

10:30 AM

**PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS**

WORKSHOP SUMMARY

Meeting Date: **March 26, 2013**

Department: **Water Utilities Department**

I. EXECUTIVE BRIEF

Title: Energy Conservation Initiatives


Summary: Palm Beach County Water Utilities Department (PBCWUD) is the largest user of electricity in the County, costing our customers nearly \$10 million/year. In WUD's 2010 Comprehensive Strategic Plan, WUD set a goal to reduce energy use by 10 percent on a kilowatt hour/dwelling unit basis by 2015 in order to be more efficient and to save money. Another goal was to produce half of that savings (5 percent) through the use of alternative (renewable) energy sources. Through diligent study, evaluations of alternatives and implementation of a formidable menu of initiatives, WUD is on track to exceed our goals by 2014.

Background and Policy Issues: With the exception of labor, electricity is the single largest operational cost within WUD. Electricity costs are projected to rise in future years. Reducing electrical costs is a major initiative in keeping our rates affordable in the future. Alternative (Renewable) energy is another method of reducing costs as well as relieving demand from the Florida Power and Light grid. WUD has received two (2) substantial Energy Efficiency Community Block Grants, issued by the federal Department of Energy and administered by the County's Department of Economic Sustainability. These grants have enabled WUD to proceed with two (2) alternative energy projects: a Bio-gas Cogeneration project and a Photovoltaic Solar Panel project at the Southern Region Water Reclamation Facility

Attachments:

1. Energy Reduction/Alternative Energy Strategies PowerPoint Presentation
-

Recommended by:


for Department Director

3/19/13
Date

Approved By:


County Administration

3/19/13
Date

II. FISCAL IMPACT ANALYSIS

A. Five Year Summary of Fiscal Impact:

Fiscal Years	2013	2014	2015	2016	2017
Capital Expenditures	_____	_____	_____	_____	_____
Operating Costs	_____	_____	_____	_____	_____
External Revenues	_____	_____	_____	_____	_____
Program Income (County)	_____	_____	_____	_____	_____
In-Kind Match (County)	_____	_____	_____	_____	_____
NET FISCAL IMPACT	___0___	___0___	___0___	___0___	___0___
No. ADDITIONAL FTE POSITIONS (Cumulative)	___0___	___0___	___0___	___0___	___0___

Is Item Included In Current Budget? Yes _____ No _____
Budget Account No.: Fund _____ Department _____ Unit _____
Object _____ Reporting Category _____

- B. Recommended Sources of Funds/Summary of Fiscal Impact:
No fiscal impact. All monies expended for the initiative projects have been included in WUD's Annual Budget and approved separately by the Board of County Commissioners (BOCC).
- C. Departmental Fiscal Review

III. REVIEW COMMENTS

A. OFMB Fiscal and/or Contract Dev. and Control Comments:

Shay 3/14/13 Dr. J. Jacobson 3/19/13
OFMB Contract Dev. and Control

B. Legal Sufficiency:

[Signature] 3/20/13
Assistant County Attorney

C. Other Department Review:

Department Director

(THIS SUMMARY IS NOT TO BE USED AS A BASIS FOR PAYMENT)

