

# Ready the Grid for High Electrification

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Jun 12, 2024

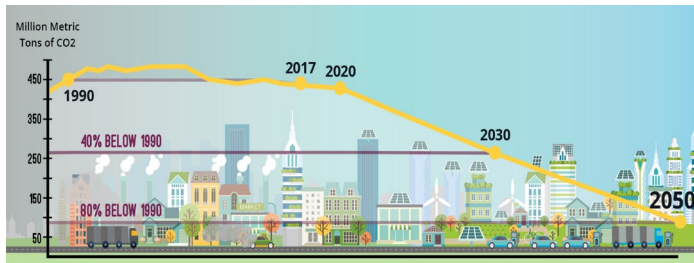


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# SCE has Laid Out Its Vision for Achieving GHG Goals and an Advanced Grid

California's climate-change goals include a 40% reduction in absolute greenhouse gas (GHG) emissions from 1990 levels by 2030, and 85% by 2045, as well as net-zero GHG emissions economy-wide by 2045



SCE is required by law to meet the following retail sales requirements for the power it delivers to customers:

- ✓ By 2020 – **33%** of power from Renewables Portfolio Standard (RPS)-eligible resources (*requirement met*)
- ❑ By 2030 – **60%** of power from RPS-eligible resources
- ❑ By 2045 – **100%** carbon-free power

SCE has published the following whitepapers outlining the cross-sector collaboration that is essential for achieving the decarb goals:

## Clean Power and Electrification Pathway

An integrated blueprint for California to reduce GHG emissions and air pollutants by 2030

## Countdown to 2045

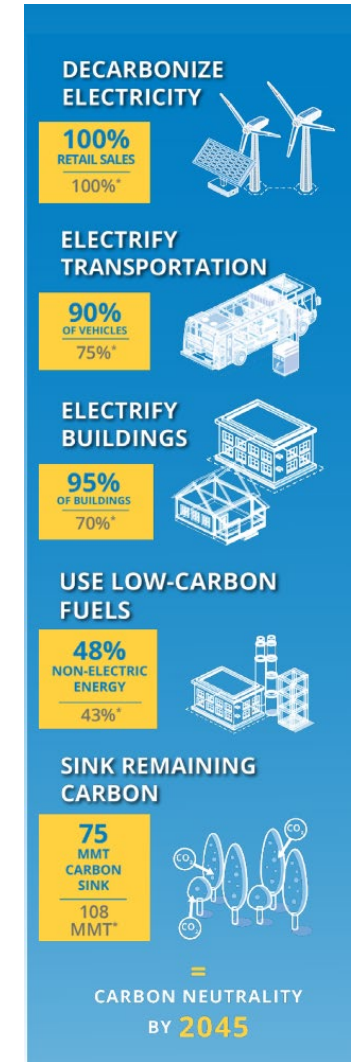
A data-driven analysis of the steps that California must take to meet 2045 goals, which identified 5 key actions for affordably achieving carbon neutrality

## Reimagining the Grid

An assessment of the grid changes needed to support GHG reduction goals, while adapting to evolving customer (EV, DERs) and climate-change driven needs.

## Mind the Gap

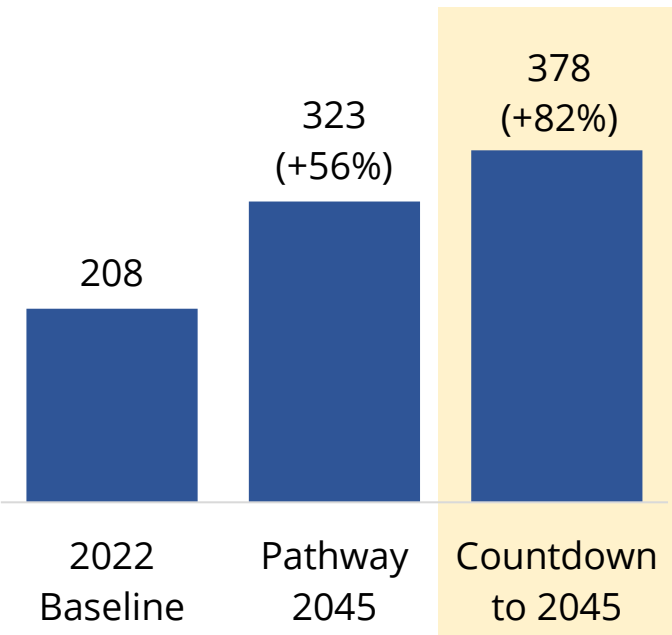
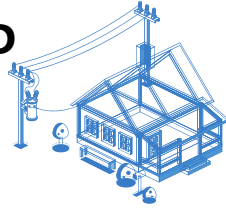
An assessment of policy changes and additions needed to ensure California meets its GHG emissions reductions targets by 2030 in anticipation of its goal to decarbonize by 2045.



