REopt Lite Overview & Training Exercise

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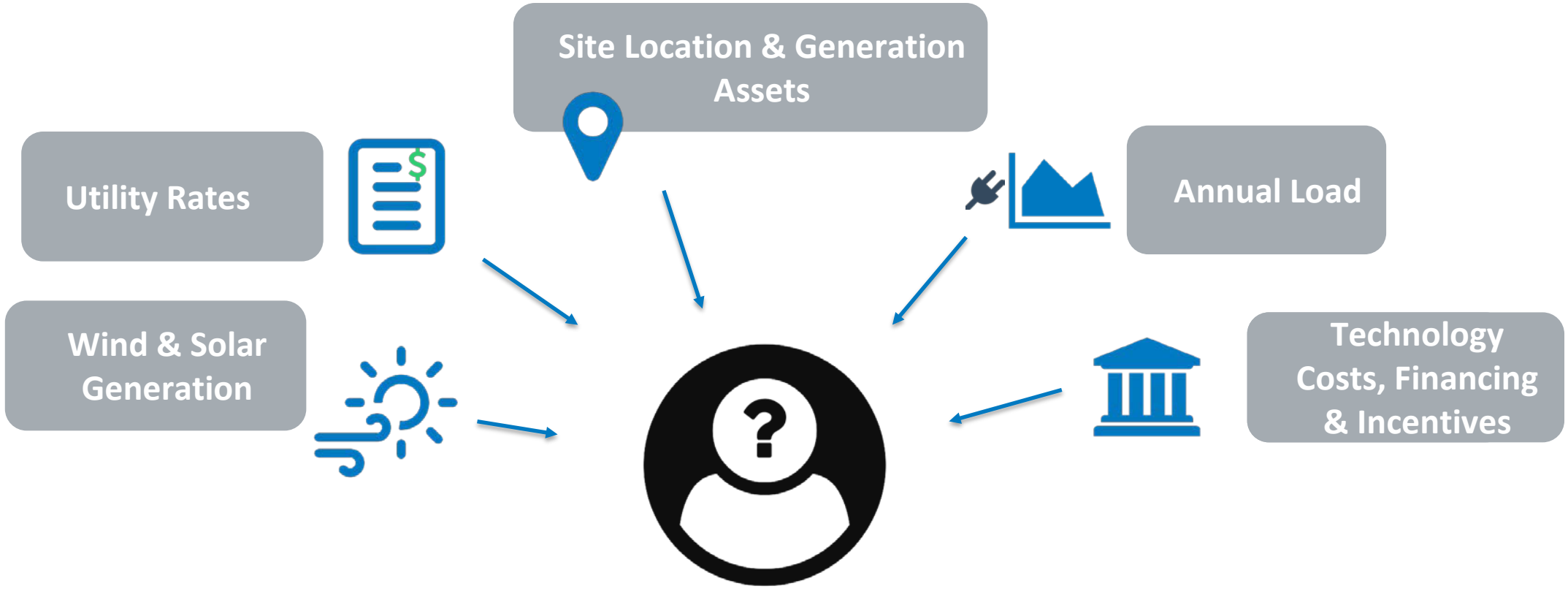
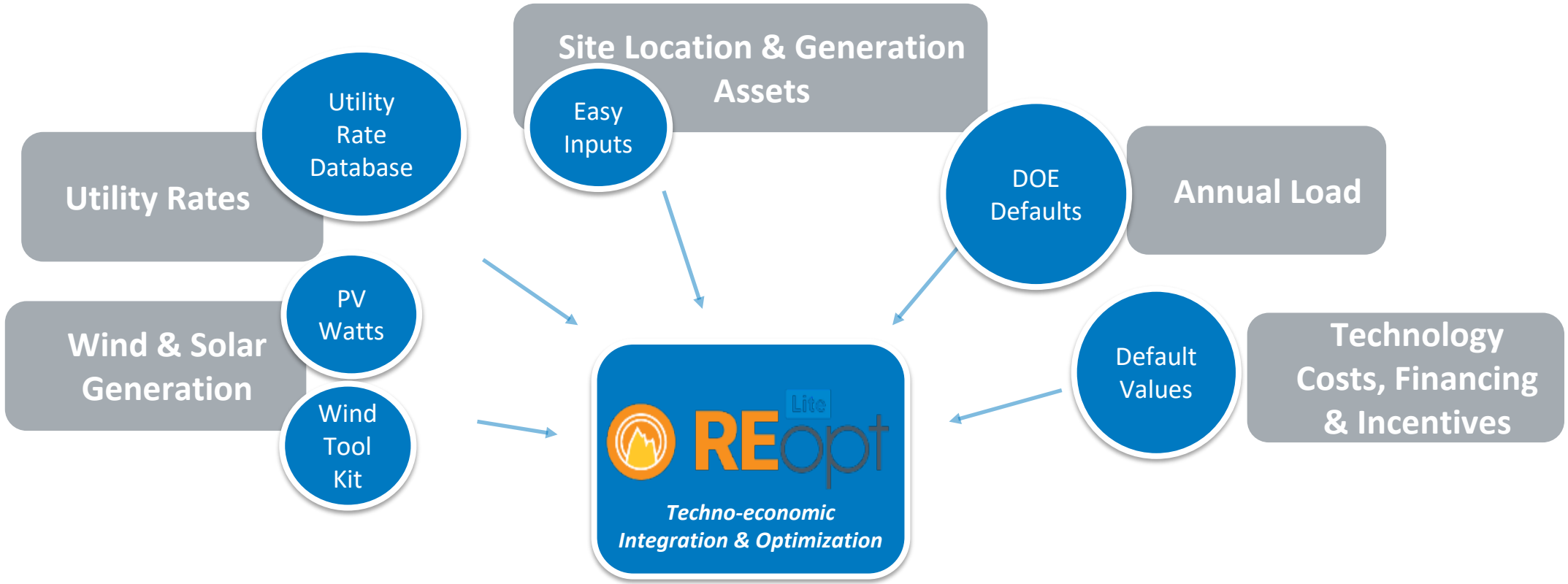
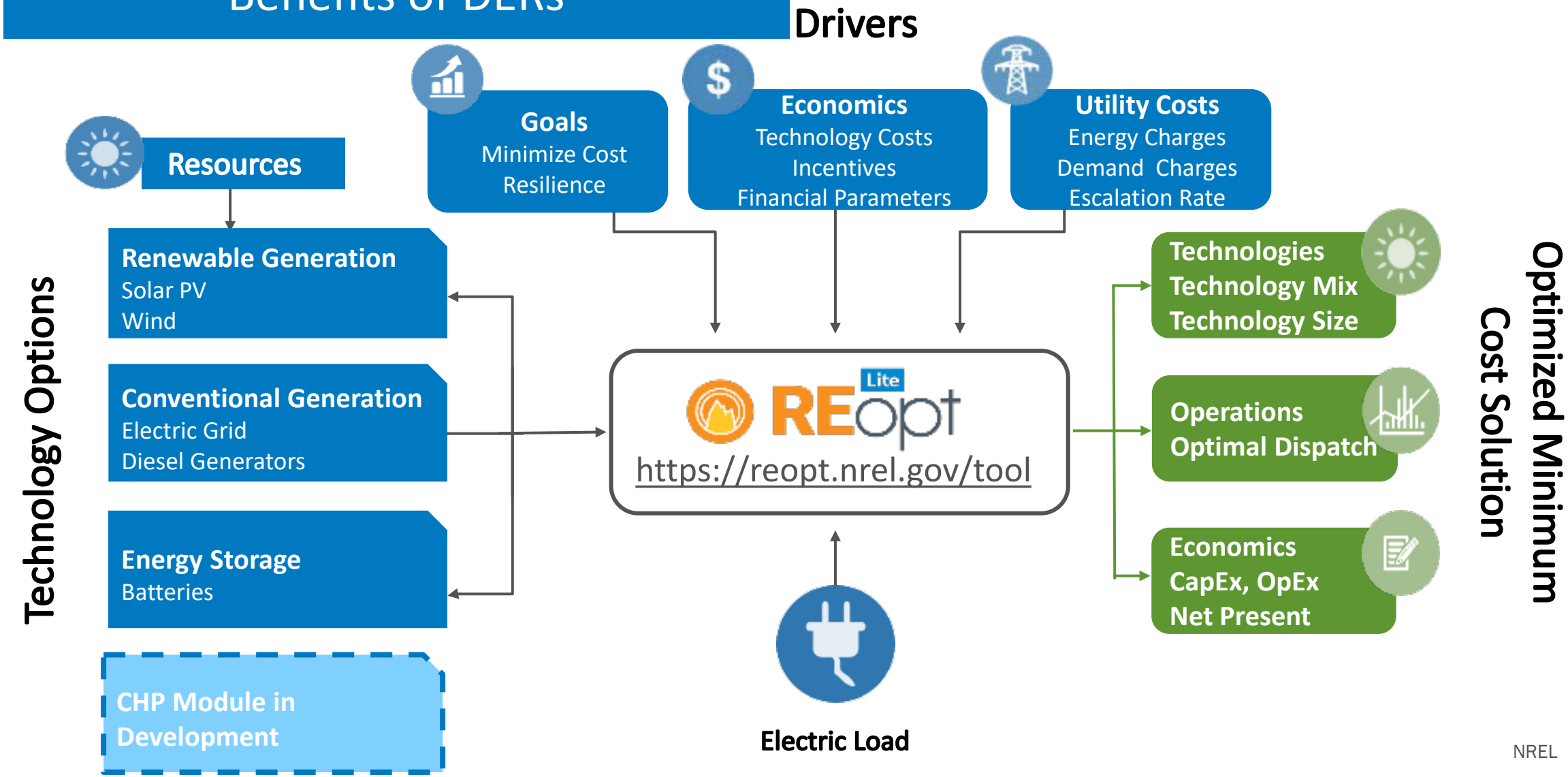
New system decisions are complex…



