

Supporting Statement – Part A

Emergency Survey – Cryptocurrency Mining Facilities

OMB No. 1905 - XXXX

Introduction

The U.S. Energy Information Administration (EIA) is the statistical and analytical agency within the Department of Energy (DOE). EIA's mission is to collect, analyze, and disseminate independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment. EIA is the Nation's premier source of energy information and, by law, its data, analyses, and forecasts are independent of approval by any other officer or employee of the United States Government. EIA conducts a relevant, reliable, and timely data collection program that covers the full spectrum of energy sources, end uses, and energy flows; generates short- and long-term domestic and international energy projections; and performs informative energy analyses. EIA communicates its statistical and analytical products primarily through its website and customer contact center.

To meet this obligation, EIA's Office of Energy Statistics (OES) conducts surveys that collect information about the national energy balance and key activities that affect that balance. Increases in electricity demand can have important effects on electric transmission and distribution systems. Consequently, the rapid increase in cryptocurrency mining activity on the electrical grid may contribute to public harm during an unexpected event. As a result, EIA requests that the Office of Management and Budget (OMB) approve a mandatory proposed emergency survey to explore ways to better quantify these effects. Additionally, these data will inform the public on the impact of recent increases in U.S. cryptocurrency mining activity on both the supply and demand side of the electric power system.

The mining of cryptocurrency is an energy-intensive activity that requires substantial amounts of electricity. Several cryptocurrencies, most notably Bitcoin, use a *proof of work* approach that requires cryptocurrency miners to validate blocks of transactions by solving complex cryptographic puzzles that require significant computational power. Each mining facility operates thousands of computers that run continuously to add virtual currency transactions to a distributed ledger. The computational equipment must be cooled, which further increases the associated electricity consumption. Given its high rate of consumption, companies, organizations and government agencies engaged in the electricity business require detailed information about how much electric power is being consumed by cryptocurrency miners and where it is occurring. EIA has engaged in a rigorous evaluation of U.S. cryptomining activity using publicly available information. We estimate cryptomining activity to represent as much as 2.2% of U.S. electricity consumption. Furthermore, there is evidence that this electricity consumption is growing rapidly. For example, the hash rate, which represents the computational power of a network mining cryptocurrency and is directly proportional to electricity consumption, has doubled in the last year.

Due to the speed with which this activity has potentially disrupted the electric power industry, the time needed to request data collection will exceed the need to urgently collect this information. This proposed emergency survey is necessary for EIA to fulfill its mission to provide timely data collection to promote sound policymaking, efficient markets, and public understanding of energy

and its interaction with the economy and the environment. EIA has determined that the collection of information monthly is required to adequately monitor the effects of cryptocurrency mining.

If approved, data collection could begin as soon as February 2024 from approximately 82 cryptocurrency mining companies. EIA would reassess the results of the data collection and send a supplemental request to OMB that reflects the experience and knowledge gains from operating this emergency survey. If EIA finds that less frequent data collection satisfies the need for information, we will reduce the frequency of data collection when pursuing a normal clearance.

SECTION A.

1. Legal Justification

The authority for this mandatory information collection is provided by the following general provisions:

- Title 15 U.S. Code §772, which established the mandatory requirement of owners and operators of businesses in the U.S. to report energy supply and consumption data to the EIA Administrator.
- Title 15 U.S. Code §764, which established the EIA Administrator's powers to plan, direct, and conduct mandatory and voluntary energy programs that are designed and implemented in a fair and efficient manner. These powers include duties to collect, evaluate, assemble, and analyze energy information on U.S. reserves, production, demand, and related economic data, while obtaining the cooperation of business, labor, consumer, and other interests.
- Title 15 U.S. Code §790a, which established the National Energy Information System (NEIS) that is the enclave containing the energy data collected by EIA, which allows EIA to describe and analyze energy supply and consumption in the U.S. NEIS allows EIA to perform statistical and forecasting activities to meet the needs of the U.S. Department of Energy and Congress, as well as the needs of the States to the extent required by the Natural Gas Act [Title 15 U.S. Code §717 et seq.] and the Federal Power Act [Title 16 U.S. Code §791a et seq.].

2. Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection.

