Austin Integrated Water Resource Planning Community Task Force

June 7, 2016

Public Outreach Update

1. Brochure
2. Survey
3. Events Update
   - Imagine Austin Speaker Series, August 3, 2016
   - District newsletters and town hall meetings

RFQ Update: Near Term Schedule

	Date	Milestone
✓	April 12th	Draft scope and fee proposal to be reviewed by Task Force
✓	April 14th	Tentative date for Scope Review Subcommittee meeting
✓	April 20th	Task Force meeting to gather feedback on draft scope and fee proposal
✓	May 3rd	Task Force review and recommendation on Recommendation for Council Action (RCA) for contract execution
✓	May 11th	Water and Wastewater Commission review and recommendation on RCA for contract execution
	June 9th	Meeting date for Council consideration of RCA for contract execution

Integrated Infrastructure: Ed Clerico

June 7, 2016

NATURAL SYSTEMS UTILITIES

A BETTER WAY

32 Year History of Innovation

200 Operating Systems

25 DNWS – Decentralized Nonpotable Water Supply

175 Aquifer Recharge/Regeneration

Bristol-Meyers Squibb, NJ
1st Pharmaceutical WWT/Reuse system in the US

1980s

Copper Hill Elementary School, East Amwell, NJ
1st public school water reuse system

1990s

Gillette Stadium, Foxboro, MA
Spurred economic development along Route 1 corridor including shops, restaurants and offices

2000s

The Solaire, Battery Park, NYC
1st residential water reuse project in the U.S.; LEED-Platinum

MacDonald Island, AB, Canada
Integrated Water Reuse and Heat Recovery system utilizing treated wastewater effluent for irrigation and flush water while also recovering the effluent heat for pool heating within the rec center.

2010s

Durst Halletts Point 1, Queens NYC
District scale redevelopment with in-building water reuse and thermal energy recovery systems

Emory University, Atlanta GA
400,000 GPD existing infrastructure sewer mining retrofit with water reuse for cooling and flushwater

NATURAL SYSTEMS UTILITIES
A BETTER WAY

Engineering To Overcome Nature

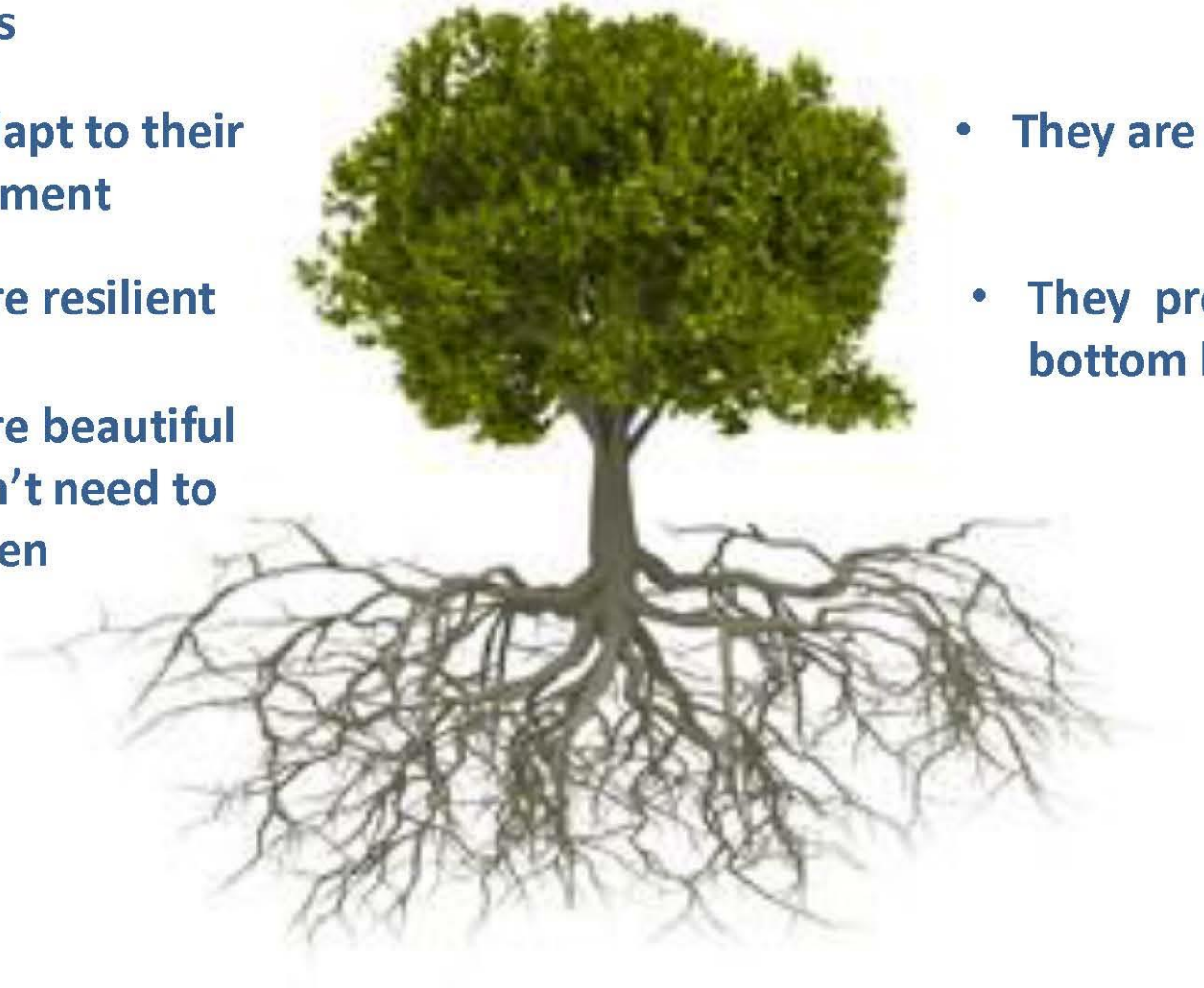
The Roman Aqueduct – more than 2000 years old - supplied abundant water to bath houses and latrines and powerfully established the relationship between wealth and water.

The Roman Toilet – 500BC *Cloacina, Goddess of the Sewers,* carried wastes to the river - so began our modern perspective on waste management. "Dilution is the Solution"

Engineering to Mimic Nature

- Natural metabolic systems don't exist as single purpose linear systems, they function as highly integrated regenerative and efficient reuse systems

- They adapt to their environment
- They are resilient
- They are beautiful and don't need to be hidden

