

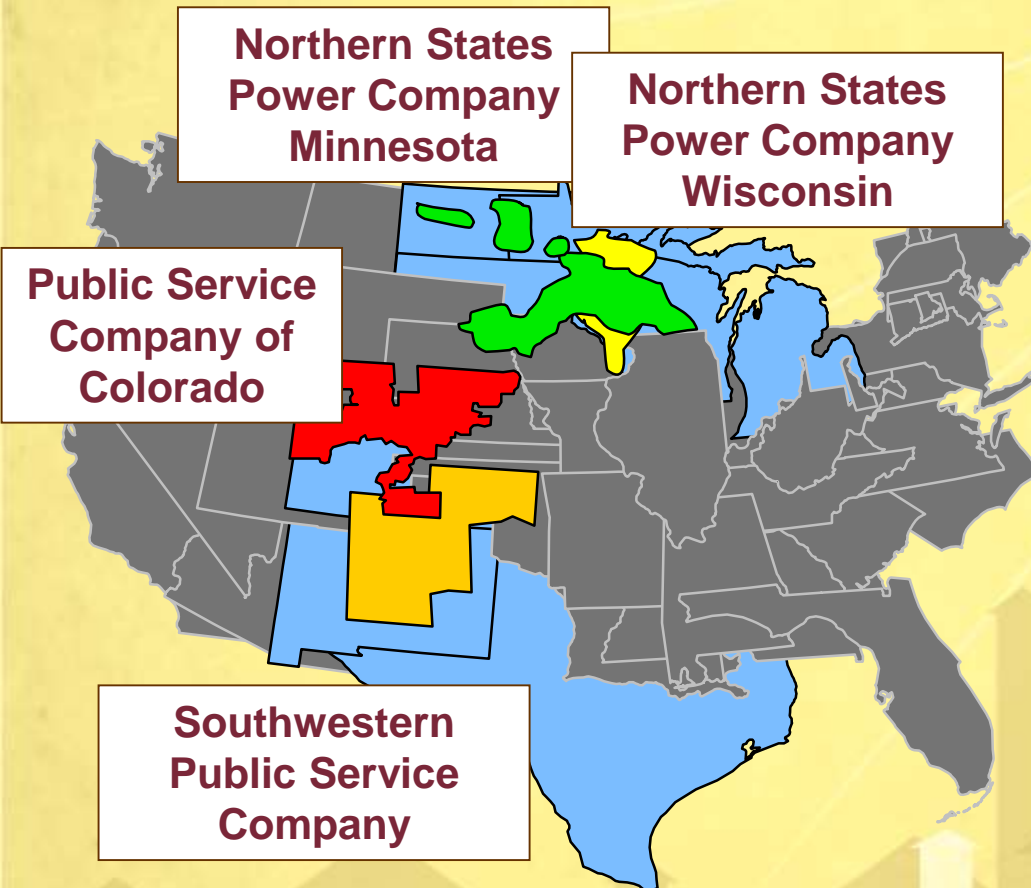
SOLAR ENERGY

DOING RENEWABLES RIGHT



Beth Chacon
Environmental Policy Manager
Oct. 15, 2014

Xcel Energy



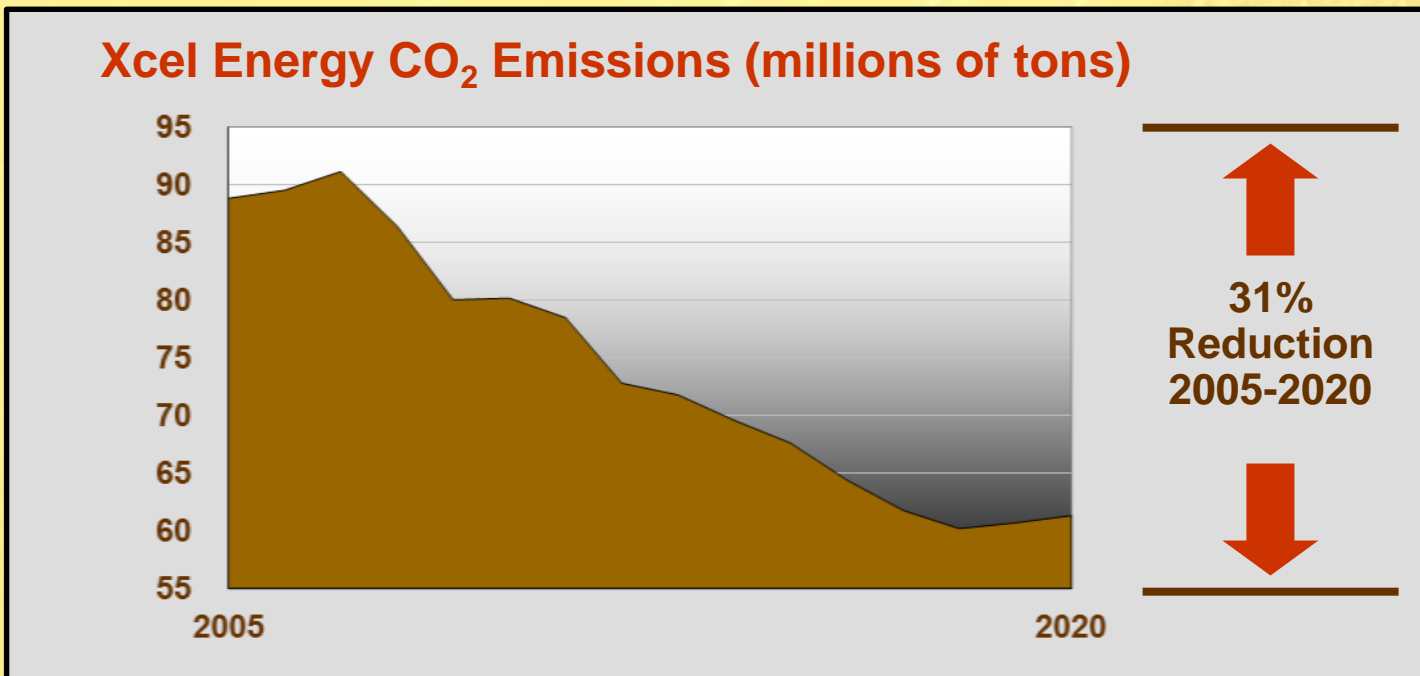
- ◆ No. 1 wind energy provider
- ◆ Top-ten utility for solar
- ◆ No. 3 green-pricing program
- ◆ Top five in conservation
- ◆ Industry-leading voluntary emission reductions

Gas Customers	1.9 M
Electric Customers	3.5 M

Clean Energy Leadership

Reducing emissions through:

- ▶ Renewable energy
- ▶ Customer energy efficiency programs
- ▶ Coal plant retirements, retrofits and conversions



Wind Energy



- ▶ **No. 1 wind provider for a decade**
- ▶ **2,200 MW of wind in Colorado**
 - **22% of your energy in 2013**
- ▶ **Plan to add 450 MW by 2016**
 - **26% of your energy in 2020**
- ▶ **Most affordable renewable option**
 - **Prices competitive with fossil fuels today**
- ▶ **Hedge against rising fuel and environmental costs**

Solar in Colorado

Desirable and Growing:

- ▶ Large, utility-scale solar
 - 87 MW online
 - 170 MW under construction
- ▶ Large-scale solar benefits
 - Half the price of rooftop
 - 40% output for the same capacity



Solar Solutions

Solar options for customers who want more:

- ▶ **Solar*Rewards[®]**
 - 218 MW
 - 22,124 participants
 - Today 80 percent of capacity from third-party installers
- ▶ **Solar*Rewards[®] Community[®]**
 - 10 gardens, 5 MW online
 - 15 more planned/under construction
 - 300+ customers subscribed
- ▶ **Solar*Connect [®]**



Solar* Connect[®]

A voluntary option to provide solar energy through large-scale solar resources

▶ **Program:**

- **Simple, hassle-free, low-obligation solar**

▶ **Supply:**

- **Seeking up to 50 MW of large-scale solar**

▶ **Timeline:**

- **PUC decision expected year end**
- **Begin Marketing/Enrollment in mid-2015**
- **System resource by April 2015**

▶ **Expected Price:**

- **Close to retail rate**



Solar Receives Significant Incentives

- ▶ **Investment Tax Credit (30%)**
 - **Funded by taxpayers**
- ▶ **Incentive and REC payments (Solar*Rewards)**
 - **Funded by other customers**
 - **Rapidly diminishing**
- ▶ **Net Metering**



The Issue with Net Metering

What is net metering?

