

# SMUD CUSTOMER PROGRAMS AND SERVICES

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Energy Efficiency Programs

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# Customer Programs & Services

1. Vision and Background
2. Energy Efficiency Programs
3. Solar/PV Programs
4. Residential Assistance Programs
5. Revenue/Customer Service Programs



# Vision Statement

*“SMUD’s vision is to empower our customers with solutions and options that increase energy efficiency, protect the environment, reduce global warming, and lower the cost to serve our region.”*

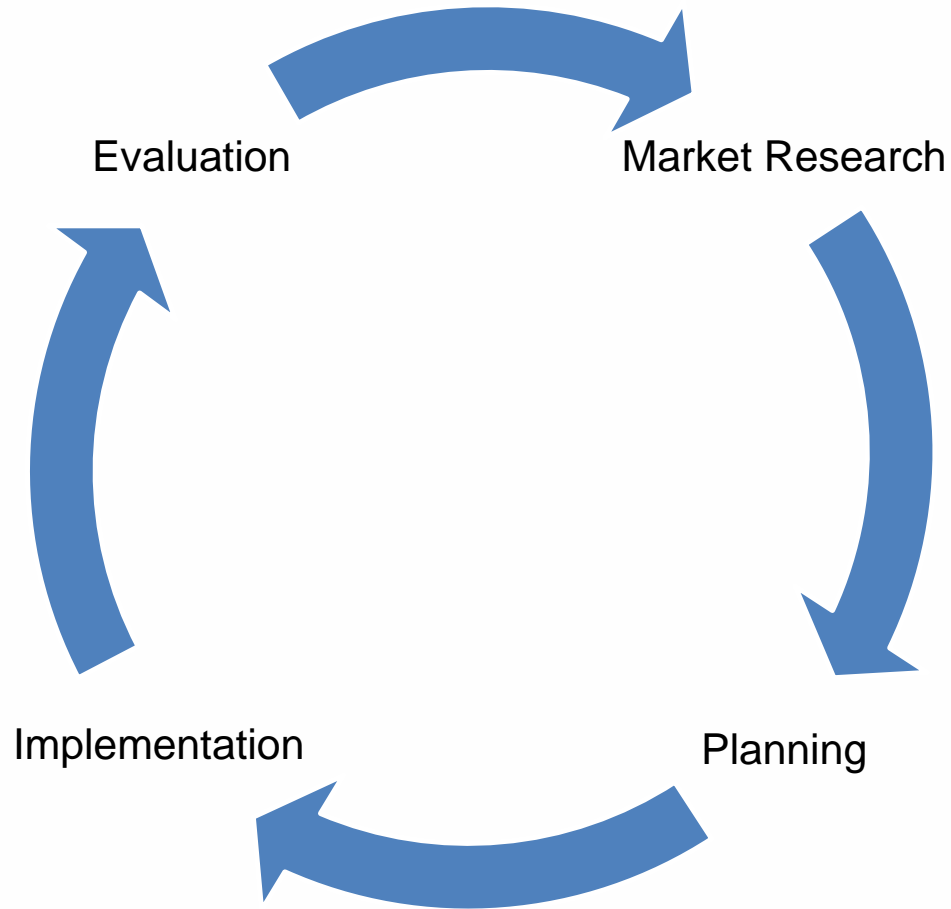


# Programs and Services Drivers

- Customer Needs
  - Information
  - Bill Management
  - Assistance
- Board Goals and Strategic Directives
  - SD-5 Customer Relations
  - SD-7 Environmental Leadership
  - SD-9 Resource Planning
- Legislation
  - AB2021 (Energy Efficiency and Resource Planning)
  - AB32 (Carbon Reduction)
  - SB1 (Solar Incentives)



# General Program or Service Lifecycle



# Program Planning and Design Criteria

- Financial Considerations
  - Available Budget and Overall Cost
  - Cost Effectiveness or ROI
  - Internal vs. External Labor Costs
  - Technology/Investment Costs
- Market Considerations
  - Needs/Opportunity Assessment
  - Customer Segment
  - Current and Future Potential
  - Feasibility vs. Acceptance
  - Market Barriers
- Implementation Models
  - Incentive Structure
  - Regional Coordination
  - Partnership Opportunities
  - Marketing and Advertising



