



NEW ENGLAND WATER ENVIRONMENT ASSOCIATION

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Data Analytics Tools for Tracking Sustainability Goals and Improving Energy Performance

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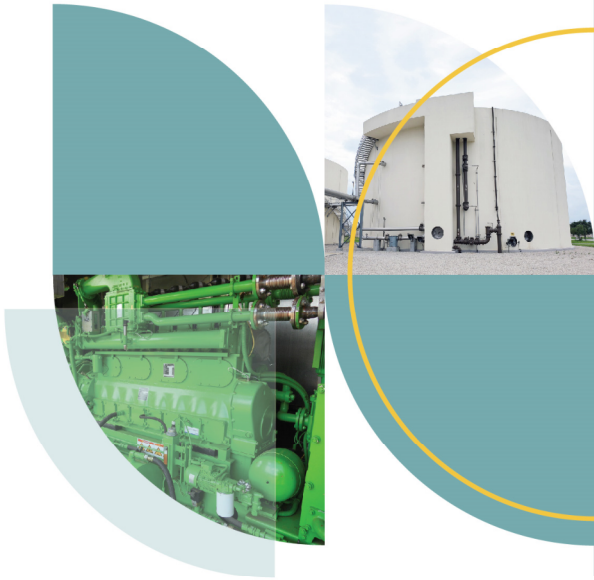
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Discussion Topics

- 1 **Industry Drivers and Trends**
- 2 **Greenhouse Gas and Energy Data Analytics Tools**
- 3 **Best Practices and Industry Standards**
- 4 **Funding Available**



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Industry Drivers and Trends

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New England GHG Reduction Mandates

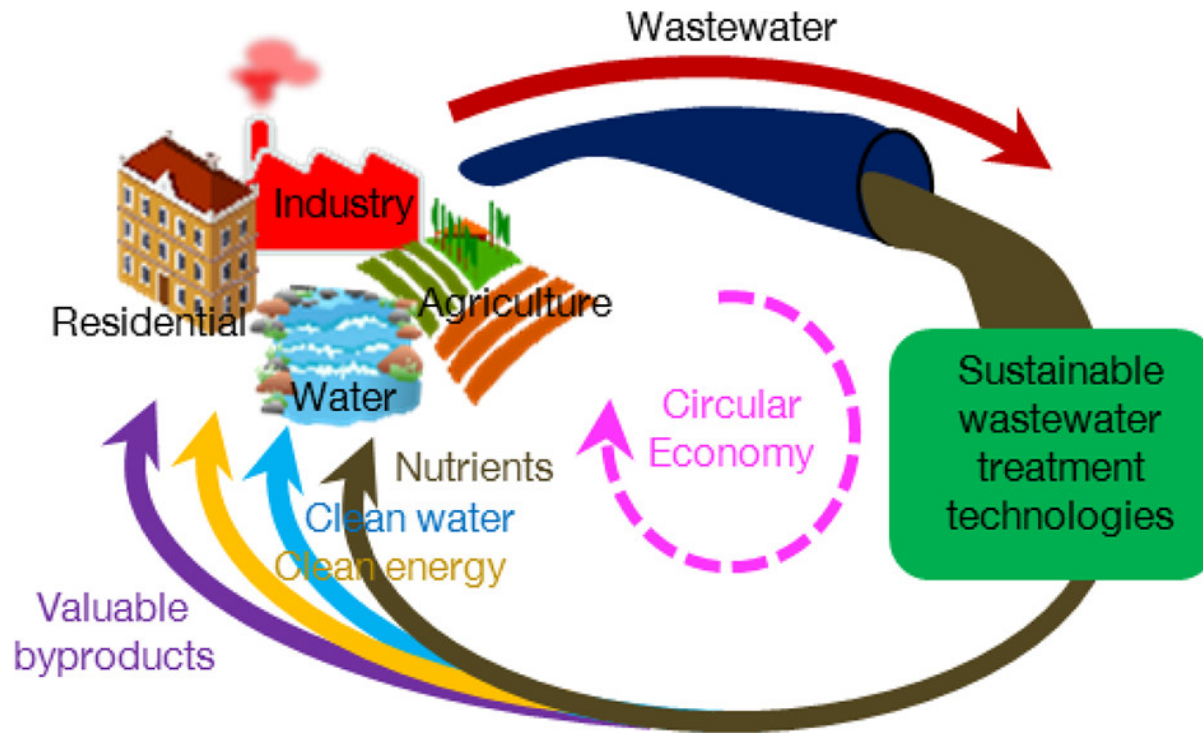
≥80% by 2050	Five states mandate greenhouse gas reductions economy wide: MA, CT, ME, RI, and VT (mostly below 1990 levels)
Net-Zero by 2050 80% by 2050	MA statewide GHG emissions limit MA clean energy standard
90% by 2050	VT renewable energy requirement
100% by 2050 Carbon-Neutral by 2045	ME renewable energy requirement ME emissions goal
100% by 2040	CT zero-carbon electricity goal
100% by 2030	RI renewable energy goal

[ISO Newswire FEBRUARY 25, 2022, “The New England states’ frameworks for reducing greenhouse gas emissions and increasing renewable energy continue to evolve”](#)

Greenhouse Gas Emissions and Water and Wastewater

- Water and wastewater facilities face competing regulatory requirements in this regard because stricter water quality regulations often require more energy intensive treatment processes.
 - PFAS
 - Contaminants of emerging concern (CECs)
- As we celebrate the 50th anniversary of the Clean Water Act and huge improvements in water quality, we also need to address the challenge (and opportunities for innovation) of decoupling high greenhouse emissions from clean water (EPRI and WRF, 2013).
 - [Water Research Foundation \(WRF\) Greenhouse Gas Emissions and Biological Nutrient Removal](#)
 - [American Council for an Energy-Efficient Economy \(ACEEE\) Incorporating Energy Impacts into Water Supply and Wastewater Management](#)
 - [Electric Power Research Institute \(EPRI\) Waste and Circular Economy](#)

Innovation = Circular Economy and Triple Bottom Line Approach



[Transitioning Wastewater Treatment Plants toward Circular Economy and Energy Sustainability, American Chemical Society \(2021\)](#)

Triple Bottom Line Plus

- Triple Bottom Line Plus (TBL+) sustainability framework encompasses environmental, economic, social and technical performance.



