



# Navigating Greenhouse Gas Reporting, Justice40, and Other Policy Drivers to Inform Sustainable Water Treatment and Biosolids Management



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# Policy Drivers





# Inflation Reduction Act (IRA)

- Environmental Justice: law directly supports communities working to address local pollution concerns by creating a new \$3 billion environmental justice grant program for community-based organizations and their partners.
- Tribes: provides \$75 million to help guarantee up to \$20 billion in loans to support Tribal investment in energy-related projects and \$150 million to electrify Tribal homes with clean energy.
- \$27 billion for the Greenhouse Gas Reduction Funds to support water treatment plants to upgrade their infrastructure; Notices of Funding Opportunities (NOFO) to be released early summer 2023.
- \$40 billion in loan authority to guarantee loans for innovative clean energy projects.
- Up to \$250 billion in new loan authority for Energy Infrastructure Reinvestment Financing

# Federal Buy Clean Initiative in IRA

- Buy Clean Task Force initiative is to promote use of low-carbon, made in America construction material
- IRA Section 70006 authorizes FEMA to provide federal assistance for costs associated with low-carbon materials; and incentives that encourage low-carbon and net-zero energy projects

**U.S. General Services Administration  
Interim IRA Low Embodied Carbon Material Requirements  
May 16, 2023**

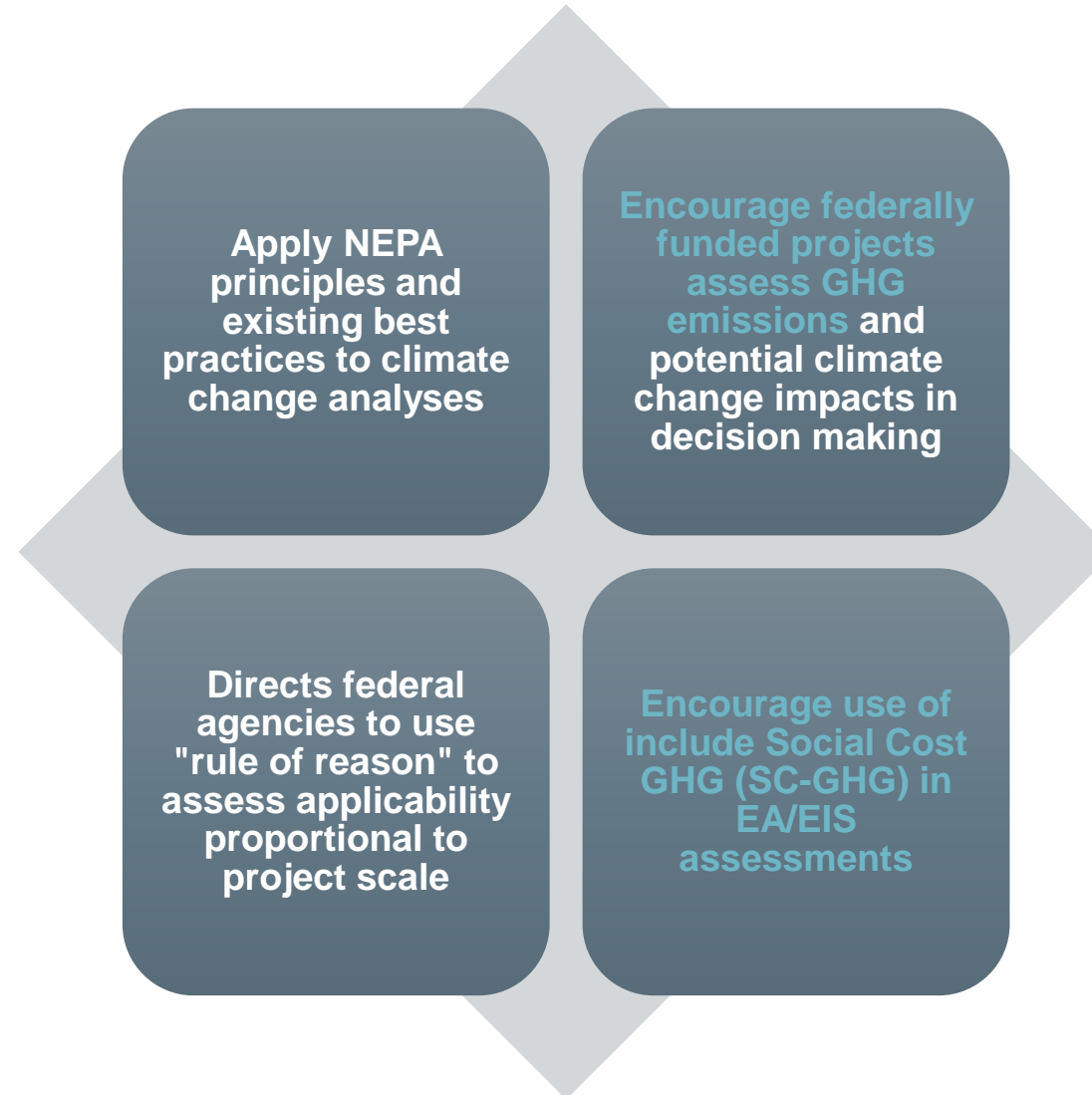
GSA IRA LEC Material Requirements

	GSA IRA Limits for Low Embodied Carbon Concrete - May 16, 2023 (EPD-Reported GWPs, in kilograms of carbon dioxide equivalent per cubic meter - kgCO <sub>2</sub> e/ m <sup>3</sup> )		
Specified concrete strength class (compressive strength [f'c] in pounds per square inch [PSI])	Top 20% Limit	Top 40% Limit	Better Than Average Limit
≤2499	228	261	277
3000	257	291	318
4000	284	326	352
5000	305	357	382
6000	319	374	407
≥7200	321	362	402

