



# **2013 Winter Conference**

## **Plugging into Clean Water's Future**

February 6, 2013

## **Energy Management & Sustainable Practices**

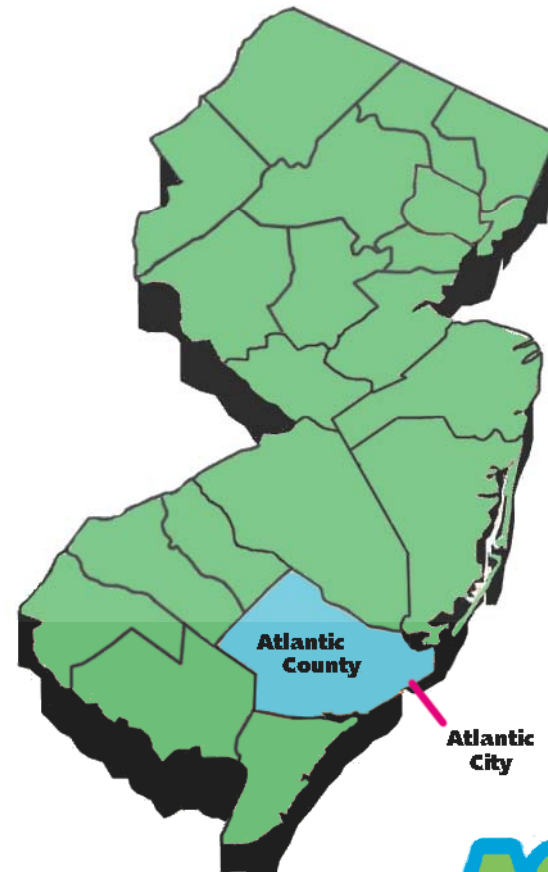
Chris Harris  
Director of Wastewater Operations  
Atlantic County Utilities Authority



# The Atlantic County Utilities Authority

| The Atlantic County Utilities Authority is a public agency that provides environmental and waste management services to the people of Atlantic County and southern New Jersey.

| The ACUA operates both Wastewater and Solid Waste Management Systems.



# About the

- | \$60 million in annual revenue
- | 250 employees
