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The Eden Deep Geothermal Plant, a first step towards the birth of new technology in Cornwall

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POTENTIAL RESOURCE IN W. EUROPE

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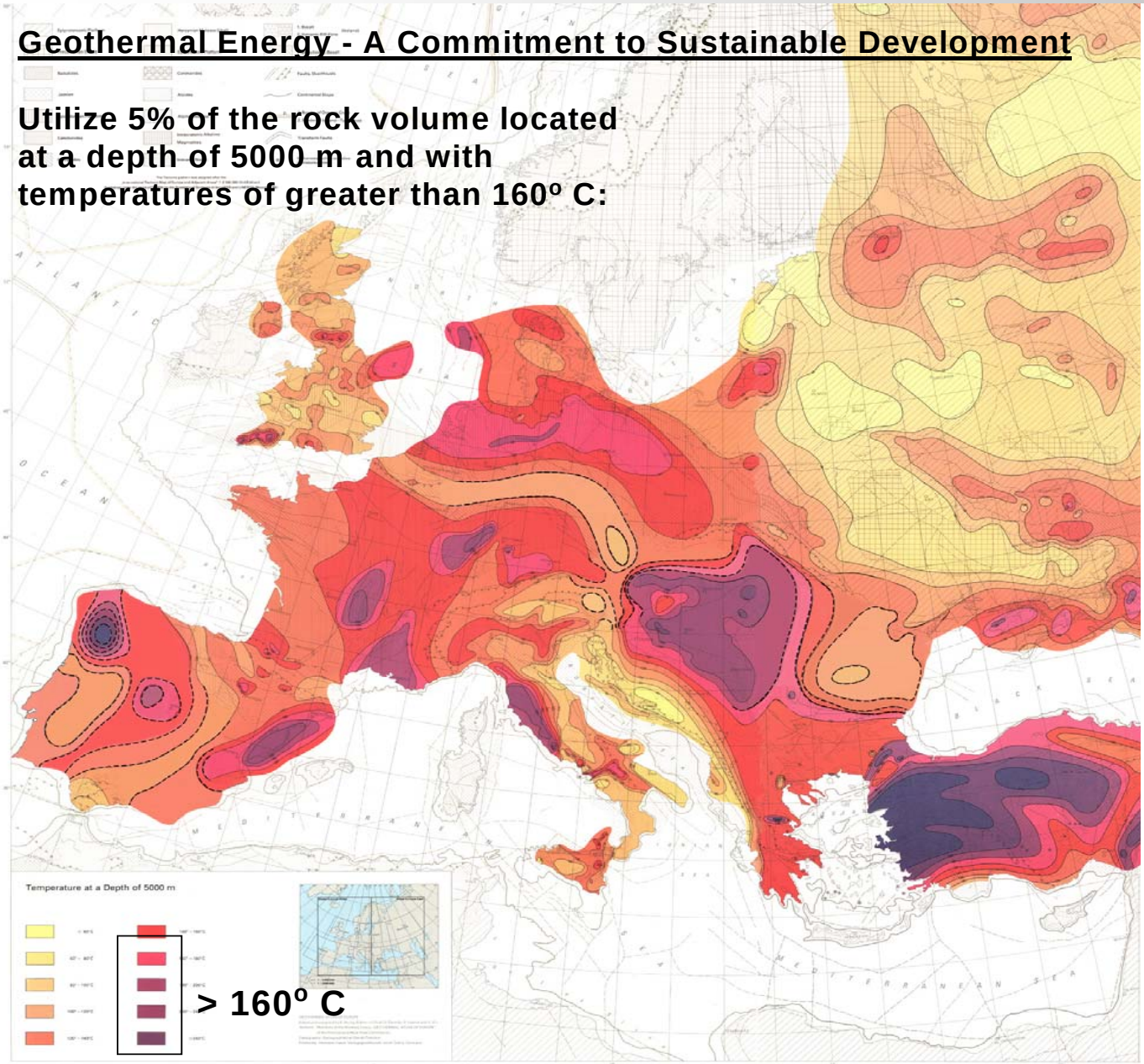
Geothermal Energy - A Commitment to Sustainable Development

Utilize 5% of the rock volume located at a depth of 5000 m and with temperatures of greater than 160º C:



EU resources could :

*** support 130 GWe of power generation capacity**

*** generate ~900 TWh (E 45 bln/yr - market)**

*** similar to 1995 electricity generation of Europe's nuclear capacity.**

*** 35% of current EU consumption.**

Stored energy in the rock-mass

- If one cools 1 km^3 of granite from 200°C by 20°C to 180°C, this is equivalent to:
  - 15,000 GWh thermal; or
  - 10 MW electric for 20 years; or
  - 8,925,000 barrels of oil.

