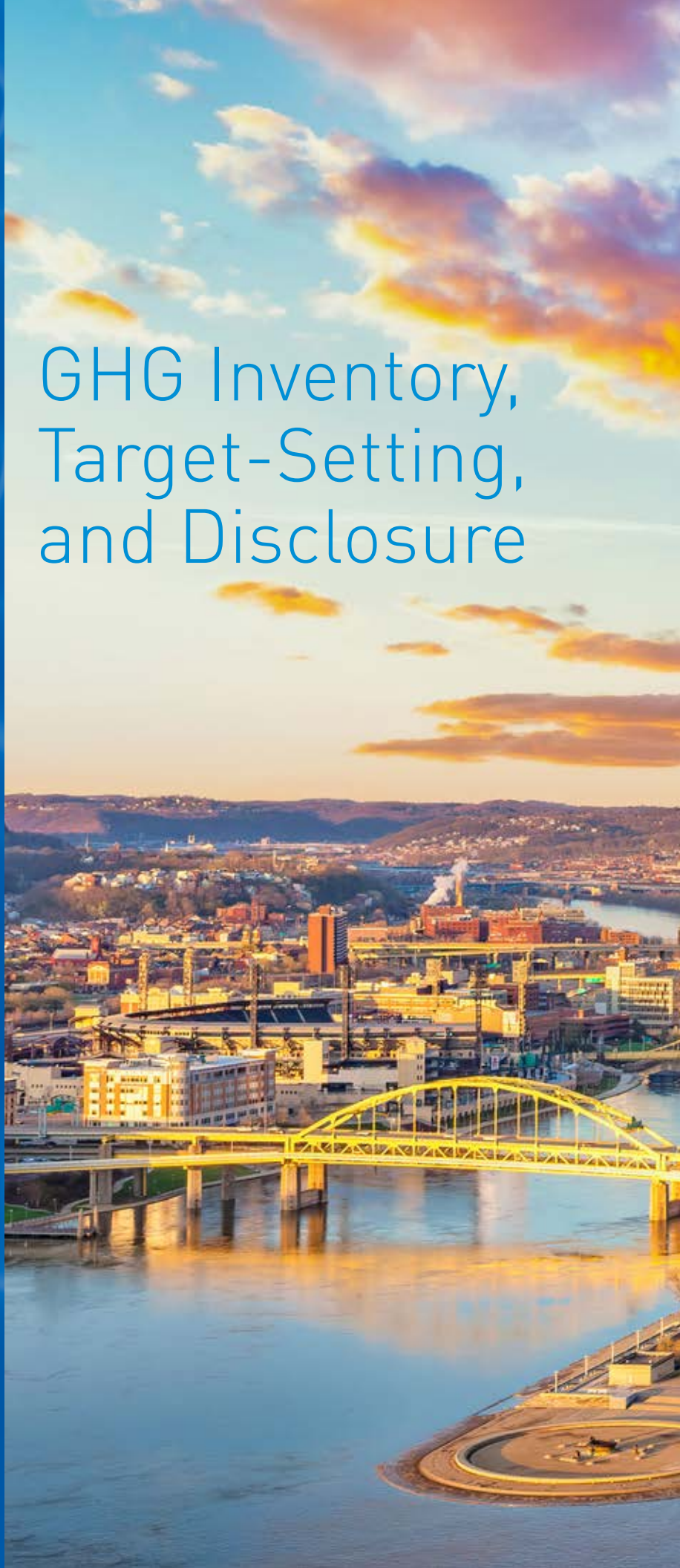
GHG Inventory, Target-Setting, and Disclosure



KEY TAKEAWAYS

- Develop a comprehensive GHG inventory covering scope 1 (direct), scope 2 (indirect purchased energy), and relevant scope 3 (value chain) emissions using standardized methodologies.
- Regularly update emissions data and integrate new measurement tools for accuracy.
- Set science-based reduction targets aligned with the latest climate science and accelerated emissions reductions.
- Maintain transparent public disclosure to build trust and accountability.