Energy Reduction / Alternative Energy Strategies

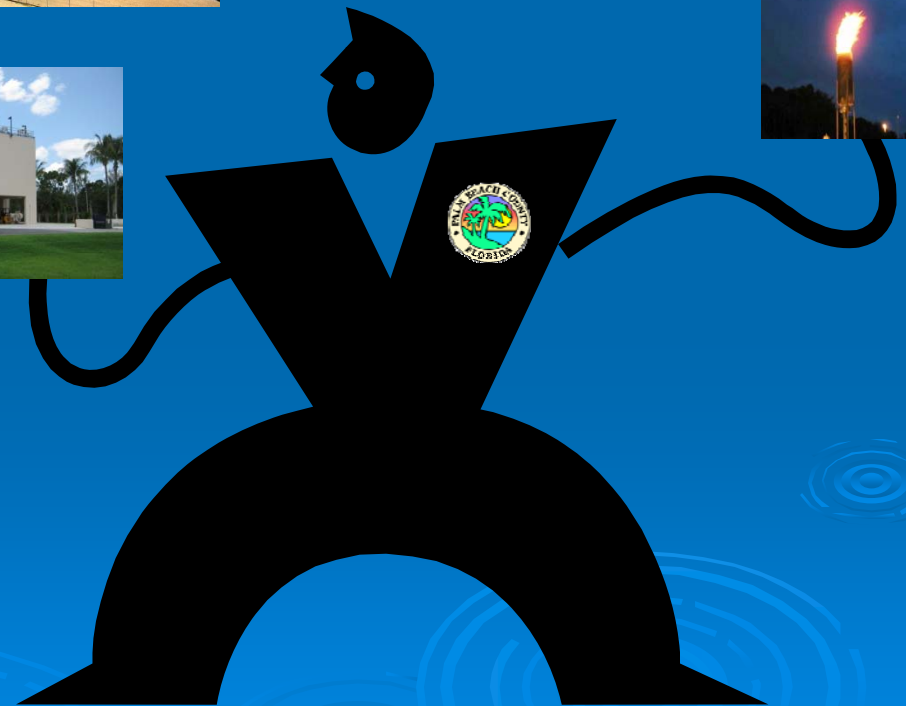
Palm Beach County
Board of County Commissioners
Water Utilities Department



March 26, 2013
Bevin A. Beaudet, PE
Utilities Director

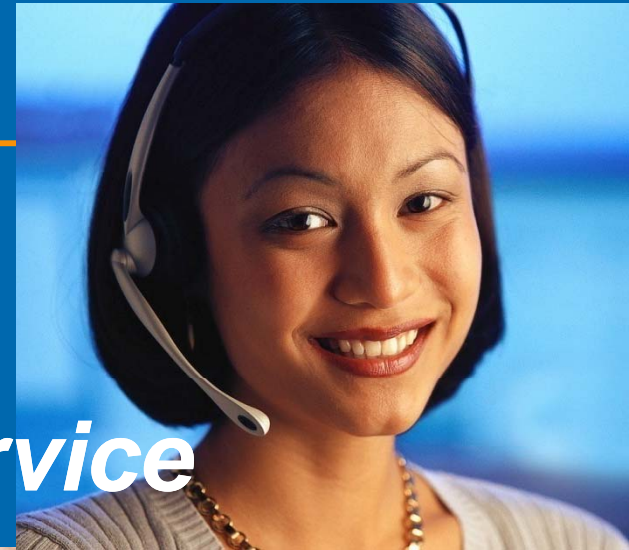
Presentation Outline

- ❖ Utility Background
- ❖ Operations
- ❖ WUD Energy Use
- ❖ Strategic Plan
- ❖ Energy Studies
- ❖ Energy Usage in Plants and wells
- ❖ Alternative Energy
- ❖ Results
- ❖ What's ahead?



Our Motto:

- 💧 ***Best Water***
- 💧 ***Best Customer Service***
- and
- 💧 ***Best Environmental Stewardship***



**In line with our Vision, Mission and Strategic Plan
to successfully map our future**

Utility Background



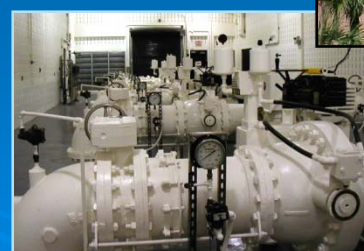
- Florida's 3rd largest water and wastewater utility
- 520,000 residents served
- 558 employees
- \$115 million annual operating budget
- Recognized as an industry leader





