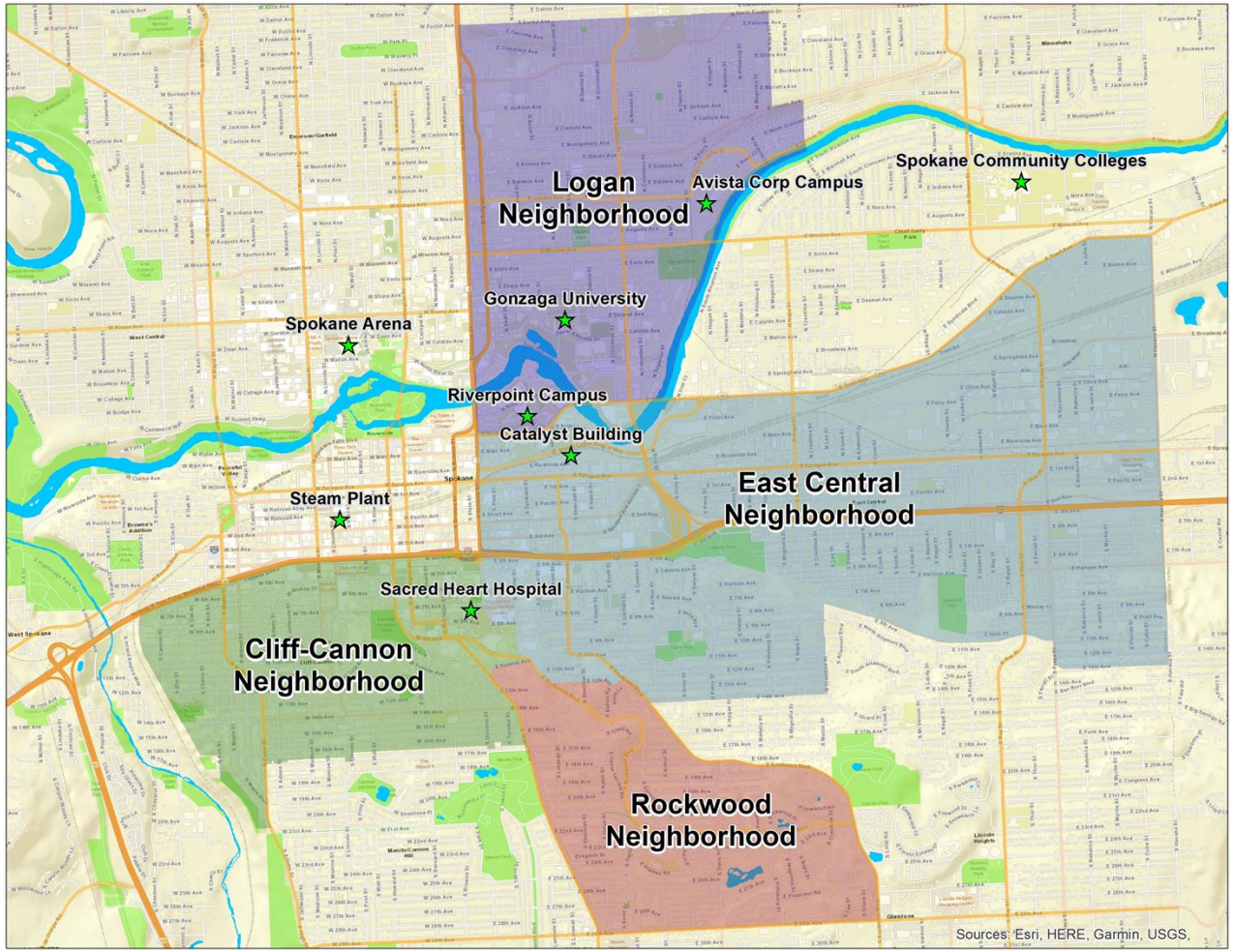
Spokane Connected Communities – Overview



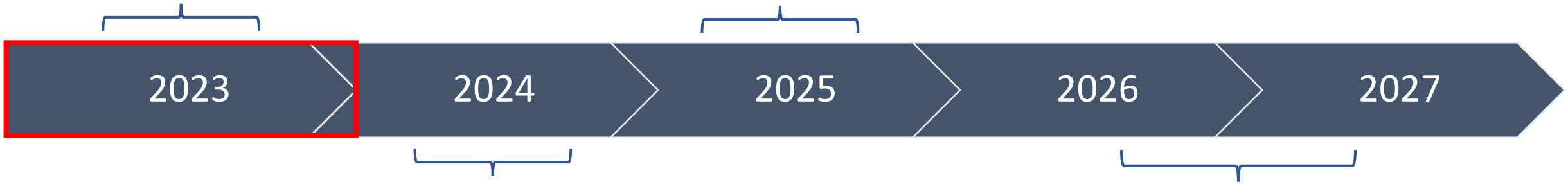
- ✓ **Focused on one substation** nearing capacity (3rd & Hatch)
- ✓ **Engage 75-125 customers**
  - ✓ Residential, multitenant, SMB, C&I
- ✓ **The project will unlock:**
  - ✓ 1.0 - 2.25 MW of flexibility using buildings & DERs
  - ✓ Save up to 900 MWh/yr from EE measures
  - ✓ Reduce emissions by up to 650,000 lb CO_2e/yr
- ✓ **Playbooks to scale**