Environmental	Emissions and Waste
	Resource Use
	Resource Recovery
	Sustainable Materials
Economic	Facility Footprint
	Life-cycle Cost Analysis
	Sustainable Balance Sheet
Social	Local Purchasing and Hiring
	Stakeholder Involvement
Technical	Workforce Sustainability
	Reliability and Redundancy
	Collection System Integrity
	Operations and Maintenance Optimization
	Resiliency and Adaptability

[Wastewater Treatment and The Triple Bottom Line, Civil + Structural Engineer \(2022\)](#)



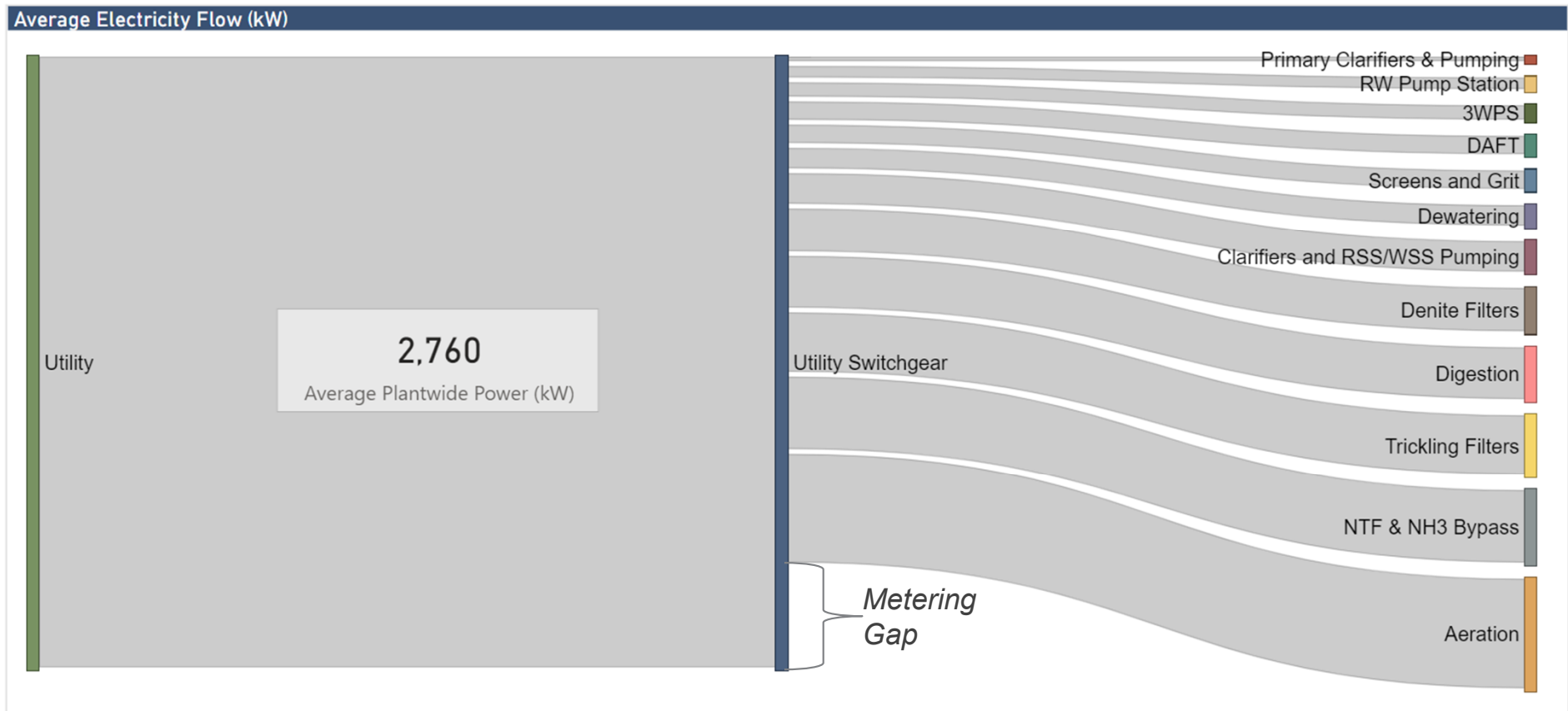
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Greenhouse Gas and Energy Data Analytics Tools

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South Platte Renew Energy Flow Schematic

