



Using less. Doing more.

Energy & Water Efficiency Municipal Waste Water & Water Supply

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Atlantic Council Workshop

Presentation Overview

- A Few Words About the Alliance
- The Water-Energy Link
- Water Delivery and Energy Use
- Wastewater Treatment and Energy Use
- The Alliance *Watergy* Program
 - Case Studies: A look at International & U.S. *Watergy* projects

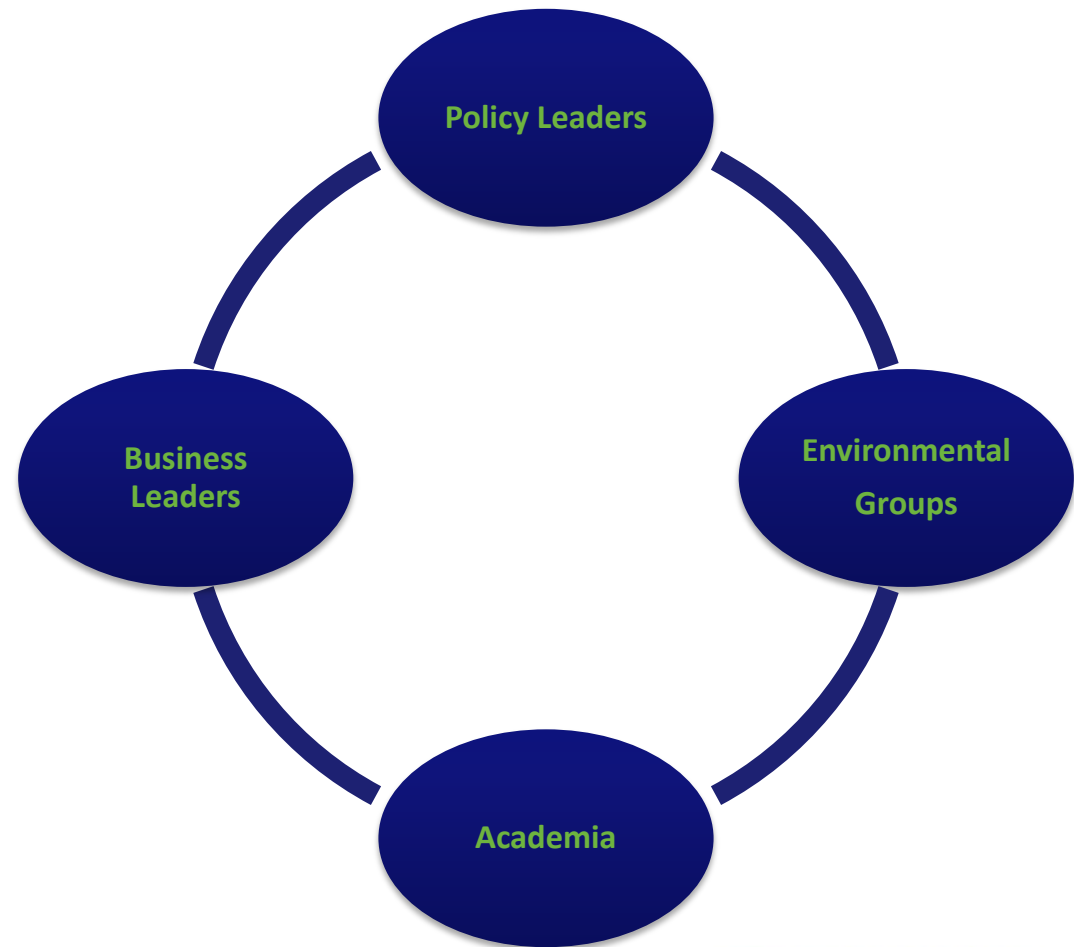
What is the Alliance to Save Energy?

Mission:

- To promote energy efficiency worldwide to achieve a healthier economy, a cleaner environment, and greater energy security.

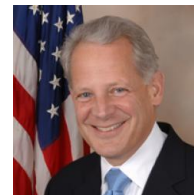
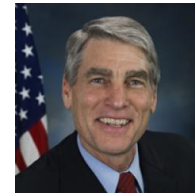
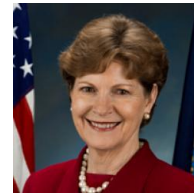
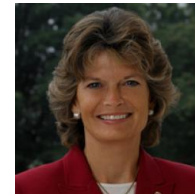
Organization:

- Staffed by 80+ professionals
- 35 years of experience
- \$17 million annual budget
- Recognized as the premier energy efficiency organization in the world



What is the Alliance to Save Energy?

