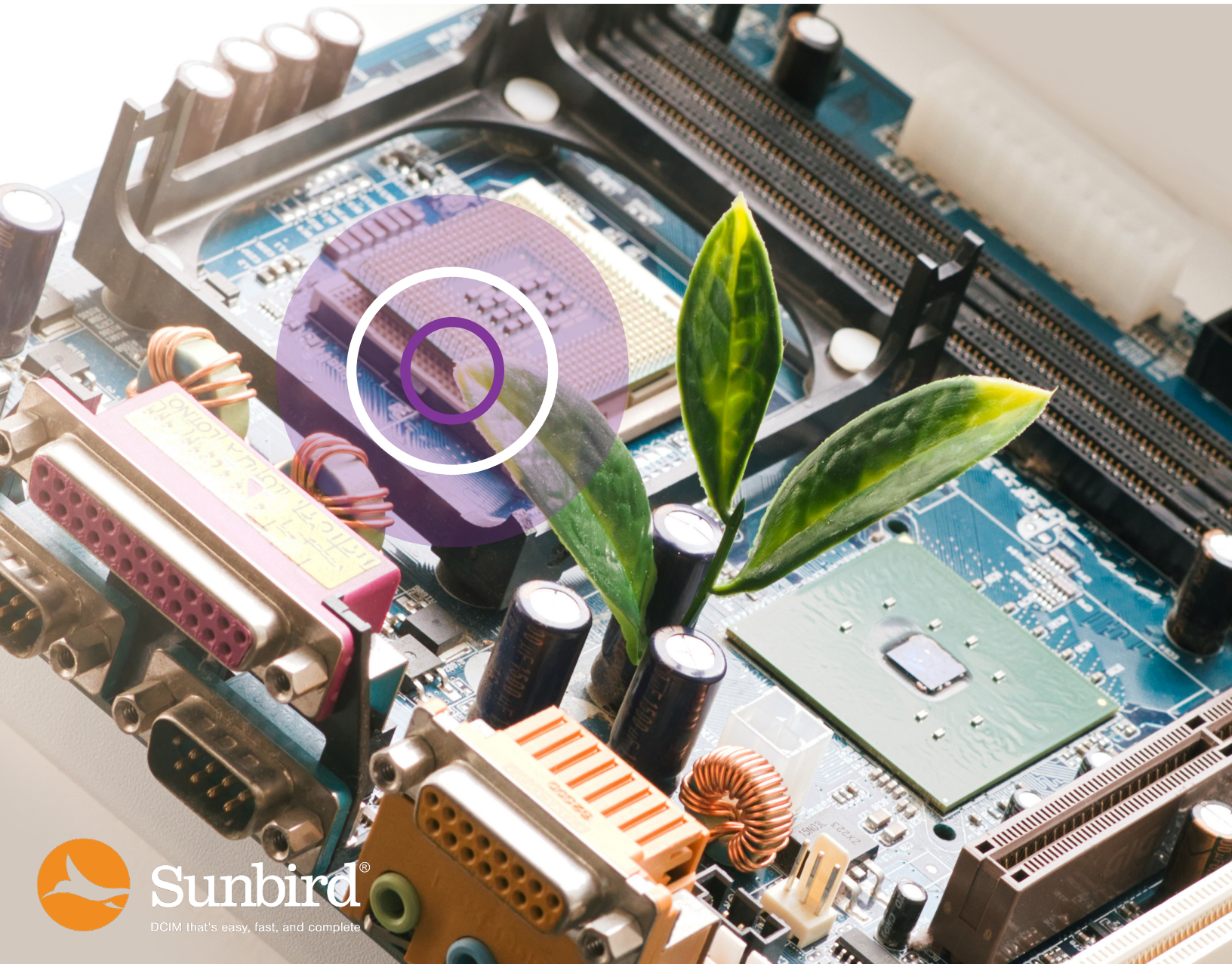
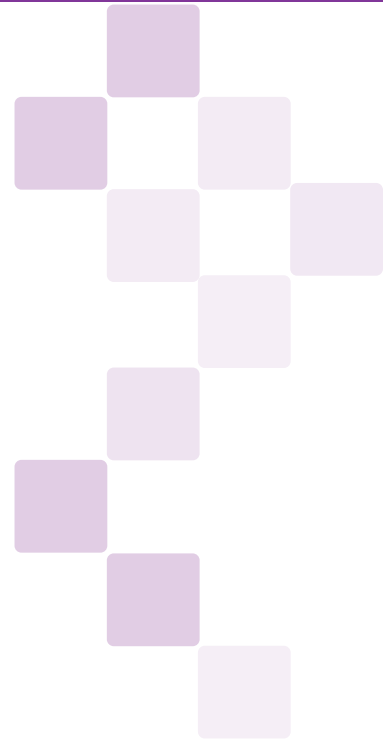


