Info & Contacts

EPOS-NL

EUROPEANPLATEOBSERVINGSYSTEM EPOS-Netherlands

Dutch participation to EPOS: the European Research Infrastructure for solid Earth sciences

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1. The science challenge driving EPOS-NL

EPOS-NL is the Netherlands' contribution of National Research Infrastructures (NRIs) to the **European Plate Observing System (EPOS)**, which is the pan-European research infrastructure for solid Earth sciences.

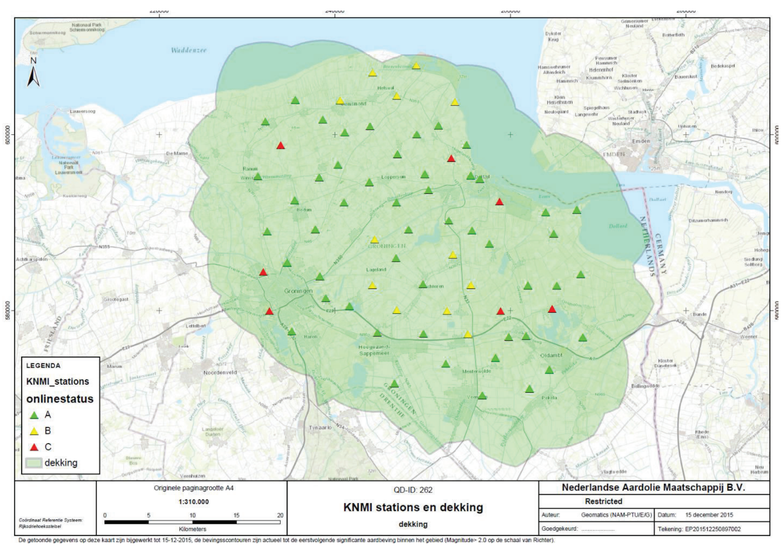
EPOS-NL will integrate all national geophysics facilities into a coherent research infrastructure and develop new research facilities and state of the art **open data access**. The new research infrastructure will support **multi-scale, multiphysics research** that will deliver a quantum leap in imaging of subsurface structure and processes and in predictive modelling, in the field of:

- **Geo-energy**: exploration and exploitation of new, low carbon geo-energy resources in the Netherlands and Europe, in particular geothermal energy.
- **Geo-storage**: geological storage of CO_2, fuels like natural gas and renewably generated hydrogen, and wastes related to energy production.
- **Geo-hazards**: such as induced earthquakes and subsidence caused by human activities in the subsurface.

2. SYSTEM-SCALE NATURAL LABORATORIES

A. Groningen gas field seismic network (KNMI)

SEISMOLOGY

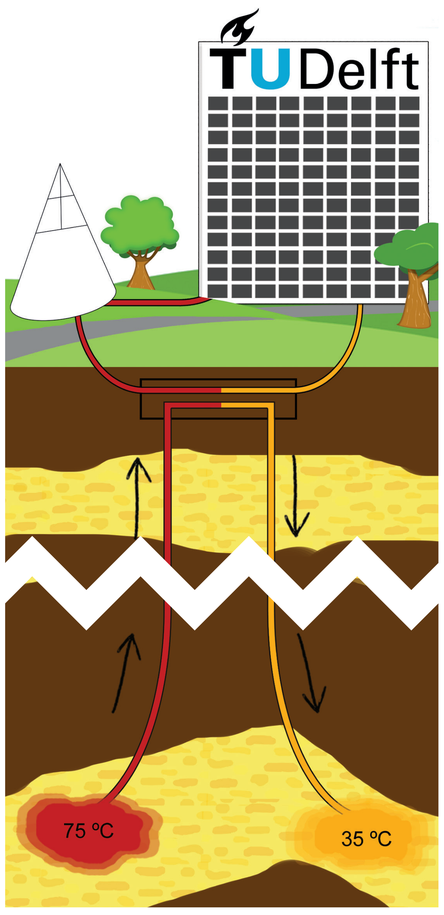


The Groningen gas field is a unique natural observatory for induced seismicity. **Big data** from the dense seismic network of borehole stations in Groningen will be integrated in the ORFEUS Data Centre and made **openly available** to the geoscientific community through the EPOS Thematic Core Service Seismology.

