Colorado Springs Utilities
It's how we're all connected

COLORADO SPRINGS UTILITIES BOARD
Mesa Conference Room
Conservation and Environmental Center
2855 Mesa Road

AGENDA
Thursday, June 20, 2024
10:00 a.m. – 2:00 p.m.
This meeting will not be held virtually

10:00 a.m.	**1.**	**Welcome**	Travas Deal, Chief Executive Officer Lisa Barbato, Chief System Planning and Projects Officer
10:05 a.m.	**2.**	**Potential Future Legislation**	Dan Hodges, Manager Government Affairs
10:30 a.m.	**3.**	**Check-in on Plan**	Travas Deal, Chief Executive Officer
10:35 a.m.	**4.**	**Sustainable Energy Plan Update**	
		Current Projects	Joe Awad, General Manager Planning and Engineering
		New Generation	Jessie Marshall, Energy Project Manager
		IRP Alignment and Scenario Planning	Kathryn Rozwod, Energy Resource Planning Supervisor
		Financial Impacts	John Hunter, Financial Planning and Risk Manager
11:30 a.m.	**5.**	**Energy Vision (Prepare for 80 by 30 and after)**	David Longrie, Energy Resource Planning and Innovation Manager
12:00 p.m.	**6.**	**Confirm Plan Direction**	Travas Deal, Chief Executive Officer
12:05 p.m.	**7.**	**Lunch / Potential Future Generation**	Kathryn Rozwod, Energy Resource Planning Supervisor
12:30 p.m.	**8.**	**Energy Vision Activity Overview**	
		Renewable Energy Integration and Energy Wise	Scott Shirola, Pricing and Rates Manager
		Regional Transmission Organization	Alex Baird, Fuels and Purchase Power Manager

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		Microgrid Pilot	Kathryn Rozwod, Energy Resource Planning Supervisor
2:00 p.m.	**9.**	**Adjournment**	Chair Donelson

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Utilities Board Workshop

Energy Resource Planning & Innovation

June 20, 2024

Agenda

1. Welcome
2. 2025 Legislative Early Forecast
3. Sustainable Energy Plan Update
4. Energy Vision
5. Potential Future Resources
6. Energy Vision Activity

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2025 Legislative Early Forecast

Dan Hodges, Government Affairs Manager

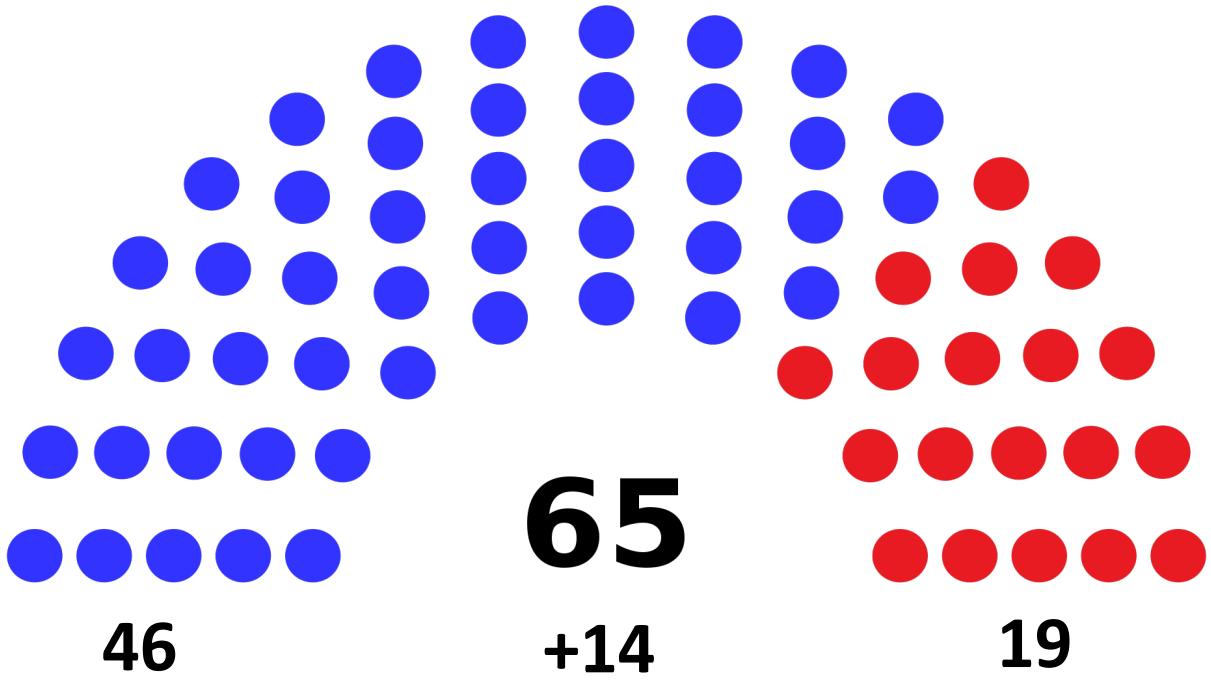
Changes in the House

Term Limited – Committee Chairs

- House Energy and Environment Committee Chair – Rep. Cathy Kipp (D-Fort Collins)
- House Finance Committee Chair – Rep. Marc Snyder (D-Colorado Springs)

Important House Seats

- HD16 – Rep. Vigil (D-Colorado Springs)
- HD19 – Rep. Parenti (D-Erie)
- HD25 – Rep. Story (D-Conifer)
- HD43 – Rep. Marshall (D-Highlands Ranch)
- HD50 – Rep. Young (D-Greely)
- HD61 – Rep. Hamrick (D-Centennial)



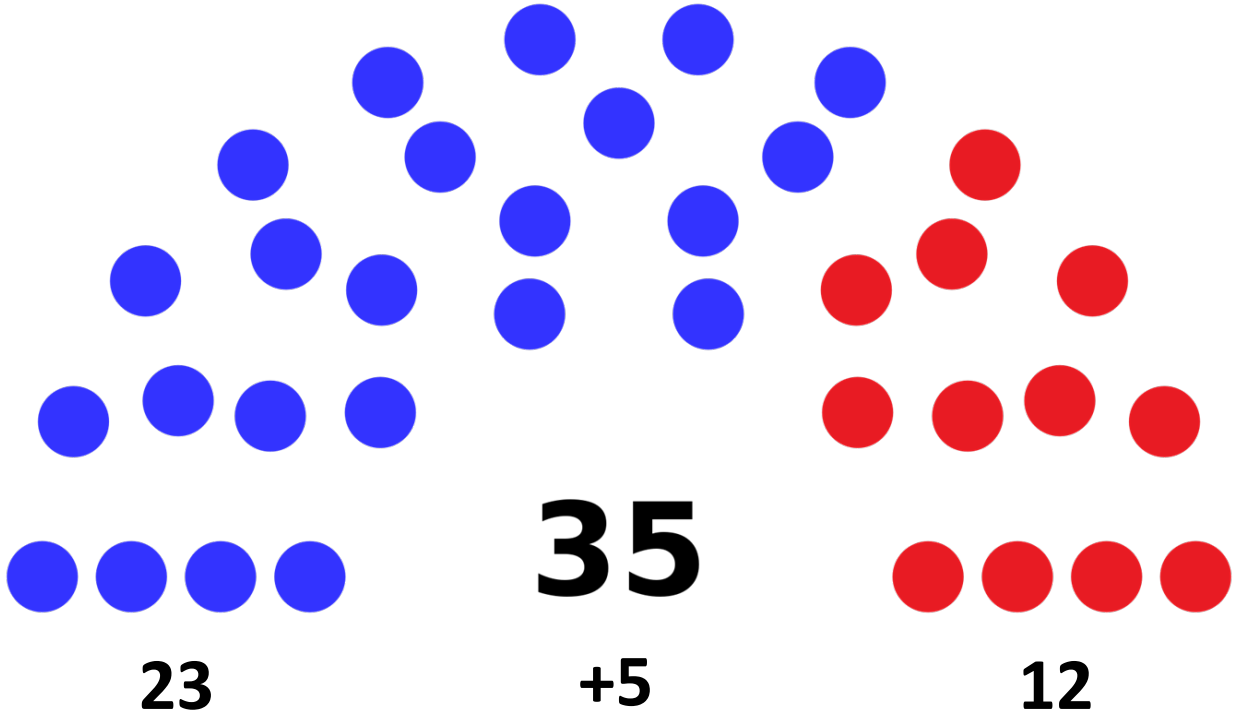
Changes in the Senate

Term Limited – Leadership / Committee Chairs

- Senate President – Sen. Steve Fenberg (D-Boulder)
- Senate Transportation Energy Committee Chair – Sen. Kevin Priola (D-Henderson)
- Joint Budget Committee Vice Chair – Sen. Rachel Zenzinger (D-Arvada)

Important Senate Seats

- SD 12 – Sen. Bob Gardner (R-Colorado Springs)
- SD 13 – Sen. Kevin Priola (D-Henderson)
- SD 5 – Sen. Perry Will (R-New Castle)



Historic Party Control

Federal / State Party Control

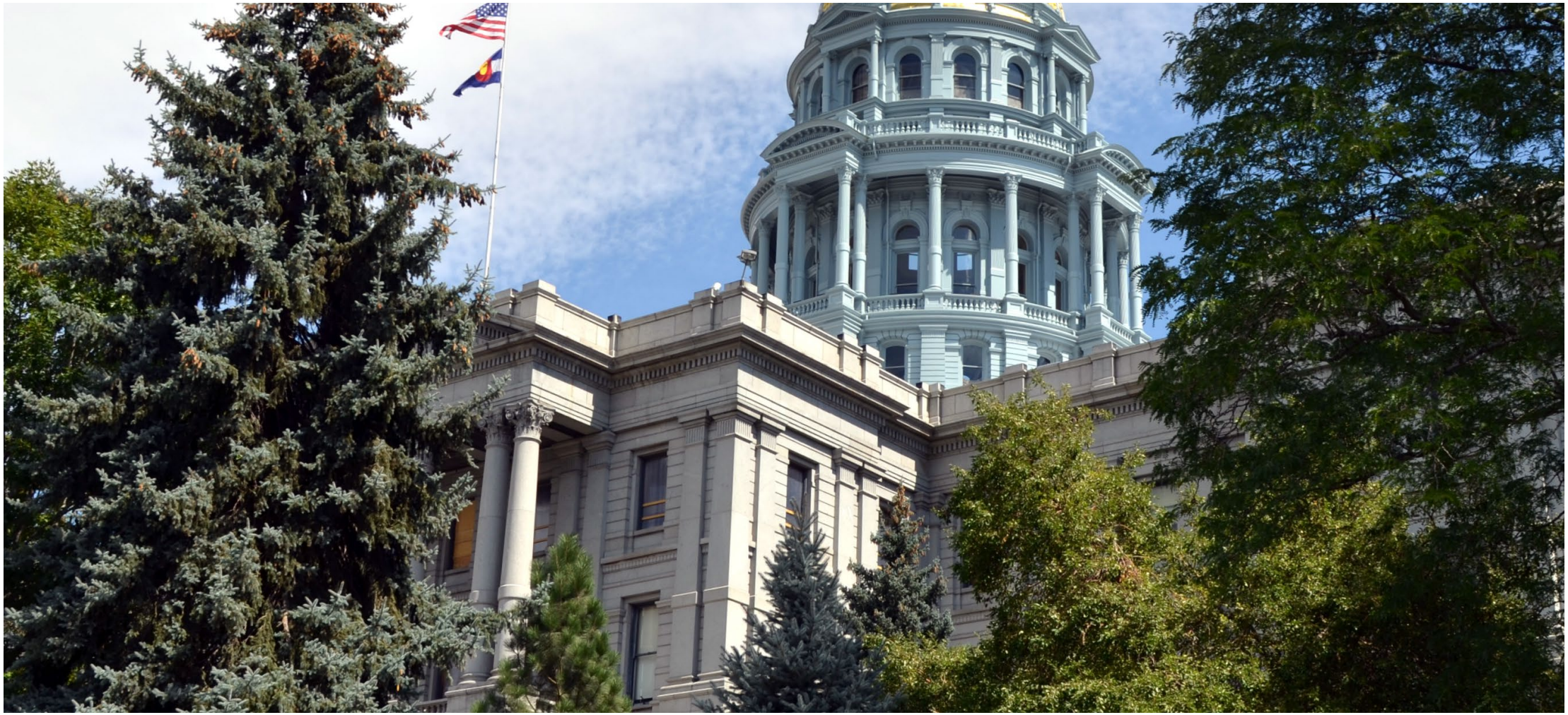
Year	'17	'18	'19	'20	'21	'22	'23	'24
Pres	R	R	R	R	D	D	D	D
House	R	R	D	D	D	D	R	R
Senate	R	R	D	D	D	D	D	D

Year	'17	'18	'19	'20	'21	'22	'23	'24
Gov	D	D	D	D	D	D	D	D
House	R	R	D	D	D	D	D	D
Senate	D	D	D	D	D	D	D	D

Colorado Past Election Results

- 2018 = House Flips
- 2020 = D's gain ALL statewide offices + gain House seats
- 2022 = D's gain House and Senate seats
  - First election post redistricting
- 2024 = What's past is prologue / All politics are *national*

Emerging 2025 Issues



Check-In On Plan

Sustainable Energy Plan

Current Projects

Project Map 2022 - 2027

North System Projects

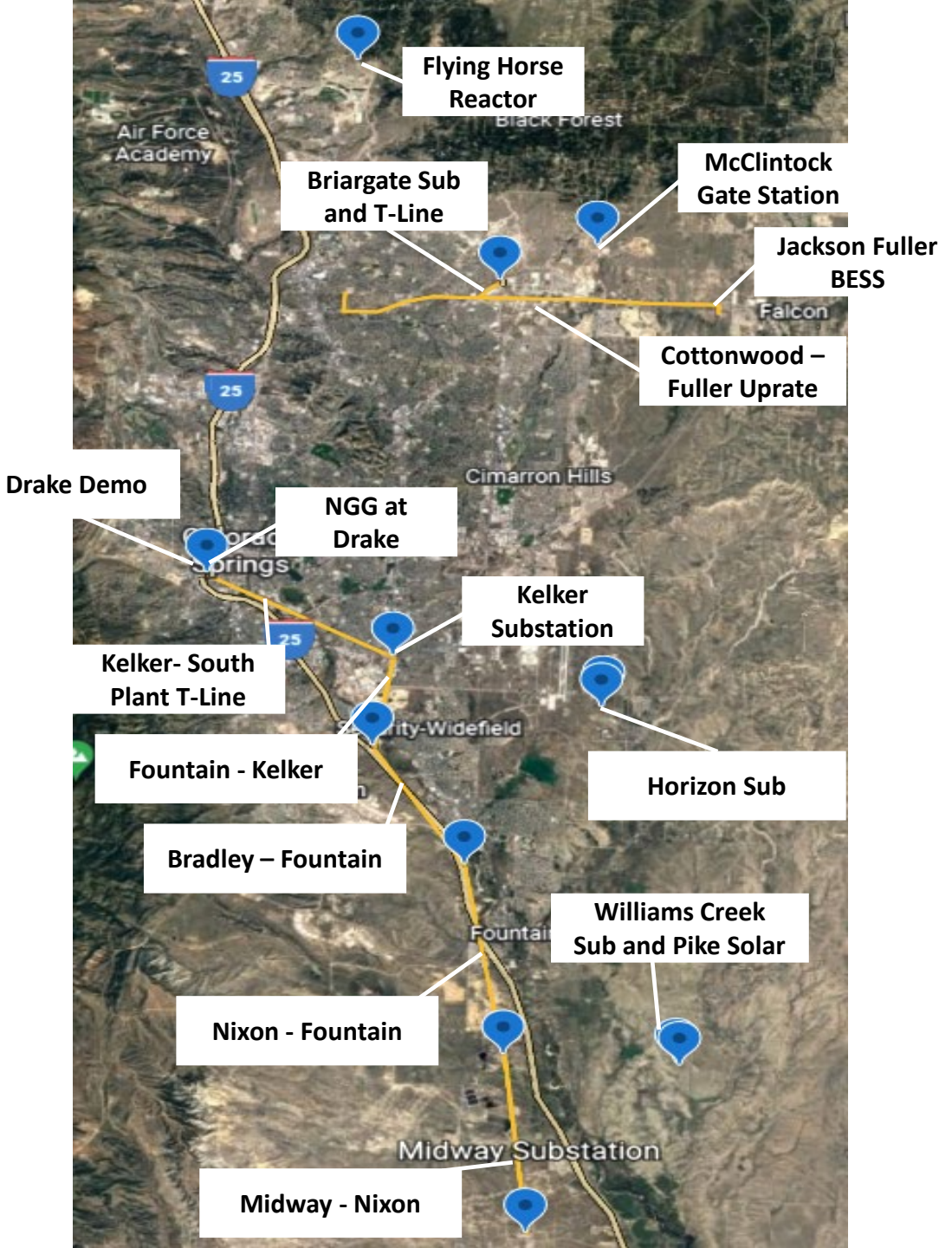
- Briargate Substation Expansion
- New Transmission Line Tap (~1/2 mile)
- Existing Transmission Line Uprate
- Flying Horse Substation Series Reactor
- Jackson Fuller Battery Energy Storage System (BESS)

Central System Projects

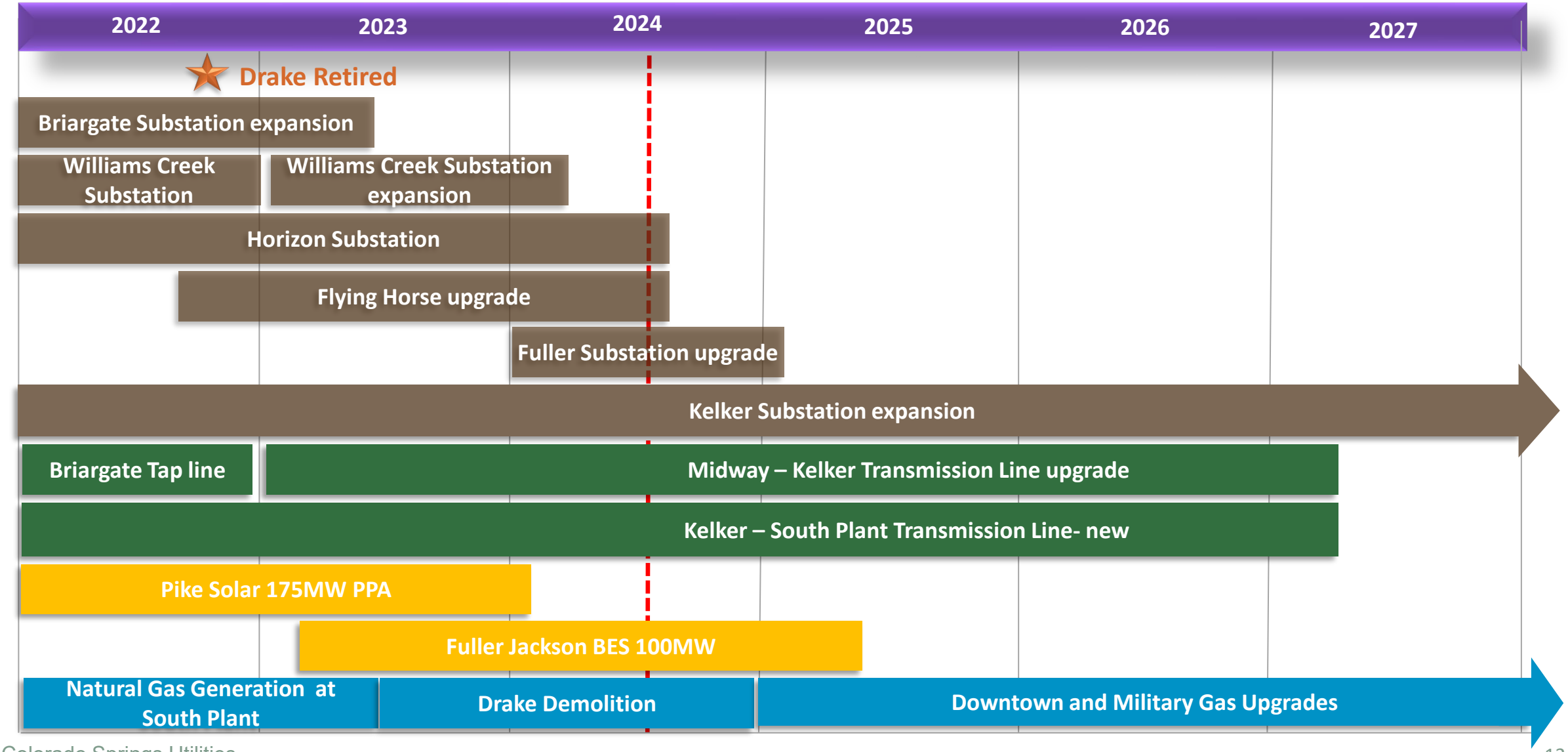
- Kelker Substation Expansion and Reconfiguration
- New Transmission Line - Kelker to South Plant (~6 miles)
- Demolition of Drake Plant

South System Projects

- New Horizon Substation
- Williams Creek Interconnection
- New Transmission Lines – Midway to Kelker (~17 miles)



Energy Projects Schedule (2022 - 2027)



New Generation

Program Background and Scope

Program Background

- Utilities' current capacity resource mix includes 1,370 MW of electricity generation capacity
- The current capacity resource mix is dominated by Natural Gas (49%) and Coal (32%), with renewable making up the rest 18% (Hydro, Solar, and Wind).
- Colorado State legislation require **80% reduction in GHG emissions by 2030** for all the Utilities operating in the State.