# Measurement & Verification

- Focused on Energy Efficiency Programs
  - Program rotation schedule utilized to evaluate programs on a 3-year cycle, due to limited budget and resources
  - Priority given to larger and more complex programs
  - New or modified programs included in mix early to allow for adjustments relatively quickly in the program cycle
- Conducted Primarily by Independent Third Party Evaluation Contractors
  - Impact evaluations supervised and directed by SMUD Resource Planning group
  - Process evaluation or customer satisfaction research conducted or managed internally or by Market Research group
- M&V Protocols and Methodology
  - Evaluation criteria use industry standards defined in the California Evaluation Framework developed in 2004
  - Methodologies utilized are established in the California Energy Efficiency Evaluation Protocols and the California Public Utilities Commission's Load Impact Estimation for Demand Response: Protocols and Regulatory Guidance



# Energy Efficiency Programs

- Energy Efficiency Portfolio 10-Year Plan
- 2010 Energy Efficiency Program Portfolio
- Energy Efficiency Information/Education Programs
  - Residential Advisory
  - Home Energy Display
  - Home Energy Reports
  - Energy & Technology Center
- Existing Home Energy Efficiency Programs
  - Appliance Efficiency
  - Equipment Efficiency
    - Energy Efficiency Loans
  - Whole House Performance
  - Consumer Electronics
  - Retail Lighting
  - Multi-Family Retrofit





# Energy Efficiency Programs (Cont'd)

- Existing Commercial Energy Efficiency Programs
  - Customized Incentives
  - Express Efficiency Incentives
  - Retro-Commissioning
  - Distributor Incentives
  - Prescriptive Lighting Incentives
- Shade Tree Program
  - Sacramento Shade
    - Community Shade
- New Construction Energy Efficiency Programs
  - Residential Solar Smart Energy Efficiency
  - Residential Advantage Home
  - Commercial Savings By Design



# 10-Year Energy Efficiency Goals

- Updated plan recently adopted by the SMUD Board
- Savings goals represent 1.5% of current energy forecast

YEAR	GWh Forecast	Proposed SD-9 Goals (GWh)	Proposed SD-9 Goals (MW)
2011	11,049	166	26.5
2012	11,281	169	27.1
2013	11,391	171	27.3
2014	11,649	175	28.0
2015	11,947	179	28.7
2016	12,172	183	29.2
2017	12,313	185	29.6
2018	12,494	187	30.0
2019	12,688	190	30.5
2020	12,911	194	31.0
Total	119,895	1,798	287.7