Plant Operations

- 4 Water Treatment Plants with total capacity of 103 mgd
- 2 Wastewater Treatment Plants with total capacity of 59 mgd
- 22 mgd Reclaimed Water Facility
- 4 mgd Wetland Treatment capacity



WTP No. 9 recently received the AWWA Outstanding Award for the State of Florida

Pipeline Operations

- ❖ 2,126 miles water mains
- ❖ 518 miles force mains
- ❖ 1,145 miles gravity sewer
- ❖ 33 miles reclaimed water
- ❖ 17 miles raw water mains
- ❖ 4.5 miles concentrate line
- ❖ 16,066 fire hydrants
- ❖ 33,403 valves
- ❖ 29,037 manholes
- ❖ 767 lift stations



**WUD currently maintains > 3,800 miles of pipelines system-wide
(spans distance from Miami to Seattle)**

Water Utilities Energy Use

- ❖ Largest User of Power in Palm Beach County
- ❖ WUD
 - ❖ 800 accounts
 - ❖ 90,000,000+ Kwh/yr
 - ❖ \$9,700,000 per year
 - ❖ This is 8.5% of WUD's Operating Budget



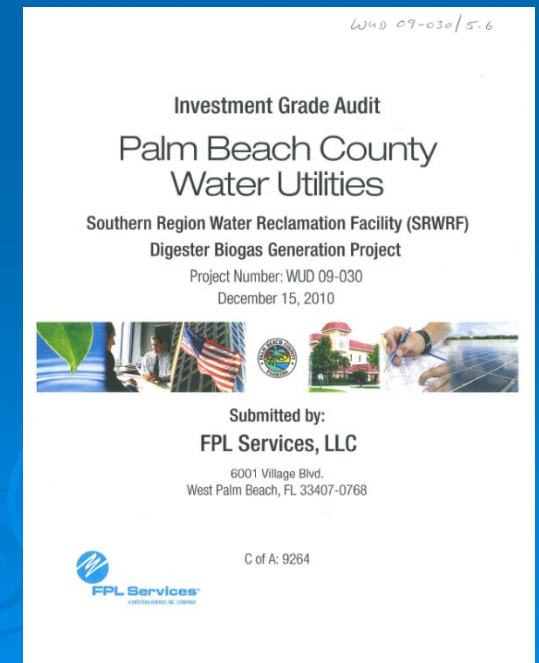
WUD Strategic Plan

- ❖ 2010 Comprehensive Strategic Plan
- ❖ Among the major goals (next 5 years):
 - ❖ Reduce energy use by 10% on a Kwh/Dwelling Unit Basis
 - ❖ Provide 5% WUD's energy off the grid using alternative/renewable energy facilities



