University of Stavanger

Prof. Mohsen Assadi

Overview: Program area for geothermal energy at UiS

Why geothermal

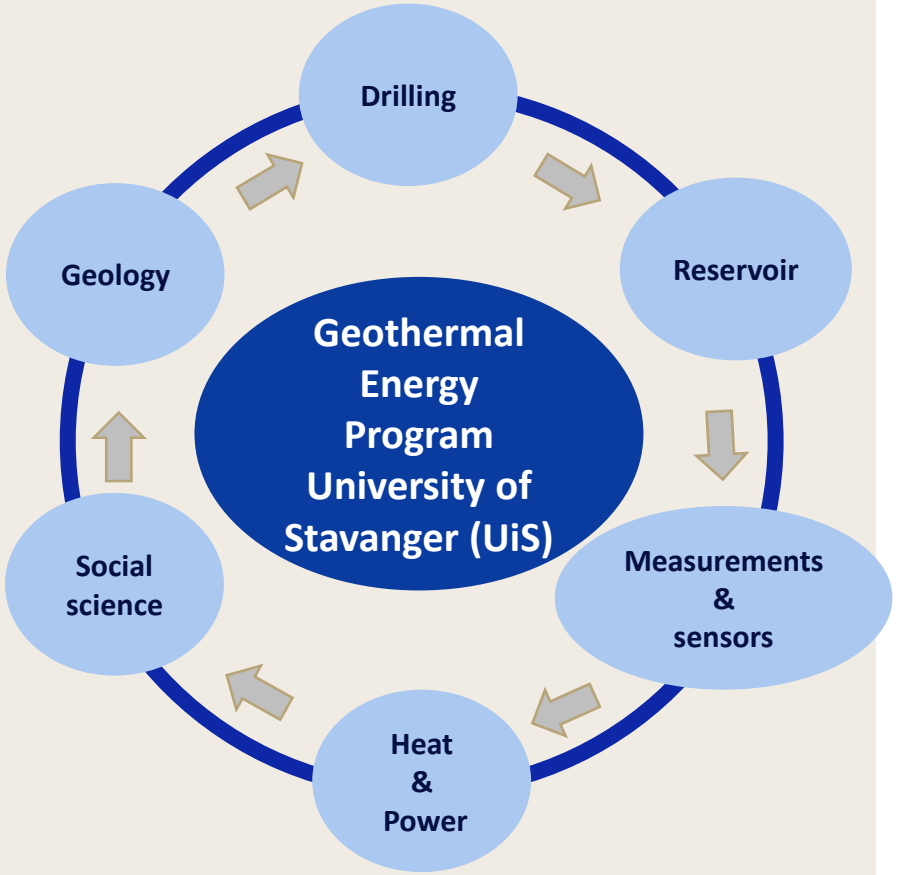
- Energy system in transition
- Renewable energy (dispatchable)
- Knowledge transfer from petroleum
- Multidisciplinary R&D activities
- External funding
- International networking
- Educational program at all levels
- Commercialization of the technology via industrial collaboration
- Building on the strong knowledge base of energy system integration

EU - Energy and Climate Goals for 2050

- The transition towards a future low-carbon economy is driven globally, supported by the Paris Agreement.
- There is a need for sustainable development to counter the threats of the climate change.
- Support will be provided to technology development with climate resilience and low greenhouse gas (GHG) emissions.
- The European Union Energy Roadmap 2050 aims at reducing GHG emissions to 80-90% below 1990 levels by 2050.
- The European "green deal", supports all energy solutions that increase the share of renewable/clean energy.
- Access to dispatchable renewable energy technologies and energy storage alternatives, as well as distributed energy systems will play an important role in reliability of the future energy systems.
- Geothermal energy is dispatchable and provides storage capability as well as opportunity for knowledge transfer from petroleum!
- Distributed energy supported by Artificial Intelligence will play a key role in the future development of all renewable energy sources.

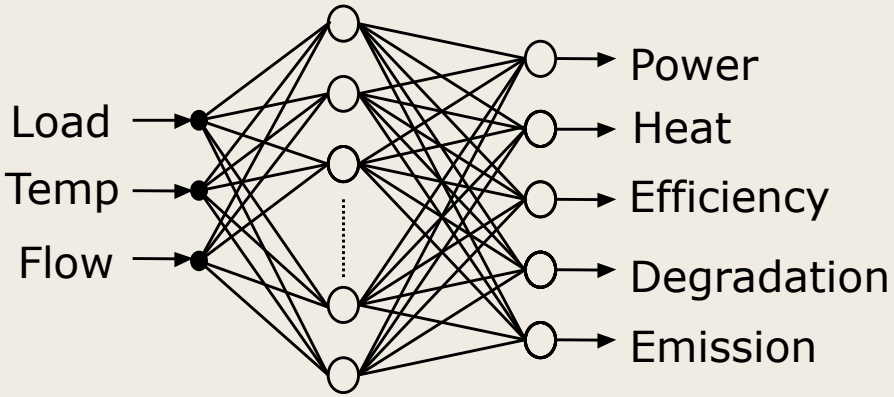
Program area: Geothermal Energy

- There are many common areas between petroleum and geothermal energy providing knowledge transfer opportunity
- Multi-disciplinary collaboration is required to enhance the performance of geothermal installations, reduce costs and increase the economical lifetime
- Share of geothermal energy in electricity generation is limited, mainly due to the high cost. However, space heating/cooling, based on shallow geothermal is a major driver for reduced CO2 footprint in Europe



The synergies

- There are strong synergies between Geothermal & Petroleum engineering to be utilized, e.g. geology, reservoir technology, drilling and well construction, etc.
- Using existing knowledge and competences to develop the renewable geothermal energy source enables access to research funding
- Utilization of existing experimental setups, completed with purpose oriented investments will strengthen the position of the energy research group in the field of geothermal energy
- Multi-disciplinary approach is needed in order to strengthen seamless collaboration between different disciplines/departments at UiS and internationally



Geothermal energy and AI technologies

Geothermal energy in EPT courses

- All educational levels: BSc, MSc & PhD
  - As part of the drilling course, PET100
    - What are specific issues/challenges for geothermal wells?
  - As part of the energy, energy technology & energy system integration course, PET515
    - Geothermal energy as renewable energy source
  - As part of the course from gas to electricity, PET640
    - Energy conversion technologies for geothermal applications
  - Part of the PhD program for our energy students with specific emphasis on artificial intelligence and data driven modeling
  - BSc & MSc thesis in the field of geothermal energy

Thank you for your attention ☺