**Activity:** Identifying Benefits

What is the greatest benefit solar can bring to your community? [Blue Card]

- **Right Now:** Write answer on card
- **During Session:** Compile results
- **After Break:** Group discussion
[Results]
Benefits of Solar Energy

- Local economy growth
- Local jobs
- Energy independence
- Stabilizes price volatility
- Valuable to utilities
- Smart investment
Benefit: Economic Growth

Benefit: Job Growth

**Benefit: Stabilize Energy Prices**

![Graph showing Boston Area Average Wholesale Price from 2003 to 2011, with prices ranging from $20 to $120/MWh. The graph includes data points for each year, showing fluctuations in energy prices.](source: NEPOOL)
Benefits: Valuable to Utilities

- Avoided Energy Purchases
- Avoided T&D Line Losses
- Avoided Capacity Purchases
- Avoided T&D Investments
- Fossil Fuel Price Impacts
- Backup Power
**Benefits: Valuable to Utilities**

Value to the utility is **10 to 25 cents** beyond the value of the electricity.

- Fuel Price Mitigation
- Distribution
- Capacity Value
- Distribution Energy
- Value
- Transmission
- Capacity Value

Benefit: Smart Investment for Homes

From NREL:

Solar homes sold

20% faster

and for

17% more

than the equivalent non-solar homes

in surveyed California subdivisions

**Benefit:** Smart Investment for Homes

From SunRun:

- **3 kW** = **$16,500** added sale premium
- **6 kW** = **$33,000** added sale premium
- **9 kW** = **$49,500** added sale premium

Source: Tracking the Sun IV, SunRun
Benefit: Smart Investment for Business
**Benefit:** Smart Investment for Business

Top 20 Companies by Solar Capacity

- Walmart
- Kohl’s
- Macy’s
- Campbell’s Soup
- Johnson and Johnson
- Bed Bath and Beyond
- General Motors
- Hartz Mountain
- Snyder’s
- White Rose Foods

$47.3 million worth of electricity annually

Source: Solar Energy Industries Association
Benefit: Smart Investment for Government
Activity: Addressing Barriers

What is the greatest barrier to solar adoption in your community? [Green Card]

- **Right Now**: Write answer on card
- **During Session**: Compile results
- **After Break**: Group discussion
[Results]
Some things you may hear...

- My area isn’t sunny enough for solar
- Going solar is too expensive
- Solar is not ready to compete as a serious energy source
- The government should not “pick winners and losers”
Fact: Solar works across the US

Source: National Renewable Energy Laboratory
Fact: Solar is a ubiquitous resource

Fact: Solar is cost competitive

US Average Installed Cost for Behind-the-Meter PV

Fact: Solar is cost competitive

US Average Installed Cost for Behind-the-Meter PV

52% drop in price
2010 - 2012

Fact: Solar is cost competitive

Source: Bloomberg
Fact: Solar is cost competitive

Source: Bloomberg
**Fact:** All energy is subsidized.

**Historical Average of Annual Energy Subsidy**

- **Oil and Gas** (1918-2009): $4.86 billion
- **Nuclear** (1947-1999): $3.50 billion
- **Biofuels** (1980-2009): $1.08 billion
- **Renewables** (1994-2009): $0.37 billion

Sources: DBL Investors
Barriers Still Exist

Comparison of US and German Solar Costs

<table>
<thead>
<tr>
<th>Non-Hardware Cost</th>
<th>Hardware Cost</th>
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<tbody>
<tr>
<td>$0.00</td>
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<tr>
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Solar Soft Costs
- Interconnection
- Financing
- Permitting
- Customer Acquisition

Agenda

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The Solar Equation

Cost
+ Installed Cost
+ Maintenance
- Direct Incentive

Benefit
+ Avoided Energy Cost
+ Excess Generation
+ Performance Incentive
The Solar Equation

**Cost**
- Installed Cost
- Maintenance

**Benefit**
- Avoided Energy Cost
- Excess Generation

- Direct Incentive
- Performance Incentive
Incentives

- Federal
  - Investment Tax Credit
  - Accelerated Depreciation
  - QECBs

- State
  - LoanSTAR Revolving Loan Program
  - Energy Device Franchise Tax Deduction

- Utility
  - Denton Muni Solar Rebate Program
  - CoServ Solar Rebate Program
  - Oncor Electric Solar Standard Offer Program
Incentives

