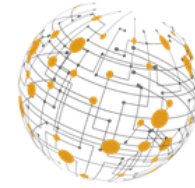




IRENA
International Renewable Energy Agency



**GLOBAL
GEOTHERMAL
ALLIANCE**



SDG7 Energy Compact of IRENA

A next Decade Action Agenda to advance SDG7 on sustainable energy for all, in line with the goals of the Paris Agreement on Climate Change

SECTION 1: AMBITION

1.1. Ambitions to achieve SDG7 by 2030. [Please select all that apply, and make sure to state the baseline of each target]

(Member States targets could be based on their NDCs, energy policies, national five-year plans etc. targets for companies/organisations could be based on their corporate strategy)

<input type="checkbox"/> 7.1. By 2030, ensure universal access to affordable, reliable and modern energy services.	<p>Target: <i>To define the GGAs' goal for geothermal heating and cooling in 2030 to achieve a three-fold growth compared to 2014.</i></p> <p>Time frame: 8 years</p> <p>Context for the ambition: The initial goal set by the GGA for geothermal heating of more than two-fold growth in geothermal heating by 2030 compared to the 2014 levels is almost achieved and could be specified by adding cooling so that geothermal applications for cooling could be included.</p> <p>Through an Energy Compact, this goal could be defined so that the meaning of the "more than two-fold" could be more ambitious, to accelerate the energy transition and climate action to ensure universal access to affordable, reliable and modern energy services.</p>
<input type="checkbox"/> 7.2. By 2030, increase substantially the share of renewable energy in the global energy mix.	<p>Target: <i>To define the GGAs' goal for geothermal heating and cooling in 2030 to achieve a three-fold growth compared to 2014.</i></p> <p>Time frame: 8 years</p> <p>Context for the ambition: Geothermal is one of the most viable options in recent years for decarbonising heating and cooling in the building sector, industrial processes and advantaging the agri-food sector.</p> <p>The initial goal set in 2014 for 2030 has already reached 52%. Nowadays, the installed capacity for direct use applications is around 107 GWt, up from about 71GWt in 2015.</p> <p>Therefore, the installed thermal power for geothermal heating increased by 52%, growing at a compound rate of 8.73% annually. Furthermore, the annual utilisation of geothermal heat reached 1,020,887 TJ in 2020, representing an increase of about 72% compared to 2015.</p> <p>This shows that the work of the GGA, its partners and members and other geothermal stakeholder has paid off in installed capacity growth and actual geothermal heat and cooling utilisation.</p> <p>Updating the GGA's goal will support the increase of the share of renewable energy in the energy mix related to heating and cooling to accelerate the energy transition and climate action.</p>
<input type="checkbox"/> 7.3. By 2030, double the global rate of improvement in energy efficiency.	<p>Target: <i>To define the GGAs' goal for geothermal heating and cooling in 2030 to achieve a three-fold growth compared to 2014.</i></p> <p>Time frame: 8 years</p> <p>Context for the ambition: World energy needs to transition to renewable energy sources, including the heating and cooling sector, mainly when geothermal heating and cooling implies energy efficiency, reduced emissions and cost-effective temperature control. The use of the low and medium temperature geothermal resources which are widely available and located in close proximity to the heating and cooling load centres (such as cities) will require the upgrading of the building envelop and retrofitting of the heat supply equipment, resulting in improved energy efficiency of buildings.</p>
<input type="checkbox"/> 7.a. By 2030, enhance international cooperation to facilitate access to predictable, affordable climate finance,	<p>Target: <i>To define the GGAs' goal for geothermal heating and cooling in 2030 to achieve a three-fold growth compared to 2014.</i></p> <p>Time frame: 8 years</p> <p>Context for the ambition:</p>

