



How Local Communities can be Designated as SolSmart

GRIDNEXT 2017 Conference, Georgetown Texas

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Council of Governments



North Central Texas
Council of Governments

www.gosolartexas.org/solsmart



Presentation Overview

NCTCOG-- Why We Care About Solar

SolSmart– The Program

Path to SolSmart Designation

Regional Highlights & Best Practices

NCTCOG Tools for Growing Solar

NCTCOG: WHO WE ARE AND WHY WE CARE ABOUT SOLAR

About NCTCOG



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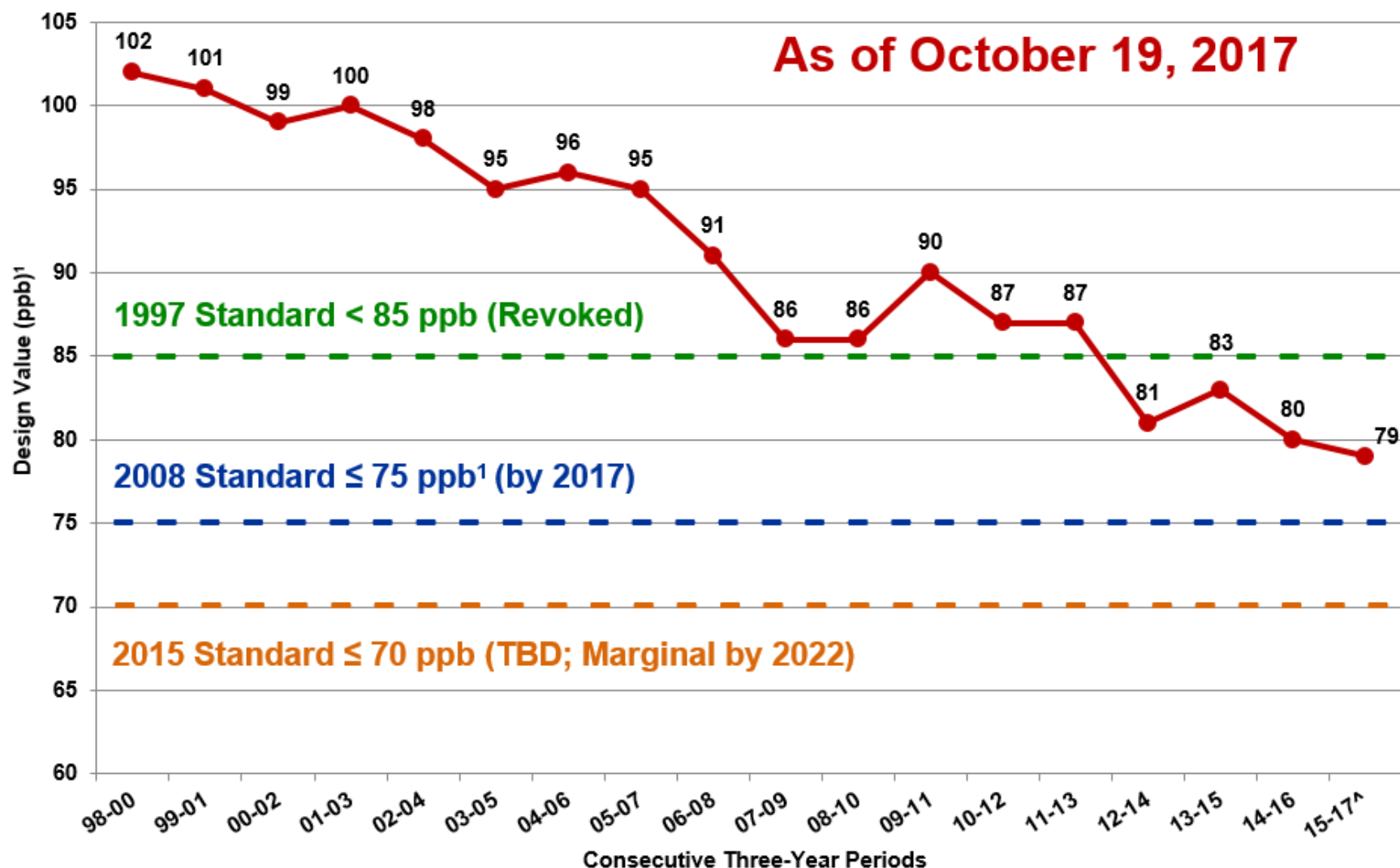


Metropolitan Planning Organization



DFW Clean Cities Coalition

Ozone Nonattainment & Air Quality



¹Attainment Goal - According to the US EPA National Ambient Air Quality Standards, attainment is reached when, at each monitor, the *Design Value* (three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration) is equal to or less than 70 parts per billion (ppb).

[^]Not a full year of data.

Control Strategies & Local Programs



Rideshare. Record. Reward.



Air Quality Benefits from Solar

Annual Regional Emission Displacements



22.5 MW

U.S. EPA AVERT Tool Output

	Original	Post-EERE	Impacts
Generation (MWh)	266,402,800	266,370,600	32,200
Total Emissions			
SO ₂ (lbs)	608,041,700	608,001,300	40,400
NO _x (lbs)	225,566,700	225,543,200	23,500
CO ₂ (tons)	201,045,000	201,024,900	20,100

Source: U.S. EPA Avoided Emissions and Generation Tool (AVERT) Tool. Based on 22.5 MW solar input– DFW install as of 2015

