

SUSTAINABLE DATA CENTERS ROADMAP

FIVE MAIN
MESSAGES

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- 1. With a data center construction boom underway globally, the months and years ahead will be a critical time for data center sustainability.** Many decisions with respect to the construction and operation of data centers will have lasting impacts on natural resources and the environment.
- 2. The energy and environmental impacts of data centers vary dramatically depending on their siting, design, management and other factors.**
 - Well-located and well-managed data centers can help accelerate deployment of low-carbon power by serving as anchor customers for innovative clean energy technologies, de-risking investments in renewables projects and enabling grid flexibility.
 - Poorly-located and poorly-managed data centers can have significant negative energy and environmental impacts, including greenhouse gas emissions, local air pollution, and water stress in surrounding areas.
 - Owners and operators of next-generation data centers are accelerating the adoption of liquid cooling and intelligent thermal management systems, while exploring opportunities such as free cooling and heat reuse.
- 3. Smart siting is key to reducing the energy, water and carbon emissions impacts of data centers.** Locations with the potential for additional low-carbon electricity and ample water resources are especially valuable. When commercial, infrastructure and strategic factors lead to data centers being sited in locations that are suboptimal from a sustainability standpoint, technology options and management practices can minimize adverse impacts.
- 4. Data center water use is tiny globally in relation to other sectors but can be very significant locally.** When a data center draws significant power from water-intensive generation sources, such as coal or nuclear plants, the data center's indirect (off-site) water use often exceeds its on-site water use.
- 5. Data concerning data centers' environmental impacts are poor, including in particular data concerning greenhouse gas emissions and water use.** Research institutions, standards bodies, NGOs, government agencies, data center operators and equipment manufacturers should converge on common metrics for reporting data center energy use, water use and emissions.