<p>investments in energy infrastructure and clean energy technology, technology transfer, clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, capacity building in the context of sustainable development and poverty eradication.</p>	<p>The Global Geothermal Alliance (GGA), coordinated and facilitated by the International Renewable Energy Agency, serves as a global platform for enhancing dialogue, cooperation and coordinated action among governments, industry, intergovernmental organisations, financial institutions, and academia; to accelerate the deployment of geothermal energy to accelerate the energy transition and climate action. Today, its constituency stands at 46 member countries and 42 partner institutions.</p> <p>The Alliance calls on stakeholders to support efforts towards achieving the deployment of geothermal energy potential through, until now, more than two-fold growth goal in geothermal heating by 2030 compared to the 2014 levels.</p> <p>The International Geothermal Association (IGA) is also a leading global platform on geothermal energy, which works under four pillars Visibility, Sustainability, Partnerships and Authority, to push geothermal as a gamechanger for achieving SDG7, providing affordable, clean, baseload energy for all.</p> <p>The IGA connects the global geothermal community, serving as a hub for networking opportunities to promote and support international geothermal development.</p> <p>With its industry partners, the IGA sets standards, mature the technology agenda and nurture entrepreneurs engaged in clean technology.</p>
<p><input type="checkbox"/> 7.b. By 2030, expand climate-resilient infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular, Least Developed Countries (LDCs), Small Island Developing States (SIDS), and land-locked developing countries, in accordance with their respective programs of support.</p>	<p>Target: <i>To define the GGAs' goal for geothermal heating and cooling in 2030 to achieve a three-fold growth compared to 2014.</i></p> <p>Time frame: 8 years</p> <p>Context for the ambition:</p> <p>The infrastructure created for geothermal projects has proven to be resilient to natural events resulting from climate change. In North America, Latin America, and the Caribbean, geothermal infrastructure has endured different hurricanes, floods, snowstorms, and droughts, which other natural resources projects have not successfully faced. This is particularly relevant in LDCs and SIDS.</p>

1.2. Other ambitions in support of SDG7 by 2030 and net-zero emissions by 2050. [Please describe below e.g., coal phase out or reforming fossil fuel subsidies etc.]

SECTION 2: ACTIONS TO ACHIEVE THE AMBITION

2.1. Please add at least one key action for each of the elaborated ambition(s) from section 1. *[Please add rows as needed].*

<p>Action 1 – Assessment of geothermal resources and market for heating and cooling applications and projects with a focus on the end-use sectors, particularly for district heating and cooling as well as agri-food applications particularly the in Latin America and East Africa.</p>	<p><i>Start and end date</i> 2022-2030</p>
<p>Action 2 – Assessment of needs and obstacles to develop geothermal heating and cooling applications and projects in identifying the potential to develop projects, creating the infrastructure needed to carry out projects to foster the use of geothermal heating and cooling.</p>	<p><i>Start and end date</i> 2022-2030</p>
<p>Action 3 – Enabling regulatory conditions, financing and business models for geothermal heating and cooling applications and projects that ensure a level playing field, provide long-term stability, ensure least-cost system design and energy supply and manage environmental benefits and harm</p>	<p><i>Start and end date</i> 2022-2030</p>
<p>Action 4 – Consolidate a global heating and cooling network of geothermal experts.</p>	<p><i>Start and end date</i> 2022-2030</p>

SECTION 3: OUTCOMES

3.1. Please add at least one measurable and time-based outcome for **each** of the actions from section 2. *[Please add rows as needed].*

Outcome 1/Action 1. :

- *Position geothermal resources and its potential as a prime source to address heating and cooling needs*

- Promoting geothermal energy’s role in supporting decarbonisation in heating and cooling strategies and implementing national climate plans
 - Create recommendations to map heating and cooling demand, identifying local heat resources, quantifying and assessing heat saving potentials with a sustainable supply and establishing scenarios for heat supply
- Outcome 2/Action 2. :**
- Identify the needs for assistance of countries with transformative potential and develop activities to accelerate removing obstacles funding or capacity building
- Outcome 3/Action 3. :**
- Support the development of effective enabling policy, regulatory and institutional frameworks and relevant legal, fiscal and capacity building activities to achieve national objectives for geothermal energy deployment in heating and cooling
 - Assist the development of administrative procedures for geothermal licensing
 - Geothermal heating and cooling technologies should be included in energy planning and strategies
 - Policy makers and civil servants well informed about geothermal energy
 - Legislation aimed to protect the environment and set priorities for the use of underground
 - The rules concerning the licensing procedure proportionate and simplified
 - Support to authorities to establish financial and regulatory measures to ensure that the benefits of geothermal heating and cooling are captured by the established pricing regimes and that, the existing regimes do not disadvantage them because of subsidies for other energy sources
 - Support the development of effective financing and risk mitigation instruments for geothermal heating and cooling to accelerate the energy transition
 - Support the development of effective NDCs related to the increment of geothermal heating and cooling
 - Support capacity building for policy makers to integrate geothermal in the energy systems
- Outcome 4/Action 4. :**
- Establish and guide of global networks of geothermal energy heating and cooling experts

SECTION 4: REQUIRED RESOURCES AND SUPPORT

4.1. Please specify required finance and investments for **each** of the actions in section 2.

Geothermal heating and cooling projects face a combination of challenges that can include inadequate policies, the high up-front cost, a lack of infrastructure, and in some regions, limited availability of technical expertise. It is broadly recognised that the high resource risk at the early stage of geothermal projects represents a critical barrier that can stall geothermal development at its inception, preventing investment in the heating and cooling sector.

