EU R&I Policy perspectives for Geothermal energy and contribution of H2020 projects to R&I policy development

Susanna GALLONI, Project Manager, INEA Dep. H2020, Unit H.1 - Energy
Matthijs SOEDE, Policy Officer, DG RTD, Unit D.1 - Clean Energy Transition
Energy Union Political Context

- Energy security, solidarity and trust
- A fully integrated internal energy market
- Energy efficiency first
- Transition to a low-carbon society
- An Energy Union for Research, Innovation and Competitiveness

**Strategic Energy Technology-Plan**

- Towards a low carbon future - COM(2007)723
- Integrated Roadmap 2014
THE CE4AE PACKAGE

Energy Union Governance

Energy Efficiency

Renewables
(Revised Renewable Energy Directive)

New Electricity Market Design
(including Risk Preparedness)

Proposed November 2016
Completed May 2019
Clean Energy Package: 2030

Energy Union Governance

- Energy Efficiency: 32.5%
- Renewables: 32%
- Electricity Market Design: Regulation and Directive on internal electricity market; Regulation on risk-preparedness, ACER regulation

Enabling Framework

- Innovative
- Inter-connected
- Socially fair
- Inclusive
- Digital
- Safe for all
- Investment-friendly

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Shaping Europe’s Energy Future
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Long Term Decarbonisation Strategy: 2050

- EU leads in clean energy transition and GHG emissions reduction. Ambitious 2030 targets. 60% reductions in 2050 with current policies – not in line with the Paris Agreement.
- Radical transformations necessary: central role of energy system, buildings, transport, industry, agriculture.
- There are a number of pathways for achieving a climate neutral EU, challenging but feasible from a technological, economic, environmental and social perspective.
EU Funding Instruments supporting Clean Energy in the next MFF

INCREASED CLIMATE MAINSTREAMING ACROSS EU BUDGET (25%)

- Low Carbon Investments kept as priority for Member States under **Cohesion funds** with **higher ring fencing** (30%)
- **New Invest EU Fund** with a € 11.5 bln Sustainable Infrastructure window to unlock private investment through financial instruments and **tailor made products**
- **Increased Funds** under **Horizon Europe** for R&I in climate, energy and mobility (€15 bln)
  - **New Window under CEF to support cross border RES Projects** (€ 865 mln)
  - **New Programme** (CEPE) under LIFE for RES & Energy efficiency capacity building and policy implementation
- **New Innovation Fund** targeting market uptake of innovative RES, CCS and solutions for Energy Intensive Industries (€ 2bln–€12 bln)

*INNOVATION FUND BUDGET COMES FROM EU ETS ALLOWANCES*
Geothermal: the contrasts

Important but largely underdeveloped renewable sector

- Large potentials exist:
  - >45% of Europe heat demand could be met
  - >25% of Europe heat demand can be covered by geothermal district heating
- Available everywhere
- Can provide electricity, heating & cooling

Current market shares:
- Electricity: 0.2%
- Commercial heat: 0.4%
- Direct geothermal heat: 0.8%
Geothermal Energy: an opportunity

Geothermal energy can become one of the main renewable energy sources in 2020-2030 and by 2050, especially for heating and cooling, and also for the highly efficient production of electricity, such as through cogeneration.

For this to happen, it is important to ensure public acceptance and high environmental standards.

The Commission is committed to support geothermal energy with low environmental impacts in its R&D and other programmes, including programmes for the use of EU funds.
SET-plan Deep Geothermal Targets

Targets of the Declaration of Intents (DOI):

1. Increase reservoir performance* resulting in power demand of reservoir pumps to below 10% of gross energy generation and in sustainable yield predicted for at least 30 years by 2030;
2. Improve the overall conversion efficiency, including bottoming cycle, of geothermal installations at different thermodynamic conditions by 10% in 2030 and 20% in 2050;
3. Reduce production costs of geothermal energy (including from unconventional resources, EGS, and/or from hybrid solutions which couple geothermal with other renewable energy sources) below 10 €ct/kWhel for electricity and 5 €ct/kWhth for heat by 2025**;
4. Reduce the exploration costs by 25% in 2025, and by 50% in 2050 compared to 2015;
5. Reduce the unit cost of drilling (€/MWh) by 15% in 2020, 30% in 2030 and by 50% in 2050 compared to 2015;
6. Demonstrate the technical and economic feasibility of responding to commands from a grid operator, at any time, to increase or decrease output ramp up and down from 60% - 110% of nominal power.

* Reservoir performance includes underground heat storage.
** Costs have to be confirmed establishing at least 5 plants in different geological situations, of which at least one with large capacity (20 MWel or, if for direct use only, 40 MWth).
Who does what?

**European Commission**

- Defines policy:
  - Defines strategy, objectives and priority areas/work programmes
  - Selects projects for co-financing
  - Makes programme decisions
  - Evaluates the programme and the Agency’s performance

**INEA**

- Turns policy into action:
  - Organises calls for proposals
  - Manages project life-cycle
  - Monitors technical and financial implementation of projects
  - Ensures sound financial management
EC contribution per year (127.3M Euro) and type of action

- **2014**: 12.1M€ (2)
- **2015**: 45.5M€ (5)
- **2016**: 10.0M€ (1)
- **2017**: 14.7M€ (2)
- **2018**: 42.6M€ (5)
- **2019**: 2.3M€ (1)

**Type of action distribution**
- **RIA**: 37%
- **IA**: 58%
- **CSA**: 5%
INEA projects - TRL scale coverage - Deep Geothermal

- GeoSmart
- SURE
- Thermo Drill
- GEO-COAT
- GeoWell
- Geo-Drill
- GEMex
- CHPM2O30
- RECLAIM
- DEEPGS
- DESSERT
- GEOENVI
- GEO/RISK

TRL scale coverage:
- TRL1: Basic research
- TRL2: Applied Research
- TRL3: Prototype
- TRL4: Scale-up
- TRL5: Pilot
- TRL6: Demo
- TRL7: Deployment

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