

**2010 CHP Partnership Meeting  
Biomass and Agricultural Applications**



**City of Dallas Water Utilities  
Southside Wastewater Treatment Plant  
Cogeneration Project  
November 2, 2010**

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**Presentation Outline**

- ◆ Project Background and Drivers
- ◆ Why Cogeneration?
- ◆ Alternative Project Delivery
- ◆ Responsibility of Parties
- ◆ Project Details
- ◆ Benefits of Cogeneration
- ◆ Lessons Learned
- ◆ Status of Project
- ◆ Q & A

## Southside Wastewater Treatment Plant

- ◆ Located 20 miles southeast of downtown Dallas – 2800 acres
- ◆ Treatment capacity is 110 millions gallons per day
- ◆ Processes over 150 tons of solids/day



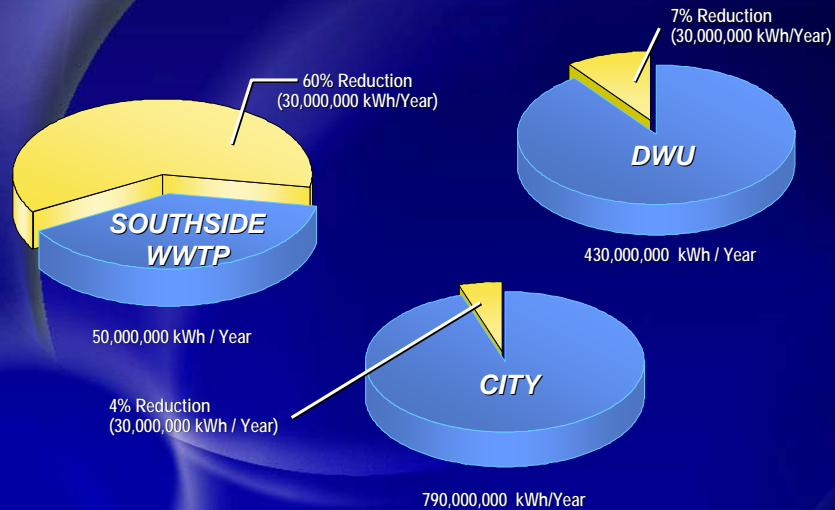
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## Project Background and Drivers

- ◆ **Wastewater Residuals Master Plan (1994)**
  - ◆ Recommended construction of a Cogeneration Facility
- ◆ **Texas Senate Bill 7 (1999)**
  - ◆ Set goals for electricity generation from renewable energy resources
- ◆ **Texas Senate Bills 5 and 12 (2001 and 2007)**
  - ◆ Required political subdivisions to reduce energy consumption by 5% per year for five years
- ◆ **Rising Electrical Costs**
- ◆ **Consistent with Conservation Efforts and Power Management Strategies**

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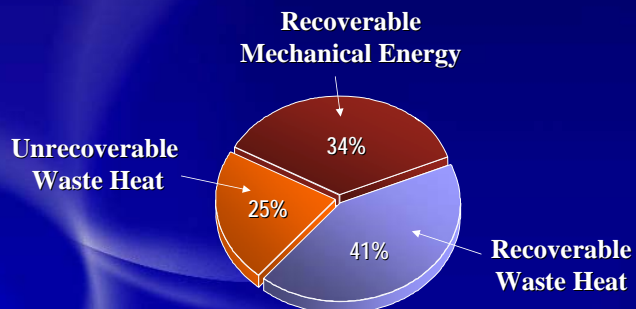
## DWU's Biogas has the potential to reduce the City of Dallas' total grid derived electricity consumption by almost 4%



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## Why Cogeneration?

- ◆ DWU's biogas is underutilized
- ◆ Use small amount to fire boilers to heat digesters
- ◆ Large portion is burned off using flares
- ◆ Makes too much sense