… REopt Lite is here to help

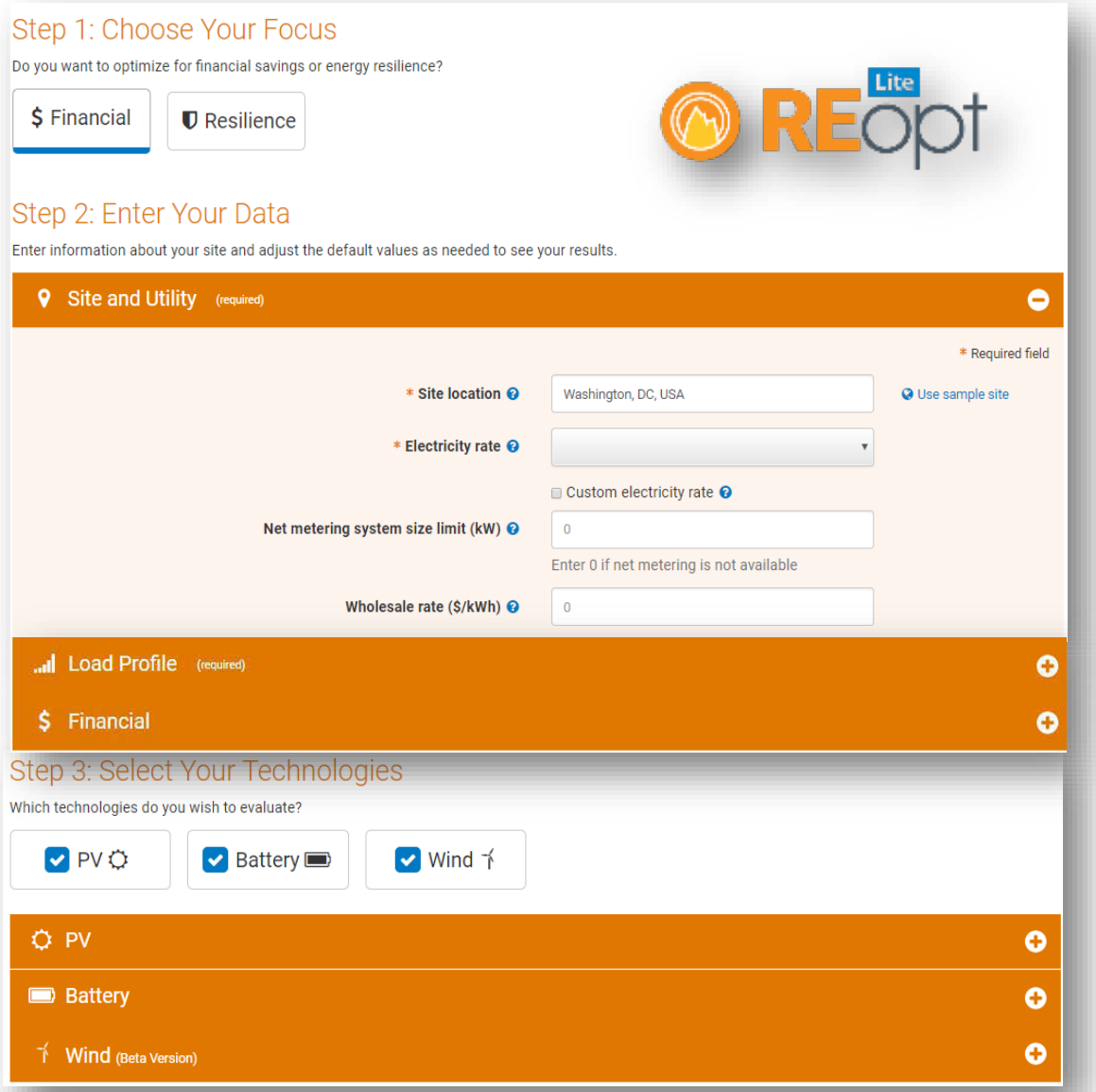


REopt Lite: Free Web Tool to Optimize Economic & Resilience Benefits of DERs

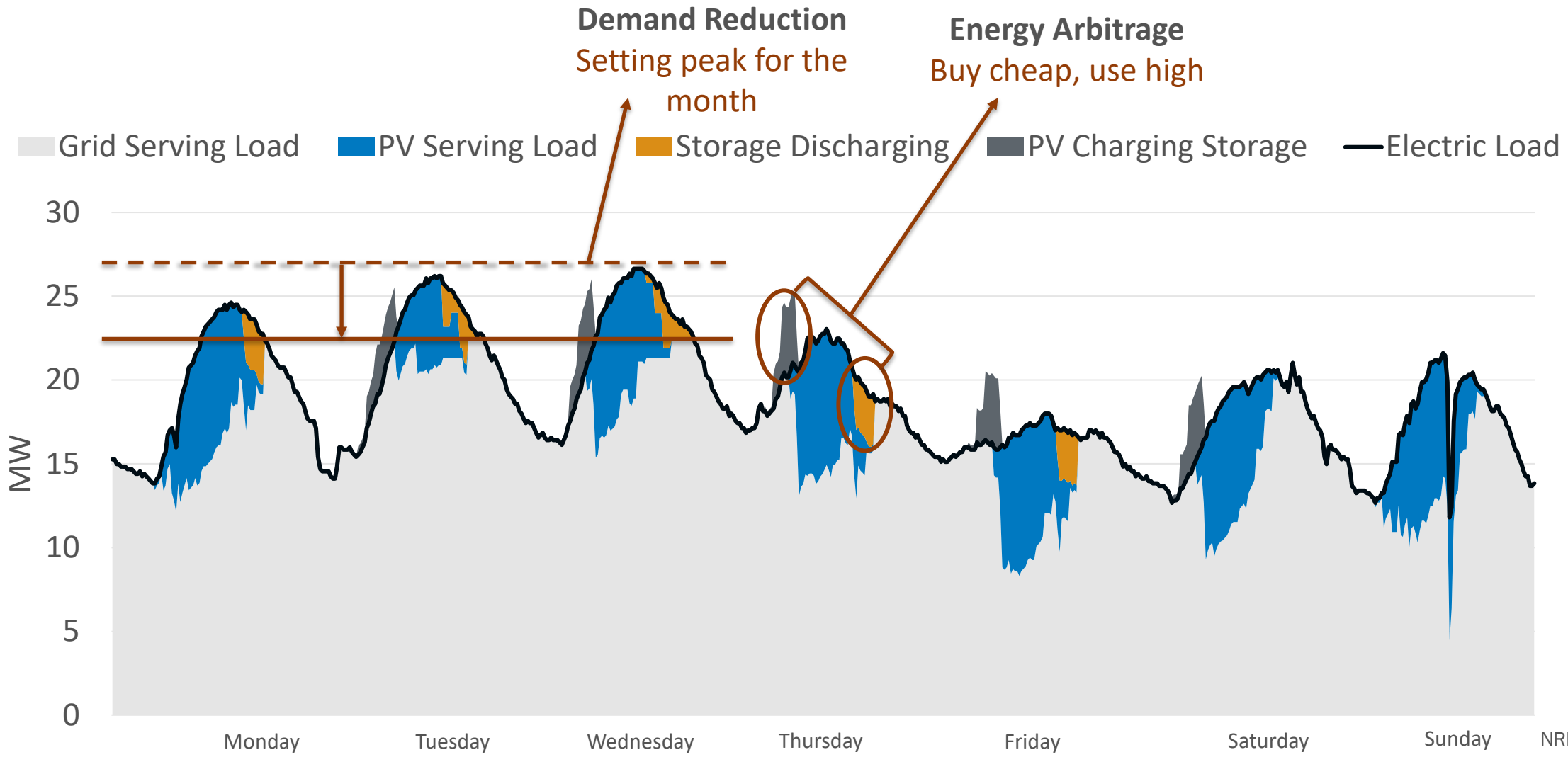


REopt Lite Web Tool

- **REopt Lite** is a web tool that offers a no-cost subset of NREL's more comprehensive REopt model
- **Financial mode** optimizes PV, wind and battery system sizes and battery dispatch strategy to minimize life cycle cost of energy
- **Resilience mode** optimizes PV, wind, and storage systems along with exiting back-up generators to sustain critical load during grid outages
- To access REopt Lite: https://reopt.nrel.gov/tool