Washington State University · urbanova · Avista · edo · Pacific Northwest National Laboratory · McKinstry For The Life Of Your Building · Open Energy Solutions

Spokane Connected Communities – 5 Year Plan

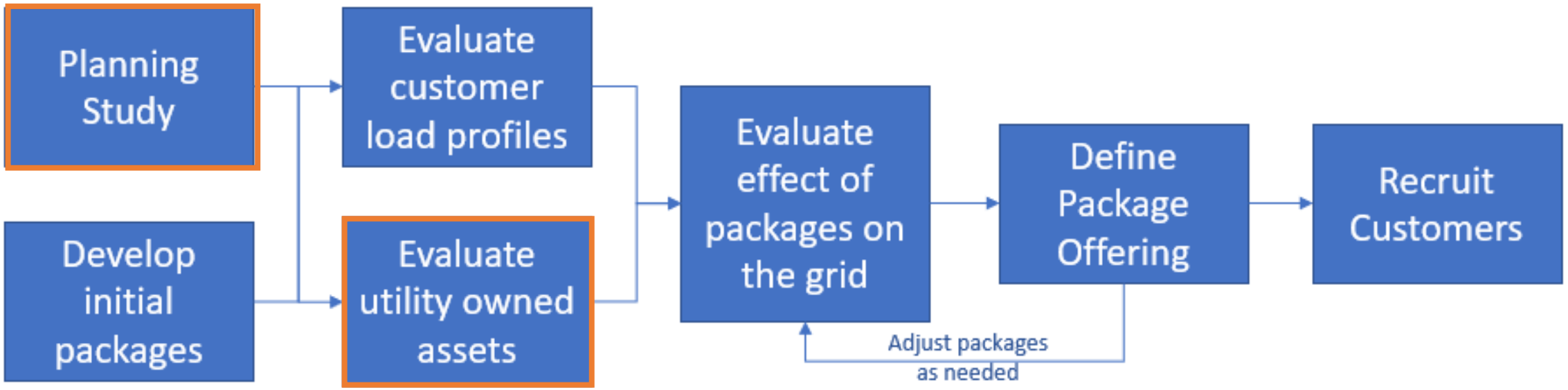
- **Engage customers and field survey**
- **Develop equipment packages and program tariffs**
- **Simulate grid impact**
- **Develop optimization & control framework**

- Full Recruitment (125 users)
- Field test scheduling & dispatch strategy
- Monitor customer participation & satisfaction
- M&V



- HIL tests of equipment packages
- Pilot Recruitment (first 15 customers)
- Refine optimization & control framework

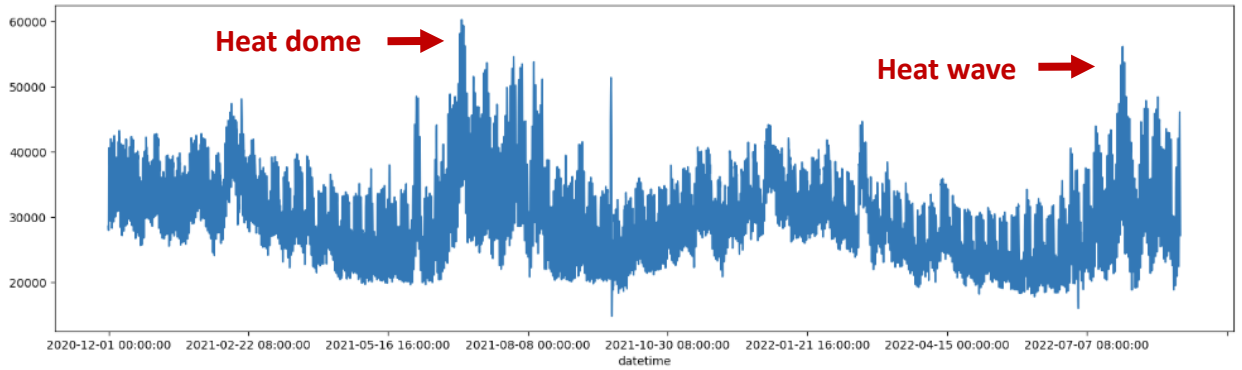
- Optimize grid services, and scheduling & dispatch strategy
- Monitor customer participation & satisfaction, and improve program design
- M&V benefits to building owner/occupant and grid
- Create playbooks describing scalable program design


Planning Study
Develop initial packages
Evaluate customer load profiles
Evaluate utility owned assets
Evaluate effect of packages on the grid
Define Package Offering
Recruit Customers
Adjust packages as needed

