

Sector Focus:

Introduction to Third-Party Financing for Large Solar Thermal Systems: An Overview for All End-Users

Renewable Heating & Cooling Webinar Series

U.S. Environmental Protection Agency

November 27, 2012

1:00 PM - 2:30 PM

Moderator

Cliburn and Associates, LLC



Jill K. Cliburn

President

jkcliburn@gmail.com

- Long career in energy efficiency and renewables, leading programs for local, state, and regional agencies, businesses, and utilities... first as an employee, and then, for 20+ years, through her own firm. Working nationally from Santa Fe, NM
- Specialized in designing innovative programs and projects, based on best-practices. Also, as a buy-side consultant: from feasibility/economic assessment through team development, implementation planning, reporting, media
- Education: marketing/journalism and energy economics (Northwestern and University of Illinois at Sangamon), plus lots of practice.

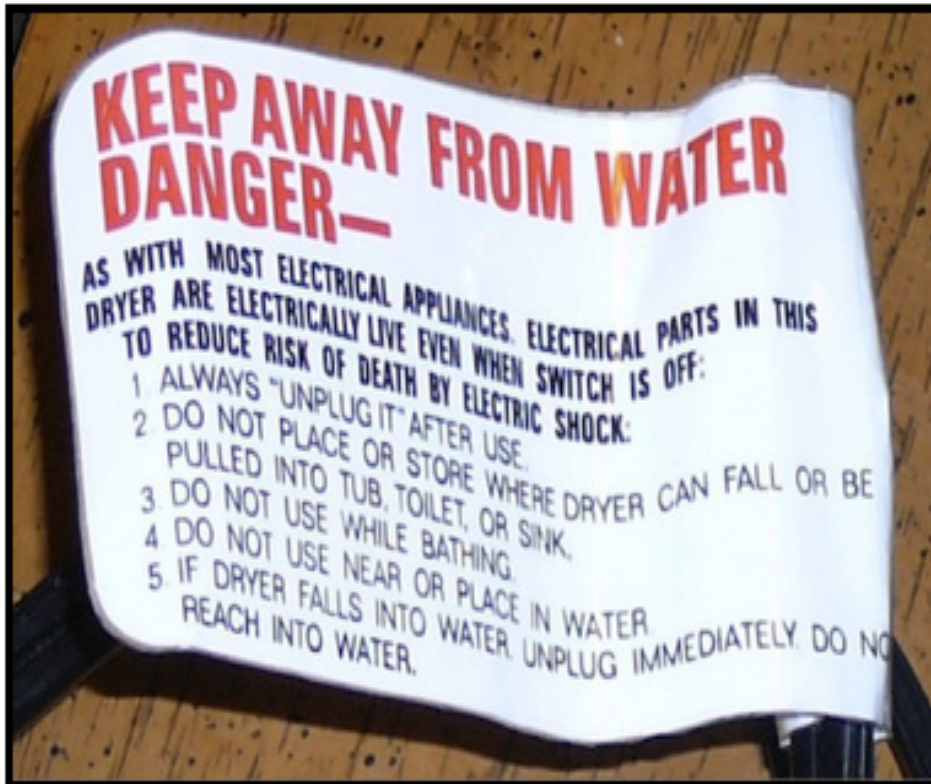
Financing to Grow the Market for C&I Solar Thermal Systems

Jill K. Cliburn, Moderator
US EPA Webinar Series
November 2012

Cliburn and Associates, llc
jkcliburn@gmail.com
Energy Program Design, Marketing,
And Assessment • Based on
Best-Practices in the Real World



Reconsider the Common Wisdom



- ✓ Technology maturity
- ✓ Solution viability/market
- ✓ System entry cost
- ✓ Savings per project

... and News About

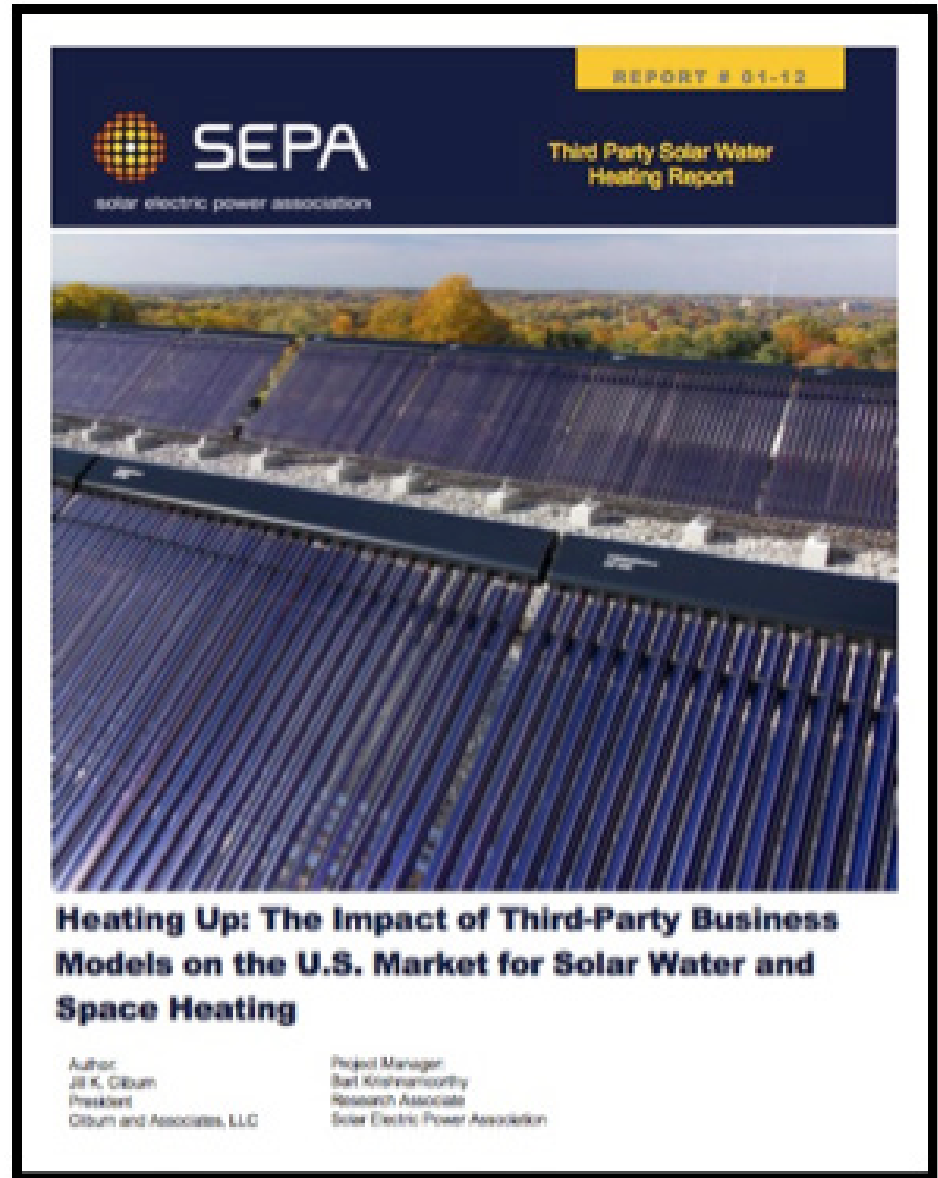
- ✓ New business models
- ✓ Financing innovation
- ✓ Utility engagement



Report #01 -12

Third-Party Business Models on the US Market for Solar... Heating

- Compares/contrasts SWH and PV business models
- Looks for trends & innovations
- Available from www.solarelectricpower.org



Third-Party Financing Models

- ✓ Loan-centered models
- ✓ Third-party financing - ESCOs
- ✓ Third-party financing – leasing
- ✓ Third-party financing – shared revenue model
- ✓ Third-party financing – energy purchase agreement

The Utility Piece

- ✓ Potential REC value: NY, MD, DC, NC, AZ, NV
- ✓ Other incentives? Check www.dsireusa.org
- ✓ Bring the right question to the right utility
- ✓ Collaborate on energy efficiency and load mgmt
- ✓ A PV alternative?
- ✓ Find out how your SWH provider works with the utility on your behalf



Zach Axelrod

Skyline Innovations, Inc.