# 2010 PLANNED ENERGY EFFICIENCY PROGRAM PORTFOLIO

Program	Budget		Savings		Cost-Effectiveness		
	Incentives	Total Budget	aMW (4-7PM)	Annual GWh	Avg. Life (yrs)	Levelized \$/kW	Levelized cents/kWh
<b>Energy Efficiency Information/Education</b>							
Residential Advisory		\$ 1,052,263					
Home Energy Display		\$ 142,660	0.100	0.500	3.0	534	10.67
Home Energy Reports		\$ 565,861	0.200	10.400	1.0	2999	5.77
<b>Total EE Information/Education</b>	<b>\$ -</b>	<b>\$ 1,760,784</b>	<b>0.300</b>	<b>10.900</b>	<b>1.1</b>	<b>5714</b>	<b>15.73</b>
<b>Existing Home Energy Efficiency</b>							
Appliance Efficiency	\$ 85,000	\$ 1,587,560	1.500	5.400	8.0	170	4.73
Equipment Efficiency	\$ 2,750,000	\$ 3,469,726	2.500	3.700	15.0	143	9.66
Whole House Performance	\$ 665,000	\$ 1,273,612	0.500	0.900	15.0	262	14.57
Consumer Electronics	\$ 1,800,000	\$ 2,344,103	1.600	12.200	5.0	348	4.56
Retail Lighting	\$ 2,400,000	\$ 2,845,245	5.900	48.000	8.3	75	0.93
Multi-Family Retrofit	\$ 1,570,000	\$ 1,771,117	0.700	5.600	10.0	344	4.30
<b>Total Existing Home EE</b>	<b>\$ 9,270,000</b>	<b>\$ 13,291,363</b>	<b>12.700</b>	<b>75.800</b>	<b>8.3</b>	<b>164</b>	<b>2.75</b>
<b>Commercial Retrofit Energy Efficiency</b>							
Customized Incentives	\$ 1,200,000	\$ 3,592,785	3.400	20.500	10.0	144	2.38
Express Efficiency Incentives	\$ 825,000	\$ 1,072,322	0.900	9.000	5.0	283	2.83
Retro-Commissioning		\$ 476,798	0.300	1.400	3.0	595	12.74
Distributor Incentives	\$ 550,000	\$ 877,863	1.700	2.800	10.0	70	4.26
Prescriptive Lighting Incentives	\$ 2,400,000	\$ 3,064,563	2.800	15.000	10.0	149	2.78
Commercial Standard Performance Contracts		\$ 102,500					
<b>Total Commercial Retrofit EE</b>	<b>\$ 4,975,000</b>	<b>\$ 9,186,830</b>	<b>9.100</b>	<b>48.700</b>	<b>8.9</b>	<b>150</b>	<b>2.80</b>
<b>Shade Trees (Sacramento Shade)</b>							
		<b>\$ 1,325,965</b>	<b>0.200</b>	<b>0.400</b>	<b>20.0</b>	<b>578</b>	<b>28.90</b>
<b>New Construction Energy Efficiency</b>							
Residential Solar Smart Energy Efficiency	\$ 382,500	\$ 1,247,266	0.100	0.200	18.0	1152	57.60
Residential Advantage Home	\$ 150,000	\$ 424,621	0.100	0.100	18.0	392	39.22
Commercial Savings By Design	\$ 466,500	\$ 1,716,668	2.000	6.500	15.0	88	2.72
<b>Total New Construction EE</b>	<b>\$ 999,000</b>	<b>\$ 3,388,555</b>	<b>2.200</b>	<b>6.800</b>	<b>15.1</b>	<b>158</b>	<b>5.10</b>
<b>Total Programs &amp; Services</b>							
	<b>\$ 15,244,000</b>	<b>\$ 28,953,498</b>	<b>24.500</b>	<b>142.600</b>	<b>8.3</b>	<b>185</b>	<b>3.18</b>
<b>Planning</b>		<b>\$ 1,505,677</b>					
<b>New Product Development</b>		<b>\$ 363,732</b>					
<b>Market Research</b>		<b>\$ 752,974</b>					
<b>Marketing</b>		<b>\$ 601,384</b>					
<b>Energy &amp; Technology Center</b>		<b>\$ 836,085</b>					
<b>Measurement &amp; Evaluation</b>		<b>\$ 713,751</b>					
<b>EE R&amp;D - Emerging Technologies</b>		<b>\$ 1,034,023</b>					
<b>Total Strategy</b>	<b>\$ -</b>	<b>\$ 5,807,626</b>					
<b>ENERGY EFFICIENCY TOTALS</b>	<b>\$ 15,244,000</b>	<b>\$ 34,761,124</b>	<b>24.5</b>	<b>142.6</b>	<b>8.3</b>	<b>222</b>	<b>3.82</b>



# Energy Efficiency Information/Education

- Residential Advisory – Offers a broad range of educational, advisory, and technical assistance services to help single-family homeowners improve the efficiency of their homes
  - Telephone assistance and advice
  - On-line information and energy auditing tools
  - In-home energy audits under selected circumstances
- Home Energy Display – Provides a means to show customers real-time information about electricity use and cost in customer homes
  - In home monitor linked to meter to show cumulative usage and estimated bill amount
  - Technology currently in flux as we transition to Smart Meters



# Energy Efficiency Information/Education (Cont'd)

- Home Energy Reports (pilot) – Increases awareness of electricity consumption by comparing customers' electricity usage to their neighbors as well as to their personal historical usage, and offers tips to reduce electricity usage.
  - Current pilot includes approximately 35,000 residential customers
  - If successful, the report will be incorporated into the portfolio on a permanent basis and rolled out to additional households
- Energy & Technology Center – Provides educational seminars, classes, and certification programs for residential and commercial customers, contractors, designers, and other market actors on a wide variety of topics



# Existing Home Energy Efficiency

- Appliance Efficiency - Increases market penetration of high-efficiency appliances, removes inefficient ones from the market, and increases consumer education on how to maximize operating efficiency and savings from equipment use
- Equipment Efficiency - Increases the energy efficiency of homes and reduces customer electric bills by improving the efficiency of the building envelope, heating, cooling, and water-heating equipment on a measure-by-measure basis
  - Energy Efficiency Loans - Provides fixed interest installment loans for residential, commercial, and multi-family property owners to install energy efficient (EE) equipment [and photovoltaic (PV) systems]
  - Provides contractors with a sales tool to help customers overcome the incremental costs of EE and increase participation in our programs