# Electricity demand

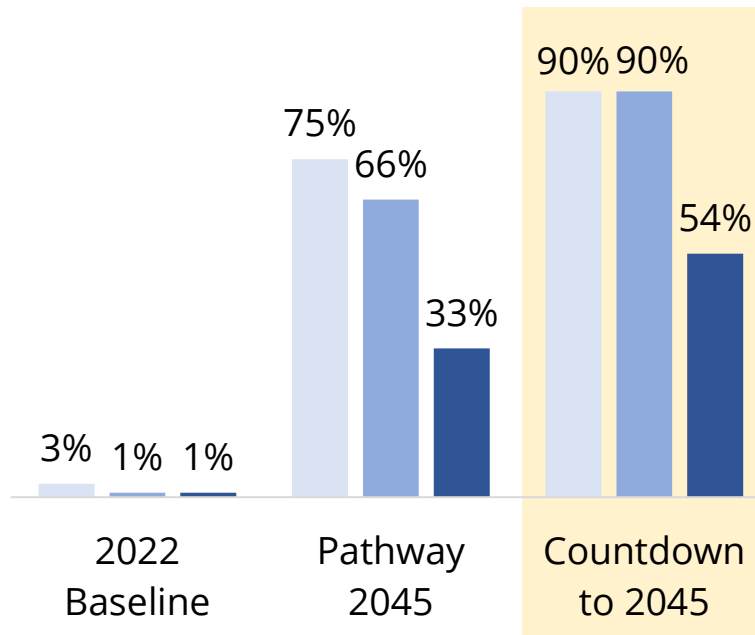
## ELECTRICITY DEMAND

Annual TWh (CAISO)



## ELECTRIC VEHICLES

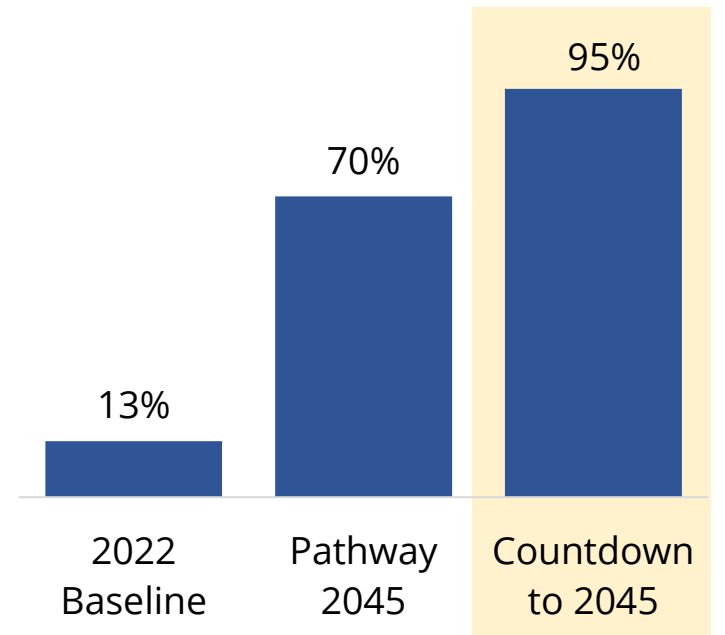
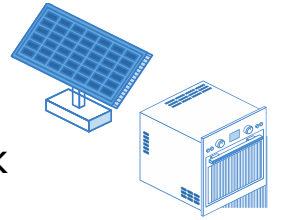
% of vehicle stock