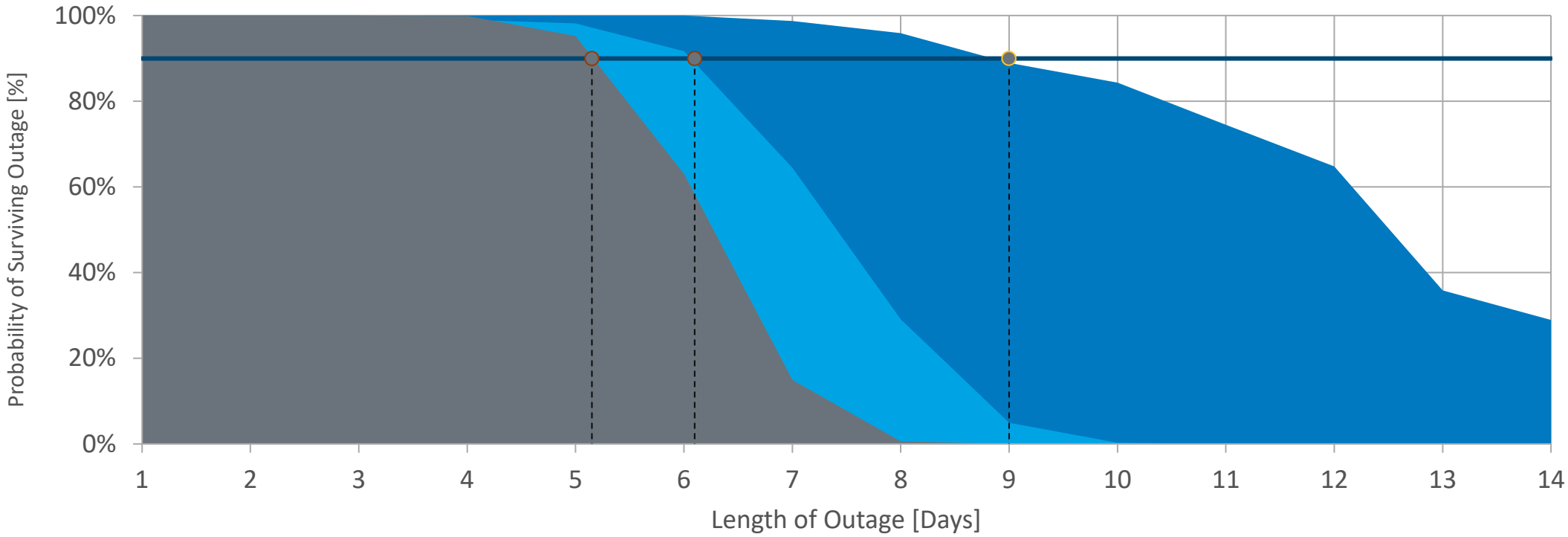


Example of Demand Reduction and Energy Arbitrage



Example of Extending Outage Survivability vs. Cost Savings

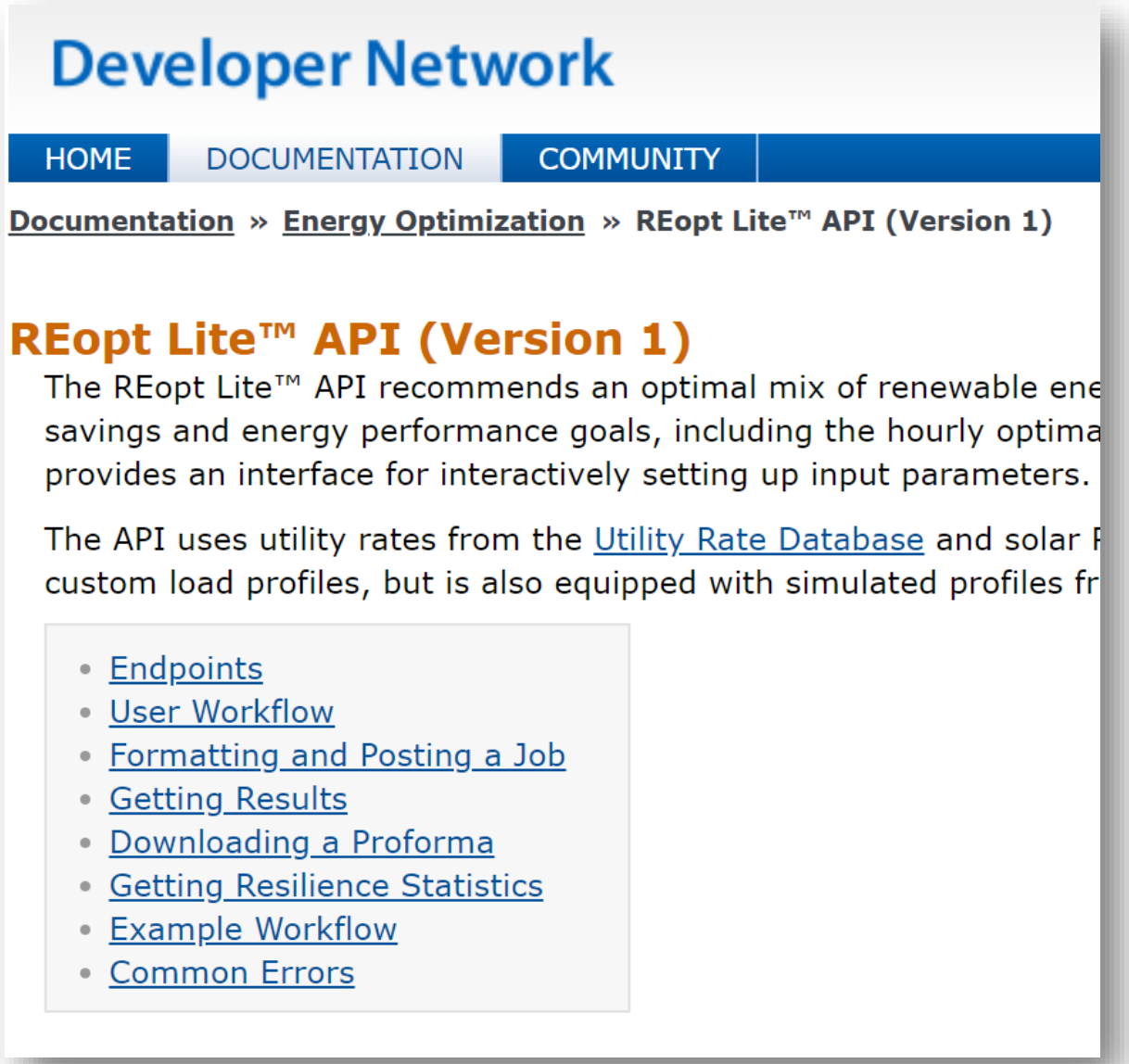
	Generator	Solar PV	Storage	Lifecycle Cost	Outage
1. Base case	2.5 MW	-	-	$20 million	5 days
2. Lowest cost solution	2.5 MW	625 kW	175 kWh	$18.5 million	6 days
3. Proposed system	2.5 MW	2 MW	500 kWh	$19.9 million	9 days



In a case study at a military base, NREL evaluated thousands of random grid outages and durations throughout the year and compared number of hours the site could survive with a diesel generator and fixed fuel supply vs. generator augmented with PV and battery.

REopt Lite API

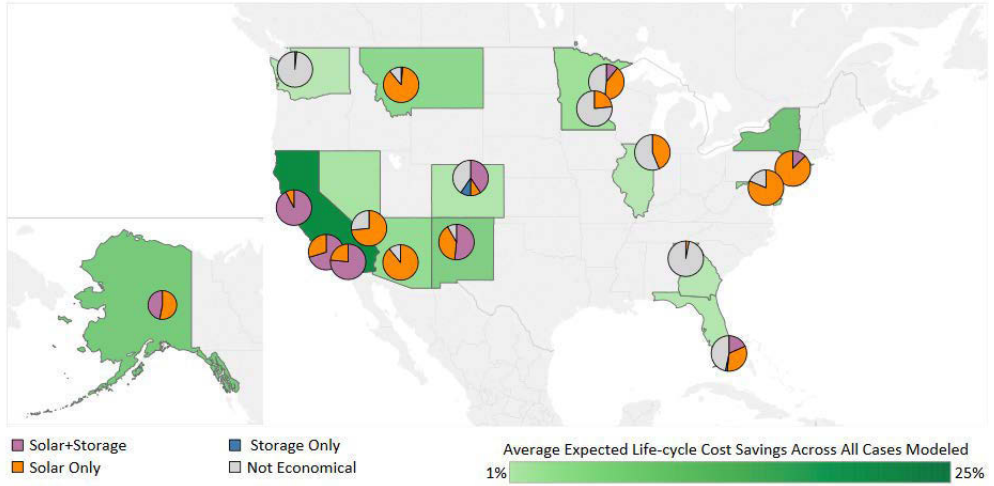
- What is an API?
  - Application Programming Interface.
  - Programmatic way of accessing REopt Lite (sending and receiving data from a server)
