Efficiency Works™

Estes Park Light and Power | Fort Collins Utilities | Longmont Power & Communications | Loveland Water and Power | Platte River Power Authority

Dynamic Duo:
The Combined Power of Energy Efficiency and Renewables

March 22, 2018

General Information

- Please be sure to sign in at back of room
- Restrooms located in the lobby west of the floating wall
- Feel free to get up, stretch and replenish refreshments
- Emergency exits for the Colorado Room are located in the west and northeast – Evacuation Assembly point is Washington Park or City Hall if inclement weather

Upcoming Events

Put Your Summer Irrigation on a Budget

April 26

Fort Collins 8:30-10 a.m., networking 10-10:15 a.m.

Learn to create water budgets based on landscape needs, while discovering best practices and other incentives for efficient irrigation. Also, see the new, free Fort Collins Utilities service that helps customers and contractors visualize the impact of excess summer water use.

Energy Efficiency 101

May 24

Fort Collins 8:30-10 a.m., networking 10-10:15 a.m.

Longmont 3-4:30 p.m., networking 4:30-4:45 p.m.

Learning the basics of energy efficiency can help you understand your utility bills and manage energy use. Find out about common terms, ways to evaluate technology and why utilities support efficiency. Also learn how to take advantage of utility incentive programs that reduce the cost of improving the performance of commercial facilities.

Efficiency Works Business Tours

June 28 Locations TBD

Take a tour of recently completed Energy Efficiency projects. Transportation and lunch will be provided. Additional details to be released soon.

Efficiency Works™

General Information

- For a limited time, qualified Efficiency Works™ lighting projects can save an additional 25 percent on efficient lighting improvements for new LED fixtures.
- This offer is valid on all commercial building projects that are pre-approved, completed and submitted for payment through November 15, 2018.
- The bonus rebate will be applied *in addition* to current Efficiency Works incentives, while funds last.
- Details, requirements and annual maximums available at *www.EfficiencyWorks.org* .

Efficiency Works™

Speakers

Charles Framularo

E-Source

Director, Market Research Services

Ryan Odell

E-Source

Analyst, Demand Side Management

Bryce Brady

Platte River Power Authority

Customer Services Program Manager – Energy Efficiency

Rhonda Gatzke

Fort Collins Utilities

Senior Energy Services Engineer

Efficiency Works Business:

2018 Energy Efficiency Rebates

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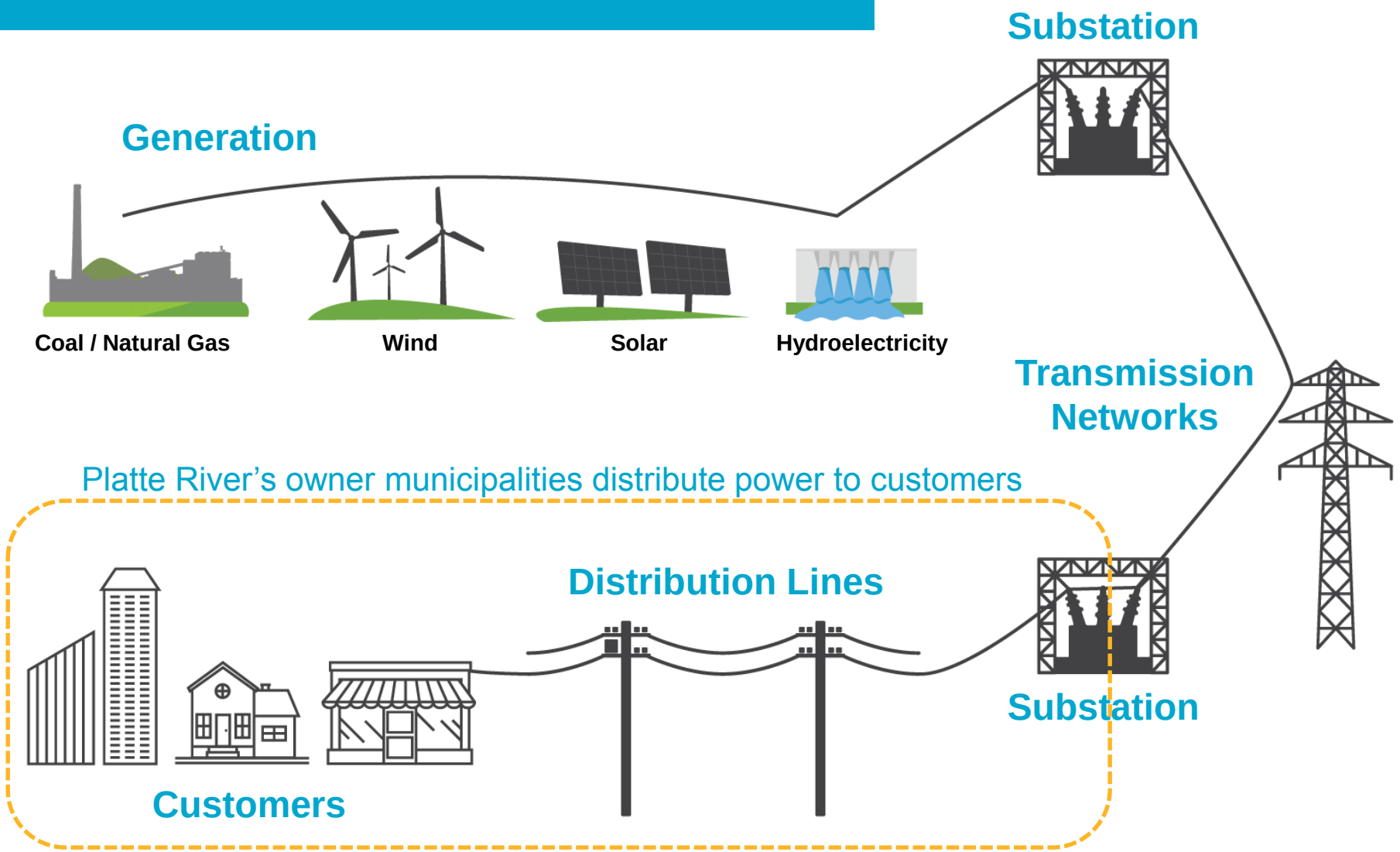
Platte River Power Authority provides electricity to Estes Park, Fort Collins, Longmont, and Loveland



Efficiency Works™

A Collaborative Effort

Program Funding

Platte River Power Authority +

EP =

Estes Park Projects

City of Fort Collins Utilities =

Fort Collins Projects

Power & Communications, City of Longmont, Colorado, Est 1912 =

Longmont Projects

City of Loveland =

Loveland Projects

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Rebates

- **Lighting** – (LEDs & controls)
- **Cooling** – (economizers, controls, evap. cooling, etc)
- **Envelope** – (windows, insulation & cool roof)
- **Food Service** – (cooking & refrigeration equipment, ice machines, etc.)
- **Grocery** – (refrigeration cases, controls & EC motors)
- **Office & IT** – (task lighting, ES computers & plug loads controls, thin client, server virtualization, etc)
- **VFDs** – up to $120 per HP, 75 HP max (fans, pumps, compressors)
- **Custom** – (NC lighting, evaporative coolers, compressed air, special controls, etc.) *Rebates based on $0.10/kWh annual savings or $500/kW*

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Lighting (Retrofit Examples)

HID to LED Example

400w
Metal Halide

100w
LED

~~$269~~
per fixture

With 25% New Fixture Bonus

$336
per fixture

Fluorescent to LED Example

4-Lamp T8's (114w)

LED Troffer (40w)