Solar Abundance

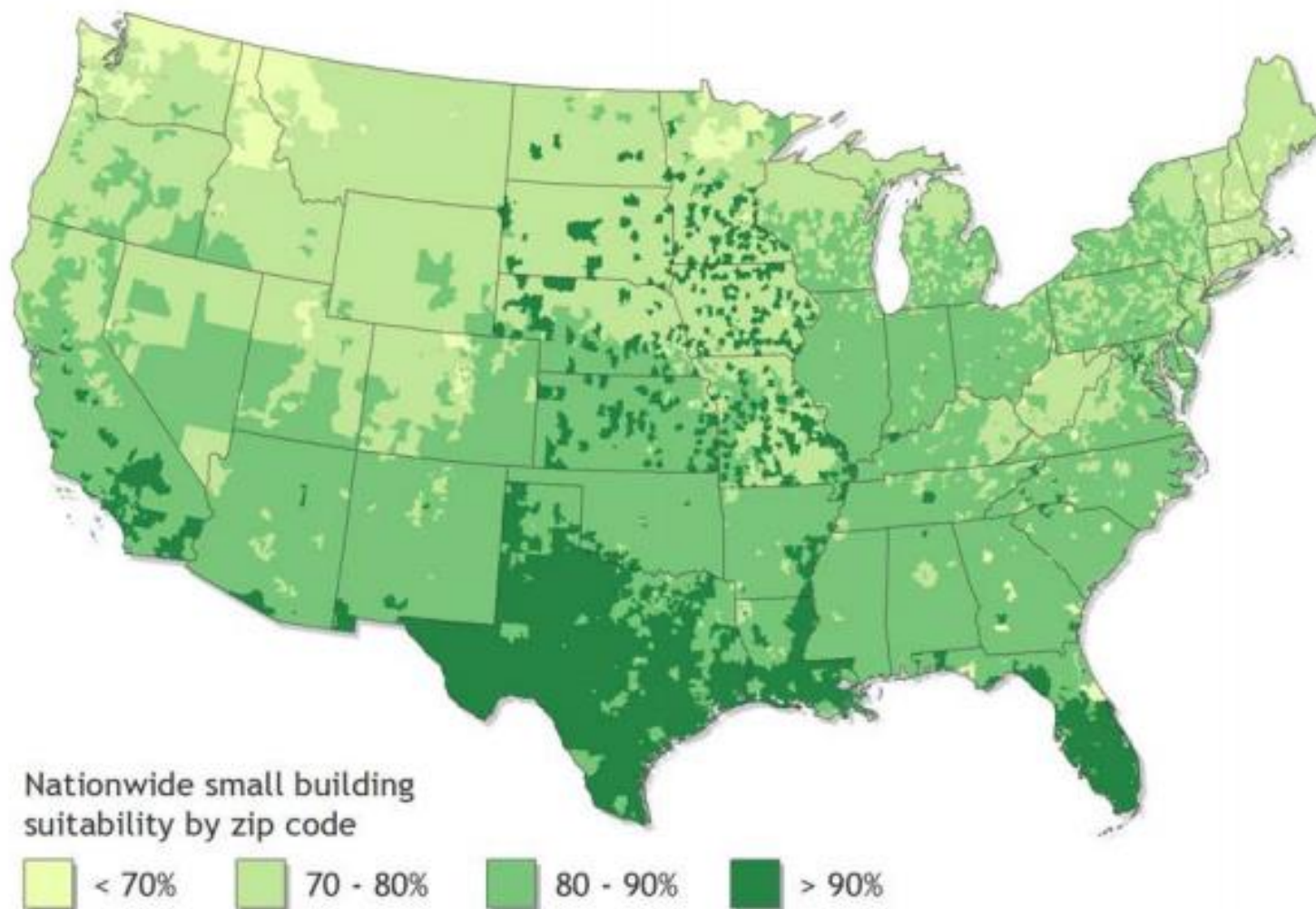
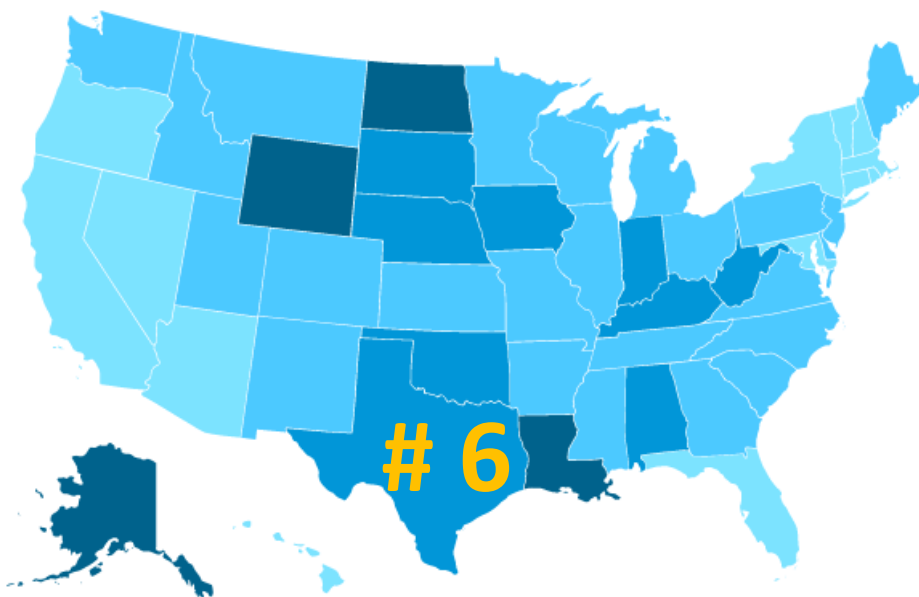