Program Scope

- To meet its GHG reduction targets and meet the growing electricity demand, CSU is planning to add **1,500 MW of new generation capacity, and 200 MW of new storage capacity by May 2028**.

	Tentative Resource Capacity Addition in MW			
Year	**Solar**	**Wind**	**Natural Gas**	**BESS (Storage)**
2026	100	100	-	100
2027	200	200	-	-
2028	225	325	350	100
Total	**525**	**625**	**350**	**200**

Program Contracting Strategy- 3 RFP

- Three different contracting strategies will be leveraged for the program, between Power Purchase Agreement (PPA), Progressive Design Build, and EPC.
- Each contracting strategy will require different method of evaluation, and negotiations.

RFP	Resource Type	Total Capacity Addition (MW)	Contracting Strategy
RFP 1	Solar	525	PPA
	Wind	625	PPA
RFP 1 & 2	Natural Gas	350	PPA; Progressive Design Build (with GMP)
RFP 1 & 3	BESS	200	ESA[1] ; EPC

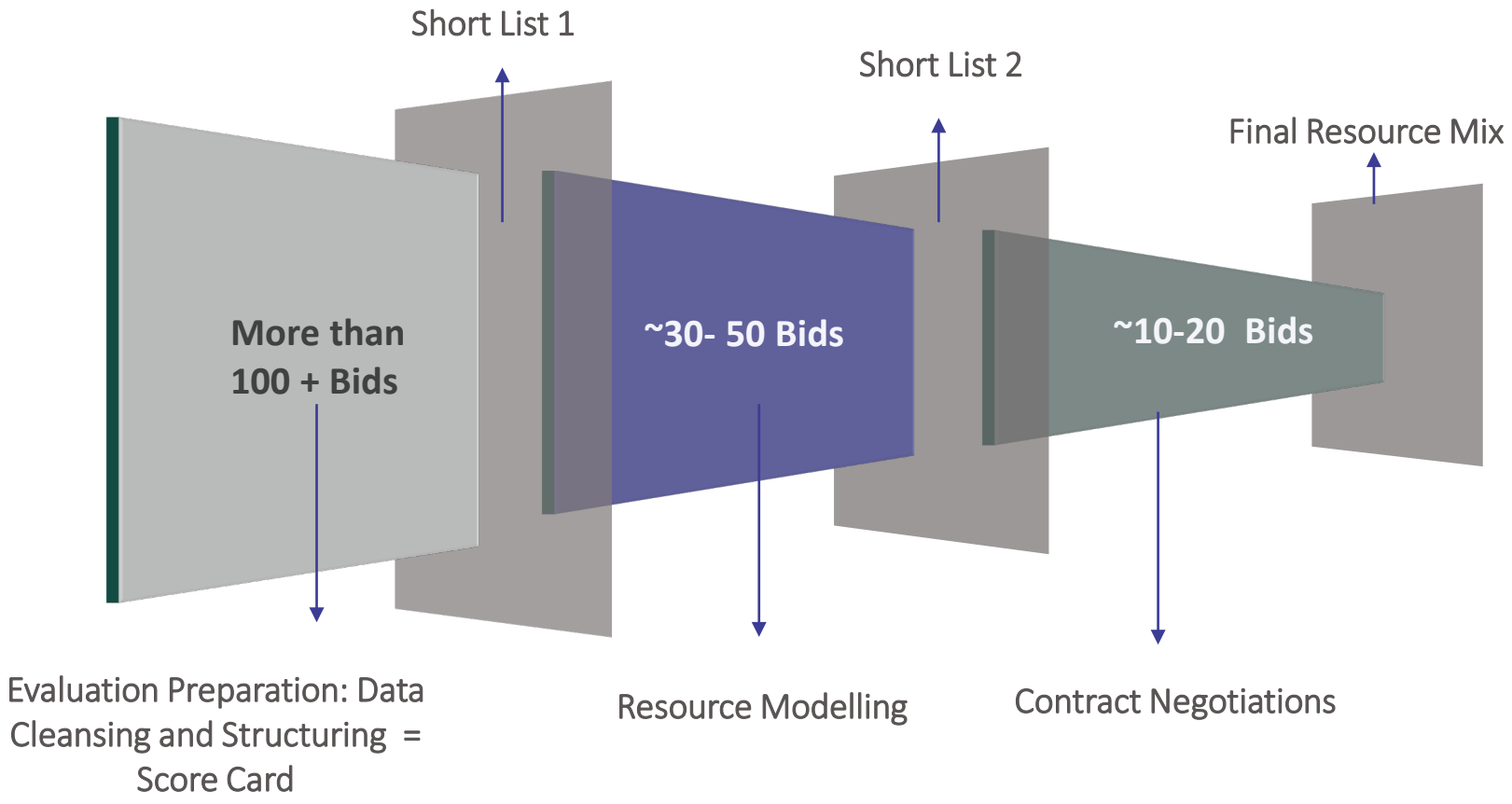
[1]ESA or Energy Storage Agreement is a battery version of PPA where UTILITIES will not own and operate the resource.

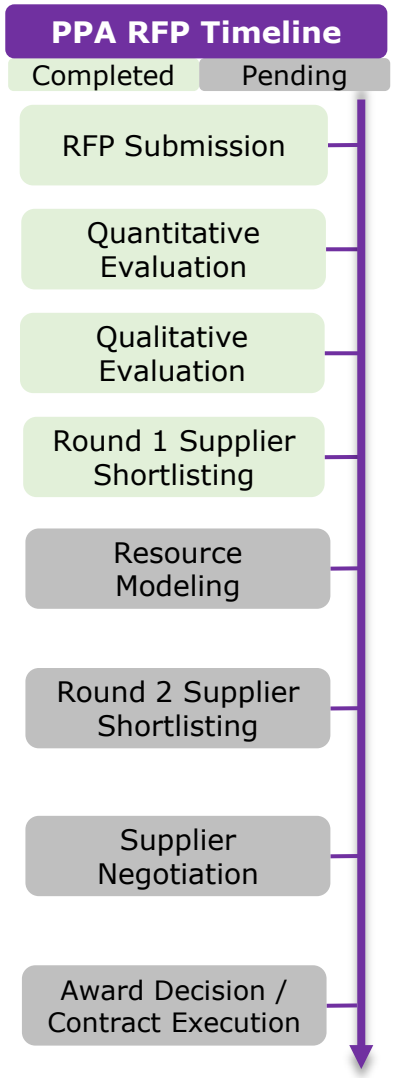
PPA

PPA Evaluation

Scoring Criteria Categories

- Price (Commercial)
- Non-Price (Qualitative)





PPA Risks & Next Steps

Risks

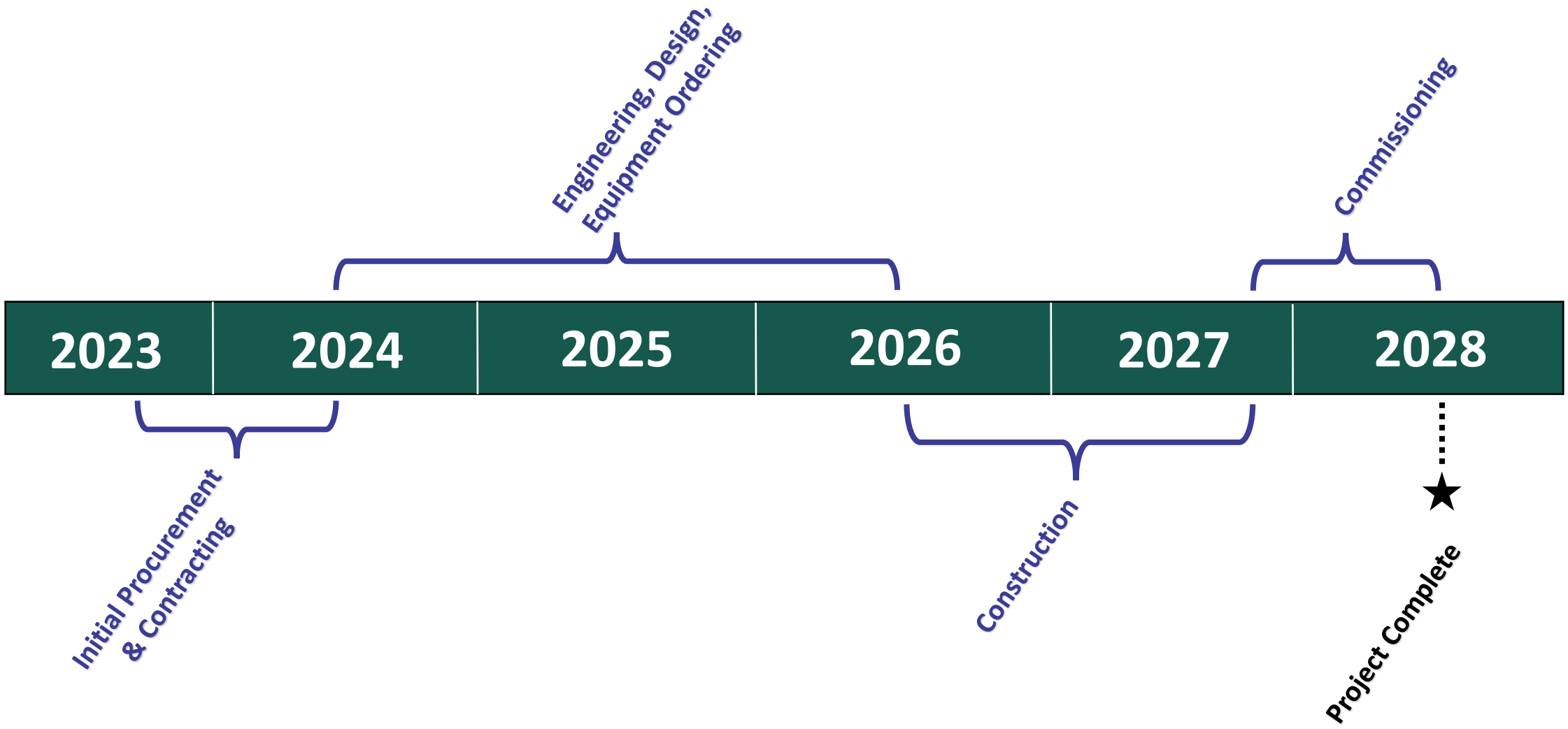
1. **Regulatory Risk –** Risks associated with interconnect application deadlines.
2. **Supply Chain Risk** – High probability of cost escalations and project delays.
3. **Supplier Financial Risk** – High financing costs for projects

Next Steps

- Resource Planning Team is undergoing the modeling process of the shortlisted proposals.
- Transmission Team is updating the estimated transmission costs.
- Finalize Round 2 Evaluation and 2nd Shortlist.
- Begin negotiation planning and develop risk mitigation strategies.

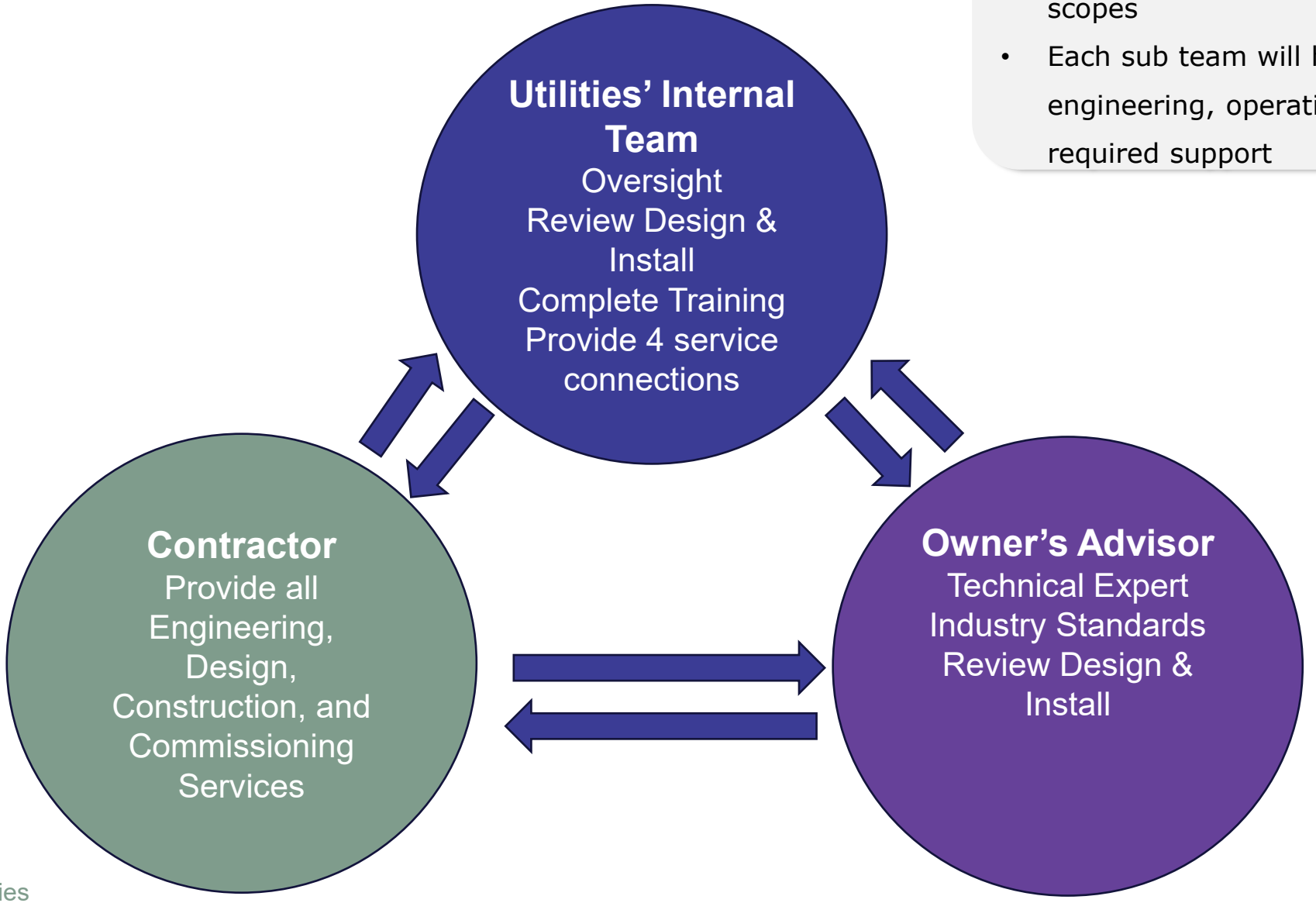
Natural Gas Generation

Timeline


Engineering, Design, Equipment Ordering
Commissioning
2023
2024
2025
2026
2027
2028
Initial Procurement & Contracting
Construction
Project Complete

Project Execution

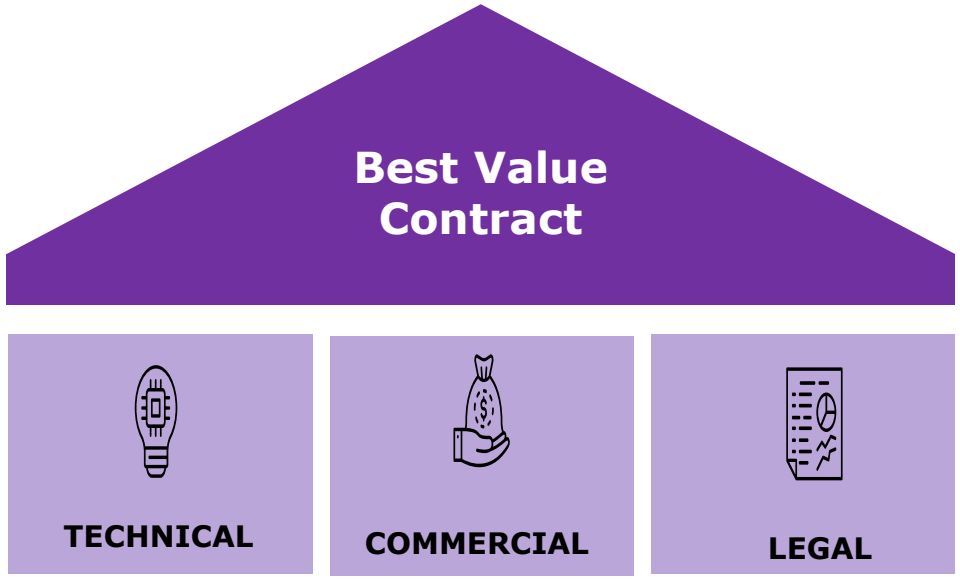
- Project will be divided into sub teams to execute each of the individual scopes
- Each sub team will have a PM, engineering, operations, and other required support

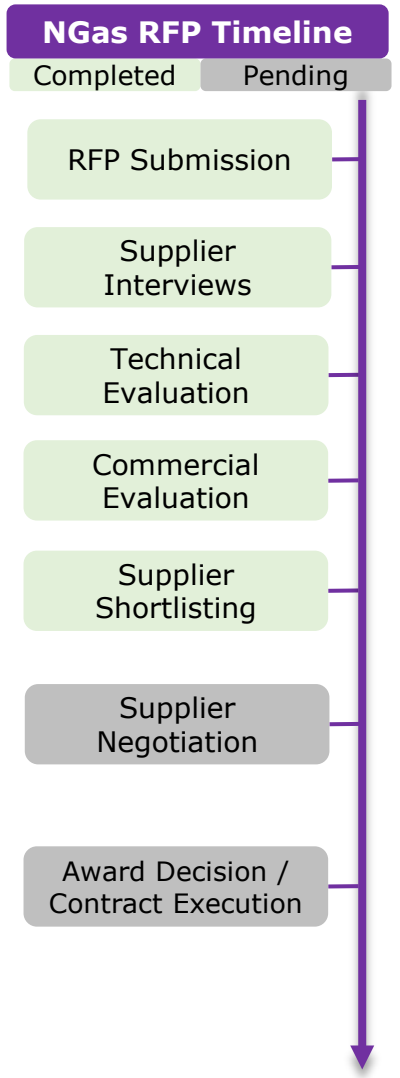


Contractor Selection

Scoring Criteria Categories

- Price (Commercial)
- Non-Price (Qualitative)





Natural Gas Risks & Next Steps

Risks

1. **Supply Chain Risk –** Limited labor resources, long lead times and equipment cost escalations.
2. **Permitting –** Challenging political climate to permit Natural Gas Generation.
3. **Utilities Interconnections –** Electric/ Gas/ Water and Wastewater required

Next Steps

- Prepare and execute contract negotiations.
- Finalize the build site.
- Finalize additional scope requirements.
- Finalize Utilities internal team.

