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GEOthermica CALL 2 IN 2019

GERMANY

*** 1 ***

Company / Institution : Fraunhofer Institute for Microelectronic Circuits and Systems

- **Speciality field:**

Fraunhofer IMS has more than a decade experience and proven expertise in the design of electronics and integrated sensor systems for the operation under extremely harsh environments, especially under ambient temperatures up to 250 °C. Applications of these sensor systems in the field of drilling supervision and borehole monitoring have the potential to significantly improve the drilling process, increase tool lifetime and reduce operation costs. Predictive maintenance and condition monitoring of existing installations are supported with very long maintenance intervals of the supervising equipment operating under high temperatures.

Fraunhofer IMS offers design, implementation and manufacturing of complete sensor systems containing the sensing elements, readout electronics and digital post-processing and communication circuitry in the in-house 0.35 µm CMOS High-Temperature CMOS technology as well as the Micro Systems Technology Lab&Fab for MEMS sensor realization

- **Website | Contact person | E-mail:**

<https://www.ims.fraunhofer.de/> | Alexander Utz | alexander.utz@ims.fraunhofer.de

*** 2 ***

Company / Institution: Bundesverband Geothermie e.V.

- **Speciality field:**

- geothermal energy
- informing the public about the advantages and possible uses of geothermal energy
- dialogue with politicians and political leaders
- improvement of the frame conditions and the political situation on a national, European and international level
- support of technological development and researches
- compilation of training material

- **Website | Contact person | E-mail:**

<https://www.geothermie.de> | Jolanda Kaufhold | jolanda.kaufhold@geothermie.de

ICELAND

1

Company / Institution: EFLA consulting engineers

- **Speciality field:**

Geothermal exploration and power production:

EFLA is one of the world's few engineering consulting firms with decades of experience in harnessing geothermal energy, a rapidly emerging but technologically demanding energy source.

EFLA is experienced in feasibility studies and cost estimation for geothermal power plants as well as direct usages of the geothermal energy

Direct Use:

Geothermal Energy is much more than a means for electricity production as the heat can be used directly for numerous industrial process, aquaculture and horticulture. As well as for house heating and cooling, spa and wellness and even extraction of valuable materials, metals and gases. Direct use of geothermal systems is vital importance in the geothermal energy value chain.

Environment:

EFLA is a leading consultant in Life Cycle Assessments (LCA) and in the calculation of both ecological and carbon footprints for products and services. Our team of experts has carried out numerous LCAs for the energy sector, namely in the field of geothermal power, hydropower, wind power and electricity transmission

- **Website | Contact person | E-mail:**

<http://www.efla-engineers.com> | Sunna Reynisdóttir | sunna@efla.is

2

Company / Institution VERKIS consulting engineers

- **Speciality field:**

Verkís has a long and solid record of successful project planning for geothermal power plants and district heating from the early stage of project development. Our strength lies in the thorough and all-encompassing understanding of the science and technology involved in geothermal projects, having for decades provided consulting services to geothermal investors and developers, operators and financial organizations.

- **Website | Contact person | E-mail:**

<http://www.verkis.com> | Carine Chatenay | cc@verkis.is

IRELAND

1

Company / Institution: Trinity College Dublin

- **Speciality field:**

The specialist knowledge of the subsurface
Geothermal modelling
Engineering Geology solutions
Academic host for researchers
Connections with indigenous industries
Public perception and understanding of geoscience and energy resource topics
Open dialogue with politicians and political decision makers

- **Website | Contact person | E-mail:**

<https://www.tcd.ie/> | Quentin Crowley | crowleyq@tcd.ie

ITALY

1

Company / Institution Sapienza University | Earth science department

- **Speciality field:**
 - reservoir characterization (fractures and faults)
 - geochemical monitoring (all geogases)
- **Website | Contact person | E-mail:**
<http://www.ceri.uniroma1.it/lombardiresearchgroup.it/> | Sabina Bigi
| sabina.biggi@uniroma1.it

