DOAA
Georgia Department
of Audits & Accounts

Greg S. Griffin
State Auditor

February 21, 2024

Honorable Shaw Blackmon
Chairman, House Ways and Means
133 State Capitol
Atlanta, GA 30334

SUBJECT: Fiscal Note
House Bill 403 (LC 43 2641)

Dear Chairman Blackmon:

The bill would provide taxpayers with an income tax credit equal to 25 percent of eligible expenses related to the installation of geothermal machinery. The credit cannot exceed $35,000 per dwelling and is limited to residential dwellings owned by the taxpayer. The credit cannot exceed the taxpayer's income tax liability but may be carried forward for five years. The credit would be effective for tax years beginning January 1, 2024 and would expire on December 31, 2033.

Impact on State Revenue
The University of Georgia's Department of Agricultural and Applied Economics estimated that the bill would decrease state revenue by the amounts shown in Table 1. Fiscal year 2025 is the first full year of the additional revenue loss. The appendix provides details of the analysis.

Table 1. Estimated Revenue Effects of LC 43 2641

($ *millions*)	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
State Income Tax	($1.52)	($3.70)	($3.81)	($3.92)	($4.04)	($4.16)

Impact on State Expenditures
The Department of Revenue would be able to implement the provisions of the bill with existing resources.

Respectfully,

Greg S. Griffin
State Auditor

Richard Dunn, Director
Office of Planning and Budget

GSG/RD/mt

Analysis by UGA Department of Agricultural and Applied Economics

The proposal permits taxpayers to claim a credit for 25 percent of the eligible expenses related to the installation of geothermal machinery, up to $35,000 per dwelling, beginning January 1, 2024. Eligible expenses are those incurred by the taxpayer for a residential dwelling that it owned by the taxpayer; the credit cannot exceed the taxpayer's income tax liability but may be carried forward over the next five years; it will expire on December 31, 2033. Geothermal heat pumps exchange warm or cool temperatures inside a building with the more-stable ground temperatures, through heat transfer between the air and the fluid in a system of pipes that run underground. These heat pumps can produce energy savings relative to other types of cooling and heating systems, but their initial costs are generally quite expensive; only about 1% of existing buildings in the United States use geothermal heat pumps (Liu et al., 2023). Of the 1.7 existing installations in 2021, about 40% were residential (Boyd, 2022); this implies a market penetration rate of about 0.77%, given American Community Survey data on existing one-unit, detached homes in the United States. Forbes Home estimates the average cost of a geothermal heat pump installation at between $17,000 and $32,000 (Wallender and Allen, 2023).

The federal government already offers a similar credit for the installation of geothermal heat pumps, currently set at 30% of the cost of installed units between 2022 and 2032; after that, the credit phases down to 26% in 2033, and 22% if placed in service after 2034. The Joint Committee on Taxation (JCT) forecasts the associated tax expenditures (defined under the Congressional Budget and Impoundment Control Act of 1974 as "revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability") at $3.6 billion, $2.3 billion, $2.4 billion, $2.4 billion, and $2.5 billion in federal fiscal years 2023 through 2027, respectively (JCT, 2023). However, the vast majority of the energy credit is claimed for solar-power-related equipment; in 2021 the JCT forecasted that between 2020-2024, $34.9 billion of the total $35.5 billion (or 98.3%) of all energy tax credit expenditures would be taken up by solar-related claims (Sherlock, 2021).

Scant public information is available about the geothermal heat pump market in the United States, although Global Market Insights (2022) valued the industry at $2.4 billion and forecasts its compound annual growth rate at 3.5% from 2023-2032. To estimate the likely foregone revenue to the State due to the proposed tax credit, we first project Georgia's gross domestic product (GDP) using the share it makes up of the national GDP, and benchmarking that to Congressional Budget Office GDP forecasts, by calendar year (CBO, 2024). Using state-level GDP from the Bureau of Economic Analysis (2024), from 2018 to 2022, Georgia's GDP ranged from 2.97% to 3.01% of the national GDP. We used a three-year moving average of this ratio to forecast the State's GDP over time, based on CBO's national forecast.

