



Renewable Energy on a Budget at the Dallas/Fort Worth International Airport

American Association of Airport Executives
Airports Going Green Conference

November 16, 2010





Outline

- Renewable Energy Purchases
- Biofuels
- Solar Water Heating
- Solar Powered Devices
- Marketing Agreement
- Grant Funded Onsite Solar PV

Renewable Energy Purchases

- 20% of DFW's annual electric energy (~60 million kWh per year) is wind-generated with zero emissions
- The U.S. EPA Green Power Partnership recognized DFW on its "Top 20 Local Government List" of the largest green power purchasers and as a member of the Green Power Leadership Club
- DFW ranks 11th on the most recent list

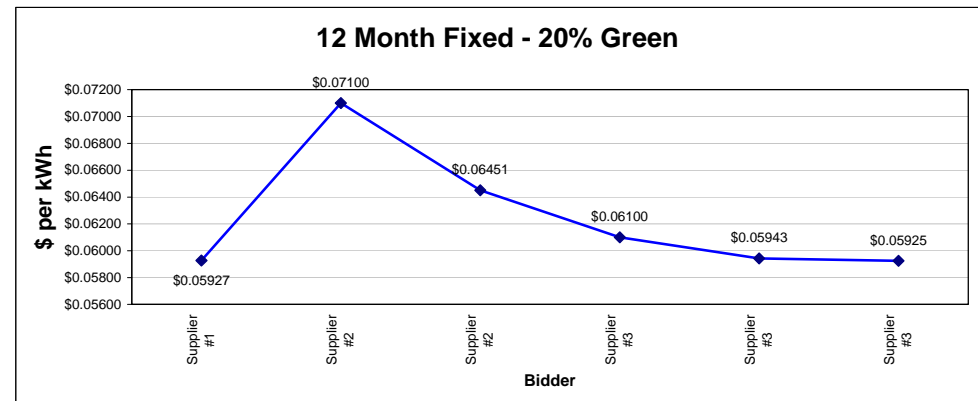




Renewable Energy Purchases

- Reverse Online Auction for supply of electricity
- 8 auctions held almost simultaneously varying pricing form, term and green content

TDSP	Contract Term	Form of Pricing	Green Power	Bandwidth (+/-)	RFP End Time (CT)
Oncor	12 month	Heat Rate + Adder	10%	10%	10:30 AM
Oncor	24 month	Heat Rate + Adder	10%	10%	10:35 AM
Oncor	12 month	Fixed Rate	10%	10%	10:40 AM
Oncor	24 month	Fixed Rate	10%	10%	10:45 AM
Oncor	12 month	Heat Rate + Adder	20%	10%	10:50 AM
Oncor	24 month	Heat Rate + Adder	20%	10%	10:55 AM
Oncor	12 month	Fixed Rate	20%	10%	11:00 AM
Oncor	24 month	Fixed Rate	20%	10%	11:05 AM



Description	Accounts	Annual kWh	Delivery Date	Auction End Date	Total Bids	Total Bidders	Best Bid	Best Bid Company
12 Month Heat Rate 10% Green	204	297,492,502	2/28/2010	5/26/2009 11:30:00 AM	6	3	0.05901	Reliant Energy Solutions East
24 Month Heat Rate 10% Green	204	297,492,502	2/28/2010	5/26/2009 11:35:00 AM	5	3	0.06169	Reliant Energy Solutions East
12 Month Fixed Rate 10% Green	204	297,492,502	2/28/2010	5/26/2009 11:40:00 AM	5	3	0.0589	Champion Energy Services
24 Month Fixed Rate 10% Green	204	297,492,502	2/28/2010	5/26/2009 11:45:00 AM	4	3	0.06345	Reliant Energy Solutions East
12 Month Heat Rate 20% Green	204	297,492,502	2/28/2010	5/26/2009 11:50:00 AM	4	3	0.059278	Champion Energy Services
24 Month Heat Rate 20% Green	204	297,492,502	2/28/2010	5/26/2009 11:55:00 AM	5	3	0.06207	Reliant Energy Solutions East
12 Month Fixed Rate 20% Green	204	297,492,502	2/28/2010	5/26/2009 12:00:00 PM	6	3	0.05925	Champion Energy Services
24 Month Fixed Rate 20% Green	204	297,492,502	2/28/2010	5/26/2009 12:05:00 PM	3	3	0.06383	Reliant Energy Solutions East

Biofuels

- B20 bio-diesel fuel used in DFW's heavy duty and off-road fleet
- 7% - 14% of diesel fuel use (0.4% - 0.7% of total fuel use)
- -\$0.06/gal to \$0.19/gal price differential



Solar Water Heating

- Solar thermal hot water system installed during Wellness Center renovation project
- 80,000 Btu per day rated capacity
- \$9,945 incremental cost
- Providing 45% of average daily HW consumption
- 14.5 year SPP at current energy rates