- | Full service regional wastewater treatment facility, trash & recycling collection, landfill, composting, recycling center, and transfer station.

## The ACUA Mission Statement. . .

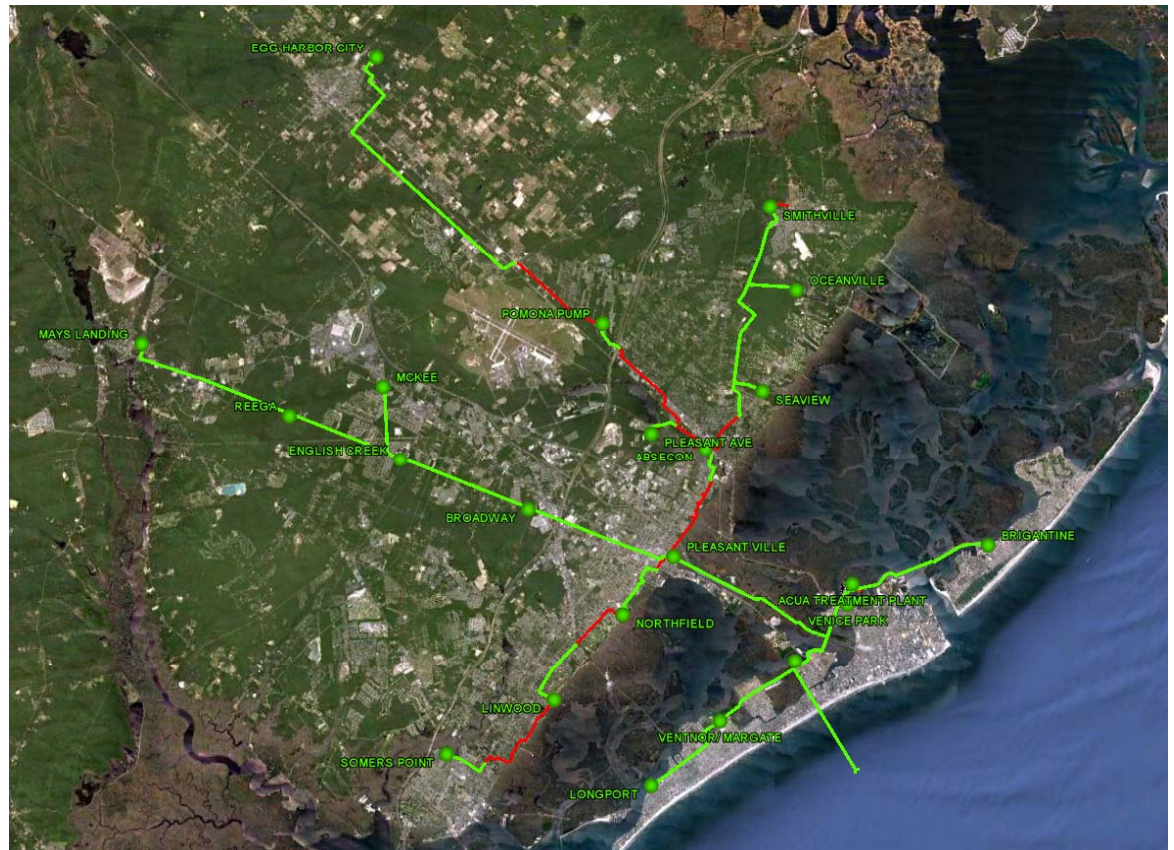
**The Atlantic County Utilities Authority is responsible for enhancing the quality of life through the protection of waters and lands from pollution by providing responsible waste management services. The Authority is an environmental leader and will continue to use new technologies, innovations and employee ideas to provide the highest quality and most cost effective environmental services.**