~~$111~~
per fixture

With 25% New Fixture Bonus

$139
per fixture

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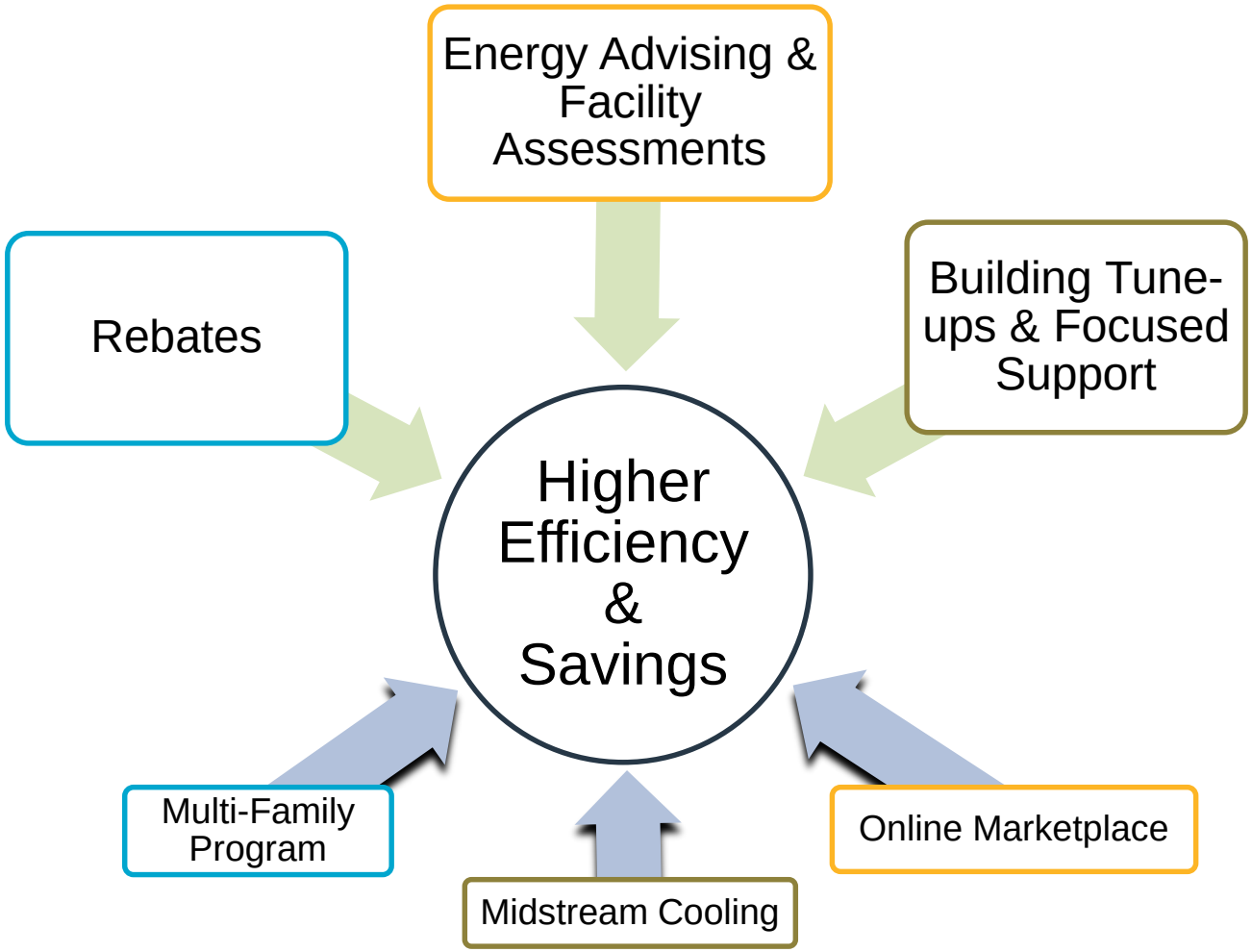
2018 Project and Customer Caps

- Rebate caps are based on a per customer per year allocation
  - Multiple projects will be counted towards this cap
  - Multiple sites with one customer will be included
  - Customer: who is paying for the project
- Per site cap is $50,000 per year per customer
- Customer annual cap is $100,000
  - Multiple non-adjacent sites

Efficiency Works Business



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Optimizing Existing and New Buildings

Building Tune-Up Program

Rebate is based on 100% of the cost of RCx study and implementation support and verification by RSP and customer commits $0.05 per sq ft for implementation of selected measures.

Integrated Design Assistance Program

Performance base incentive for designing high performance commercial buildings. Applies to new construction and major renovation projects in Fort Collins.

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Energy Advising

- Required for incentives over $10,000 (before pre-approval).
- Quality Assurance for the Customer, Contractor and Program
- Connects you to our technical resources

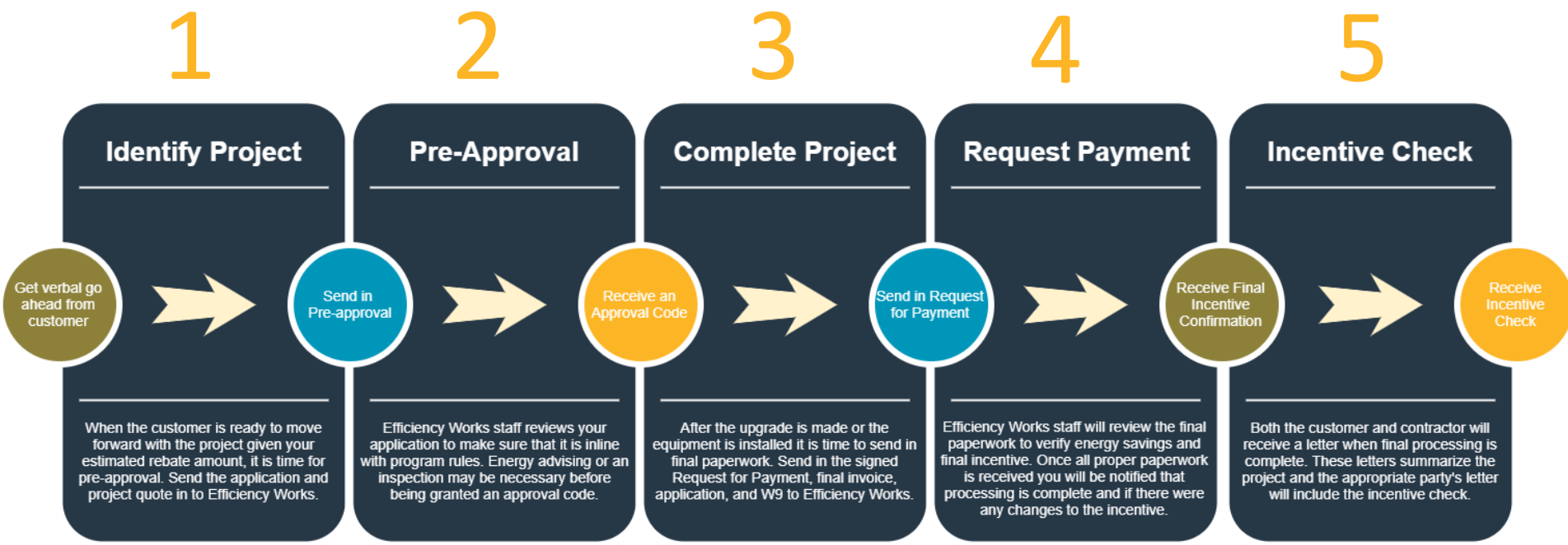
Efficiency Works™

Facility Assessment Benefits

- Provides an efficiency plan
  - ✓ Current utility usage analysis
  - ✓ Benchmarking
  - ✓ Opportunities specific to your facility
  - ✓ Cost and savings information, including rebates
- Connects you to our technical resources

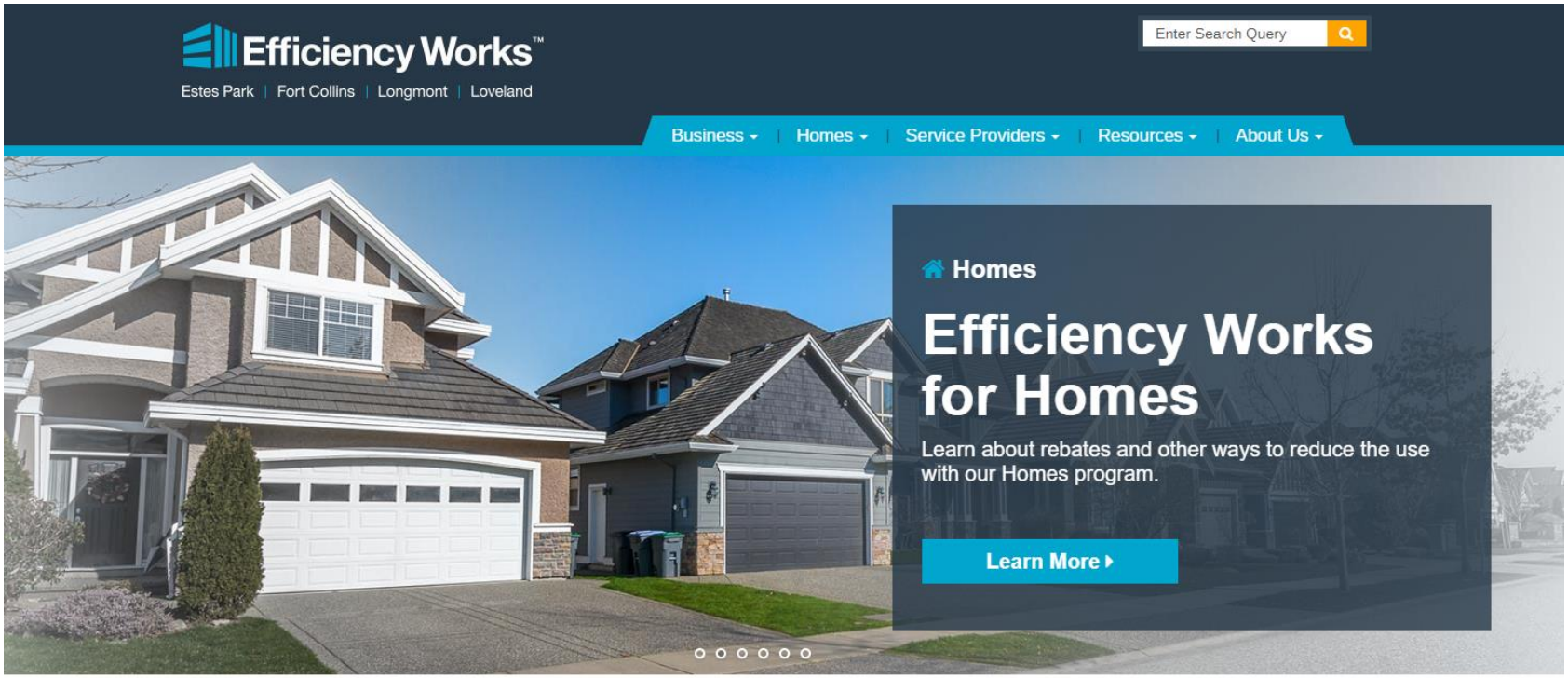
Efficiency Works™

Complete a Project with Efficiency Works



Both the customer and contractor will receive a letter when final processing is complete. These letters summarize the project and the appropriate party's letter will include the incentive check. Receive letters in 4-6 weeks.