EBOOK

# Tips for Developing a Data Center Sustainability Plan



Sunbird®

DCIM that's easy, fast, and complete

# Introduction

**As the world becomes increasingly conscious of sustainability, data centers are under scrutiny due to their significant energy requirements and environmental footprint.**

Around the globe, governments, industry regulators, and customers are demanding that data center operators adopt practices and technologies that minimize their climate impact.

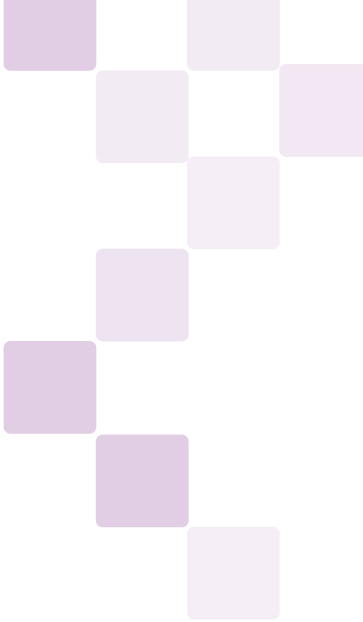
But most organizations are behind on complying with their sustainability objectives and need help creating a plan.

The purpose of this eBook is to provide you with practical guidance on forming a comprehensive sustainability plan tailored to your unique needs. It covers various aspects of sustainable data center management including insights into setting sustainability goals, overcoming obstacles, implementing instrumentation for monitoring and reporting, and developing strategies for sustainable data center design and operations.

By adopting the principles outlined in this guide, you can start to take proactive steps towards reducing your data center's environmental impact, optimizing resource utilization, and contributing to a more sustainable future.



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# Understanding Data Center Sustainability

**Sustainability lies at the core of modern data center management.**

Data center sustainability refers to the adoption of practices and technologies that minimize resource consumption, reduce carbon emissions, and mitigate environmental impact throughout the lifecycle of data center operations. It incorporates a holistic approach that considers energy efficiency, carbon footprint, water conservation, waste management, and overall environmental stewardship.

A sustainable data center achieves a balance between meeting the ever-increasing demand for computing resources and minimizing the ecological footprint associated with data center operations.

## Key Environmental Risks Posed by Data Centers

Data center sustainability is primarily driven by the environmental challenges posed by the intensive energy consumption, carbon emissions, and water usage caused by data center construction and operations.

- **Energy consumption.** Data centers are voracious consumers of energy, accounting for about 2% of global electricity usage. The continuous operation of servers, networking equipment, and cooling systems requires substantial power, contributing to high energy bills and carbon emissions.
- **Carbon emissions.** The reliance on fossil fuels for electricity generation in many regions results in data centers contributing about 2.5%-3.7% of global greenhouse gas emissions. This is more than the aviation industry. These emissions contribute to climate change and environmental degradation, underscoring the need for decarbonization strategies within the data center industry. A data center's carbon footprint is determined by its utility energy source (i.e., coal, natural gas, renewables) and the efficiency of its equipment and cooling systems.
- **Water usage.** Cooling systems, essential for maintaining optimal operating temperatures within data centers, often require massive amounts of water. A mid-sized data center uses about 300,000 gallons of water a day which is equivalent to the water consumption of 100,000 homes. This can strain local water resources and exacerbate water scarcity in regions already facing water stress.



*(continued)*

# Understanding Data Center Sustainability (continued)

## Scope 1, 2, and 3 Emissions for Data Centers

There are three primary ways that data centers contribute to greenhouse gas emissions. Tracking and managing these three “scopes” allows you to comprehensively assess our sustainability, identify opportunities to reduce emissions, and implement strategies to improve sustainability across your operations and supply chain.