Figure ES-1. Percentage of small buildings suitable for PV in each ZIP code

Growing Energy Demand



**New Peak Demand
Records are being set
each year:**

2015: 69,877 MW

2016: 71,093 MW

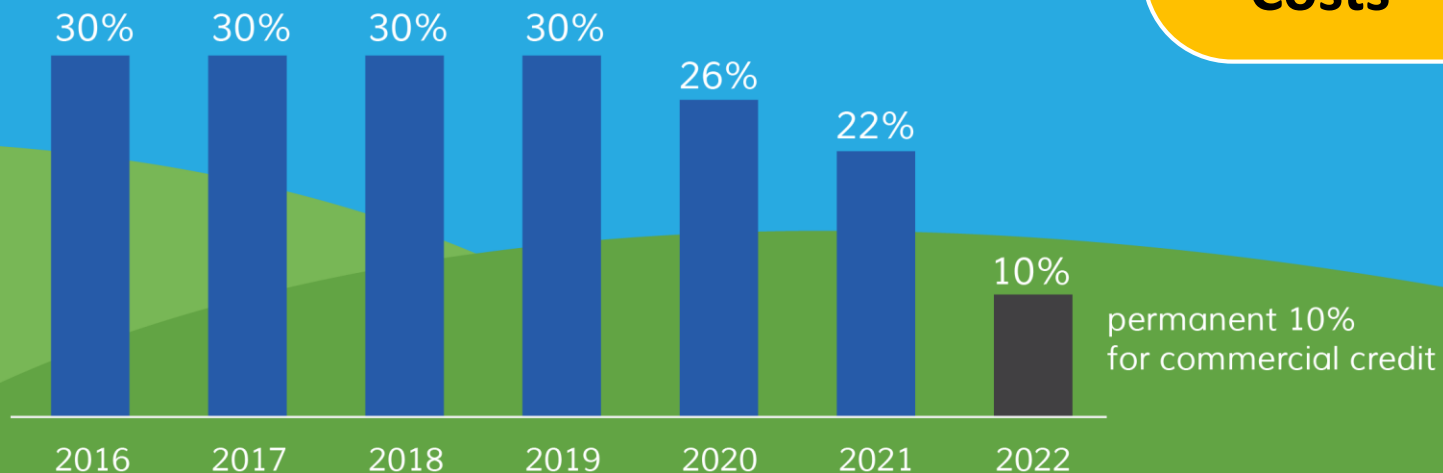
**Meanwhile
population, and
corresponding
energy needs, are
growing across North
Central Texas**

Population Trends

- One of the fastest growing states
- NCTCOG population forecasted to grow by 47% between 2017 and 2040, to over 10.5 million
- Per capita Income expected to increase
- Thousands of housing units being developed
- Business relocation to North Central Texas

Economics & Financial Stability

Everything you need to know about the extension of the ITC



- **Federal Investment Tax Credit**
- **Declining Solar Costs**

© EnergySage

Economics & Financial Stability

Unleash American Business

- 8,601 U.S. businesses comprise the solar value chain

Create American Jobs

- There are over 260,077 solar workers in the U.S.
- 1 of every 50 jobs created in 2016 was in the solar industry

Texas Specific

- 9,396 persons employed in solar jobs in
- 565 different companies
- Ranks 3rd nationally in solar jobs

NCTCOG Solar Efforts



2013 - 2014

- ▶ Reduce Soft Costs
- ▶ Streamline Processes
- ▶ Develop Best Management Practices

2015 - 2016

- ▶ Website Clearinghouse
- ▶ Resources for Niche Markets
- ▶ Cost Benefit Analysis
- ▶ Case Studies
- ▶ Videos

2017

- ▶ Designate Regional Communities
- ▶ Host Trainings & Webinar
- ▶ Provide Technical and Policy Assistance

