The **Better Buildings Initiative** is a national leadership initiative calling on corporate chief executive officers, university presidents, utilities, state and local officials, and other leaders to make substantial commitments to improve the energy efficiency of their buildings and plants, save money, and increase competitiveness. This initiative aims for 20% savings across the commercial and industrial sectors and to catalyze revolutionary change in energy use across the United States. The U.S. Department of Energy (DOE) is expanding this initiative to engage leaders in a set of Better Buildings Accelerators designed to demonstrate specific innovative policies and approaches, which upon successful demonstration will accelerate investment in energy efficiency.

The **Data Center Accelerator** will work with both public and private sector building data center owners and operators to accelerate the adoption of system metering and associated energy tracking and reduction, while developing best practice approaches for various data center configurations and demands.

Data Center Accelerator Partners will improve the energy efficiency of one or more data centers of 100 kW or greater IT load by at least 25% within 5 years. The Data Center Accelerator aims to catalyze energy efficiency improvements across different sizes of data centers, as well as across ownership structures and business types, from 2014 to 2019. It will establish these approaches over this period and maintain them for the long term.

Accelerator Goals:

▶ Demonstrate best practice approaches to implementing metering to capture infrastructure and IT energy usage in data centers across ownership models and data center sizes and yield road tested examples for other data center operators to use.

▶ Develop standardized methods for energy savings measurement and reporting.

▶ Document and share results. Highlight best practices for cost-effectively improving the energy use within data centers.

▶ Develop recommendations for post-Accelerator next steps.

Why Data Centers are Important to Reducing Energy Use

Data center energy use has grown rapidly in recent years and is expected to continue to grow. In 2013, U.S. data centers consumed approximately 100 billion kilowatt-hours of electricity, representing more than 2% of all U.S. electricity use.[1]

DOE is focused on improving energy efficiency of infrastructure (cooling, power supply losses, etc.) rather than installation of emerging IT systems or technologies because IT products naturally have refresh rates of three to five years, while infrastructure improvements often lag behind. The opportunity for infrastructure savings is nearly 50% of the overall data center energy use. DOE expects that partners will continue to refresh their IT equipment as they make improvements to their infrastructure.

Data center infrastructure energy efficiency can be improved 20% to 40% by applying best management energy efficiency measures and strategies typically with short returns on investment. Common upgrades include aligning the servers into hot and cold aisles, managing cool air flow to the servers, supplying air to the servers within the ASHRAE recommended temperature range, and optimizing cooling systems.

The potential nationwide electricity saving with 100% of data centers reaching a 25% reduction goal by 2020 would be approximately $2.5 billion in cost savings.[2]

Benefits to Accelerator Partners

▶ **Better insights into how their data centers are performing**

By employing metering at the infrastructure and IT level, data center operators/owners can gain insights into the performance of their buildings that will allow them to more confidently justify and

install improvements to increase the efficiency of the energy used.

▶ **Access tools and resources on data access and benchmarking**

Accelerator Partners gain access to tools, analysis and resources that lay out potential solutions for measuring their actions to improve the efficiency of their data centers.

▶ **National recognition**

Receive recognition from DOE for demonstrating innovative approaches to improving and measuring the energy efficiency during the commitment period. Raise the visibility of your energy efficiency efforts among within your organization or to the public.

DOE Commitment to Data Center Accelerator Partners

DOE is dedicated to helping Accelerator Partners overcome the technical barriers of installing metering and providing support on best practice approaches to improved energy efficiency.

▶ **Provide technical expertise and training**, with the help of Lawrence Berkeley National Lab, a DOE recognized center of excellence in data center efficiency.

▶ Provide a repository for relevant **best practice and research documents**

▶ **Create networking and technical opportunities** to help Accelerator Partners share innovative solutions

▶ **Facilitate the sharing of best practices** across the industry

▶ **Feature partners** who leverage, develop, and share innovative and cost-effective energy efficiency solutions.

▶ Provide **national recognition to partners** commensurate with energy efficiency results achieved.

Accelerator Partner Commitment

The Accelerator Partner is dedicated to partnering with DOE to do the following:

▶ Assign a **senior representative of the data center management team** within one month to fulfill the Data Center Accelerator Partner commitments in the Better Buildings Program

▶ **Publically pledge** to an improved efficiency goal of at least 25 percent in one (or more) data centers (total IT load > 100kw) within 5 years

▶ Develop a **baseline PUE measurement within six months**

▶ Develop and implement an **energy metering plan within 18 months** to implement metering to measure energy savings progress towards goals

▶ Make **facility-level energy performance data** for metered facilities available within 12 months; flexibility provided for proprietary information.

▶ **Provide regular updates on progress** with annual facility level energy performance information as the basis for recognition.

▶ **Share results and lessons learned** with DOE and other Accelerator Partners as approaches are implemented, such as cost effective metering strategies and examples of infrastructure improvements with short payback periods.

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[1] This figure is a DOE estimate based on the 2000-2010 historical compound annual growth rate of 10.5% from the 2007 EPA report to Congress and the 2011 Koomey Report. The projection starts from the midpoint of the 2010 range of data center electricity use provided by the 2011 Koomey report. Jonathan Koomey. 2011. Growth in Data center electricity use 2005 to 2010. Oakland, CA: Analytics Press. August Report to Congress on Server and Data Center Energy Efficiency, Public Law 109-431, August 2, 2007.

[2] These figures are DOE estimates based on the 2000-2010 historical compound annual growth rate of 10.5% from the 2007 EPA Report to Congress and the 2011 Koomey Report, as well as an LBNL survey of data centers that found that on average as much electricity was used for the cooling and power as was used for the IT equipment in a data center. The 20 billion KWh represents savings in the cooling and power infrastructure due to energy efficiency improvements. The $2 billion is a conservative approximation based upon a constant cost of 10 cents per kilowatt-hour.