- Opportunities Identified**
- Maximize RNG
 - Effluent Heat Recovery

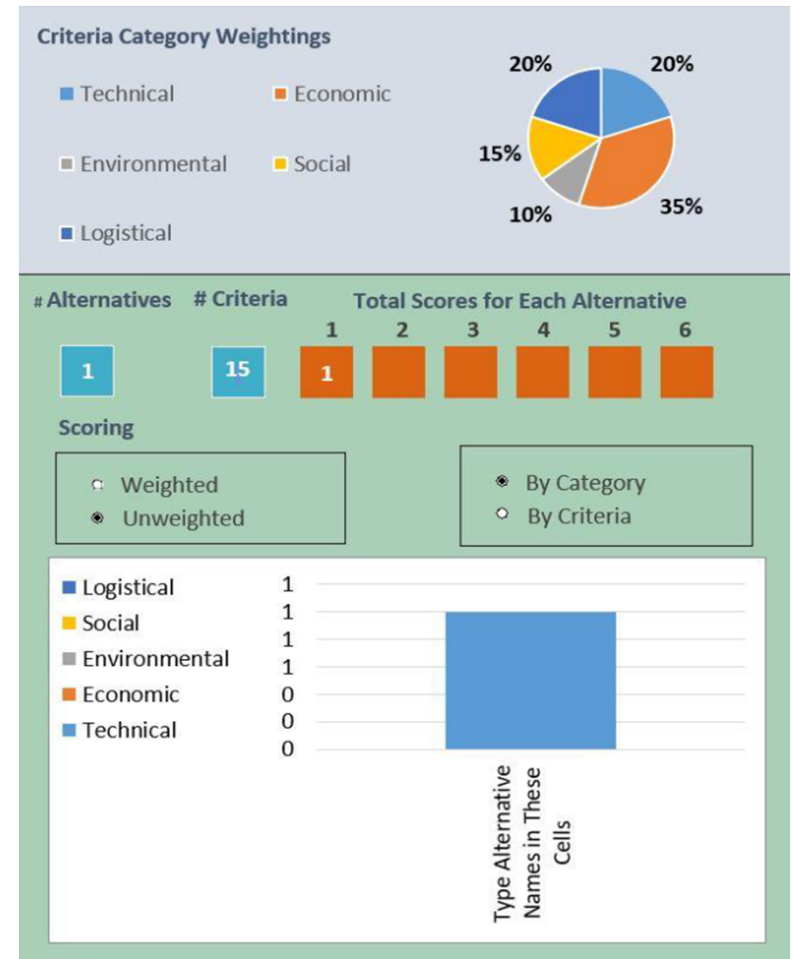


Note: This preliminary energy flow schematic includes electricity loads only.

Gainesville Regional Utilities

Evaluations and Prioritization Framework Elements:

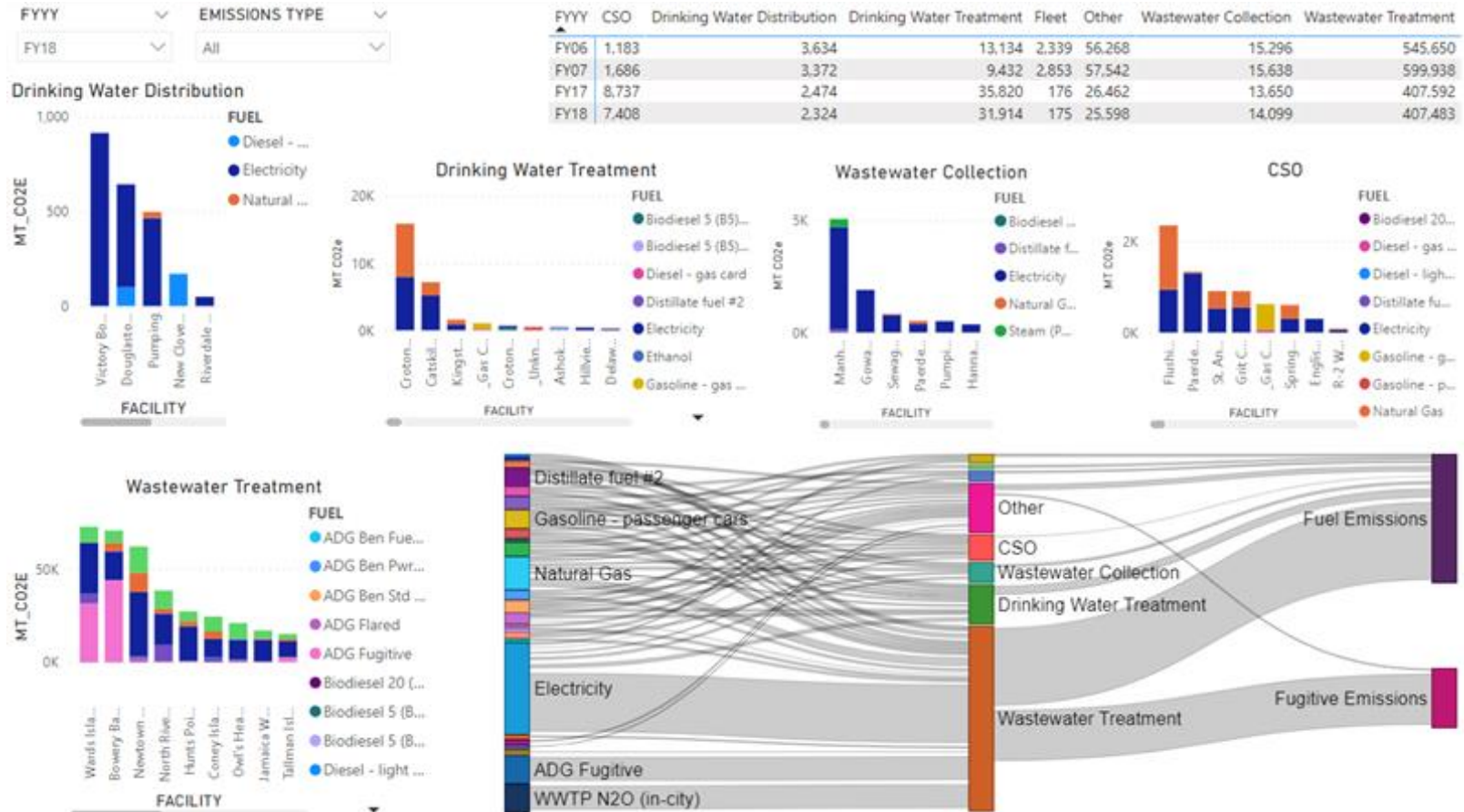
- Payback
- Risks (Markets, operations, down stream impacts)
- Resiliency and redundancy
- Alignment with CIP, Master Plan, and Asset Management Plan
- Alignment with GRU goals and objectives (i.e., energy neutrality)
- Utilization of existing infrastructure, ease of implementation, and constructability
- Potential partners, P3, and alternative delivery opportunities
- Carbon footprint
- Water quality and level of service