IRP Alignment and Financial Impacts

Additional Considerations

IRP Alignment

- 80% GHG reduction by 2030
- Existing thermal unit retirements
- Phased growth (“Tech Load”) and responsible future development

Scenarios and Risk Mitigation

- Potential stranded asset considerations
- Evolving legislation for 2035 and 2040 GHG targets
- SPP RTOW Balancing Authority Footprint
- PPA contract duration

Additional Projects

- Fuel supply
- Transmission & substations

Estimated Financial Impacts

Rate Increases to Support Projects: *After 5 years*

Rate	2025	2026	2027	2028	2029	Monthly Typical Bill Impact
Electric Gas Generation and SEP (Base Rates)	4.5%	4.5%	4.5%	4.5%	4.5%	**$20.95**
Electric Renewable PPA & Battery (ECA)	0.0%	10.7%	8.9%	27.5%	0.0%	**$17.26**
Natural Gas IRP (Base Rates)	1.5%	1.5%	1.5%	1.5%	1.5%	**$2.27**
Natural Gas Capacity (GCC)	0.0%	0.0%	9.7%	44.7%	0.5%	**$9.98**

- Gas Generation, Gas IRP, and SEP most likely funded by base rates due to difficulty delineating benefits making use of a rider difficult
- Electric PPA and Gas Capacity projects would be funded through fuel and capacity rates (ECA & GCC)

Energy Vision

Energy Vision

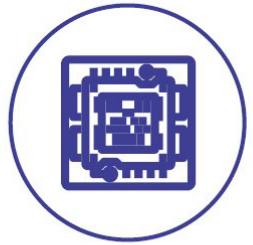
Provide resilient, reliable, and cost-effective energy that is environmentally sustainable to enhance our quality of life for generations.

STRATEGIC PILLARS TO SUPPORT THE ENERGY VISION

ECONOMIC

ENVIRONMENT

RESILIENCY



INNOVATION

Planning Drivers and Trends

Decarbonization

Customer Preferences

Renewable Generation

Time of Day

Distributed Resources

Business Model Risk

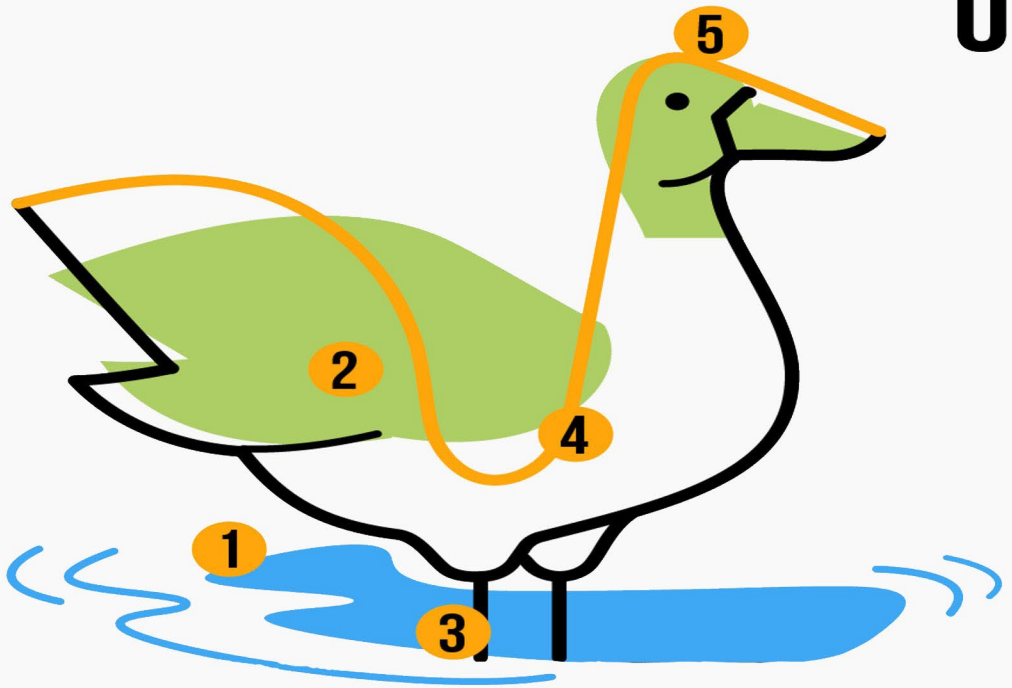
Regional Market

Supply Chain Constraints

Grid Data and Connectivity

Technological Innovation

The Energy Duck



OUR PRIORITIES IN A NEW ENERGY LANDSCAPE

1. **Protect the duck's pond** (reliably decarbonize).
2. **Keep the money in the duck's pocket** (revenue requirement reduction, customer savings).
3. **Make the duck dance** (customer services).
4. **Feed the duck** (utilize excess energy).
5. **Make the duck "duck"** (peak reduction).

Regional Transmission Organization Readiness

Prepare systems, processes and resources for entrance in Southwest Power Pool's (SPP) Regional Transmission Organization-West (RTO-W).

Renewable Energy Integration

Prepare for high levels of utility and customer owned renewable energy generation.

Resource Connectivity

Prepare for a more connected and transactive energy grid and network.

Vehicle to Grid Integration

Prepare for system impacts from electrification of the transportation sector.

Optimized Transmission Capacity and Balance

Prepare for increased import/export and system transmission capacity to account for the full range of contingency scenarios.

Microgrid Potential Study

Assess microgrid standards and benefits for enhancing infrastructure reliability and resiliency.

Clean Heat Plan and Beneficial Building Electrification

Proactively prepare the grid for increased electric load resulting from gas to electric conversion.

Confirm Plan Direction

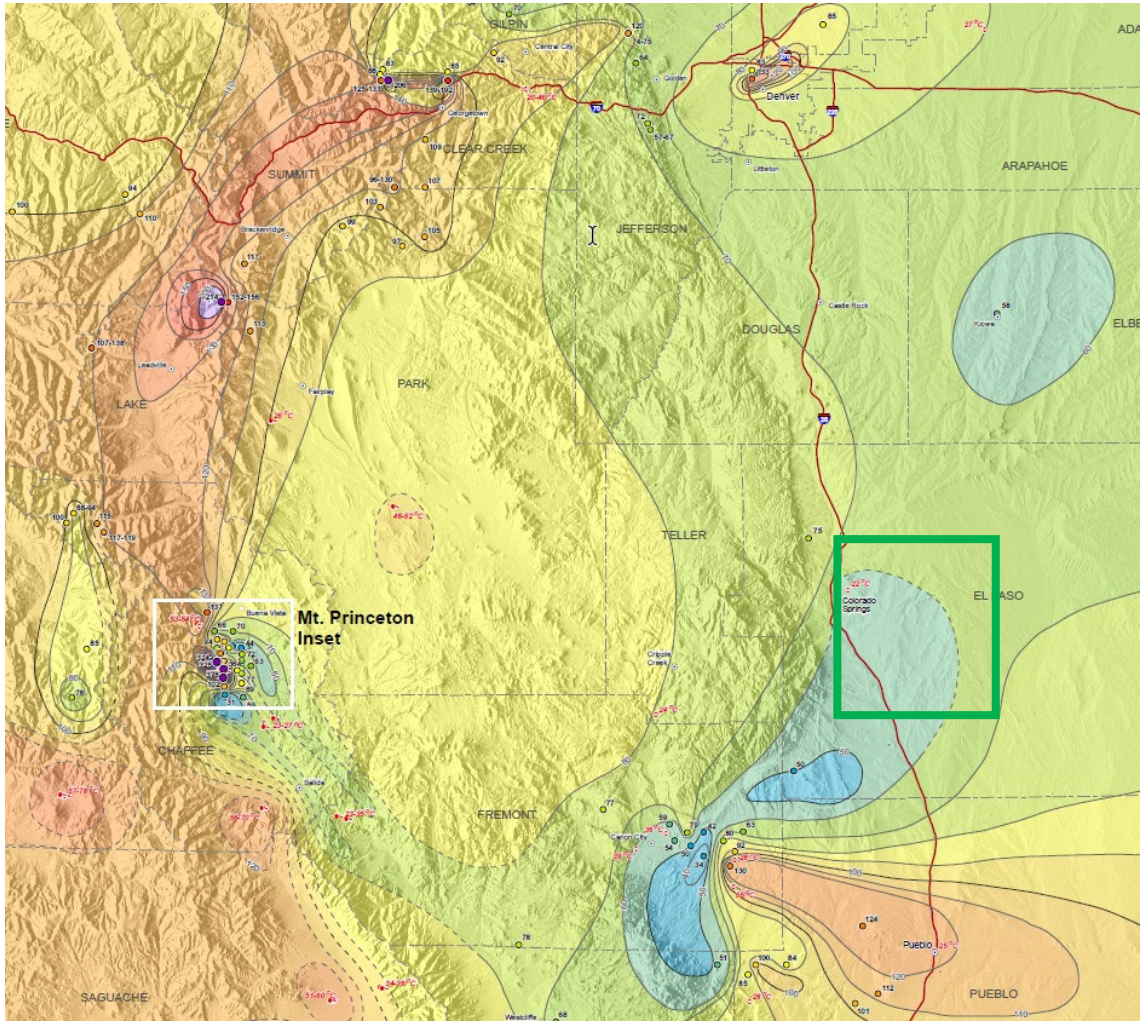
Potential Future Resources

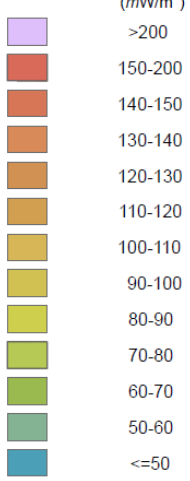
Potential Future Resources

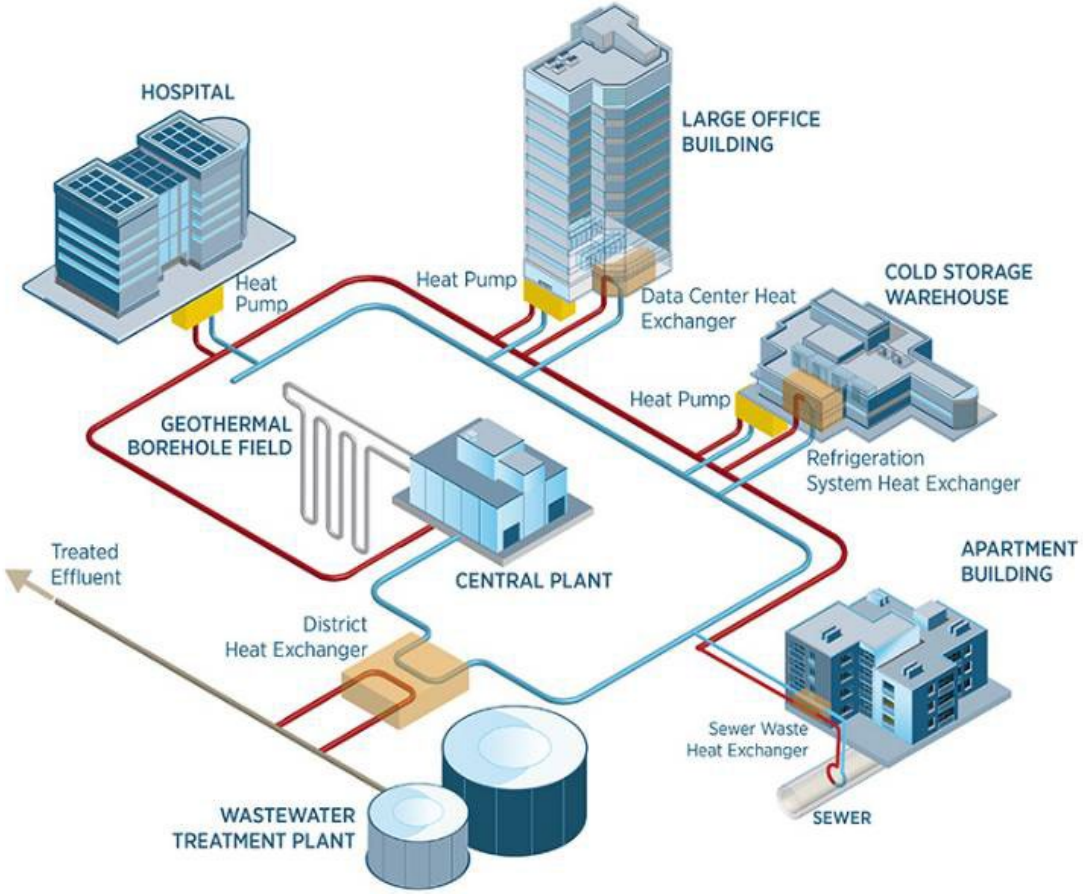
Generation Technology

- Geothermal / Thermal Heating Services
- Thermal Storage
- Hydrogen
- Renewable Natural Gas (RNG)
- Pumped Storage
- Nuclear Small Modular Reactor (SMR)

