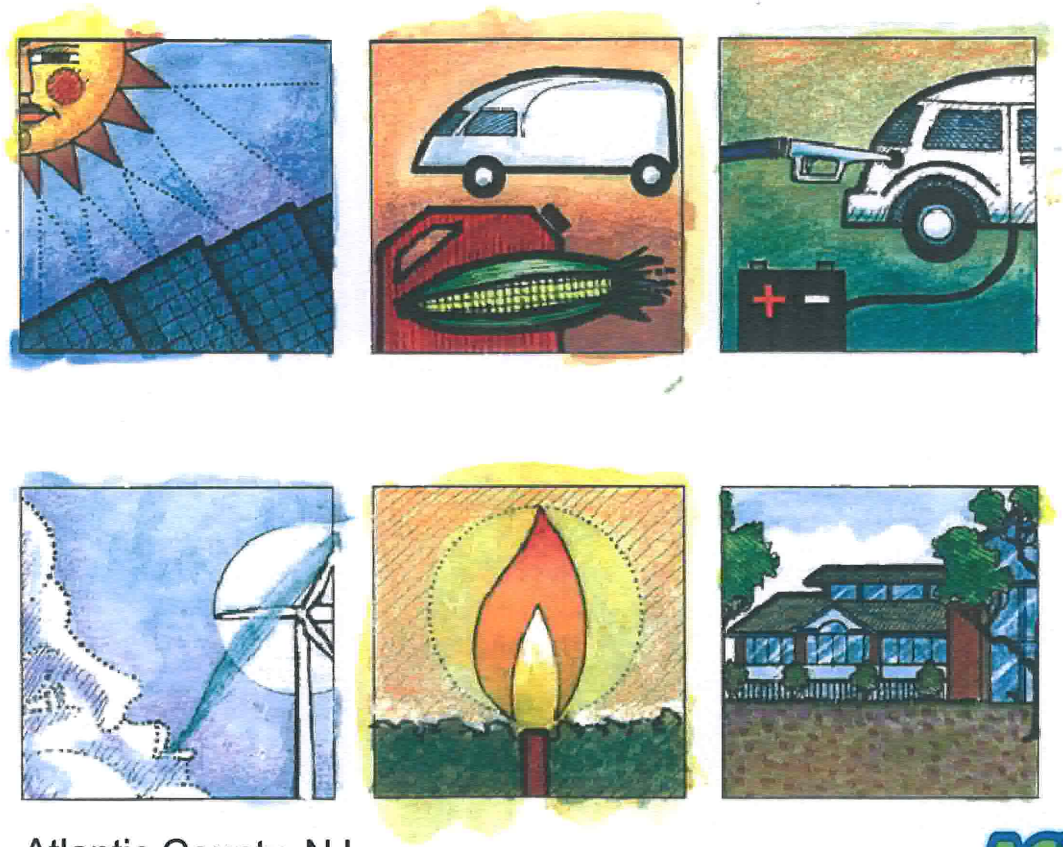
Sustainable Energy Development and Use at ACUA



Atlantic County, NJ

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Sustainable Energy Development and Use in Water and Water Resources Management

The Philadelphia Metropolitan Area Section of the American Water Resources Association

Thursday
September 17, 2009

Atlantic County Utilities Authority
Richard S. Dovey
President
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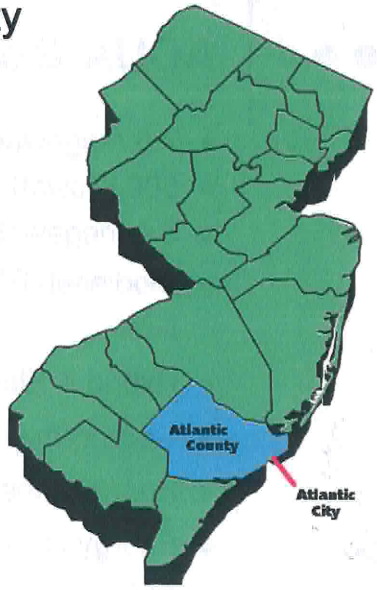
The Atlantic County Utilities Authority

- **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.**



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About the ACUA

- $70 million in annual revenue
- 250 employees
- Full service regional wastewater treatment facility, trash & recycling collection, landfill, composting, recycling center, and transfer station.

