



CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

June 19, 2007

H.R. 2304 **Advanced Geothermal Energy Research and Development Act of 2007**

*As ordered reported by the House Committee on Science and Technology
on June 13, 2007*

SUMMARY

H.R. 2304 would authorize the appropriation of \$450 million over the 2008-2012 period for the Department of Energy (DOE) to support research and development activities related to the production and use of geothermal energy (heat energy stored in the Earth's surface). Funds authorized by the bill would also be used to establish two Centers for Geothermal Technology Transfer within institutions of higher education to act as information clearinghouses for industry on geothermal energy development and management. CBO estimates that implementing H.R. 2304 would cost \$396 million over the 2008-2012 period, assuming the appropriation of the specified funds. Enacting H.R. 2304 would have no effect on direct spending or revenues.

H.R. 2304 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would benefit public institutions of higher education.

ESTIMATED COST TO THE FEDERAL GOVERNMENT

The estimated budgetary impact of H.R. 2304 is shown in the following table. The costs of this legislation fall within budget function 250 (general science, space, and technology).

| | By Fiscal Year, in Millions of Dollars | | | | |
|---|--|------|------|------|------|
| | 2008 | 2009 | 2010 | 2011 | 2012 |
| CHANGES IN SPENDING SUBJECT TO APPROPRIATION | | | | | |
| Geothermal Energy Research and Development Programs | | | | | |
| Authorization Level | 80 | 80 | 80 | 80 | 80 |
| Estimated Outlays | 44 | 68 | 80 | 80 | 80 |
| Other Geothermal Energy Programs | | | | | |
| Authorization Level | 10 | 10 | 10 | 10 | 10 |
| Estimated Outlays | 6 | 8 | 10 | 10 | 10 |
| Total Changes | | | | | |
| Authorization Level | 90 | 90 | 90 | 90 | 90 |
| Estimated Outlays | 50 | 76 | 90 | 90 | 90 |

BASIS OF ESTIMATE

For this estimate, CBO assumes that the bill will be enacted in fiscal year 2007 and that the amounts specified by the bill will be appropriated for each fiscal year.

Geothermal Energy Research and Development Programs

H.R. 2304 would authorize the appropriation of \$80 million for each of fiscal years 2008 through 2012 for DOE to support research and development programs that expand the production of geothermal energy. Funds authorized by this legislation would be used to:

- Develop tools to locate hydrothermal resources (naturally occurring bodies of hot water or steam located below the earth's surface) and improve site characterization;
- Establish field demonstration programs, in cooperation with industry partners, to demonstrate techniques and technologies used in exploratory drilling;
- Develop components and systems capable of sustaining the extreme geological environments necessary to produce geothermal energy;

- Model geothermal resource performance;
- Examine the environmental impacts of geothermal energy development, production and use, as well as technologies and practices to mitigate such impacts;
- Develop technologies to advance enhanced geothermal systems (sources of geothermal energy which require human invention to facilitate production) to the stage of commercial readiness;
- Establish at least five demonstration programs to develop geothermal energy stimulation techniques and technologies;
- Award five-year renewable grants to institutions of higher education to establish two Centers for Geothermal Technology Transfer to act as an information clearinghouse for industry on best practices to develop and manage hydrothermal resources and enhanced geothermal systems resources; and
- Expand the GeoPowering the West program to address the private market and institutional barriers of bringing geothermal energy to all areas of the United States.

Under the legislation, the federal share of such projects would be limited to 80 percent. Based on information from DOE, CBO expects that funds authorized to be appropriated by the bill would be used to establish new programs within DOE, as well as fund research projects already in existence. Assuming the appropriation of the specified funds, and based on the historical spending of DOE research and development programs, CBO estimates that implementing these provisions would cost \$44 million in 2008 and \$352 million over the 2008-2012 period.

Other Geothermal Energy Programs

H.R. 2304 would authorize the appropriation of \$10 million for each of fiscal years 2008 through 2012 for DOE to make grants to establish three demonstration projects that use geothermal techniques at oil and gas wells. Funds authorized by this legislation would also be used to support the research and development of techniques to produce energy from geopressured sources (rock deposits under high pressure and saturated with gas or methane) in and near the Gulf of Mexico. Based on information from DOE, CBO estimates that implementing these programs would cost \$6 million in 2008 and \$44 million over the 2008-2012 period.

INTERGOVERNMENTAL AND PRIVATE-SECTOR IMPACT

H.R. 2304 contains no intergovernmental or private-sector mandates as defined in UMRA and would benefit participating public institutions of higher education. The bill would authorize several grant programs for geothermal energy research, development, and demonstration. It would also authorize funding for information clearinghouses at institutions of higher education. Any costs incurred by public institutions applying to host the centers would be incurred voluntarily.

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