Experience from deep geothermal drilling
Oslo Airport

Ingeniously sharing the everlasting warmth of Mother Earth
About

- Leading geothermal energy company
- Secured intellectual property rights
- Build, own and operate plants
- Deliver turn-key plants to larger energy users
- Significant global potential
- Competencies in the full geothermal value chain
- Secured widely experienced team
  - energy, energy systems, drilling, geology, finance and project management
- First energy plant currently under construction at Oslo Airport Gardermoen
  - more plants in pipeline
Experience deep energy wells Avinor_OSL – p1

Execution:
Norwegian Energy Drilling
(50% Rock Energy AS / 50% Båsum Boring AS)

Target:
- 2 x 1500m energy wells for heating of OSL Engine test area.
- Well size 1500m = 6,5”. As planned
- Completed drilling both wells April 2018

Rock formation:
- Groundwater reservoir at 24m
- Moraine, sand, gravel to approx. 70m
- Basement rock at 70m in both wells – biotitic gneiss
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Drilling:
- Drilling rig – Commachio MC30 (32t)
- Top section – casing to basement rock
- Airhammer drilling – average ROP= 17 m/hrs

Main challenges:
- Logistics on site
- Sementing of fracture zones
- Temperatur gradient
Installation energy collector

**Well north**
- Completed 30th May
- Total work days: 7 including 3 day for adjustments on site
- Installation as planned
- Depth: 1.485m

**Well south**
- Installation started 11th June – completed 14th June
- Installation as planned
- Depth: 1.497m

**Energy production**
- Pumps, piping and instrumentation – Aug 2018.
- Test rig for optimisation/verification of well flow Sep/Oct
- Expected Annual heat delivery: ca 300 000kWh.
- Circulation temp in concrete aircraft-pad: 10-15°C.
- Energy delivery operation Q4 -2018
CONCLUSION

Drilling :
- Success full drilling – some logistical challenges
- Mapping of critical success factors for more efficient drilling and reduction of cost.

Energy collection:
- Installation of PE collector as planned.
- Circulation test Q3/Q4 2018
- Test rig to be run in October for optimisation of well flow.
- Heat delivery to engine test area winter season 2018/2019

Main challenges that is systematically approached:
- Cost reduction linked to drilling operations
- Prediction of local geological conditions
- Materials for coaxial collectors deeper than 1500-2000m
Thank you for your attention

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