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ACUA Goes Green With:

- 7.5 megawatt wind farm
- 500 kilowatt solar generation facility
- 5.4 megawatt landfill gas to electric facility
- Biodiesel- B5 blend powers the ACUA diesel fleet
- Hybrid & Electric vehicles
- Geothermal heating and cooling
- Energy conservation
- Energy curtailment
- Chicago Climate Exchange membership

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Jersey – Atlantic Wind Farm

Atlantic City, NJ

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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
- Project fully funded by a third party & NJBPU
- Five General Electric 1.5 mW turbines
- 7.5 mW of electricity during peak operations
- Enough to power 2,500 homes
- Provides almost 60% of the yearly electrical energy needs for the plant.

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Jersey – Atlantic Wind Farm

ACUA's Benefit

- Electric costs at the wastewater plant were reduced by $649,156 in 2008
- ACUA negotiated a flat rate of 7.95 cents/kWh for wind generated electricity - for 20 years
  - When the contract began in 2005, the grid price for electricity was 13.00 cents/kwh
- ACUA receives $15,000 annually to rent the property

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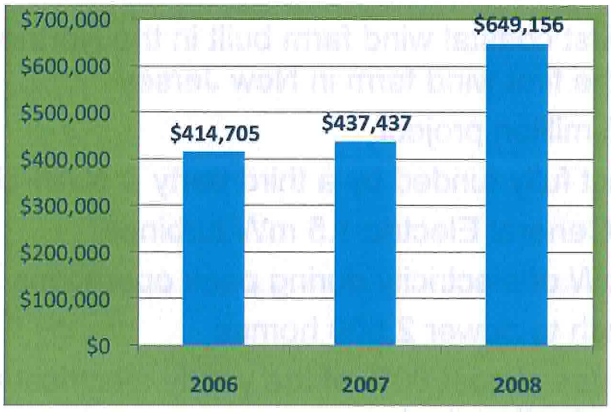
Wastewater savings from wind generated electricity



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ACUA's Solar Portfolio

- 2,700 solar panels installed at Wastewater Treatment Facility in five arrays - two roof top, two ground mounts and one canopy array
- 500 kW system owned and maintained by ACUA
- Joint agreement with WorldWater & Power and Conti Construction
- $3.25 million project
- $1.9 million CORE rebate from NJBPU
- Low-interest loan NJ Environmental Infrastructure Trust Program
- Average estimated yearly savings: $115,000-$135,000

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Landfill Gas to Electric

- ACUA project fully funded by a third party - AC Landfill Energy, LLC, a joint venture of DCO Energy and South Jersey Industries
- Methane gas powers 5.4 Mw Caterpillar® engine generator (combined 1.6 Mw generator and two 1.9 Mw generators)
- 1.6 Mw of energy produced powers all of ACUA's Environmental Park. Excess energy sold to PJM Grid
- Capable of producing enough energy to power 3,434 homes
- Excess Energy from the second 1.9 Mw generator sold to The Borgata Casino Spa & Hotel
- $513,200 incentive from NJBPU; $375,000 NJDEP Grant NJEDA Approved low interest loan for remaining $ 2 million
- Estimated 2007 savings - $556,000
- More than 44,000 greenhouse gas credits earned in 2006, worth approximately $120,000 on the Chicago Climate Exchange

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Renewable Energy: How the ACUA Benefits

Wastewater Treatment Facility:
62% of power used comes from renewables generated on site

Solid Waste Facilities:
100% of power used comes from landfill gas to electricity generated on site

Annual Savings:

2006: $1,308,383
2007: $1,175,607
2008: $1,806,449

Total to date: $4,290,439

Renewable Energy projects **save** the ACUA over **$1 million** each year

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Electric Charging Stations

- The ACUA unveiled three electric charging stations in July of 2009 on both its Solid Waste and Wastewater Treatment sites
- **The stations are capable of charging at 110 volts or 220 volts**
- The ACUA owns a low-speed GEM electric car for commuting at its Wastewater facility
- **The ACUA added a highway-approved electric car to its fleet, known as The Current**
- The Current gets 40-60 miles on a single charge and takes between 3 and 4 hours to charge
- All electricity produced for the vehicles comes from renewable sources making them zero-emission