For these reasons, support has been critical to overcoming barriers to geothermal heating and cooling that developers by themselves may not have been able to address. The development of financing mechanisms to mitigate the risk associated with geothermal must be carried out to encourage investment. Through the Energy Compact, project developers may receive support from IRENA through the [Climate Investment Platform \(CIP\)](#) to develop bankable project proposals and participate in matchmaking sessions with financiers during the subregional IRENA Investment Forums.

Indicative financial resources needed to implement this project amount to around USD 2 million, broken down as follows

Action 1 – Assessment of geothermal resources and market for heating and cooling applications and projects
USD 200,000

Action 2 – Assessment of needs and obstacles to develop geothermal heating and cooling applications and projects
USD 200,000

Action 3 – Enabling frameworks for geothermal heating and cooling applications and projects
USD 200,000

Action 4 – Consolidate a global heating and cooling geothermal network
USD 1,350,000

4.2. [For countries only] In case support is required for the actions in section 2, please select from below and describe the required support and specify for which action.

[Examples of support for Member States could include: Access to low-cost affordable debt through strategic de-risking instruments, capacity building in data collection; development of integrated energy plans and energy transition pathways; technical assistance, etc.]

<input type="checkbox"/> Financing	Description:
<input type="checkbox"/> In-Kind contribution	Description:

<input type="checkbox"/> Technical Support	Description:
<input type="checkbox"/> Other/Please specify	Description

SECTION 5: IMPACT

5.1. Countries planned for implementation including number of people potentially impacted.

The geographical coverage of this Energy Compact proposal is global since there is an incredible untapped potential for geothermal energy for heating and cooling. Nevertheless, the enabling activities will be developed with a particular interest in developing regions that showcase a substantial untapped geothermal potential.

Such regions are:

- East and Southern Africa
- Small Island Nations
- Latin America
- Asia

5.2. Alignment with the 2030 Agenda for Sustainable Development – Please describe how **each** of the actions from section 2 impact advancing the SDGs by 2030.

[up to 500 words, please upload supporting strategy documents as needed]

The actions regarding this project would concern the promotion of renewable energy in the heating and cooling sector. As such:

7.1 By 2030, Ensure universal access to affordable, reliable and modern energy services

7.2 By 2030, increase substantially the share of renewable energy in the global energy mix

7.3 By 2030, double the global rate of improvement in energy efficiency

7.A By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology

7.B By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support.

5.3. Alignment with Paris Agreement and net-zero by 2050 - Please describe how **each** of the actions from section 2 align with the Paris Agreement and national NDCs (if applicable) and support the net-zero emissions by 2050.

[up to 500 words, please upload supporting strategy documents as needed]

The project would contribute both to:

- climate change mitigation through the greater use of renewable energy in the heating and cooling sector substituting fossil fuels.
- climate change adaptation by improving access to reliable and affordable energy, which contributes to strengthening the adaptive capacity of the heating and cooling sector.

SECTION 6: MONITORING AND REPORTING

6.1. Please describe how you intend to track the progress of the proposed outcomes in section 3. Please also describe if you intend to use other existing reporting frameworks to track progress on the proposed outcomes.

The leading indicator of progress shall be the yearly increase in installed thermal capacity and energy use for geothermal heating and cooling. The project would be regularly reviewed. The project monitoring system would furthermore be based on the use of SMART (specific, measurable, achievable, resource-based and time based) indicators.

SECTION 7: GUIDING PRINCIPLES CHECK LIST

Please use the checklist below to validate that the proposed Energy Compact is aligned with the guiding principles.

I. Stepping up ambition and accelerating action - Increase contribution of and accelerate the implementation of the SDG7 targets in support of the 2030 Agenda for Sustainable Development for Paris Agreement

I.1. Does the Energy Compact strengthen and/or add a target, commitment, policy, action related to SDG7 and its linkages to the other SDGs that results in a higher cumulative impact compared to existing frameworks?

