

**THE FUTURE IS NUCLEAR: WHY THE GROWTH OF AI DATA CENTERS NEEDS  
NUCLEAR ENERGY**

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**I. INTRODUCTION**

The adoption and development of Artificial Intelligence (“AI”) programs have taken the world by storm, as their productivity and capabilities have evolved at an exponential pace.<sup>2</sup> In response, the data center infrastructure has adapted its facilities to reflect a more AI-ready and responsive framework.<sup>3</sup> The widespread advancement and implementation of AI programs and AI data centers have prompted CEOs of major tech companies and firms to push enormous investments and vast amounts of resources into the development and construction of AI data centers.<sup>4</sup>

To ensure that AI data centers run properly and are being used to their maximum potential, they need to consume a significant amount of energy.<sup>5</sup> Today, most of these AI data centers mainly derive their energy from fossil fuels, which are used primarily for generating electricity.<sup>6</sup> However, the massive amount of energy that is essential to the operational ability of an AI data center also creates

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<sup>2</sup> Alexandra Jonker & Alice Gomstyn, *What is an AI data center?*, IBM (Feb. 21, 2025), <https://www.ibm.com/think/topics/ai-data-center>.

<sup>3</sup> *Id.*

<sup>4</sup> Emil Sayegh, *The Billion-Dollar AI Gamble: Data Centers As The New High-Stakes Game*, FORBES (Sep. 30, 2024), <https://www.forbes.com/sites/emilsayegh/2024/09/30/the-billion-dollar-ai-gamble-data-centers-as-the-new-high-stakes-game/>.

<sup>5</sup> Connor Green, *Leaving the Faucet Running: The Legal Battle against Gen AI’s Water Consumption*, SUFFOLK UNIV. L. SCH. (May 21, 2025), <https://sites.suffolk.edu/jhtl/2025/05/21/leaving-the-faucet-running-the-legal-battle-against-gen-ais-water-consumption/>.

<sup>6</sup> Renée Cho, *AI’s Growing Carbon Footprint*, COLUM. CLIMATE SCH. (June 9, 2023), <https://news.climate.columbia.edu/2023/06/09/ais-growing-carbon-footprint/>.

a risk of overheating.<sup>7</sup> To mitigate this risk and safeguard their investments, tech giants are using cooling towers and air or liquid cooling systems to diminish heat.<sup>8</sup> Data centers also use large amounts of water to cool their processor chips through a closed-loop network.<sup>9</sup> In using a closed-loop network, chilled air is injected into targeted areas, such as the individual server racks housed in data centers, rather than using the chilled air to cool an entire room.<sup>10</sup> The network is “closed” in the sense that the chilled air is restricted to a smaller and more targeted area.<sup>11</sup> Therefore, with the steady and constant demand of an increasing number of AI data centers, the demand for water to cool these facilities is rapidly increasing.<sup>12</sup>

As tech companies and firms attempt to maximize profit by constructing a multitude of AI data centers, they are aiming to acquire areas throughout the United States with low land costs, tax incentives, and access to renewable energy.<sup>13</sup> There are currently more than 5,000 AI-optimized data centers in the United States alone, and certain states possessing the desirable qualities stated above have been targeted more than others.<sup>14</sup> However, although these areas seem to provide an optimal space for data center construction, they are often already faced

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<sup>7</sup> Chris Schlag, et al., *Water use in US data centers: Legal and regulatory risks*, NIXON PEABODY (Sep. 5, 2025), <https://www.nixonpeabody.com/insights/articles/2025/09/05/water-use-in-us-data-centers-legal-and-regulatory-risks>.

<sup>8</sup> Green, *supra* note 5.

<sup>9</sup> Miguel Yañez-Barnuevo, *Data Centers and Water Consumption*, ENV'T AND ENERGY STUDY INST. (June 25, 2025), <https://www.eesi.org/articles/view/data-centers-and-water-consumption>.

<sup>10</sup> Christopher Tozzi, *What is Closed-Loop Cooling, and When Should Data Centers Use It?*, DATA CENTER KNOWLEDGE (Oct. 21, 2024), <https://www.datacenterknowledge.com/cooling/what-is-closed-loop-cooling-and-when-should-data-centers-use-it->.

<sup>11</sup> *Id.*

<sup>12</sup> Green, *supra* note 5.

<sup>13</sup> Schlag, et al., *supra* note 7.

<sup>14</sup> Corin Cesaric, *AI Data Centers are Coming for your Land, Water and Power*, CNET (Sep. 24, 2025), <https://www.cnet.com/tech/services-and-software/features/ai-data-centers-are-coming-for-your-land-water-and-power/>.

with issues of water scarcity and highly competitive demands for the limited natural resources that fuel AI data centers.<sup>15</sup>

In addition, despite the exponential growth of AI data centers and concern over freshwater scarcity, these regions possess little to no enforceable legislation or regulations to confront AI data centers' environmental impacts or water consumption.<sup>16</sup>

Many tech firms and companies are looking to reduce their data centers' ecological footprint by decreasing carbon emissions and water usage; however, using solar and wind as the sole source of energy at this stage is insufficient due to its expensive nature and unreliability to generate mass amounts of energy for a large facility.<sup>17</sup> Nuclear power, on the other hand, is a source of energy that has a proven track record of being reliable. Nuclear energy produces zero carbon emissions and has the ability to constantly generate enough electricity to keep data centers running for extended periods of time.<sup>18</sup> The proven consistency of nuclear energy to continuously power large infrastructures for an extended period of time has caught the attention of those looking to capitalize on the AI data center construction market.<sup>19</sup> Tech firms and companies have grown confident in the potential investment of small modular reactors ("SMRs") because of their flexibility and reduced demand for water as a coolant as compared to their traditional energy

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<sup>15</sup> Schlag, et al., *supra* note 7.

<sup>16</sup> Lakshmee Sharma, *AI Data Centers Threaten Global Water Security*, LAWFARE (Dec. 19, 2024), <https://www.lawfaremedia.org/article/ai-data-centers-threaten-global-water-security>.

<sup>17</sup> Matthew Barotz, *An Atomic Solution to AI's Energy Needs*, KLEINMAN CTR FOR ENERGY POL'Y (May 19, 2025), <https://kleinmanenergy.upenn.edu/commentary/blog/an-atomic-solution-to-ais-energy-needs/>.

<sup>18</sup> *Id.*

<sup>19</sup> *Id.*

counterparts.<sup>20</sup> Despite the potential advantages of using SMRs powered by nuclear energy to run AI data centers, there remains some skepticism due to the catastrophes nuclear energy has caused in decades past.<sup>21</sup>

Section II of this article will explain the history, operation, and evolution of AI data centers. Section III discusses some of the negative impacts that AI data centers create, including heavy freshwater use for cooling, high electricity costs, and the absence of enforceable legislation. Sections IV-VI will argue and conclude that it is more advantageous, environmentally stable, and environmentally conscious to power AI data centers using nuclear energy, and that the trend is already beginning. This article will highlight the continued need for states to issue regulations governing the environmental impact of data centers and will argue for why AI data centers should primarily power their facilities using nuclear energy to create a more sustainable environment that will be reflected throughout the continued evolution of AI.