  - File format used for sending and receiving the data: JSON
- Advantages:
  - Multiple simulations for different sites can be run programmatically
  - Scenario analysis can be automated
  - Integration with other programs



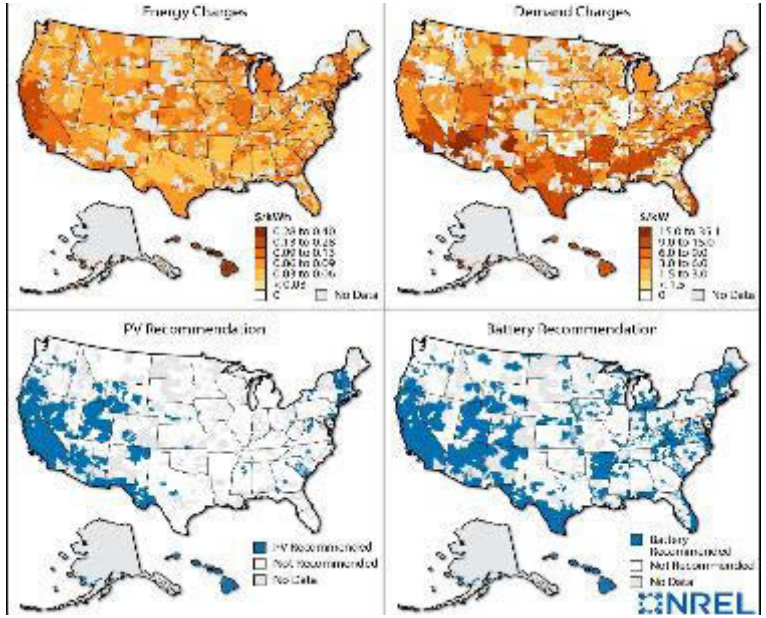
https://developer.nrel.gov/docs/energy-optimization/reopt-v1/

Analysis Enabled by API

- The REopt Lite API enables national scale analysis of storage economics and impacts on adoption/deployment
- Analysis questions include:
  - Where in the country is storage (and PV) currently cost effective?
  - At what capital costs is storage adopted across the US?
  - How does varying utility rate, escalation rates, and incentive structures impact storage profitability?
  - How (and where) can stationary storage support DC-fast-charging electric vehicle economics and deployment?