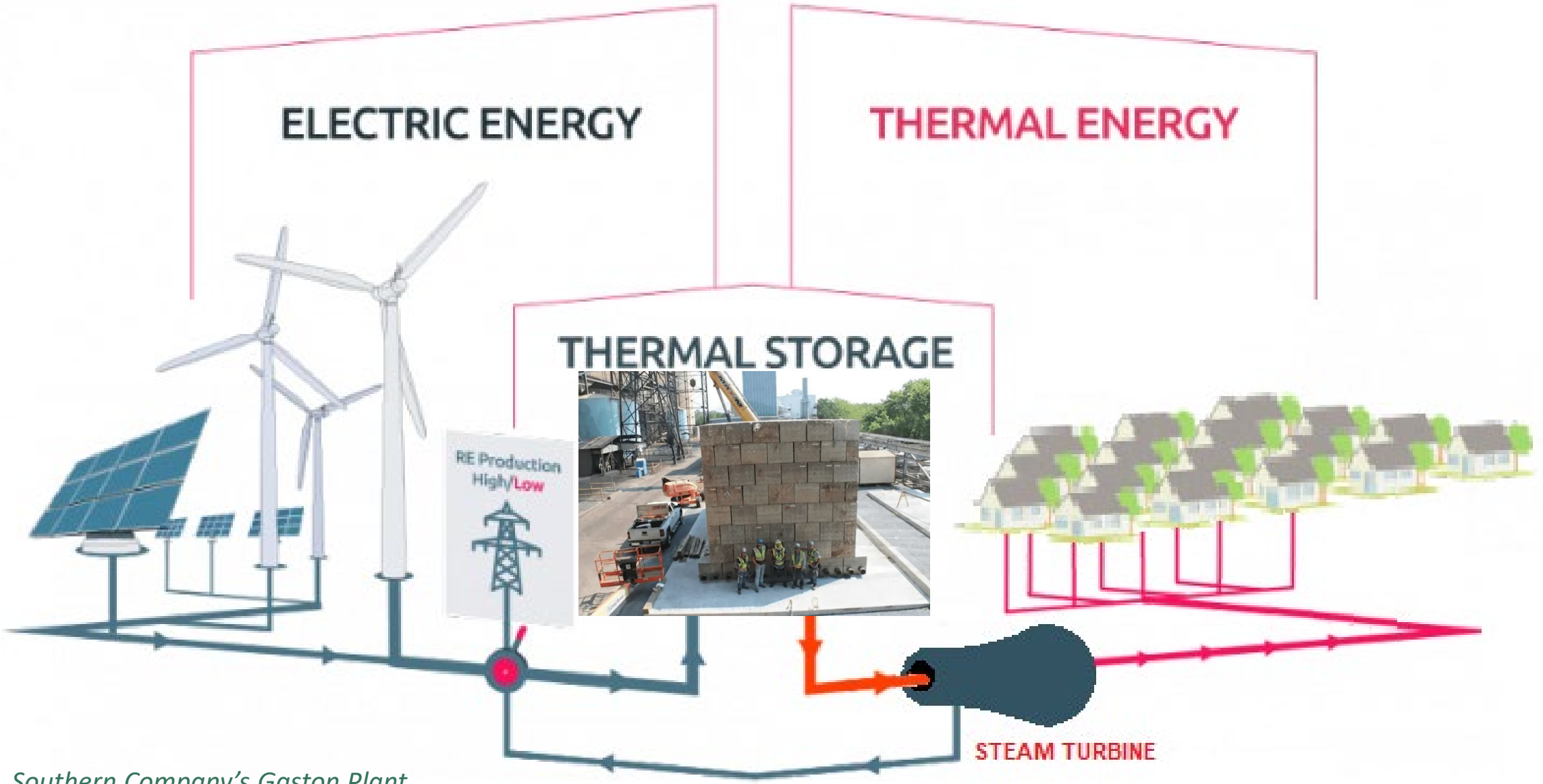
Geothermal/Thermal Heating Services





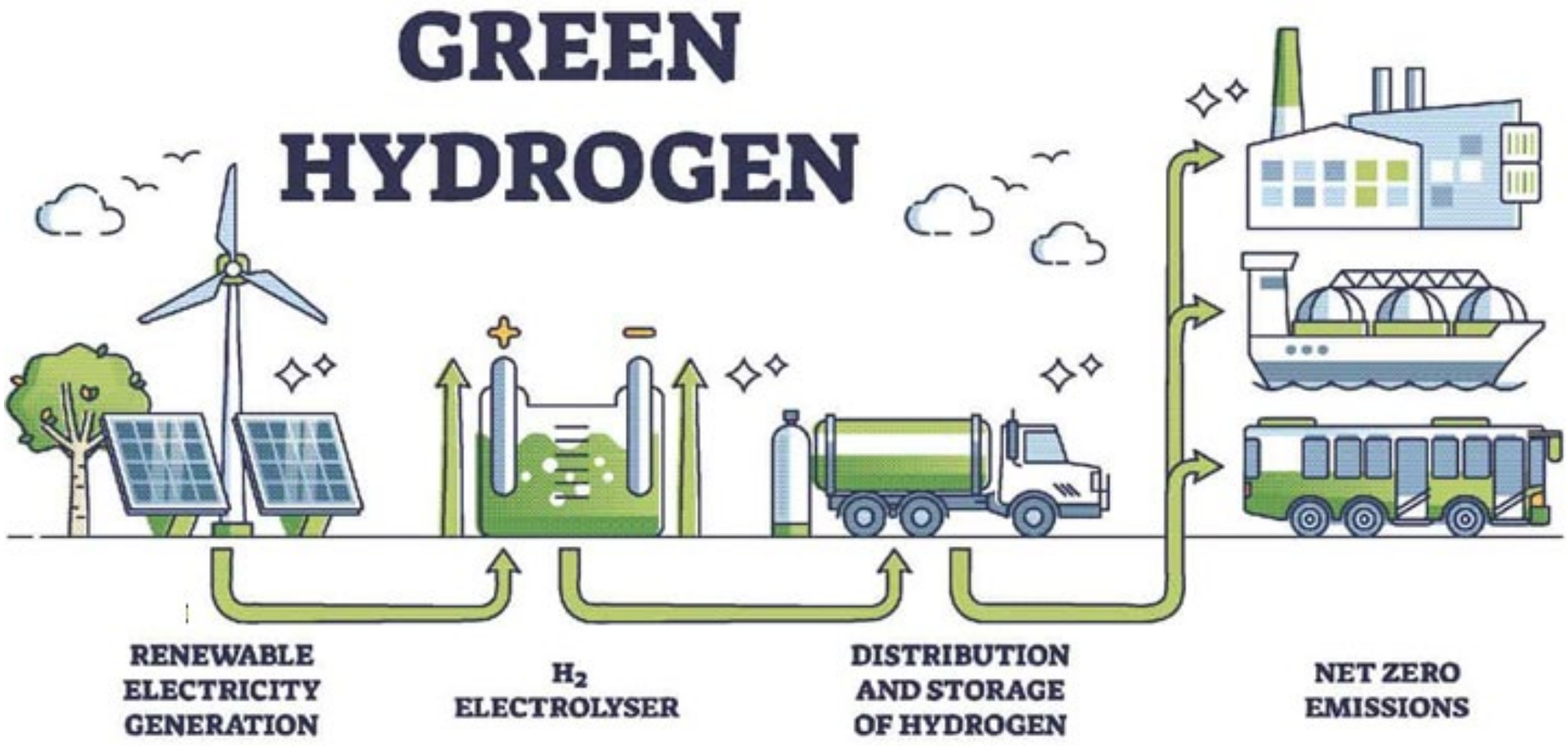


Thermal Storage

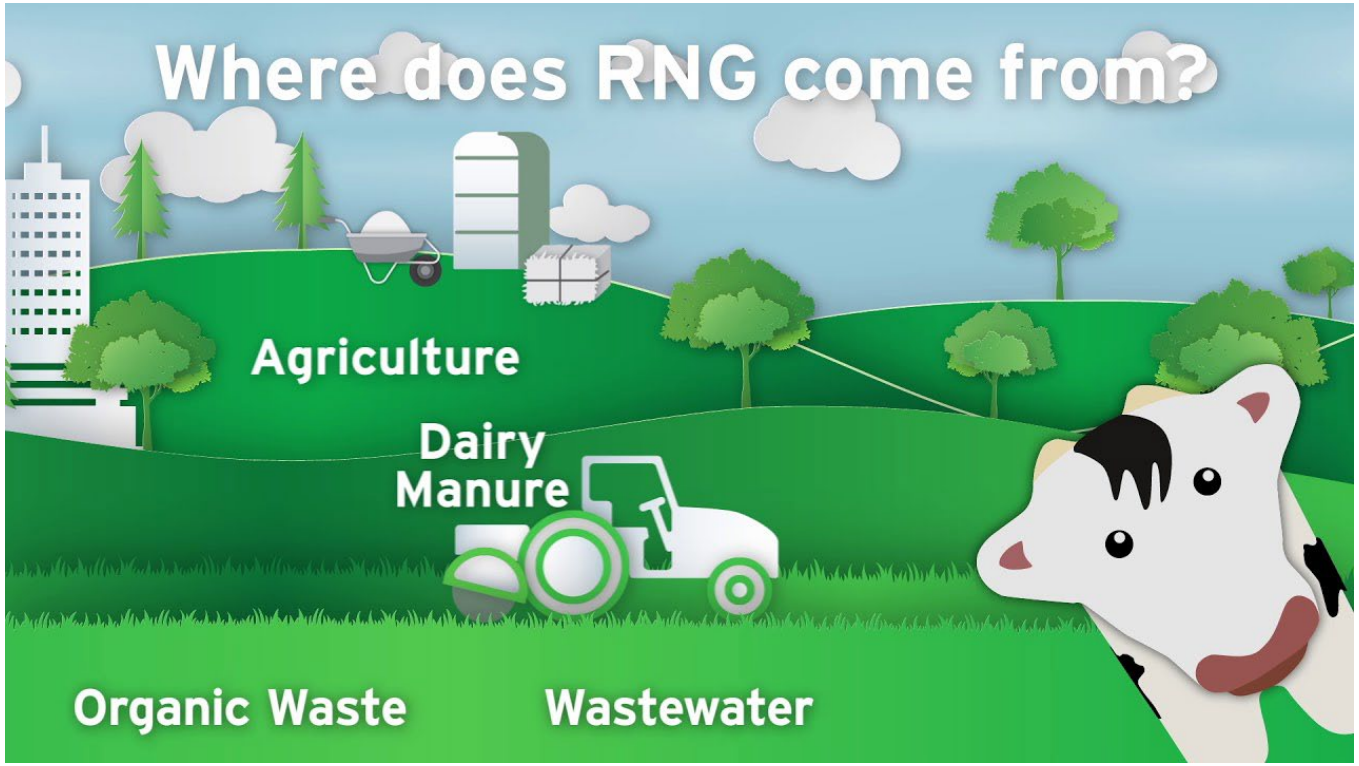


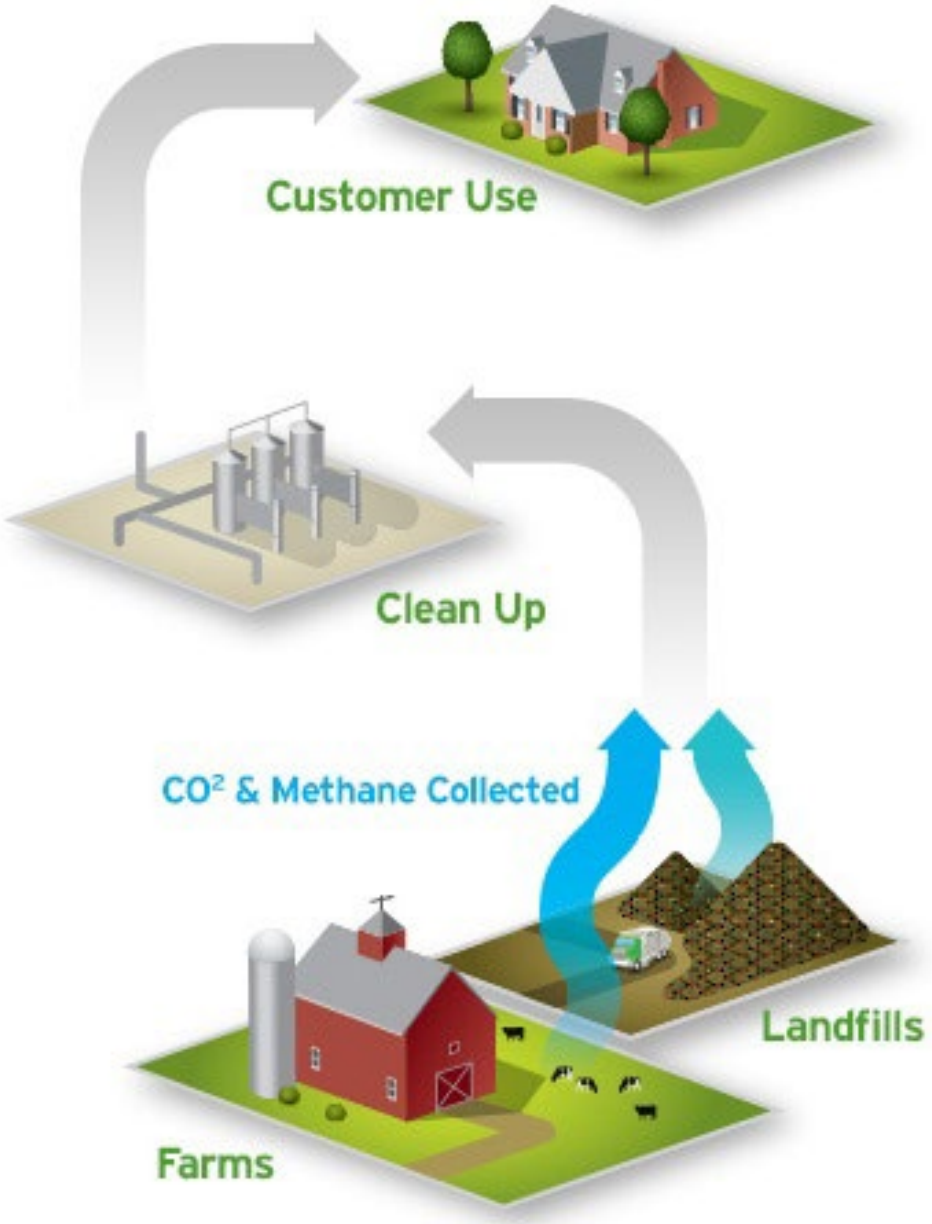
Southern Company's Gaston Plant

Hydrogen Fuel

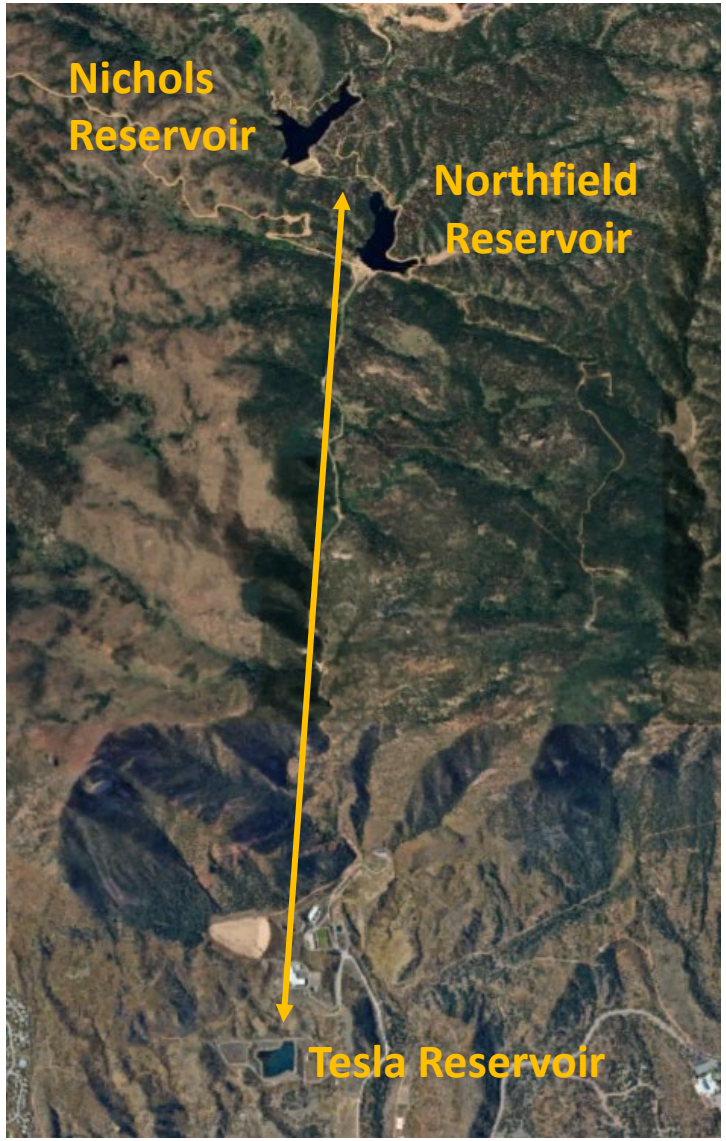


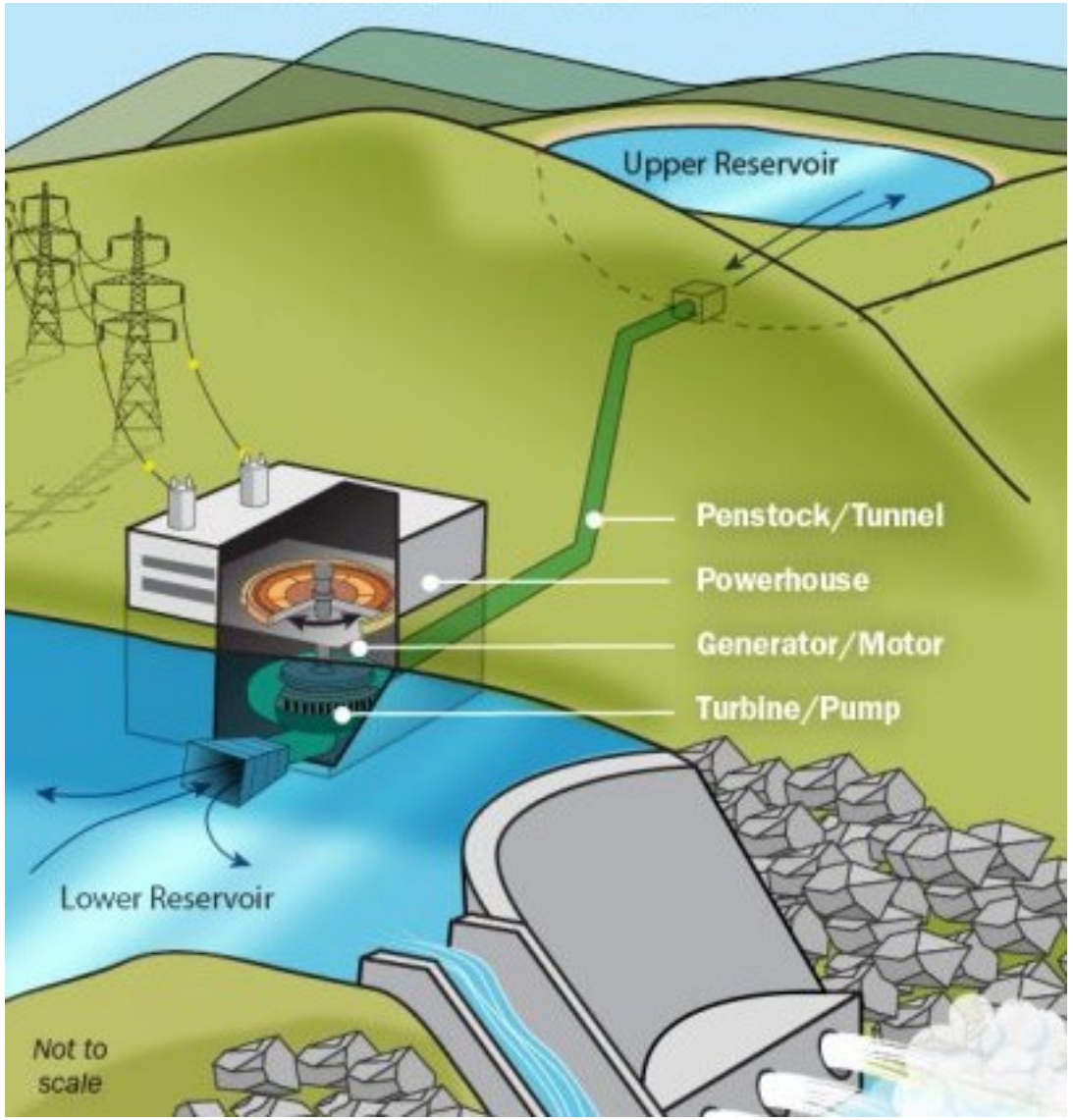
Renewable Natural Gas





Pumped Storage





Nuclear Small Modular Reactor (SMR)