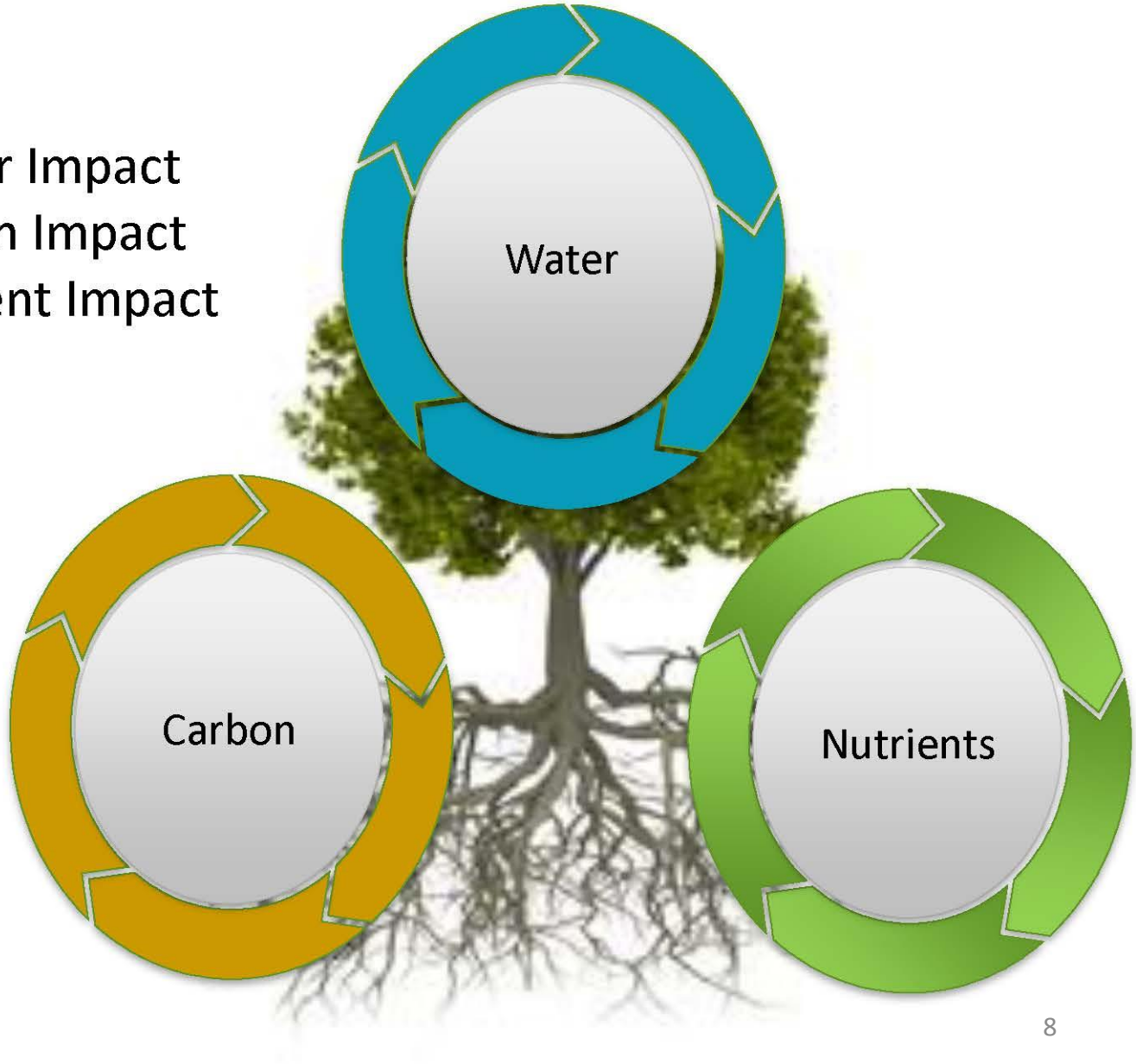


- They are distributed
- They provide triple bottom line value

Creating Balance That Mimics Nature

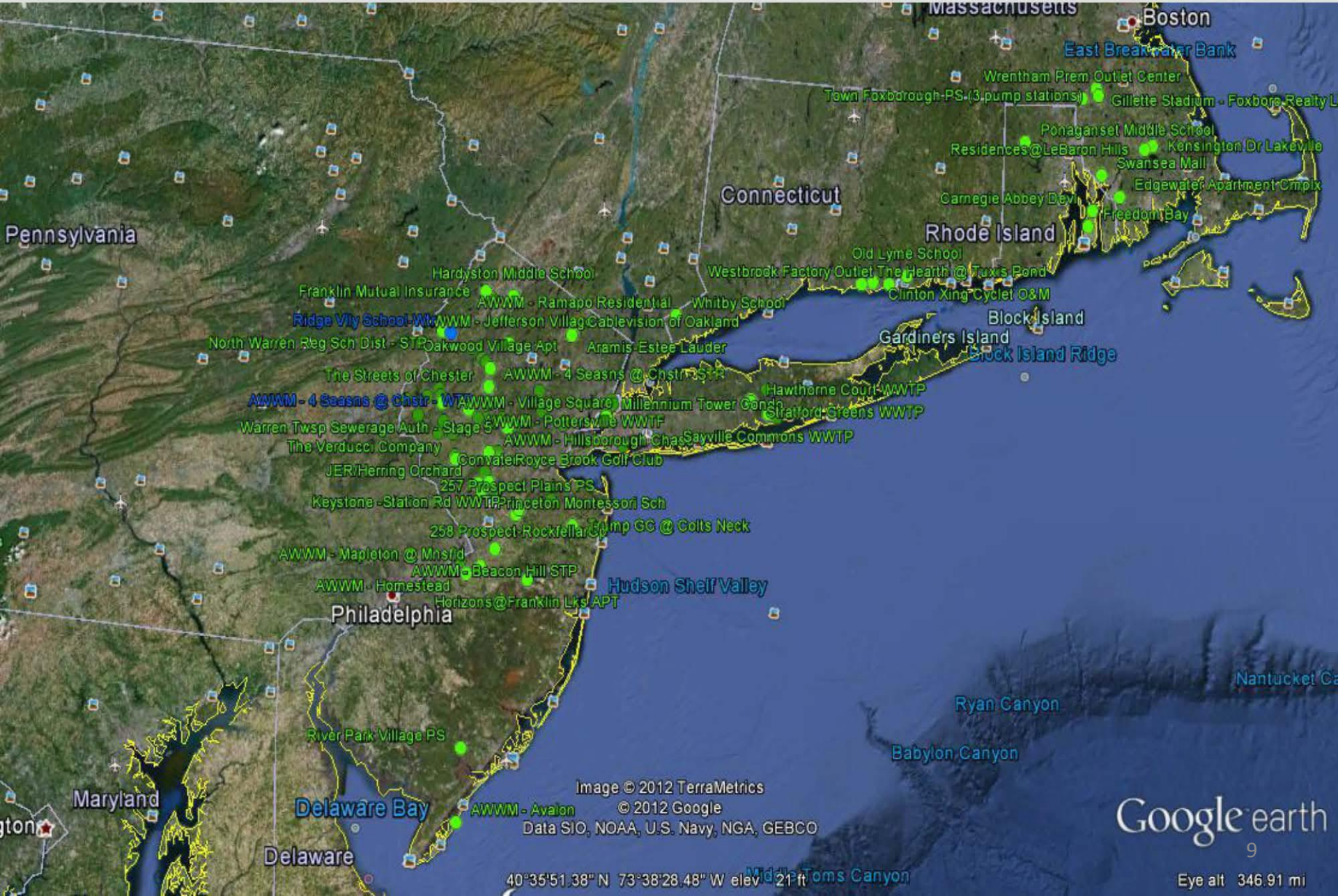
Zero Impact Goals

- ZWI – Zero Water Impact
- ZCI - Zero Carbon Impact
- ZNI – Zero Nutrient Impact

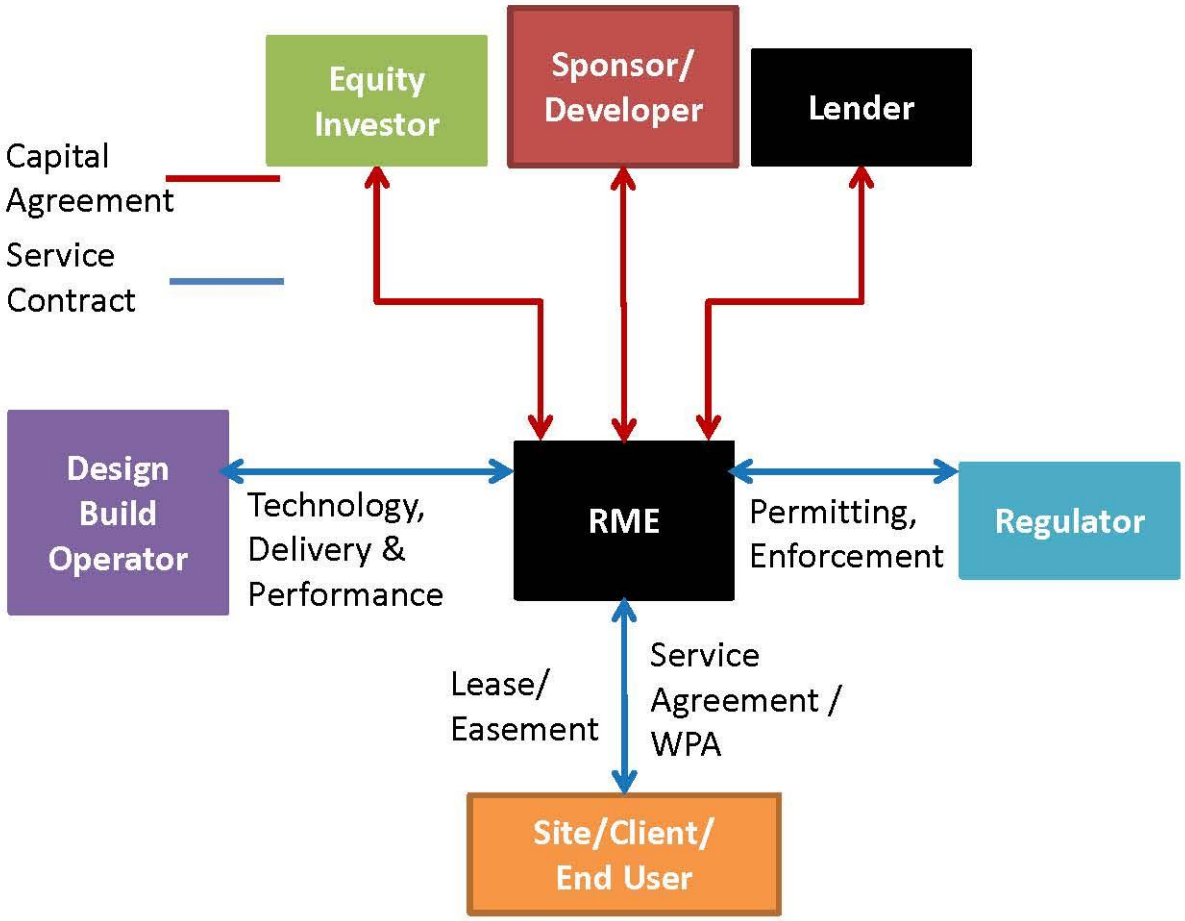


The "Infrastructure Tree" is a very simplified analogy illustrating integrated functions and the key factors that influence our current design process.

NSU Northeast – An Integrated Infrastructure Forest



Responsible Management Entity (RME)



Appropriate Risk/Reward Dynamics are Critical for Success

- Economic Benefit: Service is affordable and provides quality of life benefits to End User and economic benefit to sponsor, lender and investor
- Environmental Benefit: Resources are preserved and protected from pollution
- Social Benefit: Infrastructure supports desired Community Development while posing very low risk

NATURAL SYSTEMS UTILITIES
A BETTER WAY

National Water Research Institute & Water Environment Research Foundation – DNWS Guidelines – July 2016

1. Establish framework for a risk based method of regulating safe, affordable and dependable use of alternative nonpotable water sources
2. Nonpotable water sources –
   - Rainwater - from roof catchment
   - Stormwater – from surface runoff
   - Condensate – from steam heat, cooling or refrigeration
   - Shallow Groundwater – from sumps and drains
   - Wastewater – from buildings and neighborhoods
   - Greywater – from sinks, showers and washers
   - Blackwater – from toilets and kitchen
3. Nonpotable water uses
   - Toilet flush water
   - Laundry
   - Cooling
   - Irrigation
   - Wash-down