# Existing Home Energy Efficiency (Cont'd)

- Whole House Performance (Home Performance with Energy Star) – Utilizes a building science and measurement approach to enable a comprehensive means of assessing the performance and comfort of homes as a system, diagnose problems, and identify and implement solutions to maximize energy savings
  - New Program for 2010, currently in final stages of development with launch expected in June
  - Provides higher levels of energy efficiency, greater comfort, and lower utility bills than component-based rebate programs
  - Utilizes a third-party program administrator to recruit, educate, certify, assure job quality, and oversee the field work of trade/installation contractors, as well as provide marketing and reporting functions



# Existing Home Energy Efficiency (Cont'd)

- Consumer Electronics - Seeks to promote and increase the market penetration of high-efficiency electronics products in residential homes (and businesses).
  - Partnership agreement with other utilities to leverage regional and national marketing power. The partnership has established participation agreements with retailers and Original Equipment Manufacturers (OEMs) to provide incentives for manufacture, distribution, and sale of certain high efficiency products
  - The program currently supports TV's, computer monitors, and computers that meet or exceed specified Energy Star efficiency ratings and requirements
- Retail Lighting – Seeks to increase market penetration of high-efficiency (Energy Star) compact fluorescent bulbs and fixtures in residential households
  - Provides incentives to manufacturers on a per bulb or fixture basis to discount and sell high efficiency lighting products through local retail outlets to consumers





# Existing Home Energy Efficiency (Cont'd)

- Multi-Family Retrofit – Intended to capture significant energy savings potential in existing apartment and condominium dwelling units and common areas
  - Difficult market segment to penetrate because of the “split-incentive” where the benefits of lower energy bills are not directly accrued by property owners who must make the investments in equipment associated with energy efficiency projects.
  - Provides prescriptive incentives to contractors (or property owners if self-installed) for the installation of a wide variety of efficiency measures that meet minimum efficiency and installation specifications
  - Project applications completed and submitted by contractors or owners to program manager for approval and payment upon completion of work subject to inspection and verification



# Existing Commercial Energy Efficiency

- Customized Incentives - Provides energy information, consultation services, and financial incentives for implementation of high efficiency retrofits in commercial facilities
  - Enables commercial customers to use energy more efficiently, reduce industrial energy costs per unit of output, and manage their energy use and utility costs
- Express Efficiency Incentives - Provides fixed or prescriptive-based incentives for the installation of eligible efficiency measures in customer facilities. Example measures include:
  - Air-Conditioning Equipment
  - Food Service Equipment
  - Refrigeration Equipment
  - Network PC Management



# Existing Commercial Efficiency (Cont'd)

- Retro-Commissioning - Designed to obtain cost-effective energy savings and reductions in peak demand in commercial buildings by fine-tuning energy control systems and ensuring optimal operation of major energy-using equipment
- Distributor Incentives - Provides incentives to distributors of Heating Ventilating and Air Conditioning (HVAC), and Motors to encourage the distribution and sales of high efficiency equipment
- Prescriptive Lighting Incentives - Provides incentives primarily to small commercial customers (<300kW) to encourage the installation of high efficiency lighting systems in this hard-to-reach market segment



# Shade Trees (Sacramento Shade) & Community Trees

- The Shade Tree program facilitates planting of trees that directly shade buildings, thus reducing summer air conditioning loads
  - The Community Trees (CT) program strives to plant trees in public places, such as schools, parks and streets
  - Additional objectives include creating an urban forest to mitigate summer heat-island effects, improving the region's air quality, and carbon sequestration
  - Program is delivered via a cooperative agreement with the Sacramento Tree Foundation, a local not-for-profit organization.
  - SMUD administers and markets the program and the Sacramento Tree Foundation (on a contract basis) assesses and makes tree-siting recommendations, and delivers trees to customers



# New Construction Energy Efficiency

- Residential Solar Smart – Provides financial incentives to builders to incorporate energy efficiency along with integrated solar PV rooftop systems into new home construction
- Residential Advantage Home – Provides incentives to builders to incorporate energy efficiency features in new homes that exceed minimum required standards
  - Program is sun setting to be fully replaced with Solar Smart at the end of 2010
- Commercial Savings By Design – Provides design and construction incentives to designers, architects, and developers to incorporate energy efficiency features in commercial new construction projects
  - Part of a Statewide California program to provide a consistent implementation model and program platform