## II. HISTORY

The explosion and steady development of AI over recent years can be attributed to its promising drive to boost innovation and productivity in every sector of the worldwide economy.<sup>22</sup> Investors, CEOs, and tech giants have attempted to capitalize on the development of AI by fusing AI technology with

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<sup>20</sup> *Id.*

<sup>21</sup> See Barotz, *supra* note 17. In March 2011, nearly half a million residents of Japan had to evacuate after an earthquake caused the Fukushima Dai-ichi nuclear power plant to leak radiation. *A Brief History of Nuclear Accidents Worldwide*, UNION OF CONCERNED SCIENTISTS (Oct. 1, 2013), <https://www.ucs.org/resources/brief-history-nuclear-accidents-worldwide>. In April 1986 220,000 people had to vacate their homes in Chernobyl, Ukraine after an explosion nearly completely destroyed a nuclear reactor. *Id.*

<sup>22</sup> Brad Smith, *The golden opportunity for American AI*, MICROSOFT (Jan. 3, 2025), <https://blogs.microsoft.com/on-the-issues/2025/01/03/the-golden-opportunity-for-american-ai/>.

traditional databases to create a more expansive set of value-added services to their portfolios.<sup>23</sup> By combining AI services with traditional databases, tech giants hope to optimize computing resources and allow for almost instantaneous presentations and analyses of complex data.<sup>24</sup> A successful fusion of databases and optimization of resources will allow humans to devote more time and energy to activities that require higher-order thinking or strategic planning.<sup>25</sup>

#### A. What is an AI Data Center

AI data centers require an infrastructure of hardware and software, often called an AI stack, to deliver the applications AI-models are designed for.<sup>26</sup> Companies and tech giants have currently built over 5,000 data centers, constructed for the sole purpose of housing AI databases, with new ones being built every day.<sup>27</sup> AI data centers are designed to have advanced computing, network, and storage infrastructures, as well as energy and cooling capabilities to address any functions that the AI database is designed to perform.<sup>28</sup> AI data centers are built to withstand enormous quantities of data, while operating and dispensing this information to the user with the lowest possible lag or delay.<sup>29</sup> However, achieving and sustaining this high-caliber performance is a tall task and requires

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<sup>23</sup> Ashok Reddy, *What is an AI Database? The Future of Data-Driven Decisions*, FORBES (July 9, 2024), <https://www.forbes.com/councils/forbestechcouncil/2024/07/09/what-is-an-ai-database-the-future-of-data-driven-decisions/>.

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> Jonker & Gomstyn, *supra* note 2.

<sup>27</sup> Nancy W. Stauffer, *The Multi-Faceted Challenge of Powering AI*, MITEI (Jan. 7, 2025), <https://energy.mit.edu/news/the-multi-faceted-challenge-of-powering-ai/>.

<sup>28</sup> Jonker & Gomstyn, *supra* note 2.

<sup>29</sup> Sayegh, *supra* note 4.

AI data centers to consist of high-performing AI servers, specialized networking systems, and advanced cooling systems.<sup>30</sup>

## B. Differences between a Traditional Data Center and AI-Optimized Data Centers

Whether designed for traditional use or AI workloads, data centers have always been constructed to serve three main purposes: (1) provide a safe space for computing equipment; (2) establish a facility for the constant flow of electrons to the equipment; and (3) reject and disperse heat from this equipment.<sup>31</sup> Although both traditional and AI-ready data centers share these three common purposes, there are various differences that set the two apart.<sup>32</sup> One major difference between the two is the capabilities and services that the infrastructure within the data center are expected to perform.<sup>33</sup> Traditional data centers have infrastructure that can provide services for everyday IT operations, but AI databases are designed to generate mass amounts of complex data that require infrastructure that is beyond the capability of infrastructures in traditional data centers.<sup>34</sup> Simply put, AI databases and applications require an entirely new type of data center that is specifically designed to meet the demands of AI.<sup>35</sup>

Although AI-optimized data centers and traditional data centers possess similarities in their physical qualities, the main difference between the two lies in

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<sup>30</sup> Taryn Plumb, *Inside the AI-Optimized Data Center: Why next-gen Infrastructure is Nonnegotiable*, NETWORKWORLD (Sep. 4, 2025), <https://www.networkworld.com/article/4050973/inside-the-ai-optimized-data-center-why-next-gen-infrastructure-is-non-negotiable.html#:~:text=Because%20AI%20is%20the%20next,shape%20the%20future%20of%20computing>.

<sup>31</sup> *A look inside the 'AI Data Center'*, EDGECORE (Aug. 16, 2024), <https://edgecore.com/a-look-inside-the-ai-data-center/>.

<sup>32</sup> *Id.*

<sup>33</sup> *Id.*

<sup>34</sup> Plumb, *supra* note 30.

<sup>35</sup> *Id.*

their differing *capabilities*.<sup>36</sup> Both data centers contain infrastructure and hardware, including servers, storage systems, and networking equipment, that are used to compute data.<sup>37</sup> Moreover, both of these data centers share the same general concerns of security, reliability, and energy sustainability.<sup>38</sup> However, AI databases substantially increase the scale and density of equipment, infrastructure, and hardware that these data centers deploy.<sup>39</sup> Moreover, although all data centers consume large amounts of energy, an AI-ready data center's hunger for energy surpasses that of traditional data centers.<sup>40</sup>

If the hardware contained inside a traditional data center attempted to support a complex AI-workload, it would be quickly overwhelmed.<sup>41</sup> This is because AI requests require a more intense data analysis than typical internet searches, which in turn requires the hardware in the data center to generate a greater amount of energy.<sup>42</sup> As AI continues to expand to meet the everchanging criteria and demands of the information technology sector and society, it requires next-generation infrastructure and hardware.<sup>43</sup> Traditional data centers simply cannot provide the necessary services needed to keep pace with the quickly evolving demands of modern AI technology and databases.<sup>44</sup>

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<sup>36</sup> *Id.*

<sup>37</sup> Jonker & Gomstyn, *supra* note 2.

<sup>38</sup> *Id.*

<sup>39</sup> *Id.*

<sup>40</sup> Bhargs Srivathsan, et al., *AI Power: Expanding data center capacity to meet growing demand*, MCKINSEY & CO. (Oct. 29, 2024), <https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-power-expanding-data-center-capacity-to-meet-growing-demand>.

<sup>41</sup> Jonker & Gomstyn, *supra* note 2.

<sup>42</sup> Mike Jacobs, *Power Hungry: Why Data Centers Are Developing Their Own Energy Sources to Fuel AI*, UNION OF CONCERNED SCIENTISTS (July 10, 2025), <https://blog.ucs.org/mike-jacobs/power-hungry-why-data-centers-are-developing-their-own-energy-sources-to-fuel-ai/#:~:text=Data%20centers%2C%20and%20other%20vital,to%20on%2Dsite%20power%20supply>.

<sup>43</sup> Plumb, *supra* note 30.

<sup>44</sup> Plumb, *supra* note 30.

### C. Powering AI Data Centers

AI-ready data centers require vast amounts of electricity to function, and it is therefore vital that they be located near power sources.<sup>45</sup> Utility companies generate electrical power through multiple energy sources including natural gases, coal, and a combination of renewable energy, such as solar and wind.<sup>46</sup> As the demand for power continues to surge simultaneously with the demand for increased AI workload, the use of renewable energy to generate electrical power is not nearly enough to keep pace.<sup>47</sup> In turn, utility operators have mainly turned their attention to relying on natural gases to supply this power.<sup>48</sup>

Natural gas comprises over 40% of the electricity source for data centers in the United States; it is the largest source.<sup>49</sup> The driving reasons behind natural gases' abundant use to generate electrical energy is its fast and relatively cheap availability.<sup>50</sup> In the United States alone, utility operators can rely on an abundance of natural gas reserves in underground reservoirs and offshore deposits.<sup>51</sup> As the demand for AI data centers grows, companies are looking for the fastest and cheapest ways to power these facilities and natural gases are viewed as the best option.<sup>52</sup> By using natural gases to generate electricity, a data center

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<sup>45</sup> Maheep Mandloi, *The Energy Sources Powering the AI Revolution*, MIZUHO (Sep. 20, 2024), <https://www.mizuhogroup.com/americas/insights/2024/09/the-energy-sources-powering-the-ai-revolution.html#:~:text=As%20a%20result%2C%20solar%2C%20wind,the%20first%20half%20of%202024.>

<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

<sup>48</sup> *Id.*

<sup>49</sup> *Energy Supply for AI*, IEA, <https://www.iea.org/reports/energy-and-ai/energy-supply-for-ai> (last visited Nov. 20, 2025).