New Website (Monday)



www.EfficiencyWorks.org

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Efficiency Works Business:

Contact Us

Info@EfficiencyWorks.CO

1-877-981-1888

Call direct at
970-229-4823

Efficiency Works™

Topics

1. Current PV Incentives in FCU Service Territory
2. Commercial PV in FCU: Status & Targets
3. Motivations & Challenges to Commercial Customer
4. Rates Matter!
5. Example of Commercial 207 kW ProForma
   - Multiple Perspectives: Customer, Developer, Utility

Renewable Programs 2018

- Green Energy Program
  - 2.65 cents per kilowatt-hour by subscription
  - Wind resources through Platte River “Tariff 7”
- Solar Rebates
  - $0.50 per watt$_{DC}$ up to 200 kilowatts commercial
  - Net Metering (aka behind-the-meter ‘BTM’)

~100 kW UAB

Renewable Programs 2018

- Solar Power Purchase Program (SP3)
  - ~1.5 megawatts additional capacity by end of 2018
  - ¢ Long-term power purchase agreement
  - Purchase rate TBD with reverse auction likely (request for bids)
  - Front-of-the-meter aka ‘FTM’ and hosted on customer’s property

~1,000 kW INTEL

FCU Renewables/Parallel Generation

11,702 Total Capacity (KW)

Category Summary

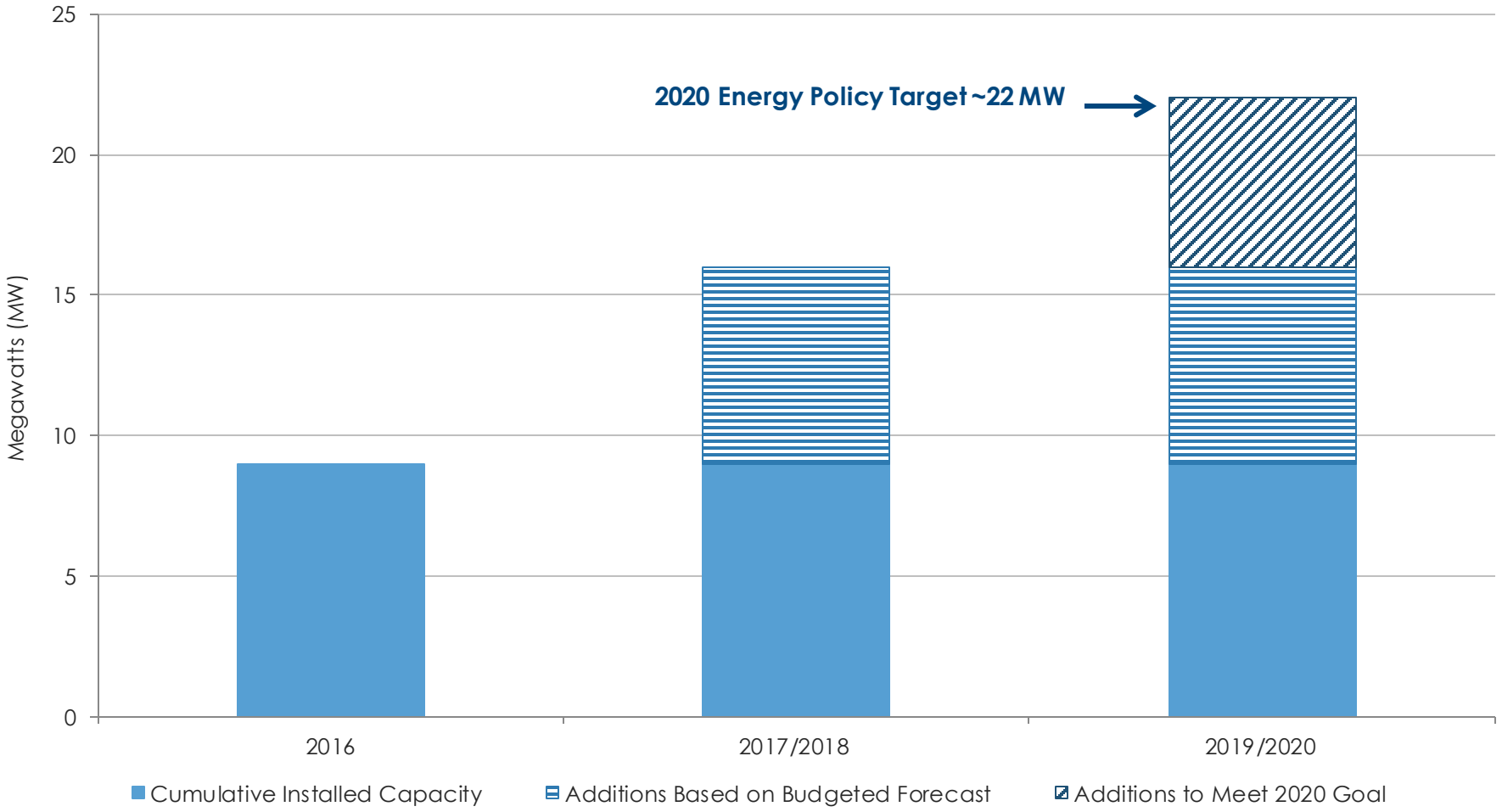
Count	Category	KW
893	Home (PV)	4,839
57	Business (PV)	1,382
14	SP3	3,660
1	CSG	621
2	CoGen	1,200

Energy Policy

20% RE by 2020

2% Energy from Local Distributed Generation by 2020 (~ 22 MW)

Cumulative Solar Capacity



Net-Metered Commercial Projects

What Motivates the Customer?

Green Goals, Environmental Leadership in Sector

Hedge Against Electric Costs

Challenges to the Customer?

Economics due To Rate Structure

Access to Capital; cannot own, prefer 3rd party

Condition of Rooftop

RATES MATTER !

4 Commercial Rate Classes

GS
GS25
GS50
GS750

The best value for solar energy is from consuming at time of generation.

Note the difference (Rate GS):

Energy ~9-10¢/kWh consumed from grid

vs.

Energy ~4.5¢kWh 'excess' energy sent to grid for 'Net-Metered' credit

Conduct Analysis of Energy Cost Savings

City of Fort Collins

RATES MATTER !

4 Commercial Rate Classes

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GS750

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Energy ~9-10¢/kWh consumed from grid

vs.

Energy ~4.5¢kWh 'excess' energy sent to grid for 'Net-Metered' credit

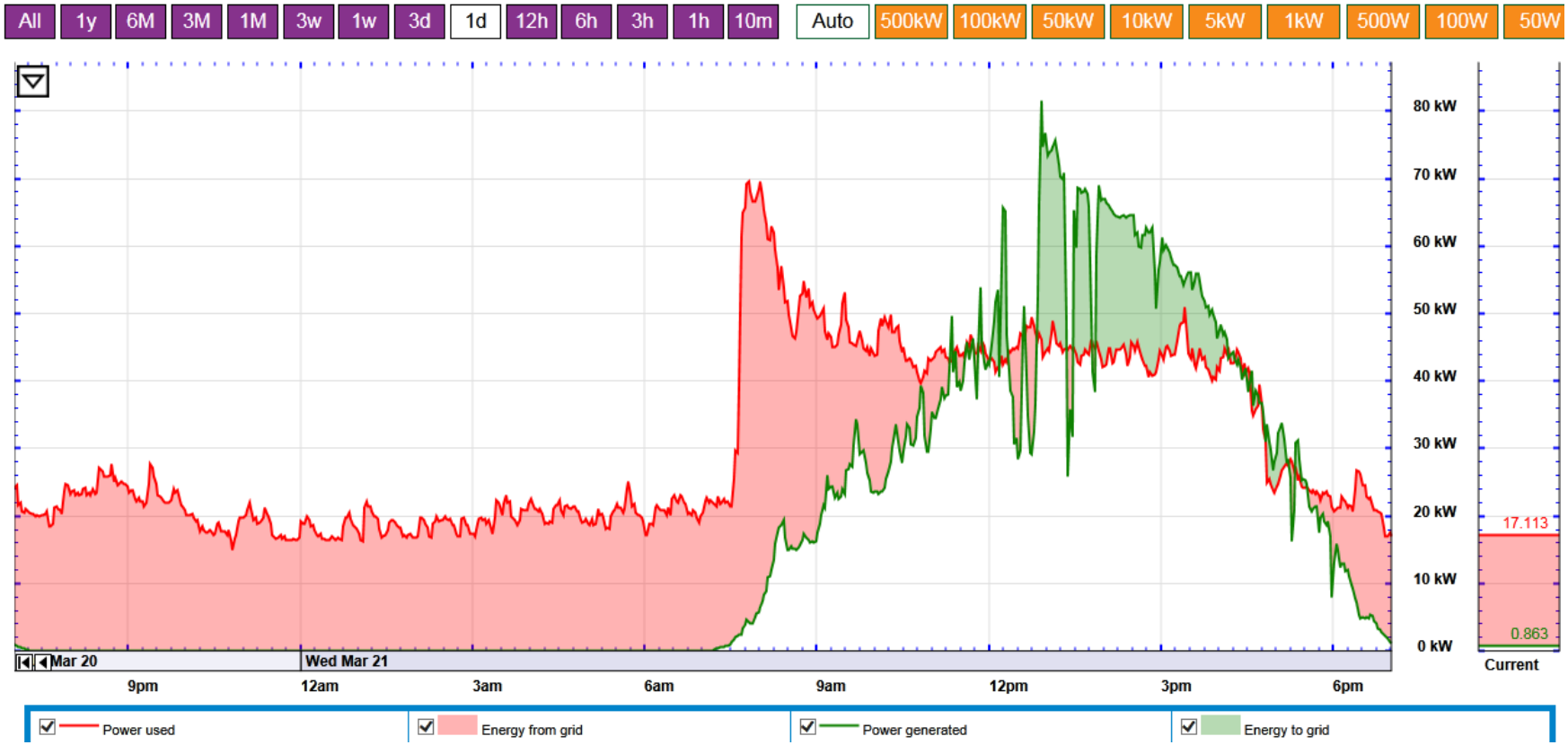
Small Commercial - Rate GS	Charges	Rate Codes	
Fixed			
1 phase; 200 Amp	$3.83 /Mo	E200 & Flat E240	
1 phase; > 200 Amp	$11.29 /Mo	E202	
3 phase; 200 Amp	$5.83 /Mo	E203	
3 phase; > 200 Amp	$13.81 /Mo	E204	
Demand & Energy Charge			
Non-Summer Charge	$0.089676 /kWh		
Summer Charge	$0.102820 /kWh	Net Meter Credit	$0.0452 /kWh

