The IEA-GIA Geothermal Trend Report
A new survey report about geothermal applications and developments in IEA-GIA member countries

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Annex X – Data Collection and Information

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IEA-GIA Data Collection Activities

ANNEX X

→ collect data on geothermal energy uses in GIA countries
→ publication of annual report (web, hardcopy)
→ data trends (power and heat) + relevant political/economic information

Annex X- Data Collection and Information

Operating Agents: Leibniz Institute for Applied Geophysics (LIAG), Germany; and the Federal Office of Energy (BFE), Switzerland
Annex Leader: Britta Ganz, Leibniz Institute for Applied Geophysics (LIAG), Germany
Status: Ongoing
Participants: Mandatory participation of all GIA Country Members
Description

The main objective of Annex X is to collect essential data on geothermal energy uses, trends and developments in GIA Member Countries and to publish these data in an annual reports available as hardcopy and on the GIA website for wide public distribution. This report will provide a brief overview of data trends such as installed capacities and produced electricity and heat, as well as relevant political and economic information. All Country Members are required to participate in this Annex, and all Sponsor members support this effort by providing supplementary material. There are plans to extend the data collection to non-GIA Member Countries, with emphasis on the remaining leading geothermal nations.
HEAT
- Geothermal contribution
- Cooling with GHP
- Geothermal production

SAVINGS
- Automatic calculation by produced energy and savings factors
- Fossil fuel and CO2 Savings

HEAT USE
- Geothermal contribution
- Cooling with GHP
- Geothermal production

CO2 SAVINGS
- Automatic calculation by produced energy and savings factors
- Fossil fuel and CO2 Savings

Questionnaire
- Plant types
- Installed (+ new) capacity
- Electricity production

Heat use
- Installed capacity and heat use
- Categories
- Geothermal heat pumps (GHP)
- Geothermal contribution
- Cooling with GHP
Questionnaire

HEAT

SAVINGS

JOBS & COSTS

POWER

HIGHLIGHTS & HSE

Policy

Jobs, costs, investments in geothermal market

• role of geothermal in national policy

Highlights & Challenges

• project news
• research and development
• challenges and development constraints (induced seismicity, technical problems, legal aspects)
First Trend Report

- 2010 Trend Report available since August 2012 on GIA Homepage (http://iea-gia.org)
- 250 hard copies
Trends in Geothermal Applications

Geothermal Power Generation
Electricity: Installed Capacity

Trends in geothermal power generation: installed capacity in GIA countries 2000 - 2011

2000 – 2009:
- Hutter (2001)
- WGC Country Updates
- GIA Annual Reports (2003 – 2009)

An-nex X data: 2010, 2011
Installed Capacity GIA/ World

Trends in geothermal power generation: installed capacity worldwide and in GIA countries 2000 - 2011

- 2011:
  - World: 11,250 MWe, 69,400 GWh
  - GIA Countries: 6,975 MWe, 41,700 GWh

→ GIA 60% of world geothermal power
Heat Use

Direct use categories
- District heating
- Space heating
- Greenhouses
- Bathing/spa
- Agriculture
- Fish farming
- Snow melting
- Other

Geothermal heat pumps
Heat Use: Data Quality

- GIA: standardized data from 2010 on, but reliable, up-to-date statistics often not available
- Geothermal cooling: almost no official data
- Difficult to outline trends for GIA from 2000 on (e.g. reliability and availability of data, total heat/geothermal contribution)
  - Heat use data best possible estimation
  - Trend with uncertainties
  - Aim to further improve data-base
Trends in Geothermal Heat Use

2000 – 2009:
WGC Country Updates
GIA Annual Reports (2007 – 2009)

54,200 MWt
127,500 GWh
460 PJ*

22,289 MWt
56,800 GWh
205 PJ **

➡️ GIA about 50 % of geothermal heat production

* estimation based on data world 2010 (Lund et al., 2011) using average growth rate
** GIA since 2010: estimated geothermal contribution (EU Directive)
CO₂ and Fossil Fuel Savings

- Savings calculated using GIA Conversion (Mongillo 2005) and savings factors according to Lund et al. (2005)
- Considerable savings of fossil fuels and CO₂ emissions by geothermal energy uses
Additional Information

Employees, costs, investments
- plant costs in million USD per MW_{e}
- cost for heat pumps (USD/ kW_{t})
- professional personnel in geothermal-related jobs
- capital investments in the geothermal market

Energy market and national policy
- geothermal as part of national energy strategies (energy plans and road maps, special programs, feed-in tariffs, emissions trading)
- share of geothermal in energy mix
- R&D funding
- market incentives, credit offers, other public support
Highlights and HSE Management

- project highlights: new projects, planned projects, R&D news

Los Azufres, Mexico
Insheim, Germany
Paralana, Australia
IDDP, Iceland

- other positive developments (new programs, positive developments for funding and support)

- Health, Security, (Safety), and Environment (HS(S)E): Challenges and development constraints (induced seismicity, technical problems, legal aspects)
Valuation of the Trend Report

- good data base for geothermal power
- heat use data of less quality, but estimation of heat use in GIA countries possible
- information on ecologic benefits (CO2 and fuel savings)
- relevant political and economic information
- project highlights and R&D news from various countries
- challenges for geothermal developments

Problems:
- data availability + reliability, national statistics
- deadlines, publication date

GIA Trend Report adds substantial information on geothermal energy uses on an international scale and helps to point out trends and developments.
Aims and Outlook

- Efforts for data collection within GIA to be continued
- Further improvement of data base and Trend Report
- Earlier date of publication
- Extend data collection to non GIA countries, with emphasis on the remaining leading nations
- Seek collaboration with other international institutions and organizations
Thank you for your Attention!

Geothermal Museum, Larderello