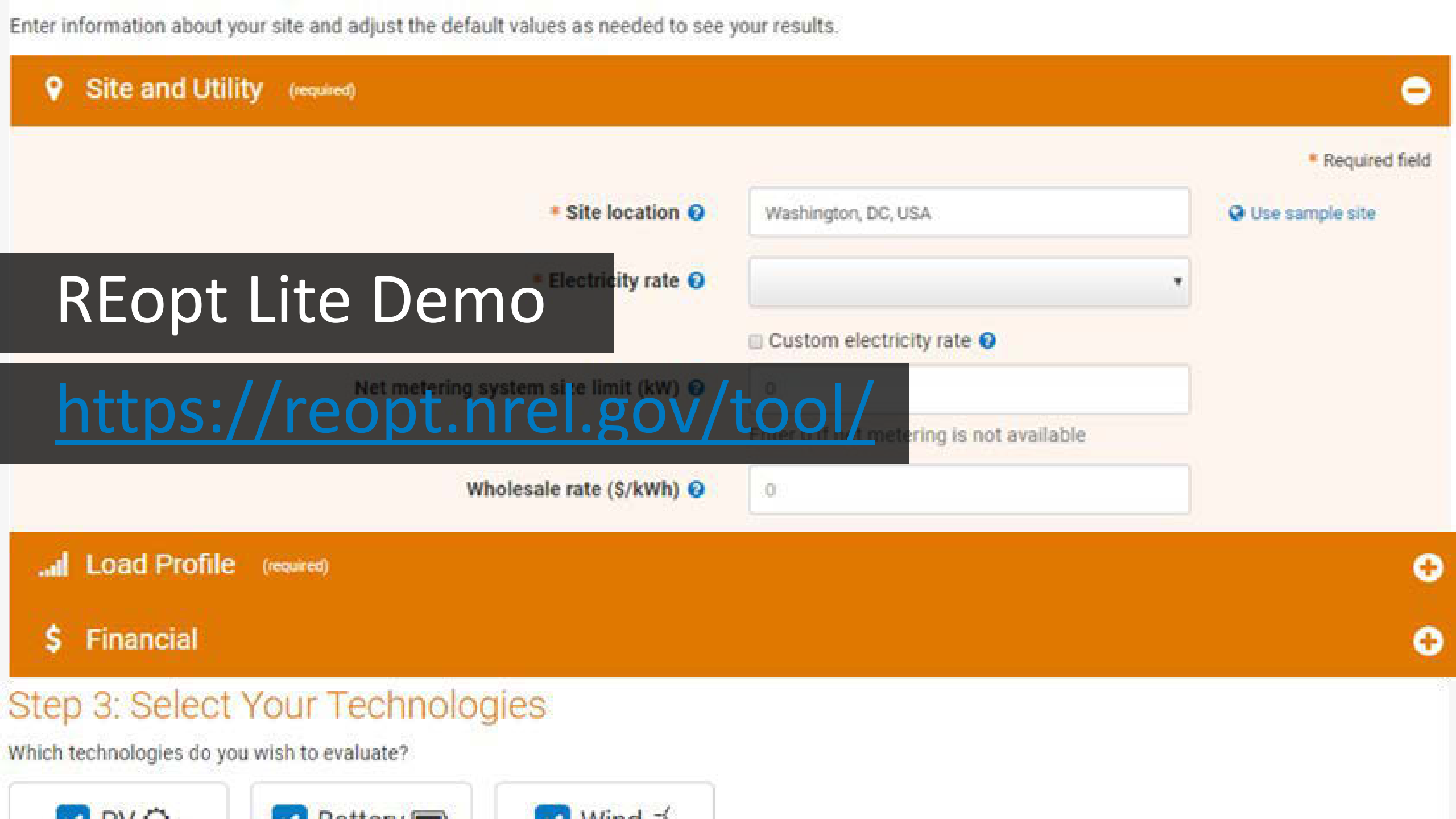
Identifying Critical Factors in the Cost-effectiveness of Solar and Battery Storage in Commercial Buildings
https://www.nrel.gov/docs/fy18osti/70813.pdf



Technology Solutions To Mitigate Electricity Cost for Electric Vehicle DC Fast Charging
https://www.sciencedirect.com/science/article/pii/S0306261919304581

REopt Lite Demo

https://reopt.nrel.gov/tool/



REopt Lite Exercise

- Using your laptop (preferred), tablet, or cell, go to the REopt Lite webtool: https://reopt.nrel.gov/tool/
  - Choose your focus: select “financial”
  - Enter your site data (see information sheet on your table)
  - Write down your results

- Each table has a different set of inputs and should expect different outputs
- You can work together with someone at you table, or alone
- If you get stuck, raise your hand. Emma and Kathleen will be walking around the room to answer questions
- We will go through the results at the end. If you finish early, complete resilience section

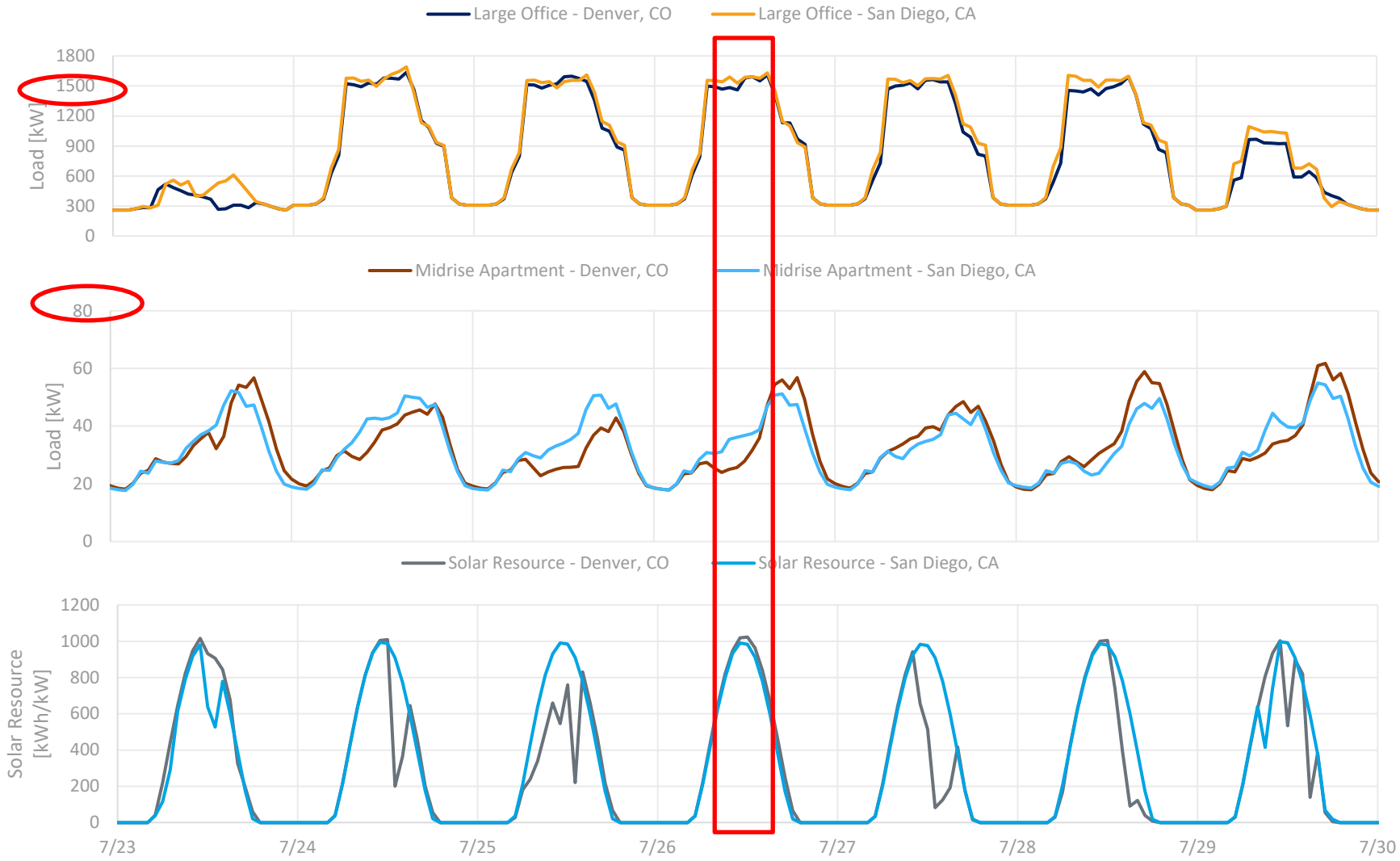
Financial Results

	Location	Electric rate structure	Net metering limit	Building/ load type	PV size	Battery size	NPV [$]
1	Denver	Flat	2,000 kW	Large office	0 kW	0 kW / 0 kWh	$0
2	Denver	Demand	2,000 kW	Large office	2,000 kW	28 kW / 37 kWh	$ 185k
3	Denver	Flat	2,000 kW	Midrise apartment	0 kW	0 kW / 0 kWh	$0
4	Denver	Demand	2,000 kW	Midrise apartment	40 kW	1 kW / 1 kWh	$ 1k
5	San Diego	Flat	10,000 kW	Large office	4,651 kW	0 kW / 0 kWh	$ 2,792k
6	San Diego	Demand	10,000 kW	Large office	4,651 kW	136 kW / 180 kWh	$ 3,291k
7	San Diego	Flat	10,000 kW	Midrise apartment	174 kW	0 kW / 0 kWh	$ 104k
8	San Diego	Demand	10,000 kW	Midrise apartment	174 kW	1 kW / 1 kWh	$ 110k

DISCUSSION TOPICS:

- Anything interesting that you notice in the results? What factors do you think are driving these results?
- What other factors would you want to consider to inform an investment decision?