Yes No

I.2. Does the Energy Compact increase the geographical and/or sectoral coverage of SDG7 related efforts? Yes No

I.3. Does the Energy Compact consider inclusion of key priority issues towards achieving SDG7 by 2030 and the net-zero emission goal of the Paris Agreement by 2050 - as defined by latest global analysis and data including the outcome of the Technical Working Groups? Yes No

II. Alignment with the 2030 agenda on Sustainable Development Goals – Ensure coherence and alignment with SDG implementation plans and strategies by 2030 as well as national development plans and priorities.

II.1. Has the Energy Compact considered enabling actions of SDG7 to reach the other sustainable development goals by 2030? Yes No

II.2. Does the Energy Compact align with national, sectoral, and/or sub-national sustainable development strategies/plans, including SDG implementation plans/roadmaps? Yes No

II.3. Has the Energy Compact considered a timeframe in line with the Decade of Action? Yes No

III. Alignment with Paris Agreement and net-zero by 2050 - Ensure coherence and alignment with the Nationally Determined Contributions, long term net zero emission strategies.

III.1. Has the Energy Compact considered a timeframe in line with the net-zero goal of the Paris Agreement by 2050? Yes No

III.2. Has the Energy Compact considered energy-related targets and information in the updated/enhanced NDCs? Yes No

III.3. Has the Energy Compact considered alignment with reaching the net-zero emissions goal set by many countries by 2050? Yes No

IV. Leaving no one behind, strengthening inclusion, interlinkages, and synergies - Enabling the achievement of SDGs and just transition by reflecting interlinkages with other SDGs.

IV.1. Does the Energy Compact include socio-economic impacts of measures being considered? Yes No

IV.2. Does the Energy Compact identify steps towards an inclusive, just energy transition? Yes No

IV.3. Does the Energy Compact consider measures that address the needs of the most vulnerable groups (e.g. those impacted the most by energy transitions, lack of energy access)? Yes No

V. Feasibility and Robustness - Commitments and measures are technically sound, feasible, and verifiable based a set of objectives with specific performance indicators, baselines, targets and data sources as needed.

V.1. Is the information included in the Energy Compact based on updated quality data and sectoral assessments, with clear and transparent methodologies related to the proposed measures? Yes No

V.2. Has the Energy Compact considered inclusion of a set of SMART (specific, measurable, achievable, resource-based and time based) objectives? Yes No

V.3. Has the Energy Compact considered issues related to means of implementation to ensure feasibility of measures proposed (e.g. cost and financing strategy, technical assistant needs and partnerships, policy and regulatory gaps, data and technology)? Yes No

SECTION 8: ENERGY COMPACT GENERAL INFORMATION

8.1. Title/name of the Energy Compact

Scaling up geothermal heating and cooling globally

8.2. Lead entity name (for joint Energy Compacts please list all parties and include, in parenthesis, its entity type, using entity type from below)

The International Renewable Energy Agency in collaboration with the Global Geothermal Alliance, its Member Countries and Partners and the International Geothermal Association.

8.3. Lead entity type

- | | | |
|--|---|---|
| <input type="checkbox"/> Government | <input type="checkbox"/> Local/Regional Government | <input checked="" type="checkbox"/> Multilateral body /Intergovernmental Organization |
| <input type="checkbox"/> Non-Governmental Organization (NGO) | <input type="checkbox"/> Civil Society organisation/Youth | <input type="checkbox"/> Academic Institution /Scientific Community |
| <input type="checkbox"/> Private Sector | <input type="checkbox"/> Philanthropic Organization | <input type="checkbox"/> Other relevant actor |

8.4. Contact Information

*From IGA: Marit Broomer, Executive Director;
 * From IRENA: Amjad Abdulla, Head Partnerships, IRENA aabdulla@irena.org

8.5. Please select the geographical coverage of the Energy Compact

- Africa Asia and Pacific Europe Latin America and Caribbean North America West Asia Global

8.6. Please select the Energy Compact thematic focus area(s)

- Energy Access Energy Transition Enabling SDGs through inclusive just Energy Transitions Innovation, Technology and Data Finance and Investment.

SECTION 9: ADDITIONAL INFORMATION (IF REQUIRED)

Please provide additional website link(s) on your Energy Compact, which may contain relevant key documents, photos, short video clips etc.

<https://www.irena.org/publications/2020/Nov/Geothermal-development-in-Eastern-Africa>

<https://www.irena.org/publications/2019/Jan/Accelerating-geothermal-heat-adoption-in-the-agri-food-sector>

<https://irena.org/publications/2021/March/Integrating-low-temperature-renewables-in-district-energy-systems>