The proposed data collection would inform several ongoing federal activities related to cryptomining, including the President's Executive Order on Ensuring the Responsible Development of Digital Assets, which is designed to coordinate federal activities on this issue. With respect to EIA, both the White House Office of Science and Technology Policy and a group of Senators, led by Senator Warren, have recommended that EIA collect energy-relevant data on U.S. cryptomining activity. Concerns expressed to EIA include strains to the electricity grid during periods of peak demand, the potential for higher electricity prices, as well as effects on energy-related carbon dioxide (CO₂) emissions. At the national scale, such data could indicate how the industry is evolving, identify geographic areas of high growth, and quantify the sources of electricity used to meet cryptomining demand. At the regional level, such information is also necessary to help electric grid operators determine how much additional generating capacity is required to be in service to ensure the electric grid reliably meets the increased demand. Also, state agencies such as Public Utility Commissions require this information to help gauge the impact of mining activity on the current and future price for electricity in different regions of the country. And finally, agencies that estimate electric sector emissions need better data to track potential negative environmental impacts.

There is precedent for EIA conducting approved emergency fuel surveys caused by emergencies or the lingering effects of emergencies. For example, the EIA-878 survey

provided daily estimates from April 29, 1996, through August 2, 1996, to Congress, Federal officials, and the transportation industry in order to monitor rapid price increases at both regional and national levels. During the 1991 Iraq war, the data were used by Congress and Federal officials to monitor the retail price of gasoline daily. After Hurricane Sandy in 2012, the EIA-878 and EIA-888 were used to evaluate the availability of gasoline and diesel in the New York City metropolitan area. In addition, the New York State Energy Research Development Authority used the EIA-878 retail gasoline price estimates for New York State to monitor supply conditions and price levels in the State.

An example of previous uses for emergency fuel survey data collection include:

https://www.eia.gov/special/disruptions/archive/hurricane/sandy/gasoline_updates.php

There is also precedent for EIA to collect information on the use of electricity by individual sectors of the economy. In its Form EIA-861, Annual Electric Power Industry Report, EIA collects data on different sectors, ranging from residential customers to commercial and industrial consumers. The data is valuable to help companies, organizations and government agencies make plans to meet demand for electricity in the future. Collection of data on the business of cryptocurrency mining is made even more urgent since it is a relatively new sector in the U.S. economy, having more than tripled in size since 2019.

- 3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g. permitting electronic submission of responses, and the basis for the decision for adopting this means of collection. Also describe any consideration of using information technology to reduce burden.**

The emergency data collection will initially use Paper-and-Pencil Interviews (PAPI) and Computer-Assisted Telephone Interviews (CATI) as the primary data collection until the respondent's email is provided. The emergency data collection will then transition to Computer-Assisted Self-Interviews (CASI) as the primary data collection mode. In addition, it is anticipated that most routine contact with respondents (e.g., notification that a survey has opened for a collection cycle) will be performed using email.

Computer-Assisted Self-Interviews (CASI) allows respondents to enter their data directly into the EIA survey database, which reduces the time needed for data collection and processing. The system also identifies data that fail edits prior to submission, which allows respondents to make necessary corrections or explain unusual events affecting the reported data prior to submission. This data editing process reduces respondent burden by reducing the number of times a respondent must resubmit forms prior to acceptance by EIA. It also improves the timeliness of reporting the information to the public. The respondent only requires an internet connection.

EIA will continue to make all survey forms and instructions available for printing or downloading from the EIA website for respondents who cannot or will not use CASI.

- 4. Describe efforts to identify duplication.**

There is no other known source available to provide a comprehensive and time-sensitive source of data on the use of electricity by the cryptocurrency mining business. Other government and industry efforts to determine the effects of cryptocurrency mining on the

energy system have generally taken the form of studies, which lack the comprehensive, standardized, timely and consistent nature of a formal data collection. EIA attempted to use the Commercial Building Energy Consumption Survey (Form EIA-871) as part of an effort to understand data center energy consumption but found that seeking data directly from the facilities on a voluntary basis was an ineffective survey approach. EIA has incorporated the knowledge gained from that effort into designing this emergency survey.

EIA has identified a few commercial organizations and trade councils that provide information on the use of electricity by this sector, but none provide data on the use and supply of electricity in a timely and regular manner. Organizations involved with balancing or regulating electricity demand and supply require data that is updated on a regular and consistent basis.