Example Evaluation Criteria with Weighted Scores

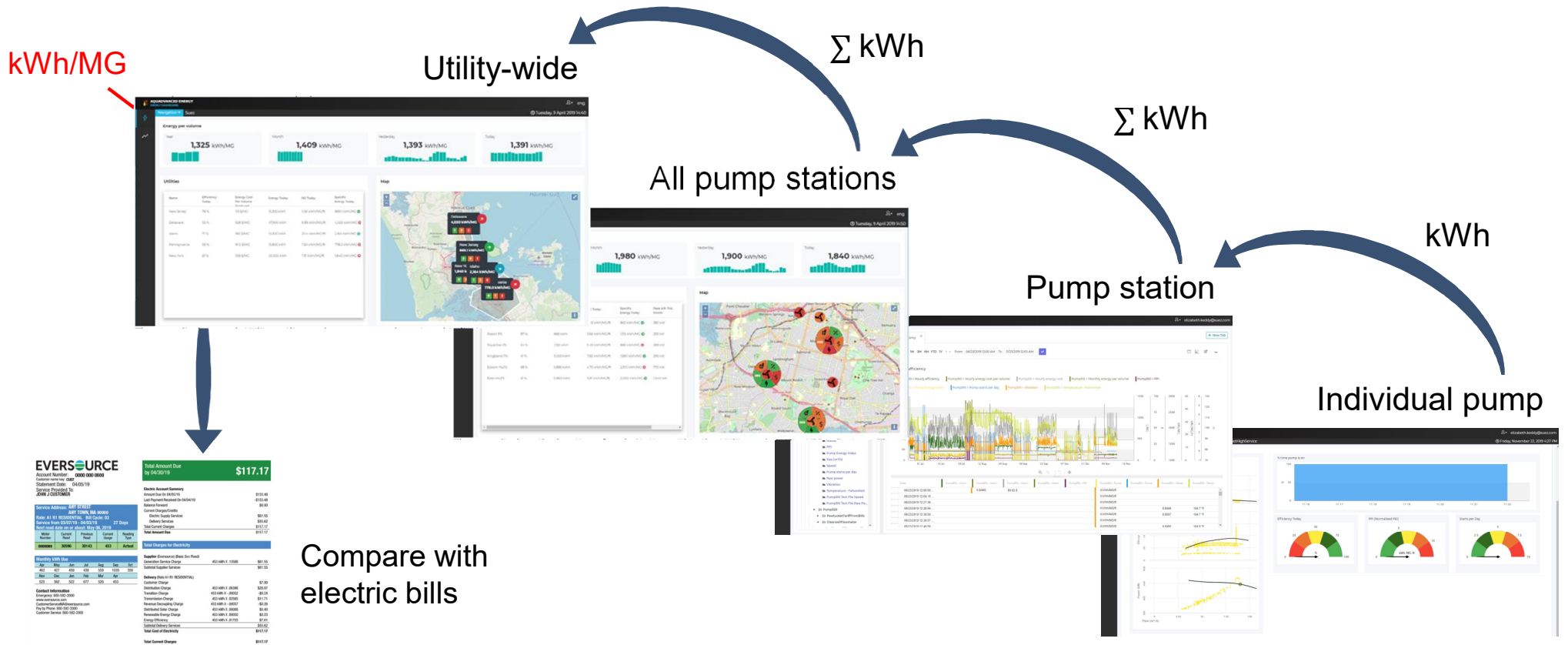
Example – Quantify Energy and Carbon Performance

Large water and wastewater utility in New York measures success and progress towards achieving net zero carbon emissions



Example - Link Energy Data with Facility and Utility Level KPIs

Large water utility using power metering data to track progress towards goal of reducing utility-wide kWh/MG by 5% in 5 years