- Nonprofit organization headquartered in U.S.; operations worldwide
- Led by **Senator Mark Warner (D-Va.)** and **Tom King, Chairman of the Board and President, National Grid US**
- Board includes 16 Members of Congress – Bi-Cameral, Bi-Partisan



Working with and Across All Sectors of the Economy

Business ▪ Government ▪ Public Interest

- Coalition membership of more than 160 diverse organizations
- Involvement by businesses in all economic sectors
- Participants active in policy advocacy, research, standards, education and communication



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TO SAVE ENERGY

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Program Areas

- Education
- Industry and Utilities
- Buildings
- International
- Policy and Research
- Communications

The Water/Energy Link

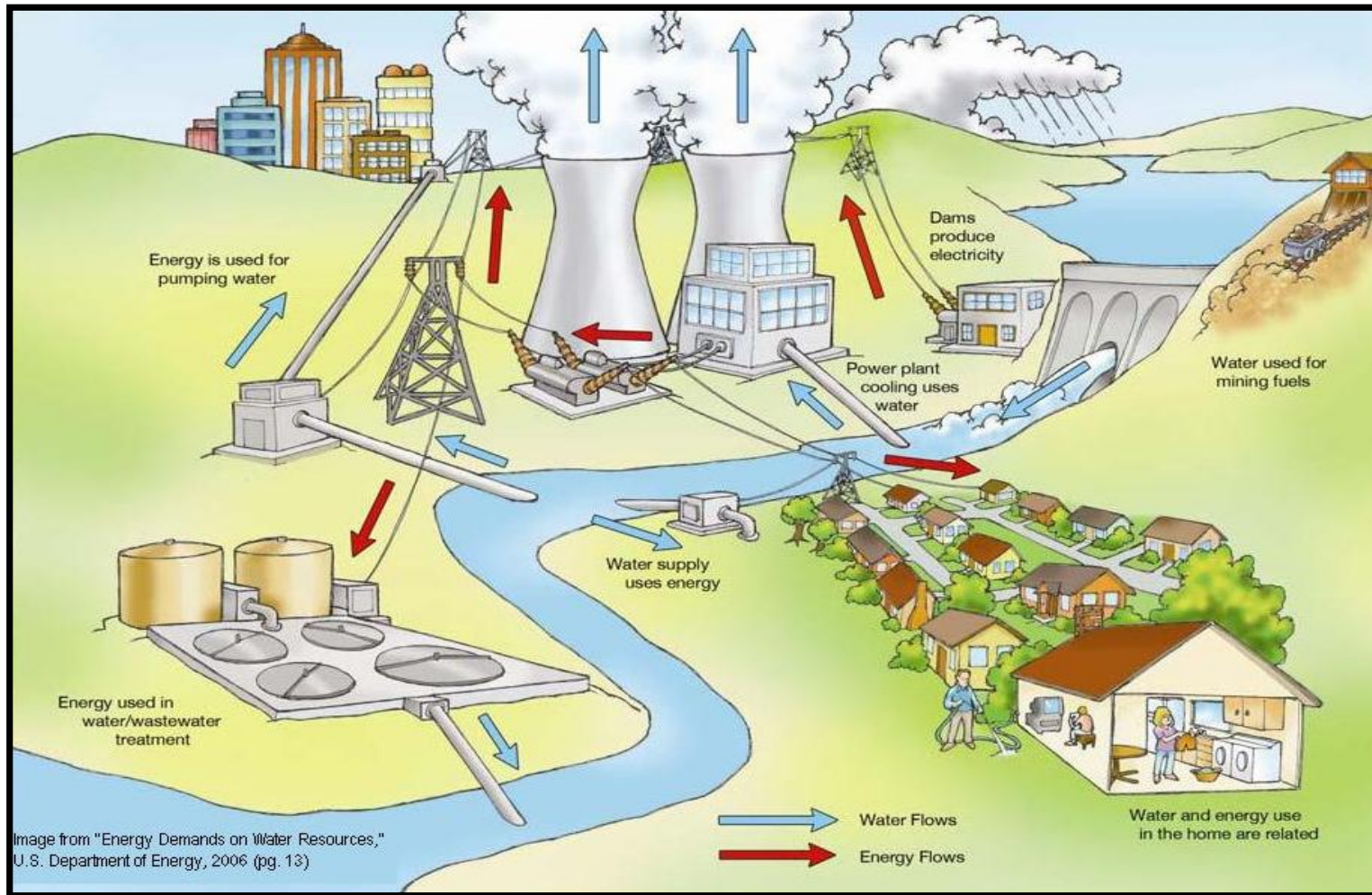


Image from "Energy Demands on Water Resources,"
U.S. Department of Energy, 2006 (pg. 13)