Zach Axelrod

Chief Executive Officer

zaxelrod@skylineinnovations.com

202-906-0403

- Founder and CEO of Skyline Innovations
- Elected to Solar Energy Industries Association (SEIA) national Board of Directors for 2012-2013
- Created and implemented the utility industry's first comprehensive Smart Grid economic model
- Former utility solutions strategist at GridPoint, Inc and wholesale power market analyst for ICF International

EPA Webinar: Financing Models and Emerging Trends in Commercial Solar Hot Water Deployment

SKYLINE INNOVATIONS

Zach Axelrod, CEO

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202-906-0403



SKYLINE
INNOVATIONS

GUARANTEED SAVINGS THROUGH GREEN ENERGY

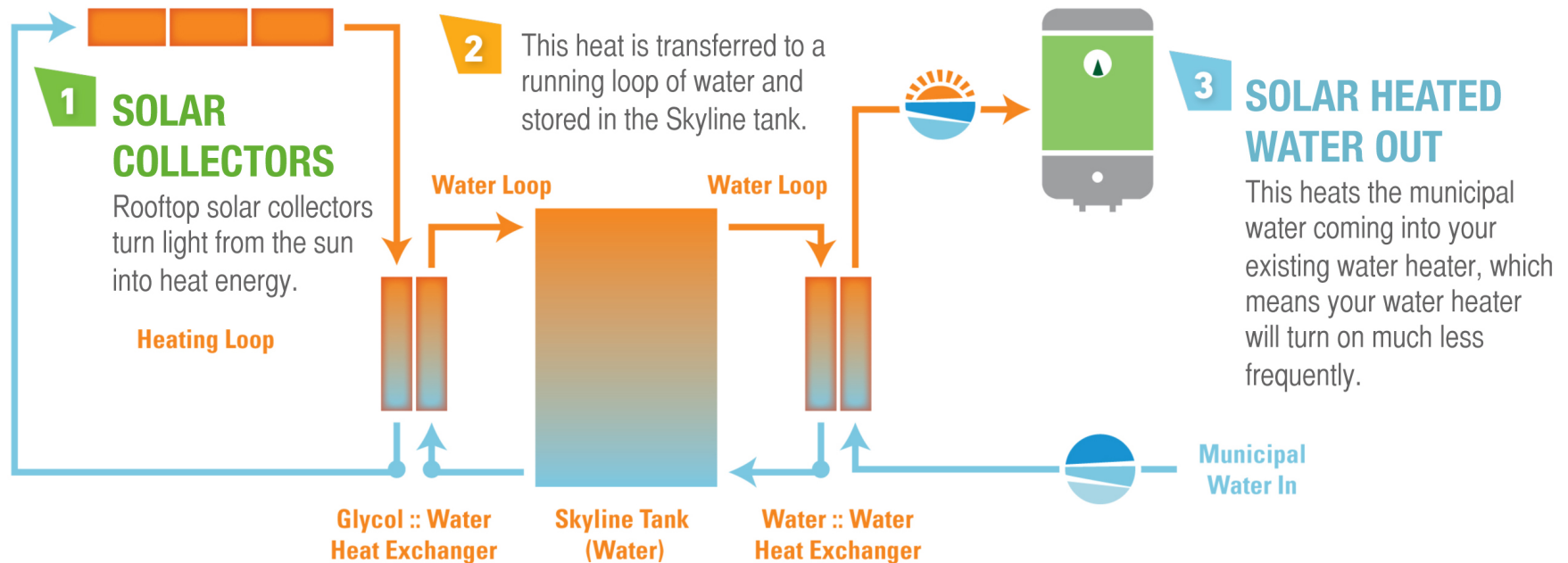
Washington, DC | Los Angeles, CA | www.skylineinnovations.com

Skyline Company Snapshot

- Founded in August 2009 with offices in DC and LA
- Industry-leading \$30M tax equity solar thermal project fund with WGL Holdings, parent company of regulated utility Washington Gas
- More than 50 projects completed to date, delivering solar hot water to over 7,000 multifamily residents daily
- Targeted solution for multifamily, lodging and commercial process domestic hot water applications
- Major milestones include HUD approval, LIHTC compliance



Fully Monitored Solar Water Pre-heating



- Solar thermal system equipment configuration based on proven technology (OG-100 certified and SRCC-rated equipment)
- Utility-grade metering and monitoring points across the system (OIML-compliant BTU meters, temperature sensors, flow meters)
- Ongoing measurement, reporting and optimization of energy savings delivery
- Internal billing software for delivery of price-indexed energy

Skyline Program Features



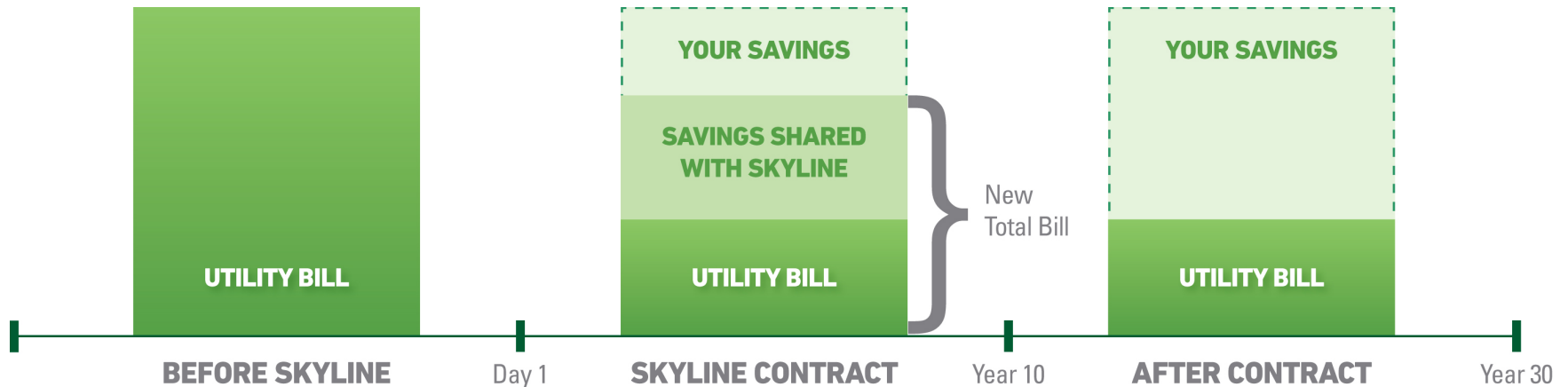
Skyline Innovations delivers guaranteed savings to customers by providing a fixed discount to their utility rates for water heating.