Mid-Sized Com - Rate GS25	Charges	Rate Codes	
Fixed			
1 phase; 200 Amp	$3.83 /Mo	E251	
1 phase; > 200 Amp	$11.29 /Mo	E252	
3 phase; 200 Amp	$5.83 /Mo	E253	
3 phase; > 200 Amp	$13.81 /Mo	E254	
Demand Charge			
Non-Summer Demand Charge	$5.05 /kW		
Summer Demand Charge	$8.81 /kW		
Energy Charge			
Non-Summer Energy Charge	$0.065720 /kWh		
Summer Energy Charge	$0.067628 /kWh	Net Meter Credit	$0.0452 /kWh

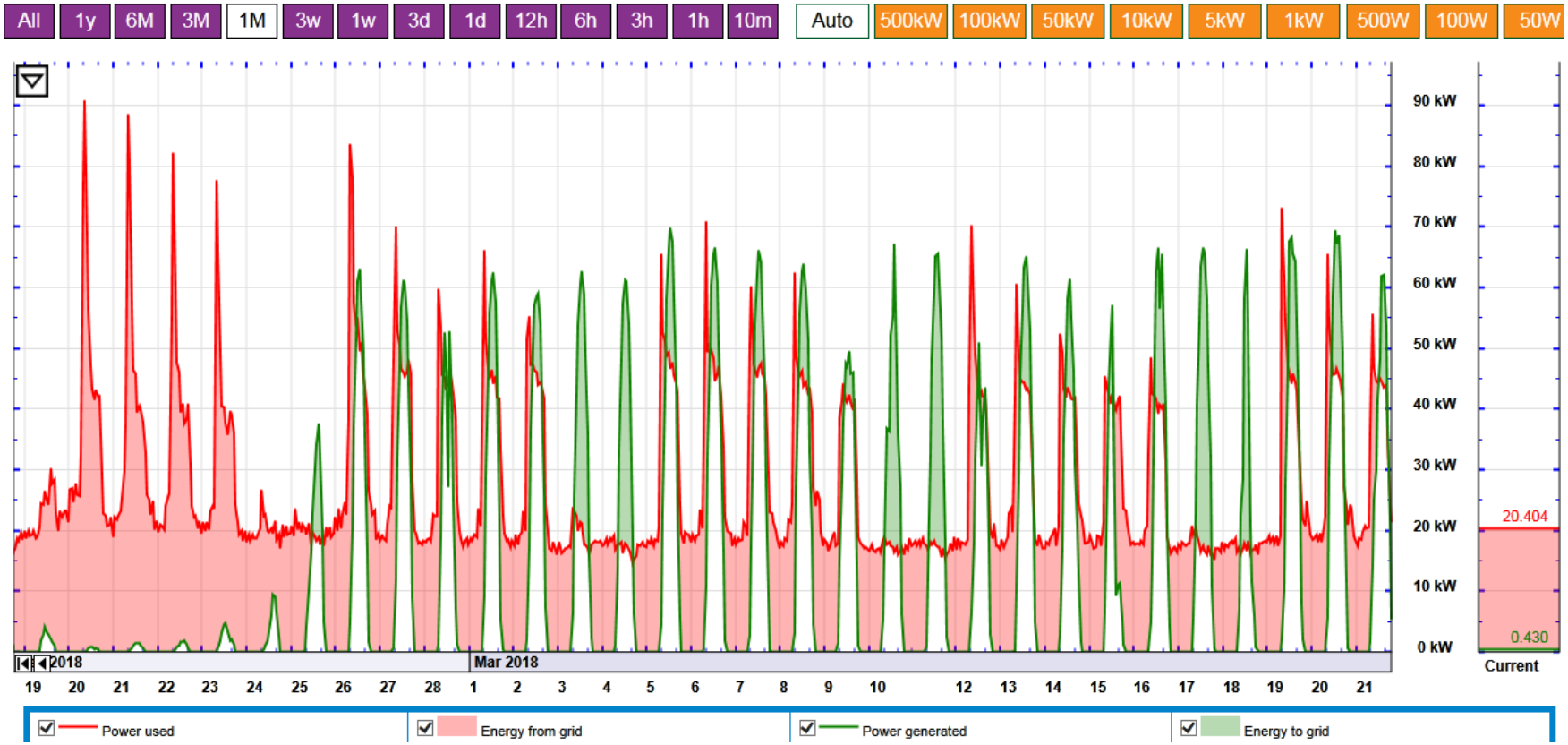
Large Com - Rate GS50	Charges	Charges -1.5%	Charges -2.0%	Charges -3.5%
	Metered at secondary voltage; City owned transformer (Standard)	Metered at primary voltage; City owned transformer MINUS 1.5%	Metered at secondary voltage; Customer owned transformer MINUS 2.0%	Metered at primary voltage; Customer owned transformer MINUS 3.5%
Fixed				
Base	$9.66 /Mo	$9.51 /Mo	$9.46 /Mo	$9.32 /Mo
Add for no phone connect'n	$42.55 /Mo	$41.91 /Mo	$41.70 /Mo	$41.06 /Mo
Coincident Peak Demand Charge				
Non-Summer Coincident Charge	$9.62 /kW	$9.48 /kW	$9.43 /kW	$9.29 /kW
Summer Coincident Charge	$12.62 /kW	$12.44 /kW	$12.37 /kW	$12.18 /kW
Dist Facilities Demand Charge	$6.65 /kW	$6.55 /kW	$6.51 /kW	$6.41 /kW
Energy Charge				
Non-Summer Energy Charge	$0.046004 /kWh	$0.045314 /kWh	$0.045084 /kWh	$0.044394 /kWh
Summer Energy Charge	$0.047912 /kWh	$0.047193 /kWh	$0.046954 /kWh	$0.046235 /kWh

Industrial - Rate GS750	Charges	Charges +1.5%	Charges +2.0%	Charges +3.5%
	Metered at primary voltage; Customer owned transformer (Standard)	Metered at secondary voltage; Customer owned transformer PLUS 1.5%	Metered at primary voltage; City owned transformer PLUS 2.0%	Metered at secondary voltage; City owned transformer PLUS 3.5%
Fixed:				
Base	$16.56 /Mo	$16.81 /Mo	$16.89 /Mo	$17.14 /Mo
Additional charge per meter	$10.10 /Mo	$10.25 /Mo	$10.30 /Mo	$10.46 /Mo
Add for no phone connect'n	$42.55 /Mo	$43.19 /Mo	$43.40 /Mo	$44.04 /Mo
Coincident Peak Demand Charge				
Non-Summer Coincident Charge	$9.49 /kW	$9.63 /kW	$9.68 /kW	$9.82 /kW
Summer Coincident Charge	$12.44 /kW	$12.63 /kW	$12.69 /kW	$12.88 /kW
Dist Facilities Demand Charge				
1st 750 kW	$6.38 /kW	$6.48 /kW	$6.51 /kW	$6.60 /kW
All Additional kW	$3.77 /kW	$3.83 /kW	$3.85 /kW	$3.91 /kW
Energy Charge				
Non-Summer Energy Charge	$0.045262 /kWh	$0.045941 /kWh	$0.046167 /kWh	$0.046846 /kWh
Summer Energy Charge	$0.047170 /kWh	$0.047878 /kWh	$0.048113 /kWh	$0.048821 /kWh

222 LaPorte – 1 DAY



222 LaPorte – 1 Month



~200 kW Project Proforma Example

Variables	Amount
System wattage	207,000
Estimated annual PV production (kWh)	296,400
Electricity price ($ per kWh)	$ 0.0485
Annual electricity price increase	2.5%
Solar panel annual degradation	0.50%
Combined federal and state tax bracket	24.63%
Inverter replacement cost per Watt in year	$ 0.08