INTRODUCTION

Effective performance management and transparency are crucial for utilities aiming to reduce greenhouse gas (GHG) emissions and align with global climate goals. This dimension focuses on three interconnected components: developing a comprehensive GHG inventory, setting ambitious and achievable performance targets, and maintaining transparent public disclosure. Each of these components provides utilities with the framework needed to manage their climate impact, track progress, and communicate their efforts to stakeholders.

A comprehensive GHG inventory helps utilities understand their emissions profile, identify key emission sources, inform mitigation strategies, and track progress over time. Setting science-based performance targets ensures that utilities stay aligned with the latest climate science, driving meaningful and accelerated emissions reductions. These targets should be periodically reviewed and refined to reflect advances in methodologies, data accuracy, and regulatory developments.

Finally, transparent disclosure builds trust and accountability by reporting on GHG inventories, progress toward targets, and ongoing efforts to reduce emissions. Effective disclosure should also acknowledge challenges, planned actions, and lessons learned, reinforcing a commitment to continuous improvement. Together, these elements ensure that utilities remain adaptable, accountable, and on track toward long-term emissions reductions.

ACTIVITIES AND ACTIONS

Creating a Comprehensive GHG Inventory

Tip: *Conduct regular third-party audits and work with industry partners to verify emissions data and ensure alignment with best practices.*

The first step in any emissions reduction strategy is the development of a comprehensive GHG inventory. This inventory should account for direct emissions from operations (known as scope 1), emissions from the energy the utility purchases (scope 2), and indirect emissions from the value chain (scope 3). By adopting standardized GHG accounting methodologies, utilities can ensure the accuracy of their data while enabling comparability with industry peers.

A well-structured inventory enables utilities to identify major emissions sources and prioritize targeted reduction strategies. As utilities refine their approach to GHG management, their inventories should evolve by integrating more granular data, leveraging advanced measurement techniques, and incorporating periodic third-party verification to strengthen credibility. Keeping the inventory modern through annual updates and reviews allows utilities to remain responsive to emerging challenges and take advantage of new opportunities for emissions mitigation.

Setting Ambitious and Achievable GHG Reduction Targets

Tip: *Manage emissions with a carbon budget, set interim targets, and adjust strategies as needed to stay on track for net zero.*

For utilities working toward net-zero emissions, setting clear, measurable GHG reduction targets is essential. These targets should be ambitious yet achievable, with five- to 10-year milestones ensuring steady progress toward deep reductions by 2050. To stay accountable and aligned with science-based emissions reductions, the Science Based Targets initiative encourages organizations to aim for at least a 4.2 percent annual reduction in scope 1 and 2 emissions and a 1.23 percent annual reduction for applicable scope 3 emissions.

Since emissions fluctuate due to operational changes, annual figures alone may not reflect long-term progress. A carbon emissions budget can help manage this variability by tracking cumulative emissions rather than isolated yearly totals. This budget—based on baseline and historic emissions, projected future emissions, and reduction targets—sets a defined emissions limit over time to align with net-zero commitments. While emissions may temporarily rise due to growth or infrastructure upgrades, they must remain within the budget to ensure steady progress toward reaching the established GHG reduction target.

Prioritizing direct reductions in scope 1 and scope 2 emissions ensures the greatest immediate impact, while scope 3 reductions and complementary measures become more viable and impactful as scope 1 and scope 2 emissions are reduced and tracking improves. Since eliminating all emissions may not be feasible, utilities must also plan for addressing residual emissions—i.e., those that cannot yet be eliminated—by implementing carbon removal or other equivalent strategies.

Interim targets are key to maintaining progress. Regularly assessing emissions reductions against milestones allows organizations to adjust strategies, respond to evolving policies, and integrate new technologies. If emissions exceed projections, deeper reductions must follow, and if reductions outpace targets, the remaining budget provides flexibility for future needs.