Our turnkey program finances, installs, maintains and monitors solar water heating systems at no upfront cost to the customer.

Customer Benefits

STEPS	RESPONSIBILITY	
	CUSTOMER	SKYLINE
SOLUTION PLANNING		✓
DESIGN & ENGINEERING		✓
FINANCING		✓
INSTALLATION & PROJECT MANAGEMENT		✓
PERMITTING & LEGAL		✓
MAINTENANCE & MONITORING		✓
MANAGE PERFORMANCE & FINANCIAL RISK		✓
ACHIEVE SAVINGS	✓	
RESULT:	CASH FLOW POSITIVE ON DAY 1	

Guaranteed Savings Model



- Solar hot water priced at fixed discount (indexed) to utility rate
- No upfront cost to customer
- 10 year contract term
- Monitoring and maintenance included
- Opportunity to take ownership of system at end of contract and keep 100% of savings

Sample 24 Collector System

3D Views



AERIAL VIEW



ROOF CLOSE-UP

SYSTEM VALUE: \$108,000

Sample Lifetime Savings

ANNUAL SAVINGS OVER LIFE OF SYSTEM - \$0.85 per therm; 30% savings rate



10 YEAR SAVINGS* **\$10,600**

30 YEAR SAVINGS* **\$108,000**



59 TONS OF CO²
REDUCED ANNUALLY



7 HOMES TAKEN OFF
THE GRID



10 CARS TAKEN OFF
THE ROAD



2,992 TREES PLANTED

*Based on a 2% annual increase in energy prices as projected by the U.S. Energy Information Administration.