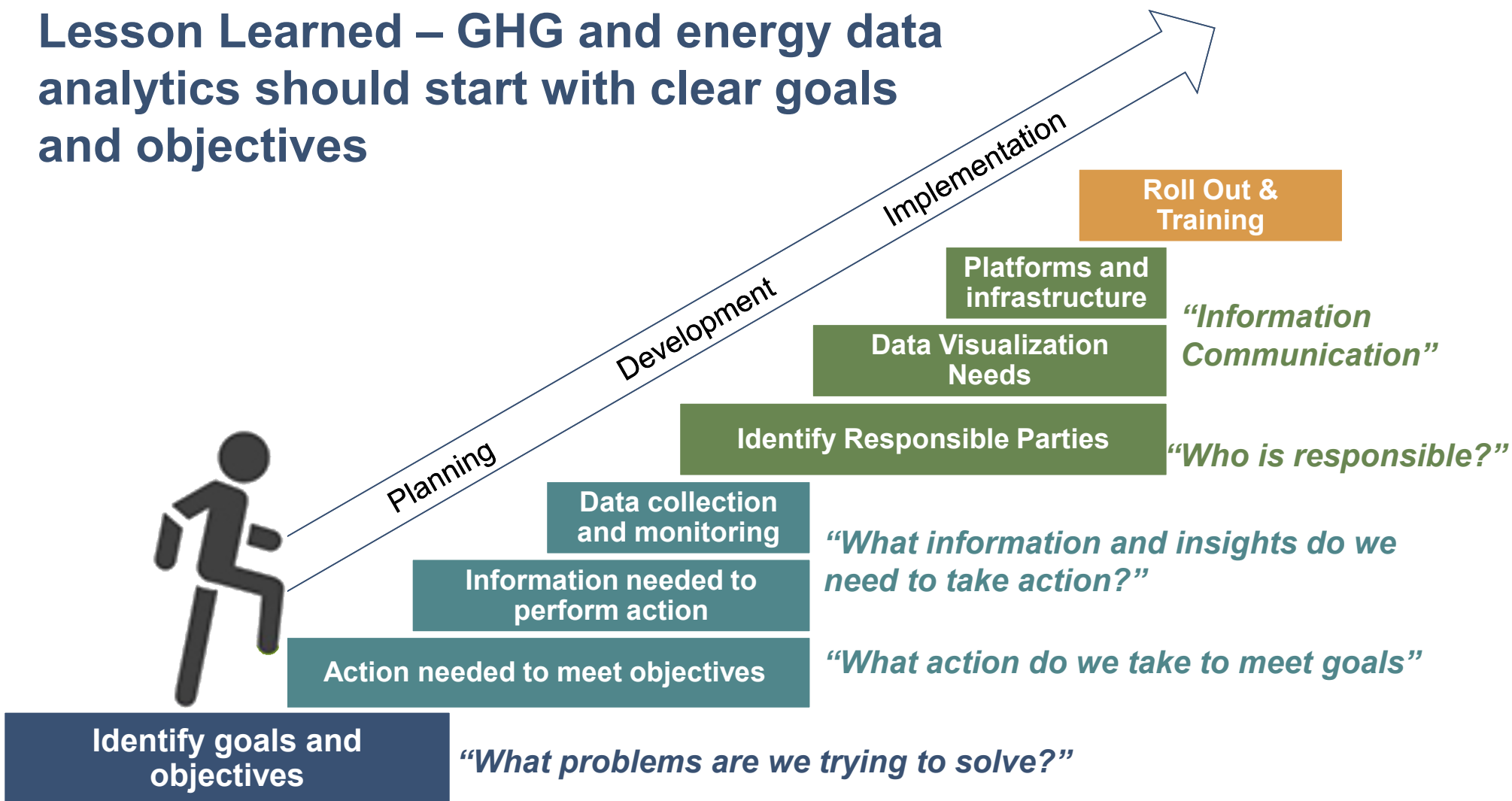




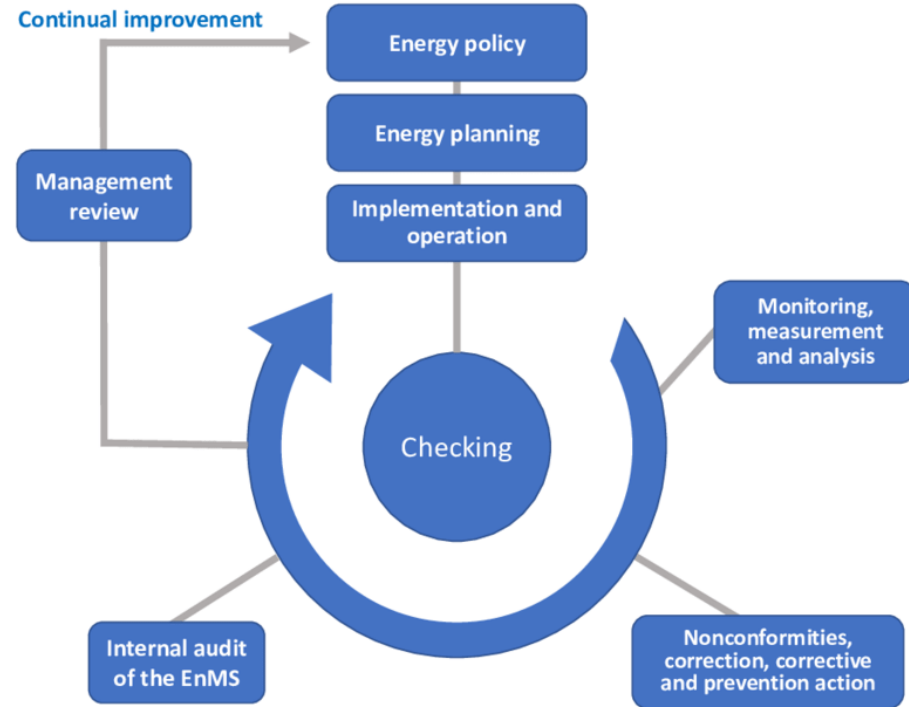
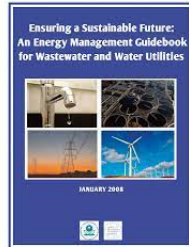
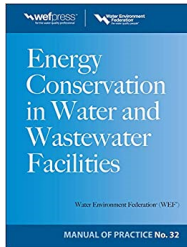
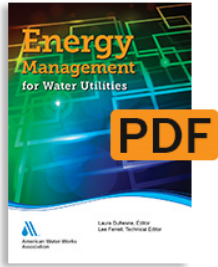
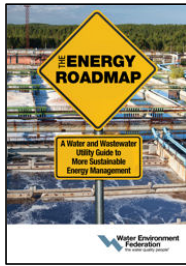
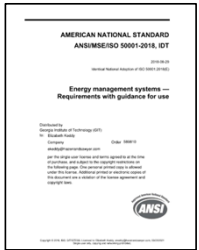
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Best Practices and Industry Standards

Lesson Learned – GHG and energy data analytics should start with clear goals and objectives



Industry Best Practices



Energy Management Program Development



Case Study: Miami-Dade County Water and Sewer Integrated Master Plan

Partnered with the U.S. Department of Energy



Goals
↓ 30% by 2030,
↓ 2.5% per year



Immediate

Optimize bioenergy recovery infrastructure

Procurement optimization

Intermediate

Expand power monitoring program and data analytics

Long-term

Implement energy-efficiency practices; leverage partnership with U.S. Department of Energy to implement the ISO 50001 Framework.