*. . .makes the Authority a natural facilitator for renewable energy projects*

# ACUA Facilities:

## Regional Wastewater System

- 40 MGD Activated Sludge Treatment Plant
- 20 Regional Pumping Stations
- 14 Member Municipalities
- Ocean Outfall



## ACUA Goes Green With:

- 7.5 megawatt wind farm
- 500 kilowatt solar generation facility
- Green Roof on Administrative Building
- Hybrid vehicles & Electric Vehicles
- Geothermal heating and cooling
- Energy conservation throughout our buildings and processes



# Jersey – Atlantic Wind Farm



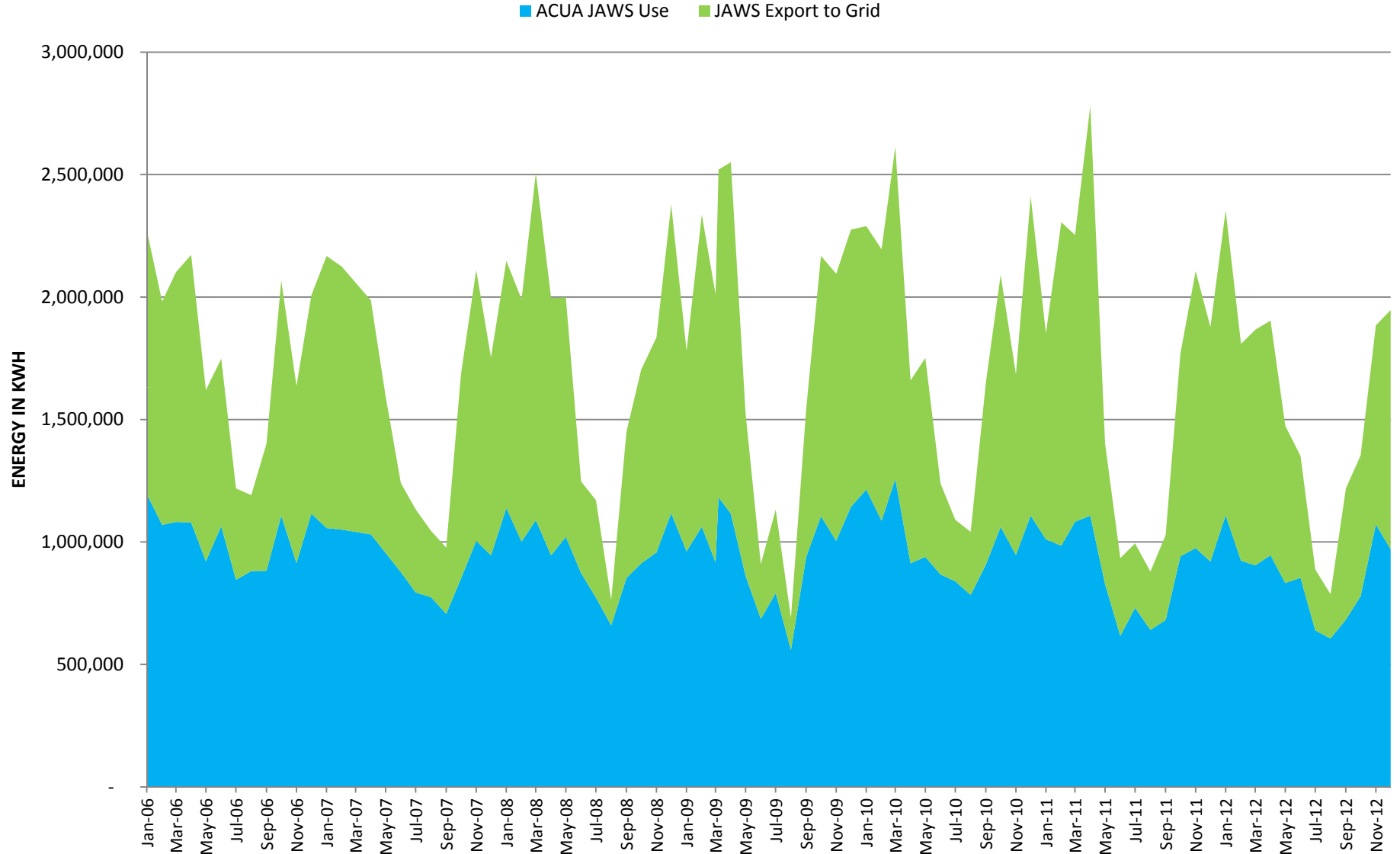
M.A. Mortenson Company

Atlantic City, NJ

## Jersey - Atlantic Wind Farm

- The first coastal wind farm built in the Northeast and the first wind farm in New Jersey
- \$12.5 million project before NJBPU grant funding
- 7.5 MW rated capacity system
- Enough to power 2,500 homes
- Provides almost 60% of the yearly electrical energy needs for the plant.
- ACUA entered into a 20 year PPA at \$0.0795 per KWH
- Total Savings to Date over \$3.2 million for our ratepayers