Driving factors: Load Profile, Solar Resource, & Utility Rate Comparison



Utility Rate

Location	Rate structure	Energy charges [$/kWh]	Demand charges [$/kW]
Denver	Flat rate	$0.10	$0
Denver	Demand rate	$0.10	$16
San Diego	Flat rate	$0.15	$0
San Diego	Demand rate	$0.15	$18

Net Metering Limit

Location	Net metering limit
Denver	2,000 kW
San Diego	10,000 kW

Resilience Results

	Location	Electric rate structure	Net metering	Building/ load type	Analysis focus	PV size	Battery size	NPV [$]	1-hr outage Survivability	12-hr outage Survivability
1	Denver	Flat	2,000 kW	Large office	Financial	0 kW	0 kW / 0 kWh	$0	0%	0%
					Resiliency	**2,000 kW**	**337 kW / 3,194 kWh**	**- $ 1,903k**	**99%**	**88%**
2	Denver	Demand	2,000 kW	Large office	Financial	2,000 kW	28 kW / 37 kWh	$ 185k	30%	0%
					Resiliency	**2,000 kW**	**495 kW / 3,194 kWh**	**- $ 1,053k**	**100%**	**98%**
3	Denver	Flat	2,000 kW	Midrise apartment	Financial	0 kW	0 kW / 0 kWh	$0	0%	0%
					Resiliency	**179 kW**	**20 kW / 190 kWh**	**- $ 114k**	**~100%**	**~100%**
4	Denver	Demand	2,000 kW	Midrise apartment	Financial	40 kW	1 kW / 1 kWh	$ 1k	23%	0%
					Resiliency	**179 kW**	**23 kW / 190 kWh**	**- $ 80k**	**100%**	**99%**
5	San Diego	Flat	10,000 kW	Large office	Financial	4,651 kW	0 kW / 0 kWh	$ 2,792k	39%	~0%
					Resiliency	**4,627 kW**	**380 kW / 2,643 kWh**	**$ 1,132k**	**99%**	**93%**
6	San Diego	Demand	10,000 kW	Large office	Financial	4,651 kW	136 kW / 180 kWh	$ 3,291k	47%	1%
					Resiliency	**4,629 kW**	**602 kW / 2,643 kWh**	**$ 2,394k**	**100%**	**96%**
7	San Diego	Flat	10,000 kW	Midrise apartment	Financial	174 kW	0 kW / 0 kWh	$ 104k	39%	~0%
					Resiliency	**173 kW**	**15 kW / 139 kWh**	**$22k**	**~100%**	**98%**
8	San Diego	Demand	10,000 kW	Midrise apartment	Financial	174 kW	1 kW / 1 kWh	$ 110k	40%	~0%
					Resiliency	**173 kW**	**22 kW / 139 kWh**	**$ 58k**	**100%**	**~90%**

DISCUSSION TOPICS:

- Anything interesting you notice in the results? What factors do you think are driving these results?
- What other factors would you want to consider to inform an investment decision?

Resources

- REopt Lite Web Tool:
  - Web tool: https://reopt.nrel.gov/tool
  - Help manual and training videos: https://reopt.nrel.gov/user-guides.html
- REopt Lite API: https://developer.nrel.gov/docs/energy-optimization/reopt-v1/
  - Information to access API
  - User guide
- REopt Website: https://reopt.nrel.gov/
  - Case studies
  - Analysis services
- Send tool feedback & ask a question: reopt@nrel.gov

Q&A

www.nrel.gov

NREL/PR-7A40-76043

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REopt™ Lite Training Exercise

About REopt Lite: The REopt™ Lite web tool helps decision makers:

- Evaluate the economic viability of grid-connected PV, wind, and battery storage at a site
- Identify system sizes and battery dispatch strategies to minimize energy costs
- Estimate how long a system can sustain critical load during a grid outage

REopt Lite offers a no-cost subset of features from NREL's more comprehensive REopt model. REopt Lite also offers an application programming interface (API) to facilitate rapid analysis of multiple sites, perform sensitivity studies, and/or to answer research questions. For more information about REopt visit https://reopt.nrel.gov/ .

This exercise is intended to provide a hands-on, interactive introduction to REopt Lite- how to use it for analysis of a particular site, for a screening of multiple sites, and to identify patterns to answer research questions.
Caveat: These inputs are meant to facilitate this activity and are not necessarily accurate or applicable to any actual site. Thus, they should not be used as the basis for actual investment decisions.

Instructions:

0. Using your laptop (preferred), tablet, or cell-phone, go to the REopt Lite webtool: https://reopt.nrel.gov/tool/
1. Choose your focus: select "Financial"
2. Enter your data (see your table's site data)
3. Fill out your recommended system sizes and net present value (NPV) in the "Financial Results" column in your results table (you can ignore the survivability rows for now).

If time allows, select "Back" at the top of the results page to return to the main REopt Lite inputs page, this time to run a resiliency analysis of the same site.

Results Table		
	Financial Results	**Resilience Results**
PV kW		
Battery kW		
Battery kWh		
NPV ($)		
1-hr outage survivability (hrs.)		
12-hr outage survivability (hrs.)		

4. Choose your focus: select "Resilience"
5. Your site's data inputs should still be populated from the purely financial analysis (if not, fill them in again). Additionally, a new section "Resilience" will have appeared. Fill in the following values:
    - Critical load factor = 30% (30% of the load must be sustained during a grid outage)
    - Outage duration: 48 hours
    - Outage start date and time: click "Autoselect using critical load profile" and in the pop-up window select "Start Outage On Peak"
    - Type of outage event: Major Outage
6. Fill out your recommended system sizes and net present value (NPV) in the "Resilience Results" column in your results table.
7. Underneath the "Resilience vs. Financial" table, see the "Outage Simulation" section and click "Simulate Outages." Mouse over the curve to see the probability of surviving outages of different durations with the two systems you've evaluated, and record each system's 1-hr and 12-hr outage survivability in your results table.