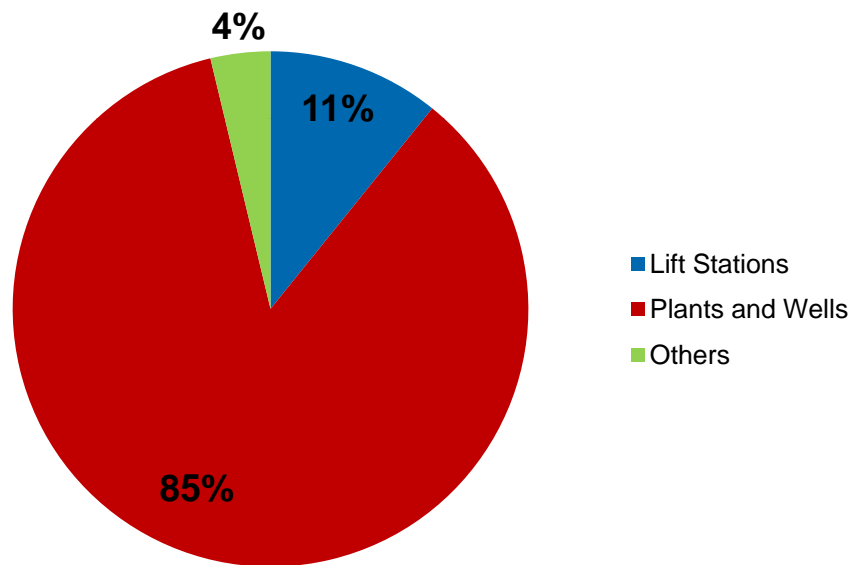
WUD Energy Studies / Audits

- ❖ Energy Evaluations for Existing Water and Wastewater Treatment Plants (2006), CH2MHill
- ❖ SRWRF Digester Biogas Generation Project - Investment Grade Audit (2010), Florida Power & Light

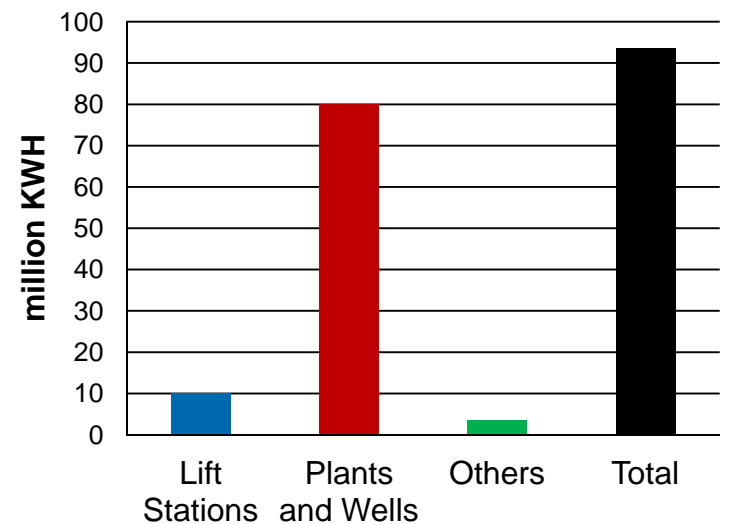


Energy Usage in WUD

PBCWUD 2011 Electricity Usage



PBCWUD 2011 Electricity Usage



Energy Usage in Plants & Wells



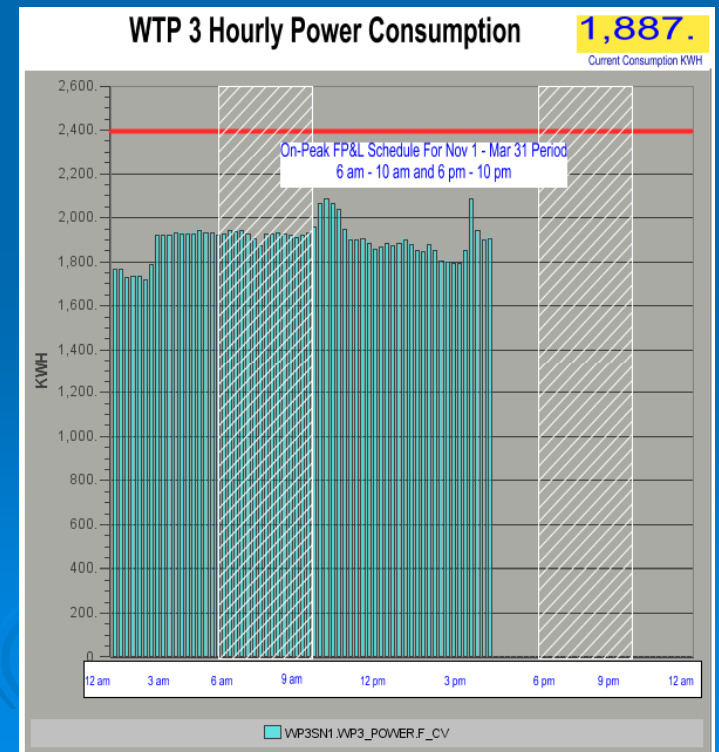
Facilities Upgrades

- ❖ Installation of motion activated lighting
- ❖ Replacement of lighting fixtures with energy efficient ones (thousands of fixtures and motion detection sensors)
- ❖ Painting of plant building ceiling with high reflective white paint
- ❖ Replacement of Inefficient HVAC systems



