



# Summary of Geothermal Energy RD&D Provisions in American Energy Innovation Act

*Resources for the Future, Fall 2020*

## Important Notes:

- This is a summary of a portion of the American Energy Innovation Act (AEIA). We will call that portion “the Legislation.”
- While the Legislation’s allocations are mostly specific to FY2021-FY2025, this summary makes a few additional assumptions and we ask you to make them too:
  - We assume that funding authorizations will translate into actual funding.
  - Because FY2021 is well underway, it is unlikely that the Legislation would still provide substantial FY2021 funding. Consequently, this summary shifts all funding to one year later than what is stated in the Legislation.
  - It is quite common and expected for funding to continue beyond the initially authorized period. We assume that enacting the Legislation would result in higher funding for ten years (FY2022-FY2031), as specified below.
- In answering our questionnaire, please use the assumptions in this summary so that the assumptions you use are known by the readers of our report/paper and are consistent with the assumptions made by the other experts who are answering the same questions you are answering.
- The Legislation described below is a portion of a larger bill. However, this elicitation is just about this portion, not about the larger bill. In answering, please answer about the effects of this portion only.
- The Legislation specifies that all activities prescribed in it are to be the responsibility of the Department of Energy, unless otherwise mentioned.
- All dollar values below are in nominal dollars.

## Summary of the Legislation

The geothermal section of the AEIA (sec. 1203) would result in a projected total of \$1.7 billion dedicated to geothermal research, development, and demonstration activities for FY2022 – FY 2031 and a separate \$50 million dedicated to the High Cost Geothermal Energy Grant Program over the same ten years. This ten-year total of \$1.75 billion represents an increase of \$650 million over the \$1.2 billion of corresponding projected funding without the AEIA (based on FY20 funding scaled up at a projected inflation rate). The geothermal section of the AEIA would establish the following additions or changes to US government RD&D support for geothermal:

- Oil and Gas Technology Transfer Initiative
  - This is an initiative among the Office of Fossil Energy, Office of Energy Efficiency & Renewable Energy, and the private sector to modify, improve and demonstrate the use in geothermal energy development of relevant advanced technology and operation techniques used in the oil and gas sector.
  
- Coproduction of Geothermal Energy and Minerals Production Prize Competition (\$5MM/year in the first four years)
  - This competition awards prizes for demonstrations of the coproduction of critical minerals from geothermal resources that improve the cost-effectiveness of removing minerals from geothermal brines.
  
- Drilling data repository (\$1MM/year)
  - A voluntary & industry-wide repository of geothermal drilling information will be established, with the objective of lowering the cost of future geothermal drilling
  
- DOE-supported testing sites
  - Support at least two field research sites, the existing one in Milford, Utah and a new one in a different geologic type.
  
- Enhanced Geothermal Systems Demonstrations
  - This is an initiative for demonstration of enhanced geothermal systems for power production or direct use, in collaboration with industry partners and institutions of higher education. No less than 4 demonstration projects would be carried out with different geologic settings and development techniques, in locations that display potential commercial viability for enhanced geothermal systems development. The initiative would start upon enactment, and Legislation does not set a deadline for arranging or completing the demonstrations.
  
- Broaden enhanced geothermal RD&D program
  - Add to the types of advances that the DOE's enhanced geothermal RD&D and commercial applications program seeks to support, specifically by adding the following: well placement and orientation; long-term reservoir management; drilling technologies, methods, and tools; improved exploration tools; and zonal isolation.
  
- Improve Geothermal Resource Assessment
  - The United States Geological Survey will improve upon the 2008 geothermal resource assessment by improving resource map resolution, quantifying mineral co-production potential, and adding information about other subsurface properties such as aquifer and soil properties and induced seismicity risk.
  - Include Alaska, Hawaii, and Puerto Rico
  
- Geothermal on public land

- The Bureau of Land Management, in consultation with other agencies, shall take any actions it determines necessary to facilitate geothermal energy development.
- The Secretary of the Interior, in consultation with other agencies, shall establish national goals for geothermal energy capacity on public land.
- Co-production by companies with oil or gas leases
  - Companies with oil and gas drilling leases may be given non-competitive (very low cost) leases to extract geothermal energy from wells producing or capable of producing oil and gas
- Categorical exclusion of test wells from NEPA
  - Categorically exclude most geothermal test wells from the requirements for an environmental assessment or an environmental impact statement under the National Environmental Policy Act.
- Program to facilitate permitting
  - Requires establishment of a program to “improve Federal permit coordination and reduce regulatory timelines with respect to geothermal energy projects on Federal land by increasing the expertise of officials administering and approving permits.”
- High-Cost Region Geothermal Energy Grant Program (\$5MM/year)
  - In regions with retail electricity or heat prices  $\geq 150\%$  of the national average, the DOE is authorized to grant funds with respect to geothermal energy projects that cover costs such as exploration, permitting, feasibility studies, design/engineering costs, and/or commercial technology demonstration costs.
- Geothermal Heat Pumps and Direct Use Research and Development program
  - Support RD&D and commercial application of improved ground loop and heat pump efficiency, reduced costs, alternative fluids, integration with power generation, seasonal energy storage, grid management, large-scale use such as for large buildings and neighborhoods, and integration with power generation.
  - “Make financial assistance available to State, local, and Tribal governments, institutions of higher education, nonprofit entities, National Laboratories, utilities, and for-profit companies to promote the development of geothermal heat pumps and the direct use of geothermal energy.”