External view of an SMR plant

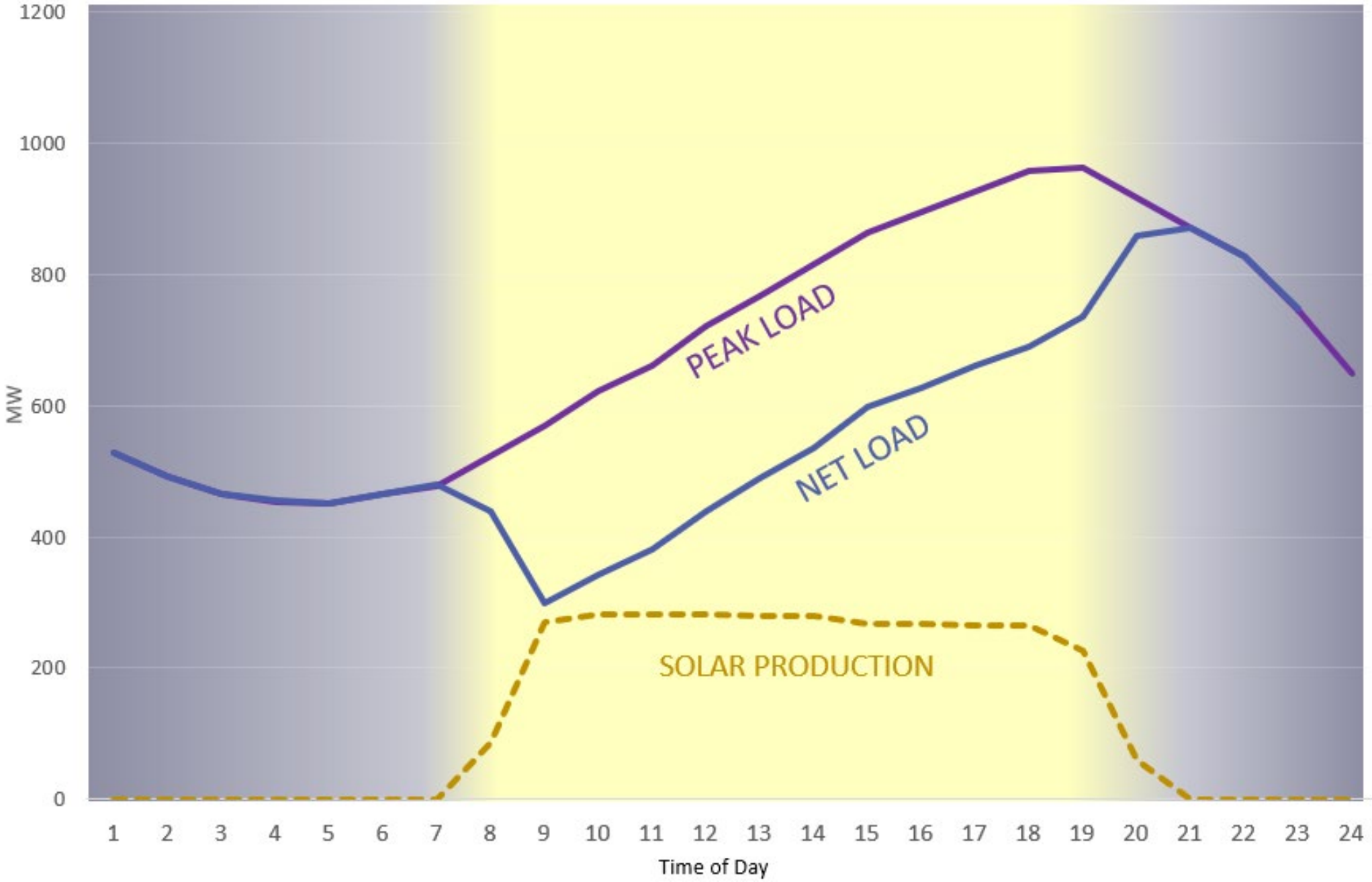
Internal view of an SMR plant

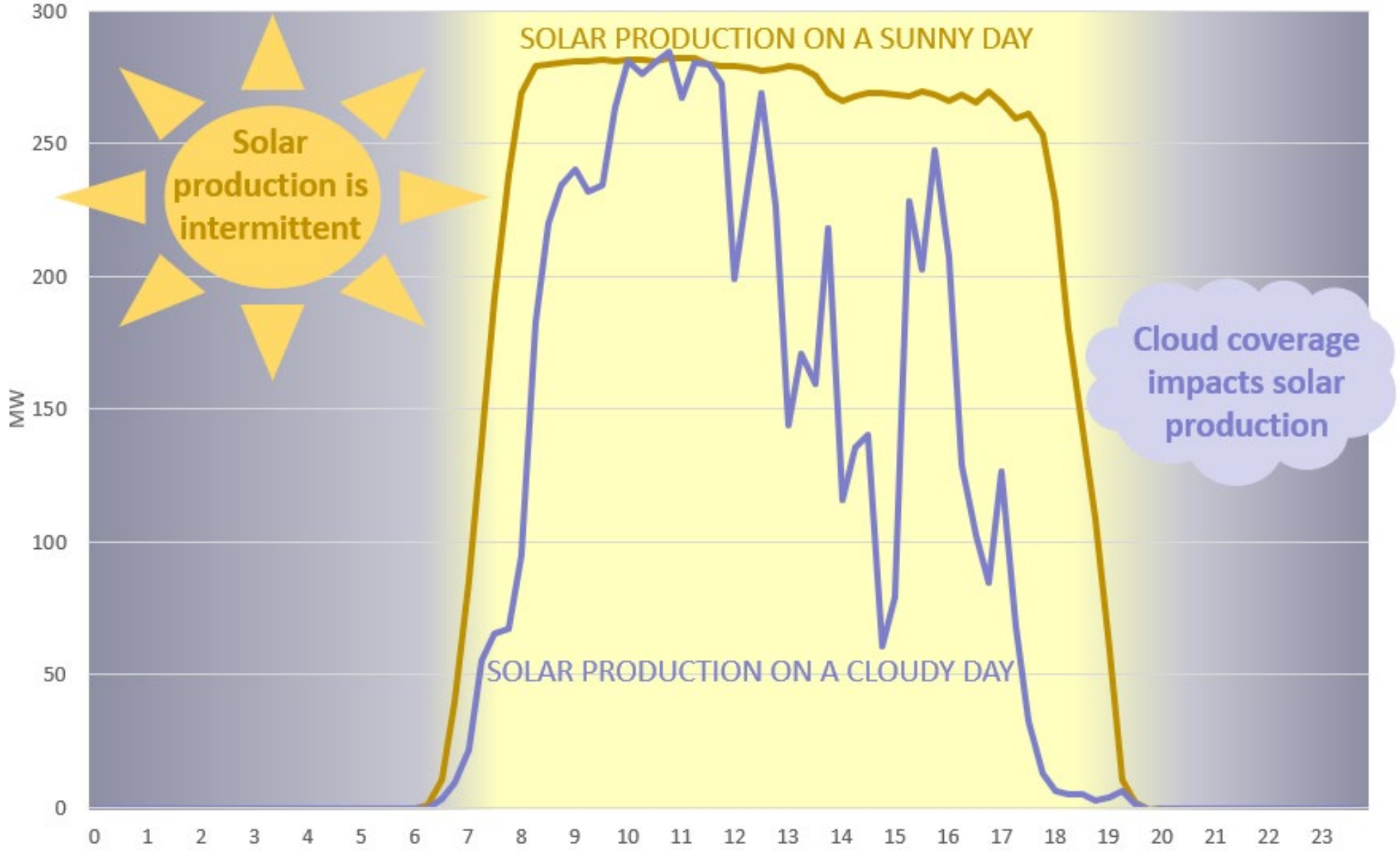
Energy Vision Activity

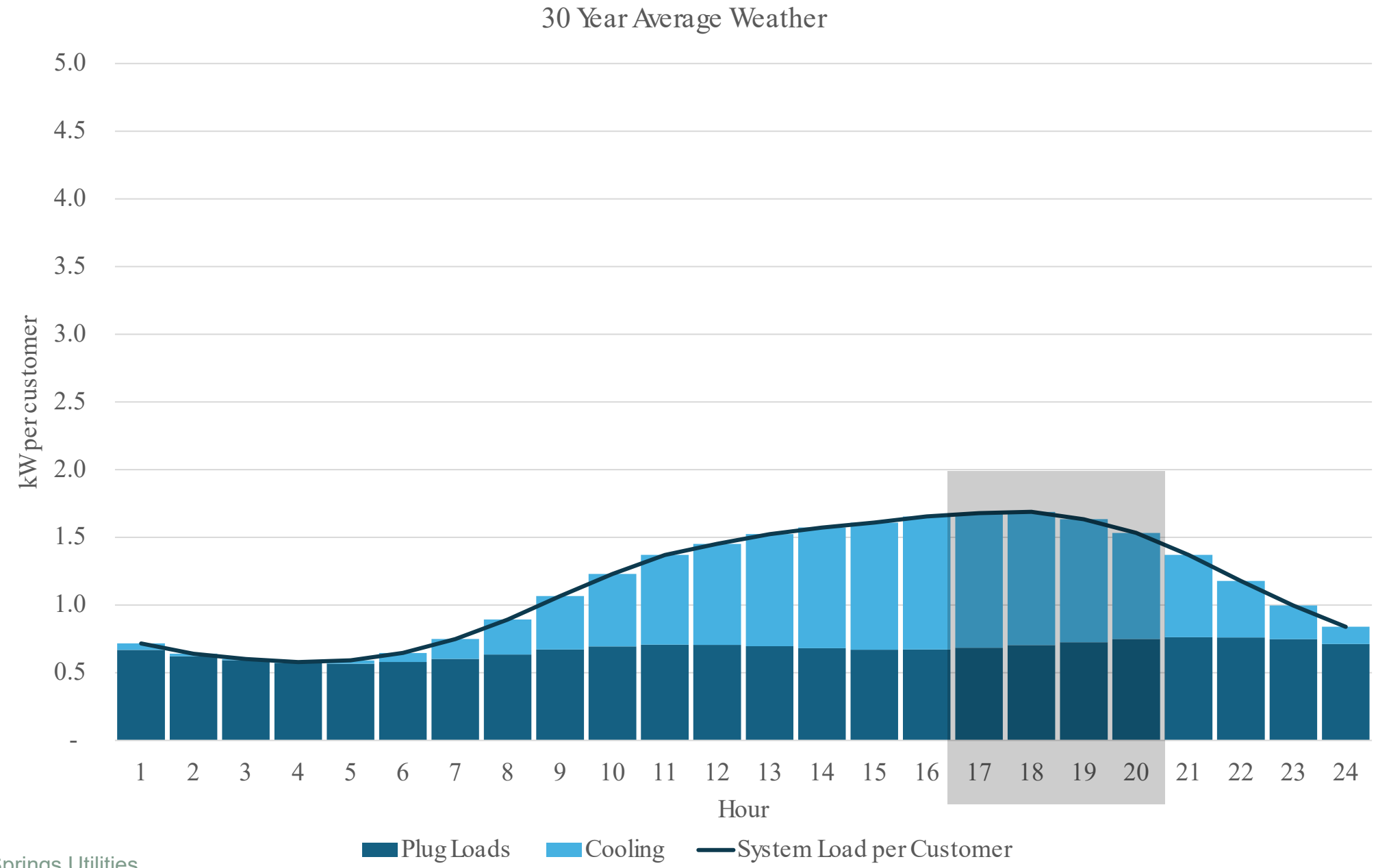
Overview

- Regional Transmission Organization (RTO) – Alex Baird, Fuels and Purchase Power Manager
- Renewable Energy Integration and Energy Wise – Scott Shirola, Pricing and Rates Manager
- Microgrid Pilot – Kathryn Rozwod, Energy Resource Planning Supervisor

Renewable Energy Integration and Energy Wise


1200
1000
800
600
400
200
0
MW
PEAK LOAD
NET LOAD
SOLAR PRODUCTION
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Time of Day


SOLAR PRODUCTION ON A SUNNY DAY
Solar production is intermittent
SOLAR PRODUCTION ON A CLOUDY DAY
Cloud coverage impacts solar production
MW
300
250
200
150
100
50
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23


30 Year Average Weather
5.0
4.5
4.0
3.5
3.0
2.5
2.0
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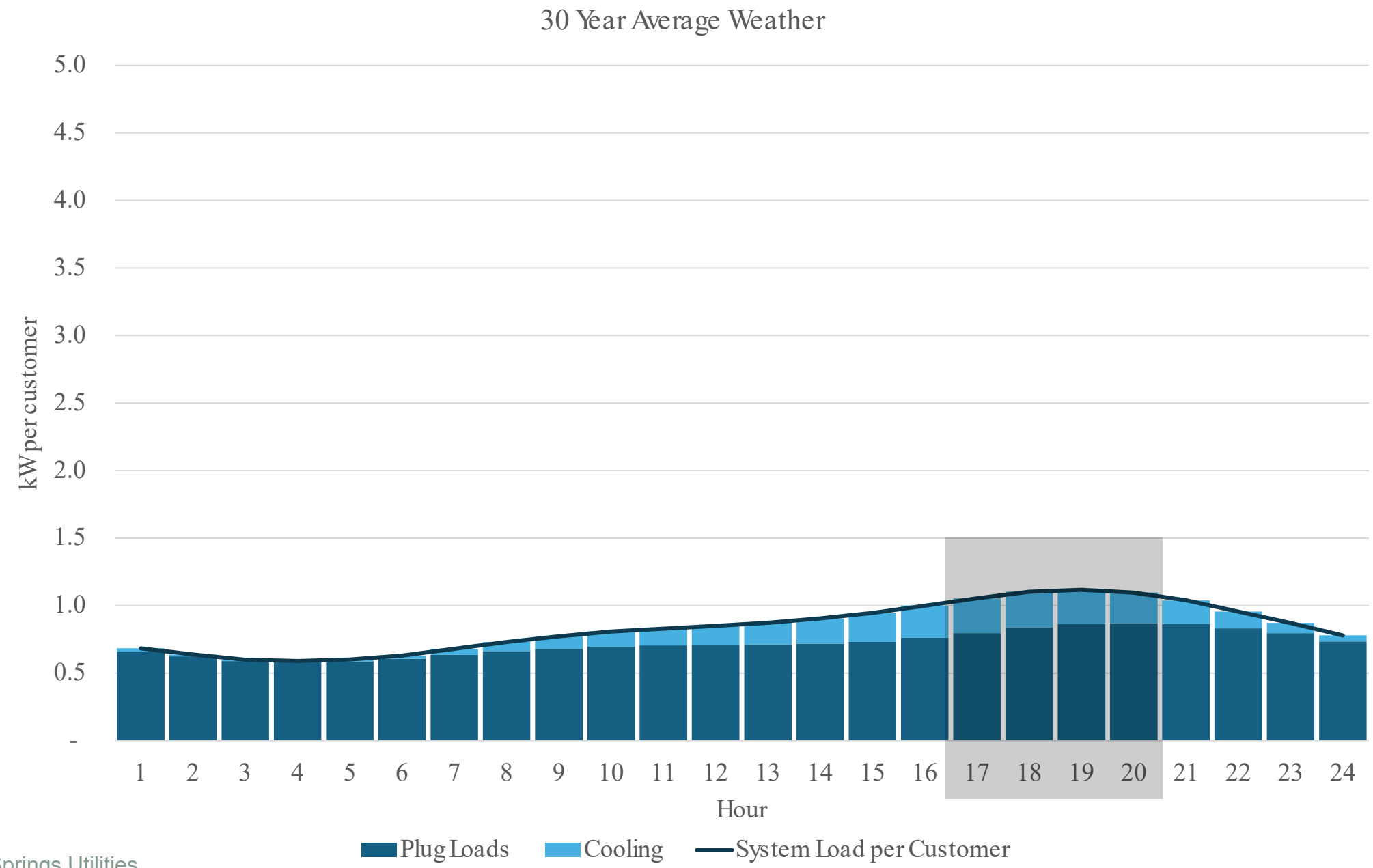
-
kW per customer
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour
Plug Loads
Cooling
System Load per Customer


30 Year Average Weather
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kW per customer
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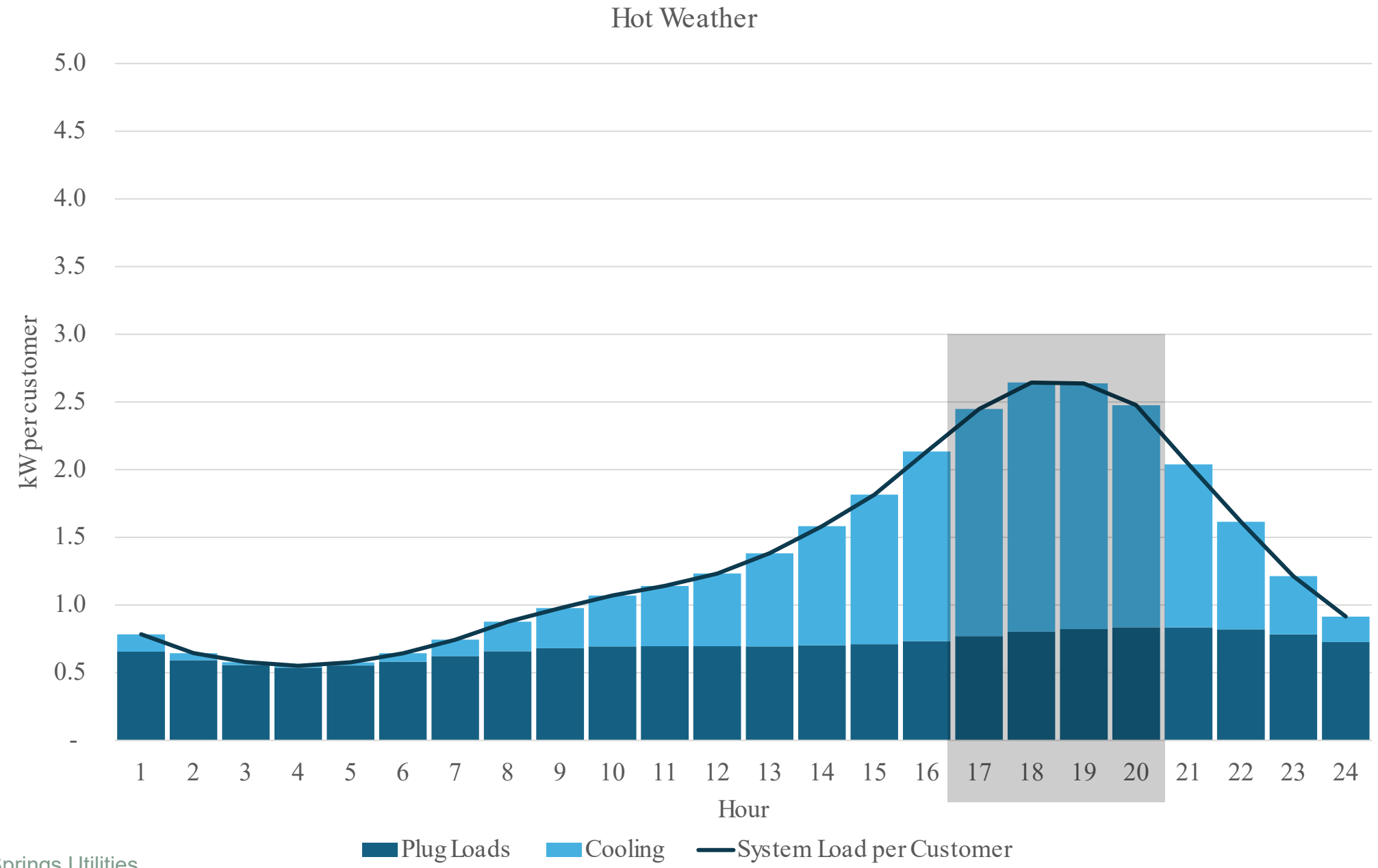
Hour
Plug Loads
Cooling
System Load per Customer


