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“Powering America's AI Future: Assessing Policy Options to Increase Data Center  
Infrastructure”

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Chairman McCormick, Ranking Member Sykes, and esteemed Members of the Committee, it is an honor to appear before you today to discuss the critical role of open and transparent data in understanding and shaping the growth of the U.S. data center sector. My name is Eric Masanet, and I am Professor and Mellichamp Chair of Sustainability Science for Emerging Technologies at the University of California, Santa Barbara. I have been researching and informing policymakers on the technology, infrastructure, and resource requirements of data centers for two decades, starting with co-leadership of the first U.S. national data center energy study commissioned by Congress back in 2007.<sup>1</sup> My remarks today are my own and not intended to represent the positions of the University of California, the Lawrence Berkeley National Laboratory, or the United States Department of Energy.

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<sup>1</sup> Brown, Richard; Masanet, Eric; Nordman, Bruce; Tschudi, Bill; Shehabi, Arman; Stanley, John; Koomey, Jonathan; Sartor, Dale; Chan, Peter; Loper, Joe; Capana, Steve; Hedman, Bruce; Duff, Rebecca; Haines, Evan; Sass, Danielle; Fanara, Andrew (2007). Report to Congress on Server and Data Center Energy Efficiency: Public Law 109-431. Lawrence Berkeley National Laboratory, Berkeley, CA. LBNL-363E.  
<https://escholarship.org/uc/item/74g2r0vg>

My field of focus is energy and resource systems analysis. As you might imagine, there is probably no hotter topic in the field these days than the growing infrastructure requirements of U.S. data centers, which are being fueled by unprecedented scales and rates of investments in data center computing capacity for artificial intelligence (AI).

How much power and water infrastructure will U.S. data centers and AI require, both now and in the future? Which technology and operating strategies can help minimize data center infrastructure demand, stress, and impacts on local communities? What are the most effective policy levers for achieving these outcomes? What types of innovations need investment now in order to achieve future goals?

These are but a few of the critical questions that analysts across public, private, research, and nonprofit organizations have been racing to answer. As you can imagine, for any analysis to be useful, it requires high-quality data in order to produce accurate, timely, and trustworthy results for decision makers.

And when high-quality data are also made publicly available, two additional benefits accrue. First, these data can provide critical “ground truths” on the past and current economic, technological, power, and water characteristics of a sector allowing all analysts—irrespective of their specific research questions—to work from a common and verifiable evidence basis. This is opposed to individual analysts constructing their own datasets that can often vary in quality.<sup>2</sup>

Second, high-quality open datasets also support innovation. Open datasets catalyze independent development of new models, software, and forecasts that can unlock a wide array of new insights for different stakeholders. These can include identifying promising areas for technology R&D, opportunities for new policy designs, new grid optimization approaches, and improved understanding of energy- and water-related impacts and ways to reduce them, to name but a few.

For these very reasons, the United States has long been a global leader in investing in the standardization, collection, and open dissemination of detailed, high-quality energy and resource utilization data for every major sector of strategic national importance. These

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<sup>2</sup> Masanet, E., Shehabi, A., Lei, N., Smith, S., & Koomey, J. (2020). Recalibrating global data center energy-use estimates. *Science*, 367(6481), 984-986.

include the U.S. power, buildings, manufacturing, and transport sectors.<sup>3,4,5,6,7</sup> We've done this for every major sector, that is, except for one, and that is data centers.

While data centers have historically been relatively small consumers of power and water at the overall U.S. national scale, the recent "AI boom" and massive investments in new data center builds have catapulted U.S. data centers into critical sector status. For example, Lawrence Berkeley National Laboratory's most recent national data center study found that, under a high growth scenario, U.S. data centers may account for up to 12% of national electricity use by 2028, up from only 1.8% in 2018.<sup>8</sup> For context, 12% is nearly half the amount of retail electricity that was used by the entire U.S. industrial sector in 2024.<sup>9</sup> Recent analyses by the Federal Reserve Bank of Saint Louis have indicated that AI-related investments, which ultimately require data center infrastructure for market deployment, have emerged as a major driver of recent U.S. GDP growth.<sup>10</sup>