B. DAPwell geothermal well (TUD)

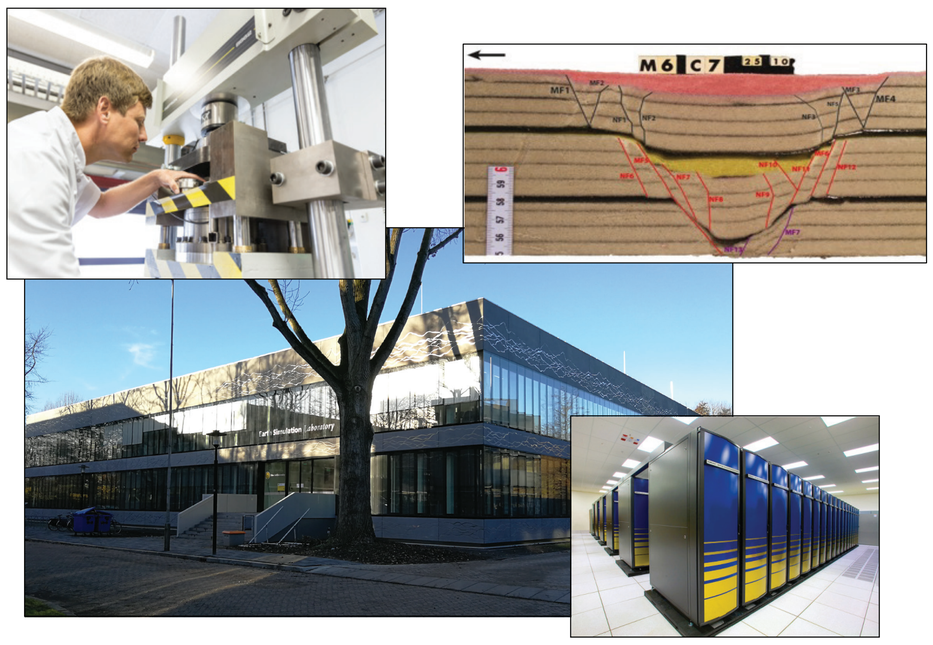
GEO-ENERGY TEST BEDS FOR LOW CARBON ENERGY

A deep **geothermal doublet**, built with extensive embedded monitoring and testing instrumentation, and including new materials (composite casing), will be installed on the TU Delft campus. Cores will be analysed in the laboratory to determine the petrophysical properties of the reservoir rocks and a seismic network at the surface will monitor fluid flow between injector and producer well.



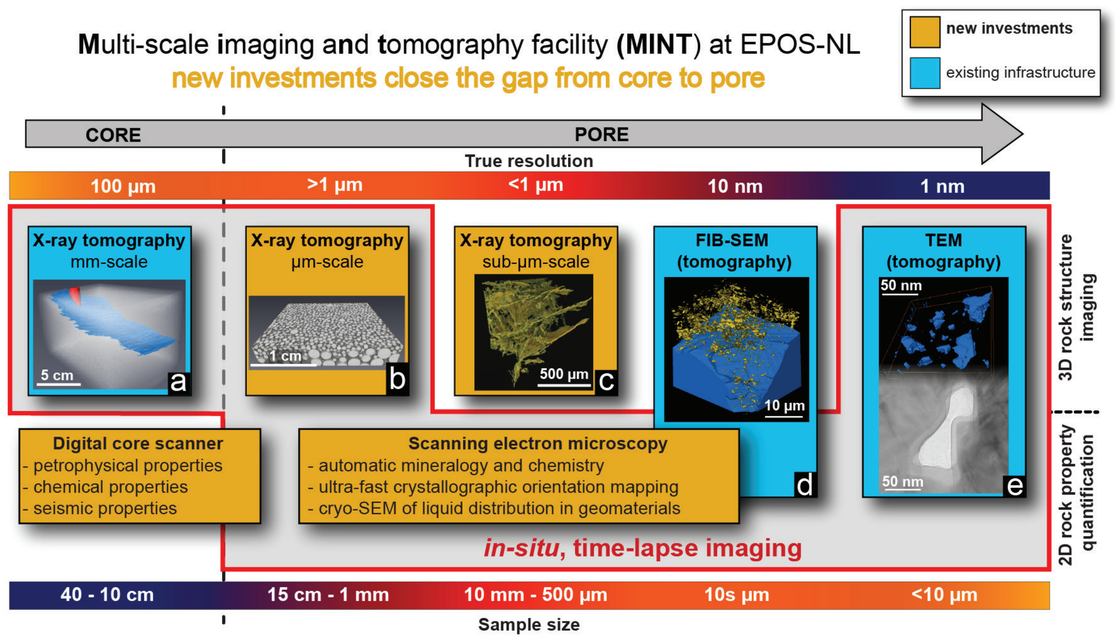
3. INTEGRATED LABORATORIES FACILITIES

C. Earth Simulation Laboratory (ESL, UU)



MULTI-SCALE LABORATORIES

D. Multi-scale Imaging and Tomography (MINT, UU & TUD)



The ESL will integrate the existing world-class **multi-scale, multi-physics** experimental facilities at UU (HPT Laboratory and TecLab) with existing n**umerical modelling and imaging facilities for seismological research**. New facilities will include a high-resolution imaging of the 4D internal deformation of analogue models and an ultra-high resolution HPT testing machine able to deform rock samples and simulate fault slip under geothermal, flow-through conditions.

A cluster of instruments enabling visualization and correlation of 3D and 2D structures within rock samples at all scales ranging from meters to nanometres. It will include **X-ray tomography systems** with a range of resolutions and sample size capabilities and cutting-edge a**utomated electron microscopes**. MINT will be able to image rocks at all scales and allow notoriously difficult sub-micron pore and fracture networks to be analysed and scaled to larger rock structures.

Koninklijk Nederlands Meteorologisch Instituut
Ministerie van Infrastructuur en Waterstaat

Universiteit Utrecht

TU Delft