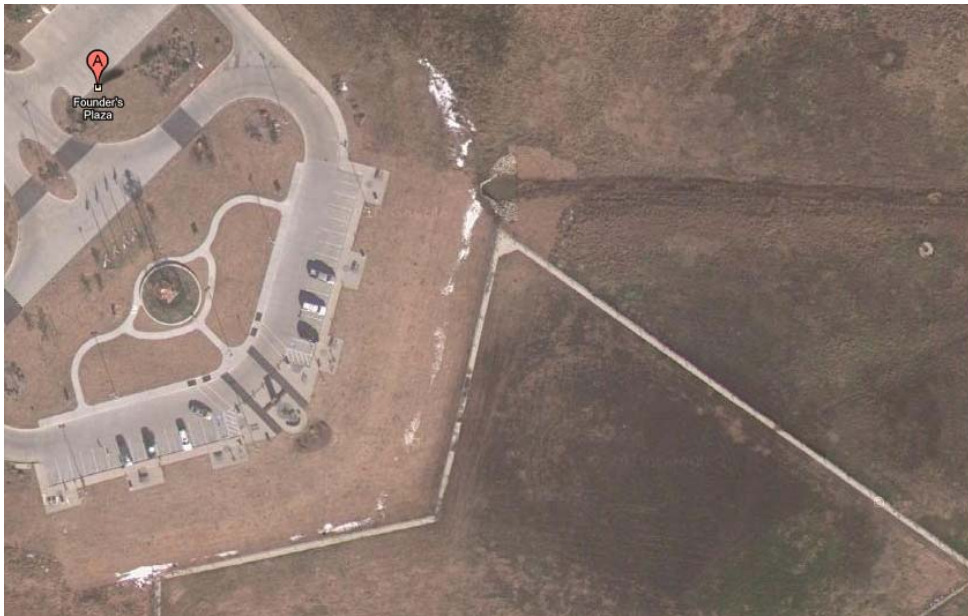
Solar Powered Devices



- Dynamic parking availability signs
- Light emitting diode displays
- Solar powered with reserve battery
- Cell phone activated
- Storm water samplers, flow metering devices, irrigation controllers, traffic signage

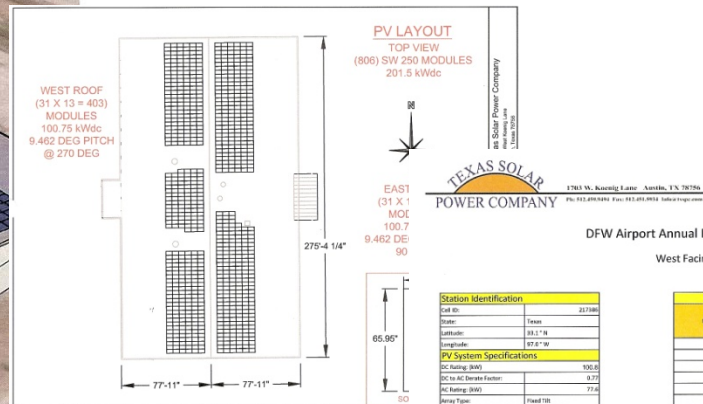
Marketing Agreement

- Sponsored purchase and installation of ground mounted 10 kW solar array at Airport observation area
- Joint marketing, promotional and educational value



Grant Funded Onsite Solar PV

- ARRA funded grant program for onsite Renewable Energy projects
- 80% grant funding up to \$1M



DFW Airport Annual Energy & Cost Savings
West Facing Modules

Month	Solar Radiation (kWh/m ² /day)	AC Energy (kWh)	Energy Value (\$)
1	2.82	635	641.51
2	3.48	754	759.23
3	4.7	1027	1040.41
4	5.76	1243	1259.44
5	6.15	1332	1358.43
6	6.48	1371	1398.13
7	6.48	1362	1383.47
8	6.02	1298	1317.27
9	5.02	1074	1094.71
10	4.27	926	943.3
11	2.97	639	649.83
12	2.54	545	556.32
Total	61.28	11773	1193.32

Results				
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2	3.48	754	759.23	759.23
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6	6.48	1371	1398.13	1398.13
7	6.48	1362	1383.47	1383.47
8	6.02	1298	1317.27	1317.27
9	5.02	1074	1094.71	1094.71
10	4.27	926	943.3	943.3
11	2.97	639	649.83	649.83
12	2.54	545	556.32	556.32
Total	61.28	11773	1193.32	1193.32



All predicted energy and cost savings are based upon the first year system performance models. Due to system degradation, performance could decrease as much as 2% each year.

201.5 kW grid-tied, roof-mounted array
 242,783 kWh annual production
 \$1.193M total cost
 10% ROI on Airport investment (\$240k)

Thank you for your kind attention

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