Federal

Investment Tax Credit

Accelerated Depreciation

QECBs

State

LoanSTAR Revolving Loan Program

Energy Device Franchise Tax Deduction

Utility

Denton Muni Solar Rebate Program

CoServ Solar Rebate Program

Oncor Electric Solar Standard Offer Program
**Investment Tax Credit**

**Type:** Tax Credit

**Eligibility:** For-Profit Organization

**Value:** 30% of the installation cost

**Availability:** Through 2016
Modified Accelerated Cost-Recovery System (MACRS)
Qualified Energy Conservation Bond

US Treasury

Local Gov

Project

Community

Qualified Energy Conservation Bond

SunShot
U.S. Department of Energy
Qualified Energy Conservation Bond

US Treasury

Local Gov

Project

Community

QEC B
Incentives

Federal
- Investment Tax Credit
- Accelerated Depreciation
- QECBs

State
- LoanSTAR Revolving Loan Program
- Energy Device Franchise Tax Deduction

Utility
- Denton Muni Solar Rebate Program
- CoServ Solar Rebate Program
- Oncor Electric Solar Standard Offer Program
LoanSTAR Revolving Loans

• 2013 Budget Allocation: $40 million
• Maximum loan amount of $7.5 million
  – 2% interest rate
• Loan recipients can be cities, counties, independent school districts, state agencies, public institutions of higher education, and tax-district supported public hospitals.
• Application deadline of June 7, 2013 for this round
Energy Device Franchise Tax Deduction

- Entities subject to the franchise tax (corporate tax) may deduct the cost of the solar energy device from their franchise tax:
  - the total cost of the system may be deducted from the company's taxable capital; or,
  - 10% of the system's cost may be deducted from the company's income.
Incentives

Federal
- Investment Tax Credit
- Accelerated Depreciation
- QECBs

State
- LoanSTAR Revolving Loan Program
- Energy Device Franchise Tax Deduction

Utility
- Denton Muni Solar Rebate Program
- CoServ Solar Rebate Program
- Oncor Electric Solar Standard Offer Program
Utility Rebate Programs

- AEP (SWEPCO) - SMART Source Solar PV Program
- AEP Texas Central Company - SMART Source Solar PV Rebate Program
- AEP Texas North Company - SMART Source Solar PV Rebate Program
- Austin Energy - Residential Solar PV Rebate Program
- City of San Marcos - Distributed Generation Rebate Program
- CoServ - Solar Energy Rebate
- CPS Energy - Solar PV Rebate Program
- Denton Municipal Electric - GreenSense Solar Rebate Program
- El Paso Electric Company - Solar PV Pilot Program
- Guadalupe Valley Electric Cooperative - Renewable Energy Rebates
- Oncor Electric Delivery - Solar Photovoltaic Standard Offer Program
- Xcel Energy - Residential and Hard-to-Reach Standard Offer Program
Denton Muni – GreenSense Solar Rebate

• Direct incentive:
  – $3.00 per Watt AC
  – Maximum of $15,000 per structure
  – Applicants qualify only once per 12-month period
  – May require pre-inspection and post-inspection by DME
  – Must be applied for by a home or rental property owner
  – Equipment must come with a five (5) year warranty.
CoServ – Solar Energy Rebate

• Direct incentive:
  – $2.00 per Watt AC
  – Maximum of $5,000 per structure
  – PV systems must be less than or equal to 50 kW, but the rebate is available only on the first 2.5 kW
Oncor – PV Standard Offer Program

• Direct incentive + performance incentive:
  – Residential: $538.79/kW AC
    • $0.53/kWh AC
  – Non-residential: $538.79/kW AC
    • $0.41/kWh AC
  – Residential: 1 kW to 10 kW DC
  – Non-residential: minimum 1 kW DC
  – Maximum rebate is equivalent to 20% of that year’s funding allocation
Solar Financing Options
Direct Ownership

- Balance Sheet
- Debt Financing
# Direct Ownership

## Pros
- Low – cost electricity
- REC revenue
- Full ownership

## Cons
- Large upfront cost
- Long term management
- Can’t take tax benefits
- Development risk
- Performance risk
Third Party Ownership: PPA

Customer

Power Purchase Agreement

Incentives

Developer
Third Party Ownership: PPA

www.dsireusa.org / August 2012

- **Authorized by state or otherwise currently in use, at least in certain jurisdictions within the state**
- **Apparently disallowed by state or otherwise restricted by legal barriers**
- **Status unclear or unknown**

**Note:** This map is intended to serve as an unofficial guide; it does not constitute legal advice. Seek qualified legal expertise before making binding financial decisions related to a 3rd-party PPA. See following slides for additional important information and authority references.