Energy Efficiency Saves Water & Energy

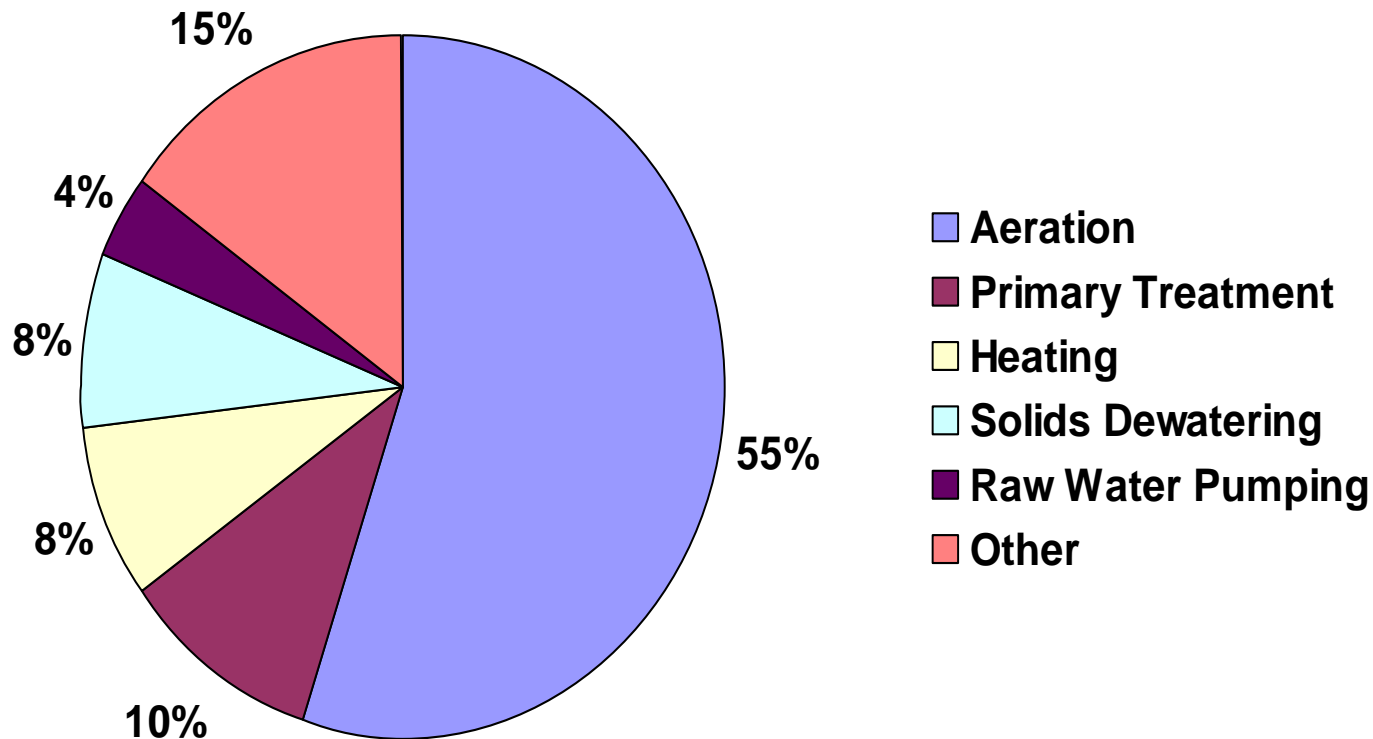
- Improving motor system EE (pumping systems, aeration blowers, grinders, mixers)
- Implementing energy management/efficient design
 - Pumping stations (right-sized pumps, VFDs, reducing head)
 - Process cooling applications (proper flow)
- Installing appropriate system automation
- Metering & energy monitoring
- Leak management & pressure reduction
 - Energy savings achieved by lowering pressure

Example: Leaks in Water Distribution Waste Energy and Water

- Whenever water is lost to leaks, the energy and cost of energy embodied in that water is also lost
- Many distribution systems around the world are leaky
 - Industrialized countries: Where infrastructure is old
 - In the U.S. 35 water utilities had 15% leakage rate in 2003
 - In developing countries leakage rates can be as much as 50%
- Often water conservation focuses on end-users (homes, businesses)
- Water and energy efficiency in the water supply infrastructure can yield important water and energy savings



Wastewater Treatment and Energy Use



Energy can make up 25 to 40% of the total operating cost of a wastewater facility

Watergy: The Beginnings

- International Program launched in 1997 (funded by USAID, REEEP, APEC, IADB, Coca Cola, and local utilities)
- Watergy goals:
 - Achieve energy, water and monetary savings through technical and managerial changes in water supply systems
 - Provide consumers with quality water while reducing water and energy waste