5. If the collection of information impacts small businesses or other small entities, describe any methods used to minimize burden.

Minimizing burden to small businesses is a primary concern to EIA. EIA designed this survey as a company level form that reports for company facilities, so that individual facilities themselves are not subject to the reporting requirements. Companies, which have responsibility for the management of the facilities and often centralize resources, can participate in a more efficient reporting process.

In addition, the significant asset requirements needed to support commercial-scale cryptocurrency mining activity acts as a barrier to small business participation. EIA has identified the larger companies for this emergency survey and will consider the development of a reporting threshold to avoid unnecessary burden on small businesses.

Finally, EIA will employ technology in its data collection system to reduce the need for data entry, which will minimize respondent burden by eliminating paperwork and reducing the need for follow-up calls and resubmissions of the forms.

6. Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.

In just a few years, the mining of cryptocurrency has become one of the larger users of electricity in the United States, accounting for as much as 2.2% of total consumption in the United States. The ability to understand the potential for greater use by mining operations in the future, especially in certain regions of the country, is critical for electric grid operators and government agencies to formulate plans that account for the cost, reliability, and environmental impacts associated with the continued rapid growth in cryptomining activity. Since adding new electric generating capacity to the grid can take years and is expensive, having accurate and timely data is essential for helping to make better decisions. Furthermore, the economics of cryptomining is partly driven by the prevailing price of electricity. Given the modular nature of the mining equipment, miners are able to relocate to new areas with lower electricity prices, which could further complicate the grid planning process.

Additionally, the monthly reporting by these facilities would provide important seasonal and geographical information, including changes in the mining activity rate, necessary for EIA to provide monthly estimates of electricity use for the companies in the sample.

7. 1 Explain any special circumstances that would cause an information collection to be conducted in a manner requiring respondents to report information to the agency more often than quarterly;

Since the production and consumption of electricity is time-sensitive, with seasonal variations affecting its availability and cost, it is important to collect this data no less frequently than monthly. That frequency could help users of EIA data better understand when the use of electricity by cryptocurrency miners has the greatest impact on electricity markets.

There is precedence for EIA to collect information on the use of electricity on a monthly basis; for that matter, on an hourly basis. Form EIA-923, Monthly Generation and Fuel Consumption Time Series collects data regularly from every utility-scale U.S. power generation source. In its Form EIA-930, Hourly Electric Grid Monitor, EIA collects data on electricity consumption and generation on an hourly basis. These two sources of data assist all EIA data users to better understand seasonal and daily shifts in electricity markets. EIA considers a monthly collection of cryptocurrency energy use to be similarly informative of the significant and rapid changes that characterize industry activity.

8. Provide a copy and identify the date and page number of publication in the Federal Register of the agency's notice, required by 5 CFR 1320.8 (d), soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice and describe actions taken by the agency in response to these comments

This is an emergency survey request and there is currently no Federal Register Notice. A Federal Register Notice will be published subsequent to the ICR approval, if approved.

9. Explain any decision to provide any payment or gift to respondents.

EIA will not provide any payments or gifts to respondents.

10. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute, regulation, or agency policy.

All information associated with the "Survey Contact", the "Supervisor of Contact Person for Survey" on Schedule 1, and the electricity bills (if provided) will be protected and not disclosed to the public to the extent that it satisfies the criteria for exemption under the Freedom of Information Act (FOIA), 5 U.S.C. §552, the Department of Energy (DOE) regulations, 10 C.F.R. §1004.11, implementing the FOIA, and the Trade Secrets Act, 18 U.S.C. §1905.

The Federal Energy Administration Act also requires EIA to provide company-specific data to other Federal agencies when requested for official use. The information reported on these forms may also be made available, upon request, to another component of DOE; to

any Committee of Congress; the Government Accountability Office; or other federal agencies authorized by law to receive such information. A court of competent jurisdiction may obtain this information in response to an order. The information may be used for non-statistical purposes such as administrative, regulatory, law enforcement, or adjudicatory purposes.

11. Provide additional justification for any questions of a sensitive nature.

No questions of a sensitive nature are anticipated in this proposed emergency data collection.

12. Provide estimates of the hour burden of the collection of information. The statement should indicate the number of respondents, frequency of response, annual hour burden, and an explanation of how the burden was estimated.