As I'll discuss next, no other major U.S. energy-consuming sector, nor one which is growing so quickly from economic and infrastructure perspectives, suffers from as many public data blind spots as U.S. data centers. Having analyzed this sector for two decades, and having contributed to all three national data center energy studies commissioned to date

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<sup>3</sup> U.S. Energy Information Administration (2026). Electricity: Data, Analysis & Projections. Washington, DC. <https://www.eia.gov/electricity/>

<sup>4</sup> U.S. Energy Information Administration (2026). Residential Energy Consumption Survey (RECS). Washington, DC. <https://www.eia.gov/consumption/residential/>

<sup>5</sup> U.S. Energy Information Administration (2026). Commercial Buildings Energy Consumption Survey (CBECS). Washington, DC. <https://www.eia.gov/consumption/commercial/>

<sup>6</sup> Davis, S. C., & Boundy, R. G. (2022). Transportation Energy Data Book: Edition 40. Oak Ridge: Oak Ridge National Laboratory. Retrieved from <https://doi.org/10.2172/1878695>.

<sup>7</sup> U.S. Energy Information Administration (2026). Manufacturing Energy Consumption Survey (MECS). Washington, DC. <https://www.eia.gov/electricity/>

<sup>8</sup> Shehabi, Arman; Newkirk, Alex; Smith, Sarah J; Hubbard, Alex; Lei, Nuo; Siddik, Md Abu Bakar; Holecek, Billie; Koomey, Jonathan; Masanet, Eric; Sartor, Dale (2024). 2024 United States Data Center Energy Usage Report. Lawrence Berkeley National Laboratory. Report #: LBNL-2001637. <http://dx.doi.org/10.71468/P1WC7Q>

<sup>9</sup> 2024 retail sales of electricity, U.S. industrial sector according to U.S. Energy Information Administration (2026). <https://www.eia.gov/electricity/data/browser/#/topic/5?> Retrieved 22-Feb-2026.

<sup>10</sup> Hannah Rubinton and Bontu Ankit Patro, "Tracking AI's Contribution to GDP Growth," St. Louis Fed On the Economy, Jan. 12, 2026. <https://www.stlouisfed.org/on-the-economy/2026/jan/tracking-ai-contribution-gdp-growth>

by the U.S. government, I am keenly aware of these blind spots.<sup>11,12,13</sup> I would argue that they pose a significant impediment to any analyst who seeks to confidently assess and inform decisions about the future infrastructure demands of U.S. data centers, irrespective of their research questions. So, what are these blind spots?

First, analysts struggle to accurately quantify the past and present scales of U.S. data center energy and water demands because **many data center operators don't adequately report such data**, even though longstanding global reporting frameworks exist.<sup>14,15,16</sup> Very few operators disclose the energy and water requirements of their specific data center locations, with U.S. operators Apple (electricity), Meta (electricity and water withdrawals), and Google (water withdrawals and consumption) being the three notable examples.<sup>17,18</sup> Instead, many operators have historically only disclosed such data for the entire company as a whole or for different operating regions as a whole, masking the energy and water requirements of individual data centers. And some operators report no data at all.<sup>19</sup>

How do analysts currently address these blind spots? Some analysts scour websites and financial filings for clues. Some analysts apply energy and water data from the companies that report data to estimate the energy and water requirements of the companies that don't report data. Some analysts even use satellite data to infer installed power capacities and sources. Regardless of the methods, analysts must typically make many assumptions to fill data gaps. As a result, there is a wide variance in analyst guesses about the energy and

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<sup>11</sup> Brown, Richard; Masanet, Eric; Nordman, Bruce; Tschudi, Bill; Shehabi, Arman; Stanley, John; Koomey, Jonathan; Sartor, Dale; Chan, Peter; Loper, Joe; Capana, Steve; Hedman, Bruce; Duff, Rebecca; Haines, Evan; Sass, Danielle; Fanara, Andrew (2007). Report to Congress on Server and Data Center Energy Efficiency: Public Law 109-431. Lawrence Berkeley National Laboratory, Berkeley, CA. LBNL-363E.