Process Changes

- ❖ Installation of Variable Frequency Drives (VFDs) at the production wells and other pump systems
- ❖ Optimization of production well pumps operation (trimming of impellers)
- ❖ Replacement of membrane elements with more efficient ones
- ❖ Operational timing to minimize energy use during peak rate hours
- ❖ Automation of chemical feeds
- ❖ Replacement of Air Diffusers



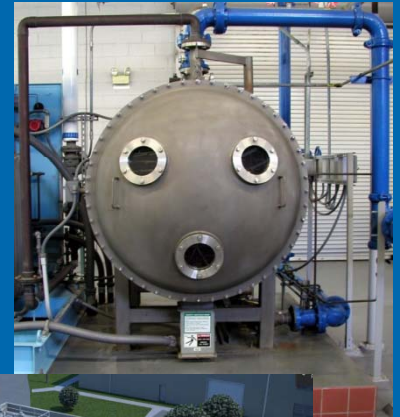
Variable Frequency Drives, (VFDs)

- ❖ Variable Frequency Drives (VFDs)
 - ❖ Is a type of motor controller that drives an electric motor by varying the frequency and voltage supplied to the motor
 - ❖ Matches pump speed to demand. Regular pumps operate in on/off mode.



Capital Projects

- ❖ Elimination of Ozone production; replaced with ion exchange
- ❖ Replacement of HS pumps & motors
- ❖ Process meters to optimize aeration at Southern Region Water Reclamation Facilities (SRWRF)
- ❖ Started power sub-metering at the WWTF
- ❖ Installation of efficient Effluent and Reclaimed water pumps



Alternative Energy Project

- ❖ Bio-Gas Generator
 - ❖ Will provide approx. 20% of power demand at SRWRF (750 Kw)