Group: 1

For inputs not on this sheet, leave values as default

	Assumption	Value
GROUP/SITE SPECIFIC	**SITE AND UTILITY**	
	Location	Denver, CO
	Electricity rate	Check "Use custom electricity rate" and input an annual energy and demand rate based on the following:
	Net metering system size limit (kW)	CO: 2,000 kW
	LOAD PROFILE	
	Simulate or Upload	Simulate
	Type of building	Large office
	Annual energy consumption (kWh)	Use default- this is based on your location and building type
SAME FOR ALL SITES	**FINANCIAL**	Leave all inputs as defaults except the following:
	Analysis period	20 years
	TECHNOLOGIES	Select Solar PV & Battery Storage only Leave all inputs as defaults except the following:
	SOLAR PV:	
	System capital cost	$1,900/kW
	MACRS bonus depreciation	0%
	BATTERY STORAGE:	
	Energy capacity cost	$500/kWh
	Power capacity cost	$1,000/kW
	Energy capacity replacement cost	$230/kWh
	Power capacity replacement cost	$460/kW
	MACRS bonus depreciation	0%

	Energy charges	Demand charges
Denver, CO – flat rate	$0.10/kWh	$0/kW

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    - Type of outage event: Major Outage
6. Fill out your recommended system sizes and net present value (NPV) in the "Resilience Results" column in your results table.
7. Underneath the "Resilience vs. Financial" table, see the "Outage Simulation" section and click "Simulate Outages." Mouse over the curve to see the probability of surviving outages of different durations with the two systems you've evaluated, and record each system's 1-hr and 12-hr outage survivability in your results table.

Group: 2

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GROUP/SITE SPECIFIC	**SITE AND UTILITY**	
	Location	Denver, CO
	Electricity rate	Check "Use custom electricity rate" and input an annual energy and demand rate based on the following: **Denver, CO – demand rate**: Energy charges $0.10/kWh; Demand charges $16/kW
	Net metering system size limit (kW)	CO: 2,000 kW
	LOAD PROFILE	
	Simulate or Upload	Simulate
	Type of building	Large office
	Annual energy consumption (kWh)	Use default- this is based on your location and building type
SAME FOR ALL SITES	**FINANCIAL**	Leave all inputs as defaults except the following:
	Analysis period	20 years
	TECHNOLOGIES	Select Solar PV & Battery Storage only Leave all inputs as defaults except the following:
	SOLAR PV:	
	System capital cost	$1,900/kW
	MACRS bonus depreciation	0%
	BATTERY STORAGE:	
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Group: 3

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<table>
<tr><th></th><th>Assumption</th><th>Value</th></tr>
<tr><td rowspan="6">GROUP/SITE SPECIFIC</td><td>SITE AND UTILITY</td><td></td></tr>
<tr><td>Location</td><td>Denver, CO</td></tr>
<tr><td>Electricity rate</td><td>Check “Use custom electricity rate” and input an annual energy and demand rate based on the following:
<table><tr><th></th><th>Energy charges</th><th>Demand charges</th></tr><tr><td>Denver, CO – flat rate</td><td>$0.10/kWh</td><td>$0/kW</td></tr></table></td></tr>
<tr><td>Net metering system size limit (kW)</td><td>CO: 2,000 kW</td></tr>
<tr><td>LOAD PROFILE</td><td></td></tr>
<tr><td>Simulate or Upload</td><td>Simulate</td></tr>
<tr><td>Type of building</td><td>Midrise apartment</td></tr>
<tr><td>Annual energy consumption (kWh)</td><td>Use default- this is based on your location and building type</td></tr>
<tr><td rowspan="11">SAME FOR ALL SITES</td><td>FINANCIAL</td><td>Leave all inputs as defaults except the following:</td></tr>
<tr><td>Analysis period</td><td>20 years</td></tr>
<tr><td>TECHNOLOGIES</td><td>Select Solar PV & Battery Storage only
Leave all inputs as defaults except the following:</td></tr>
<tr><td>SOLAR PV:</td><td></td></tr>
<tr><td>System capital cost</td><td>$1,900/kW</td></tr>
<tr><td>MACRS bonus depreciation</td><td>0%</td></tr>
<tr><td>BATTERY STORAGE:</td><td></td></tr>
<tr><td>Energy capacity cost</td><td>$500/kWh</td></tr>
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    - Type of outage event: Major Outage
6. Fill out your recommended system sizes and net present value (NPV) in the "Resilience Results" column in your results table.
7. Underneath the "Resilience vs. Financial" table, see the "Outage Simulation" section and click "Simulate Outages." Mouse over the curve to see the probability of surviving outages of different durations with the two systems you've evaluated, and record each system's 1-hr and 12-hr outage survivability in your results table.

Group: 4

For inputs not on this sheet, leave values as default

	Assumption	Value
GROUP/SITE SPECIFIC	**SITE AND UTILITY**	
	Location	Denver, CO
	Electricity rate	Check "Use custom electricity rate" and input an annual energy and demand rate based on the following:
	Net metering system size limit (kW)	CO: 2,000 kW
	LOAD PROFILE	
	Simulate or Upload	Simulate
	Type of building	Midrise apartment
	Annual energy consumption (kWh)	Use default- this is based on your location and building type
SAME FOR ALL SITES	**FINANCIAL**	Leave all inputs as defaults except the following:
	Analysis period	20 years
	TECHNOLOGIES	Select Solar PV & Battery Storage only Leave all inputs as defaults except the following:
	SOLAR PV:	
	System capital cost	$1,900/kW
	MACRS bonus depreciation	0%
	BATTERY STORAGE:	
	Energy capacity cost	$500/kWh
	Power capacity cost	$1,000/kW
	Energy capacity replacement cost	$230/kWh
	Power capacity replacement cost	$460/kW
	MACRS bonus depreciation	0%

	Energy charges	Demand charges
Denver, CO – demand rate	$0.10/kWh	$16/kW

REopt™ Lite Training Exercise

About REopt Lite: The REopt™ Lite web tool helps decision makers:

- Evaluate the economic viability of grid-connected PV, wind, and battery storage at a site
- Identify system sizes and battery dispatch strategies to minimize energy costs
- Estimate how long a system can sustain critical load during a grid outage

REopt Lite offers a no-cost subset of features from NREL's more comprehensive REopt model. REopt Lite also offers an application programming interface (API) to facilitate rapid analysis of multiple sites, perform sensitivity studies, and/or to answer research questions. For more information about REopt visit https://reopt.nrel.gov/ .

This exercise is intended to provide a hands-on, interactive introduction to REopt Lite- how to use it for analysis of a particular site, for a screening of multiple sites, and to identify patterns to answer research questions.
Caveat: These inputs are meant to facilitate this activity and are not necessarily accurate or applicable to any actual site. Thus, they should not be used as the basis for actual investment decisions.

Instructions:

0. Using your laptop (preferred), tablet, or cell-phone, go to the REopt Lite webtool: https://reopt.nrel.gov/tool/
1. Choose your focus: select "Financial"
2. Enter your data (see your table's site data)
3. Fill out your recommended system sizes and net present value (NPV) in the "Financial Results" column in your results table (you can ignore the survivability rows for now).

If time allows, select "Back" at the top of the results page to return to the main REopt Lite inputs page, this time to run a resiliency analysis of the same site.

Results Table		
	Financial Results	**Resilience Results**
PV kW		
Battery kW		
Battery kWh		
NPV ($)		
1-hr outage survivability (hrs.)		
12-hr outage survivability (hrs.)		

4. Choose your focus: select "Resilience"
5. Your site's data inputs should still be populated from the purely financial analysis (if not, fill them in again). Additionally, a new section "Resilience" will have appeared. Fill in the following values:
    - Critical load factor = 30% (30% of the load must be sustained during a grid outage)
    - Outage duration: 48 hours
    - Outage start date and time: click "Autoselect using critical load profile" and in the pop-up window select "Start Outage On Peak"
    - Type of outage event: Major Outage
6. Fill out your recommended system sizes and net present value (NPV) in the "Resilience Results" column in your results table.
7. Underneath the "Resilience vs. Financial" table, see the "Outage Simulation" section and click "Simulate Outages." Mouse over the curve to see the probability of surviving outages of different durations with the two systems you've evaluated, and record each system's 1-hr and 12-hr outage survivability in your results table.