<sup>50</sup> Evan Gorelick, *Why Don't Data Centers Use More Green Energy?*, NEW YORK TIMES (Sep. 27, 2025), <https://www.nytimes.com/2025/09/27/business/dealbook/why-dont-data-centers-use-more-green-energy.html#:~:text=If%20data%20centers%20continue%20expanding,which%20has%20its%20own%20drawbacks.&text=Trump's%20policies%20are%20only%20making,seeing%20an%20opportunity%20to%20invest.>

<sup>51</sup> *Id.*

<sup>52</sup> *Id.*

can become fully powered in one to two years.<sup>53</sup> The only other power source that can slightly compete with the inexpensive and ready availability that natural gases provide, is solar power.<sup>54</sup> However, solar energy cannot generate enough electricity to produce the large amount of power that AI-ready data centers need to function.<sup>55</sup>

To generate electricity for these data centers using natural gases, one method is to install natural gas turbines directly within data center sites.<sup>56</sup> These natural gas turbines spin rotating blades by pushing hot combustion gas through the turbine as it expands.<sup>57</sup> In turn, as these blades rotate and spin, they draw more pressurized air into the combustion section and spin a generator which produces electricity.<sup>58</sup> The steam and pressurized air used to spin these blades is then cooled by cooling water, which flows through condensers on each side of the steam turbines, before returning to the boiler.<sup>59</sup> This is the part of the process in which a cooling tower supports and plays a vital role.<sup>60</sup>

#### D. Growing Demand for AI Data Centers and Supporting Power Systems

Although the idea and development of AI has been in circulation since around the 1950's, the 'AI explosion' and specialized data center demand that is looming over the information technology space and economic sphere today seemed

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<sup>53</sup> *Id.*

<sup>54</sup> *Id.*

<sup>55</sup> *Id.*

<sup>56</sup> *How Gas Turbine Power Plants Work*, U.S. DEPART. OF ENERGY (Last visited on Nov. 20, 2025),

[https://www.energy.gov/fecm/how-gas-turbine-power-plants-](https://www.energy.gov/fecm/how-gas-turbine-power-plants-work#:~:text=As%20hot%20combustion%20gas%20expands,a%20generator%20to%20produce%20electricity)

[work#:~:text=As%20hot%20combustion%20gas%20expands,a%20generator%20to%20produce%20electricity.](https://www.energy.gov/fecm/how-gas-turbine-power-plants-work#:~:text=As%20hot%20combustion%20gas%20expands,a%20generator%20to%20produce%20electricity)

<sup>57</sup> *Id.*

<sup>58</sup> *Id.*

<sup>59</sup> *Everything you ever wanted to know about cooling towers*, DRAX (May 17, 2017), [https://www.drax.com/power-](https://www.drax.com/power-generation/everything-you-ever-wanted-to-know-about-cooling-towers/#:~:text=As%20the%20name%20suggests%2C%20a,naturally%20drawn%20through%20the%20tower)

[generation/everything-you-ever-wanted-to-know-about-cooling-](https://www.drax.com/power-generation/everything-you-ever-wanted-to-know-about-cooling-towers/#:~:text=As%20the%20name%20suggests%2C%20a,naturally%20drawn%20through%20the%20tower)

[towers/#:~:text=As%20the%20name%20suggests%2C%20a,naturally%20drawn%20through%20the%20tower.](https://www.drax.com/power-generation/everything-you-ever-wanted-to-know-about-cooling-towers/#:~:text=As%20the%20name%20suggests%2C%20a,naturally%20drawn%20through%20the%20tower)

<sup>60</sup> *Id.*

to happen overnight.<sup>61</sup> Before the launch of the infamous ‘ChatGPT’ in November 2022, data centers allocated each server rack about ten to twelve kilowatts (“kW”) of electricity to run its computing programs.<sup>62</sup> However, since the recent ‘AI explosion’, AI-optimized data centers are equipped to supply machines five to ten times that density, with forty to one hundred-ten kW of electrical power per rack.<sup>63</sup> The average power density that data centers can support has steadily increased over recent years, and by 2030, the power demand for AI-ready data centers is expected to grow by 160%.<sup>64</sup>

As AI continues to grow, the rising need for data centers and facilities has been highlighted as a real issue.<sup>65</sup> Ten years ago, before the current increased demand for AI workloads, a thirty-megawatt (“MW”) data center was considered large in size and computing power.<sup>66</sup> However, due to the increased demand for AI workloads, today a two-hundred-MW data center is considered to be average in its ability to compute power.<sup>67</sup>

#### E. Current Companies using AI Data Centers

As AI-ready databases and infrastructures continue to grow, CEOs of some of the biggest data center operators, investors, and tech firms have met with industry leaders to ensure that the United States leads the world in AI

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<sup>61</sup> *A look inside the ‘AI Data Center’, supra note 31.*

<sup>62</sup> *Id.*

<sup>63</sup> *Id.*

<sup>64</sup> William de Hoop Scheffer, *Renewable Energy for AI Data Centers: A Complete Guide*, HANWHA DATA CTRS. (Aug. 13, 2025), <https://www.hanwhadatacenters.com/blog/renewable-energy-for-ai-data-centers-a-complete-guide/>.

<sup>65</sup> Srivathsan, et al., *supra* note 40.

<sup>66</sup> *Id.*

<sup>67</sup> See Srivathsan, et al., *supra* note 40. Today, the newest large-scale data centers that support AI capabilities can use more than one-hundred MW hours a month, five times more than traditional data centers could support before the AI boom. Felicity Barringer, *Thirsty for Power and Water, AI-Crunching Data Centers Sprout Across the West*, STANFORD UNIV. (Apr. 8, 2025), <https://andthewest.stanford.edu>.

development.<sup>68</sup> Companies such as Amazon, Apple, Google, Meta, Microsoft, BlackRock, and OpenAI are all at the forefront of AI-ready data center development and are spending large amounts of money to keep ahead of the competition.<sup>69</sup> According to BloombergNEF, as of September 2025, Amazon Web Services, Google, Meta, and Microsoft have spent nearly \$100 billion on AI infrastructure in their most recent quarters and control 42% of the United States data center capacity.<sup>70</sup> Furthermore, companies and investors are not looking to construct AI-ready data centers exclusively in the United States, but rather they have a worldwide expansion at the forefront of their minds.<sup>71</sup>

Moreover, some American states are incentivizing companies to construct AI-ready data centers because of the economic benefits the data center will bring to the surrounding areas.<sup>72</sup> For example, in Oregon, companies such as Meta, Apple, Twitter, and Google have received hundreds of millions of dollars in tax breaks in exchange for developing and constructing their data centers in the State.<sup>73</sup> Furthermore, in July 2025, at an Energy Summit in Pittsburgh, Pennsylvania, developers announced an upward investment of \$90 billion for AI development in Pennsylvania.<sup>74</sup> Google, who was among these developers, individually contributed \$25 billion to the \$90 billion investment.<sup>75</sup> The following

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<sup>68</sup> Sayegh, *supra* note 4.