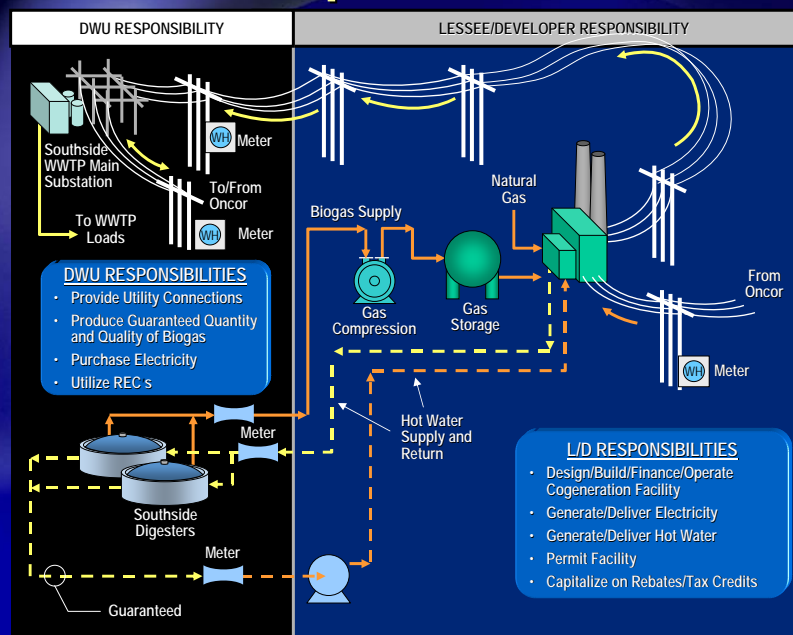
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## Alternative Project Delivery

- ◆ November 8, 2008 - City entered into a 20-year lease agreement with Ameresco Dallas, Inc.
  - ◆ Design, build, finance, own, operate Cogeneration facility
  - ◆ Option for 5-year extension
- ◆ Delivery approach fits our business model
  - ◆ City is not an expert in power generation
  - ◆ Burden of capital cost borne by others
  - ◆ Requires no additional labor or skill set to operate or maintain the facility

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## Responsibilities



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## City Responsibilities

- ◆ Lease a 2.5 acre tract of land to Ameresco
- ◆ Construct all utility extensions to the lease premises
  - ◆ 2600' of 18" stainless steel gas piping
  - ◆ 4000' of 12" insulated steel hot water piping
  - ◆ 400' of underground electrical duct bank
- ◆ Guarantee a minimum quantity of biogas (283,240 MMBtu/year)
- ◆ Purchase all power produced by the Cogeneration facility



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## Ameresco Responsibilities

- ◆ Finance, design, permit, build, operate and maintain the facility
- ◆ Lease property for \$1,000 annually
- ◆ Guaranteed minimum amount of electricity - no less than 34% efficiency
- ◆ Guaranteed minimum amount of hot water for heating - no less than 41% efficiency



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## Site Layout



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## Project Details

- ◆ Daily gas production is 1.3 million cubic feet per day
- ◆ Electricity produced using three Jenbacher - Model 420 generators
- ◆ Electrical output is 4.5 MW
- ◆ Ultimate electrical output is estimated to be 6 MW (100%)



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## Benefits of Cogeneration - City

- ◆ Reduced cost of electricity results in savings of \$900,000 annually
- ◆ Redundancy – fourth source of power
- ◆ Generation of 30,000 Renewable Energy Credits per year
- ◆ No need for additional labor or skill set above staff's current capabilities
- ◆ Meets triple bottom line
  - ◆ Planet, People, Profit

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## Emissions Comparison

- ◆ Coal fired power vs. proposed cogeneration system in tons/year

<u>COAL FIRED</u>		<u>COGEN</u>
56055	Carbon Dioxide (CO <sub>2</sub> )	15899
243	Particulate Matter (PM)	4
48	Mercury (Hg)	0
115	Carbon Monoxide (CO)	93
12	Sulfur Oxide (SOX)	1
13	VOC's	8
29	Nitrogen Oxides (NO <sub>x</sub> )	27

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## Benefits of Cogeneration - Ameresco

- ◆ Guaranteed revenue stream from the sale of electricity over the term of the contract
- ◆ Able to take advantage of available rebates from Oncor for reductions in grid derived electricity
- ◆ Can capitalize on Federal Tax Credits



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## Lessons Learned

- ◆ Seek advice from those with experience
- ◆ Ensure commitment from your legal department
- ◆ Extra effort in the planning stages and have a flexible plan
- ◆ Permitting should begin as early as possible



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## Project Status

- ◆ Facility is in process of commissioning
- ◆ Natural Gas permit is in the works



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Questions?

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