This structured approach balances ambition with flexibility, ensuring sustained reductions while adapting to operational realities. By integrating a carbon budget with interim targets, utilities can effectively manage emissions and address residuals to achieve long-term climate goals.

Transparent Public Disclosure

Tip: Make GHG disclosures more engaging by using interactive visuals, infographics, or storytelling to highlight progress, challenges, and future actions.

Transparency is essential for building trust and accountability in a utility's journey to net zero. Publicly sharing GHG inventories, reduction targets, and progress made demonstrates a commitment to meaningful climate action. Effective disclosure goes beyond numbers—it should explain how emissions are measured, what actions are being taken, and the challenges encountered along the way.

High-quality disclosures should include quantifiable emissions data, progress toward near- and long-term targets, key milestones, and adjustments to strategy. Reports should acknowledge barriers, limitations, and slower-than-expected progress, demonstrating a balanced and credible approach. Engaging stakeholders in this process strengthens accountability and provides opportunities to scale impact.

A complete and transparent report should also identify residual emissions and outline plans for addressing them through carbon removal or equivalent strategies. This ensures stakeholders have a comprehensive understanding of the utility's climate impact and mitigation efforts.

To enhance credibility, utilities should incorporate third-party verification of emissions data and reports. Independent assessments ensure accuracy, reliability, and stakeholder confidence. Over time, integrating GHG disclosures into broader sustainability or financial reporting will further demonstrate a long-term commitment to climate action and corporate transparency.

Regular, detailed, and transparent disclosures enable utilities to demonstrate accountability, engage stakeholders, and inspire confidence in their ability to achieve net-zero commitments. By openly sharing both successes and challenges, utilities can foster deeper trust and collaboration with partners, investors, and communities.

KEY CHALLENGES AND SOLUTIONS

Managing the Effort Required for a Comprehensive and Accurate GHG Inventory

Building accurate GHG inventories, especially for scope 1 wastewater and drinking water processes and scope 3 value chain emissions, demands dedicated effort rather than generalized estimation techniques (such as long-term direct measurement and robust supplier engagement) to derive emissions estimates that can usefully inform progress towards emissions reductions.

Solutions:

- Begin with a comprehensive inventory of scope 1 and scope 2 emissions, employing established GHG quantification methodologies specifically designed for water and wastewater utilities.
- Improve the accuracy of scope 1 emissions data over time by adopting direct measurement practices for wastewater and drinking water treatment processes.
- Prioritize scope 3 quantification efforts on high-impact categories like purchased goods and services, capital goods, and outsourced activities, collaborating with value chain partners to improve data accuracy.

Balancing Ambition with Feasibility in Target Setting

Setting ambitious climate targets grounded in science is essential, but balancing ambition with operational constraints, financial limitations, and available technology can be challenging, particularly in the early stages of emissions reduction.

Solutions:

- Break down the path to net zero into manageable steps, setting near-term targets (five to 10 years) for immediate action and long-term targets (by 2050) for flexibility in the adaptation of new technologies.
- Prioritize high-impact, feasible emission reductions —such as energy efficiency, renewable energy, and infrastructure upgrades—that align with broader organizational priorities.
- Establish a regular review process to track progress and adjust targets, ensuring goals remain ambitious yet achievable amid evolving challenges and opportunities.

Mitigating Reputational Risk Through Transparent Disclosure

Utilities may hesitate to fully disclose their GHG inventories and progress toward reduction targets due to fears of reputational damage if progress is slower than expected. However, a lack of transparency can erode stakeholder trust, limit support for future climate efforts, and create more uncertainty than honest disclosures.

Solutions:

- Commit to full transparency by sharing both successes and challenges, proactively engaging stakeholders to explain the approach, gather feedback, and build trust.
- Implement a phased disclosure strategy, starting with foundational data and gradually expanding reporting as internal capacity improves to ensure accuracy and credibility.
- Align disclosures with industry standards and best practices, comparing progress to industry peers to provide context and demonstrate whether the utility is ahead of pace or navigating common obstacles rather than falling behind.