Key Lessons Learned

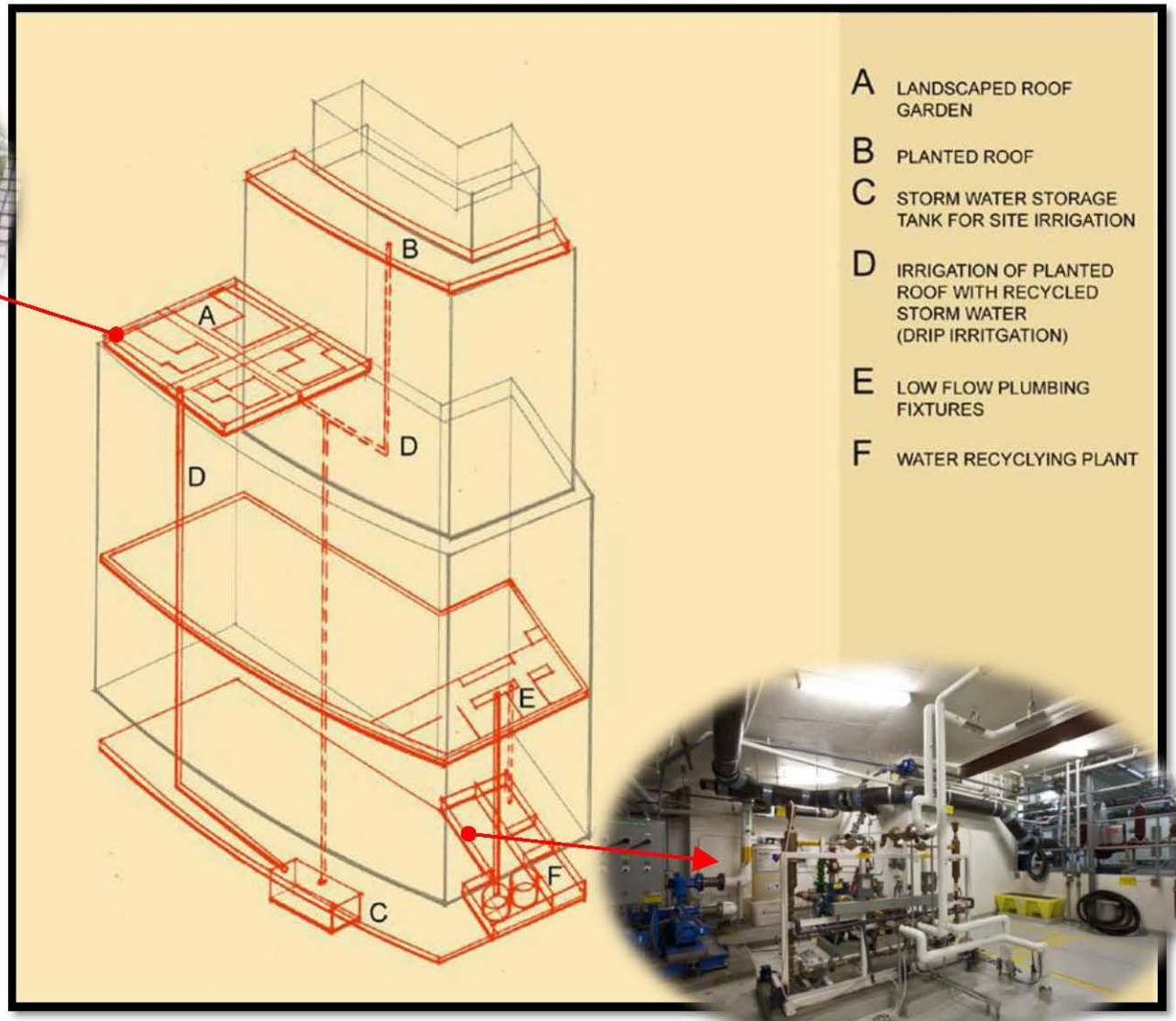
- Customer Drivers Vary Widely
  - Pollution prevention – protecting the pristine, restoring the polluted
  - Water conservation – scarcity of supply
  - Economic benefit – property value, affordability, community economic vitality, resiliency
- Delivery Mechanism Greatly Affects Innovation Potential – DBO and DBOO allow for flexibility and single point of accountability
- Innovation drives value, i.e. thermal energy transfer achieves net zero energy impact
- Performance Is Not Just O&M – System Stewardship - the responsible overseeing and protection of something considered worth caring for and preserving. Adequate performance requires RME as system steward.
- Integrated Systems Approach Provides Best Value To All Stakeholders

Case Study – Battery Park City - NYC

- **Over 10 years** of operating data. **ZERO permit exceedances** and **ZERO user complaints/public health concerns**
- System automatically controlled/monitored with alarms. Licensed Operator **On-Site 2 days/wk**, less than 4 hours per day (8 hours / wk)
- Achieving **>55% Water Use** Reduction
- Achieving **>65% Sewer** Discharge Reduction
- **100% Reclaimed Water** For Cooling Tower Make-up
- Reduced strain on municipal/centralized infrastructure
- Existing systems being retrofitted & new systems being developed with thermal energy recovery for **NET ZERO/NET POSITIVE ENERGY** water reuse

NATURAL SYSTEMS UTILITIES
A BETTER WAY

Integrated Water Resource Management



Reuse Applications:

- Toilet Flushing
- Cooling Tower Make-Up Water
- Landscape Irrigation
- Laundry

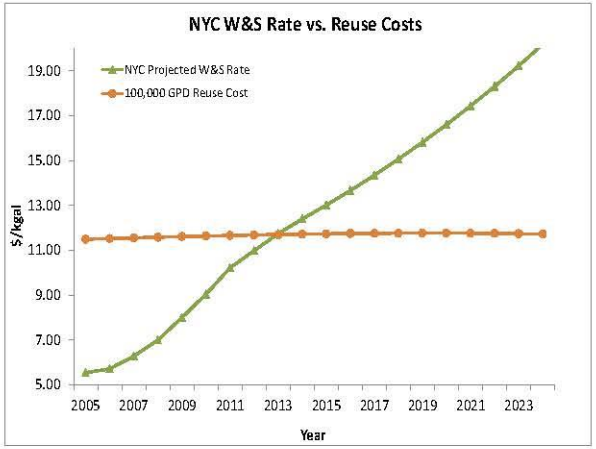
The Visionaire Building Integrates a Multi-Functional System With Existing Infrastructure

Date of Project Launch: 2004

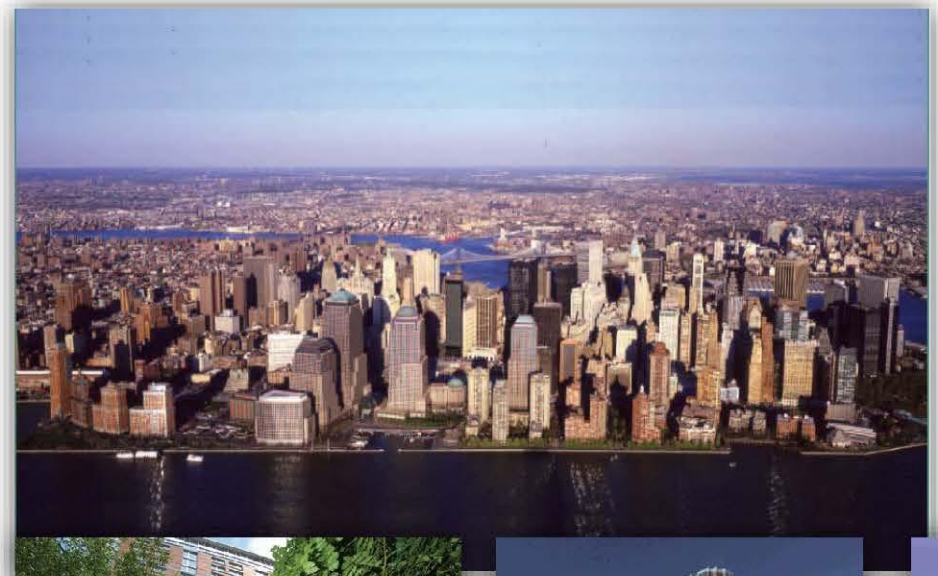
Project Summary	• Achieve 55% Water Use Reduction, 64% Sewer Discharge Reduction and 100% Reuse For Cooling Tower Make-up
	• Simple implementation for single building/owner
	  – More cost effective than NYC water & sewer (at 95,000 GPD scale)
	  – Lower energy use than NYC utility infrastructure

Value Proposition	• Proven resource stewardship that reduces lifecycle cost
	• Intelligent design recycles formerly wasted resources
	  – Energy
	  – Water
	  – Nutrients

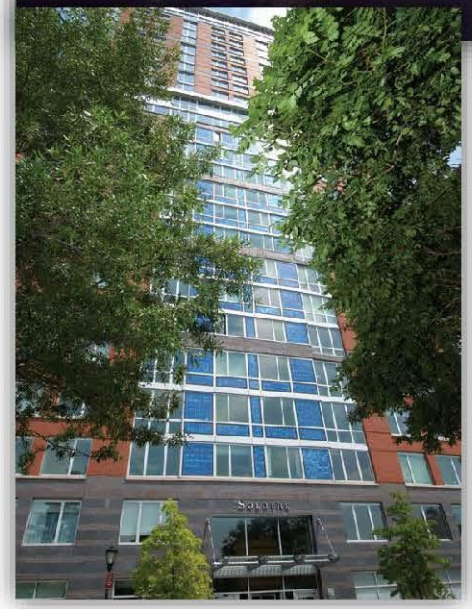
Economics	• 25% Credit on Water & Sewer Bill offsets operating cost

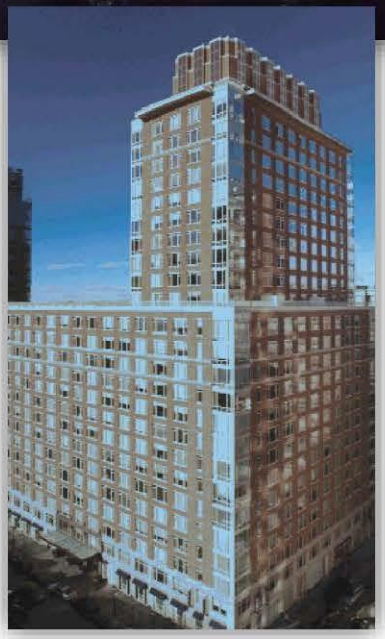


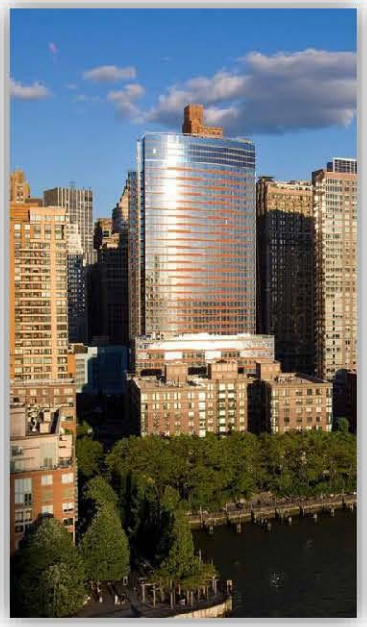
Battery Park City – Neighborhood Water Reuse



Multiple small scale systems serving densely populated areas. High efficiency MBRs – high quality water, small foot print





