

Permanent CO₂ sequestration into basalt: the Hellisheidi, Iceland project

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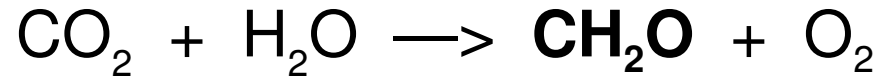
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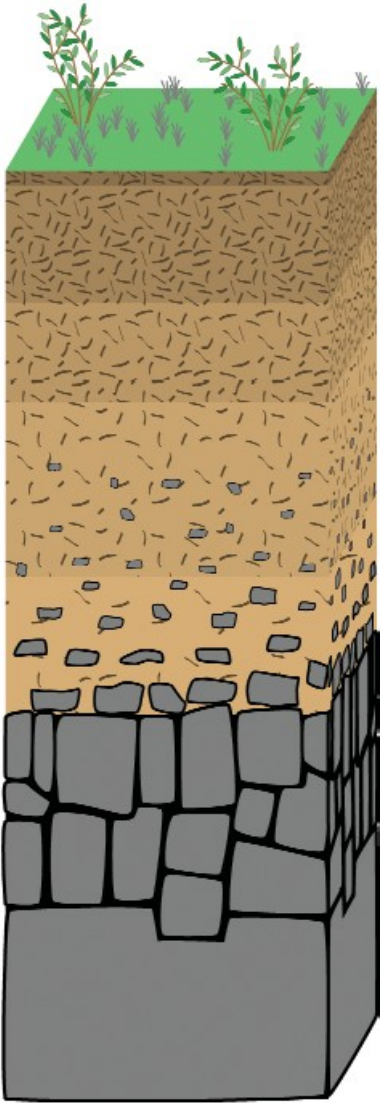
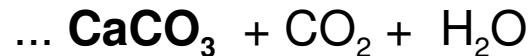
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CO₂ fixation by photosynthesis