Group: 5

For inputs not on this sheet, leave values as default

	Assumption	Value
GROUP/SITE SPECIFIC	**SITE AND UTILITY**	
	Location	San Diego, CA
	Electricity rate	Do not select a rate from the drop-down menu Check "Use custom electricity rate" and input an annual energy and demand rate based on the following: **San Diego, CA – flat rate** | **Energy charges** \$0.15/kWh | **Demand charges** \$0/kW
	Net metering system size limit (kW)	CA: 10,000 kW
	LOAD PROFILE	
	Simulate or Upload	Simulate
	Type of building	Large office
	Annual energy consumption (kWh)	Use default- this is based on your location and building type
SAME FOR ALL SITES	**FINANCIAL**	Leave all inputs as defaults except the following:
	Analysis period	20 years
	TECHNOLOGIES	Select Solar PV & Battery Storage only Leave all inputs as defaults except the following:
	SOLAR PV:	
	System capital cost	\$1,900/kW
	MACRS bonus depreciation	0%
	BATTERY STORAGE:	
	Energy capacity cost	\$500/kWh
	Power capacity cost	\$1,000/kW
	Energy capacity replacement cost	\$230/kWh
	Power capacity replacement cost	\$460/kW
	MACRS bonus depreciation	0%

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Results Table		
	Financial Results	**Resilience Results**
PV kW		
Battery kW		
Battery kWh		
NPV ($)		
1-hr outage survivability (hrs.)		
12-hr outage survivability (hrs.)		

4. Choose your focus: select "Resilience"
5. Your site's data inputs should still be populated from the purely financial analysis (if not, fill them in again). Additionally, a new section "Resilience" will have appeared. Fill in the following values:
    - Critical load factor = 30% (30% of the load must be sustained during a grid outage)
    - Outage duration: 48 hours
    - Outage start date and time: click "Autoselect using critical load profile" and in the pop-up window select "Start Outage On Peak"
    - Type of outage event: Major Outage
6. Fill out your recommended system sizes and net present value (NPV) in the "Resilience Results" column in your results table.
7. Underneath the "Resilience vs. Financial" table, see the "Outage Simulation" section and click "Simulate Outages." Mouse over the curve to see the probability of surviving outages of different durations with the two systems you've evaluated, and record each system's 1-hr and 12-hr outage survivability in your results table.

Group: 6

For inputs not on this sheet, leave values as default

	Assumption	Value
GROUP/SITE SPECIFIC	**SITE AND UTILITY**	
	Location	San Diego, CA
	Electricity rate	Do not select a rate from the drop-down menu Check "Use custom electricity rate" and input an annual energy and demand rate based on the following: **San Diego, CA – demand rate** | **Energy charges** | **Demand charges** \$0.15/kWh | \$18/kW
	Net metering system size limit (kW)	CA: 10,000 kW
	LOAD PROFILE	
	Simulate or Upload	Simulate
	Type of building	Large office
	Annual energy consumption (kWh)	Use default- this is based on your location and building type
SAME FOR ALL SITES	**FINANCIAL**	Leave all inputs as defaults except the following:
	Analysis period	20 years
	TECHNOLOGIES	Select Solar PV & Battery Storage only Leave all inputs as defaults except the following:
	SOLAR PV:	
	System capital cost	\$1,900/kW
	MACRS bonus depreciation	0%
	BATTERY STORAGE:	
	Energy capacity cost	\$500/kWh
	Power capacity cost	\$1,000/kW
	Energy capacity replacement cost	\$230/kWh
	Power capacity replacement cost	\$460/kW
	MACRS bonus depreciation	0%

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If time allows, select "Back" at the top of the results page to return to the main REopt Lite inputs page, this time to run a resiliency analysis of the same site.

Results Table		
	Financial Results	**Resilience Results**
PV kW		
Battery kW		
Battery kWh		
NPV ($)		
1-hr outage survivability (hrs.)		
12-hr outage survivability (hrs.)		

4. Choose your focus: select "Resilience"
5. Your site's data inputs should still be populated from the purely financial analysis (if not, fill them in again). Additionally, a new section "Resilience" will have appeared. Fill in the following values:
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    - Type of outage event: Major Outage
6. Fill out your recommended system sizes and net present value (NPV) in the "Resilience Results" column in your results table.
7. Underneath the "Resilience vs. Financial" table, see the "Outage Simulation" section and click "Simulate Outages." Mouse over the curve to see the probability of surviving outages of different durations with the two systems you've evaluated, and record each system's 1-hr and 12-hr outage survivability in your results table.

Group: 7

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	Assumption	Value
GROUP/SITE SPECIFIC	**SITE AND UTILITY**	
	Location	San Diego, CA
	Electricity rate	Do not select a rate from the drop-down menu Check "Use custom electricity rate" and input an annual energy and demand rate based on the following: **San Diego, CA – flat rate** | **Energy charges** \$0.15/kWh | **Demand charges** \$0/kW
	Net metering system size limit (kW)	CA: 10,000 kW
	LOAD PROFILE	
	Simulate or Upload	Simulate
	Type of building	Midrise apartment
	Annual energy consumption (kWh)	Use default- this is based on your location and building type
SAME FOR ALL SITES	**FINANCIAL**	Leave all inputs as defaults except the following:
	Analysis period	20 years
	TECHNOLOGIES	Select Solar PV & Battery Storage only Leave all inputs as defaults except the following:
	SOLAR PV:	
	System capital cost	\$1,900/kW
	MACRS bonus depreciation	0%
	BATTERY STORAGE:	
	Energy capacity cost	\$500/kWh
	Power capacity cost	\$1,000/kW
	Energy capacity replacement cost	\$230/kWh
	Power capacity replacement cost	\$460/kW
	MACRS bonus depreciation	0%

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Results Table		
	Financial Results	**Resilience Results**
PV kW		
Battery kW		
Battery kWh		
NPV ($)		
1-hr outage survivability (hrs.)		
12-hr outage survivability (hrs.)		

4. Choose your focus: select "Resilience"
5. Your site's data inputs should still be populated from the purely financial analysis (if not, fill them in again). Additionally, a new section "Resilience" will have appeared. Fill in the following values:
    - Critical load factor = 30% (30% of the load must be sustained during a grid outage)
    - Outage duration: 48 hours
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6. Fill out your recommended system sizes and net present value (NPV) in the "Resilience Results" column in your results table.
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Group: 8

For inputs not on this sheet, leave values as default

	Assumption	Value
GROUP/SITE SPECIFIC	**SITE AND UTILITY**	
	Location	San Diego, CA
	Electricity rate	Do not select a rate from the drop-down menu Check "Use custom electricity rate" and input an annual energy and demand rate based on the following: **San Diego, CA – demand rate** | **Energy charges** | **Demand charges** \$0.15/kWh | \$18/kW
	Net metering system size limit (kW)	CA: 10,000 kW
	LOAD PROFILE	
	Simulate or Upload	Simulate
	Type of building	Midrise apartment
	Annual energy consumption (kWh)	Use default- this is based on your location and building type
SAME FOR ALL SITES	**FINANCIAL**	Leave all inputs as defaults except the following:
	Analysis period	20 years
	TECHNOLOGIES	Select Solar PV & Battery Storage only Leave all inputs as defaults except the following:
	SOLAR PV:	
	System capital cost	\$1,900/kW
	MACRS bonus depreciation	0%
	BATTERY STORAGE:	
	Energy capacity cost	\$500/kWh
	Power capacity cost	\$1,000/kW
	Energy capacity replacement cost	\$230/kWh
	Power capacity replacement cost	\$460/kW
	MACRS bonus depreciation	0%