# Jersey Atlantic Wind Farm Energy Production





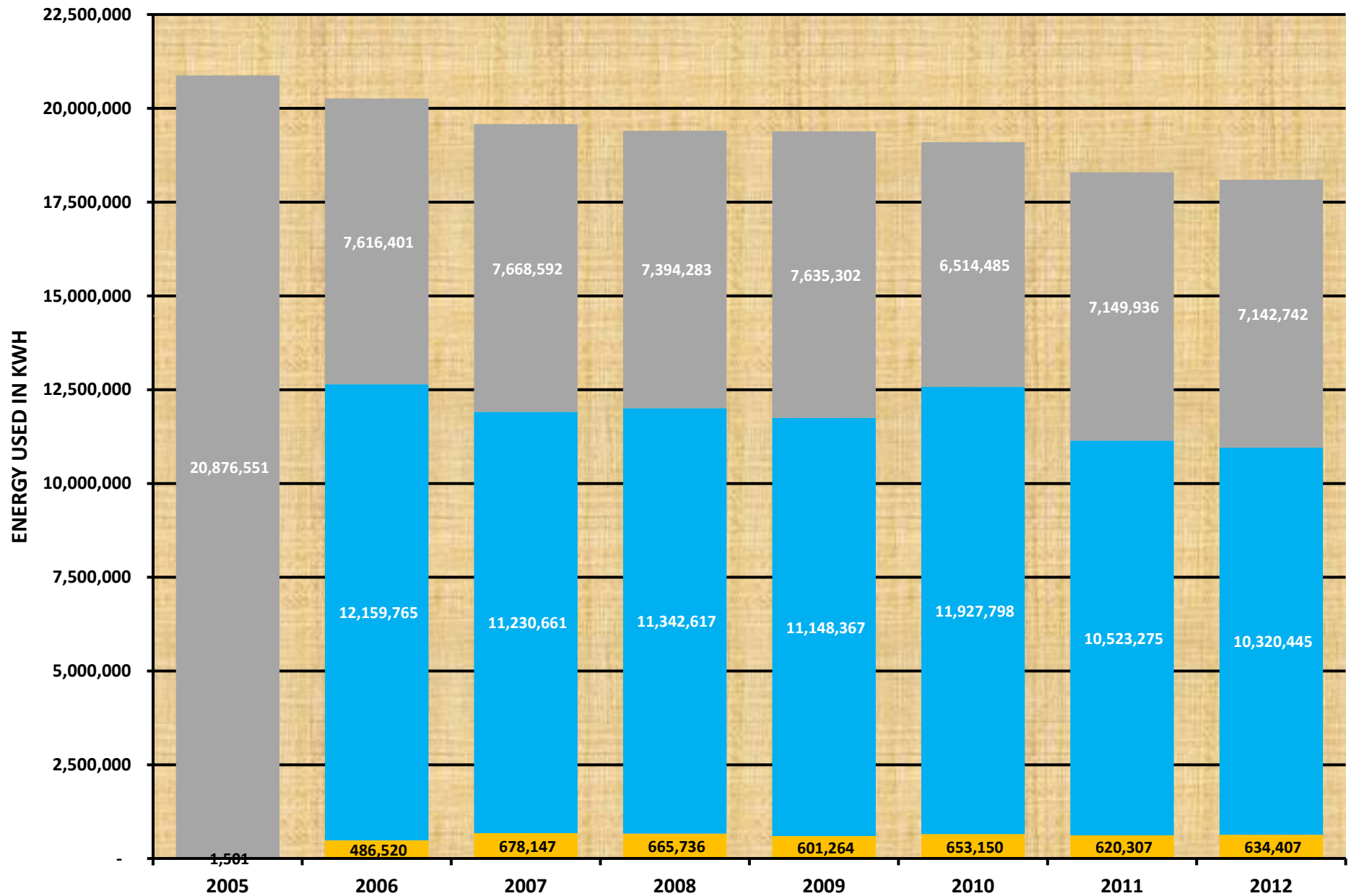
# ACUA's Solar Portfolio



- 500 kW system installed at Wastewater Treatment Facility in five arrays - two roof top, two ground mounts and one canopy array.
- Provides 3% of the annual electrical needs
- \$3.25 million project before 56% grant funding
- Thru 2012 +\$520,000 in electricity savings
- Thru 2012 +\$1.8 M in SREC revenue
- Total Savings to Date over \$2.4 million for our ratepayers