# Solar/PV Programs

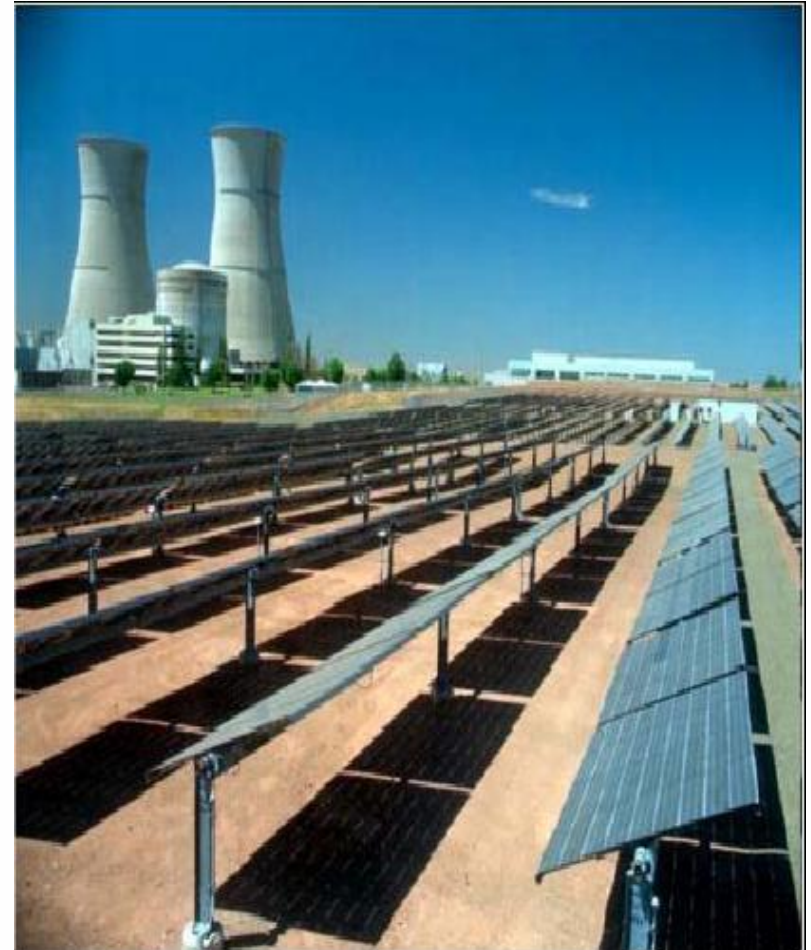
- History, Background and 10-Year Goal
- Programs:
  - Residential Retrofit PV
  - Commercial PV
  - Solar Smart PV (residential new construction)
  - Solar Shares
  - Community Solar



# SMUD Solar Programs - History

## Two Decades of Solar Leadership

- Nearly 2000 Installations of distributed PV systems
  - Residential new home and retrofit applications
  - Neighborhood PV (Non-Profits)
  - Commercial (Large & Small)
  - Utility-Scale systems



# Solar Program – 10-Year Goal

- California statewide goal of 3,000 MW of customer-installed solar PV systems over 10 years via legislation passed in 2007
- SMUD portion of this is 125 MW with a \$130 million commitment over 10 years
  - Solar surcharge implemented in January 2008
  - 2010 Goal of installing 9.3 MW with a budget of \$15.4M
- SMUD needs to install as much solar every year as we had previously from 1984 through 2006
- Up front rebates provided for system installation (in a declining block manner over time) or via performance-based incentives payable monthly over a fixed contract term





# 2007 - 2016 Incentives

INCENTIVES	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10
Buy down (\$/W)	\$3.00	\$2.50	\$2.20	\$1.90	\$1.55	\$1.10	\$0.65	\$0.35	\$0.25	\$0.20
PBI 5-yr (\$/kWh)	NA	\$0.40	\$0.35	\$0.30	\$0.25	\$0.17	\$0.10	\$0.06	\$0.04	\$0.03
PBI 10-yr (\$/kWh)	NA	\$0.24	\$0.21	\$0.18	\$0.15	\$0.11	\$0.06	\$0.03	\$0.02	\$0.02
<b>GOALS - MW</b>	<b>4.9</b>	<b>8.5</b>	<b>9.5</b>	<b>10.0</b>	<b>10.5</b>	<b>13</b>	<b>14.5</b>	<b>17.0</b>	<b>17.5</b>	<b>19.6</b>
Commercial	0.3	5.0	6.0	6.5	7.5	9.5	10.0	12.0	11.5	11.5
Residential	4.6	3.5	3.5	3.5	3.0	3.5	4.5	5.0	6.0	8.1
Res Retro	0.1	0.5	0.5	1.0	1.0	1.0	1.5	1.5	2.0	3.1
New Solar Homes	4.5	3.0	3.0	2.5	2.0	2.5	3.0	3.5	4.0	5.0