<https://escholarship.org/uc/item/74g2r0vg>

<sup>12</sup> Shehabi, A., S. J. Smith, N. Horner, I. Azevedo, R. Brown, J. Koomey, E. Masanet, D. Sartor, M. Herrlin, and W. Lintner (2016). "United States Data Center Energy Usage Report." Lawrence Berkeley National Laboratory, Berkeley, CA. LBNL-1005775. <https://escholarship.org/content/qt84p772fc/qt84p772fc.pdf>

<sup>13</sup> Shehabi, Arman; Newkirk, Alex; Smith, Sarah J; Hubbard, Alex; Lei, Nuo; Siddik, Md Abu Bakar; Holecek, Billie; Koomey, Jonathan; Masanet, Eric; Sartor, Dale (2024). 2024 United States Data Center Energy Usage Report. Lawrence Berkeley National Laboratory, Berkeley, CA. LBNL-2001637.

<http://dx.doi.org/10.71468/P1WC7Q>

<sup>14</sup> IFRS Foundation (2026). SASB Standards. <https://www.ifrs.org/issued-standards/sasb-standards/understanding-sasb-standards/>

<sup>15</sup> CDP (2026). CDP Disclosure Cycle 2025. <https://www.cdp.net/en>

<sup>16</sup> Global Reporting Initiative (2026). GRI Standards. <https://www.globalreporting.org/>

<sup>17</sup> Apple (2025). 2025 Environmental Progress Report.

[https://www.apple.com/environment/pdf/Apple\\_Environmental\\_Progress\\_Report\\_2025.pdf](https://www.apple.com/environment/pdf/Apple_Environmental_Progress_Report_2025.pdf)

<sup>18</sup> Meta (2025). 2025 Environmental Index Data. [https://sustainability.atmeta.com/wp-content/uploads/2025/10/Meta\\_2025-Environmental-Data-Index.pdf](https://sustainability.atmeta.com/wp-content/uploads/2025/10/Meta_2025-Environmental-Data-Index.pdf)

<sup>19</sup> de Vries-Gao, A. (2026). The carbon and water footprints of data centers and what this could mean for artificial intelligence. *Patterns*, 7(1). <https://www.cell.com/patterns/fulltext/S2666-38992500278-8>

water requirements of U.S. data centers—whether in the past, present, or projected into the future—which casts a cloud of uncertainty over our collective understanding of this important sector.<sup>20</sup>

This uncertainty is problematic for at least two reasons. First, it precludes the common “ground truth” I discussed earlier, allowing different stakeholders to pick results that may better suit a particular argument or that reflect confirmation bias. Second, the high-level guesswork behind this uncertainty can’t confidently capture the underlying drivers of the sector’s energy and water requirements. Such drivers include the rapid evolution of many different data center hardware, cooling technology, locational, and operating factors.<sup>21</sup> This lack of detail means that analysts can’t always explain their results nor use them to project how changes in these underlying drivers will affect future energy and water use.

Second, when data are reported or otherwise made available, they generally **aren’t timely enough for this fast-moving sector**. Operators that report energy and water data generally do so in annual environmental, sustainability, or ESG reports that cover the previous year. In other words, reported data can already be several to many months old by the time they are made available to analysts. This means that most analysts’ models are calibrated to past energy and water use and not to the “real time” requirements of the sector, especially given the fast pace of innovation in the data center and AI industries.

Meanwhile, the current “AI-boom” is leading to an unprecedented number of new data center sites being planned or built today, which can be very different from previous sites in terms of their sizes, locations, technology characteristics, cooling system choices, and energy and water requirements.<sup>22</sup> Unfortunately, many **“real time” project details are not publicly disclosed** due to nondisclosure agreements (NDAs) with local utilities and officials. Such NDAs make it hard or impossible for analysts to confidently assess the implications of planned or under-construction projects and to calibrate our models to capture the latest data center sector characteristics for more accurate and timely insights, especially at local levels. For example, investments in behind the meter generation are not always disclosed, making analysis of power and grid requirements uncertain, nor are cooling system characteristics, making analysis of water infrastructure requirements

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<sup>20</sup> Ian Goldsmith and Zach Byrum (2025). Powering the US Data Center Boom: Why Forecasting Can Be So Tricky. World Resources Institute. September 17, 2025. <https://www.wri.org/insights/us-data-centers-electricity-demand>