1987-2007 European Project @ Soultz, France

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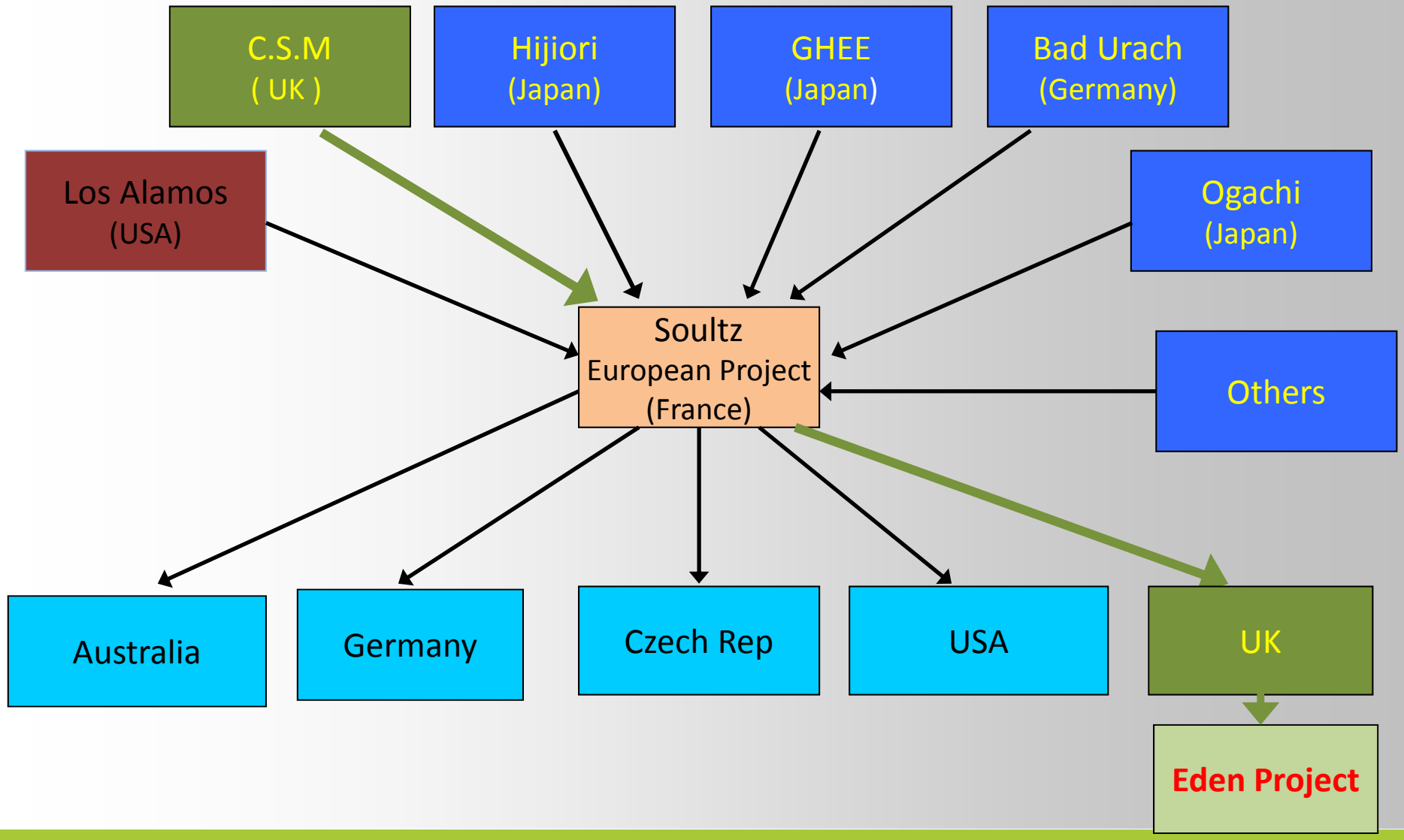

