

# Opportunity & Critical Path for Water Technology Innovation

Jennifer Garvey, Dr. Hal Walker, & Dr. Chris Gobler,  
NYS Center for Clean Water Technology

Ran Bujanover, Yellow Tree Capital &  
John Furth, John Furth & Associates

## Crisis & Opportunity

510,000 conventional septic systems +  
Sole Source Aquifer +  
World class beaches, bays and marine resources=  
*Suffolk & Nassau Counties*

## Center Premise

Marshal regional resources to *focus*  
on solving problem

Government + University Research + Private Sector

## Strategic Planning Objectives:

- Formulate near and long-term objectives
- Ensure buy-in and support from key stakeholders
- Quantify the economics: cost of action and inaction + jobs
- Learn from experiences in regions facing similar challenge
- Assess the competition and the market potential

# Methodology: 30+ Interviews

Category	Person and Institution	
Steering Committee	<ul style="list-style-type: none"> <li>• <b>Dr. Yacov Shamash</b>, Dean of the College of Engineering and Applied Sciences Stony, Stony Brook University</li> <li>• <b>Dr. Chris Gobler</b>, Professor, Stony Brook University</li> <li>• <b>Dr. Hal Walker</b>, Professor, Stony Brook University</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Stephen Savage</b>, Senior Technology Executive and Entrepreneur</li> <li>• <b>Peter A. Scully</b>, Deputy County Executive for Administration, Suffolk County</li> </ul>
Government Officials	<ul style="list-style-type: none"> <li>• <b>Maggie Theroux</b>, Senior Cluster Development Specialist, EPA</li> <li>• <b>Curt Spalding</b>, Administrator for EPA's New England Region</li> <li>• <b>Hon. Fred Thiele</b>, Assemblyman for New York State District 1</li> <li>• <b>James Tierney, Carrie Meek-Gallagher, and Angus Eaton</b> of the NYS DEC</li> <li>• <b>Rob Walker</b>, Chief Deputy County Executive, Nassau County</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Justin Jobin, Chris Lubicich &amp; Ken Zegel</b> of Suffolk County's Department of Health</li> <li>• <b>Dorian Dale</b>, Director of Sustainability &amp; Chief Recovery Officer, Suffolk County</li> <li>• <b>George Heufelder</b>, Director, Barnstable County DHE</li> <li>• <b>Jeffrey Fretwell</b>, Director, Legislative and Intergovernmental Relations, Maryland DE</li> </ul>
Industry Experts, including Scientists, etc.	<ul style="list-style-type: none"> <li>• <b>Damann Anderson</b>, Vice President, Hazen and Sawyer</li> <li>• <b>Dr. Anthony Dvaskas</b>, Environmental Economist in the School of Marine and Atmospheric Sciences, Stony Brook University</li> <li>• <b>Dr. Ben Hsiao</b>, Distinguished Professor, Stony Brook University</li> <li>• <b>Dr. Daniel Smith</b>, Vice President, APEX Companies</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Clement Cid</b>, PhD candidate, CalTech</li> <li>• <b>Mike Murphy</b>, Director of Water Innovation, MASSCEC</li> <li>• <b>Dr. David Rekhov</b>, Professor, EWRE Program Coordinator, UMass Amherst</li> <li>• <b>Dr. David Garman</b>, Founding Dean, School of Freshwater Sciences, University of Wisconsin</li> </ul>
Water Treatment Technology Providers	<ul style="list-style-type: none"> <li>• <b>Bill Cagle</b>, Business Development Manager, Orenco Systems Inc.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Jon Freedman</b>, Global Government Affairs Leader, GE Water</li> </ul>
Financial Community	<ul style="list-style-type: none"> <li>• <b>Jack Levy</b>, Partner, Israel CleanTech Ventures</li> <li>• <b>Nick Schupbach</b>, SVP, Wood Creek Capital Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Rob Newbold</b>, Managing Principle, Graham Partners</li> </ul>
Other Constituencies	<ul style="list-style-type: none"> <li>• <b>Mitch Pally</b>, CEO, LIBI</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Kevin Law</b>, President &amp; CEO, Long Island Association</li> </ul>

## Strategic Advantages

- Funding for R & D
- No other U.S. Center is focusing on onsite technology; Market Gap = Opportunity
- Focused R & D is a differentiator
- Water technology innovation typically responds to regional needs

## Methodology: Cost Analyses & Scenarios

- Economic impact forecasting based on:
  - Analysis of Regional economic data
- Implementation forecasting based on:
  - # of systems installed
  - Cost of system replacement
  - Range of installation periods