Add 30% to these numbers for GWP limits where high early strength<sup>1</sup> concrete mixes are required for technical reasons.


Source: [Interim IRA LEC Material Requirements - used in Pilot May 2023 \(gsa.gov\)](https://www.gsa.gov)

# White House Issues Guidance on Greenhouse Gas Emissions, Permitting



# Bipartisan Infrastructure Law (BIL)

- Funding opportunities for various types of infrastructure
  - e.g., Drinking Water State Revolving Fund (DWSRF)
- Establishes the Carbon Reduction Program
  - Reduce CO<sub>2</sub> emissions and embodied carbon
  - Requires a state-level Carbon Reduction Strategy
- Alignment with Justice40 Initiative



The image is a screenshot of a tweet from the account 'Energy & Commerce Democrats' (@EnergyCommerce). The tweet text reads: 'Roughly 10 million American households and 400,000 schools and childcare centers lack safe drinking water. The Bipartisan Infrastructure Law invests billions to replace lead water service lines and remove contaminants in drinking water.' Below the text is a graphic with a glass of water on the left and bold blue text on the right that says: 'THE BIPARTISAN INFRASTRUCTURE LAW INCLUDES \$55 BILLION FOR SAFE AND CLEAN DRINKING WATER'.

**Energy & Commerce Democrats** @EnergyCommerce

Roughly 10 million American households and 400,000 schools and childcare centers lack safe drinking water. The Bipartisan Infrastructure Law invests billions to replace lead water service lines and remove contaminants in drinking water.

**THE BIPARTISAN INFRASTRUCTURE LAW INCLUDES \$55 BILLION FOR SAFE AND CLEAN DRINKING WATER**

## Building off the Justice40 Initiative

APRIL 21, 2023

# Executive Order on Revitalizing Our Nation's Commitment to Environmental Justice for All

lands and waters. Pursuing these and other objectives integral to advancing environmental justice can successfully occur only through meaningful engagement and collaboration with underserved and overburdened communities to address the adverse conditions they experience and ensure they do not face additional disproportionate burdens or underinvestment.