- ▶ Solar energy credited at retail rate
- ▶ But ... for residential and small commercial customers, fixed costs are recovered through a per KWh charge
- ▶ All customers—solar and non-solar—rely on system availability 24 hours/day, even when it's sunny
- ▶ Net metering acts as a hidden incentive
 - Solar customers do not pay full share of grid
 - Paid by non-solar customers

A Solar Customer's Bill

Per KWh

Components of Retail Rate

\$0.12

\$0.10

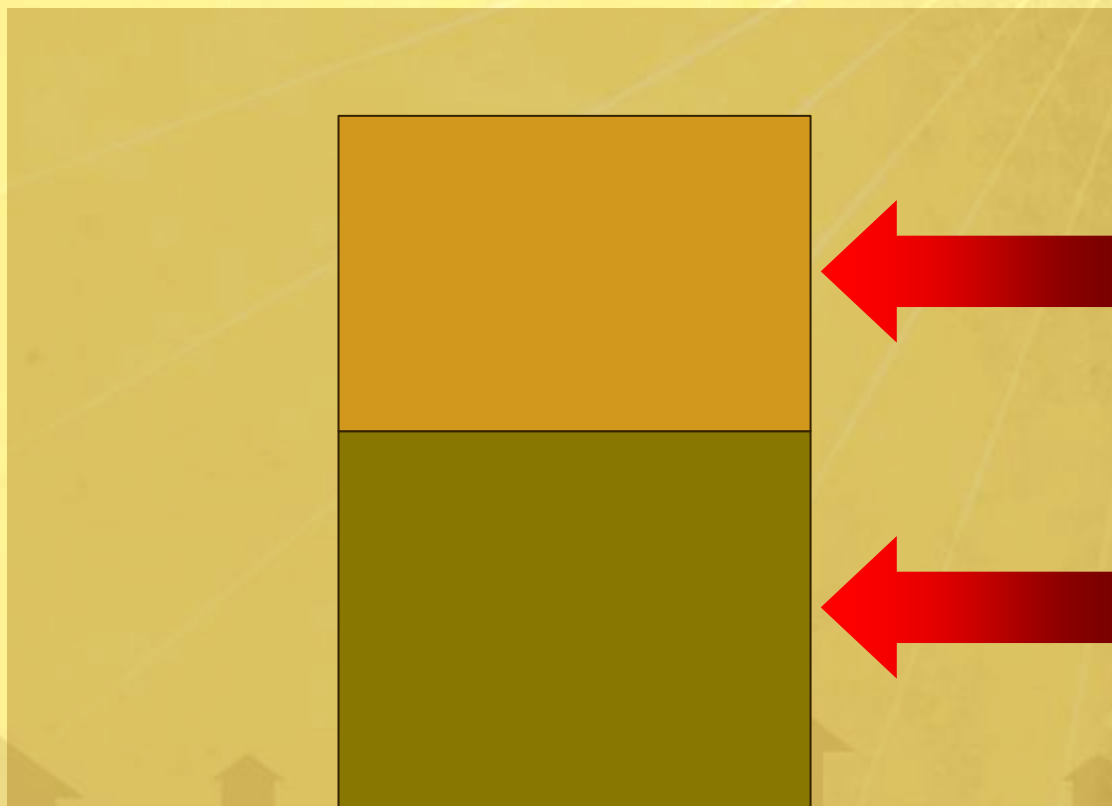
\$0.08

\$0.06

\$0.04

\$0.02

\$-



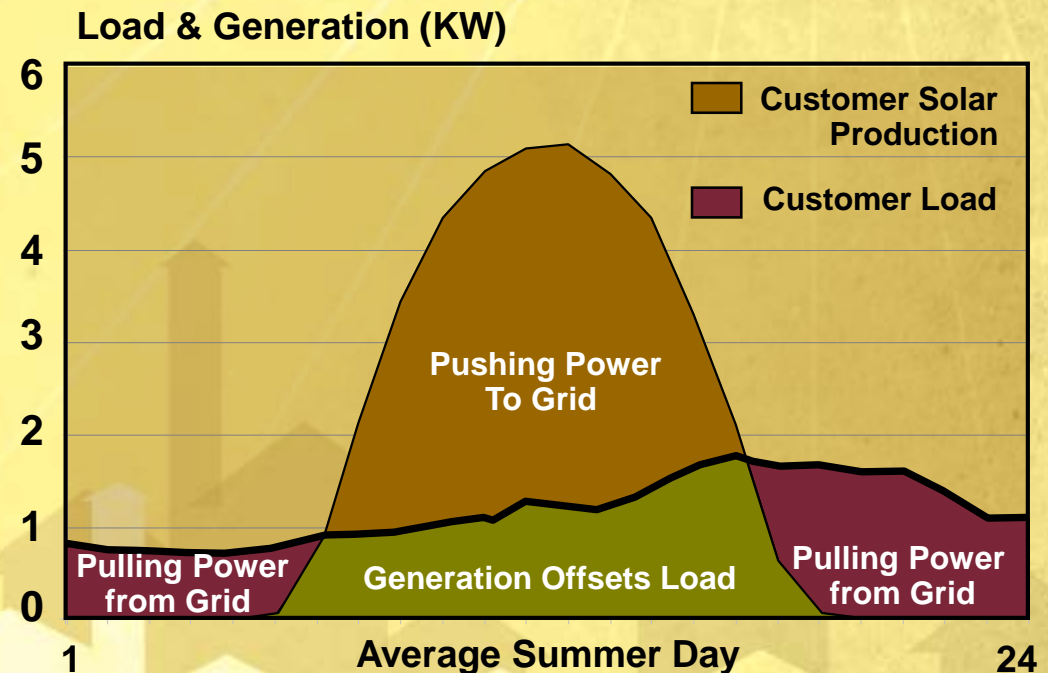
Avoided costs

Incurred costs—paid by other customers

The Solar Customer Pays Nothing

The Grid Enables Rooftop Solar

- ▶ Enables import and export
- ▶ Starts up and operates motors and appliances
- ▶ Available when solar energy is not present
- ▶ EPRI: Grid replacement cost \$275-\$430 per month above the PV system cost



Colorado Solar Policy

▶ Our Renewable Energy

Standard proposal:

- Add solar at same levels
- No changes for existing customers
- Transparency
 - Establish avoided cost
 - Identify net metering incentive



▶ PUC Action:

- Net Metering issues separated