## The Cost of Doing Nothing: What's at Risk?

### Hardest Hit:

- Real Estate ↓ 2% - 4%
- Tourism ↓ 5% - 10%
- Fishing ↓ 30% - 60%

**\$12.7 Billion to \$24.5 Billion\*\* Loss over 30 years in  
Suffolk & Nassau Counties combined**

\*\*Nominal Costs



# The Cost of Infrastructure Replacement

## Three Scenarios: \$6 Billion to \$14.4 Billion\*\* over 30 Years

	Best Case	Medium Case	Worst Case
<i>Systems replaced/ retrofitted (Suffolk)</i>	210,000	285,000	360,000
<i>Systems replaced/ retrofitted (Nassau)</i>	87,500	118,750	150,000
Systems replaced/ retrofitted (Total)	297,500	403,750	510,000
Average costs per system (year 1)	\$15,0000	\$20,000	\$25,000
Installation period in years	15 Years	22 Years	30 Years
Average year-over-year cost reduction	5%	4%	3%
Average annual O&M costs (as % of system cost)	5%	5%	5%
<b>Nominal costs over 30 years</b>	<b>\$6B</b>	<b>\$9.8B</b>	<b>\$14.4B</b>
<b>Present Value costs over 30 years at 4% discount rate</b>	<b>\$3.6B</b>	<b>\$5.5B</b>	<b>\$7.5B</b>

\*\*Nominal Costs

# Water Technology:

## A Conservative & Fragmented Industry

- Approval processes are lengthy & data intensive
- Historically, returns for water projects are low but consistent (high single to low double digits).
- Markets are fragmented and driven largely by regulation
- Scarce R & D Funding (for OWTS) & limited amount of debt available to water new technology companies.
- Abundant funding for proven technologies, with proven returns.

## The Potential Market

- Currently 40M U.S. residents rely on ~25M OWT systems.
- Projections for systems in need of nutrient removal are 10% - 15% of OWT systems, or 2.5M to 3.75M systems nationally.
- At \$10K per system to implement, potential market is estimated to be ~\$38B over 30 years, or \$1.3B annually, excluding monitoring or maintenance.
- Assuming U.S. market is half of potential worldwide market, \$2.6B annually.
- ***Do markets materialize with the right technology?***