2

Company / Institution: University of Bologna

- **Speciality field:**

The Department of Industrial Engineering (DIN) of the University of Bologna participated in the KIC funded project "Europe-wide Use of Sustainable Energy from aquifers' – E-USE(aq). The project foresaw the realization of an ATES pilot in Italy, that is now running (commissioning completed in June 2019). DIN developed some specific skills in ATES system design (especially in high groundwater velocity framework), a preliminary test for aquifer characterization, integration of ATES systems in district heating and cooling, system monitoring.
- **Website | Contact person | E-mail:**
<http://www.industrial-engineering.unibo.it/en> | Marco Pellegrini | marco.pellegrini3@unibo.it

NETHERLANDS

1

Company / Institution: Energy Conversion Technologies (Encontech BV)

- **Speciality field:**

Encontech is a small spin-off company of the Dutch Technical University of Twente that has developed a heat-driven isobaric expansion engine technology that transforms heat >70C from any source (solar, biomass, geothermal, engine & industrial process waste heat) in 1 single step into useful mechanical energy for pumping, compressing, cooling & refrigeration, drilling, hydraulics & pneumatics, power generation and propulsion.
- **Website | Contact person | E-mail:**
<http://www.encontech.nl> | Patrick Blik | p.blik@encontech.nl

NORWAY

1

Company / Institution: SINTEF

- **Speciality field:**

- Numerical/experimental platform to support the development of cost-effective hard rock drilling materials and technologies
- Research and development in material sciences: metals, ceramics, polymers, elastomers and composite materials
- Lifetime assessment of materials/components in aggressive chemical/high temperatures environments (e.g. elastomer seals in boreholes etc)
- Material tribology
- Multiscale material modelling to predict failure mechanisms
- Supporting material selection and helping with troubleshooting in manufacturing and product lifetime
- Digitalization/Digital Transformation (SINTEF Digital)

Recent project: <https://www.sintef.no/en/projects/inno-drill-technology-platform-for-research-based/>

SINTEF is an independent, not-for-profit organisation. We offer world-leading laboratory and test facilities in a wide range of technological fields. Our advanced laboratories range from microelectronics and nanoscale technologies to the world's largest laboratory for the multiphase transport of oil and gas, and the world's largest marine laboratory.

- **Website | Contact person | E-mail:**

<https://www.sintef.no/en/> | Ben Alcock | ben.alcock@sintef.no

ROMANIA

*** 1 ***

Company / Institution: STEINBEIS TRANSFER MANAGEMENT S.R.L.

Speciality field:

Generating demand for geothermal heat. Elaborating feasible business models to connect producers and consumers of heat. University-industry collaboration to develop new technologies. Promoting innovation.

STM acts as the head office of Steinbeis Network Romania. Steinbeis Transfer Centers are established in Alba Iulia, Bucharest, Cluj-Napoca, Galati and Timisoara

Website | Contact person | E-mail:

<http://www.steinbeis-romania.com> | Jürgen Raizner | raizner@steinbeis-romania.com

SPAIN

1

Company / Institution: Institut Cartogràfic i Geològic de Catalunya | Area of Geological Resources

- **Speciality field:**
 - Exploration, identification, assessment, classification and reporting of Shallow and Deep Geothermal Resources
 - Mapping and 3D Modelling and simulation

More news:

Link 1: <http://www.icgc.cat/en/Public-Administration-and-Enterprises/Tools/Geoindex-viewers/Geoindex-Deep-geothermal-energy>

- **Website | Contact person | E-mail:**
<http://www.icgc.cat/en/Public-Administration-and-Enterprises/Tools/Geoindex-viewers>
Ignasi Herms | ignasi.herms@icgc.cat

2

Company / Institution: Energylab Technology Centre | Sustainable Building

- **Speciality field:**

One of our main R&D lines is GSHP and renewable district heating systems using GSHP as a resource. We work on the improvement of the energy performance of conditioning and ACS production systems based on the electric powered heat pump technology by the following lines of work:

- GSHP Renewable district heating in open or closed loop systems.
 - Modelization of energy demand and energy production systems in buildings and DH.
 - Hybridisation with other renewable thermal generation systems.
 - Use of waste heat and energy recovery.
 - Regulation, control and energy monitoring of such systems.
 - High-temperature production (ACS, district heating, industrial uses, etc.).
- **Website | Contact person | E-mail:**
<https://energylab.es/en/lineas-investigacion/> | Eduardo Rodríguez
| eduardo.rodriguez@energylab.es

3

Company / Institution: Universidad de La Laguna | Departamento de Física and IUdEA

- **Speciality field:**
 - Development of harsh environment optical components for remote detection and analysis of physical and chemical environmental conditions.
 - Experience in participation in EU consortiums and collaborative EU-H2020 projects.
 - Development of harsh-environment photonic sensors and novel sensing technologies (patenting and high impact scientific publications).

- **Website | Contact person | E-mail:**
<http://www.ull.es> | Airan Rodenas | arodenas@ull.es

SWITZERLAND

1

Company / Institution: Eartha AG | Geothermal

- **Speciality field:**
Geothermal project development; from exploration to the power plant
- **Website | Contact person | E-mail:**
<http://eartha.engineering> | Manon Stover | manon@eartha.engineering

TURKEY

1

Company / Institution: Zorlu Enerji

- **Speciality field** Zorlu Enerji is an electricity generation, distribution, sales and trade company.
Zorlu Enerji holds 305 MW installed capacity in geothermal energy with 4 power plants;
 - 15 MWe Kızıldere 1 GPP
 - 80 MWe Kızıldere 2 GPP
 - 165 MWe Kızıldere 3 GPP
 - 45 MWe Alaşehir 1 GPP
- Zorlu Enerji has geothermal dedicated departments under its own such as;
- Exploration and Research
 - Reservoir Management
 - Drilling
 - Project Development
 - Operation and Maintenance
- **Website | Contact person | E-mail:**
<https://www.zorluenerji.com.tr/en> | Hakan Sahiller | hakan.sahiller@zorlu.com

2

Company / Institution: SIMULARGE BILISIM VE MUHENDISLIK TEKNOLOJILERI AS

- **Speciality field**
Simularge is specialized in developing Engineering Software. Dr Erhan Turan, the co-founder of Simularge, has been involved in solving geomechanics related engineering problems during his post-doctoral tenure in ETH Zürich - Switzerland. Special supercomputer models and software is developed that can be adapted for geothermal simulations (i.e. reservoir systems) Poroelasticity models were generated to solve Biot Consolidation problems. Relevant research and codes can be reviewed in the following links:
<https://www.sciencedirect.com/science/article/pii/S0167819113001063>
https://link.springer.com/chapter/10.1007/978-3-642-36803-5_27

Within the scope of this call, Simularge can help its consortium in developing unique



software and performing numerical simulations in virtual environments (cloud, server, supercomputer).

Simularge is a company founded by two GE Aviation veterans. Buryan Turan, CEO of the company, has a background in Nuclear and Mechanical engineering. She has been involved in leading gas turbine combustion chamber design in GE Aviation. She is an expert in heat transfer and fluid mechanics. Dr. Erhan Turan has a PhD in Mechanical Engineering. He is an expert in modelling multiphysics problems. Before joining Simularge, he was a tech leader/manager for GE Aviation to design next-generation civil aircraft engines including the ones for Boeing Dreamliner and 777x. He carried out research activities in Switzerland, Germany, Czech Republic and Turkey before.

Simularge is providing engineering software solutions for global companies that have operations in FMCG, Appliances and Automotive. With co-founders' experience ranging over 25+ in total, a presence both in Academia and Industry - Simularge will be a key player and complimentary for well-designed projects.

