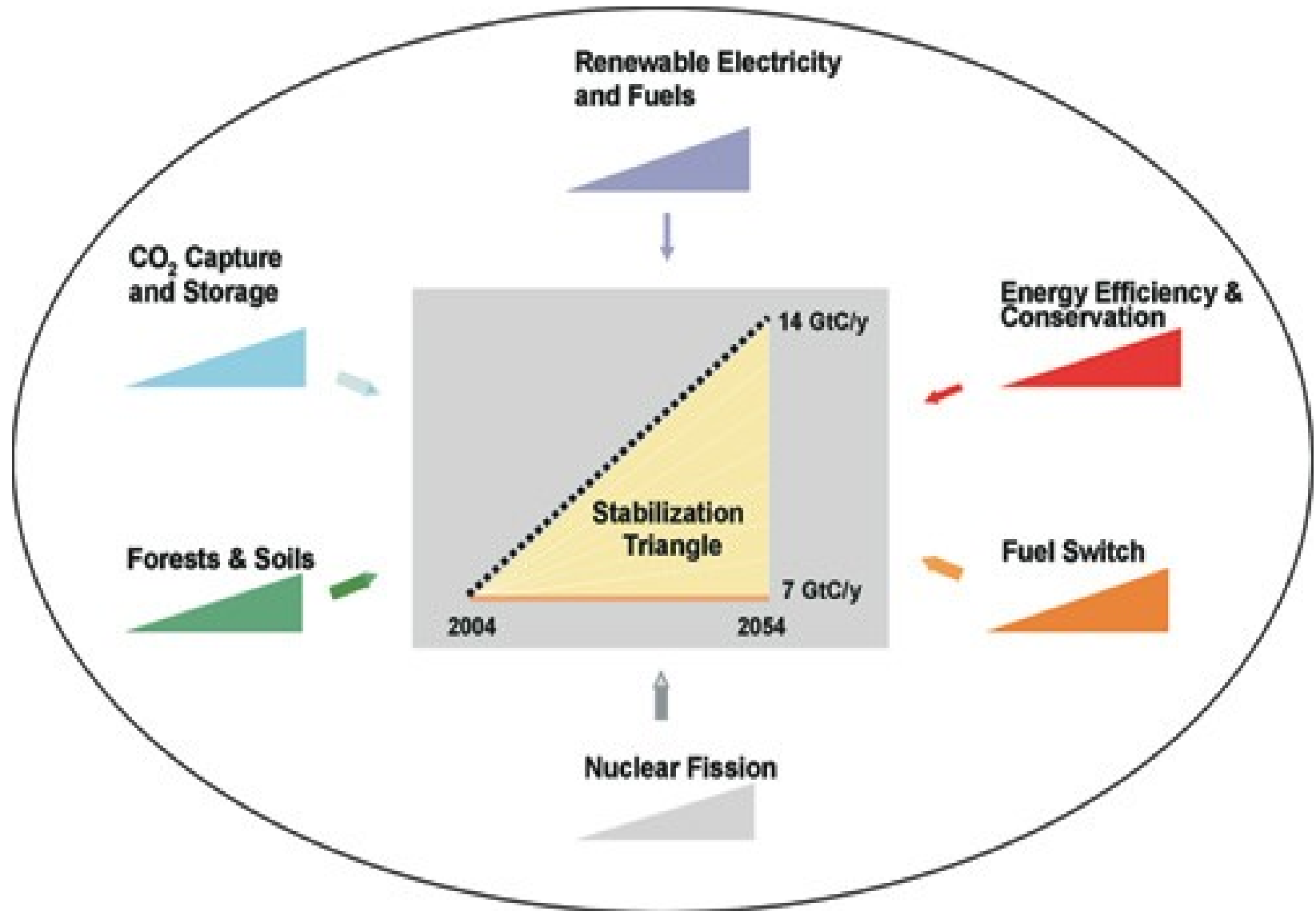


**Green area
=
CO2 emissions
reductions needed
(Socolow et al. 2004)**



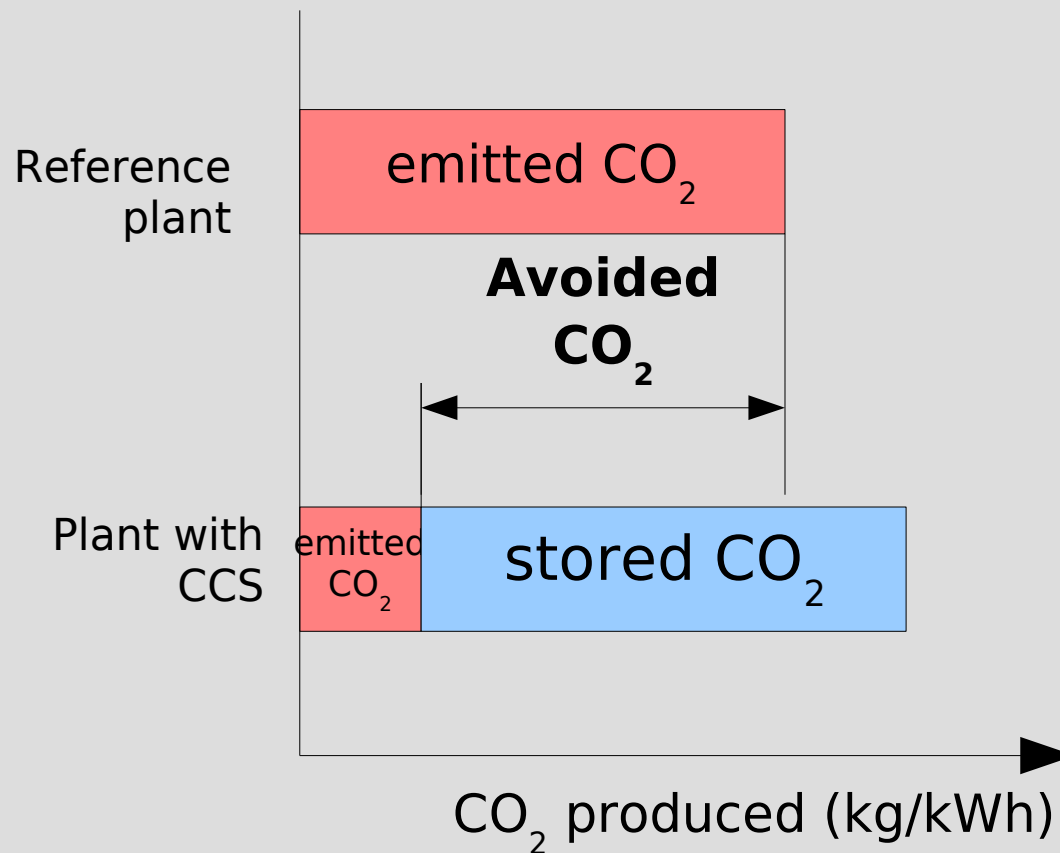
**The stabilization
triangle decomposes
into 7 “wedges”**

CCS is a “wedge”: technological option saving up to 1GtC/yr in 2050



2. Economics

30-60€/tCO₂ avoided



Capture is the biggest cost

- Capture: 25-40 € / tCO₂
- Transport* : 1-3 € / tCO₂ / 100 km
- Storage* : 5-15 € / tCO₂

*: Costs decline with scale

Electricity production cost raises by >30%

- Coal plant:
from 4.3-5.2 c/kWh without
to 6.3-9.9 c/kWh with CCS
- Natural gas combined cycle:
3.1 - 5.0 c/kWh without
4.3 - 7.7 c/kWh with

Source: IPCC SRCSS, table RT.10

3. Manageable risks

- CO₂ is
 - Lighter than water
 - An acid than may react with the rock
- But
 - Many geologic natural analogs
 - Models are improving