COMPLETE SOLAR WATER HEATING ASSESSMENT

Day 1



REVIEW AND APPROVE PROPOSAL

2 weeks



REVIEW AND APPROVE SKYLINE ENERGY SERVICES AGREEMENT

2 weeks



COMPLETE DETAILED SYSTEM ENGINEERING AND FINAL DESIGN

After ESA signature

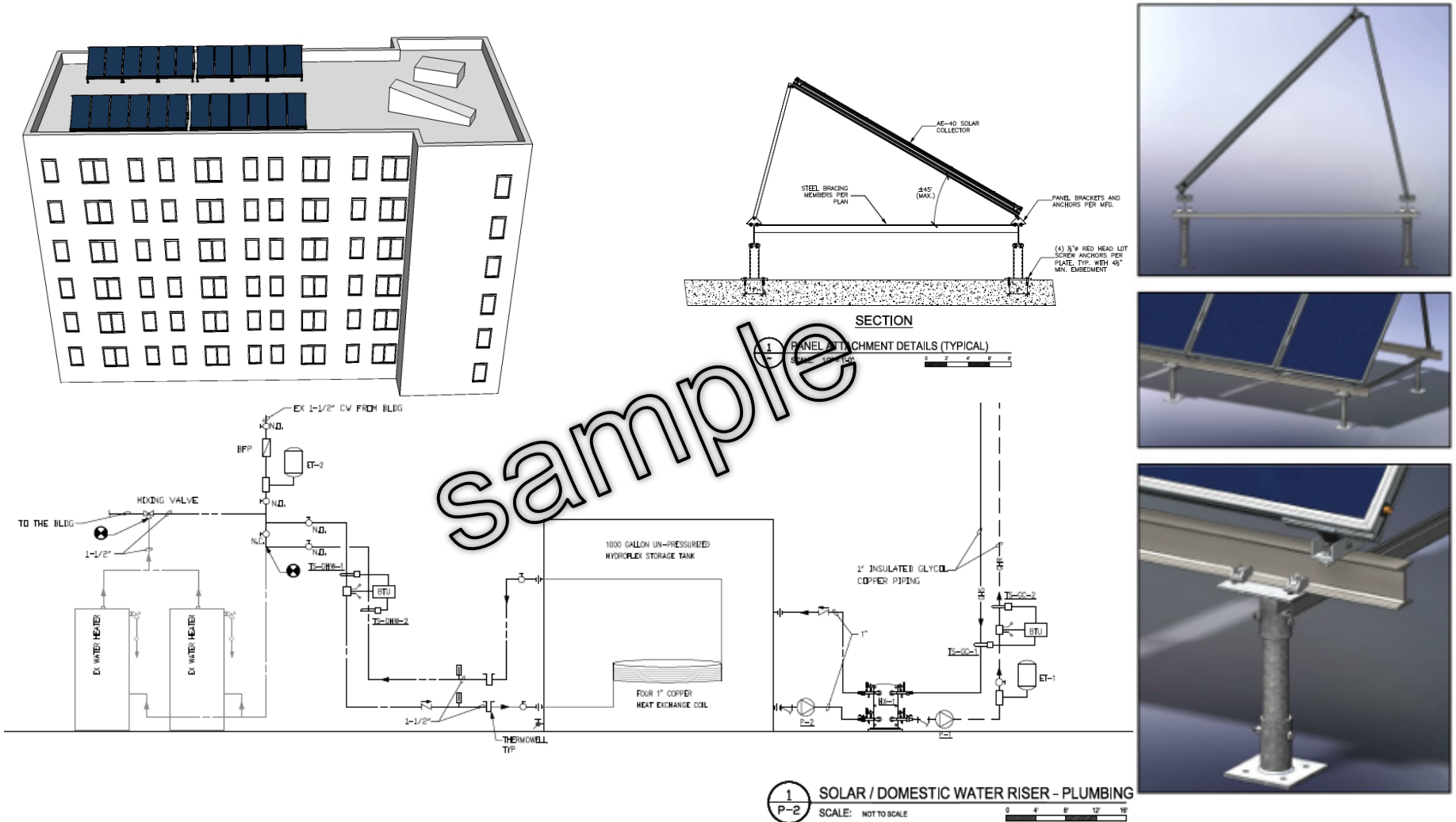


INSTALLATION, OPERATIONS, AND MAINTENANCE

After Final Design approval

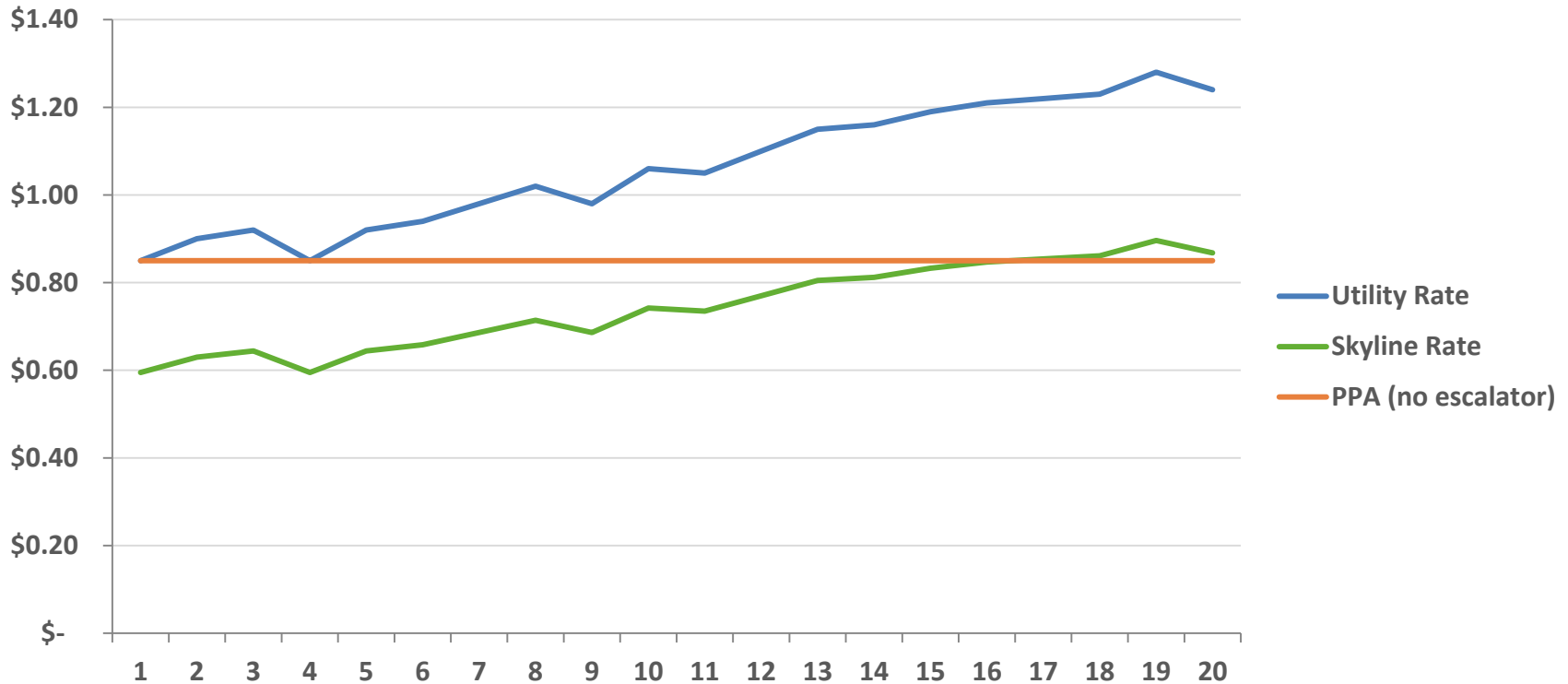
System Engineering

After ESA signature, Skyline performs rigorous structural and mechanical engineering



Why Skyline?

COMPARATIVE ENERGY PRICES OVER TIME



- No performance or financial risk to customer
- Continuous system monitoring, full maintenance and insurance
- Extensive experience in solar hot water for multifamily applications

Villa Edgemont – Los Angeles, CA



Delano Apartments – Washington, DC



Harbor House - Annapolis, MD



4600 Connecticut Condos – Washington, DC



Speaker

Johnson Controls, Inc.



William Guiney

Director Solar Heating & Cooling

507 Michigan St. M-98

Milwaukee, WI 53202

william.t.guiney@jci.com

414-524-4860

- Director of the Solar Heating & Cooling
- Responsibilities have included both PV and Solar Thermal technologies and programs
- Over 30-years of experience in the solar industry as a retailer, contractor, distributor, manufacturer and educator.
- Chair NABCEP Solar Heating Entry Level Committee
- Solar Heating Design & Installation trainer for Florida and North Carolina Solar Energy Centers



***EPA Solar Heating & Cooling Webinar: Financing
Performance Contracting and Renewable Energy
Tuesday, November 27, 2012
1:00 PM - 3:00 PM***

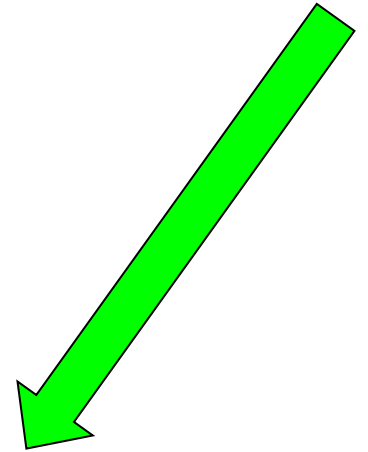


Bill Guiney
Director
Solar Heating & Cooling Business



Energy Performance Contracting

- Reduce energy usage
- Reduce water usage
- Reduce operating and maintenance costs
- Reduce emissions
- Reduce waste



In short, **Performance Contracting** is a procurement tool that allows you to leverage the savings you get from making building improvements in order to pay for the improvements.

How does it work?

How do we reduce energy and water use?

We use a host of products and services:

- Lighting upgrades
- Building management systems
- Water conservation measures
- Temperature controls
- Chiller and boiler upgrades
- Facility repairs and upgrades
- Renewable Energy

(PV, Solar Thermal, Geothermal, Waste Water Treatment, LFG)

- Green building solutions
- Wireless infrastructure
- Demand Response



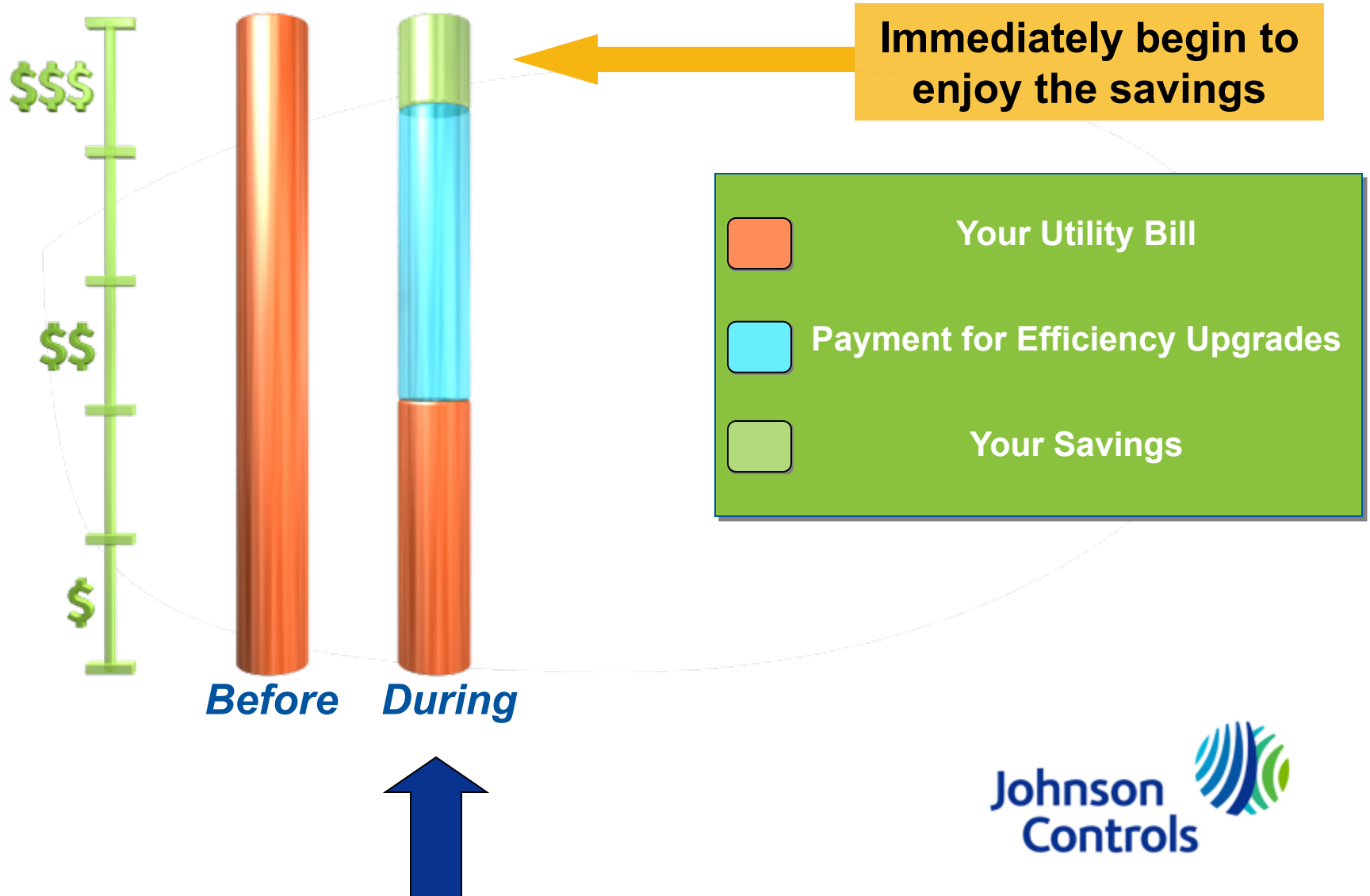
**How are your costs impacted
with Performance Contracting?**