What is SolSmart



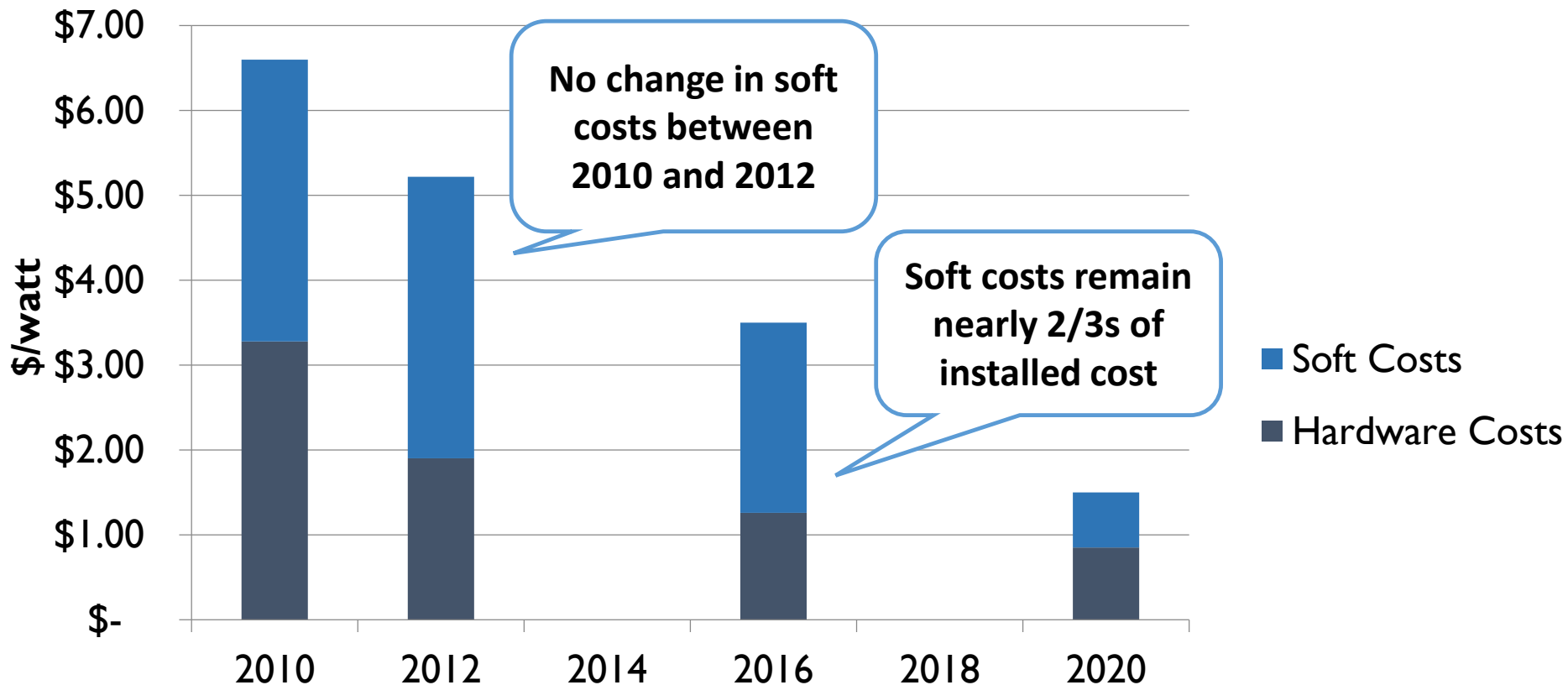
NATIONALLY DISTINGUISHED. **LOCALLY POWERED.**



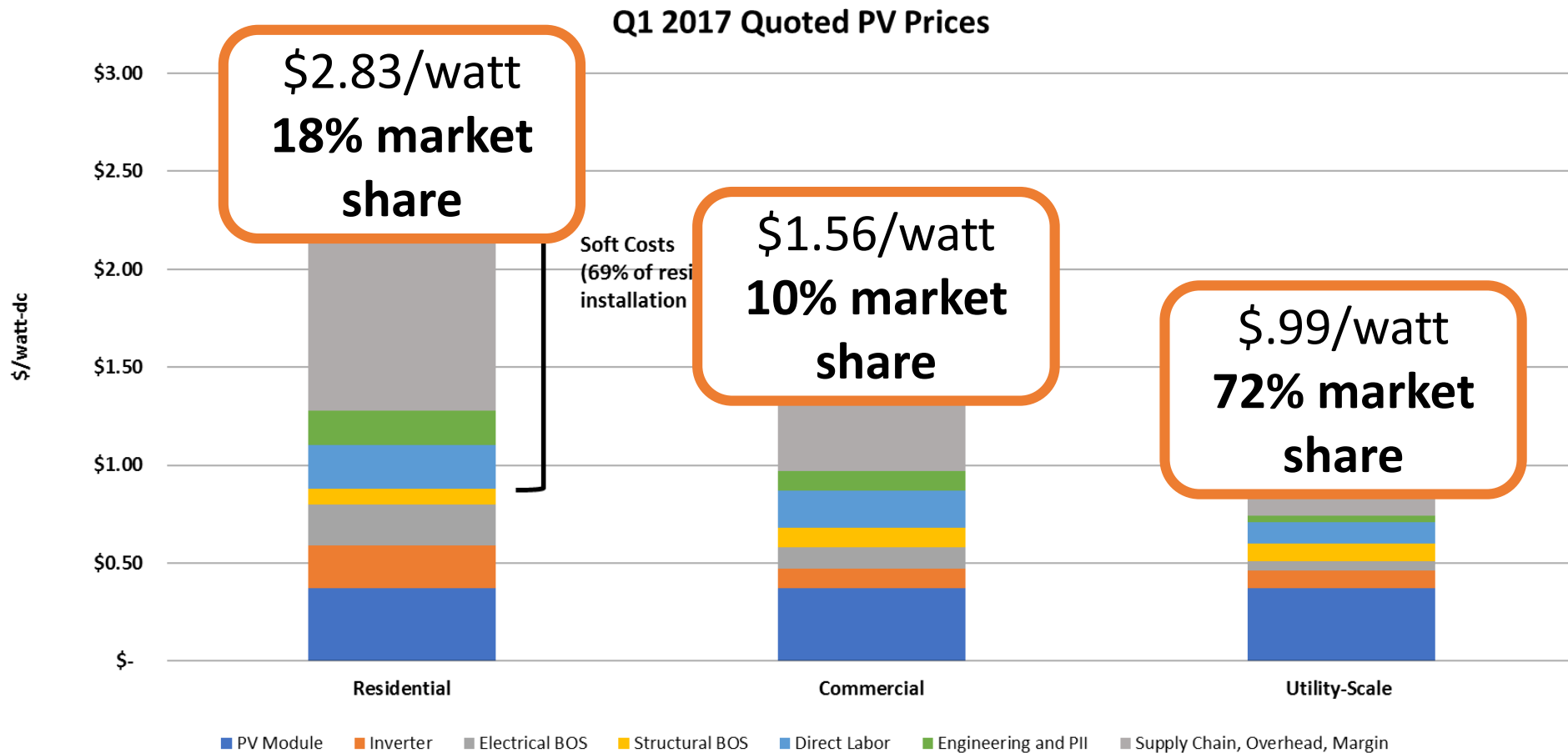
U.S. Department of Energy

Soft Costs

Change in Soft Costs and Hardware Costs Over Time



Cost Breakdown



SolSmart Overview

1. DESIGNATION



2. TECHNICAL ASSISTANCE



ELECTRIC POWER
RESEARCH INSTITUTE



Designation Levels



Satisfy bronze prerequisites

- **Solar Statement**
- **Permitting Checklist**
- **Zoning code review**

Each 20 points in permitting

Earn 20 points in PZD

Earn 20 point in Special Focus



Earn bronze designation

Satisfy silver prerequisites

- **Solar by-right in all major zones**
- **Cross-train inspection and permitting staff**

Earn 100 points in total



Earn Silver designation

Satisfy Gold prerequisites

- **PV permitting turnaround for small systems of 3 days or less**

Earn 200 points in total

SolSmart Categories



Foundational Categories

Permitting

Planning, Zoning, and
Development

Special Categories

Inspection

Construction Codes

Solar Rights

Community
Engagement

Utility Engagement

Market Development
and Finance

PATH TO SOLSMART DESIGNATION

SolSmart Designation is Possible for ALL Communities!