<sup>21</sup> Shehabi, Arman; Newkirk, Alex; Smith, Sarah J; Hubbard, Alex; Lei, Nuoa; Siddik, Md Abu Bakar; Holecek, Billie; Koomey, Jonathan; Masanet, Eric; Sartor, Dale (2024). 2024 United States Data Center Energy Usage Report. Lawrence Berkeley National Laboratory, Berkeley, CA. LBNL-2001637. <http://dx.doi.org/10.71468/P1WC7Q>

<sup>22</sup> BloombergNEF (2025). AI and the power grid: where the rubber meets the road. December 1, 2025. <https://about.bnef.com/insights/clean-energy/ai-and-the-power-grid-where-the-rubber-meets-the-road/>

uncertain.<sup>23,24</sup> When NDAs are in place, they can not only hide important data that could substantially improve analyst assessments and models, they can also hide important information from local communities for use in their decision-making processes.

Additionally, blind spots on the characteristics of new and future builds also **inhibit analysts from making more reliable projections of future data center infrastructure requirements**. There are many trends playing out in real time that may significantly affect the infrastructure needs of the U.S. data center sector. These include potential shifts toward liquid cooling at higher rack supply temperatures, onsite generation technologies, onsite energy storage, new energy supply partnerships, more efficient hardware, more efficient model types and algorithms, and waste heat recovery and utilization, to name just some of the major trends. What might these trends mean for grid reliability? For innovation opportunities? For water infrastructure requirements? Without more timely data on the actual adoption rates and real-world characteristics of these emerging technologies, it can be quite difficult for analysts to answer such questions with reasonable certainty.

Third, because analysts must often invest a lot of time and resources to construct their own datasets, these datasets **aren't always shared or made publicly available**. This can lead to knowledge silos, a lack of independent verification of data, inability to replicate studies, inability of some analysts to use the “best” data, and more closed science across the analyst community. These trends run counter to the shared data and open science foundations that the United States has laid for analysts of other major energy-consuming sectors in the past. Greater, more granular, and more standardized reporting of data center energy and water use by U.S. operators would help to alleviate this problem.<sup>25</sup>

Fourth, **analysts' understanding of the potential “net” impacts of artificial intelligence is presently very limited**. While the data centers that are fueling the “AI boom” are adding large energy loads, it is likely that AI applications will affect local and national energy and water use, too. Whether AI applications will ultimately help reduce national energy and water use (leading to “net” impacts that are lower than data center impacts) or will increase national energy and water use (leading to “net” impacts that are higher than data center impacts) is currently highly uncertain, and will require extensive data standards, collection, and sharing on AI applications moving forward. These efforts will be critical so

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<sup>23</sup> Halpern, E. (2026). Silicon Valley is building a shadow power grid for data centers across the U.S. February 19, 2026. <https://www.washingtonpost.com/business/2026/02/19/data-centers-power-grid-ai/>

<sup>24</sup> Lei, N., Lu, J., Shehabi, A., & Masanet, E. (2025). The water use of data center workloads: A review and assessment of key determinants. *Resources, Conservation and Recycling*, 219, 108310. <https://doi.org/10.1016/j.resconrec.2025.108310>

<sup>25</sup> Masanet, E., Lei, N., & Koomey, J. (2024). To better understand AI's growing energy use, analysts need a data revolution. *Joule*, 8(9), 2427-2436. [https://www.cell.com/joule/fulltext/S2542-4351\(24\)00347-7](https://www.cell.com/joule/fulltext/S2542-4351(24)00347-7)

that analysts have both a common evidence basis and consensus-based analysis standards for calculating net effects in consistent ways for decision makers, especially when estimating how impacts are distributed spatially.<sup>26</sup> The importance of such data investments has increased substantially, given that many companies have begun highlighting the potential benefits of AI applications, yet one recent independent analysis has concluded that many of these claims are not adequately supported by evidence.<sup>27</sup>

Fortunately, the above blind spots can be readily addressed and through approaches that are both well established and have precedence for other major energy-consuming sectors. My colleagues and I described a number of relevant opportunities for different stakeholders in a recent “call to action” for improved data availability.<sup>28</sup> Below, I summarize some key opportunities identified for government and industry.