# Helpful Tools





# GHG

PFCs CO<sub>2</sub> N<sub>2</sub>O HFCS CH<sub>4</sub> SF<sub>6</sub>

## Scope 3

INDIRECT

Upstream activities



## Scope 1

DIRECT

## Scope 2

INDIRECT

## Scope 3

INDIRECT

Downstream activities



# GHG Emission Modeling Portfolio



## Facilities Fuel/ Energy Use

- EPA MOtor Vehicle Emission Simulator (MOVES)
- EPA Emissions & Generation Resource Integrated Database (eGrid)
- California Emissions Estimator Model (CalEEMod)
- EPA's Electronic Greenhouse Gas Reporting Tool (e-GGRT)



## Water Treatment

- Life Cycle Assessment (LCA)
- WRF 5188 GHG LCA Tool



## Remediation

- Battelle SiteWise
- EPA Spreadsheets for Env. Footprint Analysis (SEFA)



## Biosolids Management

- Canada Biosolids Emissions Assessment Model (BEAM)



## Solid Waste Management

- Landfill Gas Emissions Model (LandGEM)
- EPA's Waste Reduction Model (WARM)
- Municipal Solid Waste Decision Support Tool (MSW-DST)



## Transportation/ Green Fuels

- Traffic Demand Model
- EPA MOVES
- CA Emission FACTors (EMFAC)
- Argonne Lab GHG, Regulated Emissions, and Energy use in Technologies (GREET)
- Add FHWA ICE tool