CO₂ fixation by chemical weathering of basalt

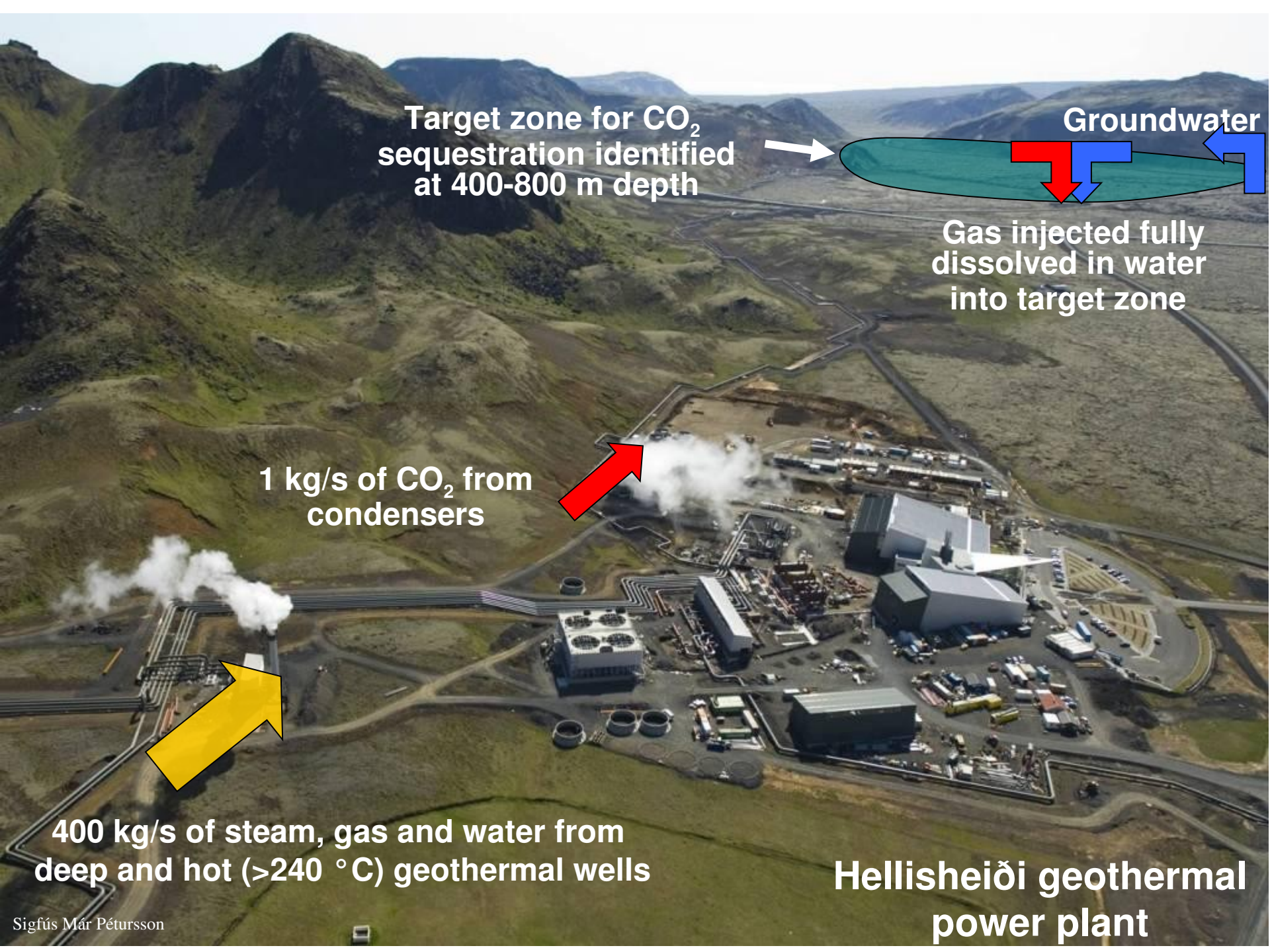


Project Goals

- **Optimize industrial methods for storing CO₂ in basaltic rocks through a combined program consisting of:**
 - field scale injection of CO₂ charged water
 - laboratory based experiments
 - large scale plug flow experiments
 - study of natural CO₂ waters and natural carbonation of basaltic rocks
 - state of the art geochemical modeling
- **Generate the human capital and expertise to apply the advances made in this project in the future**

PERMANENT CO₂ SEQUESTRATION INTO BASALT: THE HELLISHEIDI, ICELAND PROJECT





Target zone for CO₂ sequestration identified at 400-800 m depth

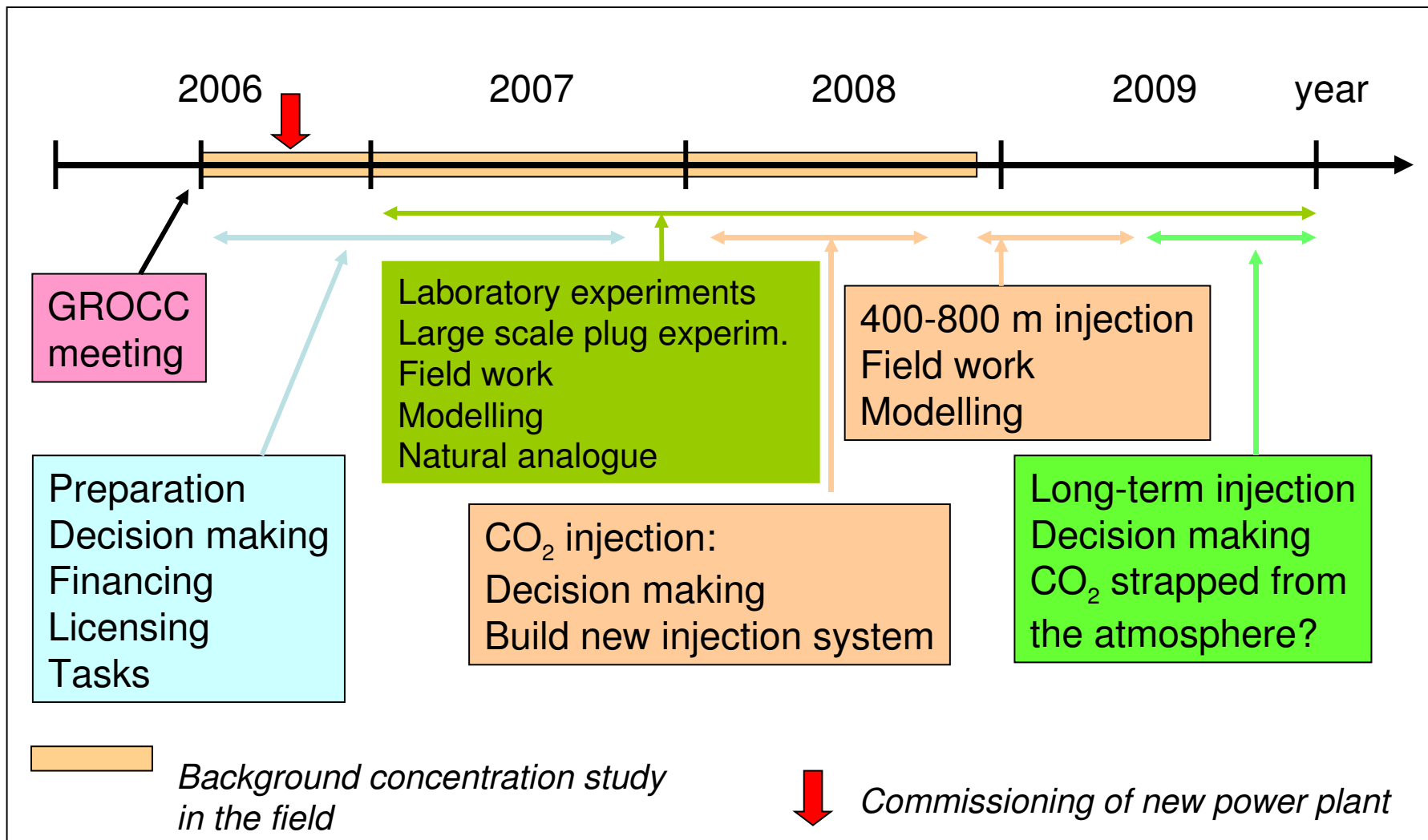
Groundwater

Gas injected fully dissolved in water into target zone

1 kg/s of CO₂ from condensers

400 kg/s of steam, gas and water from deep and hot (>240 °C) geothermal wells

Hellisheiði geothermal power plant



GROCC meeting

Preparation
 Decision making
 Financing
 Licensing
 Tasks

Laboratory experiments
 Large scale plug experim.
 Field work
 Modelling
 Natural analogue