**How do I include Solar or other Renewable Energy
Systems in a Performance Contract?**

Performance Contracting – your costs today

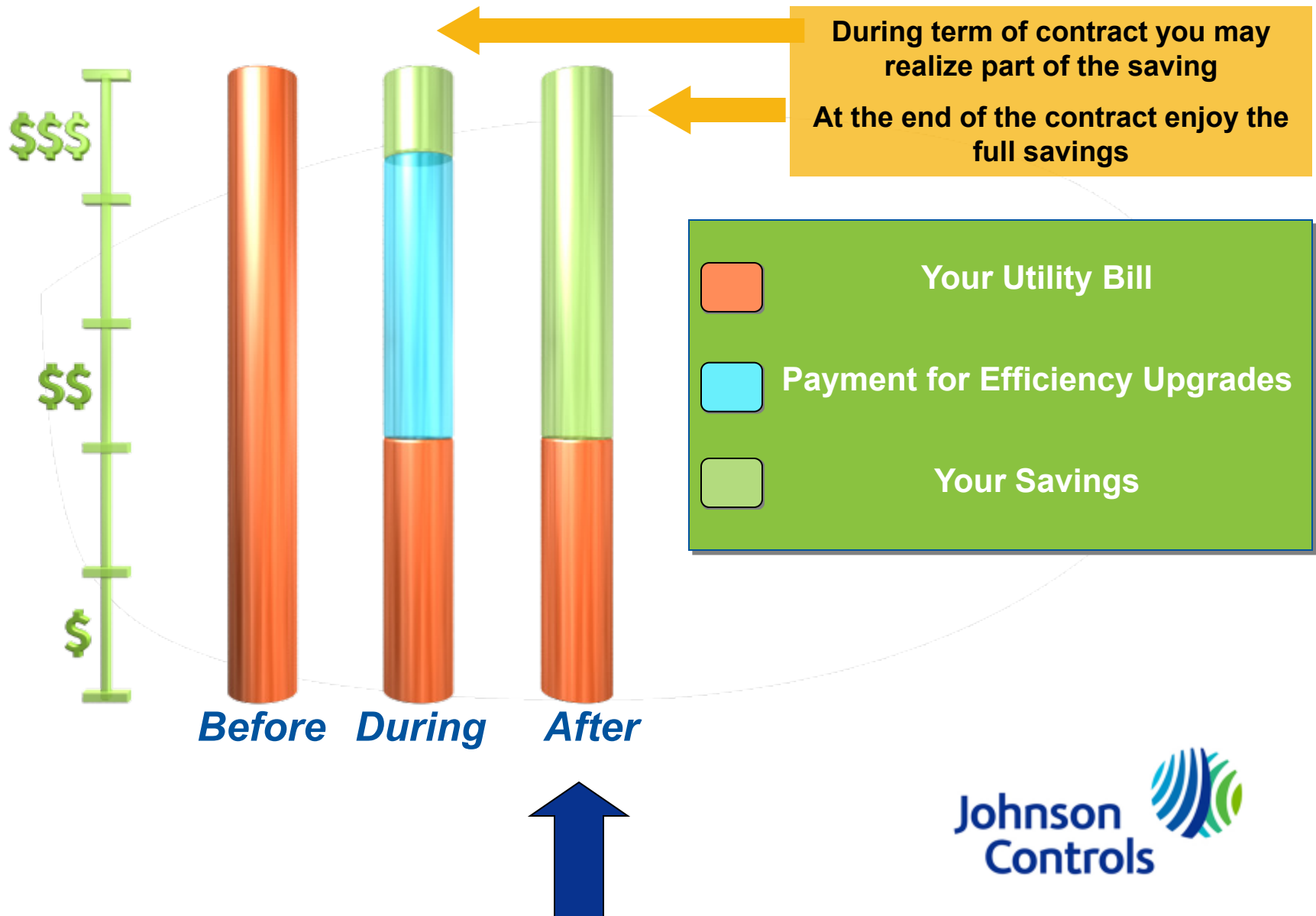


Performance Contracting – during the term of the contract



Note: this is for illustrative purposes

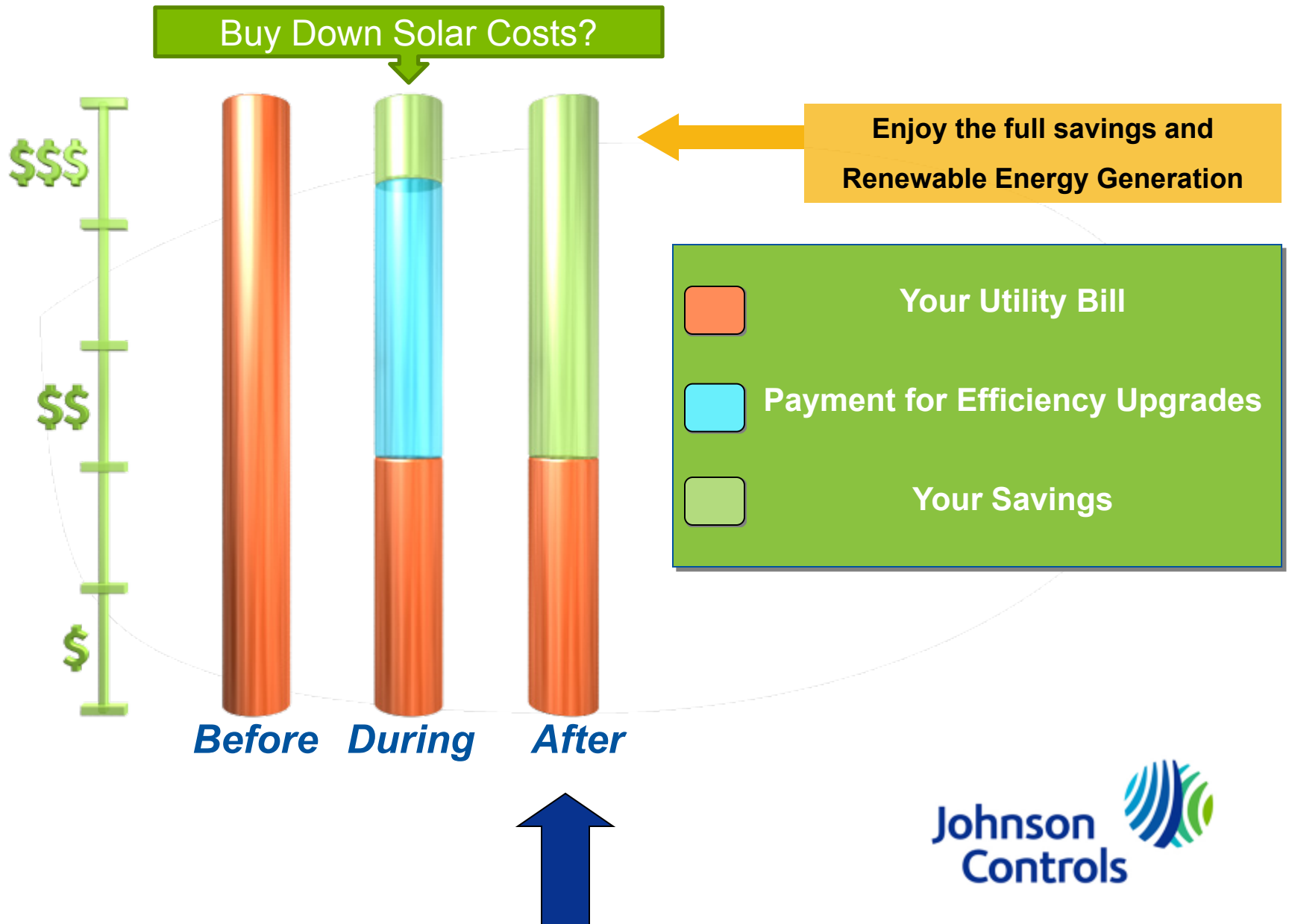
Performance Contracting – enjoying the full savings