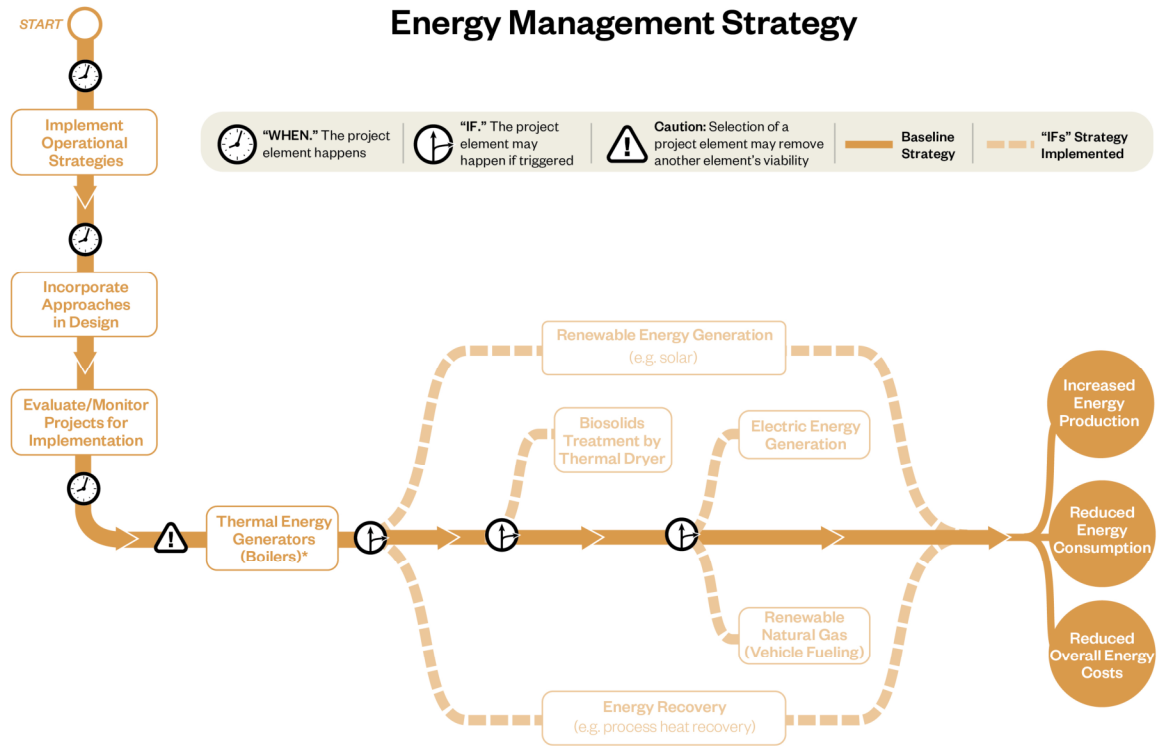


Co-digest fats, oils, grease, and other segregated waste streams.

Renewables (RNG, CNG, solar, hydrogen).