First, data center operators already have the needed data in hand, given that power and water are mission critical utilities that are monitored closely. These data just need to be unlocked. As discussed earlier, a few major data center operators already disclose energy and water utilization data for individual data centers in their annual reports, demonstrating that public disclosure is possible. These practices should be replicated across all U.S. data center operators, which could be achieved, for example, through disclosure requirements in data center, cloud, and AI service procurement standards at government agencies and other large institutions.

Additionally, there are examples of other major energy-consuming industries that have launched their own verified data collection, anonymizing, and sharing initiatives to fill critical public data gaps on their sector’s energy and resource performance, such as the global cement industry’s “Getting the Numbers Right” initiative.<sup>29</sup> The data center sector can look to these existing programs as roadmaps for proactively providing critical open data while protecting trade secrets.

Second, for more timely and granular data, government surveys and data collection initiatives can play a major role. For example, the U.S. Energy Information Administration and U.S. Census Bureau have decades of experience designing surveys, collecting and standardizing data, protecting confidential information, and publishing open datasets on a

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<sup>26</sup> Amy Luers, Jonathan Koomey, Eric Masanet, Owen Gaffney, Felix Creutzig, Juan Lavista Ferres, Eric Horvitz (2024). Will AI accelerate or delay the race to net-zero emissions? *Nature*.  
<https://doi.org/10.1038/d41586-024-01137-x>

<sup>27</sup> Taft, M. (2026). Big Tech Says Generative AI Will Save the Planet. It Doesn’t Offer Much Proof. *Wired*. February 18, 2026.

<sup>28</sup> Masanet, E., Lei, N., & Koomey, J. (2024). To better understand AI’s growing energy use, analysts need a data revolution. *Joule*, 8(9), 2427-2436. [https://www.cell.com/joule/fulltext/S2542-4351\(24\)00347-7](https://www.cell.com/joule/fulltext/S2542-4351(24)00347-7)

<sup>29</sup> WBCSD (2016). Getting the Numbers Right (GNR). <https://docs.wbcsd.org/2016/12/GNR.pdf>

wide range of energy, resource, and economic statistics for major U.S. sectors. Some of these data collection activities occur at quarterly or even monthly frequencies. Such capabilities could be leveraged for collecting timely energy, water, and technology and operations data not only from U.S. data center operators, but also from power and water utilities and local jurisdictions and permitting authorities. Many U.S. operators already report detailed data, metrics, and information on their data center facilities operating in Europe under the European Commission’s Energy Efficiency Directive, which demonstrates that such government data collection programs are not only possible but also have an established playbook.<sup>30</sup> U.S. government agencies can look to this reporting system for guidance on the types of data already being collected and how aggregated statistics will be shared publicly.

Third, government can play a key enabling role in developing improved data standards and facilitating convenings to advance the nation’s analytical excellence. Convenings of experts can help reduce knowledge silos by enabling public, private, research, and nonprofit sector analysts to collectively identify critical data needs, share and compare methods, identify and promote best analysis practices and data standards, and develop roadmaps for improving analysis techniques that can reduce uncertainties and provide more confident assessments and outlooks on U.S. data center infrastructure requirements to decision makers. Convenings and knowledge sharing forums will be especially important for developing and disseminating consensus-based standards, frameworks, and datasets for assessing the “net” effects of AI moving forward.

As the old adage goes, “you can’t manage what you don’t measure.” Unfortunately, due to the data gaps I’ve described today, many analysts currently struggle to provide accurate and timely assessments to policymakers and communities for managing the scales and characteristics U.S. data center energy and water infrastructure demands.

However, these data gaps can be addressed relatively quickly with the right actions and commitments by government and industry, many of which have established playbooks or have long been done for other major sectors of strategic national importance. High-quality, open data benefit analysts across all U.S. economic sectors, irrespective of their research questions. In my view, given the importance of data centers and AI to many different stakeholder issues, and the rapid growth of the sector, investing in improved data foundations to unlock better strategic insights should be an urgent national priority.

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<sup>30</sup> European Commission (2026). Energy performance of data centres.  
[https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive/energy-performance-data-centres\\_en](https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive/energy-performance-data-centres_en)

Chairman McCormick, Ranking Member Sykes, and esteemed Members of the Committee, thank you again for the opportunity to testify before you today. I look forward to our discussion and to answering your questions.