<sup>69</sup> Cesaric, *supra* note 14.

<sup>70</sup> *Id.*

<sup>71</sup> Srivathsan, et al., *supra* note 40. In 2023 Blackstone and Digital Realty entered into a \$7 billion deal to build data centers in Frankfurt and Paris. *Id.* A United States manufacturer, Super Micro Computer, is investing in data centers in Asia, while HCL Technologies is collaborating with Schneider Electric to develop data centers in the Asia Pacific region. *Id.*

<sup>72</sup> Barringer, *supra* note 67.

<sup>73</sup> See Barringer, *supra* note 67 (explaining that Amazon avoided \$83,877,339 in taxes in exchange for constructing a data center in Morrow County, Oregon).

<sup>74</sup> Cesaric, *supra* note 14.

<sup>75</sup> *Id.*

subsections discuss the investments that a few leaders in the AI industry have made to ensure that they stay ahead of the competition in the construction of AI-ready data centers.

*i. Microsoft*

During the 2025 fiscal year, Microsoft itself has invested nearly \$80 billion on building and developing AI infrastructure.<sup>76</sup> Microsoft announced this investment in January 2025, and Vice Chair and President, Brad Smith, stated that over half of this investment will be focused on the construction of infrastructures in the United States.<sup>77</sup>

*ii. Google*

Google has a deep and longstanding commitment to investing in the future growth of its company, especially in the area of technical infrastructure.<sup>78</sup> In August 2025, Google announced that it will be investing \$9 billion in Virginia through 2026 to support an AI-ready data center in New Chesterfield county.<sup>79</sup> This investment will not only help provide a brighter future for Google, but it will

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<sup>76</sup> See e.g., Cesaric, *supra* note 14; Smith, *supra* note 22.

<sup>77</sup> Jordan Novet, *Microsoft Expects to Spend \$80 Billion on AI-Enabled Data Centers in Fiscal 2025*, CNBC (Jan. 4, 2025), <https://www.cnbc.com/2025/01/03/microsoft-expects-to-spend-80-billion-on-ai-data-centers-in-fy-2025.html>.

<sup>78</sup> *Funding Supports new Cloud and Artificial Intelligence (AI) Infrastructure*, Including new Chesterfield County Data Center, GRPVA (Aug. 27, 2025), [https://www.grpva.com/news/google-announces-new-9b-investment-in-virginia/?utm\\_source=adwords&utm\\_campaign=Industry-Targeted+Campaign&utm\\_medium=ppc&utm\\_term=&hsa\\_ver=3&hsa\\_src=g&hsa\\_net=adwords&hsa\\_mt=&hsa\\_grp=170804041196&hsa\\_kw=&hsa\\_tgt=dsa-19959388920&hsa\\_acc=6439411779&hsa\\_cam=2057512294&hsa\\_ad=722226990880&gad\\_source=1&gad\\_campaignid=2057512294&gbraid=0AAAAADkzPCIW\\_zgWWmjUSJH-mIgCiPDF9&gclid=CjwKCAjw0sfHBhB6EiwAQtv5qTu0zHhL63L0vpGMvSCOhoOSbnOSQKUXP10TnzW\\_\\_zL66CkuakJS0RoCuOYQAvD\\_BwE](https://www.grpva.com/news/google-announces-new-9b-investment-in-virginia/?utm_source=adwords&utm_campaign=Industry-Targeted+Campaign&utm_medium=ppc&utm_term=&hsa_ver=3&hsa_src=g&hsa_net=adwords&hsa_mt=&hsa_grp=170804041196&hsa_kw=&hsa_tgt=dsa-19959388920&hsa_acc=6439411779&hsa_cam=2057512294&hsa_ad=722226990880&gad_source=1&gad_campaignid=2057512294&gbraid=0AAAAADkzPCIW_zgWWmjUSJH-mIgCiPDF9&gclid=CjwKCAjw0sfHBhB6EiwAQtv5qTu0zHhL63L0vpGMvSCOhoOSbnOSQKUXP10TnzW__zL66CkuakJS0RoCuOYQAvD_BwE).

<sup>79</sup> *Id.*

also help provide Americans a more readily accessible opportunity to experience the innovation of AI.<sup>80</sup>

*iii. Amazon Web Services (“AWS”)*

AWS is a cloud program offered by Amazon.com Inc, and has emerged as one of the primary profit drivers for Amazon.<sup>81</sup> AWS consists of many different computing products and services, and was implemented for the purpose of providing servers, networking, and remote computing to companies looking for large amounts of storage.<sup>82</sup> To further expand its current services, AWS has become committed to continue developing its AI infrastructure and resources.<sup>83</sup> One step that AWS took to meet this goal was announcing an investment of over \$30 billion to build out data centers and develop AI innovation in Pennsylvania and North Carolina.<sup>84</sup> This investment demonstrates that Amazon is committed to building its cloud and AI infrastructure to meet the increasing appetite of AI workload.<sup>85</sup>

*iv. Meta*

Lastly, Meta, the parent company of the popular social media platforms Facebook and Instagram, continues to be a leader in the AI infrastructure field through one of its newest investments in northeast Louisiana.<sup>86</sup> In December 2024,

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<sup>80</sup> *Id.*

<sup>81</sup> Vanessa Page, *What is Amazon Web Services, and why is it so Successful?*, INVESTOPEDIA (June 13, 2024), <https://www.investopedia.com/articles/investing/011316/what-amazon-web-services-and-why-it-so-successful.asp>.

<sup>82</sup> *Id.*

<sup>83</sup> Matt Vincent, *Amazon Doubles Down on Ai Infrastructure with \$30B in New U.S. Data Center Investments*, DATA CTR. FRONTIER (June 10, 2025), <https://www.datacenterfrontier.com/hyperscale/article/55295967/amazon-doubles-down-on-ai-infrastructure-with-30b-in-new-us-data-center-investments>.

<sup>84</sup> *Id.*

<sup>85</sup> *Id.*

<sup>86</sup> *Meta Selects Northeast Louisiana as Site of \$10 Billion Artificial Intelligence Optimized Data Center; Governor Jeff Landry Calls Investment ‘A New Chapter’ for State*, LA. ECONOMIC DEVELOPMENT (Dec. 4, 2024),

Meta announced it will build a \$10 billion AI data center in northeast Louisiana.<sup>87</sup> This facility will stand as one of Meta’s largest data centers in the world.<sup>88</sup> To power this data center, Meta has pledged to generate electricity with 100% clean and renewable energy and has committed to contributing \$1 million per year to “The Power Care” low-income ratepayer support program.<sup>89</sup>

As AI continues to revolutionize the data center industry, tech companies and firms will continue to invest into the development and construction of AI-ready data centers.<sup>90</sup> Analytics predict the AI data center industry will be a \$200 billion market by 2028.<sup>91</sup> As shown by the investments deployed by some of the largest technology companies stated above, this seems like a realistic prediction.<sup>92</sup>

### III. THE PROBLEM WITH AI DATA CENTERS

#### A. Cooling Towers and Water Consumption

Heat is the ultimate enemy to AI data centers and poses many complications by reducing the efficiency of the data center or even in extreme cases rendering them inoperable.<sup>93</sup> To combat and reduce the risk that excessive heat may cause, AI data centers have employed various cooling systems, including one that uses evaporative cooling and requires a significant amount of water.<sup>94</sup> Water is essential

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<https://www.opportunitylouisiana.gov/news/meta-selects-northeast-louisiana-as-site-of-10-billion-artificial-intelligence-optimized-data-center-governor-jeff-landry-calls-investment-a-new-chapter-for-state>. [hereinafter *Northeast Louisiana*].