- **Website | Contact person | E-mail:**
<http://www.simularge.com/> | Erhan Turan | erhan.turan@simularge.com

3

Company / Institution: NTU Geothermal Consulting Inc

- **Speciality field:**
 - Earth Sciences
 - Geology
 - Geophysics
 - Geochemistry
 - Preparing the Conceptual Geothermal Model
 - Resource Capacity Estimation Studies
 - Geothermal Resource Assessment
 - Preparing the Resource Protection Area

Evaluation Report and Operating Project

Drilling Services

- Preparing Drilling Program
- Material & Equipment Selection
- Cementing, Mud, Hydraulic Calculations
- Well Completion Operation
- Stimulation
- Acidizing

Production

- Well Tests
- Pressure-Temperature tests
- Transient test
- Interference test
- Tracer test
- NCG Measurement

- Production tests
- Inhibitor Dosage Depth Optimization
- Pump Selection and Optimization
- Gas-lifting

Reservoir Studies

- Preparing 3D Reservoir Modeling
- Monitoring
- CO2 Injection Project

Geothermal Power Plant

- Power Plant Design
- Power Plant Performance Analysis
- Corrosion and Scaling

- **Website | Contact person | E-mail:**

<http://www.ntu.com.tr> | Melih Çobanoğlu | melih.cobanoglu@ntu.com.tr

*****4*****

Company / Institution: Dokuz Eylül University | Geothermal Energy Research and Application Center

- **Speciality field:**

- Field Assessment
- Well Test
- Geochemistry
- 3D Geological Modelling

- **Website | Contact person | E-mail**

<http://jenarum.deu.edu.tr> | Niyazi Aksoy | niyazi.aksoy@deu.edu.tr

*****5*****

Company / Institution: JEODIJITAL BILISIM TEKNOLOJI MADENCILIK INSAAT TAAHUT SANAYI VE TICARET LIMITED SIRKETI / JEODIJITAL

- **Speciality field:**

An integrated state of the art remote sensing-earth observation (EO) and 3D geological modelling services and solutions in the exploration and geological-hydrogeological modelling of geothermal energy resources.

- **Website | Contact person | E-mail**

<http://www.jeodijital.com> | Hayati Koyuncu | ninfo@jeodijital.com

6

Company / Institution: NEU KİMYA A.Ş.

- **Speciality field:**

NEU provides high-performance chemicals for the drilling fluids industry and superior quality products for water-based muds, oil-based muds, and synthetic fluids.

NEU provides liquid and dry cementing additives that can be customized to fit the individual challenges of every well.

NEU's acidizing application involves pumping acid into a wellbore or geologic formation that is capable of producing oil and/or gas which improves a well's productivity.

NEU's production chemical technologies and services allow oil and gas production systems to perform at their full capabilities by engineering optimal solutions to protect asset integrity, safely maximizing production while minimizing environmental impact.

- **Website | Contact person | E-mail**

<https://neuchemie.com> | Eray Erdim | eerdim@neuchemie.com

7

Company / Institution: Maren Maras Elk. Urt. San. ve Tic. A.S.

- **Speciality field:**

Maren is one of the Kipas Holding company working on geothermal drilling and plant operations. Drilling operations are made by holdings service company Karen which has 2 rigs and coiled tubing unit.

Already established 6 geothermal power plants with a sum of 149,8 MW installed power.

- **Website | Contact person | E-mail**

<http://www.maren.com.tr> | Cenk Kanat | ckanat@maren.com.tr

8

Company / Institution: FNC Petrol Madencilik San. ve Tic. AS.

- **Speciality field:**

Geothermal resource exploration with Gravity, Magnetic, Magnetotelluric and VES (Vertical Electrical Sounding) methods and One, two and three-dimensional data processing methods specific to these methods are our specialities.

FNC has the following devices for explorations of a geothermal resource and another underground:

- Six pieces Magnetotelluric Recording Device (Phoenix MTU-5A with MT and AMT coils.)
- Two magnetometers (GEM GSM19, Geometrics G856)
- Gravimeter (Scintrex CG-5)
- VES (Vertical Electrical Sounding) Device

- Resistivity (AGI Superstring R8)
- Well Logging Systems (pressure, temperature, gamma, neutron, density logs)

- **Website | Contact person | E-mail**

<https://www.fnc.web.tr/> | Semih Adiguzel | fnc@fnc.web.tr

g

Company / Institution: Baskent University

Speciality field:

The activities of Bioinference Research Group in the Department of Computer Engineering includes designing, developing and applying pattern recognition, machine learning and statistical data analysis techniques with special focus on;

- Inference and retrieval of biological knowledge using a variety of biomolecular data such as sequence, gene expression and interactions,
- Intelligent interfaces for web, mobile devices and wearable sensors,
- Computer vision and image understanding for detecting objects of interest in medical or enterprise images.

