

INDIA'S NATIONAL GEOTHERMAL ENERGY POLICY, 2025

1. India unveiled its first National Policy on Geothermal Energy in September 2025 (MNRE, Geothermal Energy Decision; No. 300/4/2024 – MNRE), establishing a detailed framework for the exploration, development, and use of geothermal energy for 24/7 power production and direct heating or cooling applications.
2. Geothermal energy is strategically incorporated as a key component of India's renewable energy plan, a crucial step towards reaching Net Zero by 2070. This strategic move not only helps in meeting climate goals but also secures our energy supply. The strategy emphasizes expanding research, development, and advanced exploration and drilling techniques. It includes partnerships with global organizations and domestic laboratories, and encourages widespread use of Ground Source Heat Pumps (GSHPs) and similar direct-use solutions. The plan also collaborates with the oil and gas industry to repurpose abandoned wells and seeks to foster a robust public-private ecosystem. Furthermore, it focuses on capacity building and knowledge exchange.
3. GSI has identified 381 hot springs with temperatures ranging from 35 to 89 degrees Celsius. Himalayan hot springs can attain temperatures of approximately 200 degrees Celsius. In India, the majority of springs are medium- to low-enthalpy, ranging from 100 to 180 degrees Celsius, making them suitable for direct use, GSHPs, and specific binary/ORC power generation.
 - Ten geothermal provinces have been recognized, including the Himalayan, Naga-Lusai, Andaman and Nicobar, SONATA, West Coast, Cambay Graben, Aravalli, Mahanadi, Godavari, and South Indian Cratonic provinces. These areas span from Puga in Ladakh to Dholera/Tuwa in Gujarat and Unhavare in Maharashtra, among others.
 - The policy supports establishing a national geothermal data repository that involves MoM, MoES, DGH/NDR, CGWB, CSIR – NGRI, and industry stakeholders; access to DGH data is expected to follow NDR guidelines.

4. What the policy covers (scope) –

- Resource assessment – surveys in geology, geochemistry, and geophysics, with UNC-aligned classification.
- Drilling and exploitation encompass both shallow and deep methods, including EGS/AGS.
- Power generation methods encompass dry steam, flash, binary/ORC, and modular deployment.
- Direct Use includes applications such as district heating, greenhouses, aquaculture, cold storage, food drying, industrial process heat, and geotourism.
- GSHPs function at temperatures between 16 and 30°C at depths of 5 to 20 meters. They can be configured as open or closed loop systems and are suitable for deployment throughout India.
- Innovations encompass hybrid geothermal systems that combine solar and thermal methods, closed-loop geothermal energy storage, offshore applications, and deep direct use.
- Clearly identify abandoned O and G wells as a pathway for retrofitting inactive wells for geothermal use.
- Mineral by-products include regulated extractions like silica, borax, cesium, lithium, and alkali minerals, which require MMDR permissions and royalties.

5. Development and enabling measures –

- FDI is fully allowed in renewables, with a preference for local technology, safe reinjection, and exceptional support for Northeast and category states in central aid.
- Oil and gas conversion – MNRE aims to convert abandoned oil and gas wells in collaboration with MoPNG, DGH, and oil companies. It includes using EC-financed equipment for geothermal initiatives. Possible payment models include revenue-sharing or milestone-based payments.

6. Financing (Illustrative menu) –

- MNRE RE – RD grants for research, resource assessment, and pilots.
- Promote FDI, donor and DFI funding, and philanthropy.
- Consider long-term concessional loans, Green Bonds, VGF, risk-mitigation grants or loans, and feed-in tariffs.

7. Fiscal measures (illustrative menu) –

- Import duty and GST exemptions on geothermal equipment, machinery, and services; tax holidays, accelerated depreciation, and property tax exemptions for GSHP/heating/cooling users (subject to approvals).

8. Regulatory facilitation –

- It applies RE support norms to geothermal energy, including ISTS waiver, open access, must-run status, RPO eligibility, inclusion in the Indian Carbon Credit Trading Scheme, and promoting GSHP/district heating in the National Building Code.
- MNRE and MoEFCC might publish guidance on E and S impact assessments, based on global best practices.

9. Guidance for States/UTs –

- The states handle the allocation of exploration sites and blocks. This process is transparent and fair, with permits and land leases issued in accordance with criteria that prioritize the efficient and sustainable use of geothermal resources.
- For overlaps with oilfields, MNRE will review and coordinate with MoPNG, and if feasible, provide consent.
- A single-window support system requires each state to designate a nodal agency responsible for overseeing all land, water, forest, environmental, and transmission clearance processes.
- Community Safeguards include consultations and compensatory actions, especially in tribal and remote areas.
- Tenure for exploration blocks typically lasts 3 years, with an option to extend for two additional years, especially in regions like Ladakh and Arunachal, where work seasons are shorter. Development leases can last up to 30 years and may be renewed based on resource availability.
- Concessional land allotment could be facilitated by obtaining MoD clearance as needed, to streamline the process through a portal and concurrent processing.