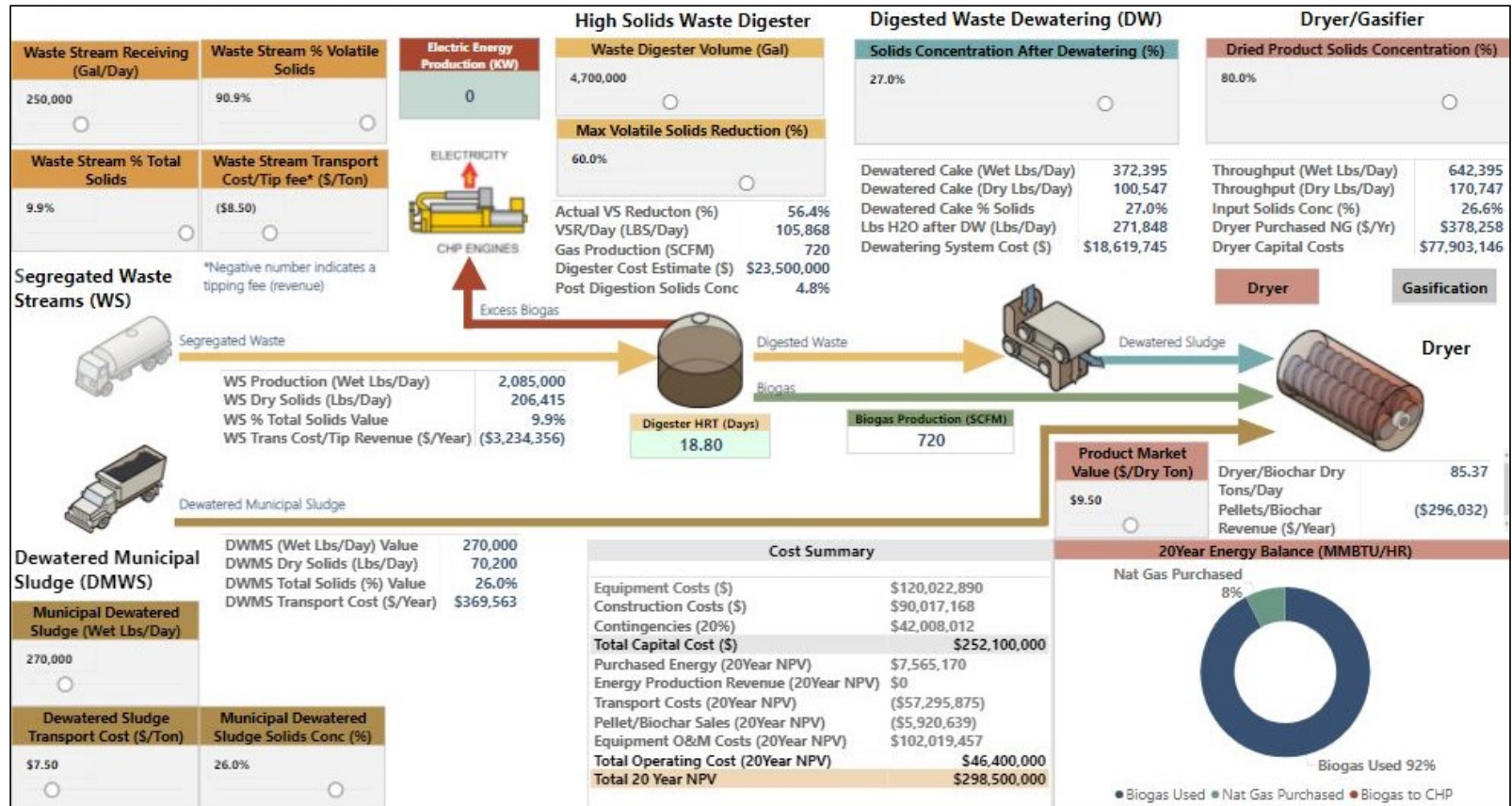
Integrated Energy Management Planning

1. Near and long-term energy optimization planning (**quick wins**)
2. Integration with current CIP and master plans (**roadmaps**)
3. Flexibility for changing conditions (**dashboards**)



Bioenergy Recovery Planning and Data Visualization Platforms

- Microsoft PowerBI
- Tableau
- Monitor key performance indicators and process performance metrics

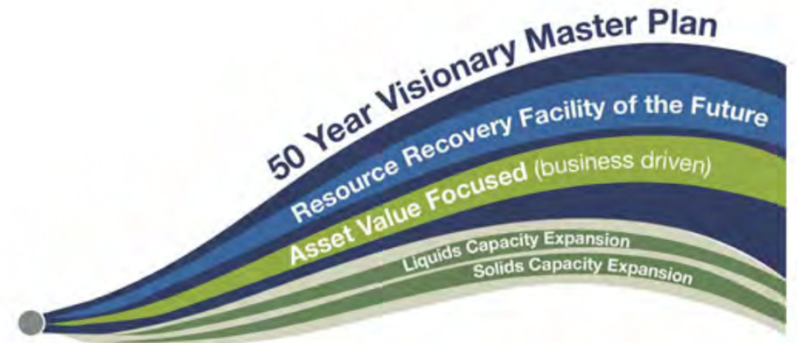


Case Study: Broad Run Water Reclamation Facility Master Plan

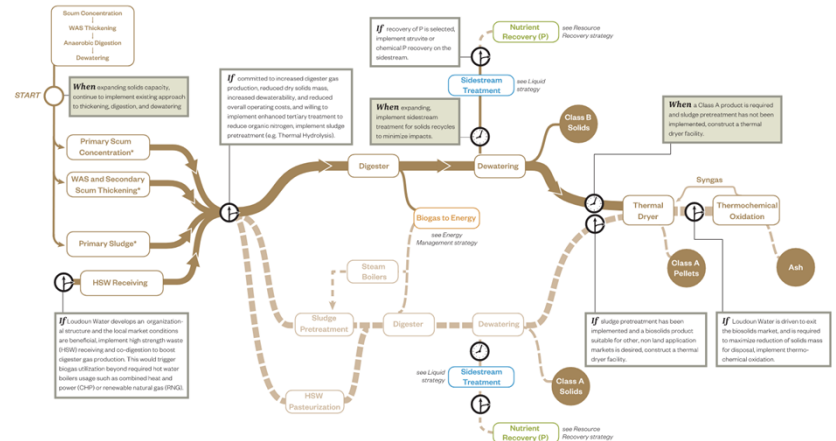
Loudoun Water in Ashburn, VA

A 50-year master plan to expand the liquid and solids treatment trains by leveraging resource recovery, energy markets, and future treatment technologies. The Master Plan for Loudoun Water included:

- Shifting towards energy neutrality
- Quadrupling bottom-line analysis
- Planning for asset management
- ISO 50001 frameworks



Biosolids Management Strategy





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Funding Available

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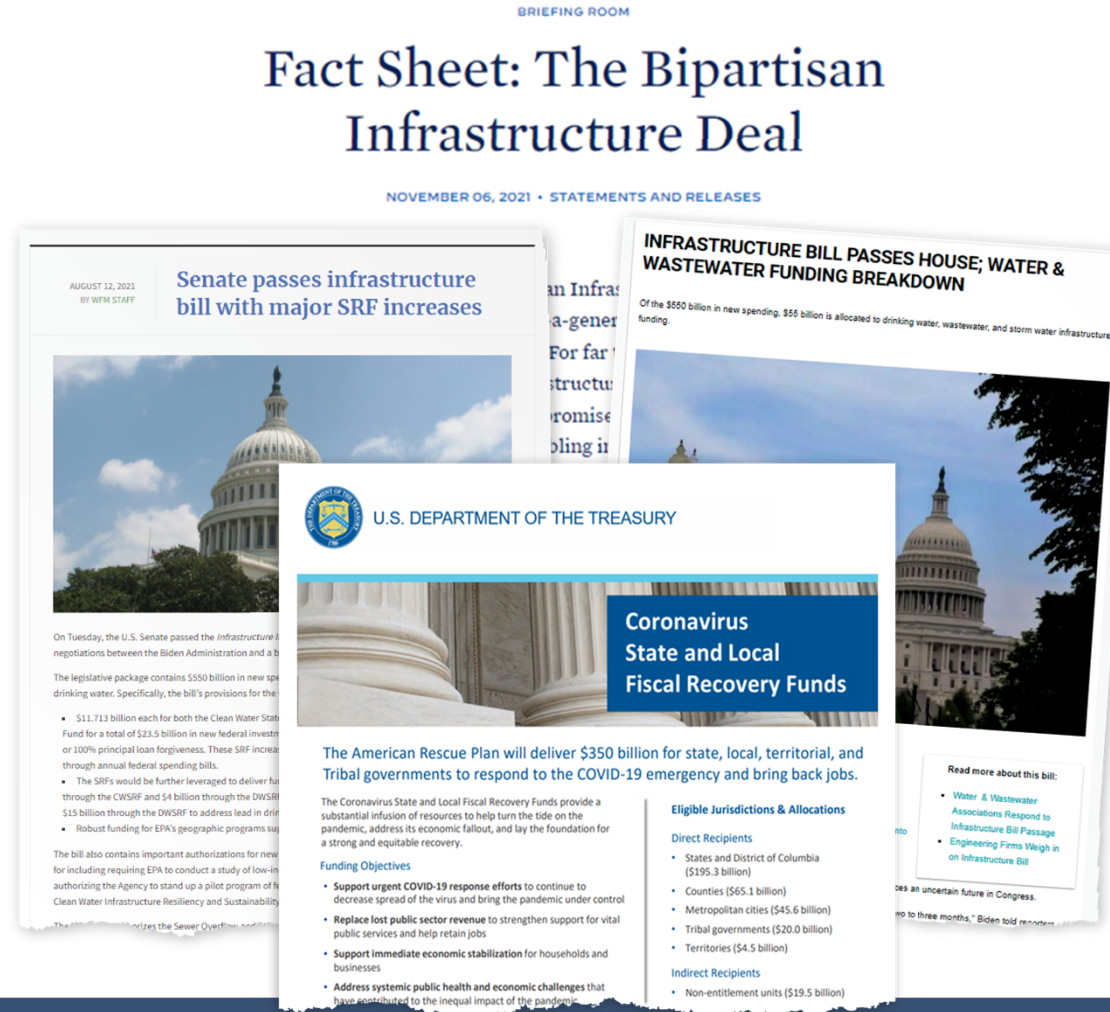
Increased Water Infrastructure Funding