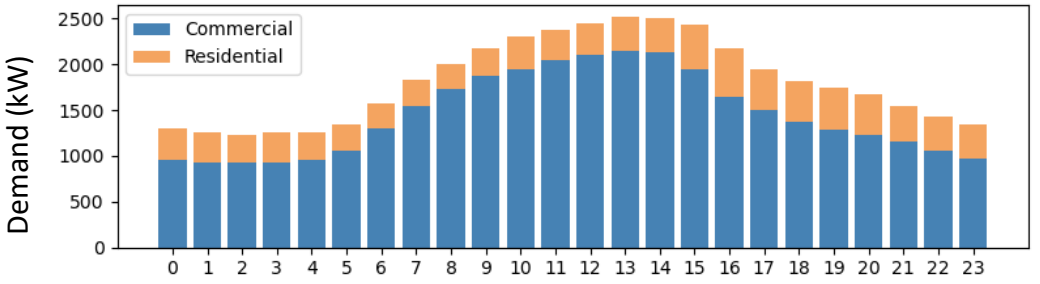
Understanding 3rd and Hatch Substation

[supplement to] Planning Study

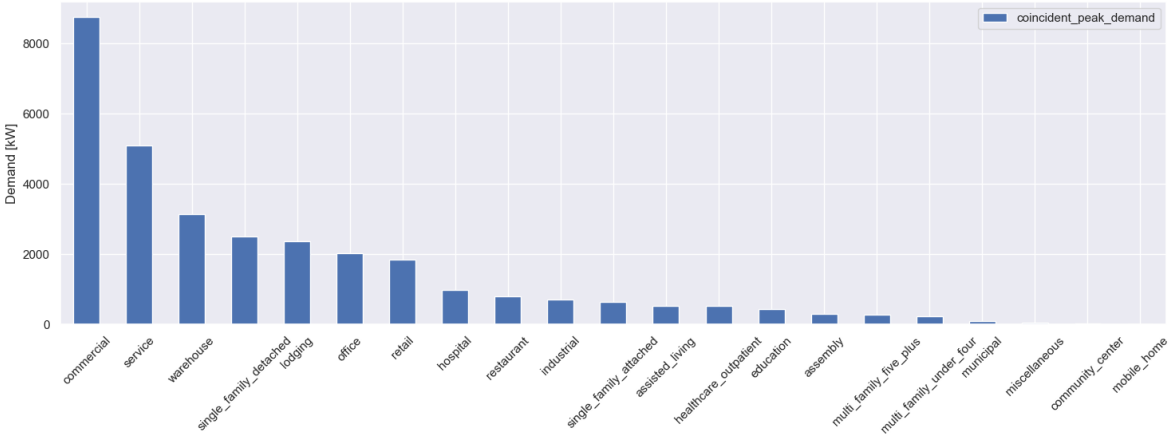
Substation Congestion Issues



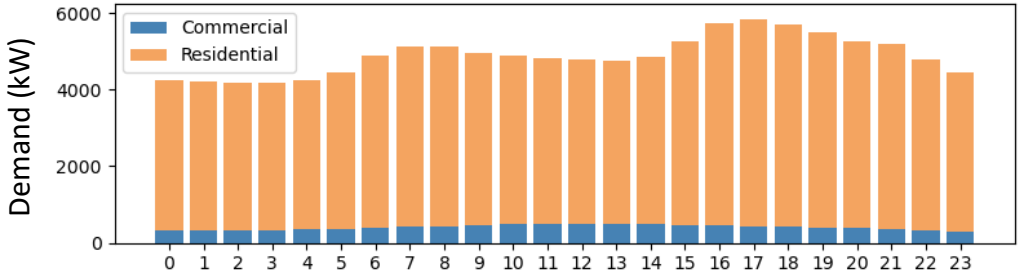
Commercial dominant feeder



Contributions to Coincident Peak Load



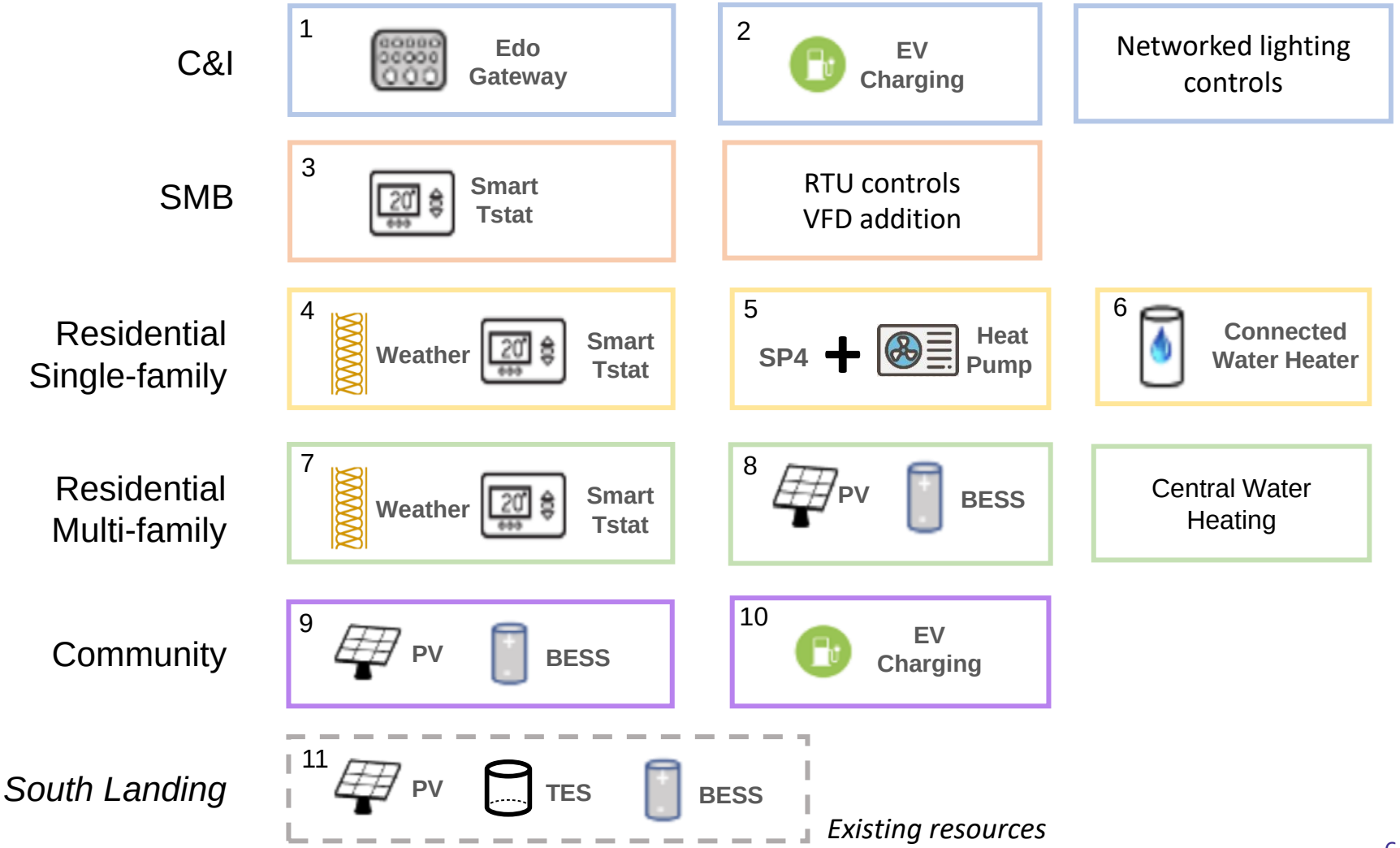
Residential dominant feeder



Solution packages; balance programmatic needs with budget

Develop Initial Packages

1		Gateway
2	C&I	EV Charging
3	SMB	Smart Thermostat + Re-lamping
4		Smart Thermostat + Weatherization
5		SP4 + Dual Fuel Heat Pump
6	Residential/ SF	Water Heater (CTA - 2045)
7		Smart Thermostat + Weatherization
8	Residential/ MF	PV + BESS
9		PV + BESS
10	Community	EV Charging