Process Steps

1. Understand Context and Community's Goals

- **Local Utility Presence**
- **Rural or Urban?**
- **Current Solar**
- **Conduct Interviews**
- **Sustainability Goals?**
- **Review Website and Public Documents**

Process Steps

2. Create Community-Specific Designation Pathway

- Already Achieved Criteria
- SolSmart Pre-requisites
- Develop Workplan & Milestones

Process Steps

3. Do The Work

Bronze Prerequisites

- I. Commitment Letter
- II. Zoning Code Review
- III. Permitting Checklist

Silver Prerequisites

- I. Solar by-right in all major zones
- II. Cross-train inspection and permitting staff

Gold Prerequisites

- I. PV permitting turnaround for small systems of 3 days or less

Process Steps

4. Trainings

- Meet Criteria P8, P9, PZD9, and I1
- Available Resources

Process Steps

5. Documentation

- **Critical & Administrative Heavy**
- **Low Hanging Fruit**
- **Document As You Go**

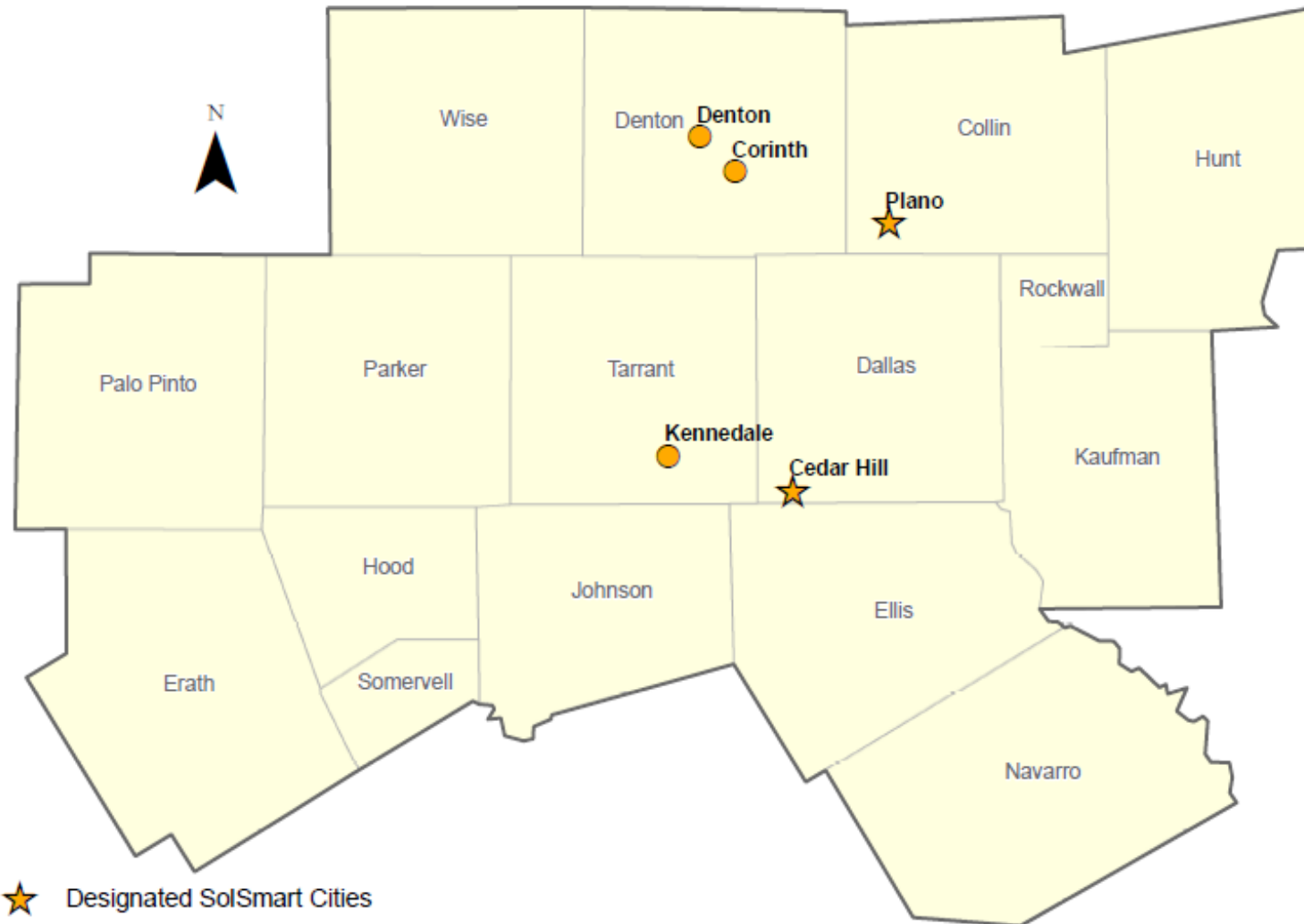
Process Steps

6. Designate, Celebrate, and Promote!!!!



REGIONAL HIGHLIGHTS & BEST PRACTICES

DFW Area Participating Cities



- ★ Designated SolSmart Cities
- Participating SolSmart Cities
- NCTCOG 16 County Region