\$350 billion American Rescue Plan Act (ARPA)

- one time, emergency fiscal recovery funds
- gives local/state governments broad discretion on how to use funds
- some state funds are still available for utilities

\$1.2 trillion Bi-Partisan Infrastructure Law (BIL)

- represents a historic opportunity for utilities to both understand and invest in their infrastructure needs
- Increases WIFIA funding
- includes \$55 billion in new water, wastewater/stormwater, and resiliency funds
- expands existing SRF funding and adds new programs
- funds to be administered over a 5-year timeframe



Inflation Reduction Act

Tax “Credits”

- Expands tax credits to new sources of renewable energy including biogas at wastewater treatment facilities
- Tax credit for production
- Tax credit for construction
- Provides tax credits to tax exempt entities
- Provides uncapped credit opportunities



AUGUST 15, 2022

BY THE NUMBERS: The Inflation Reduction Act



▶ [BRIEFING ROOM](#)

▶ [STATEMENTS AND RELEASES](#)

The Inflation Reduction Act will lower costs for families, combat the climate crisis, reduce the deficit, and finally ask the largest corporations to pay their fair share. President Biden and Congressional Democrats have worked together to deliver a historic legislative achievement that defeats special interests, delivers for American families, and grows the economy from the bottom up and middle out.

Here's how the Inflation Reduction Act impacts Americans by the numbers:

Inflation Reduction Act

- Change in Investment Tax Credit (ITC) Rate
 - Prevailing Wage Bonus
 - Domestic Content Bonus
 - Energy Community Bonus
- Expansion of Entities Eligible for ITC
- Expansion of Electricity Production Tax Credit (PTC) to Include “Qualified Biogas Properties”
 - No longer limited to electricity production
- Provides Payment in lieu of Credits for Tax Exempt Entities

Department of Energy Grants and Loans

Energy Efficiency and Conservation Block Grant Program (EECBG)

The Infrastructure Investment and Jobs Act of 2021, also referred to as the Bipartisan Infrastructure Law, appropriated \$550 million to the Energy Efficiency and Conservation Block Grant (EECBG) Program. The purpose of the EECBG Program is to assist eligible local governments, states and territories, and Indian tribes in implementing strategies to:

- Reduce fossil fuel emissions.
- Reduce the total energy use of the eligible entities.
- Improve energy efficiency in the transportation, building, and other appropriate sectors

Energy Infrastructure Investment Program

The Inflation Reduction Act (IRA) appropriates approximately \$11.7 billion in total for the Department of Energy (DOE) Loan Programs Office (LPO) to support issuing new loans. These amounts increase loan authority in LPO's existing loan programs by approximately \$100 billion. The IRA also adds a new loan program, the Energy Infrastructure Reinvestment (EIR) Program (section 1706), to help retool, repower, repurpose, or replace energy infrastructure that has ceased operations or to improve the efficiency of infrastructure that is currently operating. The wide-ranging impacts of these new and expanded authorities are further described below.



Greenhouse Gas Reduction Fund

The Inflation Reduction Act allocates \$27 billion to a “Greenhouse Gas Reduction Fund” that will be administered by the EPA. By using financing, not grants, capital is expected to be repaid, which creates a multiplier effect in which a single taxpayer dollar can be recycled and lent multiple times to facilitate a clean energy transition. Green banks generally target market sectors in which payback is expected and lent to proven, technically viable projects that are well past the research and development stage

\$11.9 billion in total funds are allocated. There are three funding streams, the first stream authorizes \$7 billion for “low-income and disadvantaged communities to deploy or benefit from zero-emission technologies.” The second funding stream features \$8 billion to support low-income and disadvantaged communities by funding direct or indirect investments in renewable energy projects that would otherwise lack access to financing. The third funding stream features \$12 billion that can be used broadly to support eligible direct and indirect investments in renewable energy projects nationwide.



Takeaways

- Significant new opportunities for funding and tax credits over the last 12 months
- Projects that previously didn't provide an adequate ROI may now be feasible
- Probably just the first steps in changing energy policy
- Things are constantly changing and evolving



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Thank You!

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