Note: this is for illustrative purposes



Use some or all of the savings to buy down the cost ?



Note: this is for illustrative purposes

Energy Efficiency - Dallas Convention Center

- Re-commission and replace chillers and cooling towers
- Use free cooling
- Retrofit lights
- Upgrade building control and automation systems
- Water conservation
- Optimize HVAC system
- Correct power factor
- Add Solar water heating



Dallas Convention Center

Project Cost

- \$16 Million

Guaranteed Annual Savings

- Over \$2 Million in Utility costs
 - 83% in electricity
 - 16.5% in gas
 - 0.5% in water

Project Term

- 10 year Performance Period
 - October 1, 2008



Project included Solar Water Heating in the Performance Contract



High ROI for many Swimming Pool Heating systems make them easy to include in a bundled Performance Contract



Beaumont Federal Corrections Complex Beaumont, TX



Location

5430 Knauth Rd
Beaumont, TX

Installation Date

March 2011

Number of Solar Panels

178 solar collectors

Solar Panel Square Footage

8,900 sq.ft.

Ft. Bliss, Texas

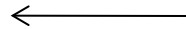
Solar Air Conditioning

40-ton
Chiller &
Storage



Solar Hot Water
Storage
Pumping Station

High Temperature
Tracking Solar Trough



Beaver County Utah

7,200-gallons per day
~30% of Facility Hot Water Load
30KW PV System



Overview solar thermal energy (annual values)

Collector area	2,570 ft ²
Solar fraction total	32.2%
Total annual field yield	1,116,793 kBtu
Collector field yield relating to gross area	435 kBtu/ft ² /Year
Collector field yield relating to aperture area	466 kBtu/ft ² /Year
Max. fuel savings	1,223,123.9 ft ³ : [Natural gas H]
Max. energy savings	1,240,880.5 kBtu
Max. reduction in CO2 emissions	185,675.7 pound



Nueces County Court House and Jail

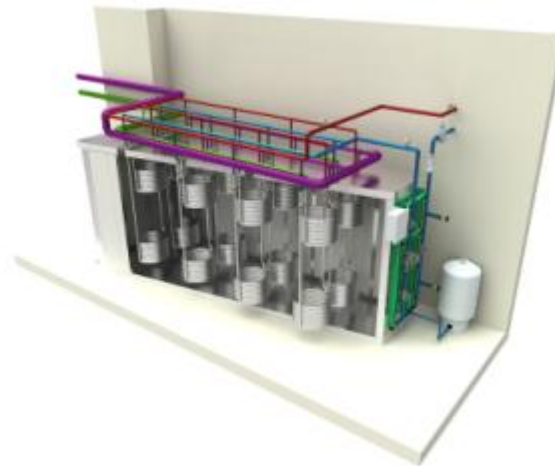


Solar Water Heating System
(84) - 4' x 10' collectors = 3360 ft²

25KW PV System



Drive Down the Installation Costs for Solar Thermal



Summary

- Performance Contracting is a great financing vehicle for customers with no capital budget.
- Finding the “Low-Hanging Fruit” i.e. Lighting
- Using any additional savings to buy-down the RE System
- Bundled approach to EE & RE
- Third Party Financing
 - Project must cash flow and provide the IRR the lenders want. Many deals will not pass review.

Thank you



Speaker

FLS Energy, Inc.



Dale Freudenberger

President

dale@flsenergy.com

- Dale is a founding partner of FLS Energy and has overseen its growth from 3 employees in 2006 to 75 employees today.
- FLS Energy has been recognized as the fastest growing company in North Carolina for the past two years by Inc Magazine.
- Oversaw the development of the solar energy system atop the Proximity Hotel in Greensboro, the first LEED Platinum-certified hotel in America. Commissioned the largest flat plate solar thermal system in the country at Prestage Farms and over 2000 solar thermal systems on military bases.
- Serves on advisory boards for Western Carolina University's Electrical and Computer Engineering Technology Program and the University of North Carolina Energy Frontier Research Center's Industrial Advisory Board.
- 2012 Ernest & Young Entrepreneur of the Year Award recipient.