Revenues and Expenses	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capital Requirement	$ (260,000)									
30% Federal Investment Tax Credit (ITC)	$78,000									
5-year accelerated depreciation tax saving	$10,886	$17,418	$10,451	$6,271	$6,271	$3,135				
Electricity bill savings	$14,375	$14,661	$14,953	$15,250	$15,553	$15,862	$16,177	$16,499	$16,827	$17,161
Est. Biz Personal Prop. Tax by county	$0	$0	($5,054)	($4,999)	($4,890)	($4,778)	($4,663)	($4,545)	($4,369)	($4,245)
Interest expense	To Be Determined by Client									
Annual net cash flow	**($156,738)**	**$32,079**	**$20,350**	**$16,521**	**$16,934**	**$14,220**	**$11,514**	**$11,954**	**$12,457**	**$12,916**
Accumulated cash flow	**($156,738)**	**($124,659)**	**($104,309)**	**($87,788)**	**($70,855)**	**($56,635)**	**($45,121)**	**($33,167)**	**($20,710)**	**($7,794)**

Revenues and Expenses	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Inverter Replacement					($16,560)					
Electricity bill savings	$17,502	$17,850	$18,296	$18,754	$19,222	$19,703	$20,196	$20,700	$21,218	$21,748
Est. Biz Personal Prop. Tax by county	($4,062)	($3,875)	($3,683)	($3,488)	($3,288)	($3,083)	($2,875)	($2,662)	($2,444)	($2,283)
Interest expense	To Be Determined by Client									
Annual net cash flow	**$13,440**	**$13,975**	**$14,613**	**$15,266**	**($625)**	**$16,620**	**$17,321**	**$18,039**	**$18,774**	**$19,465**
Accumulated cash flow	**$5,646**	**$19,621**	**$34,233**	**$49,499**	**$48,874**	**$65,493**	**$82,814**	**$100,853**	**$119,627**	**$139,093**

Revenues and Expenses	Year 21	Year 22	Year 23	Year 24	Year 25
Electricity bill savings	$22,181	$22,621	$23,071	$23,530	$23,997
Est. Biz Personal Prop. Tax by county	($2,057)	($1,888)	($1,653)	($1,477)	($1,362)
Interest expense	To Be Determined by Client				
Annual net cash flow	**$20,124**	**$20,733**	**$21,418**	**$22,053**	**$22,635**
Accumulated cash flow	**$159,217**	**$179,950**	**$201,368**	**$223,421**	**$246,056**

25-YR UNLEVERED Internal Rate of Return (IRR)
9.6%

Perspectives: Customer, Developer, Utility

Questions from the Customers' Perspective?	Questions from the Contractors' Perspective?	Questions from the Utility Perspective?
What is my Return on Investment? When is my cash flow positive?	What is clients' energy usage patterns?	Interconnection Agreement - required standards on equipment and design configuration
Up front costs? (up front debt?)	What is clients' rate schedule (wrt Demand charges)	
		Rebate processing and eligibility (ensuring rebate funding appropriations)
Perhaps:	How do I design the system for best value and performance?	
What % of my bill will be covered by Green Energy?		120% sizing (gross generation to gross consumption)
Can I retain the sRECs (aka the 'bragging rights')?	How is my Capacity Factor? (A. ~1,400 kWh/kW-dc)	
		Evaluate circuit loading by DG capacity
Will it favorably impact my Peak Demand?	Can I bring the Financier?	
How is system performance estimated? (A.~1,400 kWh/kW-dc)		Monthly Reports to Federal Energy Information Agency EIA
Will it unfavorably impact my buildings Roof?	All Project Development Concerns	
Will it unfavorably impact my buildings O&M?		How will this contribute to our Energy Policy Goals?
	Contractor files Interconnection Application w/Utility	
Will I get a warranty on the system performance?	Contractor files Rebate Application w/Utility	
	Contractor provides Commissioning Tests; Utility Witnesses	
What about de-commissioning costs?		
When is my breakeven? (A. Yr 11)		
What is NPV?		

Commercial Solar FCU

Resources-

Link to Rates:

https://www.fcgov.com/utilities/business/manage-your-account/rates/electric

Link to our Rebate and Interconnection & sREC Agreement:

https://www.fcgov.com/utilities/residential/renewables/solar-rebates

MV-Web Tool for FCU Commercial Customers:

https://www.fcgov.com/utilities/business/manage-your-account/electriconnect

Rhonda Gatzke
Sr Energy Services Engineer
rgatzke@fcgov.com
970-416-2312

END. Q&A.

Business Customer Acquisition of Photovoltaic Systems

Strategic Implications for Your Business

Charles Framularo

Director, Market Research Services,
E Source

E Source

Agenda

Research background

Adoption of PV

Barriers to adoption and engagement strategies

The future of PV

Background & Objectives

Background

- Changes in market conditions appeared to be affecting changes in business customer attitudes and preferences for PV

Objectives

- Identify those most likely to adopt PV
- Provide insight into motivations and drivers of business customer acquisition
- Understand barriers and provide strategies for overcoming those barriers

Methodology

Two-Phased Approach:

- Qualitative: Get insight into decision-makers & future prospects relevant to existing/new installations
- Quantitative: Provide statistically reliable assessments of actions and motivations now and projections for the future

Quantitative Methodology

- 802 large and medium-sized businesses in the US
- Participants represent businesses with more than 50 employees in eight sectors
- ~5% of all such business establishments

Adoption of PV

Facilities with PV Systems Installed

Of the 35% of facilities with a PV system:

79% are owned

18% are leased

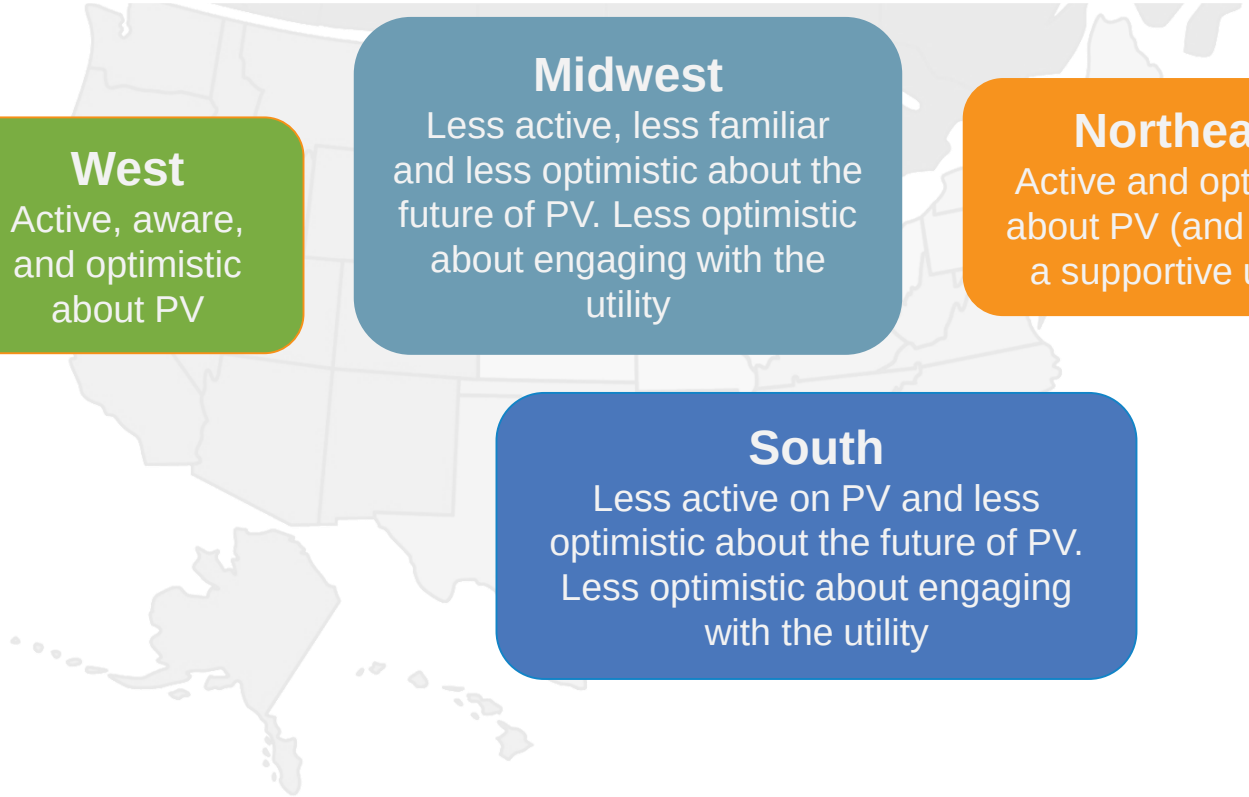
About 1/3 of the larger facilities represented by the sample have at least one PV system operating, with most being owned.

At the time, these systems were also new: 84% said their most recent system was installed since 2011.

As far as electricity generated, the systems are providing most with a significant amount of coverage.