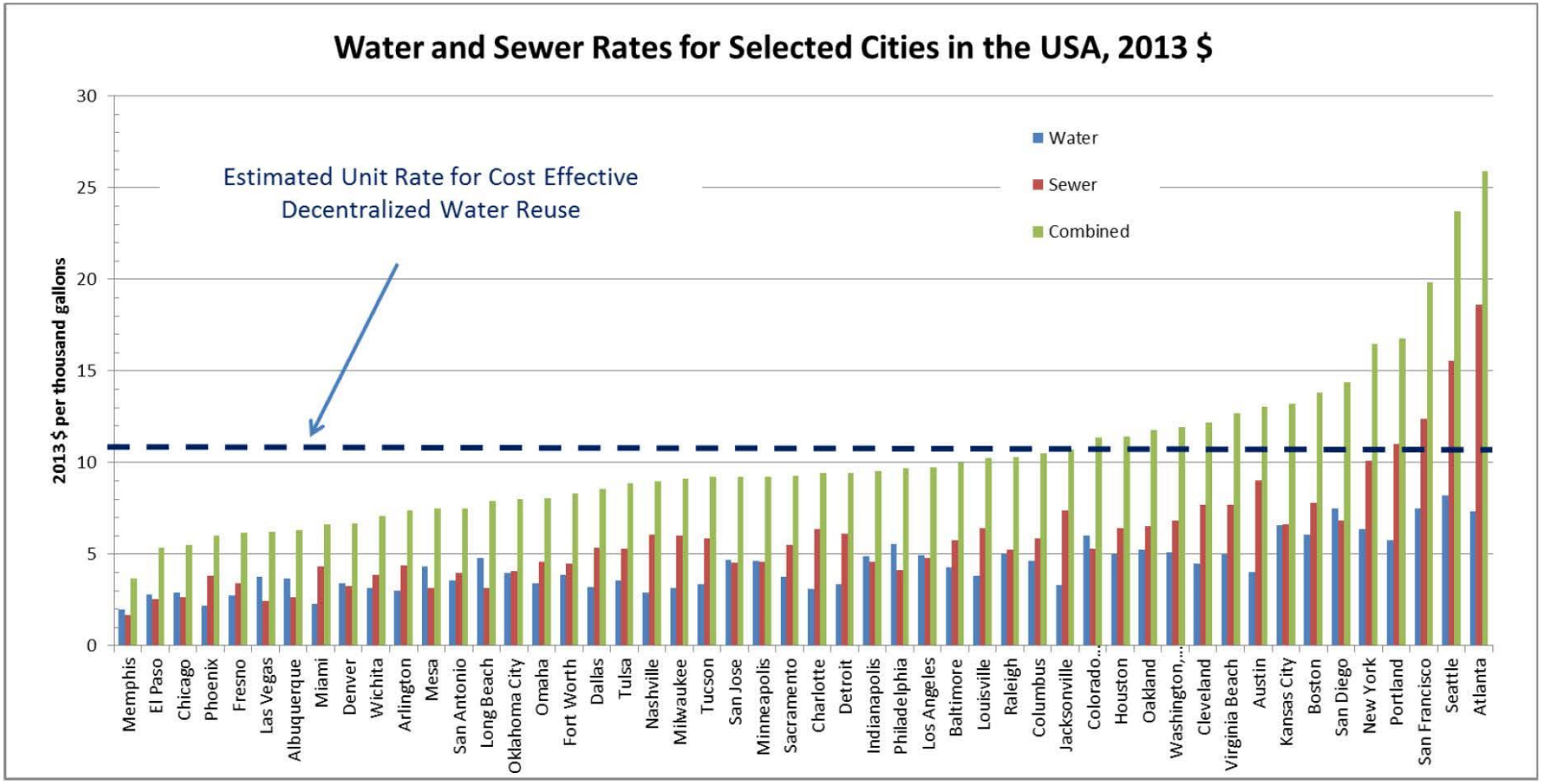


Gillette Stadium, Foxboro MA – New England Patriots

- Intensive applications of wastewater treatment and water reuse that set new standards of performance.
- Gillette Stadium provides a case study of developer and community economic benefits coupled with environmental gains.

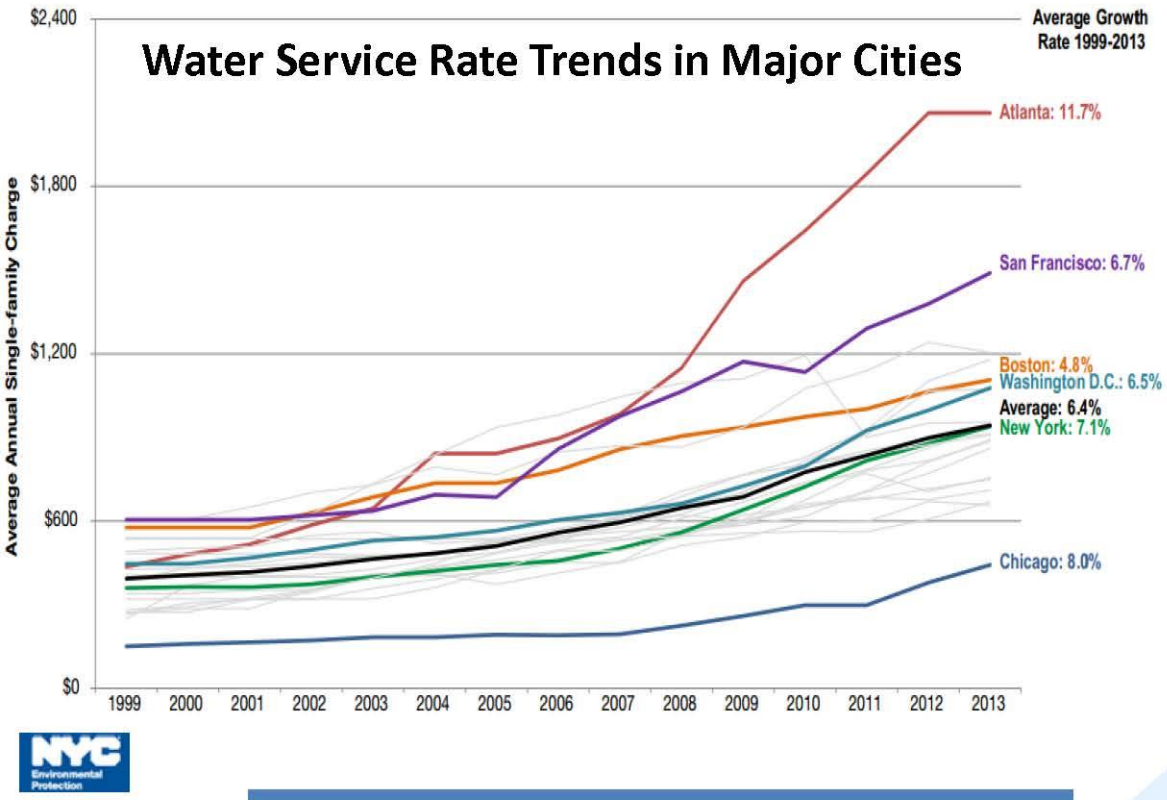
Gillette Stadium- Economic Growth Engine

Geographies for Municipal Water Reuse



- Similar Opportunities for Industrial

Distributed Water Market Drivers are at an Inflection Point

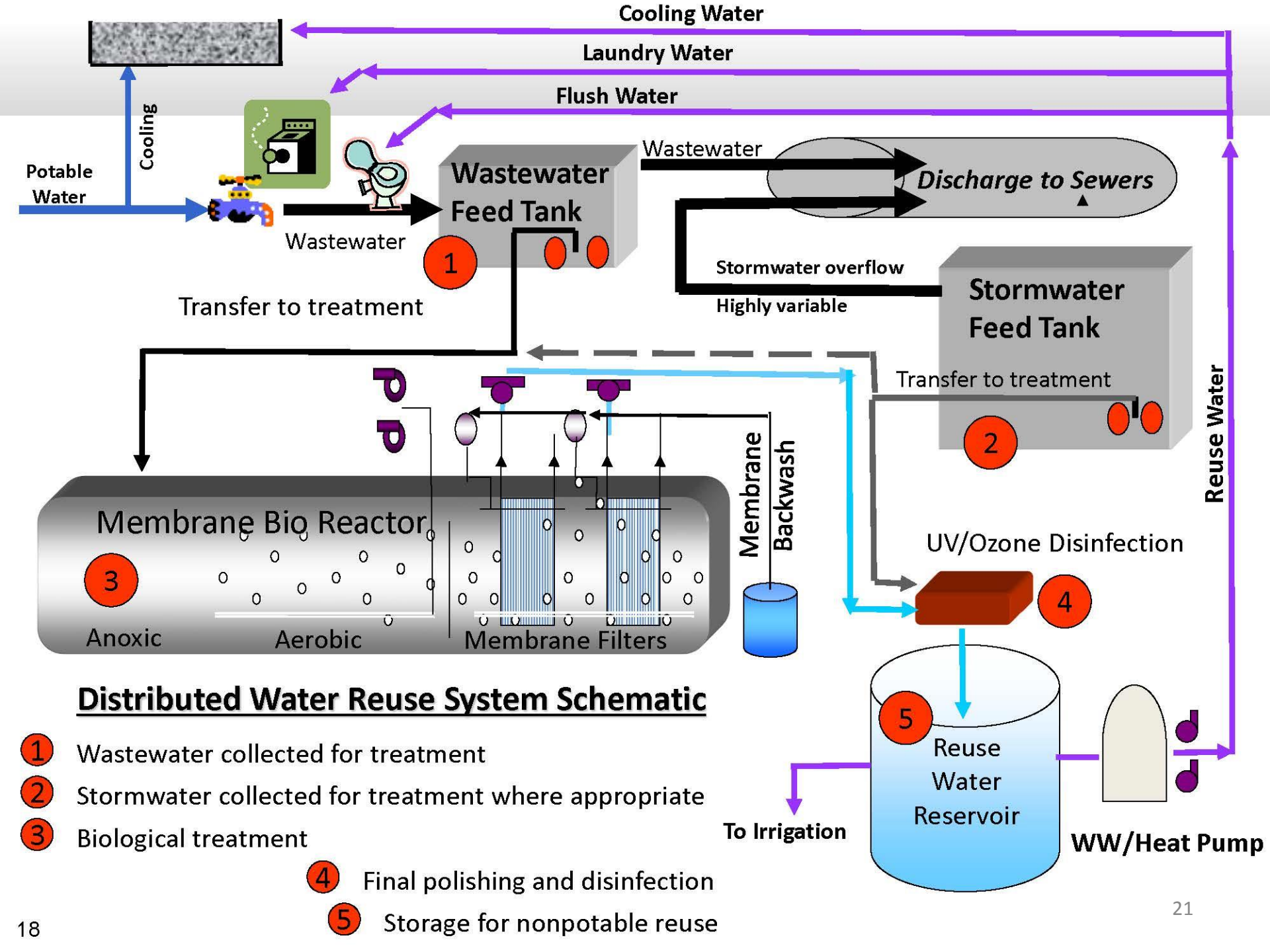


Past

1. Engineering Specialists Develop Experience in Niches
2. Environment & Public Health Regulations Expand
3. Incumbent Centralized Infrastructure Ages
4. Technology Tested in the Field