Volcanism is an unlikely analog *(Lac Nyos, Cameroun)*



A more plausible analog of leakage through an orphaned well



CO2 leaks already managed

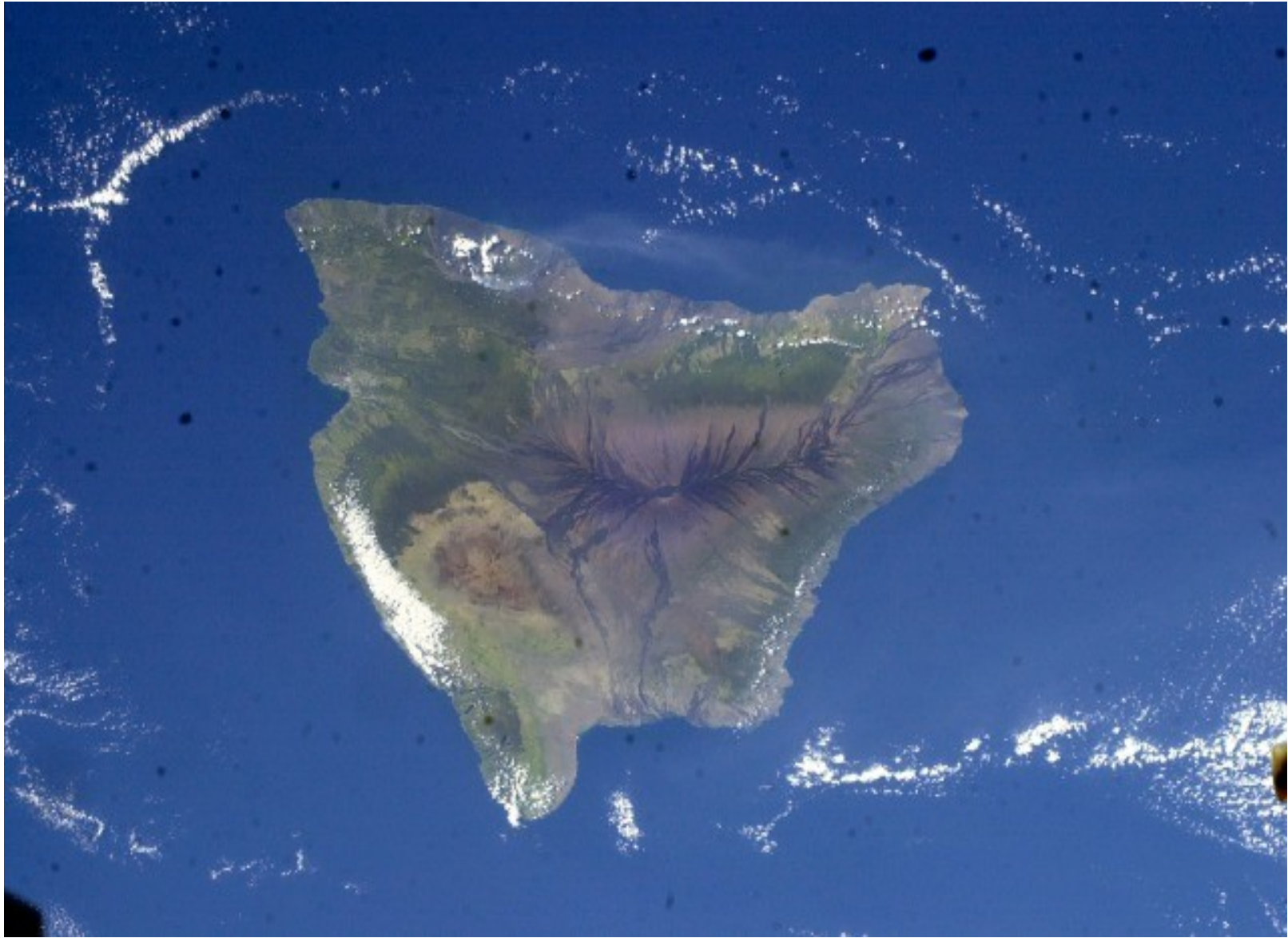


4. Regulation and acceptance

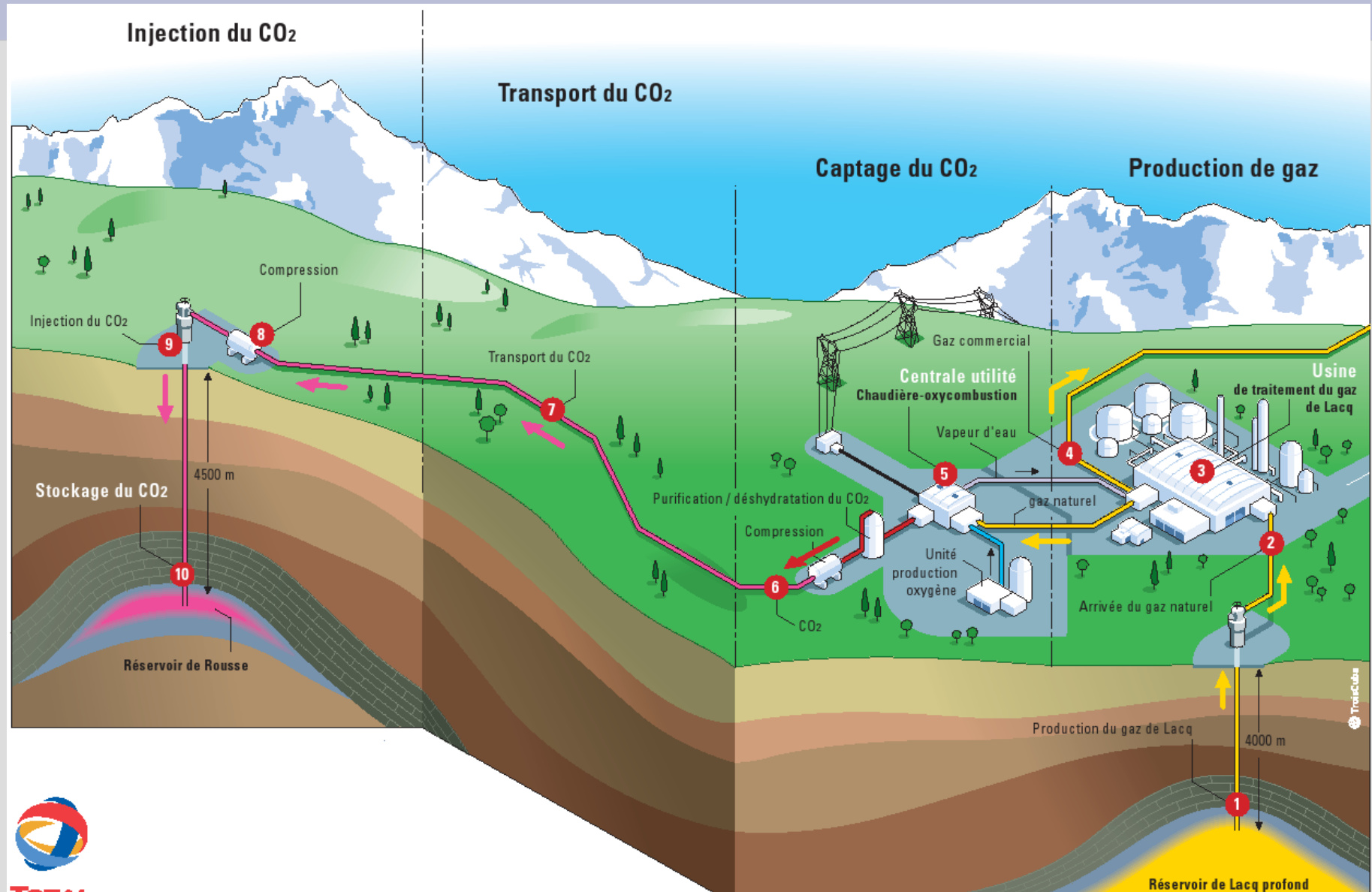
- Existing “large” projects (1MtCO₂/yr)
Sleipner, In Salah, Weyburn
- Many smaller, pilot projects today to
 - Master the technological chain
 - Engage the administrations
 - Explore local acceptance issues

Acceptance issue illustrated

“Feds to Test Impact of Dumping CO₂ into Kona Waters” *West Hawaii Today*, 18/3/1999.



The TOTAL pilot in France



SOCECO2 survey

- Representative sample, face to face, 1076 French 15yr+
- Awareness
 - 6% describe CCS correctly
 - 8% vaguely
- Approval of / opposition to CCS:
 - 58% approve initially
 - drops to 38% after explaining the risks

Open questions...

- CO2 purity
- Reversibility
- Monitoring for leakage
- Long term liability
- Financing and incentives