POWERING AGRI-FOOD VALUE CHAINS WITH GEOTHERMAL HEAT

GEOTHERMAL RESOURCE AND HEAT DEMAND MAPPING

CAPACITY BUILDING EVENT – GLOBAL WEBINAR

JUNE 23, 2022

De-risking Investment in the Geothermal Agri-Food Sector

Resource Mapping

- ✓ Perform initial technical pre-feasibility study followed by collecting field data (chemistry, temperature and flow rates from hot springs, hot water boreholes and wells, supported by geology and geophysical information)
- ✓ Identify temperature and depth ranges of geothermal resources
  - Temperature will to a large extent influence the choice of the direct use application
  - Geothermal resources at shallow depths can be developed more easily and at lower cost
- ✓ Energy source may be related to an existing geothermal power plant development (reinjection brine, wells with sub-commercial pressure) to lower cost and risk, or unrelated (new direct use geothermal well, utilisation of hot springs, repurposed oil & gas well)

Heat Demand Mapping

- ✓ Identify and map existing agriculturally productive areas and potential markets near geothermal resource areas
- ✓ Use maps and interactive online GIS platforms to show the co-location between geothermal energy resources and demand

Agri-Food Industry and Resource Alignment

Resource Push

Engineering optimisation of the application

Local technical and engineering assessment of the resource at the site of an existing facility

Engineering optimisation of the facility itself to evaluate its heat and/or power requirements

Most suitable technologies are lower-temperature applications (<60°C) such as aquaculture, greenhouses, and soil warming

Industry Pull

Opportunistic use of the resource

Regional technical assessment to identify the most favourable sites to produce geothermal energy and attract industries to relocate there

Assessment of the potential geothermal agri-food applications around an area with known geothermal potential

Interactive Digital Geothermal Maps

Africa Geothermal Inventory Database

AGID; East Africa

Hungarian geothermal system

Hungary

Canadian National Geothermal Database

Canada

Danube region geothermal information platform

Central Europe

ThermoGIS

Netherlands

Geologic database of Switzerland

Switzerland

National Inventory of Clean Energies

INEL; Mexico

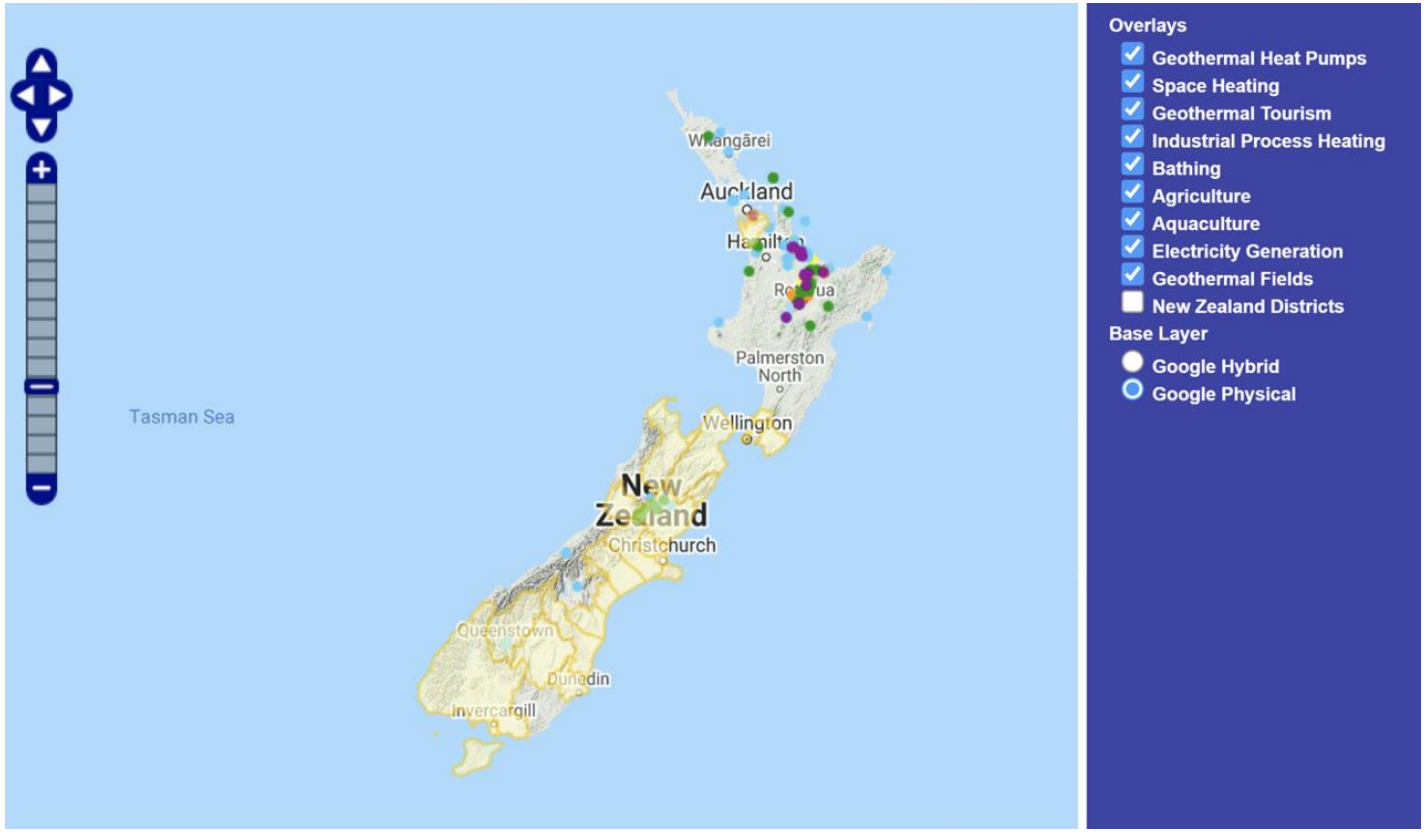
National Renewable Energy Laboratory Geothermal Prospector

NREL; United States

Digital Portals, Online Databases and Interactive GIS Maps

- ✓ Identification of sites with techno-economic potential for direct use heating applications
- ✓ Provide an initial overview of the geothermal potential for a given location or region
- ✓ Facilitate geothermal direct-use resource assessments for potential investors at the regional, national and local levels
- ✓ Raise awareness of geothermal solutions
- ✓ Encourage geothermal development of new areas

Interactive geothermal use map of New Zealand



Source: GNS Science, 2021

Recommendations

Challenge/gap	Description	Recommendations/lessons learnt
Mapping of potential supply and demand of geothermal energy for agri-food systems	Inadequate data exist on the availability of geothermal resources suitable for direct use. Shallow geothermal resources, which could be developed more easily than deeper geothermal resources for direct use, are largely unexplored.	• Collect data on geothermal resources from various sources. • Develop mapping tools to integrate the available geothermal data to inform policy making (digital data portals, online databases, interactive GIS maps and analytical tools will all help map out potential areas with geothermal resources suitable for direct-use applications). • Focus on development of shallow geothermal resources for direct-use applications in agri-food systems. • Identify agri-food value chains that can benefit from the use of geothermal energy due to their co-location with geothermal resources. This could be represented in maps.

Q&A Session

THANK YOU!