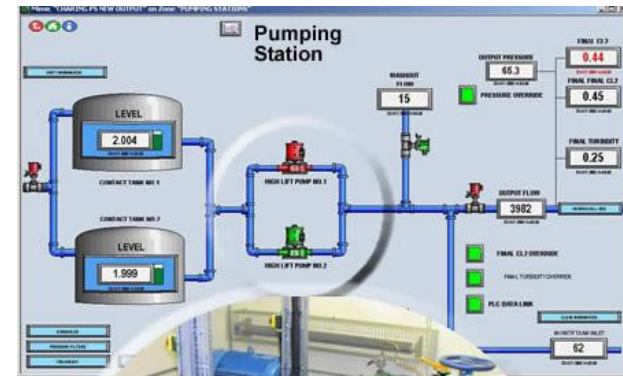


Cost-Effective Interventions

- Pump system efficiency
- Leak Management
- Automated Control
- Metering & Monitoring



Diagnostic Solutions, LLC



Bucks County Assessment Team



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Watergy Successes

WATERGY
AROUND THE
WORLD



EE in Caribbean Water Utilities



Lake Victoria Watergy project



Watergy in South African schools

Maximizes efficiency of both energy and water

- Since 1997: has helped more than 100 cities in:
 - Bahamas, Bosnia, Brazil, Costa Rica, Guyana, Honduras, India, Jamaica, Kenya, Mexico, Panama, Philippines, South Africa, Sri Lanka, Suriname, Tanzania, Uganda, Ukraine.
- Kicked off in the U.S. in 2010 (Bucks County, PA)
 - Added focus on energy management and financing solutions

And it's cost-effective...

- **Rapid Payback:** generally from a few months to 3 years
- **Huge Savings:** at least 20% in energy costs; much higher possible
- Makes the most of existing **infrastructure**; reduces the need for new



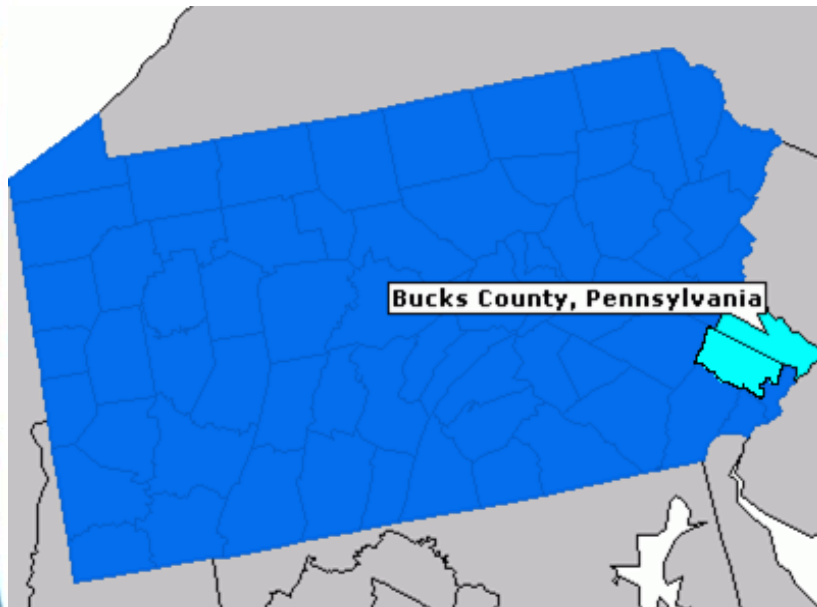
Case Study: Emfuleni, South Africa

- **Problem:** **80%** of water flowing to homes **lost** through leaking main pipes and home plumbing fixtures!
- **Technical Solution:** **Pressure Management**
 - Automated pressure management valves on each supply line
 - Reduced high bulk pressure; further reductions @ night
 - \$800,000 construction
- **Financing Solution:** **Performance Contracting**
 - Water pressure mgmt firm acting as ESCO
 - Build-Operate-Train-Transfer to municipality after 5 years
 - Fees: firm gets 20% of savings



Case Study: Bucks County Water & Sewer Authority

Nearly 1,000 of these large systems across the US



Proposed Measures:

- Pump control replacements
- Blower improvements
- Other mechanical and metering improvements
- Operator training and incorporating energy management into SOPs, O&M manuals
- Financing packages from government, utility, and private parties

Water/Energy Efficiency Conclusions

- Water/Wastewater Agencies in U.S.
 - Culture of focusing on primary mission (water quality, production)
 - Many aging facilities & infrastructure
- Financing
 - Many energy efficiency incentives do not apply to water/wastewater agencies
 - Water/wastewater agencies not always aware of funding sources
- Programs & Policies
 - More incentives, voluntary programs & workforce training needed
 - Better coordination with electric utilities needed
 - More incentives for consumers & end users to manage water/energy efficiently





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Thank you!

Questions?