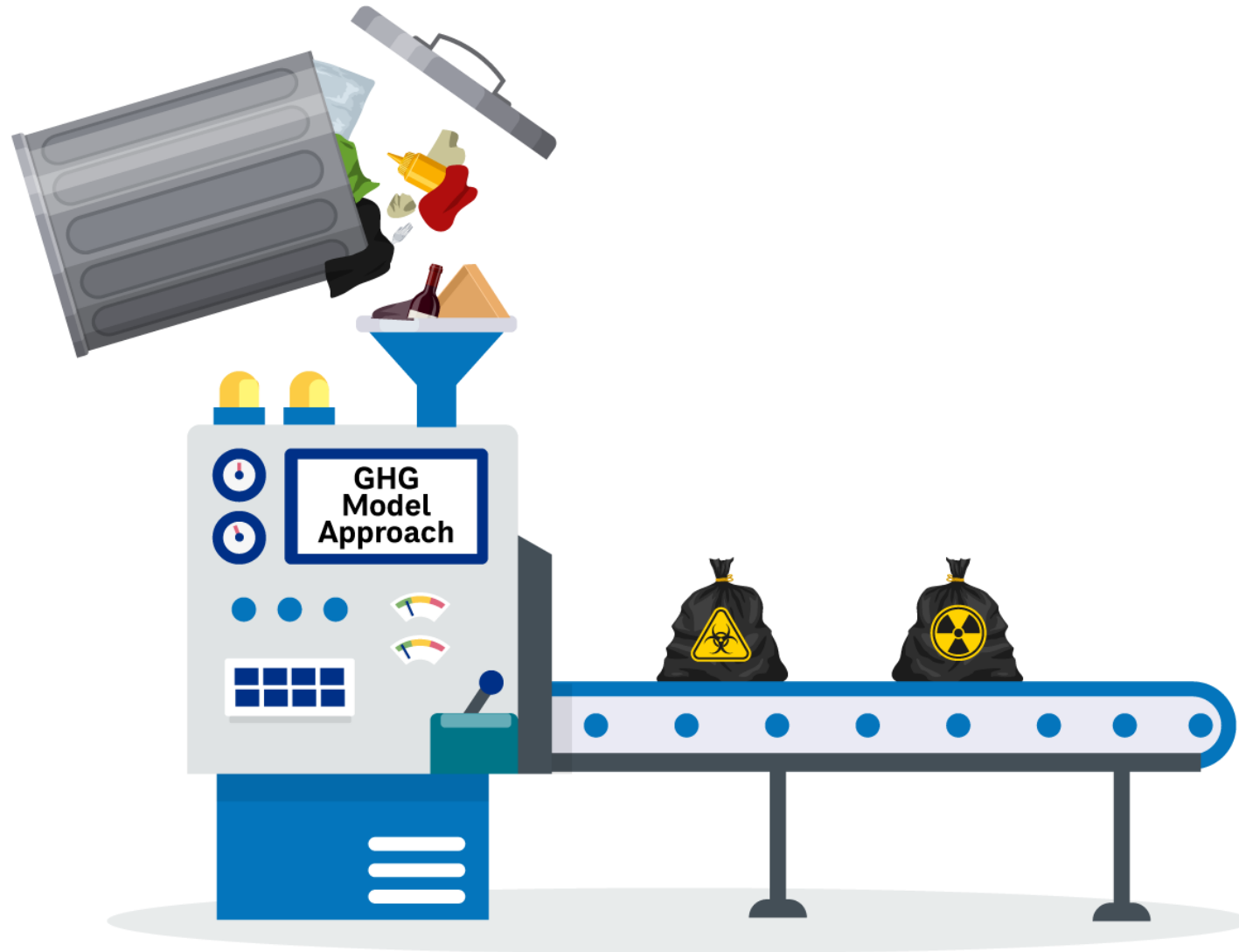
## Materials – Consumables

- Environmental Product Declarations (EPDs)
- IAEG Scope 3 Purchased Goods and Services (PGS) and Capital Goods (CG) GHG Calculation Tool
- Life Cycle Assessment

### WSG Applicable GHG Tools

typically requires a compilation of multiple models

# GHG Modeling is not Plug and Play





# Environmental Life Cycle Assessment

- Example: AnMBR treatment of domestic wastewater may be more energy efficient and sustainable than conventional treatment with:
  - Primary sedimentation with anaerobic digestion
  - Alternative processes for dissolved methane removal
  - Biological sulfide removal
  - Biogas recovery as energy source

Contents lists available at ScienceDirect

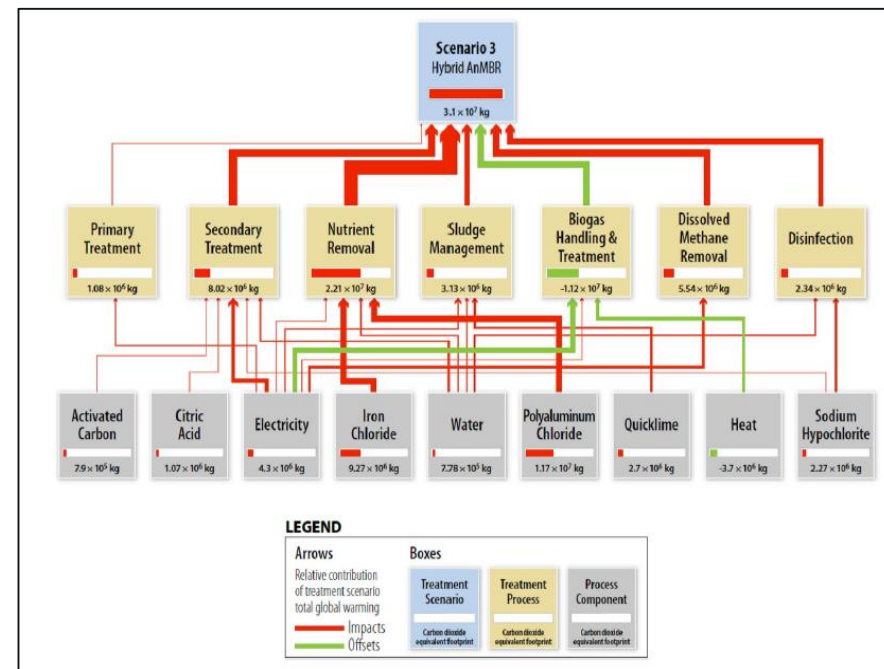
Journal of Environmental Management

journal homepage: <http://www.elsevier.com/locate/jenvman>


Research article

Life cycle assessment and economic analysis of anaerobic membrane bioreactor whole-plant configurations for resource recovery from domestic wastewater

Melissa Harclerode<sup>a,\*</sup>, Alexandra Doody<sup>b</sup>, Andrew Brower<sup>c</sup>, Paloma Vila<sup>d</sup>, Jaeho Ho<sup>e</sup>, Patrick J. Evans<sup>e</sup>



# GSA's Green Procurement Compilation

 **Green Procurement Compilation**      **LEARN**      **PLAN**      **EXPLORE**      **PROCURE**      **APPLY**      **TRA**  
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**Green Procurement Compilation**  
The Green Procurement Compilation (GPC) is a comprehensive green purchasing resource designed for federal contracting personnel and program managers.