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Alternative Fuels

Biodiesel

- ACUA operates largest biodiesel fleet in New Jersey
- Entire ACUA diesel fleet, 106 vehicles, runs on a B5 blend of biodiesel
- In addition, 23 municipal vehicles and four county vehicles use biodiesel and fill-up at the ACUA

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What's Next: Compressed Natural Gas (CNG)

- ACUA is building a CNG filling station
- Converting entire collection fleet to CNG
- First of its kind in southern NJ
- Operational by early 2010
- Will be open to third party fleets

Why CNG?

•Burns cleaner
80% less ozone forming emissions than gasoline vehicles

•Costs less
The abundance of available natural gas makes CNG cheaper than diesel

•Produced domestically

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What's Next: Plug in Hybrids

One of ACUA's Ford Escape Hybrids will be converted to a plug in hybrid

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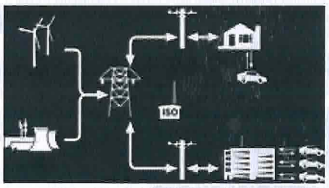
V2G
Vehicle to Grid



MAGIC Consortium Partners

- University of Delaware
- Pepco Holdings Inc
- pjm
- comverge
- AC PROPULSION
- ACUA

- •Utilizes the stored energy in electric vehicle batteries
- •Contribute electricity back to the grid upon demand
- •Customers earn revenue for energy sold back
- •Increases grid efficiency and reliability
- •Makes it possible to use intermittent renewable sources like wind and solar to power vehicles

ACUA is a partner in the Mid-Atlantic Grid Interactive Cars Consortium (MAGICC), created to test, develop and demonstrate V2G technology
www.magjicconsortium.org

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What's Next: Solar on the Landfill

Utilizing the landfill area for solar arrays

- 15 acre area of ACUA landfill
- 2-3 megawatts could be installed
- Power can be sold to customer adjacent to property
- Revenue from SRECs and electricity offset capital cost for ACUA or 3rd party
- Could be operational by mid 2010

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What's Next: Plasma Gasification

- ACUA is exploring plasma gasification as a way to divert material from the landfill
- Byproduct: electricity and syngas

What is plasma gasification?

- **Plasma gasification differs from incineration**
- **Plasma described as "fourth state of matter"**
- **No oxygen introduced**
- **Higher temperatures, high energy state**
- **Plasma torches break trash into atoms that compose it**
- **Efficient – 46% of waste converted to energy**
- **Diverts material from the landfill**

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What's Next: Green Roof

- The ACUA will add a green roof to a building located out in front of its Wastewater Treatment Plant
- A green roof is a small cover of vegetation consisting of turf grass, shrubs and trees
- The benefits of green roofs include, lower heating and cooling costs, retains runoff storm water, provides a natural habitat for wildlife, and extends the life of the roof
- The green roof was donated by Parker Plants and installed by their volunteers
- The roof would have cost $72,000

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Offshore Wind Farms in New Jersey

- New Jersey's aggressive energy plans support development of offshore wind
- 3 developers plan offshore projects:
  Garden State Offshore Energy
  Bluewater Wind, and Fishermen's Energy
- Each wind farm will produce approximately 350 megawatts

Governor Corzine Increases Wind Energy Goal

October 6, 2008

Original Goal: 1000 megawatts of wind by 2020
New Goal: 3000 megawatts of wind by 2020

13% of New Jersey's energy enough to power 800,000 homes could come from wind energy by 2020

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Solar Communities

- Prior to release of NJ's Energy Master Plan, regulations were prohibitive
- NJBPU and State owned utilities are working to address obstacles
- Changes are a direct result of stakeholders' appeals and insistence

- Community members buy shares
- Project located in the community
- Allows people who cannot have panels to develop and use solar
- People can pool resources; can makes solar more affordable

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