Present

1. DBOO Platform Allows Solutions to Scale
2. Falling Subsidies / Demand for New Project Financing
3. Distributed Solutions Extend Capacity at Lower Cost
4. Innovative Technology Enhances Sustainability

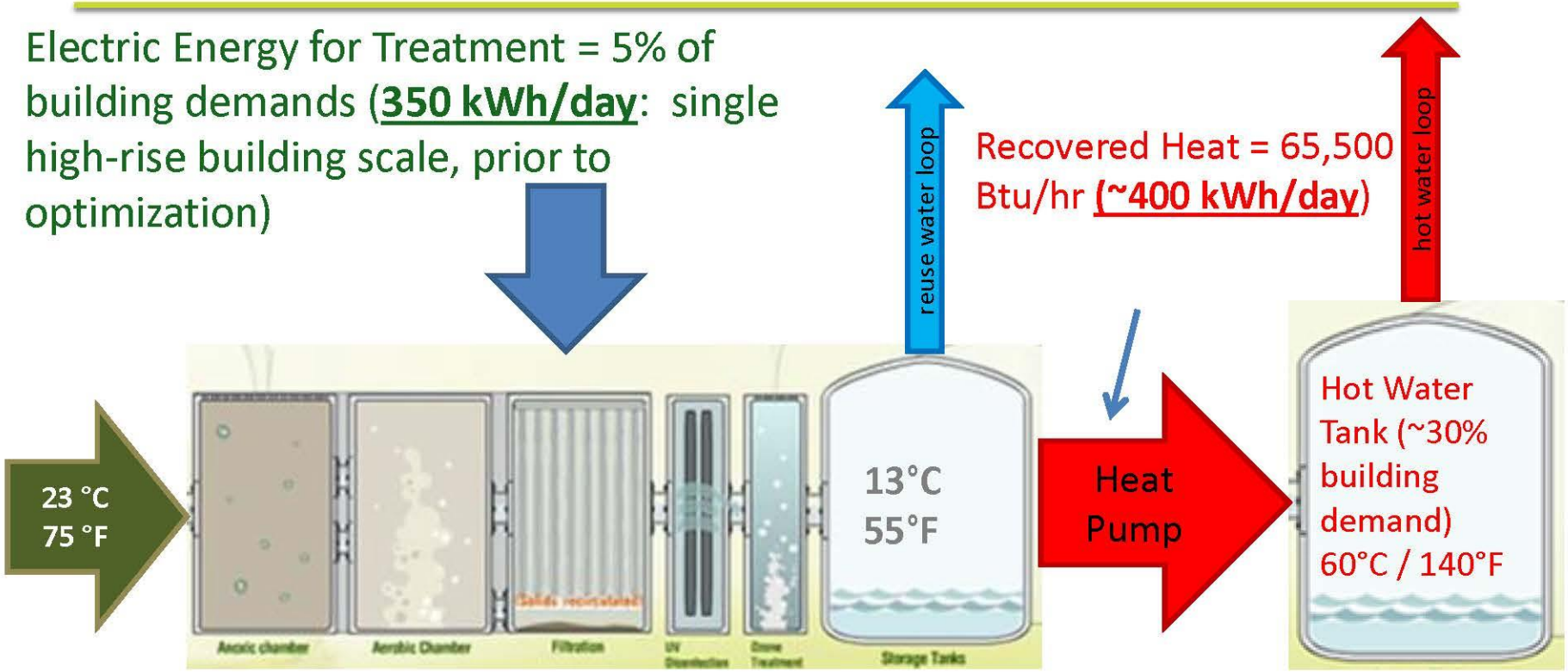


Distributed Water Reuse System Schematic

1. Wastewater collected for treatment
2. Stormwater collected for treatment where appropriate
3. Biological treatment
4. Final polishing and disinfection
5. Storage for nonpotable reuse

Value Derived From Innovation

Electric Energy for Treatment = 5% of building demands (**350 kWh/day**: single high-rise building scale, prior to optimization)

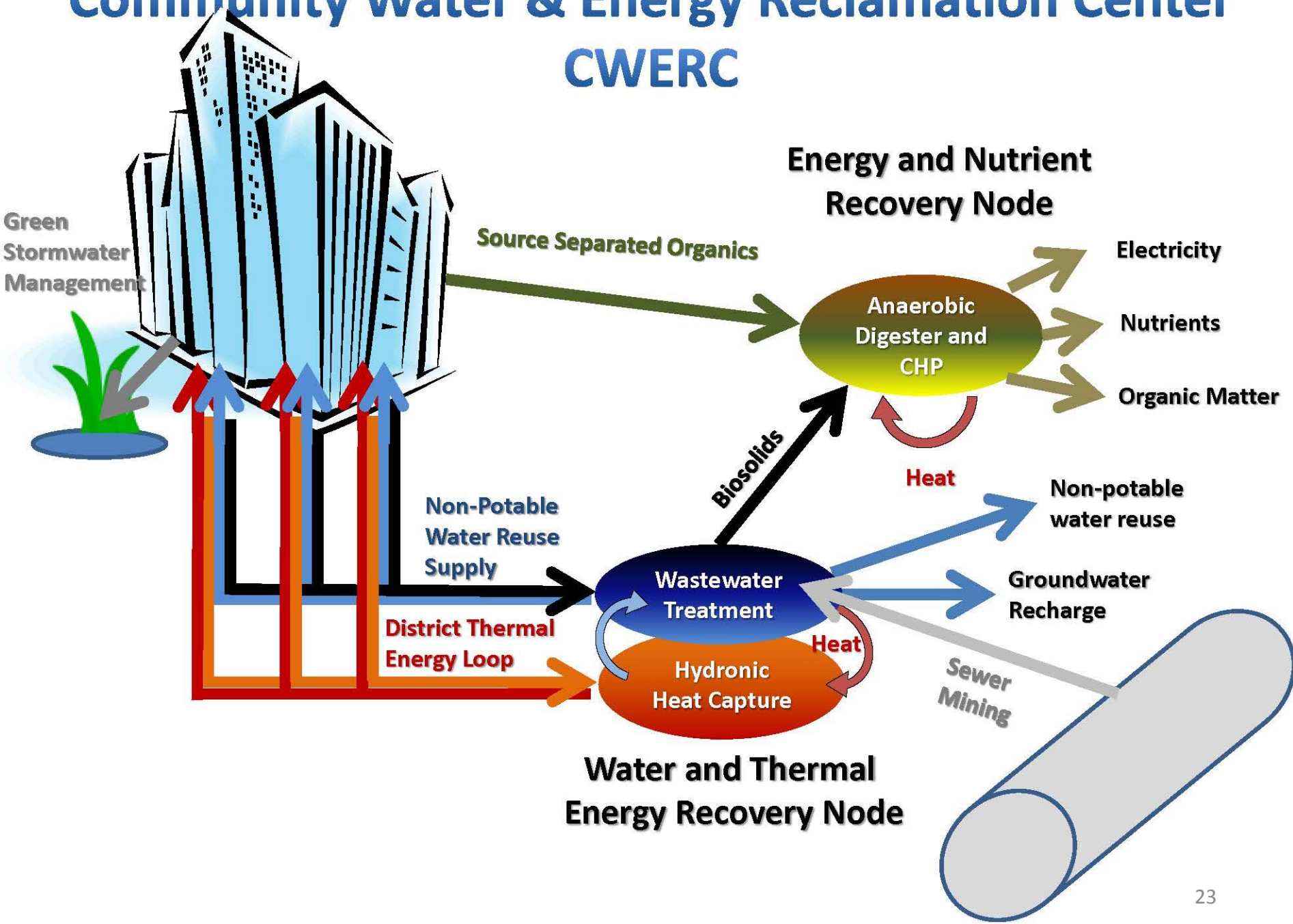


Mac Island Subcontractor/Client Testimonial:

"The temperature in competition pool became to hot, but I will adjust the boiler heat exchanger lower than normal set point, so can use more heating from glycol heating" – Jonathan German, RRC/MIPC

"Delivering enough free heat to actually overheat the competition pool!" - Andrew Byrnes, DEC

Community Water & Energy Reclamation Center
CWERC



Thank You!

Net Blue: Supporting Water-Neutral Community Growth

Presentation to Austin's Integrated Water Resource Planning Community Task Force
June 7, 2016

Dave Anderson, The Drenner Group &
Katherine Baer, River Network

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Outline

- Background
- Model ordinance tool selected components
- Calculating offsets
- Next steps and discussion questions

Why Water Neutrality?

- How will communities cope with new construction water demand as they face restrictions on even current customer water use or unaffordable new infrastructure?
- Land use and development must involve new thinking to solve this problem
- Current trends indicate the housing sector has gained significant momentum
- Offsets can be one way to solve it

What is a Water Demand Offset?