October 2017

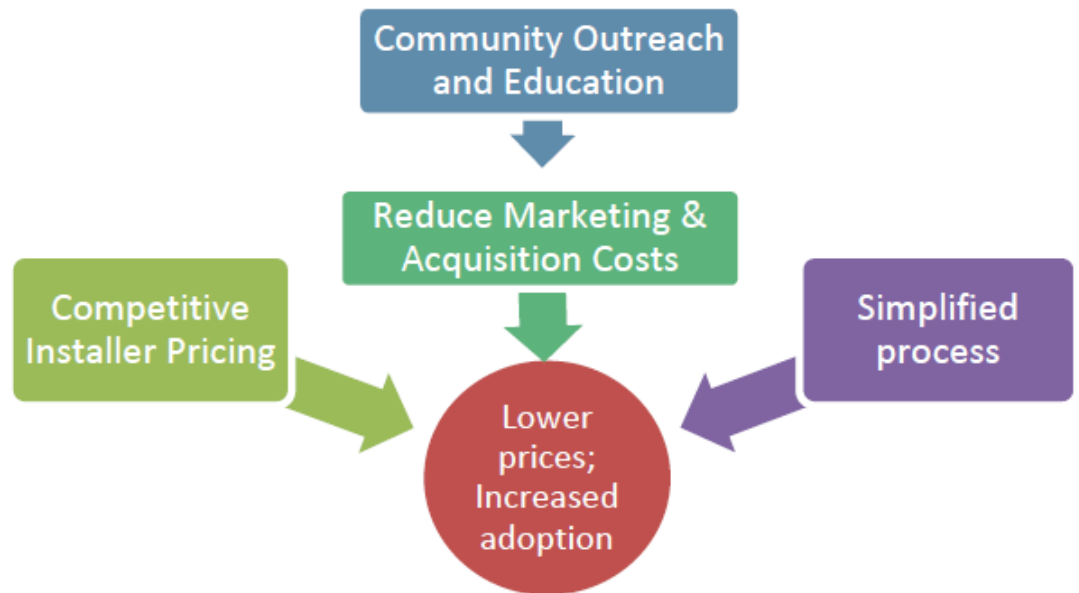


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City of Plano, Solarize

Group Solar Purchase Concept

- Community Outreach and Education
- Lower Prices & Increased Adoption
- Criteria Awarded:
 - SR-5
 - CE-4a
 - CE-5b
 - CE-9



City of Kennedale, Handout



Permits & Planning Department
405 Municipal Drive, Kennedale, Texas 76060
Website: www.cityofkennedale.com
Phone (817)-985-2100
Fax (817) 483-0182

Solar Photovoltaic (PV) System Handout

This handout is intended to provide solar installers with an overview of the City of Kennedale's solar installation requirements for residential and commercial solar photovoltaic (PV) systems. This handout includes fees, application and permitting process, required documents for permit approval, and inspection information.

Note: It is the responsibility of a licensed electrician, registered with the City of Kennedale, to obtain the Solar Electrical Permit.

1. Electrical permit fee of \$55.00
2. Plan review fee of \$25.00

For solar installations, the electrical permit and plan review fees are the only fees assessed. To see the full schedule of fees, please review the City of Kennedale permit fee schedule available on the city website at www.cityofkennedale.com.

1. Submittal of permit application, fees, and required documents. Application and documents should be submitted to the Kennedale Permits and Planning Department, located at 405 Municipal Drive, Kennedale, Texas 76060.
2. Once application is submitted, please allow 3 business days for plan review and approval of permits.
3. Once a permit has been issued and the system has been installed, an inspection can be scheduled. More information about inspections are located on the next page.

To obtain a permit, the installer must complete the [Solar Electrical Permit Application](#) and provide copies of the items listed below.

**** Additional information may be requested to determine compliance. The following items are required:**

- ☐ Sufficient information to deem compliance with the adopted 2015 International Building Code/International Residential Code/Fire Code and applicable ordinances.
- ☐ A letter from the Texas Licensed Professional Engineer stating that the roof will support the proposed panels. If needed, the letter must include any recommended modifications.
- ☐ Solar Collectors and other system components must be listed and labeled by an approved national recognized agency.

- Transparency
- Criteria Achieved:
 - P-2
 - P-4
 - P-5a&b
 - P-6
 - I-2
 - I-3
 - I-4
 - I-5
 - I-6

City of Cedar Hill, Sustainability Goals



- Quality of Life
- Respond to Public
- Criteria Achieved:
 - CE-2
 - CE-5a&b
 - CE-9
 - MDF-5

City of Denton, Rebate



- Solar Friendly
- Sustainability Goals
- Criteria Achieved:
 - MDF-7
 - CE-5e
 - U-3a

- **\$0.75 per AC Watt** up to \$30,000, not to exceed 50% of total install cost, for PV system equipment
- **\$1.50 per AC Watt** up to \$30,000, not to exceed 50% of total install cost, for PV system + **battery storage**

City of Corinth, Appendix U

2015 International Residential Code– Appendix U

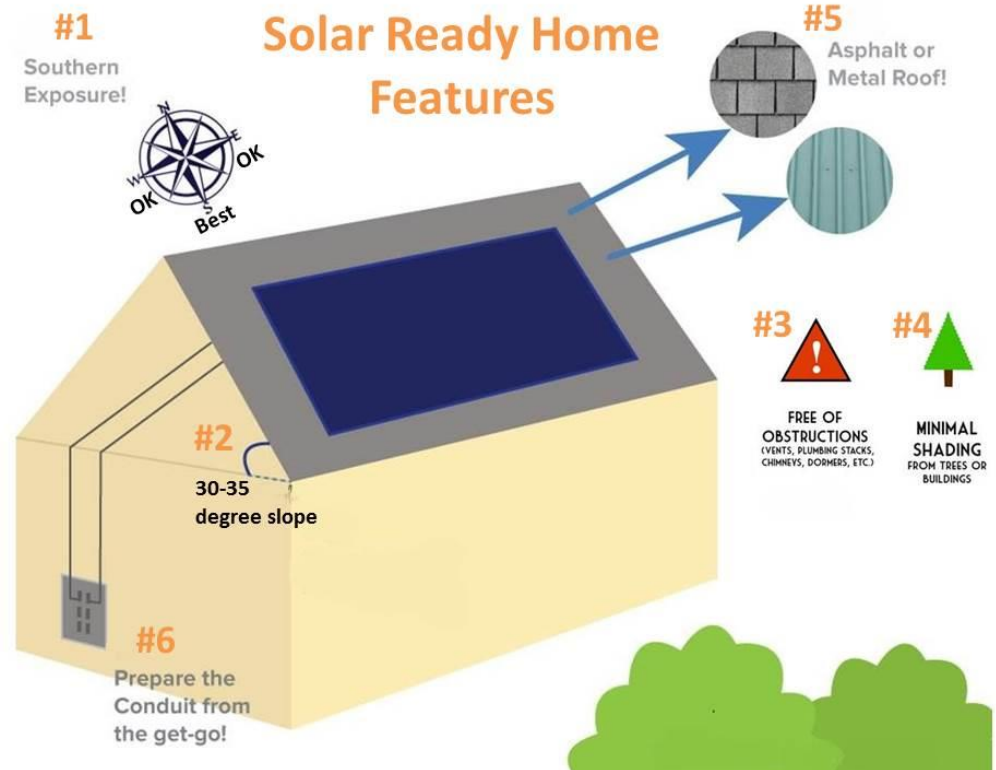
- Solar Ready Construction

- Adopted in August 2017

- Regional Leader

- Criteria Achieved:

- CC-1a
- CC-2
- CC-4



WEBSITE RESOURCES

SolSmart Resources

Demo of website:

www.gosolartexas.org/solsmart



SolSmart

View Edit Outline

Is Your Community S



SolSmart is a national community designation program, funded by the U.S. Department of Energy, designed to recognize communities that take steps to make it easier for businesses and residents to go solar. Communities committed to pursuing SolSmart designation will be eligible for no-cost technical assistance from a team of national solar and local government experts.

Participating cities can earn SolSmart designation—at the bronze, silver, or gold level—by completing criteria that fall into eight categories: 1) Permitting; 2) Planning, Zoning, and Development; 3) Inspection; 4) Construction Codes; 5) Solar Rights; 6) Utility Engagement; 7) Community Engagement; and 8) Market Development and Finance. For more information on SolSmart, view the [SolSmart Program Guide](#). The resources to the right hand side include regional guidance and best practices for each category.



About SolSmart



Designated Cities



Permitting



Planning, Zoning and
Development



SolSmart Resources

Local Governments

View Edit Outline

The success of solar is largely dependent on local government support. Decisions about planning and zoning can decide how solar friendly, or unfriendly, a municipality is. This portal provides resources



Best Management Practices

These resources are meant to assist cities with planning and soft cost reduction so that homeowners, businesses, schools, and other entities interested in solar energy have an easier path to getting solar up and running.



SolSmart Designation

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Link to our website:
www.gosolartexas.org

incentives and to demonstrate the viability of solar power themselves through installations on municipal properties.



Cost-Benefit Analysis

These documents, developed by Frontier Associates, present information and analysis about five model solar applications likely to be of interest to local government officials. Frontier produced a detailed report, 2-page fact sheets, and Microsoft Excel-based financial pro forma templates that can be customized and applied to specific projects under consideration.



Community Solar

Community solar is one way to improve citizens' accessibility to solar energy. These resources provide an overview of community solar, its benefits, and current community solar programs in Texas.



Local Government Solar Initiatives

Want to find out how other jurisdictions are making solar work for them? These are the projects, programs, and policies from Texas solar leaders.



Inspectors, Firefighters, & Code Officials

These resources are meant to educate and assist inspectors, firefighters, and code officials to the relevant issues surrounding solar PV systems.



Frequently Asked Questions



Additional State and National Resources

Solar Rights—1

Market Development and Finance-- 1

Market Development and Finance-- 3

Community Engagement— 5&b

Cost Benefit Analysis

Project Deliverables

Report



Benefits and Costs of Model Solar Applications for Local Governments

Frontier Associates, August 2016
www.frontierassoc.com



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Fact Sheets

1 SIMPLE GRID-TIED SOLAR

Simple grid-tied solar installations can offset purchased electricity on public properties such as wastewater treatment facilities, city halls or libraries, etc. These systems are by far the most common solar application deployed by public and private entities.

MODEL SOLAR APPLICATIONS

1. SIMPLE GRID-TIED SOLAR
2. SOLAR ON LANDFILLS OR OTHER UNDERUTILIZED SITES
3. SOLAR ON SHADING STRUCTURES
4. GRID-TIED SOLAR WITH ENERGY STORAGE
5. MOBILE SOLAR WITH ENERGY STORAGE

Solar and energy storage applications can provide energy, capacity, shade, mobility, resilience and other benefits to local communities. The North Central Texas Council of Governments (NCTCOG), with support from the Texas State Energy Conservation Office (SECO), identified a need for efficient approaches to evaluating solar and storage costs and benefits. This fact sheet, developed by Frontier Associates, presents information and analysis about one of five model solar applications likely to be of interest to local government officials. Frontier also produced a detailed report and Microsoft Excel-based financial pro forma templates that can be customized and applied to specific projects under consideration. All of this information may be obtained at www.gridtiedsolar.org.

5 SOLAR



FIRE STATION #6 IN MCKINNEY

An example simple grid-tied solar energy system is the 52 kWdc solar array at Fire Station #6 in McKinney. The system produces an estimated 137,000 kWh of electricity annually, about 50 percent of the Fire Station's annual energy needs.

This project was funded in part by a grant through the Texas State Energy Conservation Office. It consists of 222 polycrystalline solar modules, rated at

235 watts each, installed on 3 different roof surfaces. The panels are attached to the roof seam utilizing clamps that allow the modules to be attached to the roof without making penetrations. It utilizes multiple string inverters due to limited space for a large centralized inverter, and includes a web based monitoring system that provides real time energy production data through a standard web browser.

