

## **SHORT COURSE 7: Expanding the geothermal business model – Circular economy approach to geothermal development**

**Length:** 1 day  
**Location:** Reykjavik University  
**Dates:** October 24, 2021  
**Convenor:** *Mr. Sigurdur Markússon*, Business Innovation Manager at Landsvirkjun - The National Power Company of Iceland.  
**Other lecturers:** In addition, *one Icelandic and two international lecturers from Europe and New Zealand* are expected to join the lecturing team. *The course may need some restructuring which will be announced soon* (before end of April 2021).

### **Scope of the course**

Energy is one of the fundamental necessities for economic growth, increased social equity and an environment that allows livelihoods to thrive. Development is not possible without energy, and sustainable development is not possible without sustainable energy. Renewable Energy is a key to sustainable development and offers an opportunity to improve access to modern energy services for the impoverished segments of society, which is essential for sustainable community development.

Geothermal energy can be utilized for electricity generation and for various other types of heat direct use applications, e.g. heating purposes, fish farming, bathing etc. Compared to other renewable energy technologies, geothermal is unique as it provides a base-load alternative to fossil fuel-based electricity generation but can also replace those used for heating purposes.

The direct use of geothermal resources is the use of the heat energy or the fluid form geothermal resources without intervening medium as opposed to its conversion to other forms of energy such as electrical energy.

### **Course outline:**

08:00-09:00 Registration and coffee.  
09:00-10:30 Aim of SC - thermodynamics, what can geothermal energy be used for – electricity generation and direct applications depending on the enthalpy and chemistry of the resource. Cascaded utilization of geothermal energy ensures efficient and cost-effective utilization of the available energy - Lindal diagram.  
10:30-11:00 *Coffee/tea break.*  
11:00-12:30 Business development - Geothermal sustainable driver expanding the value chain. Climate change and sustainability – U.N. Sustainable Development Goals, Eco-industrial parks, Economic factors for direct use.  
12:30-13:00 *Lunch*  
13:00-15:00 Show cases - Iceland – Resource Park and other success stories, New Zealand geothermal success stories, European opportunities.  
15:00-21:00 Fieldtrip to S-Iceland, Haedarendi CO<sub>2</sub> factory, Fridheimar greenhouse farm, and Ölverk Pizza and Brewery, Hveragerdi.

*Only on-site participation possible.*