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Technology developed at the Rosemanowes project (CSM & CCC)

- Drilling technology: Select the right bits, geometry of the bits, weight on bit, no problems
- Geomechanics: Influence of stresses on fluid flow & shear failure as a dominant mechanism
- Stress measurement: In-situ stress measurement techniques
- Hydraulic investigation: Characterisation of deep geothermal reservoir; double porosity
- Tracer studies: Tracer studies to evaluate the life of the reservoir & preferential paths
- Microseismic: Monitor the development of the reservoir in real time & characterisation
- Development of specialised instrumentation: explosive tools, microseismic sensors, PTF logging sondes, downhole sparker, tracer injector, downhole samplers,
- Numerical modelling: FRIP (geomechanic code), tracer, borehole stability, directional drilling, Economics of reservoir, system life time, characteristic of shear failure, data presentation & plotting routines, etc.
- Project coordination & management: created on site with support from industry & CCC.

- Technology Exploitation: Altcom Ltd (Penzance), Geoscience (Falmouth), Calidus Engineering Ltd (Redruth), Neopartners Ltd (Falmouth), Loeb Aron & Company Ltd (London), MIL-TECH UK Ltd (Woking), EGS Energy Ltd (Penzance), Itasca (USA), Poly Dynamics (Switzerland) and others.

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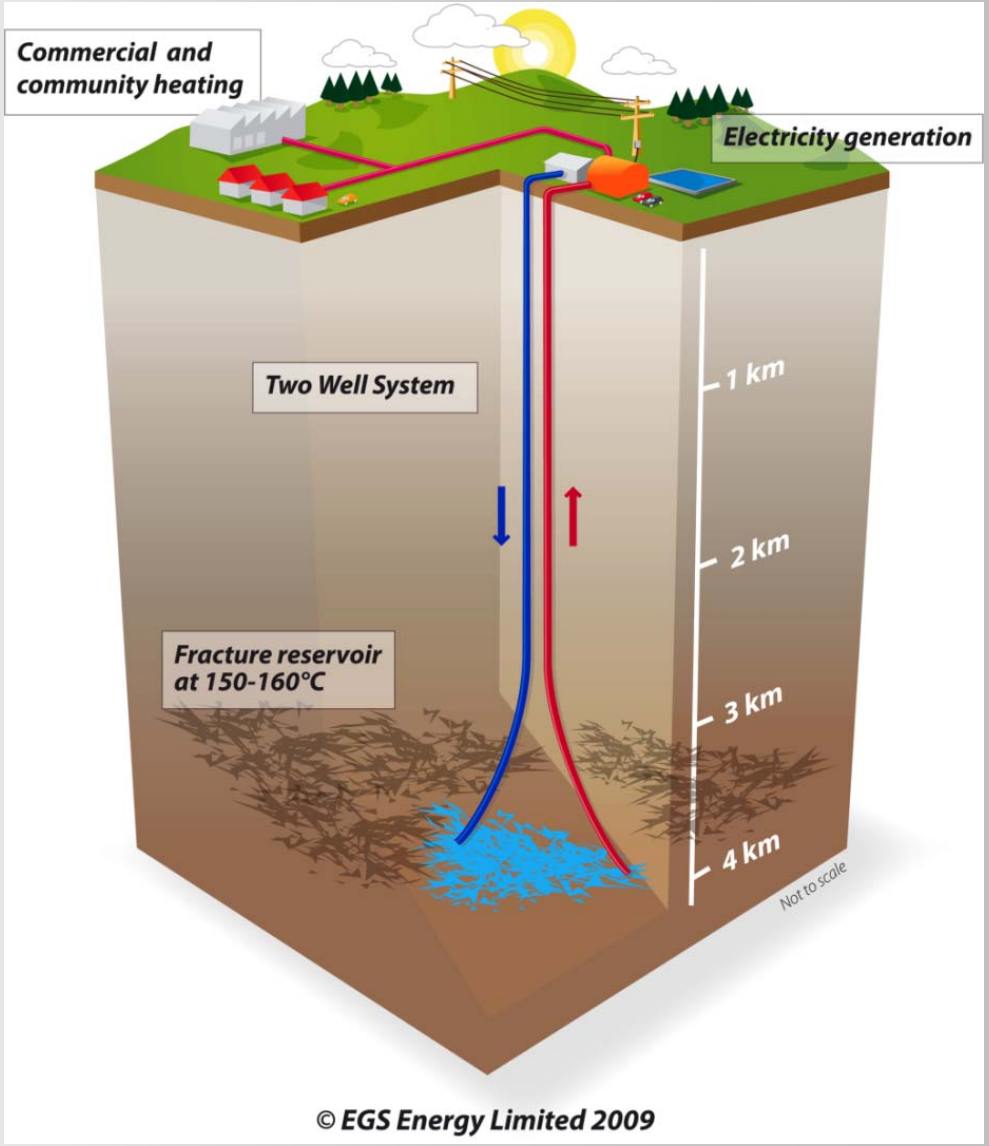
Schematic of the proposed first commercial EGS plant in the UK.