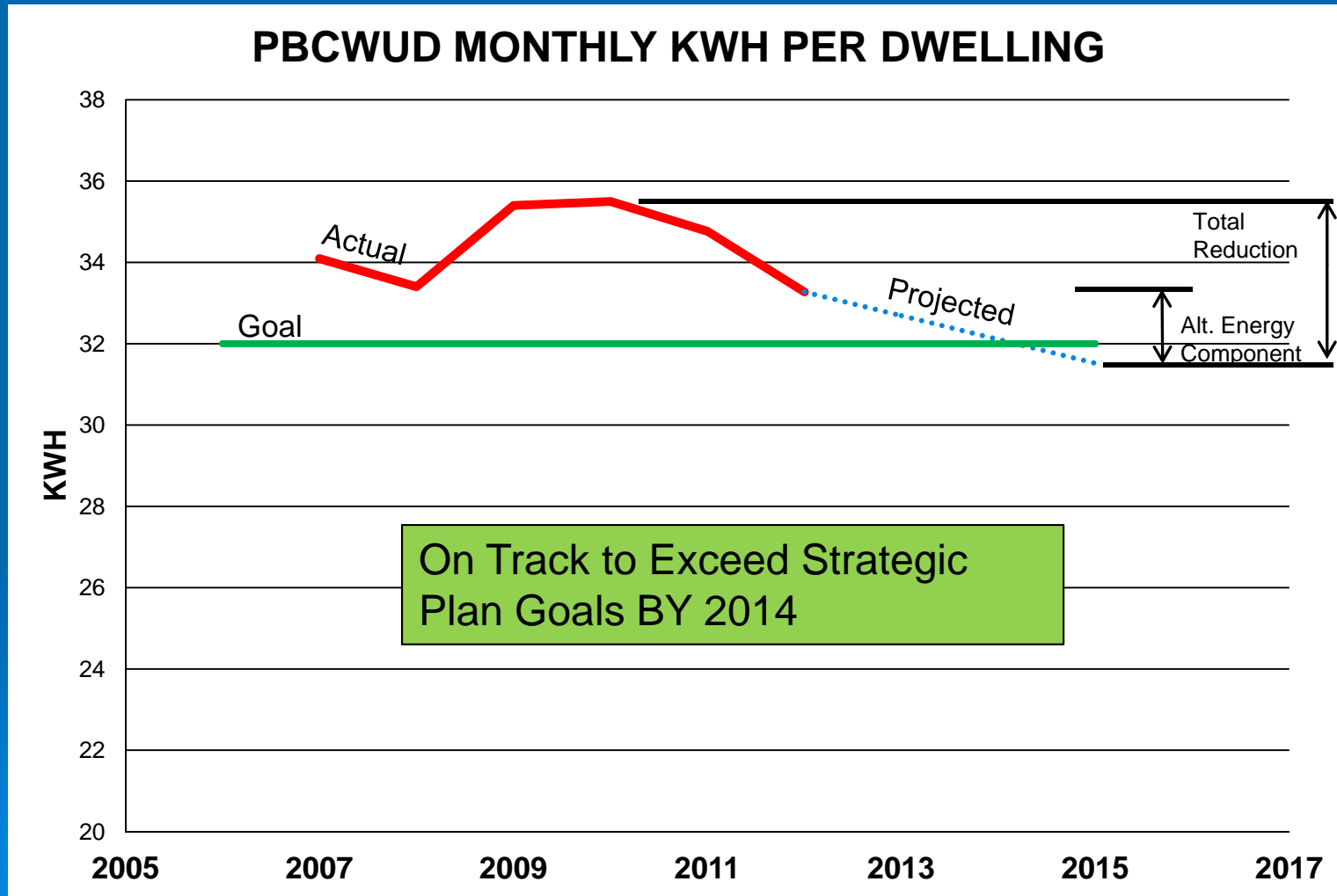


Alternative Energy Project

- ❖ Solar Panels
 - ❖ 125 kw of panels currently being installed at SRWRF

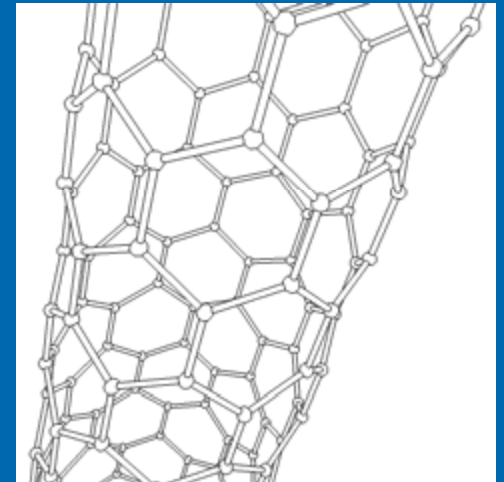
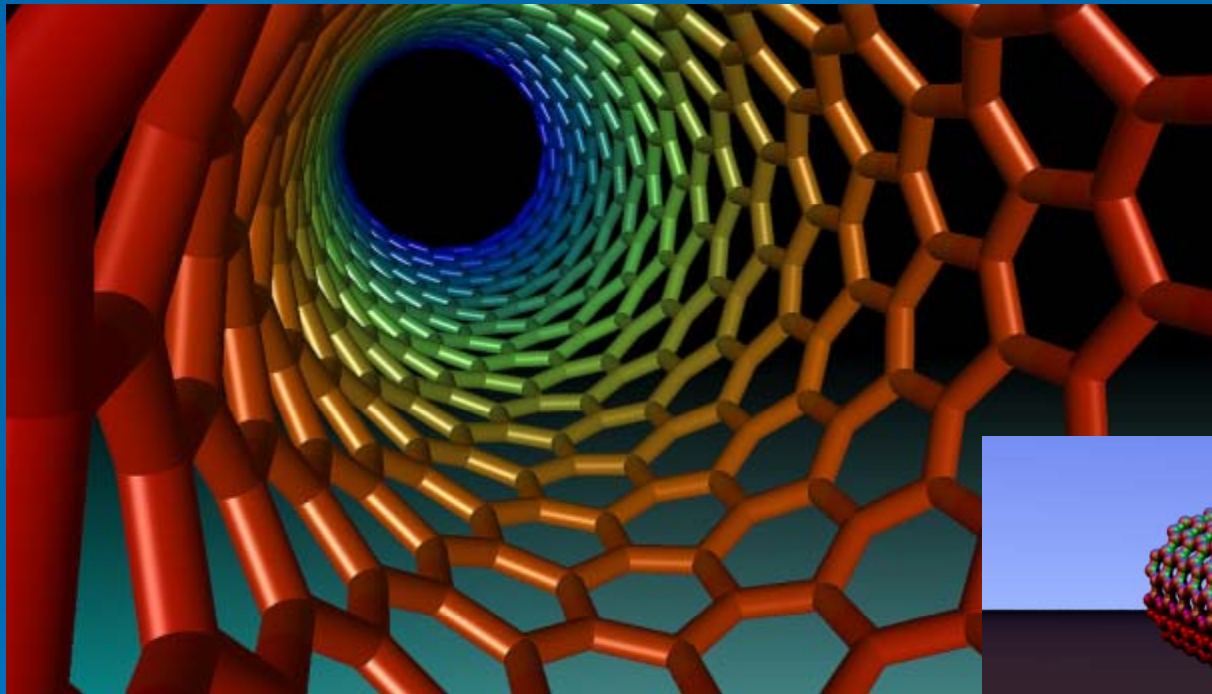


Results