Hot Weather
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4.5
4.0
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3.0
2.5
2.0
1.5
1.0
0.5
-
kW per customer
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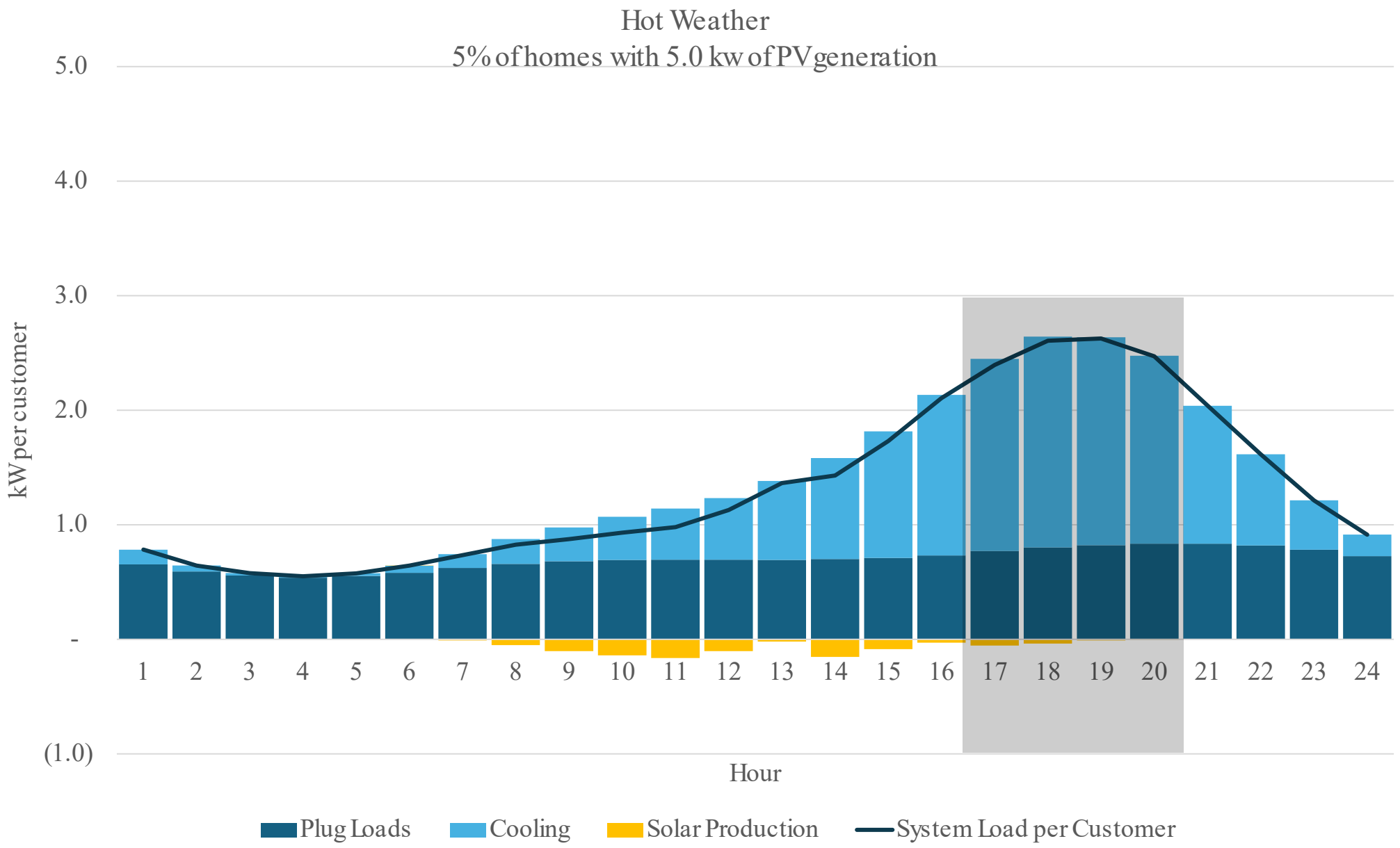
Hour
Plug Loads
Cooling
System Load per Customer


Hot Weather
5% of homes with 5.0 kw of PV generation
5.0
4.0
3.0
2.0
1.0
-
(1.0)
kW per customer
1
2
3
4
5
6
7
8
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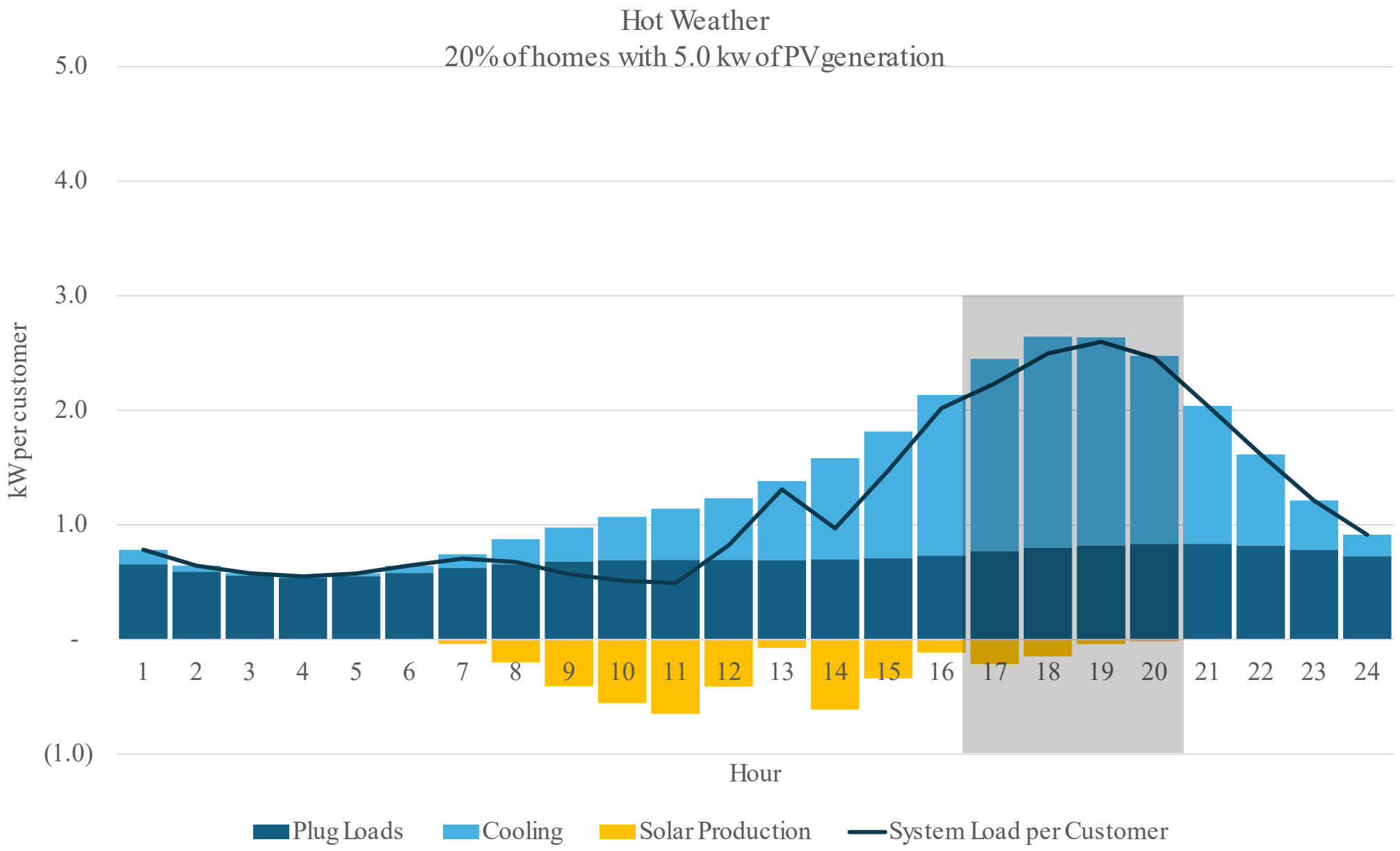
22
23
24
Hour
Plug Loads
Cooling
Solar Production
System Load per Customer


Hot Weather
20% of homes with 5.0 kw of PV generation
5.0
4.0
3.0
2.0
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-
(1.0)
kW per customer
1
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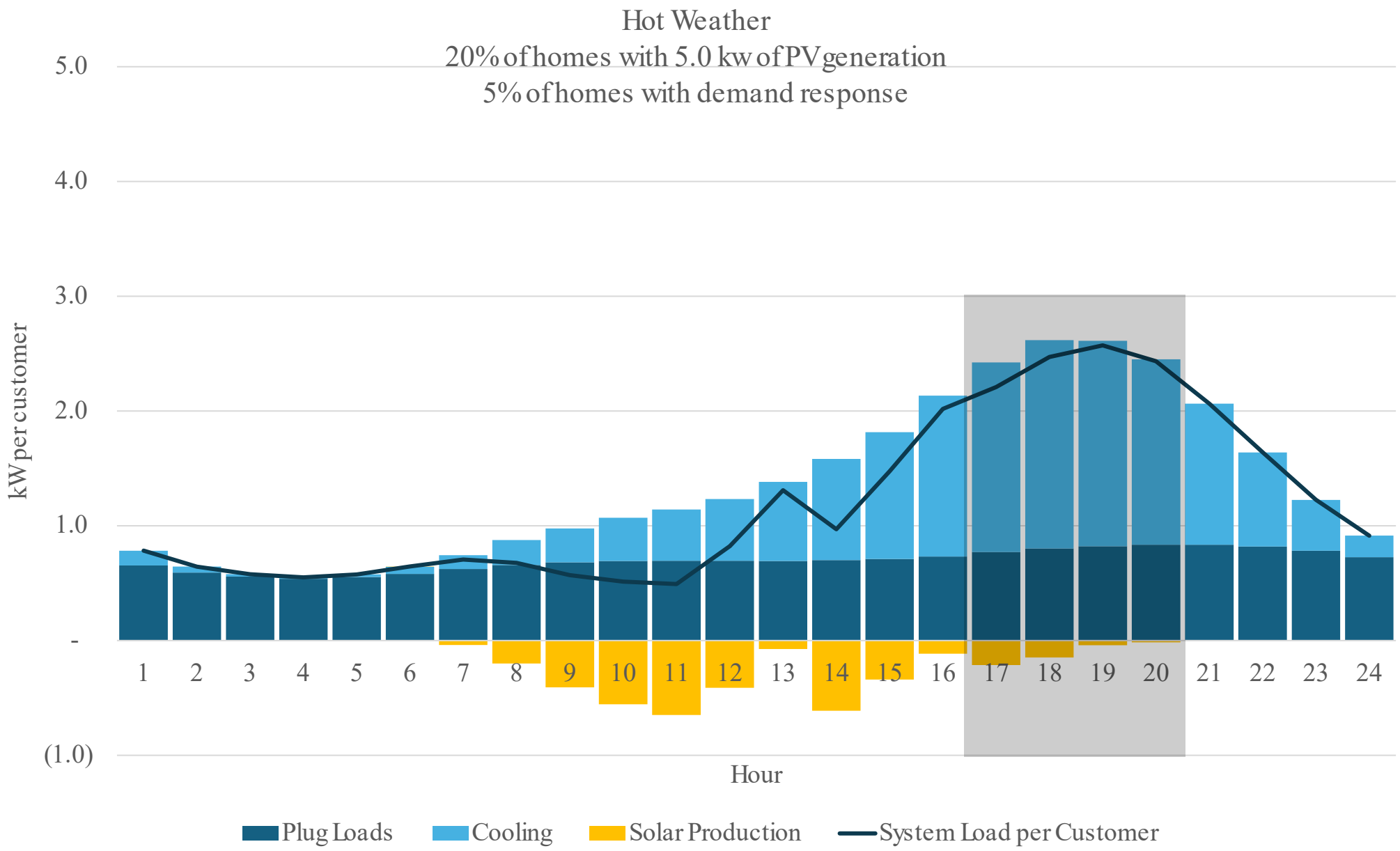
Hour
Plug Loads
Cooling
Solar Production
System Load per Customer