11	South Landing	PV + TES + BESS



Solution Package Analysis Example

Evaluate Customer Load Profiles

Commercial & Industrial (C&I)

Description

- Generally, 50K square feet and above
- *Has Building Automation System (BAS)*
- Peak demand usually in range of 150 – 750 kW
- Customer serviced by Avista Account Executives

Prototype Building

- Building Size: 100,000 ft2
- Peak Demand: 300 kW
- Expected demand reduction of ~7.5%
- Demand Reduction: ~23 kW

Buildings	Demand Reduction [kW]	Energy Reduction [MWh]	Carbon Reduction [klb CO2]	Total Cost [$]
10	225	2,250	1,437	$233,000
15	338	3,375	2,155	$350,000
20	450	4,500	2,873	$467,000

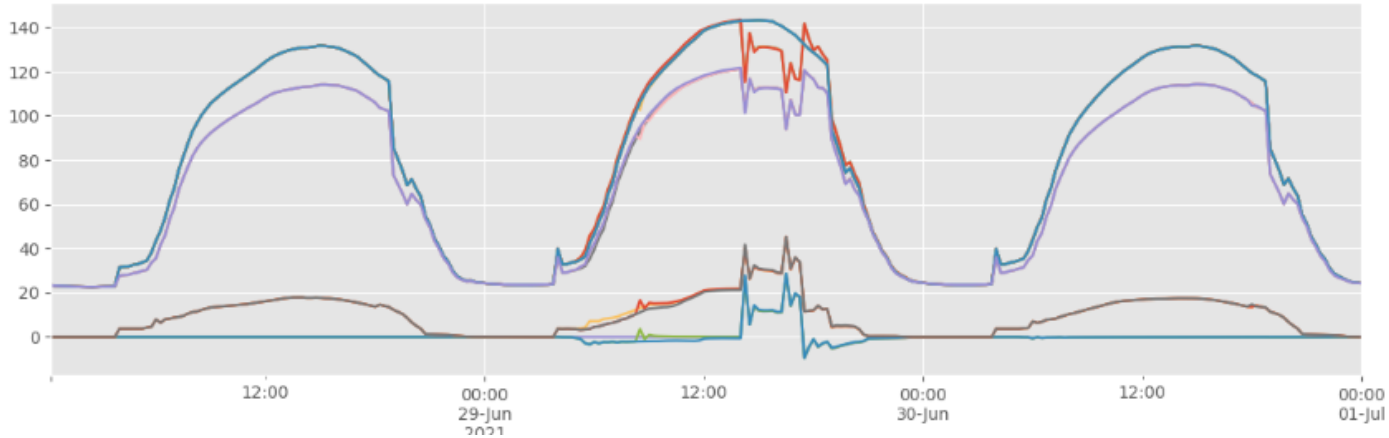
Simulating demand reduction with planned measures