Percentage of electricity needs covered (%) (n = 317)	Percentage of respondents (%)
0–20	31
30–70	59
80–100	10

Overview of Regional Variation



West
Active, aware, and optimistic about PV

Midwest
Less active, less familiar and less optimistic about the future of PV. Less optimistic about engaging with the utility

Northeast
Active and optimistic about PV (and expect a supportive utility)

South
Less active on PV and less optimistic about the future of PV. Less optimistic about engaging with the utility

PV Adopter Characteristics

LESS Likely to Have **PV** Installed

- Healthcare & Manufacturing sectors
- Use traditional utility
- NOT on a demand rate
- Medium / low on green commitment
- NOT highly satisfied with utility
- Have not used EE rebates
- Lease their facility
- Number of locations is 1

MORE Likely to Have **PV** Installed

- Grocery, Retail, Lodging sectors
- Use a competitive retail provider
- On a demand rate
- High on green commitment
- Highly satisfied with utility
- Used EE rebates
- Own their facility
- Number of locations is 11+
- Actively manage energy use

Reasons for Acquiring PV Systems

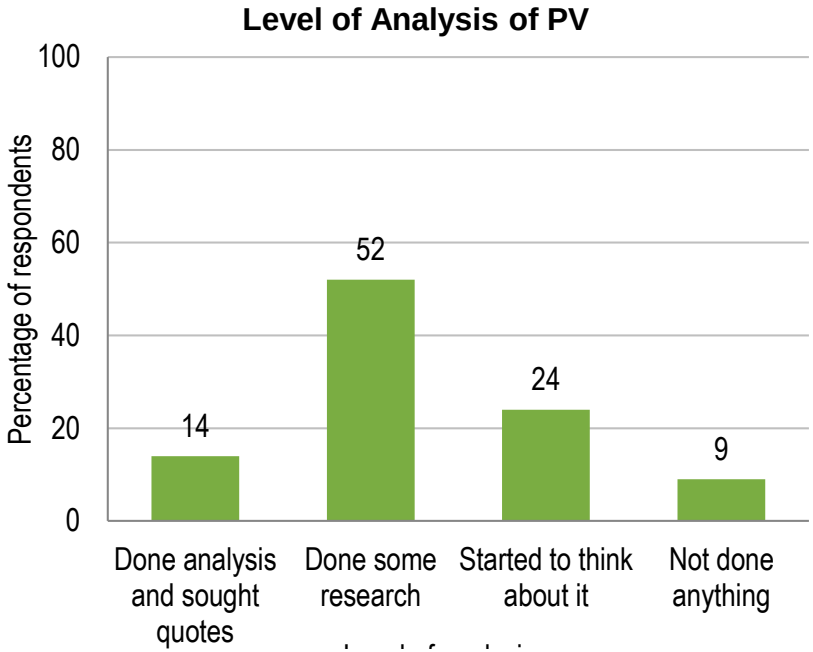
Factor driving the acquisition of EXISTING PV systems	Percentage rating as "single most important" factor (%)
Lower overall electricity costs	13
Enhance the brand and reputation of our company	13
Avoid electric demand charges	10
Help meet overall company environmental / sustainability goals	9
Experiment with the technology to see how well it works	9
Be independent of "grid electricity"	9
Take advantage of rebates and tax credits that were available	9
Help eliminate uncertainty about future environmental compliance costs	8
Help eliminate uncertainty around future electricity costs	6
Respond to specific pressure from customers / stakeholders to reduce our carbon footprint	6

- Also a "key deciding" factor

Barriers to Adoption

Familiarity with PV Among those W/O

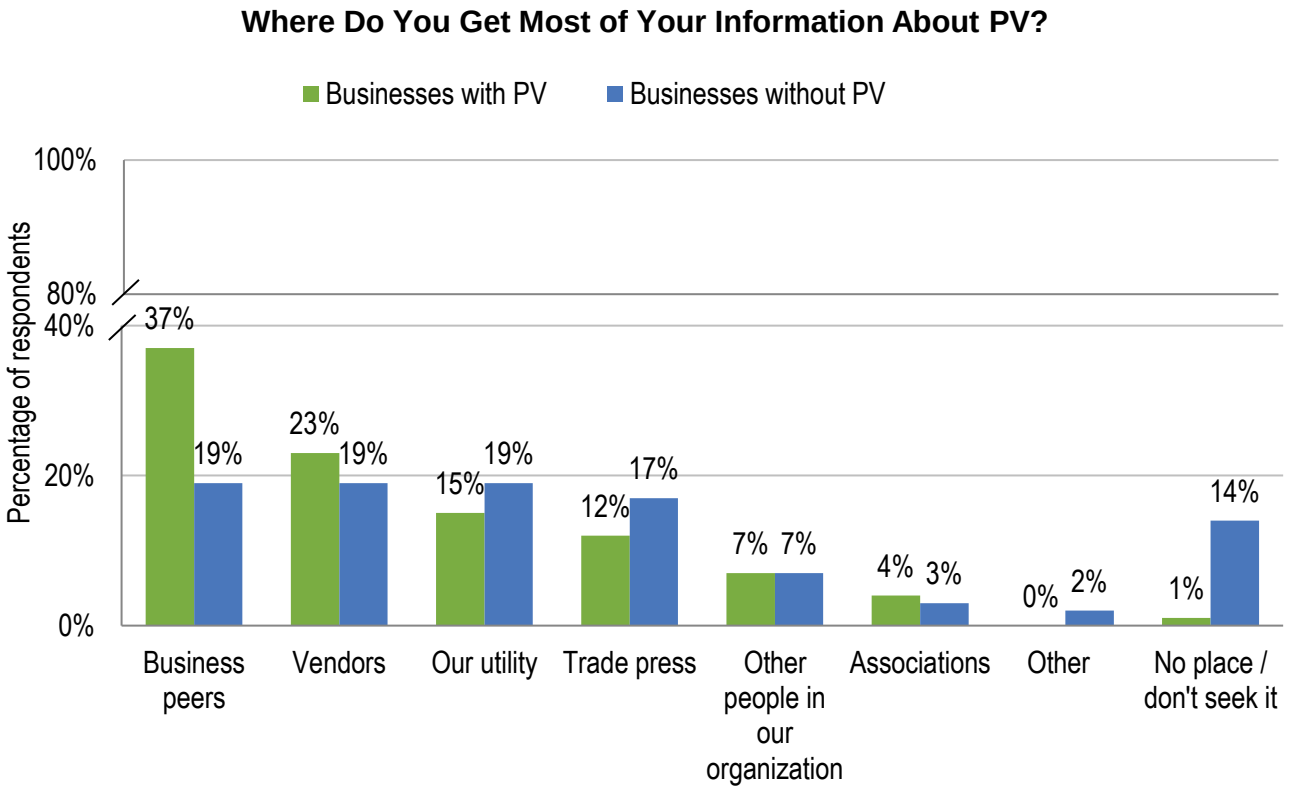
4 in 5 businesses without PV systems say they're familiar with PV, and 2/3 of those have conducted at least some research on PV.