- **Website | Contact person | E-mail**

<http://bil.baskent.edu.tr/> | Hasan Ogul | hasanogul@gmail.com

UNITED KINGDOM

1

Company / Institution: the University of Glasgow | School of Engineering / Systems, Power and Energy Research Division

- **Speciality field:**

- Identification, assessment and classification of resources and reserves
- Reservoir stimulation
- Unconventional Borehole heat exchanger designs (incl. single-well, closed-loop)
- Innovative ORCs
- Cogeneration and trigeneration
- Repurposing hydrocarbon wells
- Harnessing mine water
- Fluid flow, heat & mass transfer
- Ground source heat pump systems
- Geological thermal energy storage
- Groundwater quality and hydrochemistry

As the home institution of such global luminaries as Lord Kelvin, James Watt, W.J.M. Rankine and Joseph Black, our reputation in energy engineering science is long-standing and world-renowned. Currently partners in the DESTRESS and newly granted CROWD THERMAL EU projects.

Currently leading [list is not exhaustive]: EPSRC (GCRF) Geothermally sourced combined power and freshwater generation for eastern Africa (Combi-Gen); Innovate UK (Newton Fund, China-UK Research and Innovation Bridges competition): An ORC power plant

integrated with thermal energy storage to utilise renewable heat sources for distributed heating and power; EPSRC Thermally Driven Heat Pump Based on an Integrated Thermodynamic Cycle for Low Carbon Domestic Heating (Therma-Pump); EPSRC CESI Repurposing Hydrocarbon Wells for Geothermal Energy Production and Storage.

- **Website | Contact person | E-mail:**
<https://www.gla.ac.uk/schools/engineering/research/divisions/systems>
Gioia Falcone | mgioia.falcone@glasgow.ac.uk

UNITED STATES

1

Company / Institution: National Renewable Energy Laboratory

- **Speciality field:**

Identification and assessment of geothermal resources, reserves and reservoirs
 - Exploration Techniques
 - Resource Assessments
 - Modeling
Geothermal Resource Development
 - Drilling and Completion
 - Induced Seismicity
Supply and Smart integration into the Energy System
 - Heating, cooling, storage
 - Super-critical fluids/magma utilization
 - Hybridization
 - Urban heating/cooling
 - Energy Storage
 - Direct-Use
 - Cascading Uses
- **Website | Contact person | E-mail:**
<https://www.nrel.gov/geothermal/> | Caity Smith | caity.smith@nrel.gov

2

Company / Institution: US WON

- **Speciality field:**
 1. Identification and assessment of geothermal resources – Modeling
 2. Supply and smart integration into the energy system – Hybridization
 3. Supply and smart integration into the energy system – Direct Use

We know that the sun places enough energy on our planet in one hour to handle all our electrical needs for a year. The real challenge is to find ways to capture and store this energy to use it at our convenience. Renewable Geothermal (renewgeo.com) is simply the idea of harvesting solar energy in the form of heat and injecting it into the ground to create a synthetic geothermal resource. The amount of solar heat injected in 8 hours is adequate to

replenish the resource to allow for 24 hours of electrical power generation with no depletion to the reserve.

- **Website | Contact person | E-mail:**
<http://www.renewgeo.com> | Mark Hauenstein | markh@uc-won.com

*****3*****

Company / Institution: Lawrence Livermore National Laboratory

Speciality field:

Computational rock mechanics, high-temperature geochemistry, induced seismicity, seismic tomography, fiber optic sensors, numerical modeling, machine learning

Website | Contact person | E-mail:
<https://www.llnl.gov/> | Robert Mellors | mellors1@llnl.gov

Contact

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Alicja Wiktoria Stokłosa, Hjalti Páll Ingólfsson

Email

info@geothermica.eu

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