Then, we gathered historical, nationwide and State-level energy credit filers and credit amounts data from the Internal Revenue Service (IRS) Statistics of Income (SOI) tables (2024). Although these data represent *all* eligible technologies—not just geothermal heat pumps—we calculate the share of all filers and energy credits that State of Georgia taxpayers represent each year, and project them into the future using a two-period moving average. The same IRS program also provides nation-wide estimates for the number of returns that report a non-zero amount of any line item, as well as the total qualified costs claimed by taxpayers; we collected form 5695 data, which reports qualified energy credit costs claimed on federal tax returns for geothermal heat pump installations. We project (the average for the latest two available years of) these costs into the future at the expected rate of economic growth we estimate above, and then multiply these expected costs by the proposed State credit of 25% and our SOI-based estimated share that the State of Georgia makes up of nation-wide (1) energy credit-related returns, and (2) energy credits. We average these two projections to produce a forecasted foregone revenue for each year.

Finally, we adapt the tax year basis to a State of Georgia fiscal year basis, and adjust for the proposal effective date, to arrive at the figures in table 1.

Table A1. Forecasts And Foregone Tax Revenue Calculations

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Gross domestic product ($ billions)											
United States	$21,521.4	$21,323.0	$23,594.0	$25,744.1	$27,341	$28,177	$29,256	$30,504	$31,756	$33,043	$34,375
Georgia	$646.9	$637.9	$701.6	$767.4	$815	$813	$827	$877	$909	$943	$985
Share	3.01%	2.99%	2.97%	2.98%	2.98%	2.88%	2.83%	2.88%	2.86%	2.85%	2.86%
Statistics of Income											
Federal											
Energy credit claims	1938410	2270260									
Energy credits	$3,443.9	$3,572.2									
Georgia											
Energy credit claims	51620	61700									
Energy credits	$45.1	$56.7									
Geothermal Heat Pumps											
Federal											
Qualified Costs	$668.4	$570.4	$637.8	$656.8	$676.4	$696.6	$717.3	$738.7	$760.7	$783.4	$806.8
Georgia Estimate											
Qualified Costs - Claim Share	$4.45	$3.88	$4.29	$4.44	$4.56	$4.70	$4.84	$4.99	$5.13	$5.29	$5.44
Qualified Costs - Credit Share	$2.19	$2.26	$2.31	$2.49	$2.51	$2.61	$2.68	$2.76	$2.84	$2.93	$3.02
Average	$3.32	$3.07	$3.30	$3.47	$3.53	$3.66	$3.76	$3.87	$3.99	$4.11	$4.23

Note: These figures are presented on a tax year basis. Geothermal heat pump entries from 2021-2029 are forecasts.

References

Boyd, L. 2022. *2021 United States Country Report*. U.S. Department of Energy, IEA Geothermal. October. Accessed at: https://drive.google.com/file/d/17c3OLDOZBfu6PzYDDaHQ_S15jBdiTCRp/view?usp=sharing

Bureau of Economic Analysis (BEA). 2024. *GDP by State*. Interactive Data Tables. Accessed at: https://www.bea.gov/data/gdp/gdp-state

Congressional Budget Office (CBO). 2024. *The Budget and Economic Outlook: 2024-2034*. February. Accessed at: https://www.cbo.gov/system/files/2024-02/59710-Outlook-2024.pdf

Internal Revenue Service (IRS). 2024. *SOI Tax Stats – Historic Table 2*. Statistics of Income data. Accessed at: https://www.irs.gov/statistics/soi-tax-stats-historic-table-2

Joint Committee on Taxation (JCT). 2023. *Estimates of Federal Tax Expenditures for Fiscal Years 2023-2027*. Report number JCX-59-23. December 7th. Accessed at: https://www.jct.gov/getattachment/4bb6796c-df84-4179-9226-8cce61c7c4b5/x-59-23.pdf

Liu, X., J. Ho, J. Winick, S. Porse, J. Lian, X. Wang, W. Liu, M. Malhotra, Y. Li, and J. Anand. 2023. "Grid Cost and Total Emissions Reductions Through Mass Deployment of Geothermal Heat Pumps for Building Heating and Cooling Electrification in the United States." Oak Ridge National Laboratory report # ORNL/TM-2023/2966. November. Accessed at: https://info.ornl.gov/sites/publications/Files/Pub196793.pdf

Sherlock, M.F. 2021. "The Energy Credit or Energy Investment Tax Credit (ITC)". Congressional Research Service, *In Focus* series. April 23rd. Accessed at: https://crsreports.congress.gov/product/pdf/IF/IF10479

Wallender, L., and S. Allen. 2023. "How Much Do Geothermal Heating And Cooling Systems Cost?" *Forbes Home*. March 14th. Accessed at: https://www.forbes.com/home-improvement/hvac/geothermal-heating-cooling-systems-cost/