Excel Tool

Solar/Energy Storage Financial Pro Forma and Benefit/Cost Analysis Tool									
Model Application 1. Simple Grid-Tied Solar									
A. Model Inputs					B. Model Outputs				
Category	Item	Value	Unit		Category	Item	Value	Unit	
System	PV System Size	200	kWdc		Direct Financial Benefits and Costs (from financial pro-forma model at right)				
	Storage System Size	0	kWh		Direct	RPS	6.5%	%	
	Storage System Size	0	kWh		Financial	Simple Payback Yrs	12	years	
	Storage System Size	0	kWh		Metrics	NPV	\$29,091	\$	
Costs	PV System Cost	\$100,000	\$		Annual and Cumulative Cash Flows				
	Storage System Cost	\$0	\$						
	Utility Interconnect	\$100,000	\$						
	Tax Credits	\$0	\$						
Financing	Additional Grants	\$0	\$		Jobs and economic development impacts (see notes on Instructions worksheet)				
	Federal ITC Value %	26%	%		Construction Jobs				
	Does ITC apply?	No "Yes" or "No"			Dining	Jobs	3.7		
	Financing %	100%	%		construction	Employment	\$250,292	\$	2000 2016
PV Specs	Term	20	years		retail	Output	\$251,055	\$	2000 2016
	Rate	4.00%	%		Dining	Jobs	0.1		
	Loan origination costs	5%	%		operating	Employment	\$3,441	\$	2000 2016
	Long-term maintenance fee?	No "Yes" or "No"			year (time)	Output	\$1,700	\$	2000 2016
Rural Billing	Annual PV Production (or I)	235,593	kWh (from PV Watts)		Annual avoided emissions impacts (see notes on Instructions worksheet)				
	Annual PV Degradation Rate	0.50%	%		Annual avoided emissions (see notes on Instructions worksheet)				
	PV Output/Fed Production R	92%	%		Annual avoided monthly kWh	24,353	kWh/month		
	PV Demand Factor	92%	%		Annual avoided CO2 emissions	195	tonnes/yr		
Retail Billing	Credit value for reduced imports	\$1,000	\$/kWh		Annual avoided SO2 emissions	0.08	tonnes/yr		
	Credit value for exports	\$1,000	\$/kWh		Annual avoided CO2 emissions	195	tonnes/yr		
	Demand charge?	Yes "Yes" or "No"			Annual avoided SO2 emissions	0.08	tonnes/yr		
	Demand charge savings rate	15.00%	%		Annual avoided CO2 emissions	195	tonnes/yr		
Add'l Storage	Time of use savings rate	\$1,000	\$/kWh		Annual avoided SO2 emissions	0.08	tonnes/yr		
	Energy/demand rate escalator	15%	%		Annual avoided CO2 emissions	195	tonnes/yr		
	Storage roundtrip efficiency	80%	%		Annual avoided SO2 emissions	0.08	tonnes/yr		
	Storage useful life	10	years		Annual avoided CO2 emissions	195	tonnes/yr		
Shading Value	Shaded parking spaces	0	#		Annual avoided SO2 emissions	0.08	tonnes/yr		
	Increased daily rental fee/pays	2	\$		Annual avoided CO2 emissions	195	tonnes/yr		
	Utilization rate	50%	%		Annual avoided SO2 emissions	0.08	tonnes/yr		
	Tax Value	Increases in tax revenues	\$0	\$/yr, yr 1-5	Annual avoided CO2 emissions	195	tonnes/yr		
Resilience	Resilience value	\$0	\$/yr, yr 1-5		Annual avoided SO2 emissions	0.08	tonnes/yr		
	REC value	\$0	\$/yr, yr 1-5		Annual avoided CO2 emissions	195	tonnes/yr		
	REC value	\$0	\$/yr, yr 1-5		Annual avoided SO2 emissions	0.08	tonnes/yr		
	REC value	\$0	\$/yr, yr 1-5		Annual avoided CO2 emissions	195	tonnes/yr		
Operating	PV O&M costs	\$13.33	\$/kW (from JED)		Annual avoided SO2 emissions	0.08	tonnes/yr		
	O&M cost escalator	15%	%/yr		Annual avoided CO2 emissions	195	tonnes/yr		
	Inverter or 2 of inverter cost	10	years		Annual avoided SO2 emissions	0.08	tonnes/yr		
	Inverter cost reduction	-2.0%	%/yr		Annual avoided CO2 emissions	195	tonnes/yr		
Depreciation	Base "None", "MACRS"	None			Annual avoided SO2 emissions	0.08	tonnes/yr		
	Depreciation method	Depreciation basis	\$100,000	\$	Annual avoided CO2 emissions	195	tonnes/yr		
	Tax Rate	Marginal tax rate	0%	%	Annual avoided SO2 emissions	0.08	tonnes/yr		
	Is Rec Income taxable?	No "Yes" or "No"			Annual avoided CO2 emissions	195	tonnes/yr		
Discount Rate	Discount rate for NPV calc.	4%	%		Annual avoided SO2 emissions	0.08	tonnes/yr		
	PV Watts	Month	AC Energy		Annual avoided CO2 emissions	195	tonnes/yr		
	Monthly	January	18,551	kWh	Annual avoided SO2 emissions	0.08	tonnes/yr		
	Output	February	20,506	kWh	Annual avoided CO2 emissions	195	tonnes/yr		
Output	March	26,305	kWh		Annual avoided SO2 emissions	0.08	tonnes/yr		
	April	26,000	kWh		Annual avoided CO2 emissions	195	tonnes/yr		
	May	23,843	kWh		Annual avoided SO2 emissions	0.08	tonnes/yr		
	June	23,757	kWh		Annual avoided CO2 emissions	195	tonnes/yr		
Output	July	20,716	kWh		Annual avoided SO2 emissions	0.08	tonnes/yr		
	August	20,890	kWh		Annual avoided CO2 emissions	195	tonnes/yr		
	September	25,710	kWh		Annual avoided SO2 emissions	0.08	tonnes/yr		
	October	24,430	kWh		Annual avoided CO2 emissions	195	tonnes/yr		
Output	November	15,250	kWh		Annual avoided SO2 emissions	0.08	tonnes/yr		
	December	16,243	kWh		Annual avoided CO2 emissions	195	tonnes/yr		
	Annual	235,593	kWh		Annual avoided SO2 emissions	0.08	tonnes/yr		

Questions and Contact

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