CO₂ injection:
 Decision making
 Build new injection system

400-800 m injection
 Field work
 Modelling

Long-term injection
 Decision making
 CO₂ strapped from the atmosphere?

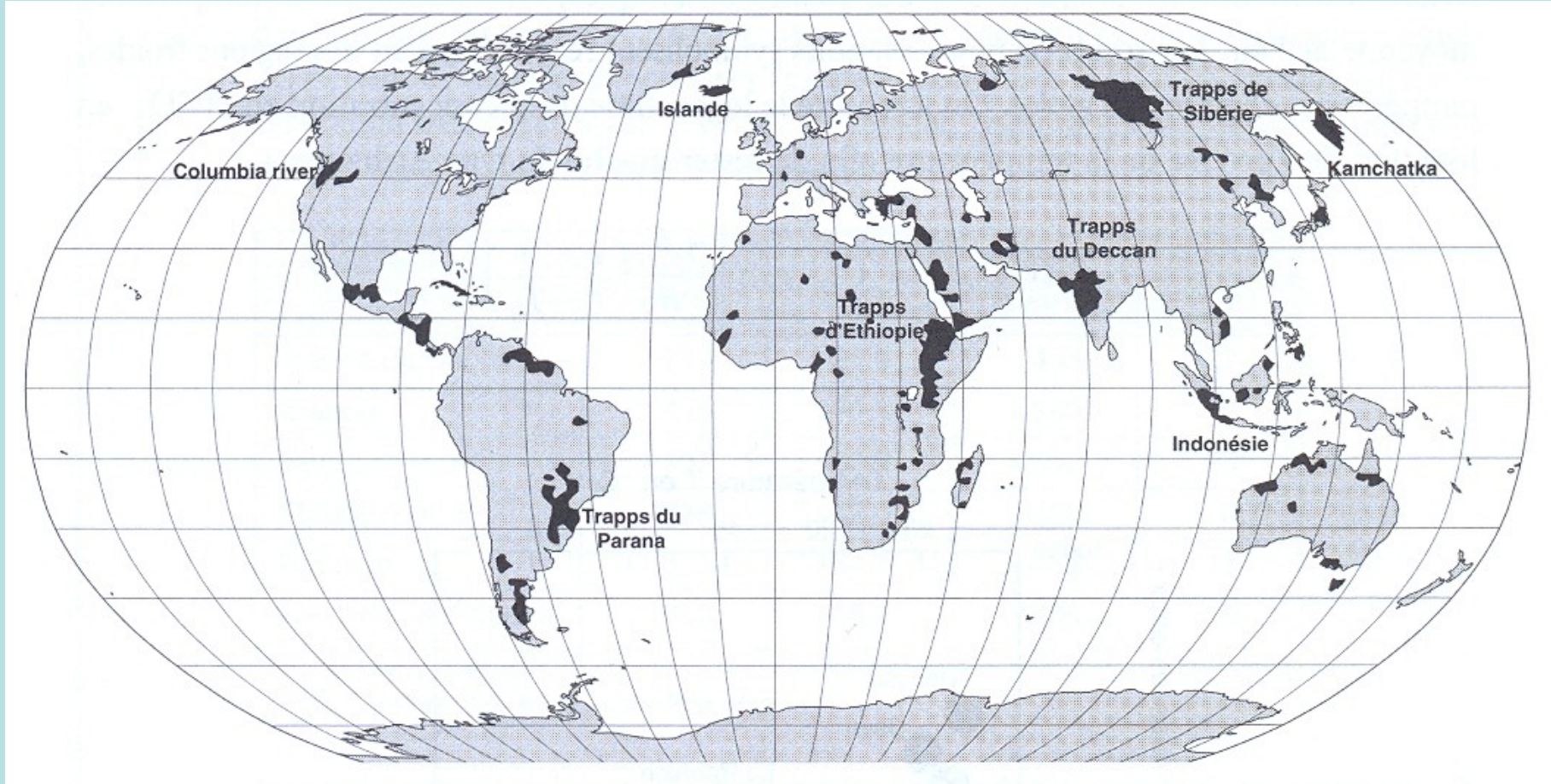
Background concentration study in the field

Commissioning of new power plant

Chemical weathering of basalts

8.4 % of the whole silicate surface

33% of CO₂ consumption by silicates



ATLANTIC OCEAN FLOOR

GREENLAND

EUROPE

NORTH

AMERICA

AFRICA