<sup>87</sup> *Id.*

<sup>88</sup> *Id.*

<sup>89</sup> See *Northeast Louisiana*, *supra* note 86. Entergy created “The Power to Care Program” to help provide emergency utility bill assistance to older adults and people with disabilities.

<sup>90</sup> Scheffer, *supra* note 64.

<sup>91</sup> John Temple, *How Are Companies Building AI-Ready Data Centers? The Infrastructure Race Reshaping Digital Computing*, HAWNWA DATA CNTRS. (July 30, 2025), <https://www.hanwhadatacenters.com/blog/how-are-companies-building-ai-ready-data-centers-the-infrastructure-race-reshaping-digital-computing/>.

<sup>92</sup> Scheffer, *supra* note 64.

<sup>93</sup> Barringer, *supra* note 67.

<sup>94</sup> *Id.*

in the cooling systems of data centers to ensure that the servers can run without interference for 24 hours a day, 7 days a week.<sup>95</sup> The amount of services that an AI data center can produce is largely dictated by how well the data center can cool its servers and infrastructure.<sup>96</sup> Additionally, AI data centers use water for their humidification systems and facility maintenance.<sup>97</sup> In addition to the on-site use of water data centers consume substantial water off-site, which typically occurs at power plants that generate electricity for the data centers.<sup>98</sup>

In a water cooling method, water is used in chilled water systems of cooling towers to absorb and remove heat from the data center.<sup>99</sup> A chilled water system works by circulating water through cooling coils that absorb the heat from the air inside the data center.<sup>100</sup> The chilled water system then pushes the heat into the outside environment through a cooling tower.<sup>101</sup> Although this cooling system is an effective method to cool data centers, it requires significant water usage, which is especially a concern in areas facing water scarcity, where it seems AI data centers are gravitating towards.<sup>102</sup>

AI data centers primarily obtain the water needed for its cooling systems from municipal or regional water utility companies.<sup>103</sup> This water is typically potable water or freshwater, which is suitable for drinking.<sup>104</sup> Potable water and

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<sup>95</sup> Mary Zhang, *Data Center Water Usage: A Comprehensive Guide*, DGTL INFRA (Jan. 17, 2024), <https://dgtlinfra.com/data-center-water-usage/>.

<sup>96</sup> Barringer, *supra* note 67.

<sup>97</sup> Zhang, *supra* note 95.

<sup>98</sup> *Id.*

<sup>99</sup> *Id.*

<sup>100</sup> *Id.*

<sup>101</sup> *Id.*

<sup>102</sup> *Id.*

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

other freshwater is used and preferred over alternatives such as salt water because these water sources typically do not cause microbial build-up through exposure to nutrients, sunlight, or air that other water sources may be susceptible to.<sup>105</sup> A microbial build-up could result in a massive disruption of the data center's ability to operate.<sup>106</sup> Moreover, potable water is easily accessible and reliable, making it the premium choice for cooling systems of large AI data centers.<sup>107</sup> Because of these benefits, 95% of water used for AI data center cooling systems is potable water while alternative water sources are used minimally, contributing less than 5% of the total water usage.<sup>108</sup>

Companies attempt to conserve water and maximize its use in a cooling system to the fullest extent possible by, reusing water and circulating it through their cooling systems multiple times.<sup>109</sup> However, this process of recycling the same water through the cooling system is not unlimited.<sup>110</sup> Replacement of this water becomes necessary when the water's conductivity reaches excessively high levels.<sup>111</sup> Once the water is no longer usable in the data center's cooling system it becomes 'spent' and can only be repurposed for other uses such as irrigation.<sup>112</sup> Moreover, the recycling of water does not recoup a majority of the water that is

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<sup>105</sup> Abby Lopez, *AI, Data Centers, and Potable Water*, ACCOUNTABILITY (Sep. 2, 2025), <https://www.accountabilityconsole.com/newsletter/articles/ai-data-centers-and-potable-water/#:~:text=Additionally%2C%20potable%20water%20is%20used,use%20on%20these%20data%20centers.>

<sup>106</sup> *Id.*

<sup>107</sup> *Id.*

<sup>108</sup> Zhang, *supra* note 95 (finding that the alternative water sources that are used include on-site groundwater, surface water, seawater, and rainwater).

<sup>109</sup> *Id.*

<sup>110</sup> *Id.*

<sup>111</sup> *Id.*

<sup>112</sup> *Id.*

used during the cooling process.<sup>113</sup> This point was made by Mashieka Allgood, an AI ethicist, who states that during the cool processing of a data center, a significant amount of water is evaporated, and even if all the water doesn't evaporate, you still have to treat it, which renders it unrecyclable.<sup>114</sup>

As the number of AI data centers continue to expand and use a growing amount of energy, so does the amount of water that is needed to cool the facilities servers and processing chips.<sup>115</sup> With AI data centers expanding at an extraordinary pace and their growing thirst for water, freshwater supplies are put at a great risk.<sup>116</sup>

#### B. Concerns about Water Consumption Are Well Documented

A report published by the Energy Department highlights the growing demand for water by AI data centers.<sup>117</sup> The report notes that in 2014, U.S. data centers used 21.1 billion liters or 5.6 billion gallons of water to cool down the servers and infrastructure within the data center.<sup>118</sup> However, by 2023, 84 percent of the water was used to run large scale data centers designed for AI workload, and the total water use tripled to 66 billion liters or 17.4 billion gallons.<sup>119</sup>

In the southwest of the United States, AI data centers are generating mass concern over the amount of water they are consuming in areas already facing water

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<sup>113</sup> Barringer, *supra* note 67.

<sup>114</sup> *Id.*

<sup>115</sup> See Yañez-Barnuevo, *supra* note 9. The new computer chips designed to produce AI workloads, like Nvidia's Blackwell chip, use more electricity and therefore need more cooling than the AI chips developed in past years. Barringer, *supra* note 67.

<sup>116</sup> Yañez-Barnuevo, *supra* note 9.

<sup>117</sup> See Barringer, *supra* note 67; Arman Shehabi, et al., 2024 United States Data Center Energy Usage Report, LAWRENCE BERKELEY NAT'L LAB'Y (Dec. 20, 2024), <https://escholarship.org/uc/item/32d6m0d1>.

<sup>118</sup> *Id.*

<sup>119</sup> *Id.*

scarcity.<sup>120</sup> A recently published APM Research Lab report stated that Meta's AI data center in Goodyear, just west of Phoenix, Arizona, uses about 56 million gallons of potable water per year, which is the equivalent of two percent of the town's residential use.<sup>121</sup> AI data centers like Meta's are continuing to gravitate towards the southwestern region of the U.S., and their environmental impacts, specifically water, continue to concern local residents and officials.<sup>122</sup>

### C. Increasingly High Electricity Costs

The electricity demands of AI data centers are another one of various detrimental environmental and social impacts caused by these facilities.<sup>123</sup> The power needed to train the generative AI models deployed with AI data centers, demand a staggering amount of electricity, which in turn leads to increased carbon dioxide emissions, pressures on the electric grid, and an increased cost on local residents.<sup>124</sup> According to the Organization for Economic Co-operation and Development, in 2022, the electricity consumption of AI data centers ranked as the 11<sup>th</sup> largest electricity consumer in the world.<sup>125</sup> Furthermore, by 2026, the electricity consumption of AI data centers is expected to move up to fifth on this global list.<sup>126</sup> As AI data centers continue to grow in the United States, the

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<sup>120</sup> Barringer, *supra* note 67.