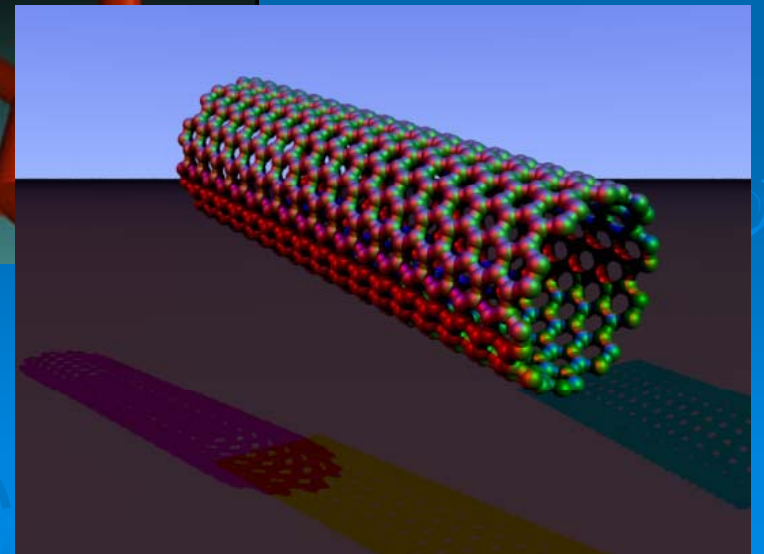


What does the future hold?

- 💧 New types of more efficient membranes



- 💧 Lawrence Livermore National Laboratory



Energy Recovery at Membrane Treatment Plants

Figure 1. RO Process with a Turbine Energy Recovery Device.