**At least 22 states + PR authorize or allow 3rd-party solar PV PPAs**
Third Party Ownership

In the top 5 solar markets

60-90%

of new installations use third party ownership

Source: NREL (http://www.nrel.gov/docs/fy12osti/54689.pdf)
Third Party Ownership: PPA

**Pros**
- No upfront cost
- No O&M costs
- Low risk
- Predictable payments
- Tax benefits

**Cons**
- Not supported in all states
- Don’t keep RECs
Third Party Ownership: Lease

No tax incentives for public entities
Third Party Ownership: Lease

**Pros**

- No upfront cost
- No O&M costs
- Low risk
- Predictable payments
- Keep incentives

**Cons**

- Can’t take tax benefits
Solar Financing Options

- Direct Ownership
- Direct Ownership
- Direct Ownership
- Direct Ownership
- Third Party Lease

Powered by SunShot
U.S. Department of Energy
Options for Solar Programs

Solarize

QECB’s
Solarize

Solarize
Group Purchasing
# Solarize: Advantages

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Solutions</th>
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<td>Community outreach</td>
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<td>Customer inertia</td>
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**Barriers**

- High upfront cost
- Complexity
- Customer inertia

**Solutions**

- Group purchase
- Community outreach
- Limited-time offer
Solarize: Advantages

Customer Acquisition

Cost per Watt

$0.80
$0.70
$0.60
$0.50
$0.40
$0.30
$0.20
$0.10
$-

US

Germany

10x the cost for customer acquisition

Source: NREL, LBNL
Benefits to Local Government:

Low upfront cost: $5,000 - $10,000 + Labor

Quick turn-around: 9 Months

Long-term impact: Sustainable ecosystem
Solarize: Process

1. Select Installer
2. Marketing & Workshops
3. Enrollment
4. Site Assessment
5. Decision & Installation
Solarize: Case Study

Harvard, Massachusetts
Population: 6,520

Solarize: Case Study

Select Installer

Marketing & Workshops

Enrollment

Site Assessment

Decision & Installation

Solarize Mass Harvard

April 2011

Nov 2011
Group Purchasing

Harvard Mass Group Purchasing Tiers

Average PV Cost July 2011: $5.75 / watt
Solarize: Case Study

Solarize Mass Harvard

- Select Installer
- Marketing & Workshops: May – July 2011
- Enrollment
- Site Assessment
- Decision & Installation

April 2011 → Dec 2011
Solarize: Case Study

Marketing Strategy:

- Electronic survey of 1,100 households
- Email newsletters and direct mailings
- Float in July 4 parade
- Articles and advertisements in local newspaper
- Facebook page and online discussion board

Source: Vote Solar
Solarize: Case Study

Solarize Mass Harvard

- Select Installer
- Marketing & Workshops
- Enrollment
- Site Assessment
- Decision & Installation

April 2011

June – Oct 2011

Dec 2011

429 households signed up
Solarize: Case Study

Solarize Mass Harvard

- Select Installer
- Marketing & Workshops
- Enrollment
- Site Assessment (Oct 2011)
- Decision & Installation

April 2011 to Dec 2011

151 feasible households
Solarize: Case Study

Solarize Mass Harvard

Select Installer
Marketing & Workshops
Enrollment
Site Assessment

Decision & Installation
Oct – Dec 2011

April 2011

Dec 2011

75 Contracts
Group Purchasing

Harvard Mass Group Purchasing Tiers

403 kW capacity contracted

1 kW - 100 kW
100 kW - 200 kW
200 kW - 300 kW
300 kW +
Solarize: Case Study

75 new installations totaling 403 kW

30% reduction in installation costs

575% increase in residential installations
Solarize: Lasting Impact

Source: NREL

Annual Portland Residential PV Installations

Source: NREL
Solarize: Resources

Resource The Solarize Guidebook

A roadmap for project planners and solar advocates who want to create their own successful Solarize campaigns.

www.nrel.gov
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