 - Public panel discussions
 - Costs/benefits
 - Decision late 2014

▶ Interim agreement to maintain programs

SolarTAC

**A world-class solar technology research,
testing and demonstration facility**



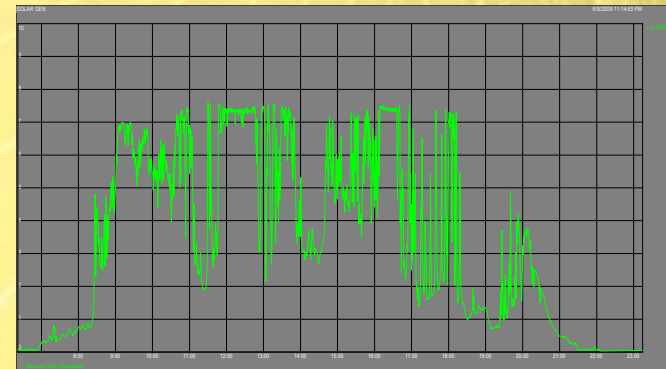
SolarTAC Objectives

- ▶ **Provide real-world testing environment**
 - **Fine tune nearly commercial technologies**
 - **Demonstrate reliability**
 - **Optimize performance**
 - **Secure financial backing**
- ▶ **Accelerate Solar Technology and market adoption**



SolarTAC Highlights

- ▶ **Sun Edison**
 - Module and inverter technologies
 - Tracking, control, monitoring systems
- ▶ **Abengoa**
 - Concentrated solar power testing
 - Optimizing system
- ▶ **NREL**
 - Thermal storage, PV
- ▶ **Electric Power Research Institute**
 - Multi-client PV testing
- ▶ **Xcel Energy**
 - Solar to battery testing



CO PV Facility Data

Xcel Energy Solar Position

Everyone wins when we do renewable energy right

- ▶ **Invest in cost-effective resources to keep energy affordable**
- ▶ **Support fair, sustainable and transparent policies**
- ▶ **Offer a range of solar solutions to meet customer needs**



Questions?