The 82 selected cryptocurrency mining companies will have a total burden estimate of 246 hours if OMB approves this emergency ICR for the maximum of 180 days. The estimated total additional cost to respondents for the burden hours is estimated to be \$21,491 dollars, i.e., 246 hours times \$87.36 per hour. (The average loaded salary plus benefits for an EIA employee is \$87.36 per hour).

Table 1.

Number of Cryptomining Companies	Burden Hours	Frequency	Duration	Total Burden Hours
82	0.5 hours	Once per month	6 months	246 hours

13. Provide an estimate of the total annual cost burden to respondents or recordkeepers resulting from the collection of information.

The estimated total additional cost to respondents for the burden hours is estimated to be \$21,491 dollars, i.e., 246 hours times \$87.36 per hour. (The average loaded salary plus benefits for an EIA employee is \$87.36 per hour).

14. Provide estimates of annualized cost to the Federal government; provide a description of the method used to estimate cost which should include quantification of hours, operational expenses (equipment, overhead, printing, and staff), and any other expense that would not have been incurred without this collection of information.

The expected cost of operating this emergency survey is estimated at \$193,152 and includes federal staff time for survey-related activities, such as frame maintenance, collection, processing, dissemination, and data systems maintenance.

15. Explain the reasons for any program changes or adjustments reported in Items 13 or 14 of the OMB Form 83-I (reasons for changes in burden).

This is a new collection request.

16. For collections of information whose results will be published, outline plans for tabulation and publication. Address any complex analytical techniques that will be used. Provide the time schedule for the entire project, including beginning and ending dates of the collection of information, completion of report, publication dates, and other actions.

Upon receipt of these data, EIA will produce a summary of the energy use associated with cryptocurrency mining activities of the companies in the sample only, so that the implications of this significant and growing demand can be quantifiably assessed. However, population estimates will not be produced due to coverage error, a result of the challenges of defining the target population. The purpose of the survey is to only produce descriptive statistics of the population in the sample. The need for timeliness compels the collection of these data monthly. Upon authorization to conduct the survey, EIA will contact respondents, providing a baseline of facilities for which the companies should report and expanding or adjusting the population of facilities based on respondent feedback. Ongoing survey operations during the emergency data collection may require monthly adjustments of the company and facility inventory.

Below are EIA's objectives for this survey and the associated publication plan:

- **Objective 1:** Develop a baseline snapshot of the cryptomining companies in the sample. **Publication plan:** Publish aggregate statistics on cryptocurrency mining activities across all companies and their facilities in the sample, including miner counts, miner age, miner electricity load, and miner hash rate. These aggregate statistics will include the total count of companies and facilities surveyed.
- **Objective 2:** Quantify the rate of change in cryptomining activity among the companies in the sample. **Publication plan:** Publish aggregate statistics on monthly facility-level energy consumption and hash rate of the companies in the sample; identify interesting trends in miner equipment characteristics.
- **Objective 3:** Identify electricity sources for US cryptominers in the sample. **Publication plan:** Publish aggregate statistics indicating the ownership, sources, and carbon intensity of the electricity used to support U.S. cryptomining activity.
- **Objective 4:** Identify regions of the United States with concentrated cryptomining activity based off the companies in the sample. **Publication plan:** Publish aggregated state-level statistics on cryptomining hash rate and energy consumption. If areas of highly concentrated cryptomining activity at the balancing authority level are identified, EIA may release facility-level energy consumption data along with its location.

Since this data will be collected using an emergency clearance, all published data will be marked as provisional. In addition, publication plans will be adjusted accordingly based on the response rates and the consistency of responses across all respondents.

If this emergency clearance is approved, data collection will begin in February and conclude at the end of July. Publication of these data described above would take place following all data collection and would take the form of a series of articles that appear on the EIA website. Publications would be released in the latter half of 2024.

EIA does not see technical challenges to the design and operation of the data collection.

17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.

EIA will display the expiration date for OMB approval on the information collection instrument(s).

18. Explain each exception to the certification statement identified in Item 19, "Certification for Paperwork Reduction Act Submissions" of OMB Form 83-I.

No exceptions to the Certification Statement should be required. If so, OMB approval will be requested in advance of conducting the survey.