<sup>121</sup> See Barringer, *supra* note 67; Maya Chari, *Are Data Centers Depleting the Southwest's Water and Energy Resources?*, APM RSCH. LAB (Feb. 27, 2025), <https://www.apmresearchlab.org/10x/data-centers-resource#:~:text=An%20analysis%20Microsoft%20shared%20with,1.9%25%20of%20the%20town's%20population.>

<sup>122</sup> Barringer, *supra* note 67.

<sup>123</sup> Adam Zewe, *Explain: Generative AI's environmental impact*, MIT (Jan. 17, 2025), <https://news.mit.edu/2025/explained-generative-ai-environmental-impact-0117>.

<sup>124</sup> *Id.*

<sup>125</sup> *Id.*

<sup>126</sup> Zewe, *supra* note 123 (stating that by 2026, it is expected that AI data centers' electrical consumption will approach 1,050 terawatt-hours).

increased electricity demand is simultaneously going to follow.<sup>127</sup> In 2023, AI data centers consumed more than 4% of the United States' electricity, and government analysts suggest and predict that this percentage will rise to 12% in as little as three years.<sup>128</sup>

As the electricity consumption of demand and consumption continues to increase, local residents have seen a dramatic increase in their electricity rate.<sup>129</sup> Recent reports expect that local residents and small businesses will bear this cost as a result of the expensive upgrades needed to improve the electric grids surrounding AI data centers, training of AI-models, and powering the infrastructure of AI data centers.<sup>130</sup> The increase in residential electricity rates has already been seen in states that are heavily populated with AI data centers.<sup>131</sup> In Ohio, for example, according to data from an independent monitor of the electric grid, the electricity bill of a typical household increased at least 15 dollars a month due to the effect of AI data centers.<sup>132</sup> Moreover, according to a study conducted by Carnegie Mellon University and North Carolina State University, electricity bills are on track to rise on an average of 8% nationwide by 2030.<sup>133</sup> In areas like Virginia, where the AI data center population is especially high, there is an expected increase to as much as 25%.<sup>134</sup> States across the country are starting to

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<sup>127</sup> Ivan Penn & Karen Weise, *Big Tech's A.I. Data Centers Are Driving Up Electricity Bills for Everyone*, NEW YORK TIMES (Aug. 14, 2025), <https://www.nytimes.com/2025/08/14/business/energy-environment/ai-data-centers-electricity-costs.html>.

<sup>128</sup> *Id.*

<sup>129</sup> *Id.*

<sup>130</sup> *Id.*

<sup>131</sup> *Id.*

<sup>132</sup> *Id.*

<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

see and feel the increased costs associated with AI data centers and residents are beginning to complain.

#### D. Air Pollutants

As AI data centers continue to grow, so do the number of pollutants being pushed out into the environment.<sup>135</sup> AI models that consume and depend on fossil-fuel-based electricity emit significant amounts of carbon dioxide and pollutants which contribute to the growing issue of greenhouse gas emissions.<sup>136</sup> Additionally, in areas where AI data centers generate a majority of their energy through the use of fossil fuels, the number of pollutants emitted has been found to be extraordinarily high.<sup>137</sup> The pollutants created from fossil fuel combustion cause air and water pollution, respiratory issues, and acid rain.<sup>138</sup> Additionally, the actual process of extracting fossil fuels, which is needed for electricity generation, can disrupt ecosystems, contribute to climate change, and cause environmental degradation.<sup>139</sup> These air pollutants are not solely negatively impacting the environment, but have been linked to cause consequential damages to humans.<sup>140</sup> The pollutants emitted from coal and natural gas plants, such as fine particular

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<sup>135</sup> *Why AI uses so much energy – and what we can do about it*, PENN. ST. INST. OF ENERGY AND THE ENV'T. (Sep. 8, 2025), <https://iee.psu.edu/news/blog/why-ai-uses-so-much-energy-and-what-we-can-do-about-it#:~:text=The%20environmental%20impact%20of%20AI,harm%20and%20worsen%20climate%20change>.

<sup>136</sup> *Id.*

<sup>137</sup> Bree Shirvell, *Can We Mitigate AI's Environmental Impacts?*, YALE SCH. OF THE ENV'T. (Oct. 10, 2024), <https://environment.yale.edu/news/article/can-we-mitigate-ais-environmental-impacts#:~:text=Yao:%20Powering%20computing%20systems%20for,and%20contribute%20to%20environmental%20degradati> on.

<sup>138</sup> *Id.*

<sup>139</sup> *Id.*

<sup>140</sup> Jeff Young, *AI's Air Pollution Problem: Data Center Energy Use Adds to Deadly Emissions*, NEWSWEEK (Dec. 12, 2024), <https://www.newsweek.com/ais-air-pollution-problem-data-center-energy-use-adds-deadly-emissions-2000092>.

matter and nitrogen oxides, contribute to respiratory and cardiovascular diseases.<sup>141</sup>

E. Lack of Comprehensive Legislation: Proposed and Enacted State Legislation in Place to Monitor the Impacts of AI Data Centers

Currently, the United States does not have any comprehensive legislation or regulations in place to monitor and hold AI data centers accountable for their environmental impacts.<sup>142</sup> However, regions in the United States like the Southwest that have faced water scarcity and have attempted to put regulations and legislation in place to keep these data centers accountable.<sup>143</sup> Specifically, the following states are looking to implement water use disclosure reporting requirements with site permitting applications.<sup>144</sup> These states are among some of the areas that face water scarcity and are pushing for regulations and legislation to be put in place.

*i. California*

California is one of the states considering implementing a measure that would address the increasing water demands of AI data centers.<sup>145</sup> The state's goal is to regulate AI data centers in manner that encourages stricter water conservation measures.<sup>146</sup> One proposed bill that would help implement the goals stated above is SB-58 Sales and Use Tax Law: exemptions: certified data center

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<sup>141</sup> *Id.*

<sup>142</sup> Mya Garcia, *Ai Uses How Much Water? Navigating Regulation of Ai Data Centers' Water Footprint Post-Watershed Loper Bright Decision*, 57 TEX. TECH L. REV. 517, 530 (2025).

<sup>143</sup> Schlag, et al., *supra* note 7.

<sup>144</sup> *Id.*

<sup>145</sup> *Id.*

<sup>146</sup> *Id.*

facilities (“S.B. 58”).<sup>147</sup> This bill would grant AI data centers a tax credit if they adopt sustainable practices.<sup>148</sup> This bill specifically emphasizes that among other requirements, an AI data center is eligible for tax exemptions if it employs water-efficient cooling systems for the duration of the qualification period.<sup>149</sup> Outside of employing more water-efficient systems, S.B. 58 also focuses on incentivizing data centers to utilize carbon-free energy and avoiding diesel fuel sources.<sup>150</sup> Outside of proposed legislation and bills, governmental agencies in California have explored issuing potential bans on the use of potable water for non-essential tasks within the AI data center.<sup>151</sup> S.B. 58 and governmental agencies are pushing for a bigger emphasis on water conservation in order to combat drought conditions.<sup>152</sup>

*ii. Arizona*

Officials in Arizona are addressing water allocation for AI data centers amid the state’s ongoing drought conditions.<sup>153</sup> Arizona has attempted to persuade AI data centers to use alternative water sources, other than potable water, and to contribute to the state’s local conservation programs.<sup>154</sup> One bill that has been introduced in Arizona to attempt to implement these measures is HB 2893; data centers: qualification period; distribution (“H.B. 2893”).<sup>155</sup> H.B. 2893 states that computer data centers are eligible for tax relief if they comply with numerous

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<sup>147</sup> *Id.*

<sup>148</sup> S.B. 58, 2025-2026 Leg., Reg. Sess. (Cal 2025).