Hot Weather
20% of homes with 5.0 kw of PV generation
5% of homes with demand response
5.0
4.0
3.0
2.0
1.0
-
(1.0)
kW per customer
1
2
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4
5
6
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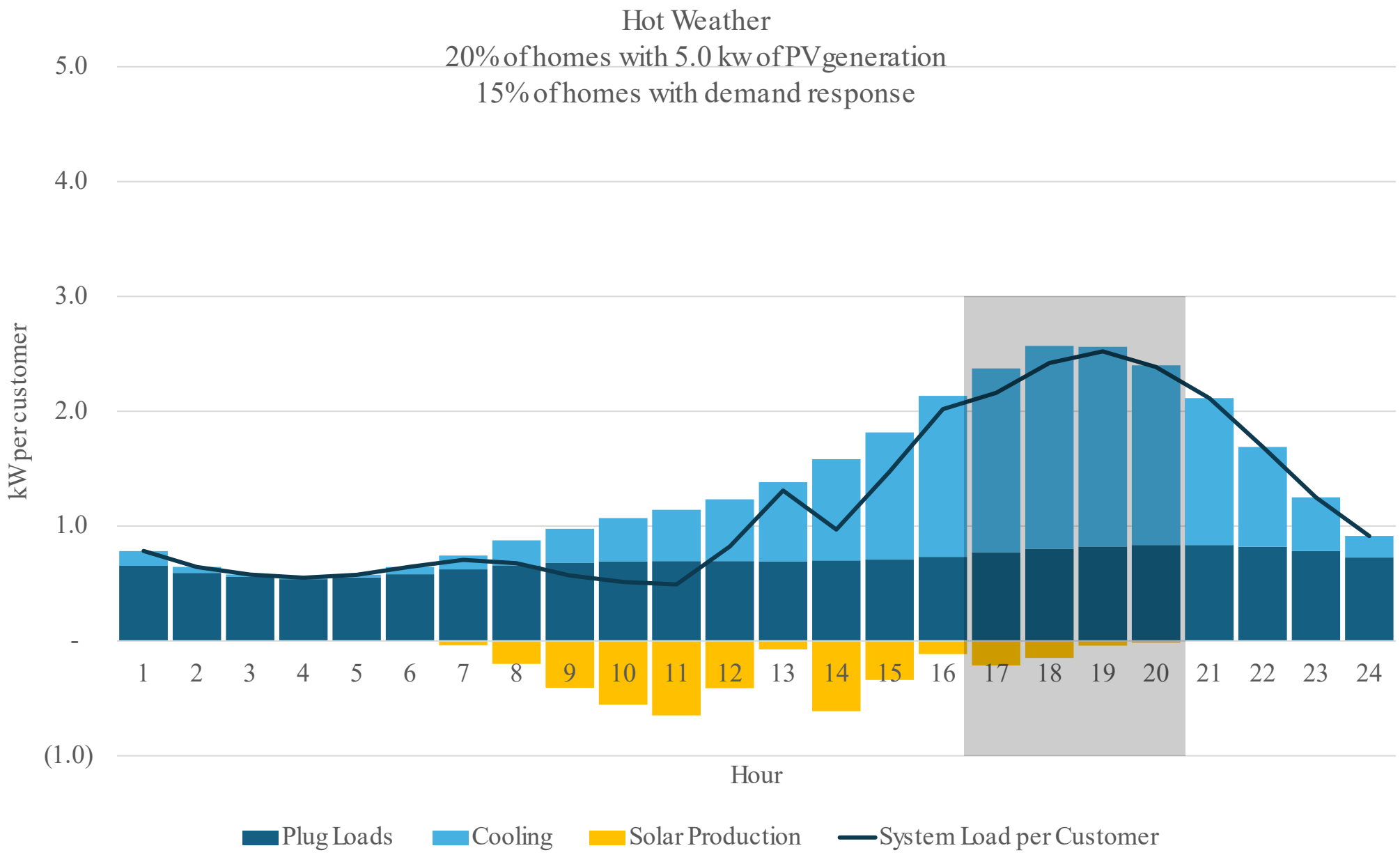
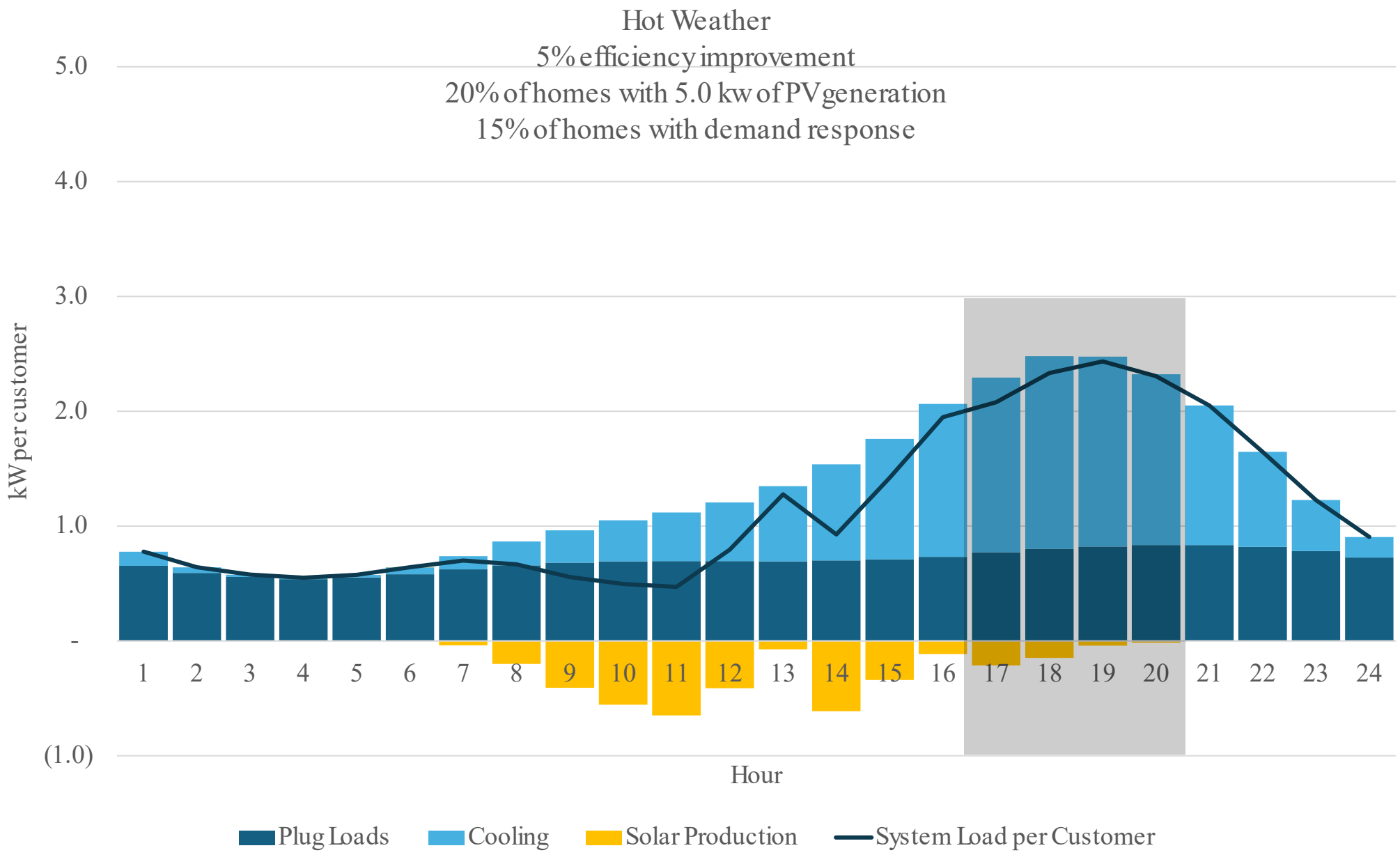
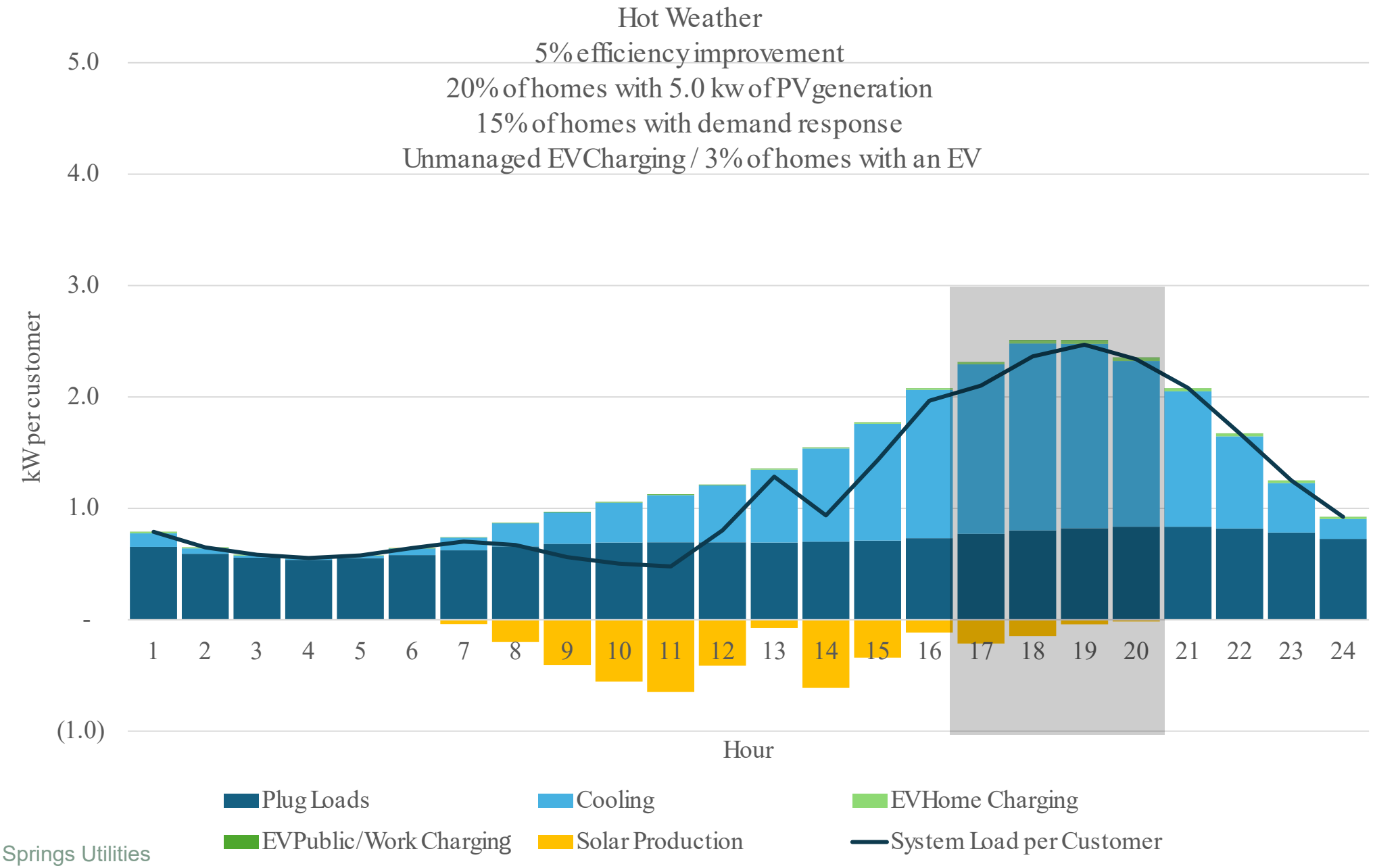
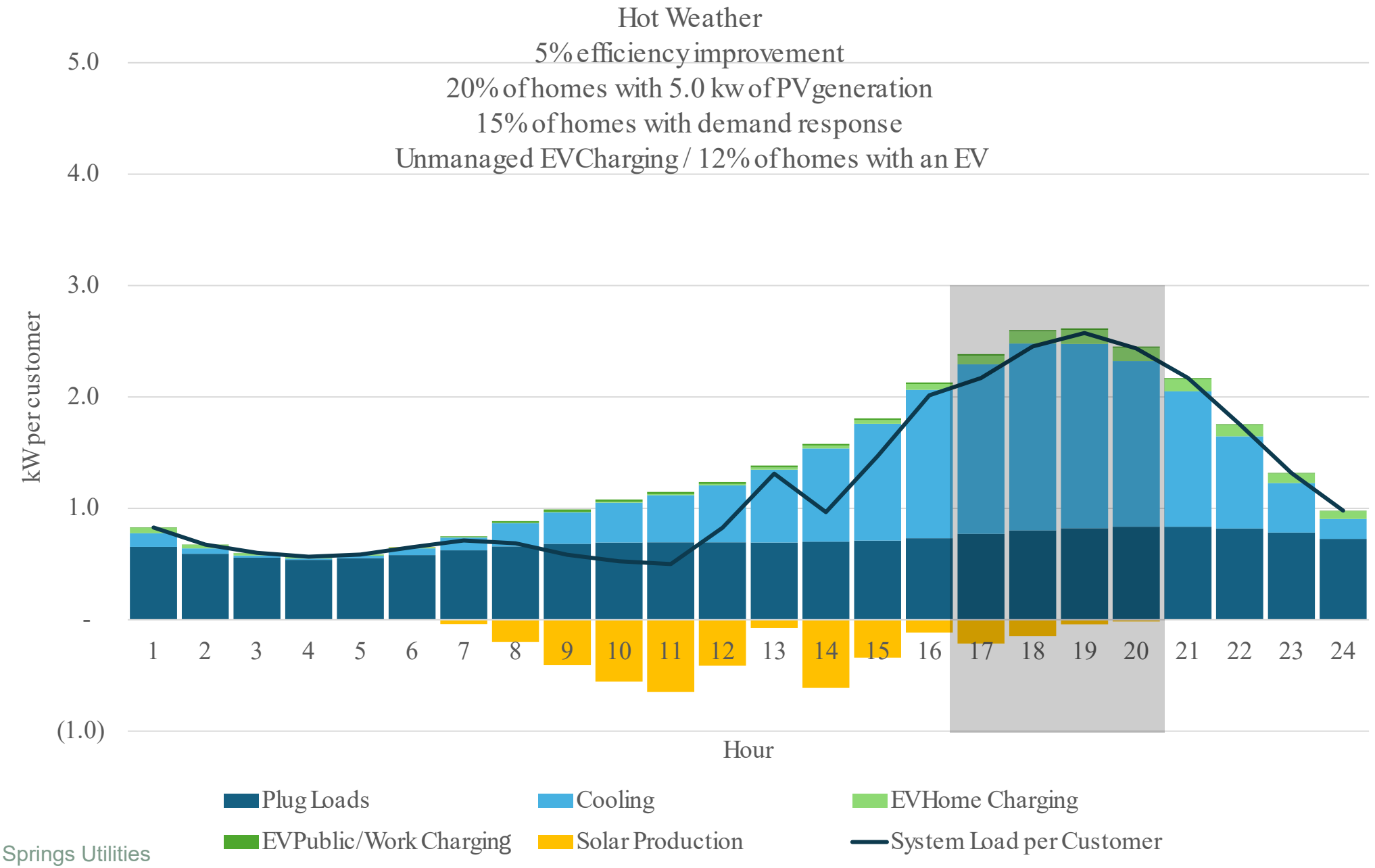
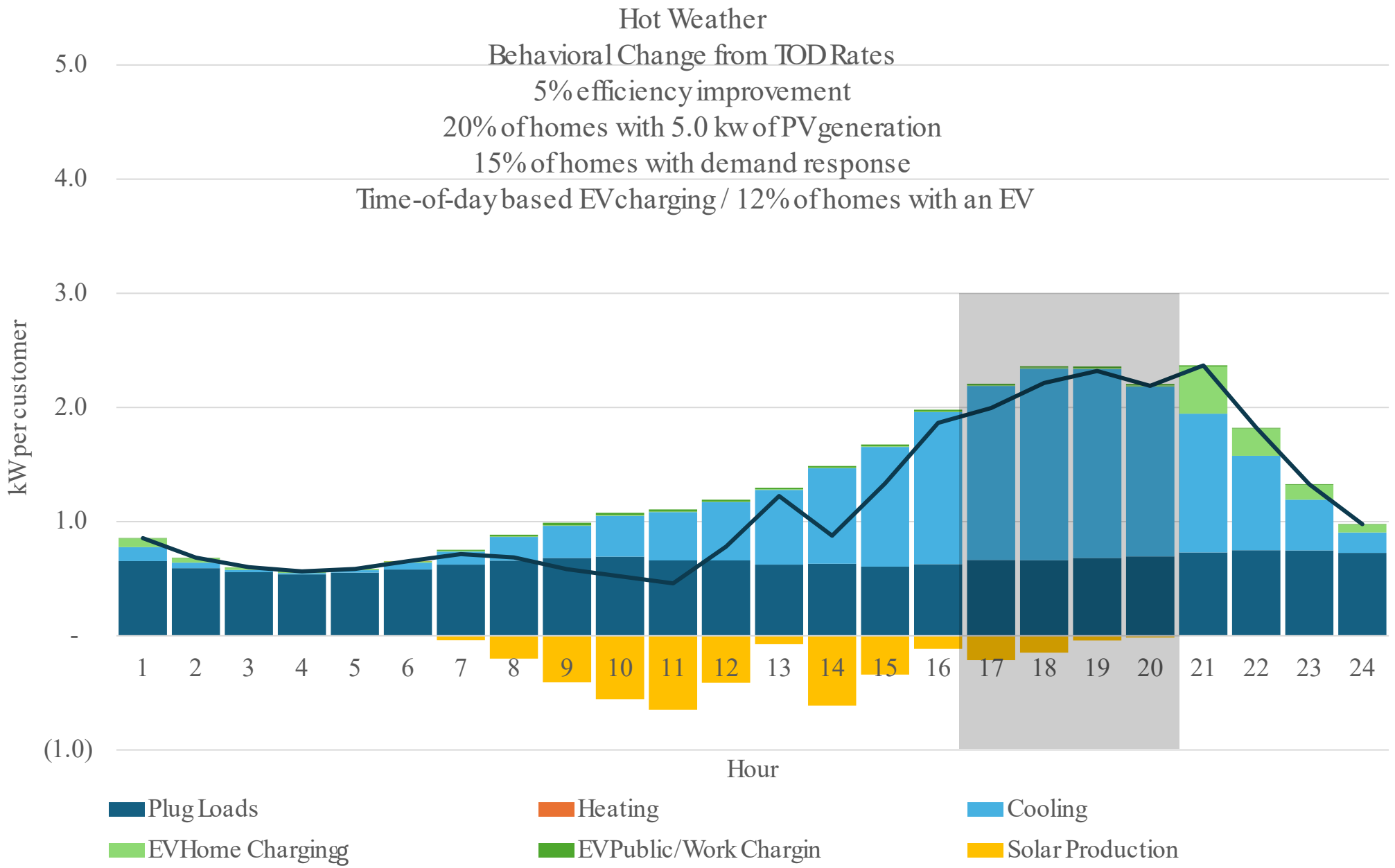
Hour
Plug Loads
Cooling
Solar Production
System Load per Customer

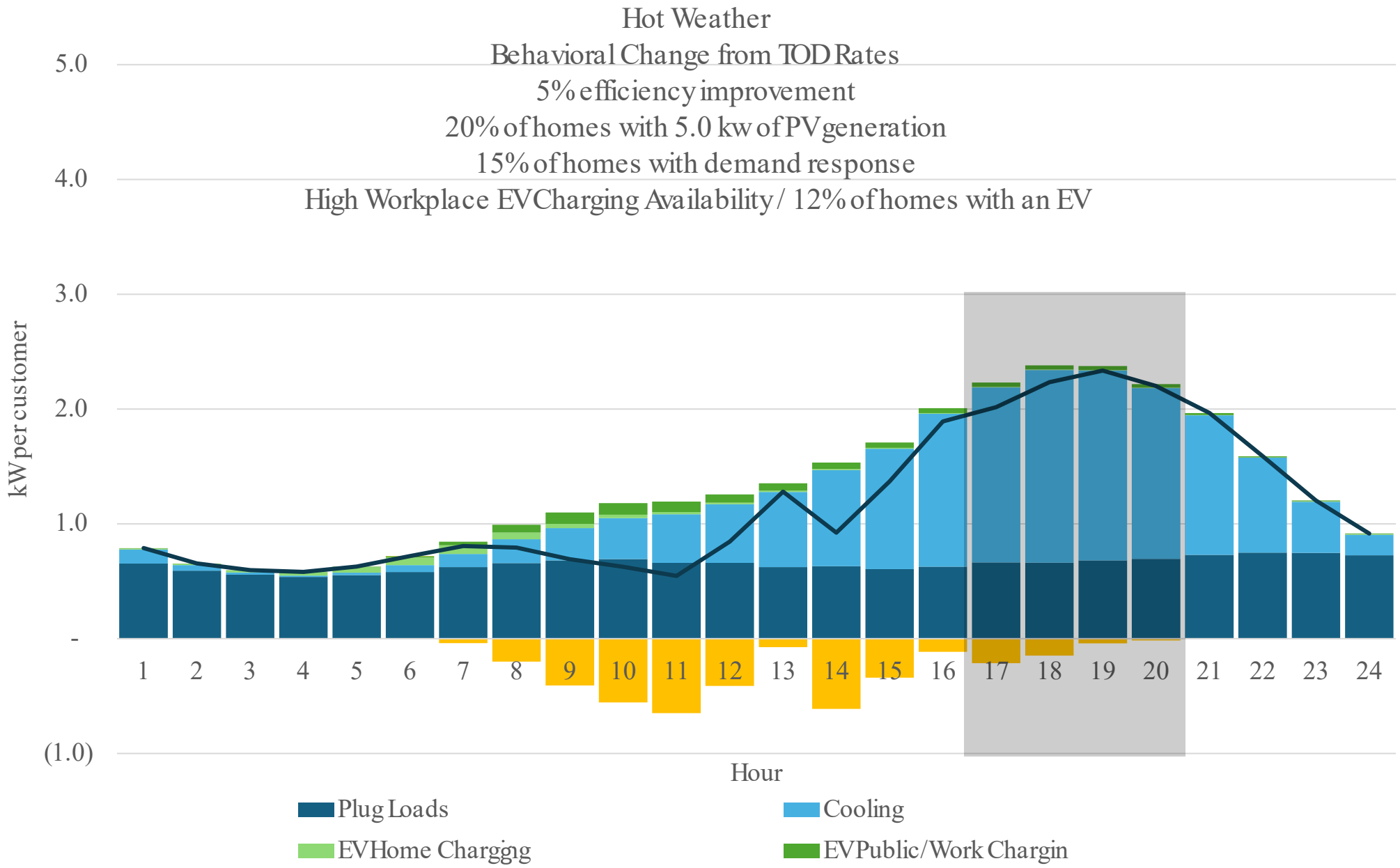

Hot Weather
20% of homes with 5.0 kw of PV generation
15% of homes with demand response
5.0
4.0
3.0
2.0
1.0
-
(1.0)
kW per customer
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour
Plug Loads
Cooling
Solar Production
System Load per Customer

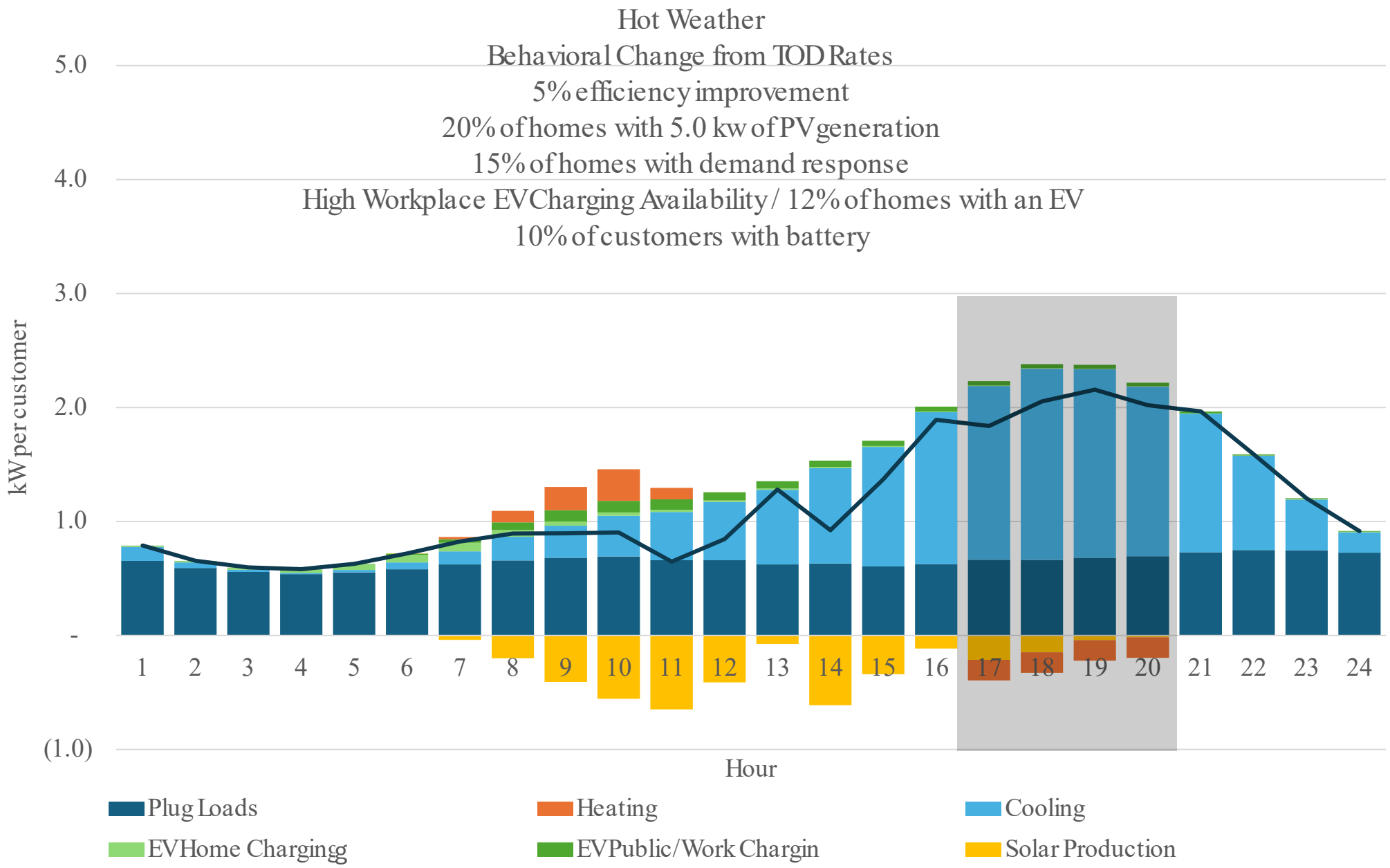

Hot Weather
5% efficiency improvement
20% of homes with 5.0 kw of PV generation
15% of homes with demand response
5.0
4.0
3.0
2.0
1.0
-
(1.0)
kW per customer
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
Hour
Plug Loads
Cooling
Solar Production
System Load per Customer