Evaluate Effects of packages on the grid

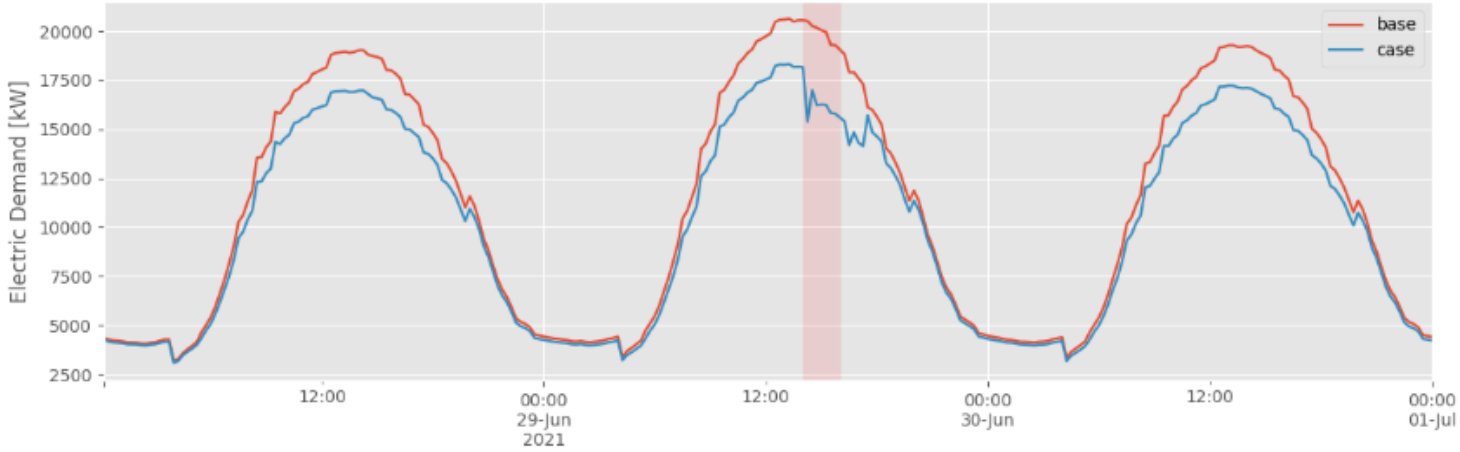
- Calculate demand reduction for each model

Demand reduction is average difference between base and solution package from 2pm – 4pm

- Aggregate to customer group using weighting factors
- Calculate average performance for a building in customer group
- Apply cost-benefit analysis



Building with Thermostat Setback Control (2F)