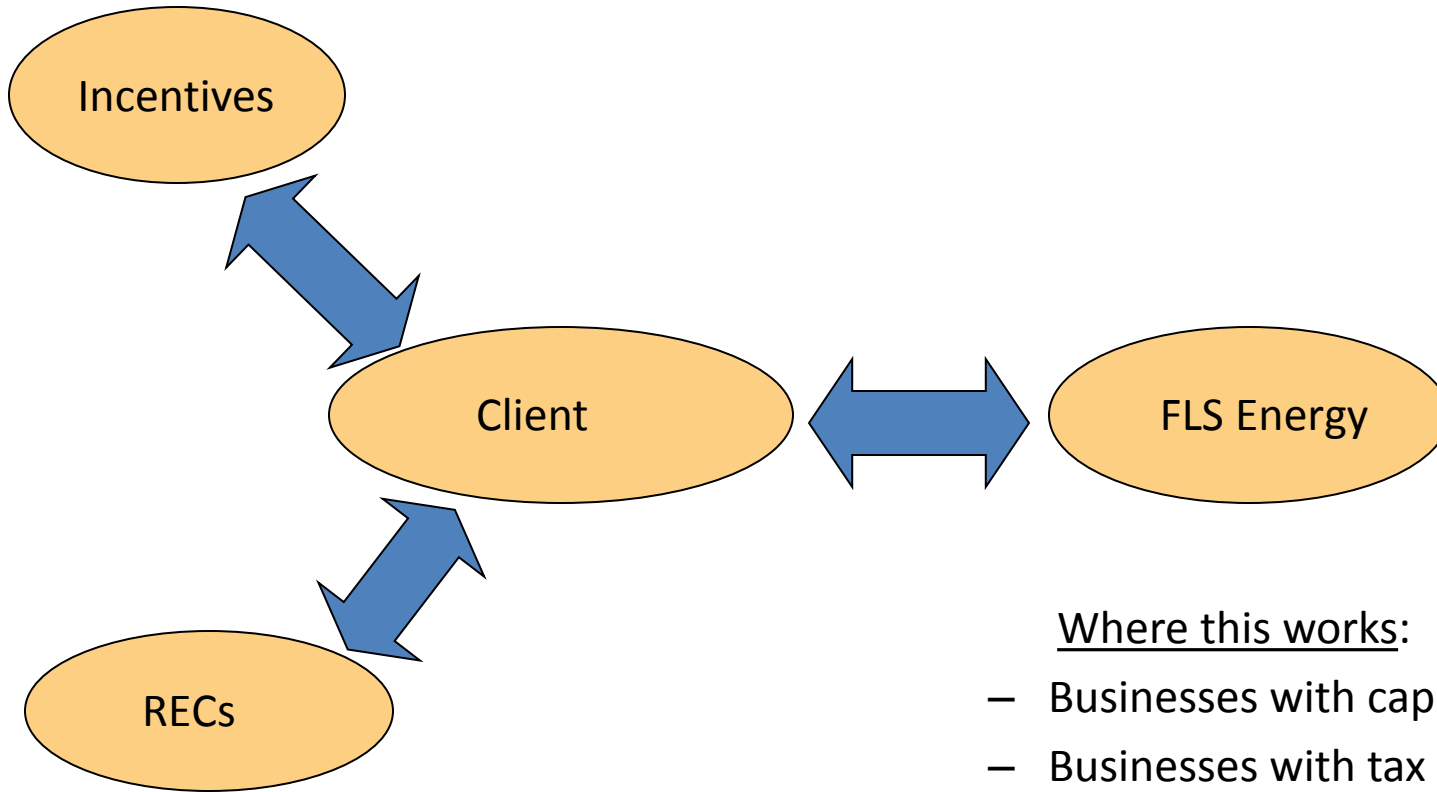




Financial Models: Emerging Trends in Commercial Solar Water Deployment

Dale Freudenberger, President | www.flsenergy.com

Conventional Equipment Purchase

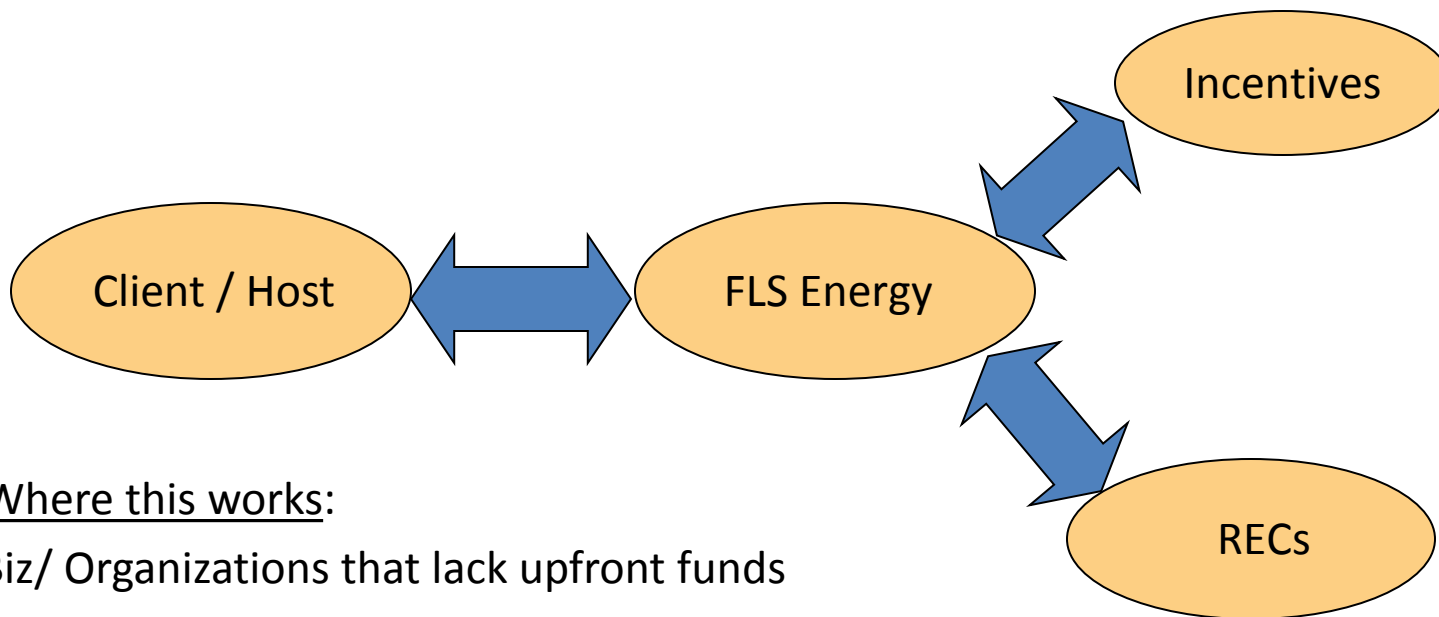


Where this works:

- Businesses with capital available
- Businesses with tax appetite
- New construction, fold into large project financing