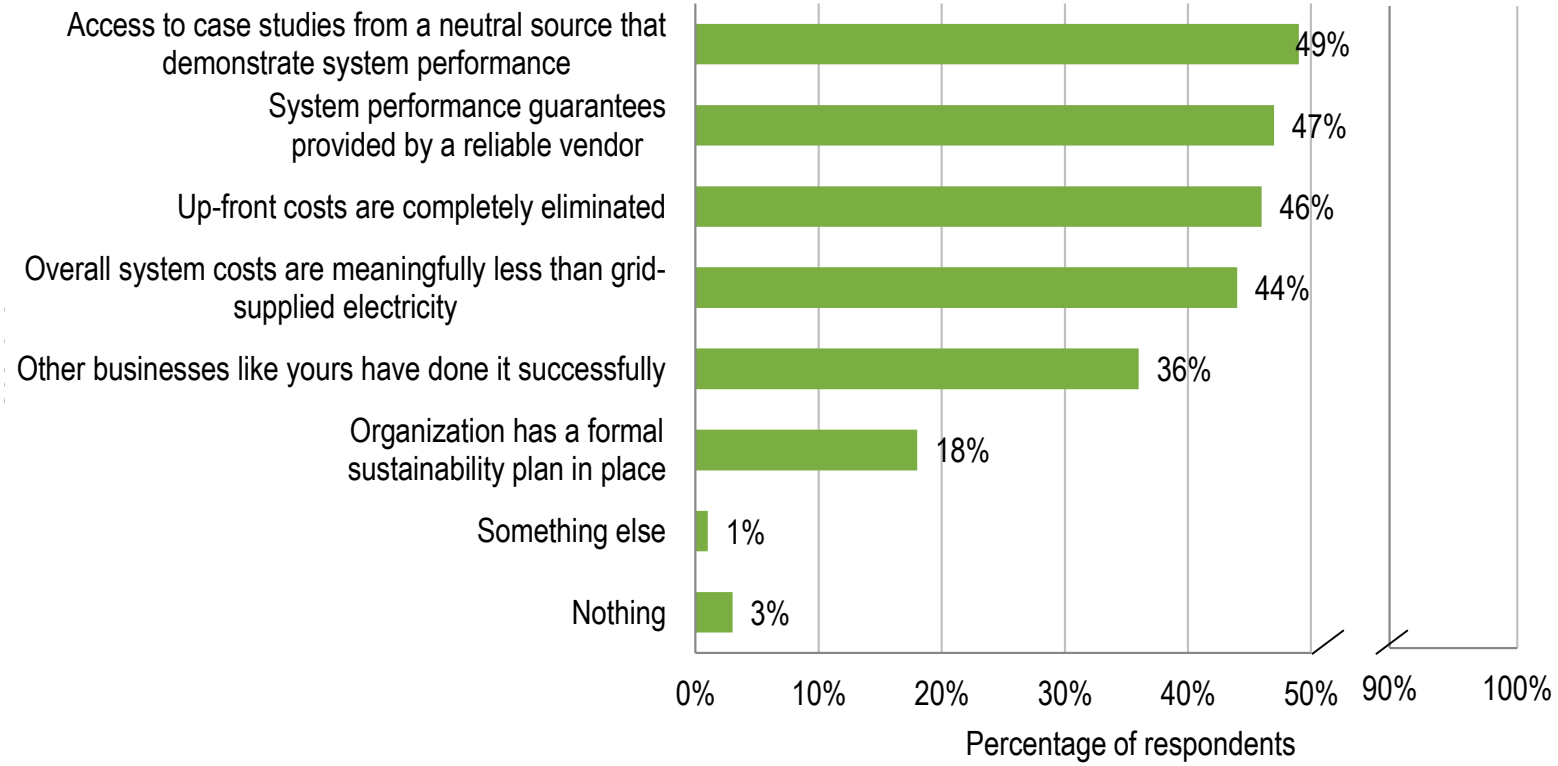
Biggest Barriers to PV Investments

Barrier that limits the ability to acquire an initial or another PV system	Percentage rating as one of two "most limiting" factors (%)
The up-front costs would be too high for us	20
Our management has other concerns that take priority over things like this	14
We don't have enough information to make an informed decision	11
We are not confident in the performance / reliability of the technology	9
We doubt that the overall financials would work for us	9
Our electricity provider's pricing options are not compatible with solar investments	8
We have the space for a PV system, but the sun exposure we have is not adequate	8
We lease our space and it would be challenging to get our landlord / building manager to facilitate the installation	8
We have never thought seriously about it	8

Sources of Information About PV



Influencing Factors



Engagement Tips

Focus on “active energy managers”

- Companies that are more actively engaged in energy efficiency and have made greater commitments to sustainability are more likely to explore new or additional PV systems.

Provide comprehensive proposals

- Customers want clearly outlined design and cost elements.

Provide convenience

- Customers are looking for turnkey solutions. Work with your utility to secure permits and interconnection approvals, determine the best rate structure, and streamline installation.

Create certainty

- Work with your utility to develop specific rate structures and provide performance guarantees that minimizes bill variability.

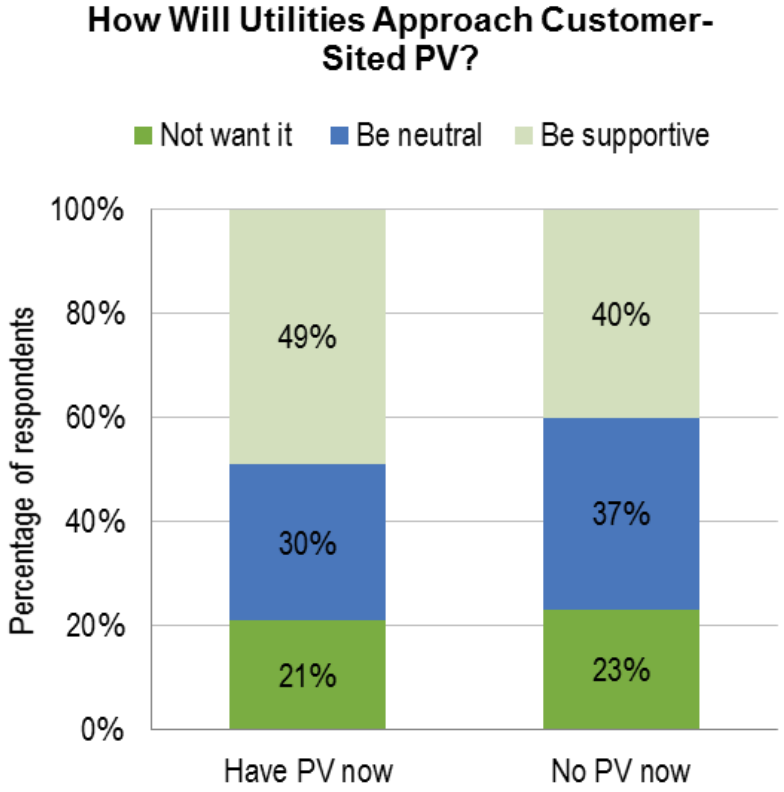
Clarify financial impacts

- Assist business customers in understanding the true financial costs and benefits with detailed bill and rate analyses.

Provide financing options

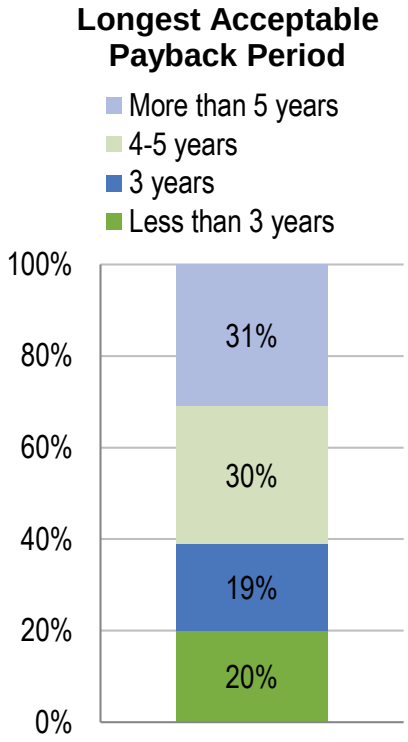
- Work with your utility to develop PV solutions that minimize up-front costs. Potential options include direct utility financing, on-bill financing, and leasing options.

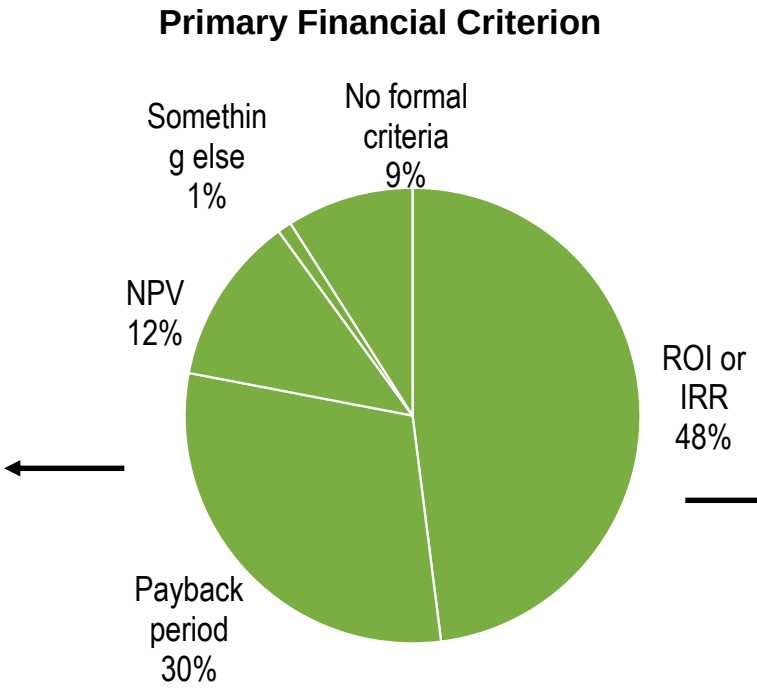
Your Utility as Partner

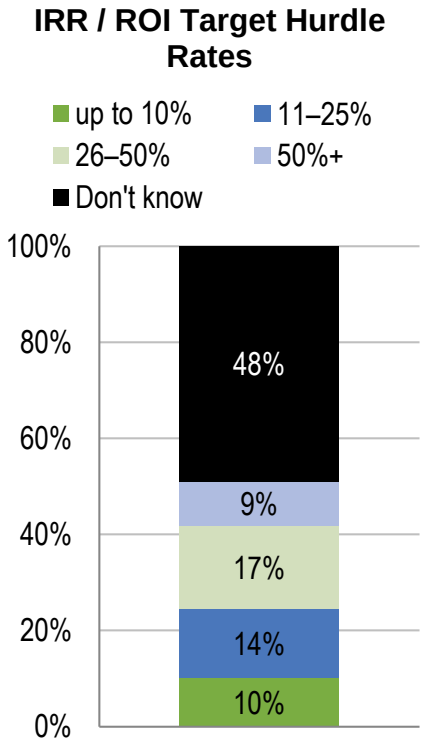


Customers who have installed PV tend to say their electric utilities were supportive and helpful during installation. For example, 69% say their electric utility was generally supportive of their installation, whereas only 3% said their utility was negative.