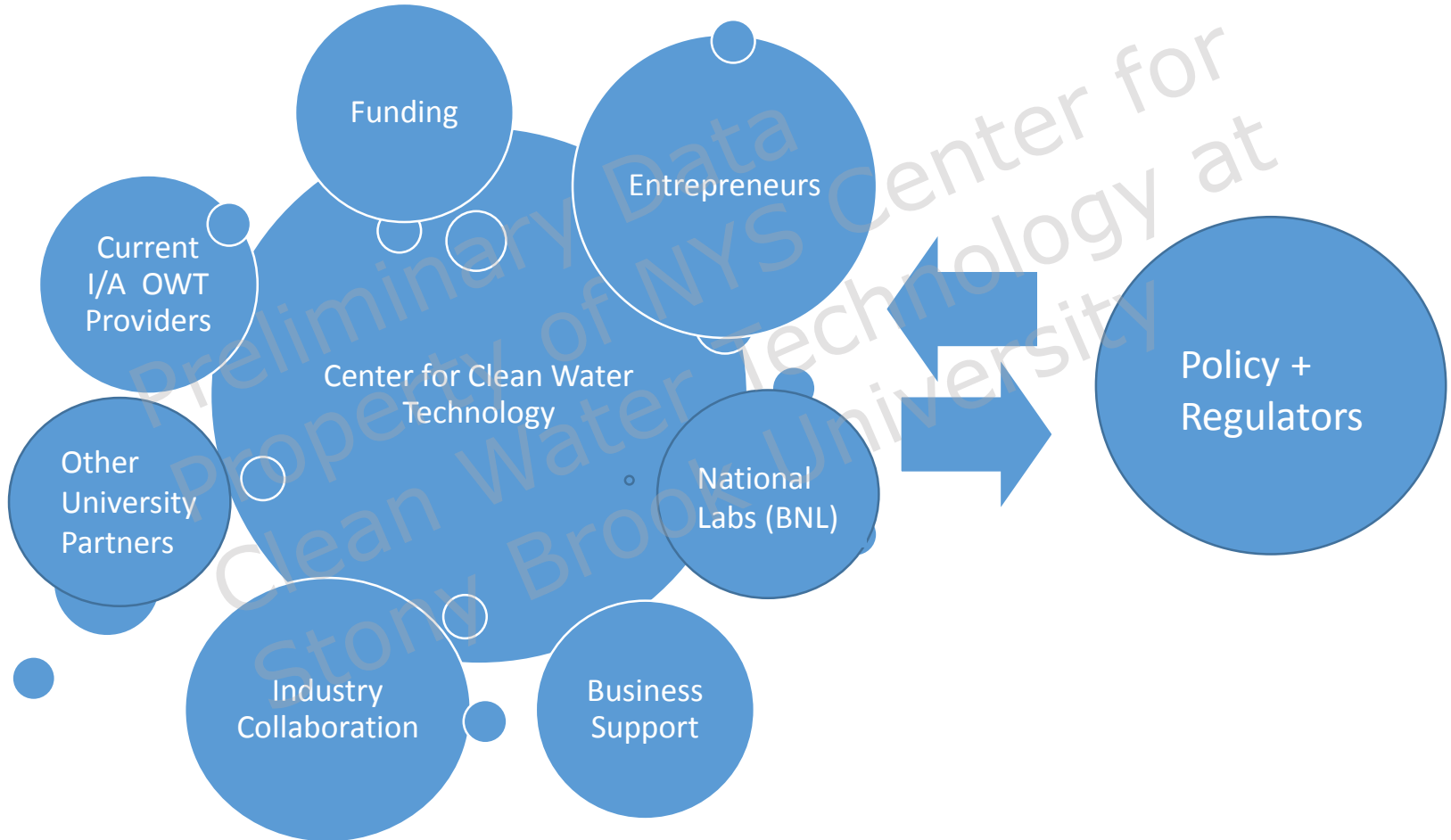
## Opportunity Indicators

- Entry of Long Island into innovative/alternative market
- Immense public and political awareness
- Consideration of dedicated funding streams
- NYS Economic Development Programs offers compelling opportunities to attract business and talent
- Data sharing agreement underway for North East Region
- Data sharing agreement struck in mid-Atlantic states

## Short Term Objectives: Three to Five Years

- Build multi-disciplinary teams to develop OWTS technologies that:
  - **Reduce nitrogen levels to below 10 mg/liter.**
  - **Cost \$10K or less per (typical) household to install, and less than \$500 per annum to maintain.**
  - **Have a life expectancy of at least 30 years**
- Communicate knowledge and progress to key stakeholders.

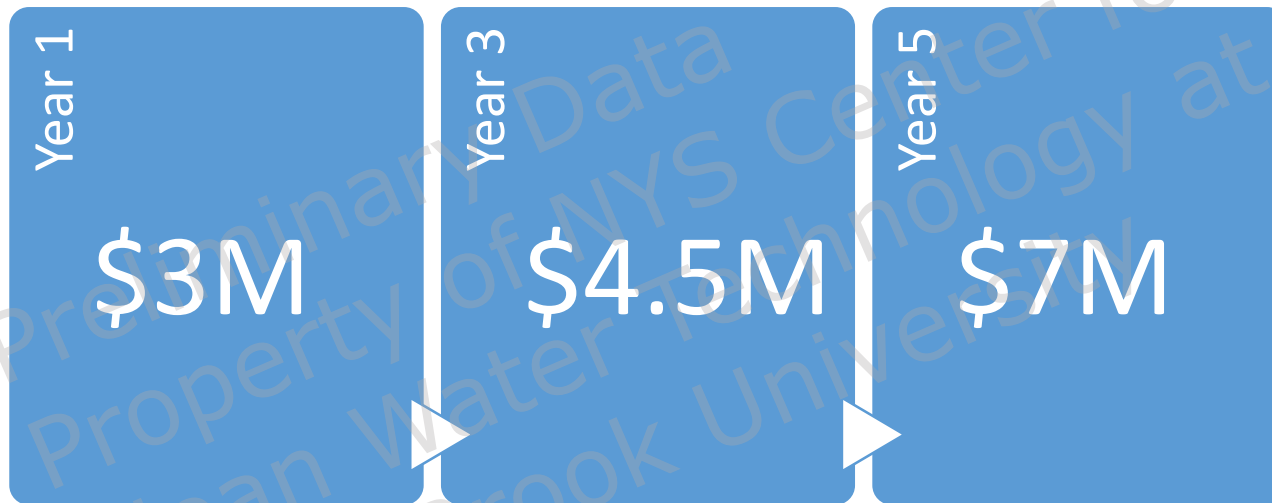
# Develop Capacities, Collaborations & Contacts



## Long Term Objectives

- Leverage experiences/expertise/processes developed in OWTS focus to transition into new sectors.
- Contribute to the national and international conversation about water protection and restoration.
- Become a hub of water technology commercialization.
- Ancillary discoveries or needs present further opportunities for commercialization.

## Funding Goals (Annual)



**Leverage 10-year State Collaboration with  
Philanthropy, Industry, Federal Funds**



## Methodology: Long Term Job Analysis

- Center jobs = direct employees of the Center + 1 FTE per \$150K of research funding
- Implementation jobs = Jobs associated with upgrading onsite systems (based on Best Case Scenario)
- Incubation jobs = jobs from small and medium water companies incubated with Center's support

# 15 Year Job Creation Potential