<sup>149</sup> *Id.*

<sup>150</sup> *Id.*

<sup>151</sup> Schlag, et al., *supra* note 7. The State Water Resources Control Board and the California Public Utilities Commission want to conserve potable water for non-essential activities such as landscape irrigation and cooling.

<sup>152</sup> *Id.*

<sup>153</sup> *Id.*

<sup>154</sup> *Id.*

<sup>155</sup> *Id.*

requirements such as improving water use efficiency, water reliability, and creating sustainable reductions in water use.<sup>156</sup> If H.B. 2893 is passed, it would provide tax relief and incentives to AI data centers that complied with water conservation efforts and agricultural irrigation efficiency.<sup>157</sup>

*iii. Colorado*

Colorado is also among the states looking to incentive AI data centers to prioritize water conservation through tax relief.<sup>158</sup> One act that has been introduced in the state of Colorado that embodies this idea is “The Colorado Data Center Development and Grid Modernization Act” (“S.B. 25-280”).<sup>159</sup> However, if enacted S.B. 25-280 would provide more than simple tax relief; it would also provide utility rate incentives and reputational enhancements associated with the environmental stewardship components of the bill’s certification.<sup>160</sup> In order to obtain the relief provided by S.B. 25-280, the bill requires that data centers obtain certification under the bill first.<sup>161</sup> To obtain certification the bill requires data centers, amongst other things, to develop water stewardship strategies, energy efficiency solutions, and source a minimum of 50% of their energy from renewable or clean sources.<sup>162</sup> Specifically, S.B. 25-280 focuses on the idea of water conservation by implementing a water stewardship strategy and management plan that would serve as a standard for all AI data centers in the area to meet in

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<sup>156</sup> H.B. 2893, 57th Leg., 1st Reg. Sess. (Ariz. 2025).

<sup>157</sup> Schlag, et al., *supra* note 7.

<sup>158</sup> *Id.*

<sup>159</sup> *Id.*

<sup>160</sup> *Id.*

<sup>161</sup> *Data Center Development and Grid Modernization Act*, S.B. 25-280, 2025 Leg. Sess. (Colo. 2025).

<sup>162</sup> *Id.*

order to obtain certification.<sup>163</sup> S.B. 25-280 requires annual compliance reporting to ensure that AI data centers are continuously monitoring their ecological footprint and water consumption.<sup>164</sup>

*iv. Minnesota*

Minnesota is one of the few states that has enacted legislation that pertains to incentivizing data centers to monitor their water consumption by providing taxation benefits.<sup>165</sup> The Minnesota Legislature recently passed a Session Law titled, HF 16, which is an act that is focused on modifying the various environmental and energy regulations that are currently in place.<sup>166</sup> HF 16 is focused on creating new requirements for data centers located in Minnesota that are expected to use 100 million gallons or more of water per year.<sup>167</sup> Within these requirements, HF 16 allows the Minnesota Department of Natural Resources (“MDNR”) to require data centers to evaluate water conservation measures and ensure protection to public health before qualifying for tax exemptions.<sup>168</sup> Moreover, HF 16 allows for proposed AI data centers in the area to seek advice from the MDNR about viable water sources before they implement any liquid cooling systems of their own.<sup>169</sup>

*v. Texas*

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<sup>163</sup> *Id.*

<sup>164</sup> *Id.*

<sup>165</sup> Schlag, et al., *supra* note 7.

<sup>166</sup> Act June 30, 2025, ch. 12, 2025 Minn. Laws 16.

<sup>167</sup> *Id.*

<sup>168</sup> *Id.*

<sup>169</sup> *Id.*

The rapid expansion and development of AI data centers in Texas has caused the state to implement legislation to tackle the growing issue of water usage and consumption.<sup>170</sup> The Houston Advanced Research Center conducted a study on the water consumption of AI data centers in the state which raised the concerns of Texas Officials.<sup>171</sup> The study showed that data centers can consume up to 793 gallons of water per megawatt-hour.<sup>172</sup> The study further concluded that this massive water consumption would result in an estimated 49 billion gallons of water use by the end of 2025.<sup>173</sup> Further, the study predicted that by 2030 data centers will count for about 6.6% of Texas's total water use, or approximately 399 billion gallons per year.<sup>174</sup> To address this problem Texas passed Senate Bill 7 and House Joint Resolution 7.<sup>175</sup> Both Senate Bill 7 and House Joint Resolution 7 focus on allocating billions of dollars to create a standard of water conservation and a system of water infrastructure.<sup>176</sup>

*vi. Virginia*

Since the emergence of AI data centers in the state of Virginia, state officials have been looking for ways to offset the massive amounts of water consumption and environmental impact that AI data centers impose.<sup>177</sup> One solution that Virginia has pushed to implement is for data centers to be required to disclose their

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<sup>170</sup> Schlag, et al., *supra* note 7.

<sup>171</sup> *Id.*

<sup>172</sup> *Id.*

<sup>173</sup> *Id.*

<sup>174</sup> *Id.*

<sup>175</sup> *Id.*

<sup>176</sup> See Tex. S.B. 7, 89th Leg., Reg. Sess. (2025) (enacted); H.J.R. 7, 89th Leg., Reg. Sess. (Tex. 2025) (enacted).

<sup>177</sup> Schlag, et al., *supra* note 7.

projected water usage with their permitting applications.<sup>178</sup> Virginia has moved in a positive direction towards this solution through the passage of S.B. 1449.<sup>179</sup> This bill, passed by Virginia's legislature requires companies that plan on building AI data centers in the state to obtain additional approval from local officials.<sup>180</sup> This may result in investigation into the effects on the water, land, and agriculture that the proposed data center may create.<sup>181</sup> Although this bill was not passed statewide, it is still a move in the right direction to ensure that AI data center's water consumption does not continue to grow exponentially.<sup>182</sup>

As AI data centers continue to explode around the world and within the United States, if the water consumption, negative environmental impacts, and lack of legislation is not addressed, there could be disastrous repercussions and consequences on the environment.<sup>183</sup>

#### IV. ANALYSIS

As the AI data center construction and infrastructure continues to grow worldwide, the concern over the negative environmental impacts grows as well. To address these concerns and temper the negative consequences of AI data center's environmental footprint, the industry as a whole should turn its focus to powering AI data centers using nuclear energy. Nuclear energy has one of the smallest carbon footprints of all energy sources, which in turn helps it sit as one of the

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<sup>178</sup> *Id.*

<sup>179</sup> *Id.*

<sup>180</sup> S.B. 1449, 2025 Sess. (Va. 2025).

<sup>181</sup> *Id.*

<sup>182</sup> Schlag, et al., *supra* note 7.

<sup>183</sup> Green, *supra* note 5.

largest low-carbon electricity generators in the world.<sup>184</sup> By providing a steady low-carbon power, nuclear energy can temper and reduce the reliance on other energy and emission sources, such as fossil fuels. By using nuclear energy to supply its energy needs as opposed to natural gases, AI data centers can emit less carbon emissions, decrease electricity costs, and minimize pollution, which in turn will significantly decrease its ecological footprint and enable more environmentally sustainable practices.<sup>185</sup> Despite these clear benefits, nuclear energy currently provides a mere 15% of all of the AI data centers energy needs.<sup>186</sup>

*i. Lower Carbon Emissions*

When generating electricity, fossil-fuel power plants produce mass amounts of air pollution that is comprised of carbon dioxide that is emitted during the operating process.<sup>187</sup> In contrast, nuclear energy is a clean energy source that produces virtually no greenhouse gas emissions during operation.<sup>188</sup> Further, while emitting zero carbon emissions, nuclear energy can provide a consistent, 365 day a year, source of electricity that is vital to the successful operation of an AI data center.<sup>189</sup>

*ii. Lower Water Consumption*

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<sup>184</sup> *Nuclear energy is making a massive contribution to combating climate change*, WORLD NUCLEAR ASS'N (Oct. 26, 2021), <https://world-nuclear.org/climate-change-and-nuclear-energy/sustainable-development-goals-and-nuclear/sdg13-climate-action?>. The use of nuclear energy avoids over two billion tons of carbon dioxide emissions every year. This is the same as removing 210 million vehicles from the world.