10. Implementation Architecture –

- MNRE is the nodal ministry; actions include –
 - International collaboration in technology and peer exchange.
 - Collaborate with DFIs and multilateral organizations to secure grants and concessional funding.
 - Implement pilot projects at scale within RE–RTD (power and direct use) and establish a national program supported by financial and fiscal incentives.
 - Soft loans are offered via IREDA or other financial institutions.
 - Establish Centres of Excellence (CoE) dedicated to technology, capacity building, and implementation.
 - Regular progress updates and comprehensive SOPs for project execution.

11. Why it matters (context and global markers) –

- Geothermal energy holds the promise of providing reliable, low-carbon baseload power with capacity factors exceeding 80% and no fuel costs. This potential not only supports grid stability but also helps decarbonize industrial heat, offering a hopeful future for India's renewable energy landscape.
- The policy promotes the worldwide transition to renewable energy, with at least 28 countries expected to produce geothermal power in 2024. The leading capacities are in the US, Indonesia, the Philippines, Türkiye, New Zealand, Kenya, Italy, Iceland, and Japan.
- Government press releases and trade coverage emphasize repurposing oil and gas wells and deploying GSHPs as immediate wins.

12. Main Points In Brief –

- The national policy is set to be implemented in September 2025, led by the MNRE's Geothermal Division as the main agency. The Geothermal Division will be responsible for coordinating all activities related to the policy, including research, resource assessment, and pilot projects.
- The instruments include R&D grants (RE–RTD), concessional finance from IREDA, VGF/green bonds/FiT (exploratory), tax, GST, and duty reliefs, ISTS/open access waivers, RPO/offsets via carbon credit schemes, and NBC's support for GSHP.

- The state's duties involve assigning sites and blocks, facilitating single-window clearances, supplying concessional land, overseeing exploration periods of 3 + 2 years (+2), and issuing development leases that can extend up to 30 years.
- Priority channels include abandoned oil and gas wells, geothermal heat pump (GSHP) or direct use clusters such as those for agriculture, aquaculture, food processing, cold chains, and tourism, as well as pilot projects in high-enthalpy Himalayan areas.



Geothermal Policy 2025

VISION & GOALS

Make geothermal a key pillar of India's RE mix in support of Net-Zero 2070

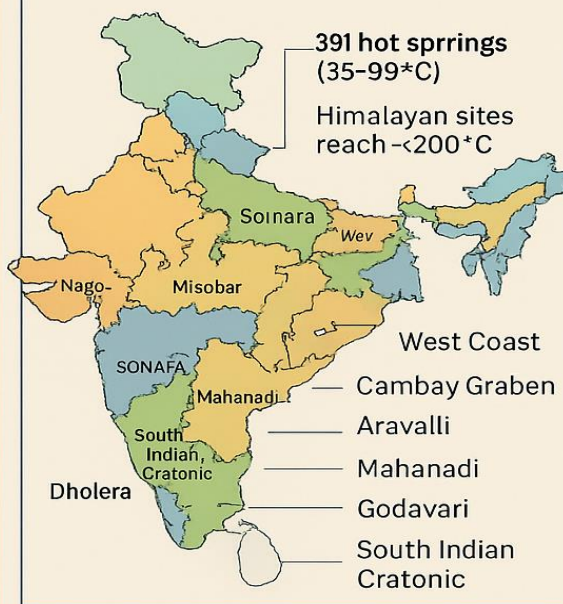
WHAT THE POLICY COVERS

- Resource assessment (geological/geechemical/) geophysical
- Drilling & exploitation (including EGS/AGS)
- Power production (dry steam, flash, binary/ORC)
- Direct use. e.g. district heating, greenhouses, aquaculture)
- GSHPs (16–30 °C at 5–20 m)
- Innovations (hybrid, closed-loop, storage, offshore)
- Abandoned O&G wells (retrofit inactive wells)
- Mineral by-products (e.g. silica, lithium)

IMPLEMENTATION ARCHITECTURE

- MNRE is nodal ministry
- International tech collaboration
- wDFIs/multilateral agents & concessional finance

INDIA'S RESOURCE PICTURE



DEVELOPMENT & ENABLING MEASURES

- MNRE is prioritize converting abandoned oil
- MNRE RE-RTD grants for research
- long-term concessional loans, Green Bonds, VGF, risk mitigation grants/lo
- Import duty and GST exemptions
- tax holidays, accelerated depreciation
- open-access, must-run rules, RPO eligibility, inclusion in Indian Carbon Credit Trading Scheme
- community safeguards
- community safeguards

-XXXX-

Author: Darshita Neeraj
Senior Researcher,
Mudita Learning and Knowledge Private Limited
Email: info@muditabooks.com
Date of post: 23.07.2026