Aggregate Customer Group Demand Reduction

Solution packages; refinement

Define Package Offering

1		Gateway
2	C&I	EV Charging
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4		Smart Thermostat + Weatherization
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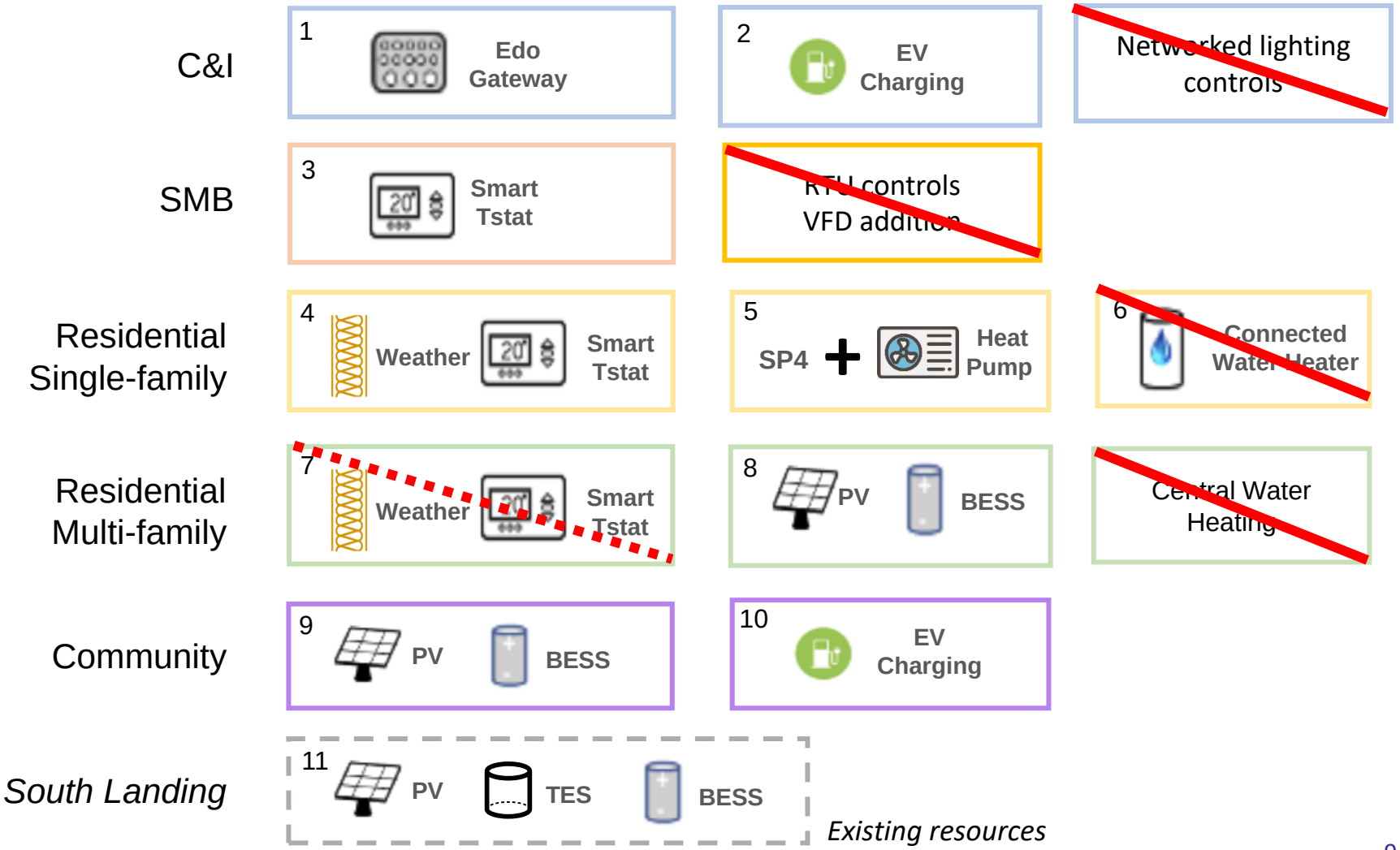