[Read About](#)      [Watch Video !\[\]\(13f8cc7f38c868748825f3a80b201b57\_img.jpg\)](#)

**Greenhouse Gas (GHG) Management Training for Federal Contractors**

Learn about federal policies impacting GHG management, how to develop a GHG inventory for your company, and how to begin reducing your GHG emissions now!

# White House Climate Economic Justice Screening Tool

## **NEW** Historic underinvestment

Census tracts that experienced historic underinvestment based on redlining maps created by the federal government's Home Owners' Loan Corporation (HOLC) between 1935 and 1940. The tool uses the National Community Reinvestment Coalition's [methodology](#) for converting boundaries in the HOLC maps to census tracts. Census tracts meet the threshold when they have a score of 3.25 or more out of 4.

## Workforce development

Communities are **identified as disadvantaged** if they are in census tracts that:

**ARE** at or above the 90th percentile for [linguistic isolation](#) OR [low median income](#) OR [poverty](#) OR [unemployment](#)

**AND** more than 10% of people ages 25 or older have a [high school education](#) (i.e. graduated with a high school diploma)

## Water and wastewater

Communities are **identified as disadvantaged** if they are in census tracts that:

**ARE** at or above the 90th percentile for [underground storage tanks and releases](#) OR [wastewater discharge](#)

**AND** are at or above the 65th percentile for [low income](#)

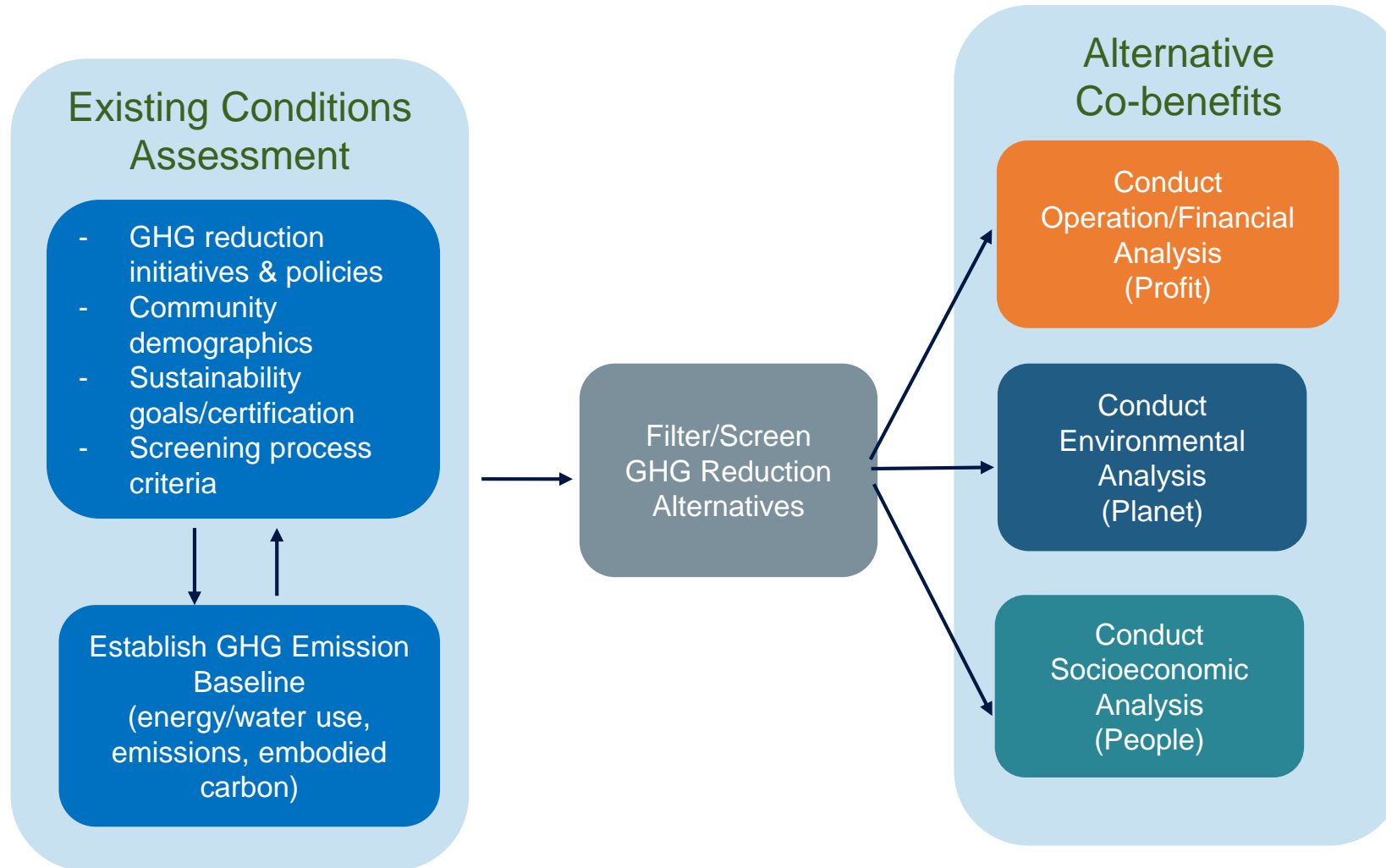




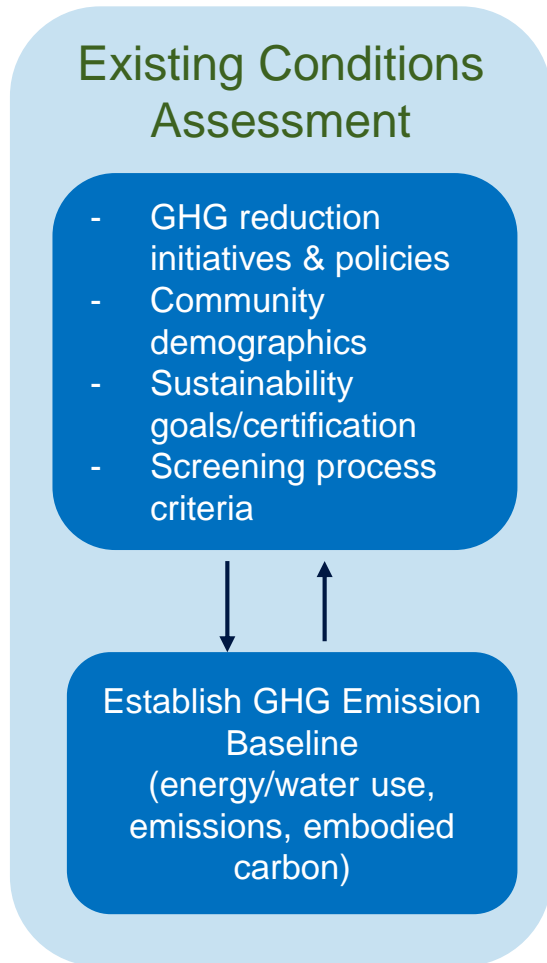
# CDM Smith's SustainAlytics Framework



# Municipality or Water Utility GHG Reduction Strategy Framework



# GHG Reduction Strategy Framework: Existing Conditions Assessment



- Assess current state of water sustainability
  - Establish GHG emission and embodied carbon baseline
  - Existing GHG reduction initiatives and policies
  - Alignment with master plan
- Identify sustainability goals
  - Local and regional GHG reduction targets
  - Sustainable water source(s) and watershed stewardship
  - Economic recovery in biosolids management
  - Improve clean water access to disadvantaged communities
- Establish screening process to select sustainable solution