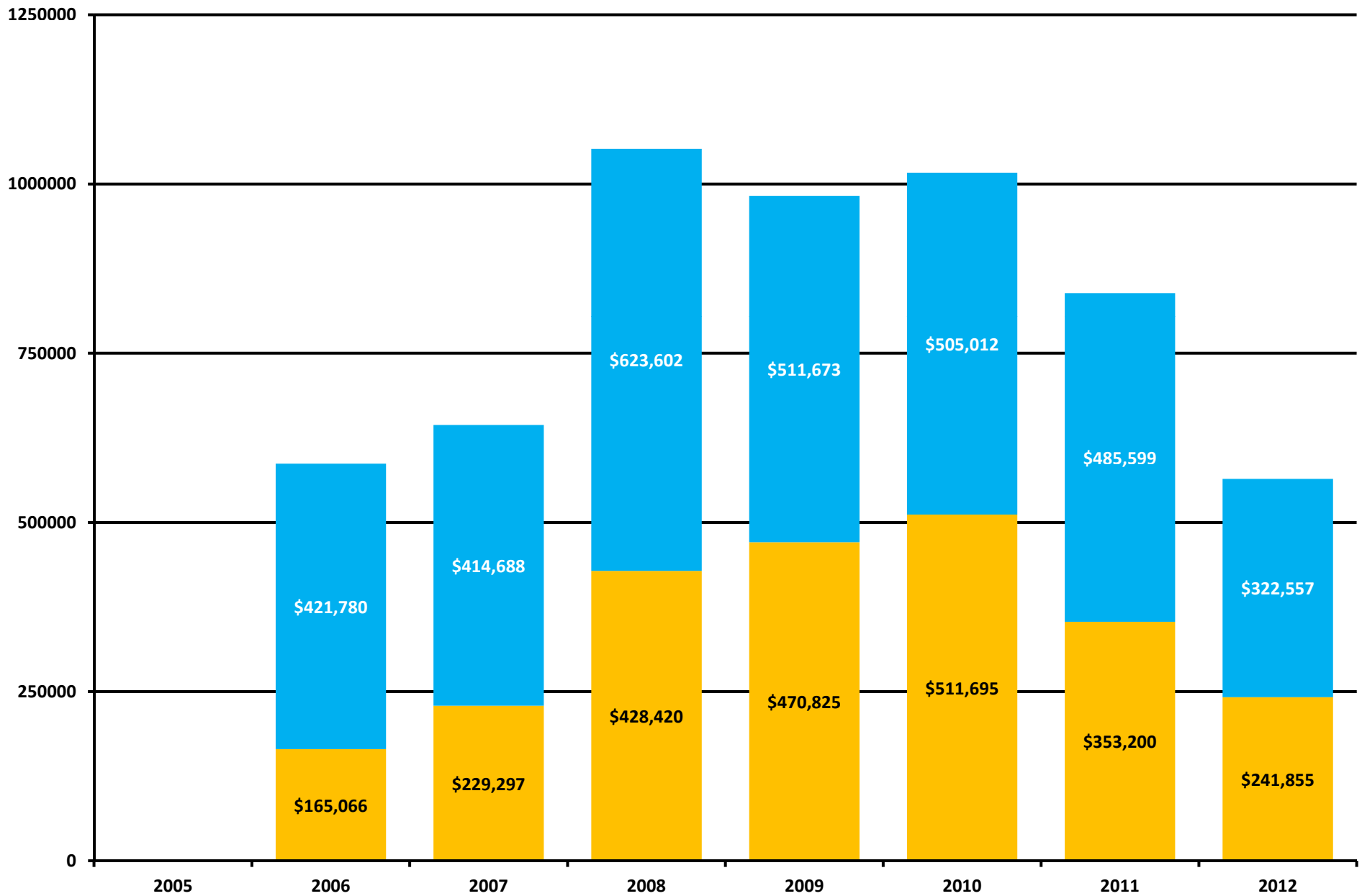
# ACUA Electricity Use By Source

■ Solar ■ Wind ■ Grid Power



# Alternative Energy Projects - Cost Savings & Revenue

■ Solar Total ■ Wind Total



# Geothermal Energy



## ACUA's Geothermal Office Building

Built in 1993, the Geo Building was one of the first geothermal buildings in southern New Jersey

Reduces Electric Use by over 20%

- Geothermal energy is the only renewable energy source created naturally by the earth itself
- Well-designed geothermal systems are among the most environmentally benign sources of energy
- A closed loop geothermal unit provides the heating and cooling for the Authority's administrative office or Geo Building

# Leading by Example: Water and Energy Conservation

- The ACUA's Geo Building has waterless urinals, faucet sensors and aerators to conserve water
- Energy star certified appliances and office equipment save energy
- CFL Bulbs where appropriate
- Copiers default to double-sided copies, and monitors utilize energy saving "sleep" mode.
- Promoting and providing local assistance to towns applying for NJ Energy audit program



# Alternative Fuel Vehicles: Hybrid & Electric

- ACUA owns six Ford Escape Hybrids and five Chevy Silverado Hybrid trucks
- ACUA WW maintenance staff uses a Ford Ranger EV pick up and low speed GEM EV at the Treatment Plant
- ACUA's pool car fleet includes a Nissan Leaf and Plug-In Prius