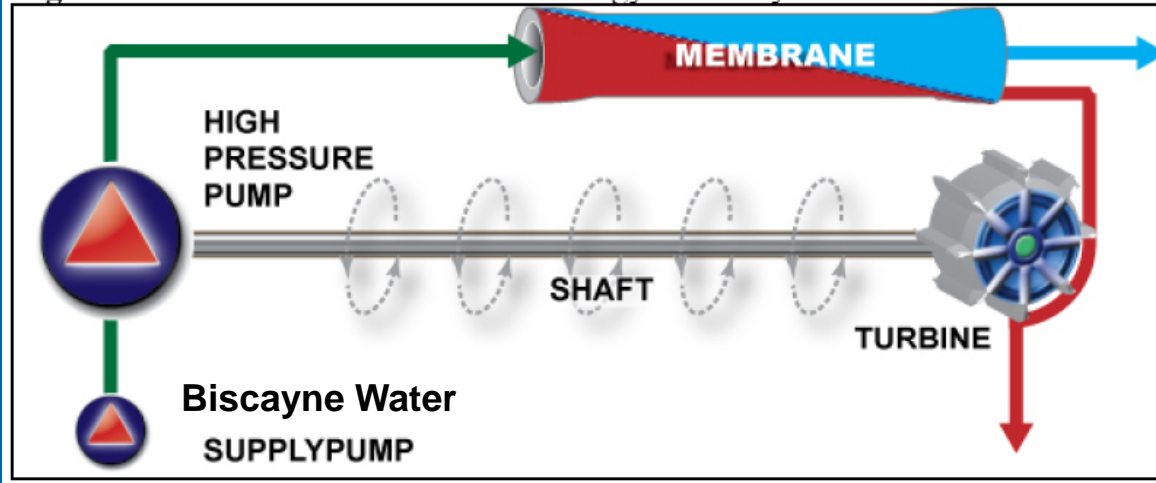
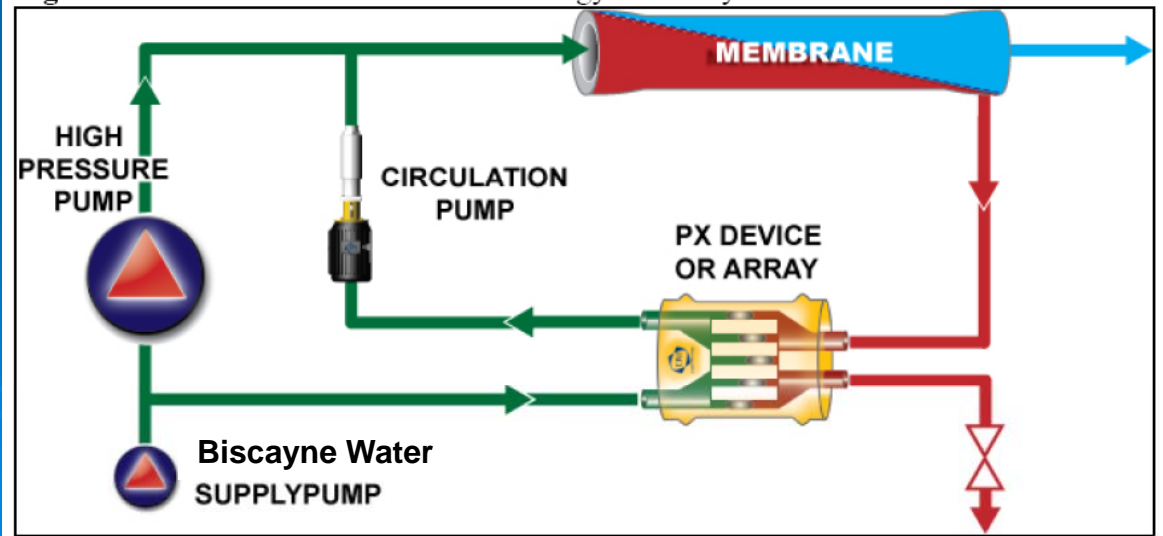


Figure 2. RO Process with an Isobaric Energy Recovery Device.



Questions!

Bevin A. Beaudet, P.E.
Director, Water Utilities Department