# GHG Reduction Strategy Framework: Initiatives Screening

Filter/Screen  
GHG Reduction  
Alternatives

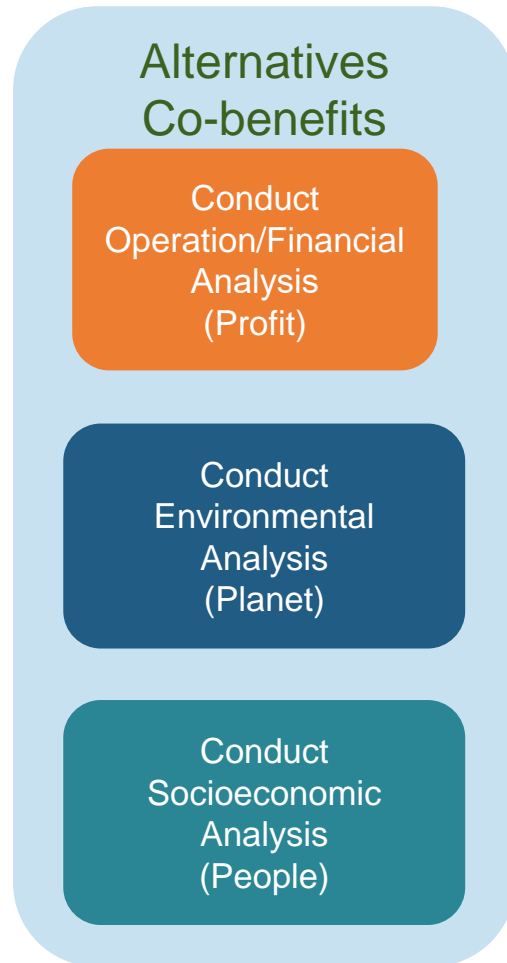
After determining GHG emission and embodied carbon baseline a filter/screen process will be applied to identify any critical shortcomings, ensuring that only strategies aligned with agency and stakeholder sustainability goals and those of its planning partners are considered.

## Filter/Screening Process Criteria

- Impacts to existing utility infrastructure
- Requires community partners and/or other stakeholder partnerships
- Jurisdictional, policy and legal limitations
- Alignment with existing master plan
- Carbon reduction potential
- Criteria air pollutant (CAP) emissions
- § Environmental justice and social equity considerations
- § Land use burden/ecosystem services
- § Opportunity to incorporate resiliency
- § Potential to energy recovery/reuse
- § Opportunity to improve access to clean water

# GHG Reduction Strategy

## Consideration of the Triple Bottom Line



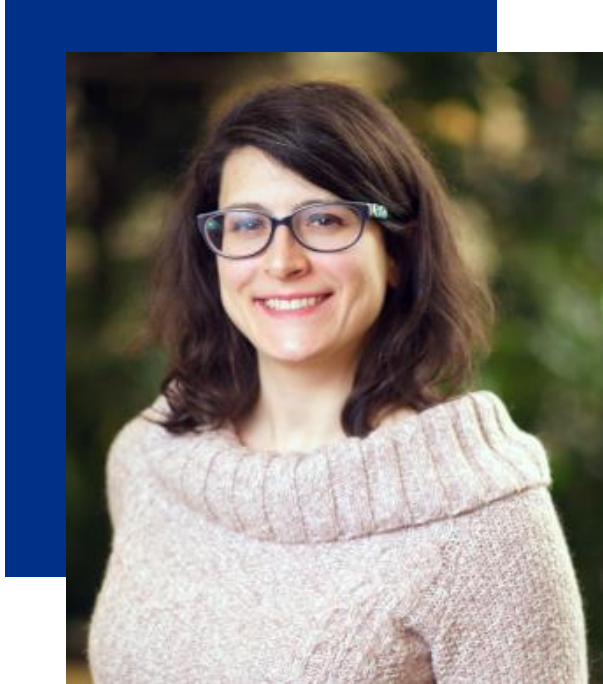
- Funding Requirement Metrics
  - GHG reduction potential
  - Disadvantaged community (DAC) benefits
- Expand Benefit Cost Analysis
  - Social cost of GHG and CAP emissions
  - Value(s) of water
  - Ecosystem restoration and services
  - Economic recovery in biosolids management
- Implement Sustainability Certification
  - ISI Envision
  - USGBC LEED



# Key Takeaways

- Federal funding is and becoming available to improve water infrastructure
- Consideration of GHG reduction and disadvantaged communities (DACs) are regulatory required
- GHG reduction includes carbon emissions and embodied carbon
- Vetted sustainability tools are available to estimate GHG reduction potential, assess impacts to DACs, and other co-benefits
- Low carbon materials resources are available, however require engineering analysis to determine feasibility
- Sustainable water treatment and biosolids management is achievable

# Thank you! Questions?



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