Birth of new technology in Cornwall

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1. Initiate and build the first deep geothermal plant in the UK at the Eden Project
2. Probable cooperation between Germany & UK as a research/commercial site.
3. Establish the site as an International Centre of Excellence on deep geothermal in conjunction with BritGeothermal, European Universities and Exeter Uni/CSM

- Expand the application of deep geothermal by building 4-10MWe plants in a more systematic way to create an industry, based on electricity production & industrial heat usage.
- Establish economic criteria which encourages investment and further exploitation of deep geothermal (reduce drilling risk, planning permission, financing etc.)
- Work in conjunction with CCC and DECC to develop this & take it to much higher leve

❑ Create a successful horticultural (Dutch !)/aquaculture/recreation industry and other application of heat to provide jobs and tourist industry throughout 12 months .

❑ Further development of binary plant to improve efficiency ad heat recovery.

❖ Use the establishment of the International Centre of Excellence to create a specific course at a number of UK Universities, centred at Exeter Uni / Eden Project .

❖ Seek support from EU and others to countries to maintain this.

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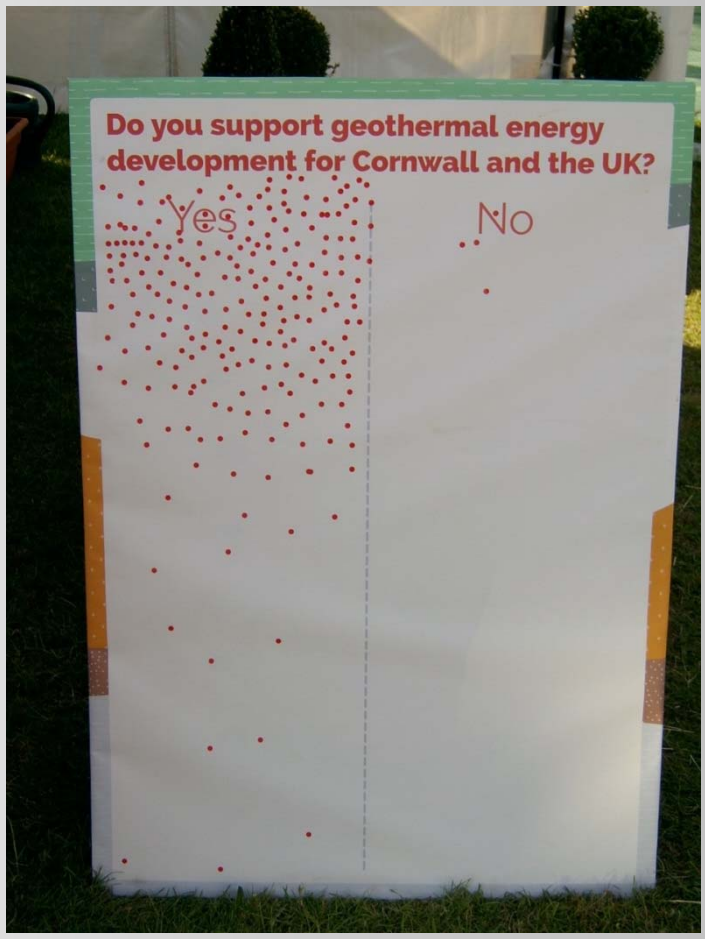
PEOPLE WANT DEEP GEOTHERMAL!



Public support for deep geothermal (Royal Cornwall Show 2013)

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The old guard: 1980 CSM TEAM AT ROSEMANOWES