# Solar PV Programs

- **Residential retrofit** – Customer owned/contractor installed rooftop PV systems
- **Commercial** — Customer or third-party owned rooftop or parking lot PV systems (retrofit and new construction)
- **SolarSmart New Homes** — PV systems integrated into the design and construction of new tract homes
- **SolarShares** — Customer buys share of solar farm built by third party and power sold to SMUD
- **Community Solar** — PV installed on community-based projects such as Habitat For Humanity and PV for schools



# Residential Retrofit PV

- Average System Size: 3.4 kW
- Average duration: 15 weeks
- Average Install Cost: \$9.00/Watt



	# of Installs	kW	Incentives
2007	61	183	\$ 533,500
2008	67	203	\$ 514,500
2009	207	668	\$ 1.33M



# Commercial PV Installations

# of Installs		kW	Incentives
2006	3	109	\$ 290,000
2007	5	305	\$ 948,00
2008	10	1,449	\$ 4.3M
2009	12	4,848	\$15M



# Solar Smart New Homes

Transforming the market to make solar part of all new homes built in Sacramento

- Over 4,000 homes and nearly 10 MW subscribed
- 450 completions since program inception in January 2007
- 11 Builder-Partners
- Average system size ~ 2.5 kW



# Solar Shares

- 1MW PV system built by SMUD via power purchase contract with outside provider
- Marketed as an alternative to installing PV on rooftop
- Generation sold to customers as “virtual net metering”
- Sold out in six months to ~700 customers



# SMUD Solar Shares

- Large installations, no site issues, available to all residential customers, 20 year contracts
- Available to customers July 2008
- Fully subscribed Jan. 2009 – 1.5 kW avg.
- Virtual net-metering – monthly credits on bill
- Monthly subscription fee based on capacity size (.5kW – 4 kW) - \$10.75 - \$132/mo



- 1 MW – 8 acres – solar thin film
- 20-year PPA (power purchase agreement)
- 3<sup>rd</sup> Party owned



# Residential Assistance Programs

Goal is to make the electric bills of our special needs customers affordable and to provide assistance with managing usage and bills through a variety of methods

- **Rate Assistance** – (Energy Assistance Program Rate, Medical Equipment Discount Rate)
- **Bill Assistance** – (customer EnergyHelp donations, federally funded bill payments, local agency bill payments)
- **Dwelling Assistance** – (Weatherization, Refrigerator Program, Community Partners Program)
- **Education & Outreach** – (workshops, fairs, events, partnerships, multiple languages)





# Revenue/Customer Service Programs

Designed to provide a variety of value-added services and options for customers based on market research around customer wants and needs

- **Energy Profiler On Line - Commercial energy data for large commercial/campus billed customers**
  - 300 data points for 150 large customers
- **Power Protection Service - Whole house surge protector--\$6.95 per month**
  - 5,000 customers; 650 new customers in 2009
- **HomePower - Minor electrical repair service--\$5.95 per month**
  - 30,000 customers; 7,000 in 2009



# Revenue/Customer Service Programs (Cont'd)

- **Greenenergy - Customers buy renewable energy for \$3 or \$6 per month or \$10 per block for commercial**
  - 44,000 enrolled; 18,000 new customers in 2009
- **Carbon Offsets - Customers can opt to purchase offsets to reduce their carbon footprint based on their estimated household characteristics**
  - Credits are used to construct local emission reduction projects
  - Mainstream program in 2009; 1,200 enrollments
- **Moving Connections - Move-ins transferred to third party vendor for other service hookups in exchange for share of revenue**
  - transfer rate of 60%--63,700 transferred last year
- **Cell Site Leasing - Cell phone vendors lease transmitter space on SMUD poles/towers**
  - 16 current sites; 6 new sites in 2009