- **Scope 1 emissions.** These are direct emissions from sources that are owned or controlled by the data center, such as backup diesel generators. They indicate the direct environmental impact of data center operations.
- **Scope 2 emissions.** These are indirect emissions associated with purchased electricity consumed by the data center. They measure the environmental impact of total energy usage and help identify opportunities to reduce carbon footprint through renewable energy procurement and efficiency initiatives.
- **Scope 3 emissions.** These are indirect emissions that occur upstream or downstream of the data center’s operations, including emissions associated with the production and transportation of purchased equipment and services, employee commuting, and end-of-life disposal of equipment. While scope 3 emissions are not directly caused by the data center, they represent a significant portion of the overall carbon footprint and require collaboration with supply chain partners to address effectively.

## Benefits of Implementing Sustainable Practices

Embracing data center sustainability offers numerous environmental and economic benefits.

- **Reduced environmental footprint.** By optimizing energy efficiency, reducing carbon emissions, and minimizing water usage, sustainable data center practices help mitigate environmental impact and contribute to global efforts to combat climate change.
- **Cost savings.** Energy-efficient technologies and practices not only reduce electricity bills, but also lower operational costs associated with cooling and maintenance, offering long-term savings for data center operators.
- **Enhanced reputation.** Demonstrating a commitment to sustainability can enhance brand reputation, attract environmentally conscious customers, and differentiate data center operators in a competitive market.
- **Regulatory compliance.** Adhering to sustainability standards and regulations ensures compliance with environmental laws and regulations, mitigating regulatory risks and potential fines.

# Setting Sustainability Goals and Overcoming Obstacles

Setting clear and measurable sustainability goals is essential for driving meaningful progress. However, it's important to anticipate and overcome several common challenges.

## Common Data Center Sustainability Goals

Organizations often set sustainability goals aligned with reducing environmental impact and improving resource efficiency. The most common goals include:

- **Offsetting 100% of energy consumption with renewables.** Transitioning to renewable energy sources such as solar, wind, or hydroelectric power can offset the entire energy consumption of the data center.
- **Reducing reliance on diesel generators.** Minimizing or eliminating the use of diesel generators for backup power reduces carbon emissions.
- **Achieving a Power Usage Effectiveness (PUE) of 1.2 or lower.** While not perfect, this popular metric is a good indicator of the overall energy efficiency of a data center.
- **Consuming little or no water.** Implementing water-efficient cooling systems and practices can minimize water consumption in data centers.

## Common Data Center Sustainability Obstacles

Despite the importance of setting sustainability goals, you may encounter various obstacles that impede progress. The most common obstacles include:

- **Technical barriers.** Implementing sustainable practices may require significant technical expertise and investment in new technologies.
- **Existing long-term contracts.** Contracts with utility providers or colocation facilities may limit your ability to quickly transition to renewable energy sources or make other sustainable changes.
- **Uncertainty on critical metrics to monitor.** Determining which sustainability metrics to track and how to measure them effectively can be challenging, leading to uncertainty and indecision.
- **Too low a priority.** In some cases, sustainability may not be a top priority for organizations, leading to a lack of resources, investment, or focus on implementing sustainable practices.
- **Absence of a meaningful plan.** Without a clear roadmap in place, you may struggle to make progress towards your sustainability goals.
- **Lack of budget.** Improving sustainability may require upfront investment in new technologies, equipment upgrades, or infrastructure improvements, which may not be feasible without adequate budget.

*(continued)*

# Setting Sustainability Goals and Overcoming Obstacles (continued)

## Strategies for Overcoming Obstacles

To overcome these obstacles and effectively set sustainability goals, consider the following strategies.

- **Establish clear and measurable objectives.** Define specific, measurable, achievable, relevant, and time-bound (SMART) sustainability goals that align with the overall business strategy and environmental objectives.
- **Prioritize areas for improvement.** Identify areas where sustainable practices can have the most significant impact and prioritize efforts accordingly based on their feasibility and potential environmental benefits.
- **Develop a timeline for achieving targets.** Create a realistic timeline for implementing sustainability initiatives, taking into account factors such as resource availability, budget constraints, and technical feasibility.
- **Collaborate with stakeholders.** Engage with internal stakeholders to garner support for sustainability initiatives and secure buy-in for necessary changes.
- **Seek external support and expertise.** Leverage external resources, such as sustainability consultants, industry associations, or government incentives, to gain insights, access funding, and overcome technical or regulatory hurdles.
- **Monitor progress and adjust strategies.** Regularly monitor progress towards sustainability goals, track key performance indicators (KPIs), and adjust strategies as needed to address emerging challenges or capitalize on new opportunities.



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