Hot Weather
5% efficiency improvement
20% of homes with 5.0 kw of PV generation
15% of homes with demand response
Unmanaged EV Charging / 3% of homes with an EV
5.0
4.0
3.0
2.0
1.0
-
(1.0)
kW per customer
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour
Plug Loads
Cooling
EV Home Charging
EV Public/Work Charging
Solar Production
System Load per Customer


Hot Weather
5% efficiency improvement
20% of homes with 5.0 kw of PV generation
15% of homes with demand response
Unmanaged EV Charging / 12% of homes with an EV
5.0
4.0
3.0
2.0
1.0
-
(1.0)
kW per customer
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour
Plug Loads
Cooling
EV Home Charging
EV Public/Work Charging
Solar Production
System Load per Customer


Hot Weather
Behavioral Change from TOD Rates
5% efficiency improvement
20% of homes with 5.0 kw of PV generation
15% of homes with demand response
Time-of-day based EV charging / 12% of homes with an EV
5.0
4.0
3.0
2.0
1.0
-
(1.0)
kW per customer
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour
Plug Loads
Heating
Cooling
EV Home Chargingg
EV Public/Work Chargin
Solar Production


Hot Weather
Behavioral Change from TOD Rates
5% efficiency improvement
20% of homes with 5.0 kw of PV generation
15% of homes with demand response
High Workplace EV Charging Availability / 12% of homes with an EV
5.0
4.0
3.0
2.0
1.0
-
(1.0)
kW per customer
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour
Plug Loads
Cooling
EV Home Charging
EV Public/Work Chargin


Hot Weather
Behavioral Change from TOD Rates
5% efficiency improvement
20% of homes with 5.0 kw of PV generation
15% of homes with demand response
High Workplace EV Charging Availability / 12% of homes with an EV
10% of customers with battery
5.0
4.0
3.0
2.0
1.0
-
(1.0)
kW per customer
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour
Plug Loads
Heating
Cooling
EV Home Chargingg
EV Public/Work Chargin
Solar Production

Energy-Wise Transition

Utilities' Energy-Wise initiative includes:

- **Alignment of TOD periods** — On-Peak 4:00PM-8:00PM
- **Transition customers to Energy-Wise** — Standard TOD Rate Option
- **Addition of Energy-Wise Plus** — Rate Option
- **Addition of Fixed Seasonal** — Residential and Small Commercial Rate Option
- **Restructure from two to three Commercial Classes** — Small, Medium, Large
- **Addition of demand charge** — Medium and Large Commercial

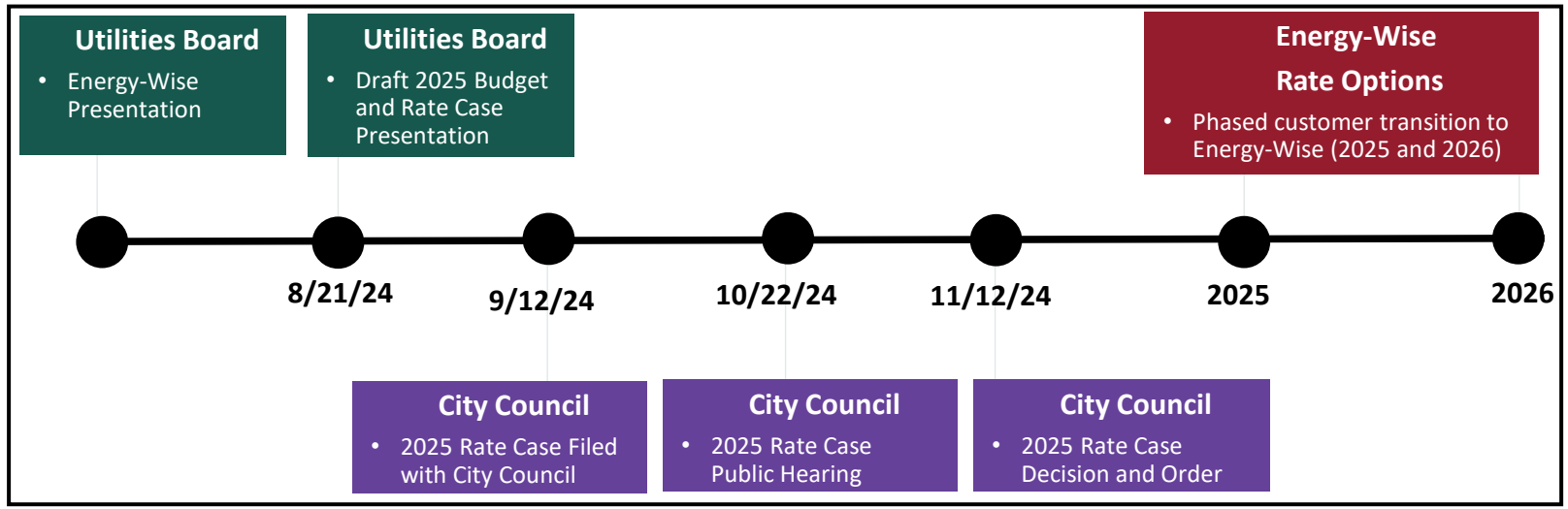
Energy-Wise Rate Options			
Customer Type	**Energy-Wise (Standard TOD)**	**Energy-Wise Plus (Optional TOD)**	**Fixed Seasonal (Optional anytime rate)**
Residential & Small Commercial	✓	✓	✓
Medium & Large Commercial	✓	✓	
Industrial & Special Contract	✓	✓	

TOD periods provide Customers opportunities to control and reduce their bill by shifting a portion of their energy usage to the Off-Peak period

Additional opportunities for Customer bill control and savings by shifting energy usage to the Off-Peak and Off-Peak Saver periods and reducing usage during Critical Peak Events

Opportunities for reduced bill fluctuation from month to month with enhanced Access and Facilities per Day charges and fixed seasonal energy rates

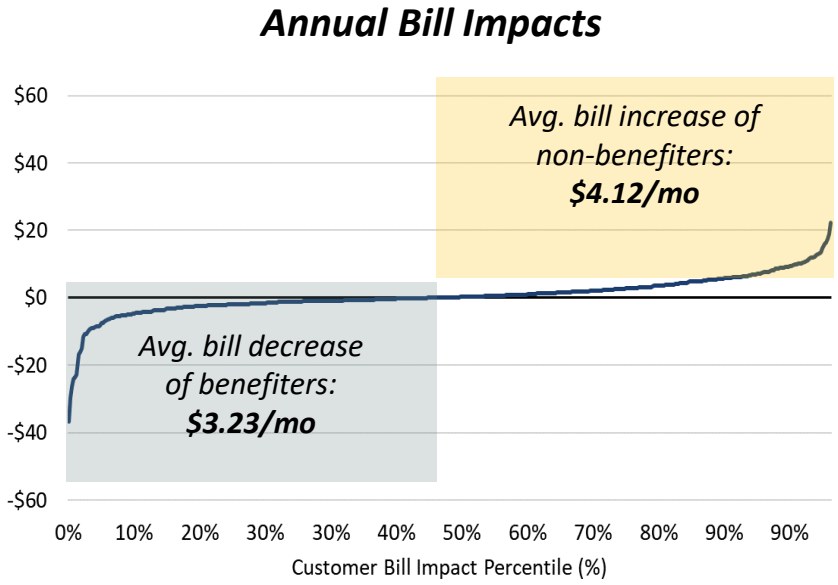
Energy-Wise Timeline

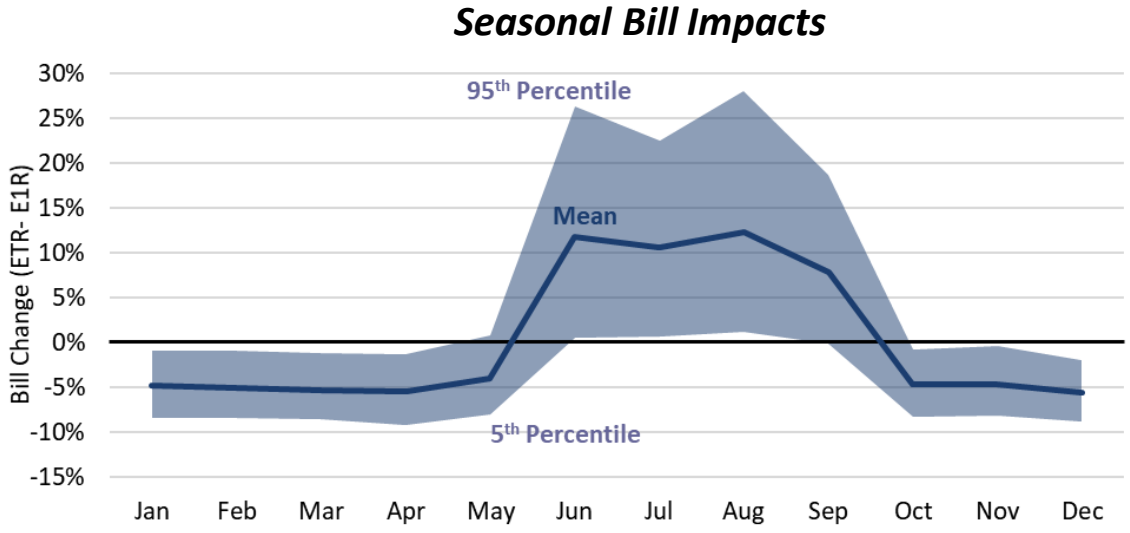


Residential Energy-Wise Bill Impacts

- Transition to Energy-Wise produces an even split of benefiters and non-benefiters
  - Outlier bill decreases are much greater than bill increases
  - About 13% of customers would experience bill increase greater than 5%

- Energy-Wise reflects the seasonal variation in costs, which results in higher summer bills and lower winter bills for most customers





Colorado Springs Utilities Case Study

Customer profile:
Gen X
Middle-class
Homeowner
AC must be used for health reasons
Enrolled in budget billing

Home profile:
Small to medium sized home, built in 1999
Empty on weekdays during the day in fall, winter and spring
1-2 people home during the day in summer
HVAC is standard, not energy efficient
Appliances are Energy Star rated

No behavior changes

$54.55 Annually / **$4.55 Monthly***

*Consistent change due to budget billing. Without budget billing, monthly increases up to $26.60 in the summer and monthly decreases of up to $6.62 in spring.

What could shift

- Timing of laundry
- Timing of dishwasher

What could not shift

- Timing and temperature of air conditioning
- Timing and method of cooking meals

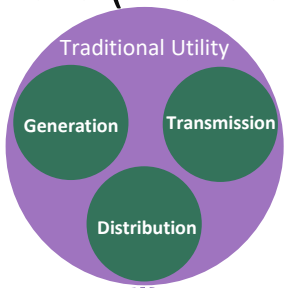
With behavior changes

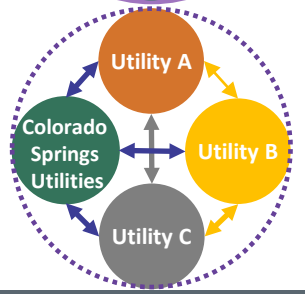
$48 Annually

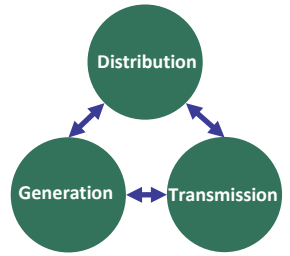
Could save more with appliance upgrades, changing meal preparation methods, pre-cooling home in summer and more.

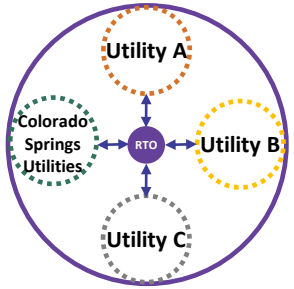
Regional Transmission Organization (RTO)

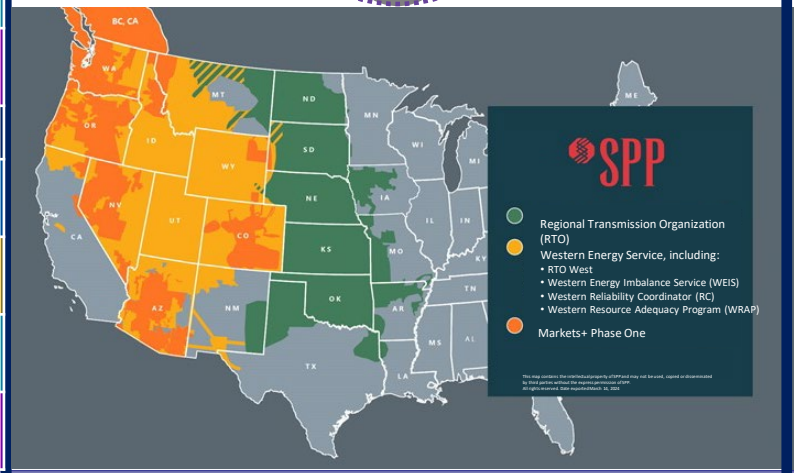
RTO Services	Current State (Bilaterals + WEIS)	Future State (RTO)
Reliability coordination	✓	✓
Tariff and market administration	⊘	✓
Regional scheduling	⊘	✓
Transmission planning	⊘	✓
RTO Benefits		
Greater reliability through larger resource and transmission network	⊘	✓
Cost savings through economics of scale and diverse generation sources	⊘	✓
Increased access to non-carbon resources	⊘	✓
Greater price and operational transparency	⊘	✓
RTO Challenges		
Less control of planning and operations	⊘	✓
Tariff, protocols and enhanced practices	⊘	✓
Complex products	⊘	✓
Exponentially more data	⊘	✓

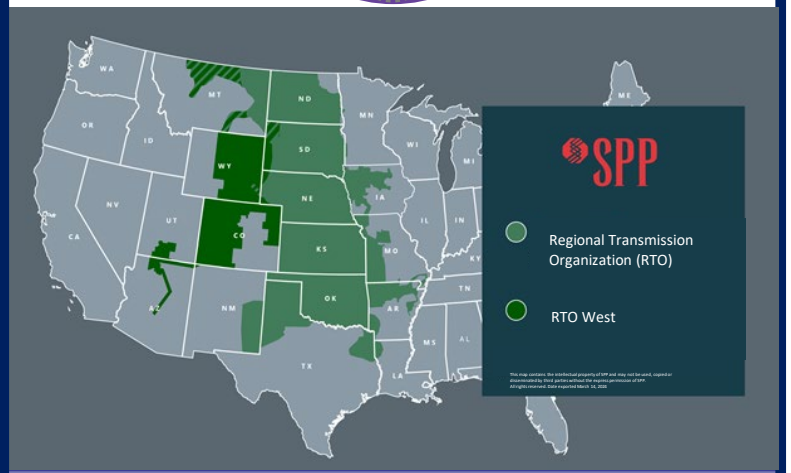








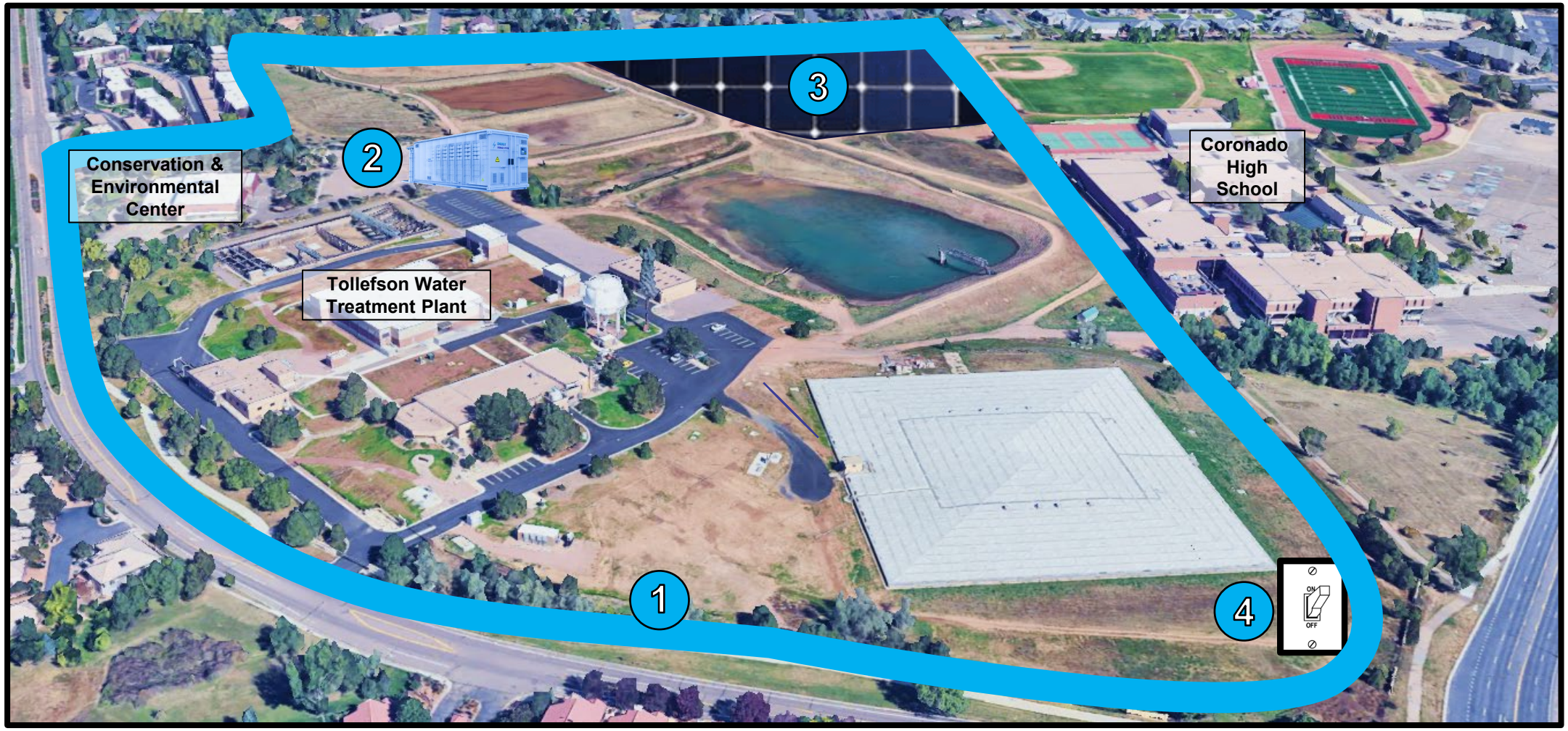




Microgrid Pilot

Mesa Campus Microgrid

PILOT DEMONSTRATION



1. 49 acres Microgrid site
2. 1 MW battery energy storage system (BESS)
3. Up to 5 acres for solar array (1.6 MW)
4. Microgrid controller and recloser


Colorado Springs Utilities
It's how we're all connected