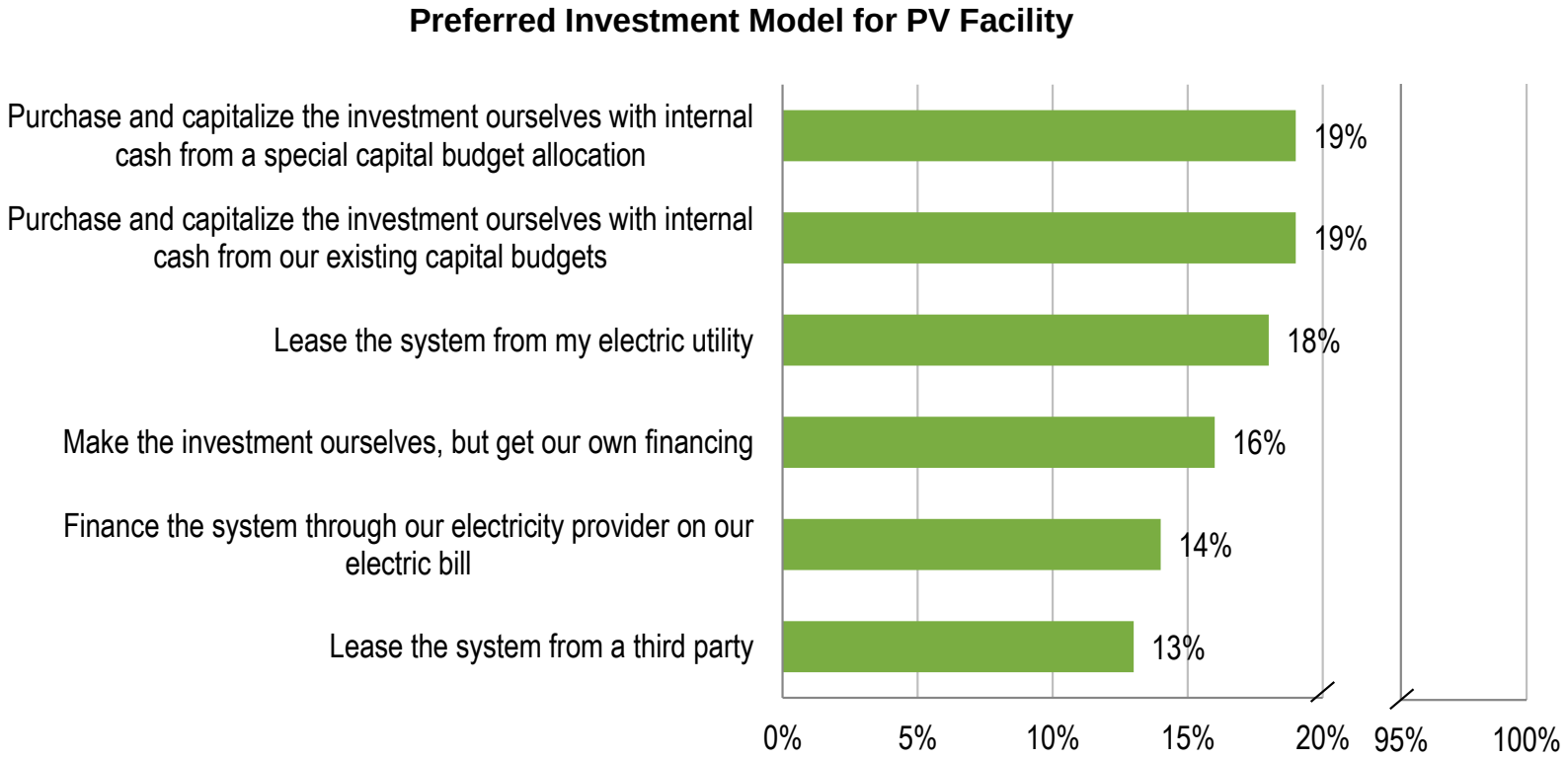
Financial Criteria





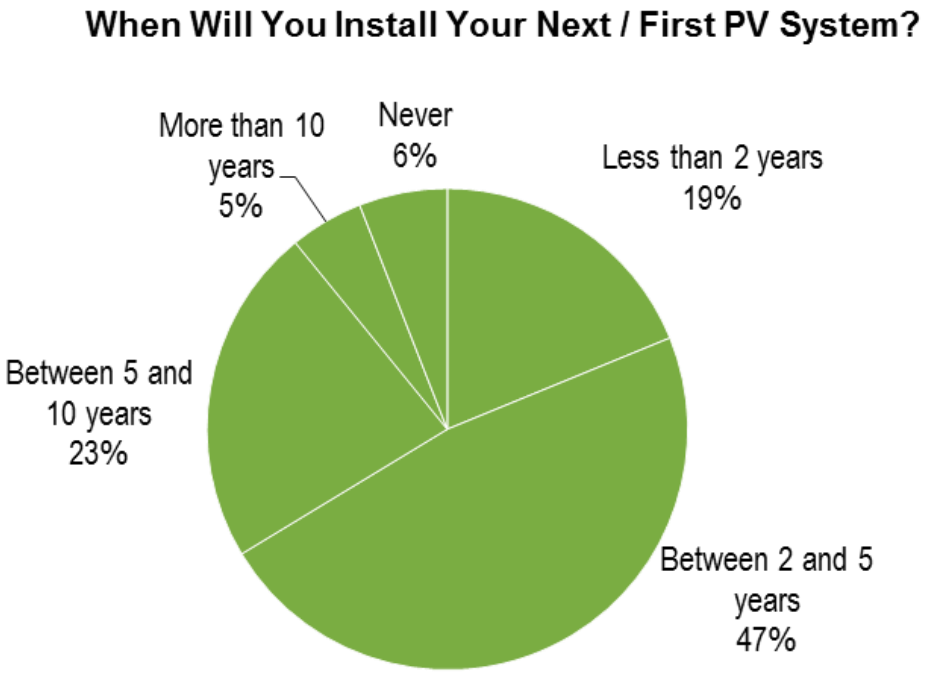


Financial Models for PV



The Future of PV

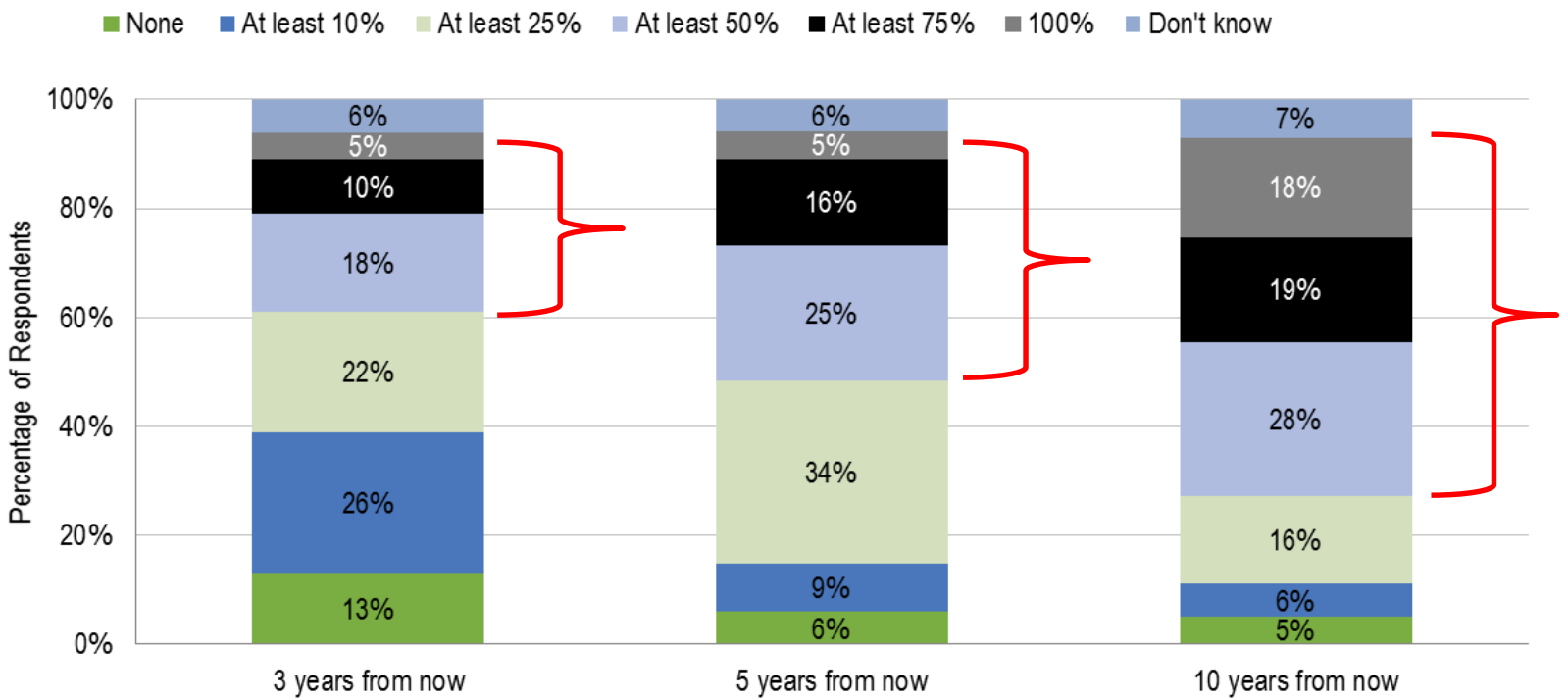
Who Says They Will Have PV?



These groups include customers that:

- Are grocery stores and restaurants
- Are on demand rates and dynamic pricing rates
- Are highly committed to green initiatives and energy-efficiency investments
- Are satisfied with their electricity provider
- Have backup generation
- Have energy-intensive operations
- Operate in states with high electricity costs

Customers expect to install a LOT of PV



Base: Respondents who expect a first / next PV installation (n = 755). **Question 35:** At each of the points in time listed in the table below, about what percentage of your total electricity needs will be met by on-site photovoltaic (PV) solar systems? **Note:** Percentages may not add to 100

For More Information

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