Solar Utility

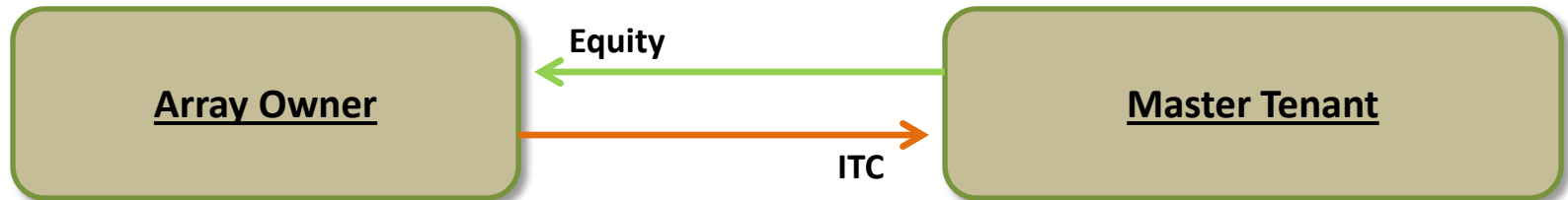
Power Purchase Agreement



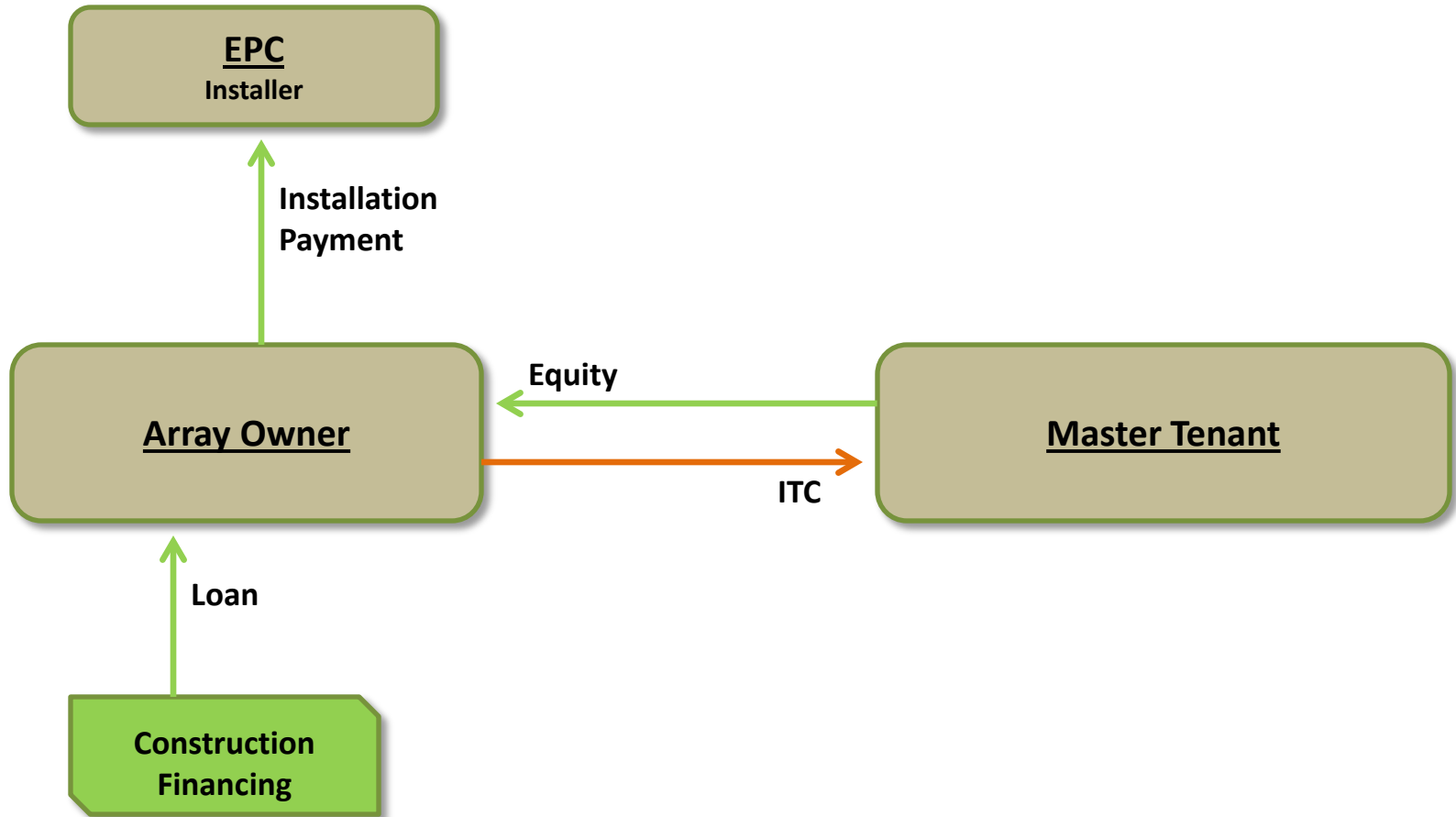
Where this works:

- Biz/ Organizations that lack upfront funds
- Non-profit and other tax exempt organizations
- Groups that want long-term maintenance/ performance guarantees

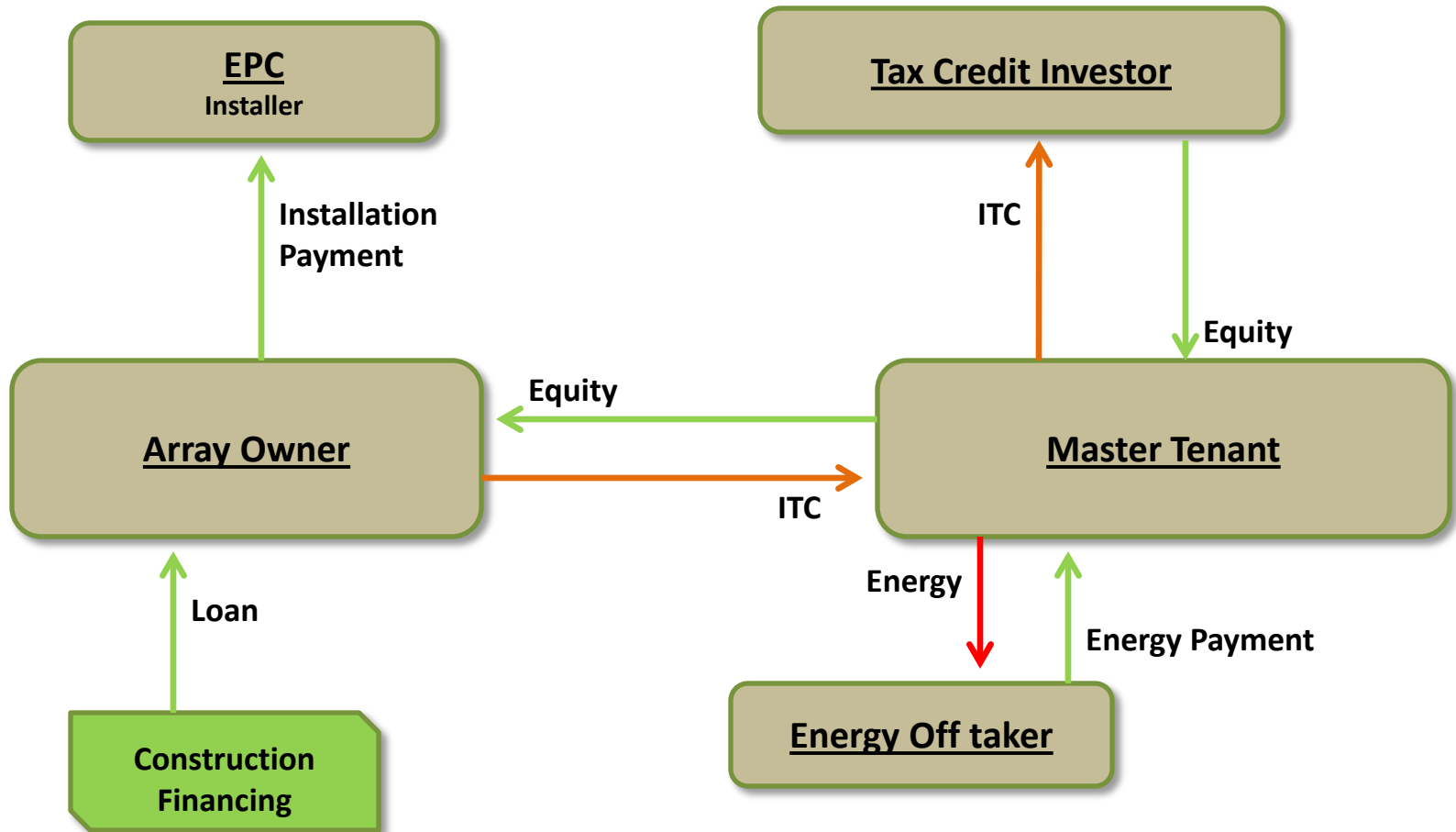
Master Tenant Structure



Master Tenant Structure



Master Tenant Structure



Camp Lejeune Jacksonville, NC



Prestage Farms St Pauls, NC





Questions?

Question and Answer Session

Please type your questions into the Q/A window on your screen.

For a copy of the slides or additional questions, please contact:
James Critchfield, Director, Clean Technology Initiatives
(Critchfield.James@epamail.epa.gov)