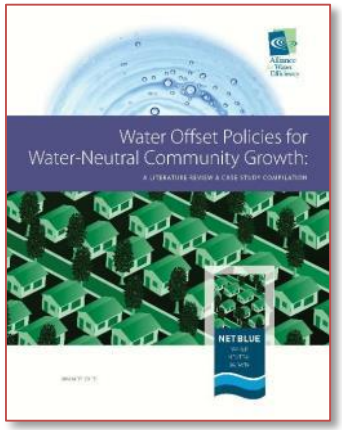
- Allow growth without increasing system-wide water consumption across a community or a water supply service area
- Achieved through a combination of on-site water efficiency and off-site water efficiency
- Reduces or completely eliminates impact of new development on water supply
- Can help avoid building moratoriums in resource-constrained communities
- Not a new concept

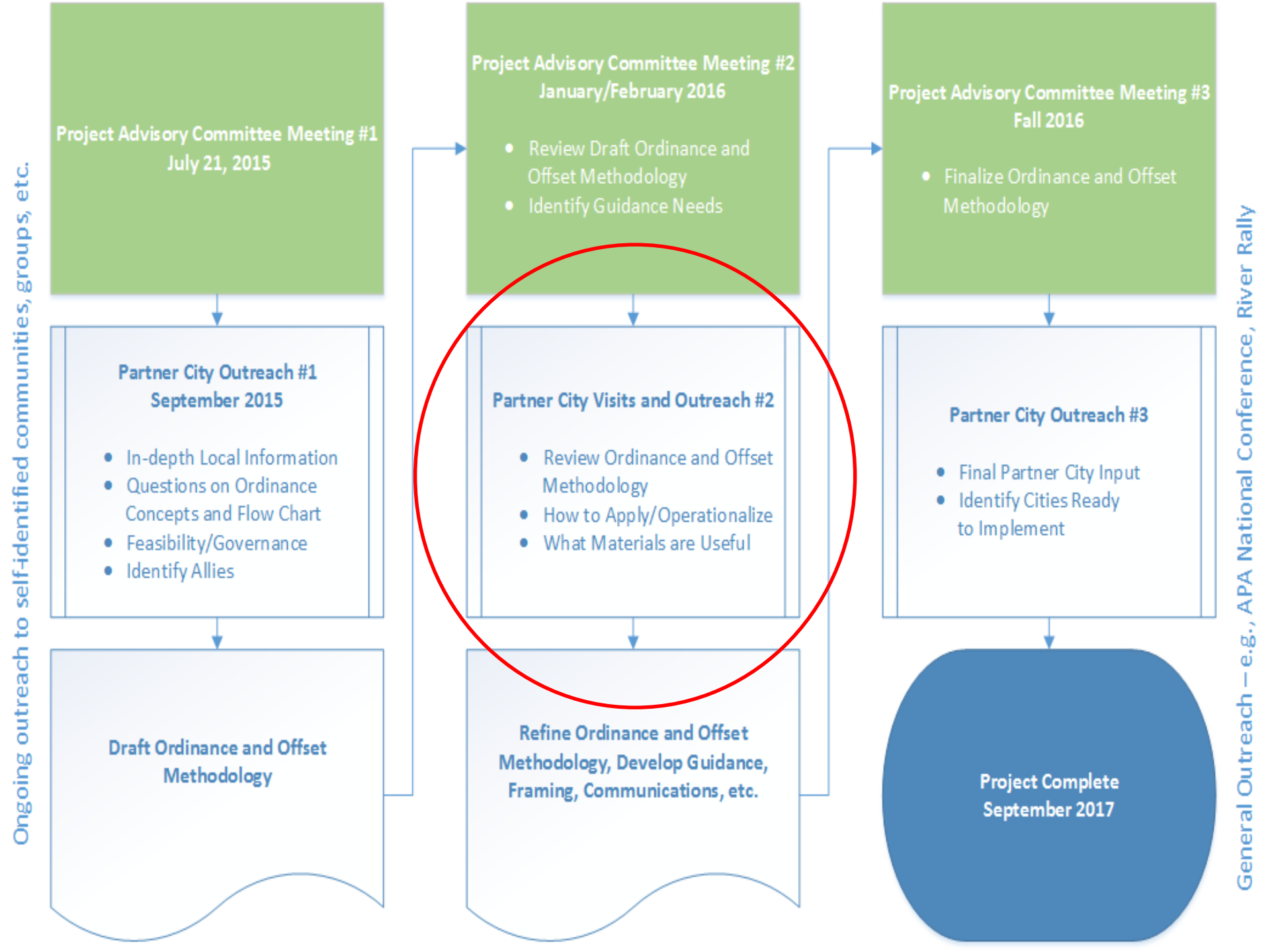
Example: Santa Fe

- Year Began: 2002
- Type of Policy: Water demand offset for new development projects via credits or water rights transfer
- Offset Ratio: 1:1 + 9.8% "contingency water"
- Offset fees in Lieu of Retrofits: $16,600/AF/year to purchase from Water Bank
- Demand Methodology: Water budget approved by the Water Budget Administrative Office

Net Blue: Water-Neutral Growth

- Initial work: AWE conducted research related to water demand offset policies (download at ww.a4we.org)
- Three-year project to promote sustainable communities
- Develop a national Model ordinance tool communities can tailor to create a water demand offset approach
- Flexible approach and structure
- Working with seven partner communities to pilot approach
- Partners: Alliance for Water Efficiency, Environmental Law Institute and River Network



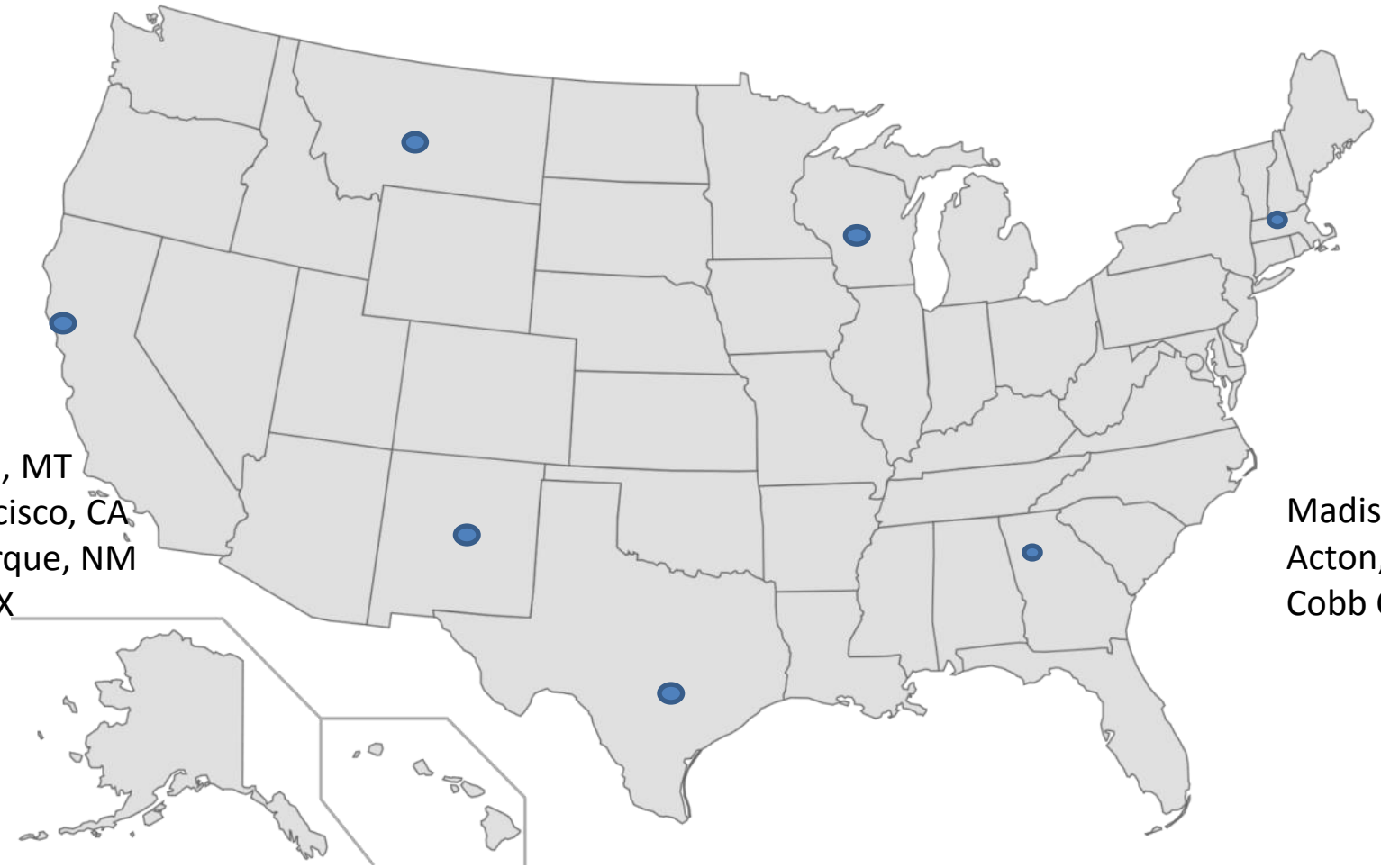

Project Advisory Committee Meeting #1
July 21, 2015
Project Advisory Committee Meeting #2
January/February 2016
Review Draft Ordinance and Offset Methodology
Identify Guidance Needs
Project Advisory Committee Meeting #3
Fall 2016
Finalize Ordinance and Offset Methodology
Partner City Outreach #1
September 2015
In-depth Local Information
Questions on Ordinance Concepts and Flow Chart
Feasibility/Governance
Identify Allies
Partner City Visits and Outreach #2
Review Ordinance and Offset Methodology
How to Apply/Operationalize
What Materials are Useful
Partner City Outreach #3
Final Partner City Input
Identify Cities Ready to Implement
Draft Ordinance and Offset Methodology
Refine Ordinance and Offset Methodology, Develop Guidance, Framing, Communications, etc.
Project Complete
September 2017
Ongoing outreach to self-identified communities, groups, etc.
General Outreach – e.g., APA National Conference, River Rally

Community Engagement

- Broad outreach survey
- Partner communities
  - Selection
  - In-depth interviews
  - Community meetings
- National roll-out