<sup>185</sup> *Id.*

<sup>186</sup> *Energy Supply for AI*, *supra* note 49 (reasoning that these statistics vary by region, and currently the highest contribution of coal-fired electricity is found in China).

<sup>187</sup> *Nuclear explained*, EIA (Nov. 7, 2022), <https://www.eia.gov/energyexplained/nuclear/nuclear-power-and-the-environment.php?>.

<sup>188</sup> Kate Hardin et al., *Nuclear energy's role in powering data center growth*, DELOITTE (Apr. 9, 2025), <https://www.deloitte.com/us/en/insights/industry/power-and-utilities/nuclear-energy-powering-data-centers.html>.

<sup>189</sup> Barotz, *supra* note 17.

Second, by powering AI data centers with nuclear energy, AI data centers will consume less water and provide fewer detriments to areas suffering from water scarcity. Like AI data centers powered by fossil fuels, data centers that are powered by nuclear energy require large amounts of water to cool down the servers and infrastructure in order to maintain an operable temperature. However, as noted above, AI data centers powered by fossil fuels also use large amounts of off-site cooling. A report published by Lawrence Berkeley National Lab found that about 75% of a data center's total water use comes from the process of off-site electricity generation.<sup>190</sup> Therefore, if an AI data center is powered by nuclear energy, the reliance on the water-intensive fossil plants is reduced. Thus, the AI data center will indirectly consume less water.

*iii. More Stable Market Conditions and Supply*

Another downfall of using fossil fuels to power an AI data center is that the market price for fossil fuels is extremely volatile and there is growing global concern about the increasingly limited supply of this resource.<sup>191</sup> Unlike the volatile market of fossil fuels, the cost of nuclear energy is extremely stable. While the price of uranium may fluctuate, the variation is very small and amounts to a minuscule percentage amount.<sup>192</sup>

*iv. Lower Utility Costs to Residents*

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<sup>190</sup> Shehabi, et al., *supra* note 117.

<sup>191</sup> *Advantages and Challenges of Nuclear-Powered Data Centers*, U.S. DEPARTMENT OF ENERGY (Apr. 8, 2025), <https://www.energy.gov/ne/articles/advantages-and-challenges-nuclear-powered-data-centers#:~:text=Nuclear%20operates%20at%20full%20capacity,as%2010%20years%20without%20refueling>.

<sup>192</sup> *Id.*

As set forth above, citizens and consumers are raising concerns about shouldering the excess cost associated with a data center's need for electricity by having to pay hundreds of dollars annually on top of their typical electric bill. AI data centers that rely on nuclear can address this problem. If data centers rely on nuclear-generated electricity, they will not be as dependent on the local electrical grid connections, which in turn will help local power companies save on generation, transmission, and distribution costs. These cost savings will translate into lower electricity bills for consumers and local residents.

*v. Potential Barriers to Nuclear Energy*

Of course, it would be remiss to ignore that no form of energy, including nuclear energy, is without drawbacks. First, nuclear energy is often associated with past nuclear disasters and the process of storing or eliminating the nuclear waste dispensed throughout the process. As such, nuclear energy comes with social concerns from citizens and communities. Nuclear energy production faces immense reputational issues, as well as public fear and concern.<sup>193</sup> Second, due to the inherently dangerous nature of nuclear energy, there are various federal and state regulations that create immense obstacles that nuclear energy must overcome before it can be identified as a primary source of energy for AI data centers.<sup>194</sup>

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<sup>193</sup> James Ashmore, *A New, Clear Demand: Necessary Changes to the Inflation Reduction Act to Prevent the Current Fallout in the Nuclear Industry*, 56 TEX. TECH L. REV. 481, 491 (2024).

<sup>194</sup> *Id.*

*vi. The Current Movement Towards Nuclear Energy*

Tech companies, investors, and the United States as a whole, have already started to shift towards a future where AI data centers are powered primarily with nuclear energy. In March 2025, The United States Department of Energy re-issued \$900 million of funding to minimize the risk of deploying SMRs.<sup>195</sup> These SMRs present a more flexible option for energy intensive operations, like AI data centers, to power their facilities without the extra hassle of having to implement large nuclear reactors.<sup>196</sup> Moreover, in October, the United States Government, Brookfield, and Cameco came together to announce a partnership that would propel the future role of nuclear energy in AI.<sup>197</sup> The partnership includes at least \$80 billion to construct new Westinghouse nuclear power reactors for the purpose of accelerating AI growth in the United States.<sup>198</sup> Once the Westinghouse nuclear power reactors are constructed, they will generate power for data centers in America that will extend the growth of AI.<sup>199</sup> Furthermore, tech giants such as Google, Microsoft, Amazon, and Meta are exploring investing into nuclear energy to meet the rising energy demand of their data centers and AI models.<sup>200</sup>

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<sup>195</sup> Amy Roma, et al., *The US Regulatory Landscape At The Intersection Of Nuclear Energy And Data Centers*, AFIRE (Aug. 5, 2025), <https://www.afire.org/summit/labyrinth/#:~:text=Pairing%20nuclear%20energy%20with%20data%20centers%20raises%20several%20novel%20practical,the%20cost%20of%20replacing%20it>.

<sup>196</sup> *Id.*

<sup>197</sup> *United States Government, Brookfield and Cameco Announce Transformational partnership to Deliver Long-term Value using Westinghouse Nuclear Reactor Technology*, WESTINGHOUSE (Oct. 28, 2025), <https://westinghousenuclear.com/strategic-partnership/press-releases/brookfield/>.

<sup>198</sup> *Id.*

<sup>199</sup> *Id.*

<sup>200</sup> Bradley Hoppenstein, *Why tech giants such as Microsoft, Amazon, Google, and Meta are betting big on nuclear power*, CNBC (Dec. 28, 2024), <https://www.cnbc.com/2024/12/28/why-microsoft-amazon-google-and-meta-are-betting-on-nuclear-power.html>.

## V. CONCLUSION

The importance that new-generation data centers play in the overall evolution and development of AI cannot be understated.<sup>201</sup> These data centers not only provide massive computing power and data storage, but they also handle and disperse the large amounts of data that AI applications rely on.<sup>202</sup> However, the reliance on fossil fuels and natural gases as the primary source of energy is not sustainable as this industry continues to grow. To keep pace with the rapid growth and development of AI, data centers should switch their focus onto the idea of nuclear energy. Nuclear energy is a cleaner alternative as opposed to its counterparts and will allow companies and tech giants to continue to grow their AI data centers, while positively changing their ecological footprint. In addition to switching to the more reliable, cleaner, and environmentally conscious power source of nuclear energy, regulations and legislation need to continue being passed. The combination of enacted legislation and regulations, along with a stronger dependence on nuclear energy, will allow AI data centers to continue to soar.

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<sup>201</sup> Mandloi, *supra* note 45.

<sup>202</sup> *Id.*