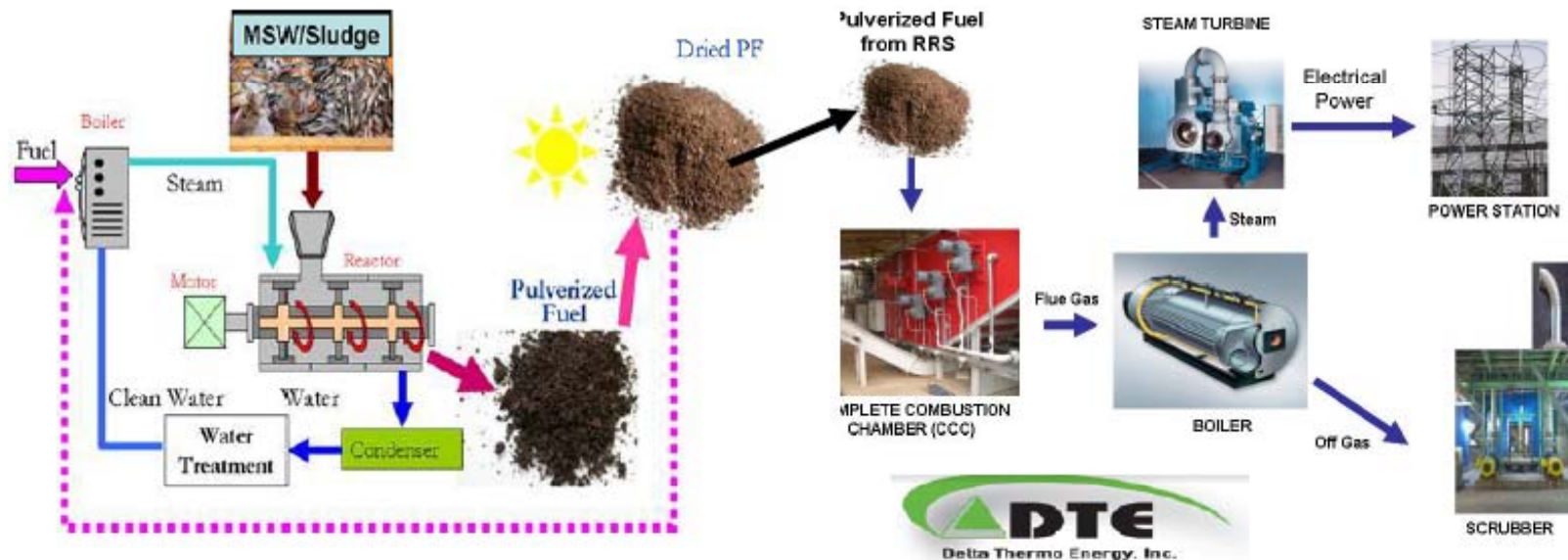




# ***What's Next??***

- Waste to Energy
- Waste Heat Recovery at WW Incinerator
- Water Reuse Projects

# Waste to Energy



- Delta Thermo Energy operating Bench Scale test system in ACUA's transfer station.

# Delta Thermo Energy WTE System

- Scalable from 100 TPD
- Uses hydrothermal decomposition to treat mixtures of MSW and sludge
- Resulting RDF has energy content similar to coal and emissions comparable to “clean coal”
- Combustion chamber cleanly burns RDF to create electricity
- First commercial scale project in Allentown, PA approved and permitted

# Waste Heat Recovery

- ACUA has been developing a waste heat recovery project to generate electricity from sludge incinerator's excess heat.
- Technically feasible, but operational obstacles remain:
  - ACUA has an existing PPA with the wind farm
  - Third party owner/operator of WHR system would require a degree of control over incinerator operations
  - EPA regulations will impact incinerator operations

# Water Reuse Projects

*ACUA had developed two wastewater reuse projects in Atlantic County:*

- Four Season's Residential Reuse project:
  - Would use treated wastewater for lawn irrigation in the housing development
  - NJDEP issued temporary water permit until reuse project was operational
  - Residents did not support the project and NJDEP did not revoke the temporary permit

# Water Reuse Projects

- Marina Thermal Reuse Project:
  - District heating facility in Atlantic City would use wastewater as part of their heating/cooling system for future casinos
  - Planned casino development stalled and the reuse water was no longer needed for the system.



# Water Reuse Projects Challenges

- Public buy in / education
  - The public is often misinformed on how water reuse will affect them
- Project economics
  - Additional up front costs can be an obstacle
- Local water supply / seasonal rainfall
  - If there has not been recent drought or water use restrictions, the public does not see a need for wastewater reuse

# WEF Energy Roadmap

*Steps to developing energy neutrality in the water sector*

- Strategic Management
- Organizational Culture
- Communication Outreach
- Demand Side Management
- Energy Generation
- Innovating for the Future

# Strategic Management

- Provide Strategic Direction
- Identify Financial Viability
- Develop Collaborative Partnerships
- Plan and Prepare Towards Carbon Neutrality

# Organizational Culture

- Create an Energy Vision
- Form an Energy Team
- Foster Staff Development & Alignment

# Communication and Outreach

Actively and honestly communicate with:

- Customers and Community
- Regulatory and Legislative sectors
- Media
- Environmental Advocacy Groups
- Peers in the Water / Wastewater Sector

# Demand Side Management

- Identify Electricity Costs and Billing
- Evaluate Power Measurement and Controls
- Develop Energy Management Strategies
- Gain Control



# Innovating for the Future

- Actively Participate in Research and Development Opportunities
- Identify and Prioritize Future Risks
- Evaluate New Technologies
- Identify Available Alternatives

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