Source: xavier.edu

Partner Communities

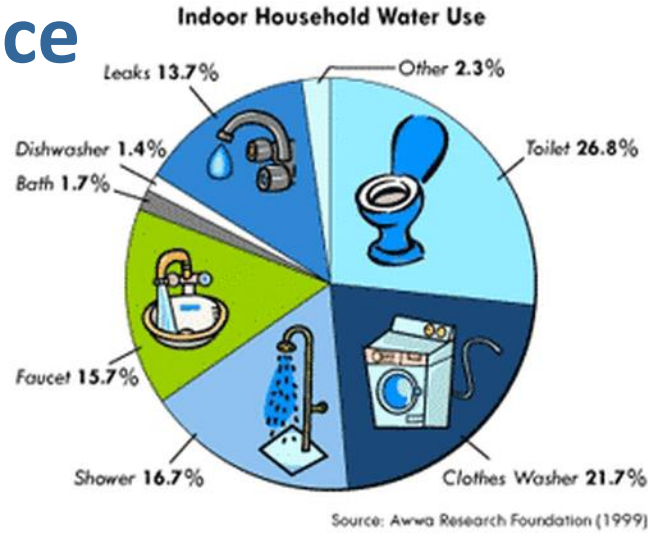


Bozeman, MT
San Francisco, CA
Albuquerque, NM
Austin, TX

Madison, WI
Acton, MA
Cobb County, GA

Partner Communities:

In-person community meetings – feedback and refining ordinance



- Input on:
  - Model ordinance
  - How to make it happen
  - Offset methodology

Source: wateruseitwisely.org

The Model Ordinance Tool

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Approach

- Reviewed literature and identified potential water constraint scenarios for which the ordinance may be used
- Dissected existing water offset ordinances
- Designed framework for ordinance
- Drafted a model ordinance tool with:
  - Elements of existing water offset ordinances
  - Elements drawn from other laws
  - The results of AWE's water offset work

Organization of the Tool

1. Purpose
2. Findings
3. Authority
4. Requirement and Applicability (or Incentive)
5. Definitions
6. Determining the Offset
7. Compliance with the Offset
8. Offset Credit Bank
9. Fees
10. Variances
11. Appeals
12. Severability
13. Consistency with Other Laws
14. Effective Date

Example Sections of the Tool

1. Purpose

The purpose of this ordinance is to:

- ☐ Protect and provide for the public health, safety, and general welfare.
- ☐ Set and meet sustainability goals.
- ☐ Manage the addition of new demand for water uses in city/county/district/region, to ensure that
  - ☐ Demand for water does not exceed available current or future supply
  - ☐ Demand for water does not exceed the sustainable yield of the source
  - ☐ Demands on water infrastructure do not exceed its capacity or impair its function

1. Purpose (Cont.)

- ☐ Ensure a reasonable and orderly process and pace of making water supply and/or infrastructure capacity available to new users.
- ☐ Minimize the adverse effects on the community of limitations on the city/county/district/region's water supply and/or infrastructure.
- ☐ Manage water and/or infrastructure to better satisfy both present and future human needs.
- ☐ Manage water to better protect fish, wildlife, and recreation, now and in the future.
- ☐ Comply with the specified plan(s) by identified means.

1. Purpose (Cont.)

- ☐ Retain groundwater aquifers at levels sufficient to protect against contamination from saltwater intrusion.
- ☐ While preserving water resources, allow reasonable time to complete necessary studies and reports for amendments to
  - ☐ The Comprehensive Plan
  - ☐ Zoning ordinance
  - ☐ Insert other
- ☐ Other

Calculating Offsets

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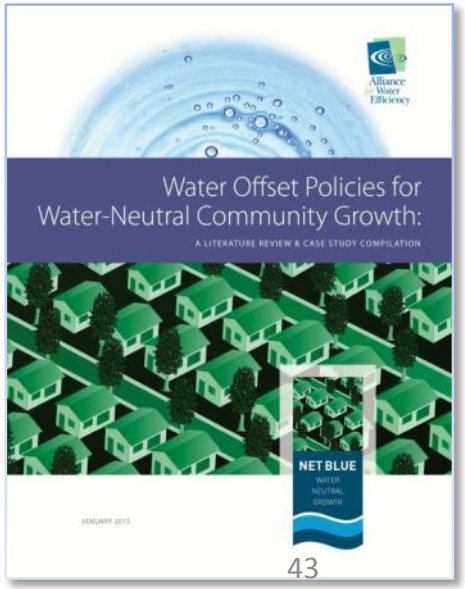
Offset Components

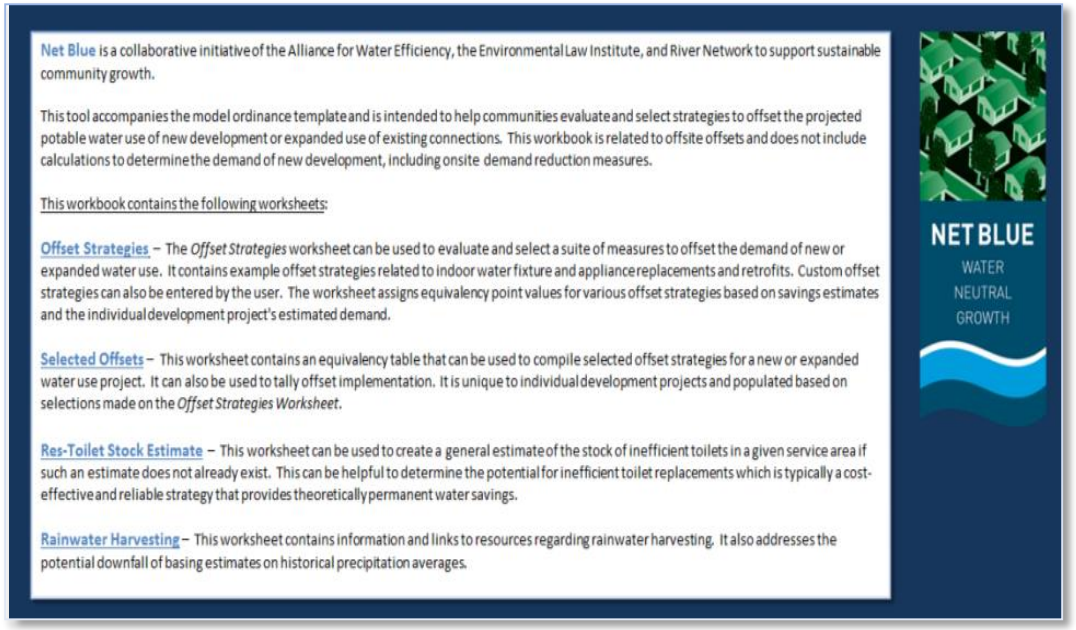
- A condition that triggers the requirement for a water demand offset (i.e., new development and/or expanded use of an existing connection)
- Water demand projection of new development
  - On-site efficiency
  - Offset ratio (% of demand that is required to be offset)



Offset Considerations

- Predetermined based on either 1) credits or equivalency units published as part of the ordinance; or 2) “as determined by the Water Department”
- Plumbing code interaction
- Reliability and certainty of estimates
- Seasonality
- Useful Life

Net Blue Offsets Workbook



Net Blue is a collaborative initiative of the Alliance for Water Efficiency, the Environmental Law Institute, and River Network to support sustainable community growth.

This tool accompanies the model ordinance template and is intended to help communities evaluate and select strategies to offset the projected potable water use of new development or expanded use of existing connections. This workbook is related to offsite offsets and does not include calculations to determine the demand of new development, including onsite demand reduction measures.

This workbook contains the following worksheets:

Offset Strategies – The *Offset Strategies* worksheet can be used to evaluate and select a suite of measures to offset the demand of new or expanded water use. It contains example offset strategies related to indoor water fixture and appliance replacements and retrofits. Custom offset strategies can also be entered by the user. The worksheet assigns equivalency point values for various offset strategies based on savings estimates and the individual development project's estimated demand.

Selected Offsets – This worksheet contains an equivalency table that can be used to compile selected offset strategies for a new or expanded water use project. It can also be used to tally offset implementation. It is unique to individual development projects and populated based on selections made on the *Offset Strategies Worksheet*.

Res-Toilet Stock Estimate – This worksheet can be used to create a general estimate of the stock of inefficient toilets in a given service area if such an estimate does not already exist. This can be helpful to determine the potential for inefficient toilet replacements which is typically a cost-effective and reliable strategy that provides theoretically permanent water savings.

Rainwater Harvesting – This worksheet contains information and links to resources regarding rainwater harvesting. It also addresses the potential downfall of basing estimates on historical precipitation averages.

NET BLUE
WATER
NEUTRAL
GROWTH

- New demand information
- Offset strategy evaluation worksheet
- Selected offsets worksheet
- Supplemental worksheets
  - Residential inefficient toilet stock estimator
  - Rainwater harvesting information and resources
  - More to come…

NET BLUE

Availability

- Ordinance and Methodology are “works in progress”
- Materials will be available soon on the Alliance web site:
  - Draft ordinance
  - Draft Methodology
  - Power Point Presentation

www.allianceforwaterefficiency.org/net-blue.aspx

Partner Communities Discussion: Input to inform ordinance toolkit development

- How could this work in Austin (based on legal structure, politics, other processes)
- How would you change/refine components of the ordinance to make it a better fit for your community?
  - *Are there things you would add (e.g. options for types of permits)*
  - *Are there aspects that don't work and why?*
  - *Are there parts that could be optional?*
  - *If only parts of the ordinance would be useful, what are they and why?*
  - *For the parts that you wouldn't use/pursue, why?*
- What are the opportunities and barriers?