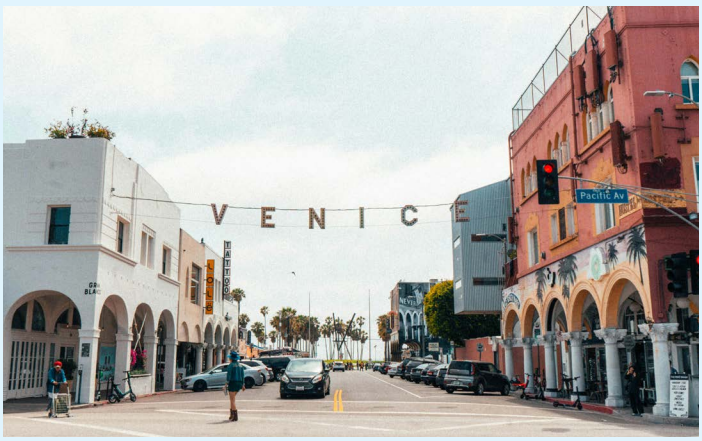
UTILITY SPOTLIGHT

Metropolitan Water District of Southern California—Transforming GHG Inventory Into an Action Framework Through Carbon Budgeting

The Metropolitan Water District of Southern California (MWD) has transformed its GHG inventory into a dynamic carbon budget, a forward-looking framework that aligns emissions tracking with real-world operations and climate targets. By linking annual emissions to a structured GHG reduction pathway, MWD ensures that climate commitments are not just statements but rather actionable strategies that drive measurable results.

Budgeting for Change

MWD's Climate Action Plan carbon budget sets a cumulative emissions limit and aligns with California's climate goals of reducing emissions 40 percent below 1990 levels by 2030 and achieving carbon neutrality by 2045. Each year, MWD's operational emissions are added to this budget, allowing the organization to monitor its progress and ensure it remains within the designated limits. For example, in 2021, MWD's carbon budget was approximately nine metric tons of carbon dioxide equivalent (MT CO_2e), but actual emissions were about 5.3 million MT CO_2e, indicating that their emission reduction efforts are yielding positive results.



Rather than a static emissions report, the carbon budget functions as a planning tool, enabling MWD to anticipate and manage fluctuations in emissions. This approach accounts for operational variabilities, such as an increase in the energy-intensive pumping of water on its Colorado River Aqueduct, while ensuring the utility stays on track toward its 2045 net-zero target. Adopting a carbon budget has given MWD the flexibility to accommodate new or unanticipated projects coming down the road and know when to investigate the addition of new GHG reduction measures.

Key Insight: A carbon budget allows utilities to balance operational realities with long-term climate goals, preventing reactive decision-making and ensuring emissions reductions remain on course.

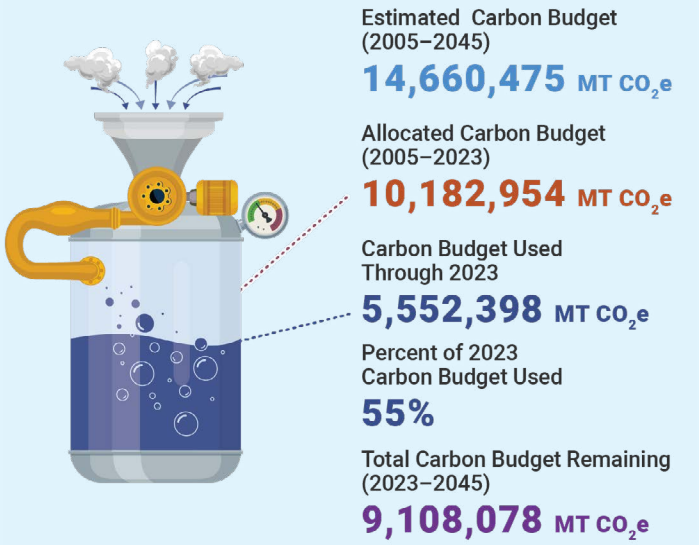


Figure 2: MWD's total carbon budget from 2005 to 2045, how much was allocated through 2023, and what remains to meet long-term climate goals.