Recruitment

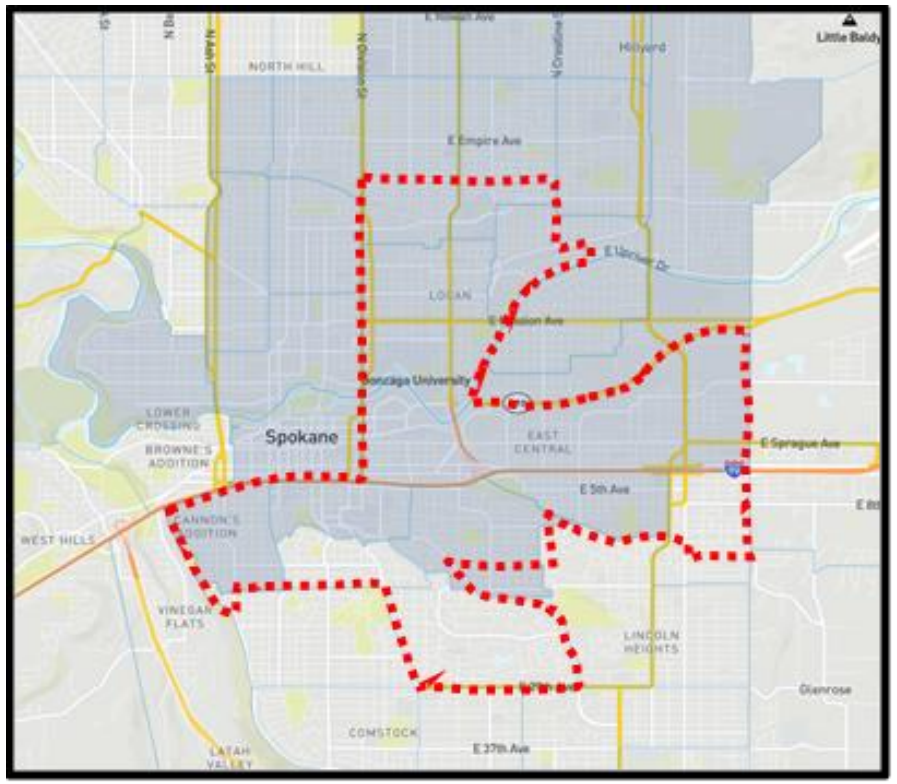
Customer input to program design

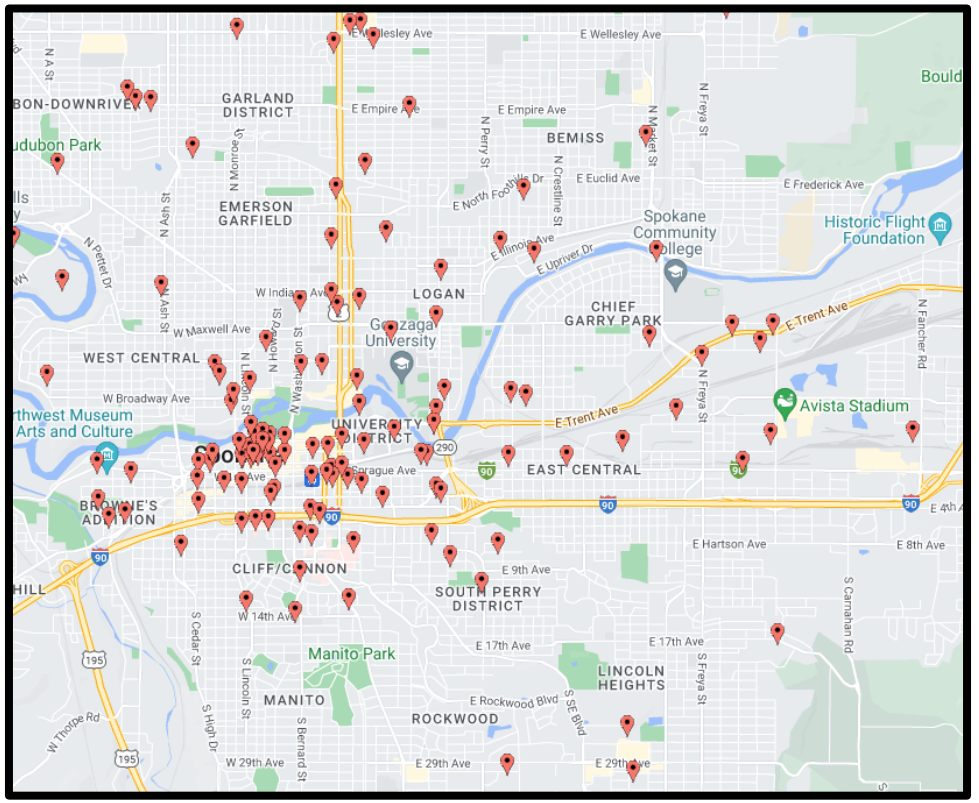
- Review past programs and community surveys
- CC Program Design Survey –Ed & WTP

Leveraging existing sales teams

- McKinstry Account Executives
- Avista Account Executives

Recruit Customers

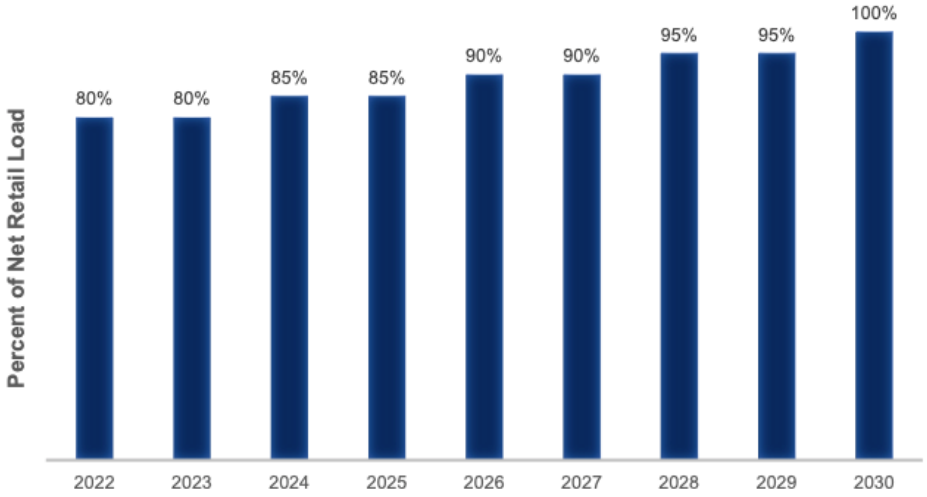




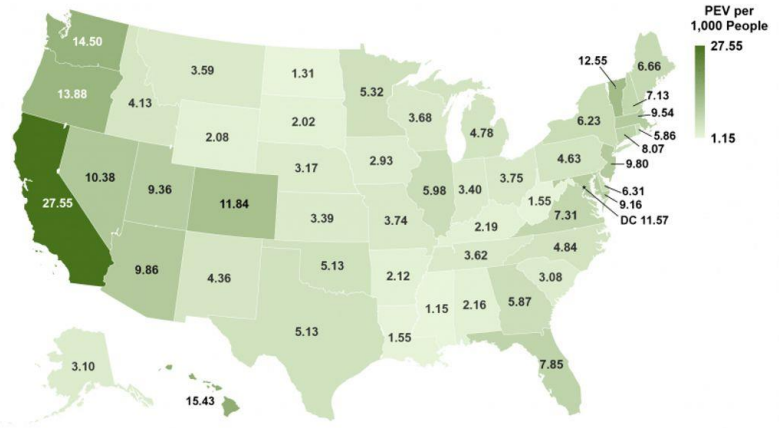
Evolving need for Demand Flexibility: WA State