For further information:

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http://www.allianceforwaterefficiency.org/net-blue.aspx

NET BLUE PRESENTATION

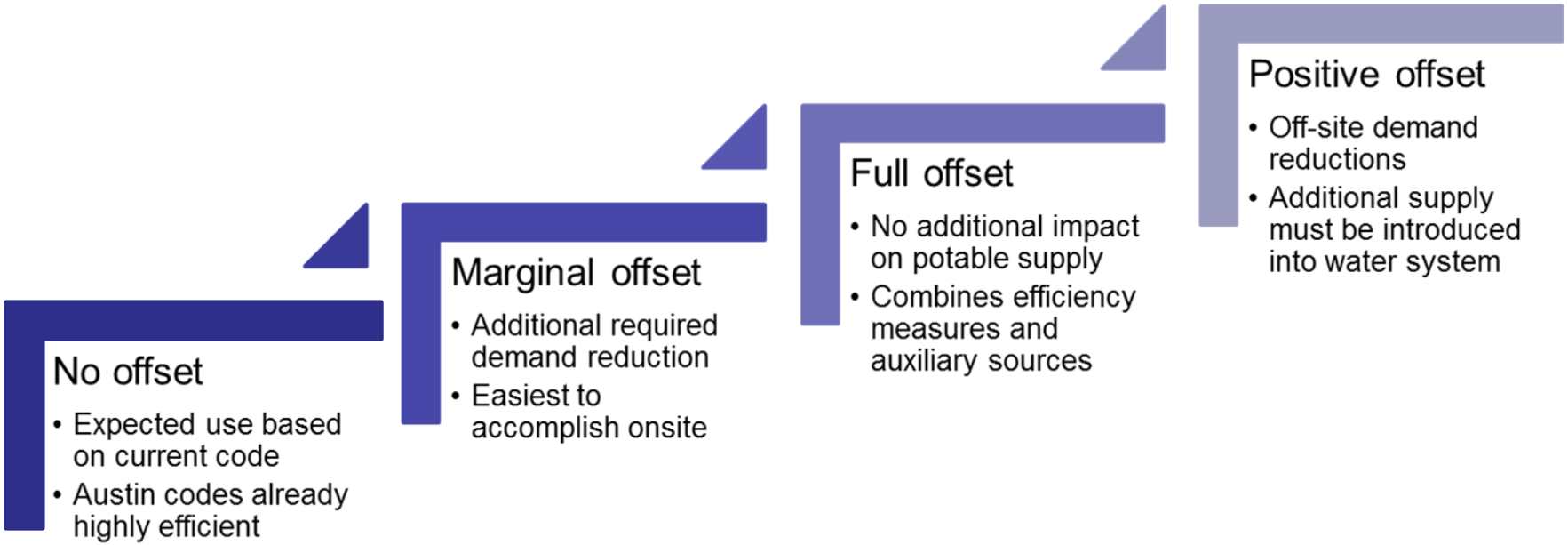
Water Forward Meeting

June 7, 2016

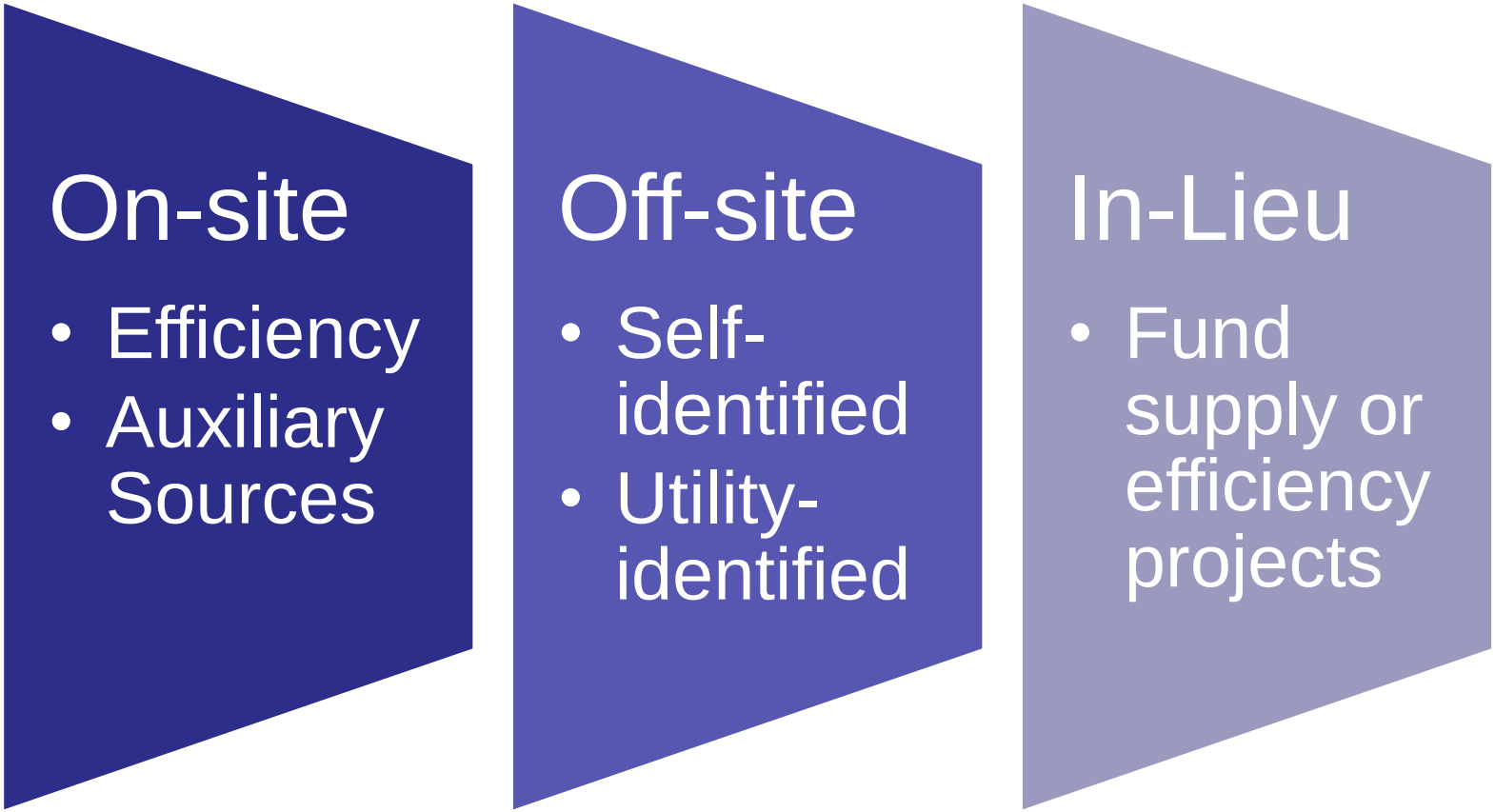
Net Blue in Austin

- Now focused on customization of ordinance
- What's feasible in Austin
- What's in our "toolbox" to implement
- How Net Blue fits with other initiatives
  - 100 year timeline

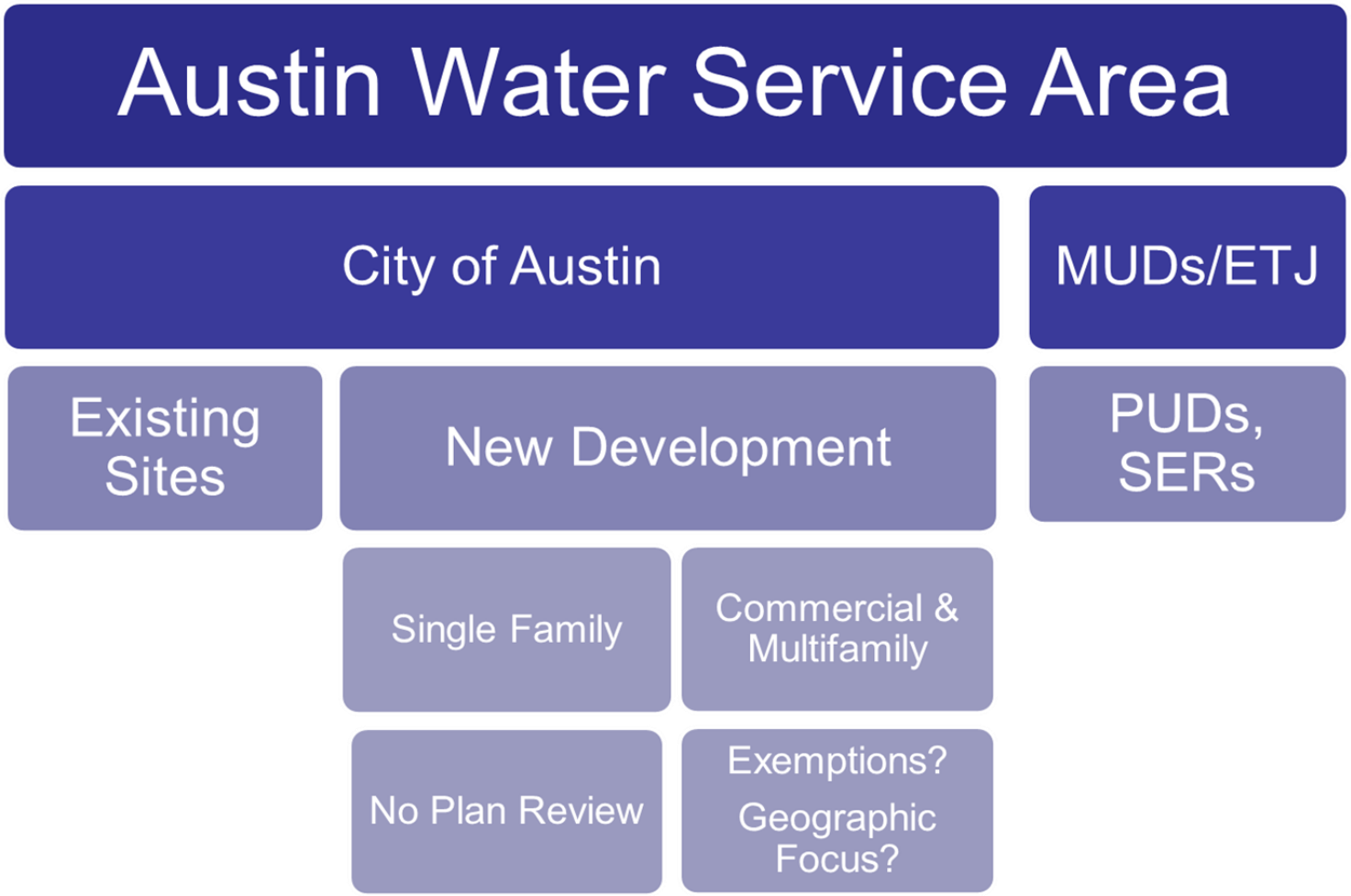
Offset Amount



Offset Methods



Potential Applicability



Considering Net Blue in Water Forward

- Develop option(s) for Net Blue policy consistent with other City policies and goals
  - Imagine Austin, Code Next, affordability, development review process, etc.
- Options may become strategies for consultant quantification and evaluation
- Stakeholder process begins if policies selected for implementation

Questions and Discussion

Next Meeting

- Public Outreach update
- Consultant Services Procurement: Request for Qualifications (RFQ) Process update
- Other items to be determined
- Continuation of information and discussion items from Meeting #14 as needed

Austin WATER