Building Credibility Through Transparency and Verification

MWD fosters public trust and accountability through multiple transparency measures, including presenting its annual Climate Action Plan progress reports to its board of directors and subsequently releasing them publicly (supplemented by press releases).

MWD also maintains a publicly accessible, web-based dashboard of its inventory. This openness builds trust and accountability with the community. To reinforce accountability and public trust, MWD subjects its carbon budgeting process to third-party verification, strengthening the credibility of its GHG inventory and ensuring emissions data meets the highest reporting standards.

> *"Third-party verification was part of the inventory process since 2005—well before we published our Climate Action Plan," said Jon Chang, Associate Resource Specialist at MWD. "It gave our CAP validity, ensuring our data is consistent and comparable with peer agencies."*

Key Insight: Third-party verification and public disclosure build trust, reinforce accountability, and align climate efforts with stakeholder expectations.

Future Outlook: Continuous Improvement and Public Engagement

MWD's carbon budgeting framework is designed to evolve. In its upcoming five-year Climate Action Plan update, the wholesale water agency will seek and incorporate public input to align community priorities and update emissions reduction strategies. This iterative approach will enhance stakeholder trust and engagement, reinforcing climate action as a shared responsibility.

> *"It's very important to us to have public input on the five-year update. We'll be seeking input on new measures, priorities, and actions they would like to see in the next five years or so," emphasized Ursula Schmidt, Climate Action Plan Program Manager at MWD.*

By applying carbon budgeting principles, integrating transparency, and aligning climate action across its operations, MWD is proving that emissions inventories can be more than reporting tools by serving as strategic drivers of real-world climate progress.

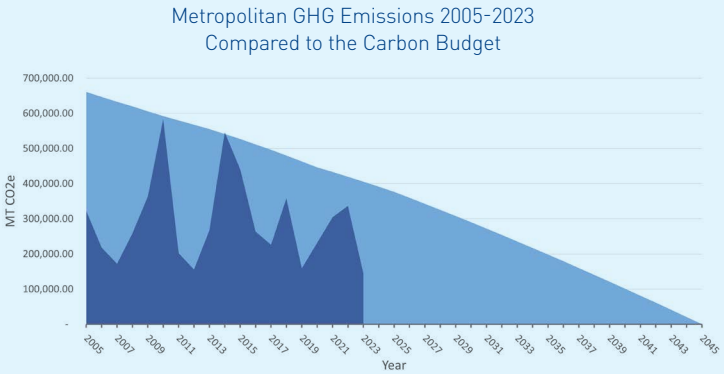


Figure 1: Tracking annual GHG emissions against MWD's carbon budget, illustrating how year-to-year performance aligns with MWD's path to net zero by 2045.

ADDITIONAL RESOURCES AND REFERENCES

1. The Science Based Targets initiative is the leading framework for setting science-based net-zero targets. Learn more about the Net-Zero Standard on their website.
2. MWD's Carbon Budget and CAPDash Portal.
3. The two leading frameworks for water and wastewater utility emissions quantification and reporting are The Climate Registry's Water-Energy Nexus Registry Protocol and the North East Biosolids and Residual Association's Biosolids Emissions Assessment Model.

This paper is part of Net Zero Fundamentals, a collection of action-oriented briefs designed to help water and wastewater utilities cut climate pollution and chart a clear path to net zero. Each brief delivers practical insights, real-world utility examples, and implementation guidance for immediate impact. Access the collection of briefing papers on the US Water Alliance website.

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