- CEIP
  - Ratepayer cost and reliability protections
  - Equitable distribution of clean energy benefits to customers
  - 100% clean energy targets
- Linking existing programs to DF
  - Demand response targets
  - Rates pilots (ToU, PTR, etc.)
  - Water heater and EV programs
- Load growth trends
  - Transportation electrification plan
  - Heat pump market share increase
  - Extreme heat events

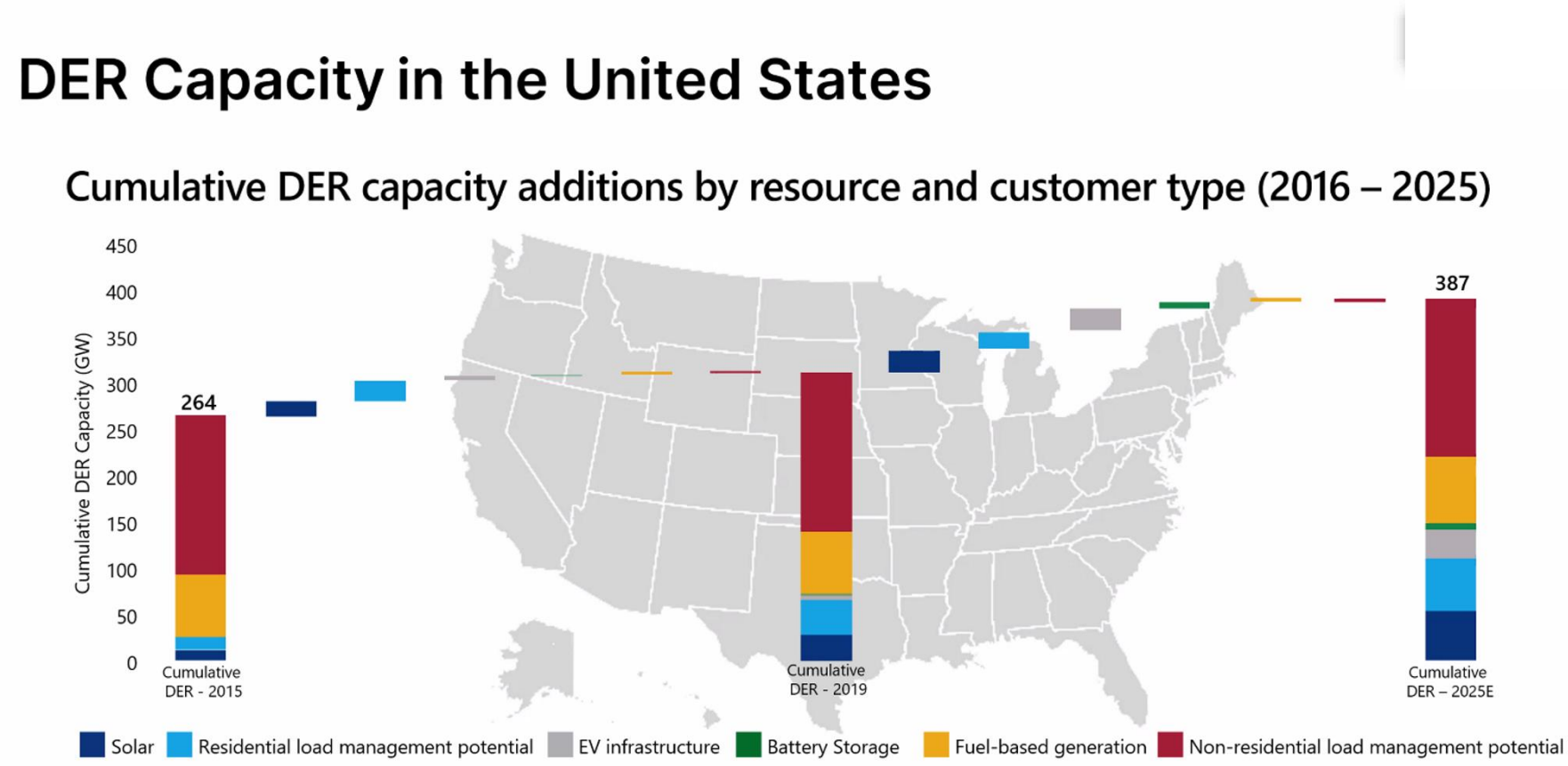
Figure 2.4: Total Clean Energy Acquisition Targets by Year



PEV Registrations per Thousand People, 2022



Thinking about scale; the need for load management programs



Source: Wood MacKenzie Energy Storage, Grid Edge Service, U.S. Distributed Solar Service; U.S. Department of Energy

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