Data Centers

What are Data Centers?

Data centers are the physical facilities which house the information technology (IT) infrastructure which is essential to the modern digital economy. These facilities may include the IT infrastructure a company or enterprise needs to conduct its own internal operations, or the IT infrastructure that is utilized on a daily basis by consumers, banks, hospitals, schools, governments and a host of other entities to store, manage, process and utilize digital data.

For example, the "cloud" that so many are dependent upon to store important documents, images and information refers to a system of servers, storage and interconnected infrastructure located within data centers and accessible over the internet.

Why are Data Centers attracting so much attention?

The increased use and evolution of artificial intelligence (AI) in the digital economy requires a significant amount of electricity to operate. For example, AI-driven data centers can use 50-100X more energy than traditional IT infrastructure. Data centers currently use approximately 4.4% of all electricity in the United States, and this demand is expected to increase by up to 200% just over the next three years.

How do I use AI in my daily life?

There are a multitude of examples where AI is used in our daily lives, including internet searches, smart phones, GIS-aided travel, health care diagnosis and early detection, pharmaceutical development, online shopping, customer assistance and other routine services.

What are the benefits of Data Centers?

We all utilize and depend upon data centers in our professions and personal lives, even if those uses are not always easily identifiable. Building secure data centers domestically helps to safeguard critical information.

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The construction, maintenance and powering of data centers also deliver significant economic benefits by using local skilled employees and domestically produced energy.

How are Data Centers powered?

Data centers need a reliable, scalable and consistent source of electricity to enable them to operate 24 hours a day, 365 days a year. Currently only three sources of electricity can meet this requirement: natural gas, coal and nuclear.

With many coal-fired power plants retiring and no new nuclear power plants on the immediate horizon, the only practical source of new electricity generation for data centers is natural gas. Additionally, the flexibility to build natural gas power generation to varying sizes that can match electricity needs and in proximity to where natural gas is produced is a significant advantage for Pennsylvania.

Will Data Centers use up all of Pennsylvania's natural gas?

No. While it is true that data centers consume a lot of electricity – a 100 MW data center can consume the same amount of electricity as approximately 85,500 homes – Pennsylvania has the resources available to meet this demand.

Pennsylvania is currently the second largest natural gas producer in the nation, with 2024 production equating to 7.4 trillion cubic feet, or about 18% of the nation's total supply. Yet in-state demand for electric generation equaled only about 14% of this total production. The ability both to produce more natural gas and increase the percentage of natural gas used for electric generation is a significant advantage for Pennsylvania.

This increased utilization is beneficial for consumers and leaseholders and helps further the environmental progress made to date from using natural gas.

Do Data Centers require water to operate?

Yes. Water is necessary to help dissipate the heat generated by computer servers within a data center. In addition, an on-site electric generation facility that powers a data center also requires water for cooling purposes.

The amount of water required varies depending on the size of the data center and the amount of heat that needs to be dissipated. Pennsylvania's colder winters, for example, are a strategic benefit for data centers because the ambient air temperatures can act as a natural cooling agent, reducing demand for water.

Large scale water users that trigger certain water withdrawal thresholds will typically be required to obtain approval from one of the state's river basin commissions or the Pennsylvania Department of Environmental Protection. These regulatory agencies work to manage overall water withdrawals while providing protections and prioritizing water use for aquatic life and human needs.

Additionally, agencies like the Susquehanna River Basin Commission are prioritizing data center projects that use innovative technologies like dry cooling, which relies on cool ambient air and can significantly reduce the amount of water needed for cooling purposes.