■ Light duty ■ Medium Duty ■ Heavy Duty

## BUILDING ELECTRIFICATION

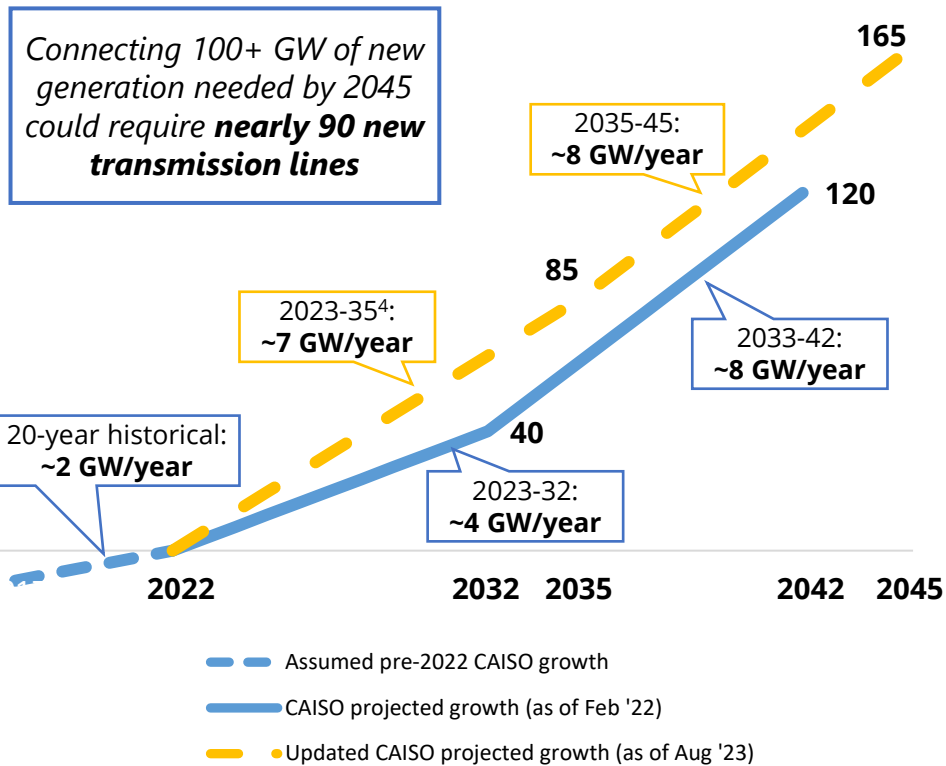
% of appliance stock



# Grid expansion

## TRANSMISSION

### New CAISO transmission capacity needed



## DISTRIBUTION

### SCE distribution projects needed

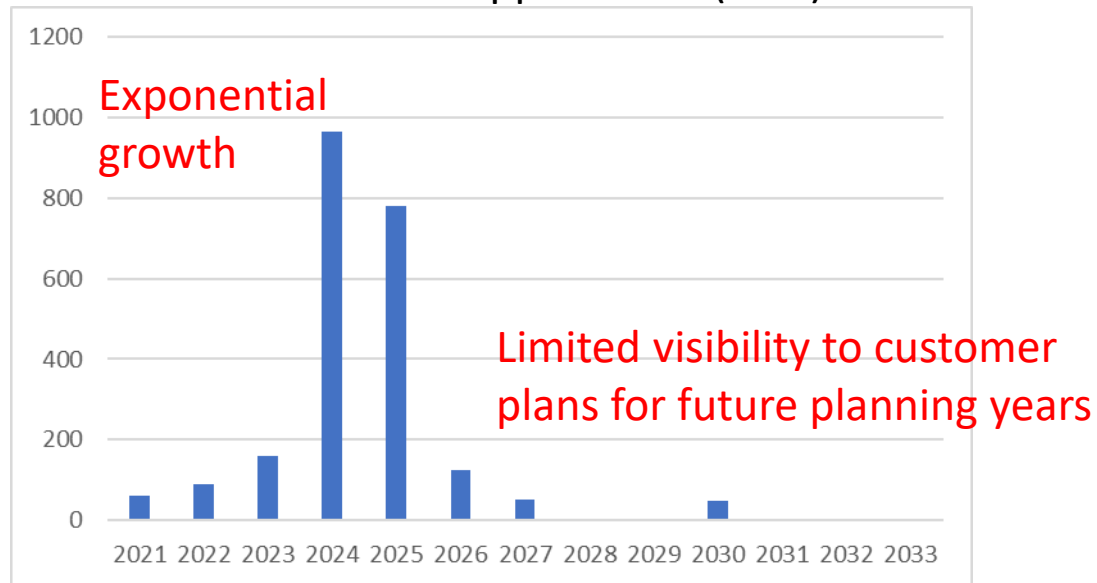
	Planned in next 10 years (2023-2032)	Incremental for Countdown (2033-2045)
New substations <sup>1</sup>	~10	~75
Substation expansions <sup>1</sup>	~45	~300
New circuits <sup>1</sup>	~130	~1300

#### SCE Distribution in 2045...

- ~25% larger distribution system
- ~90% average circuit utilization
- Many service transformers and wires upgraded

# Challenges of Planning for High Electrification

SCE received TE applications (MW)



\* Only included TE projects larger than 500 kW

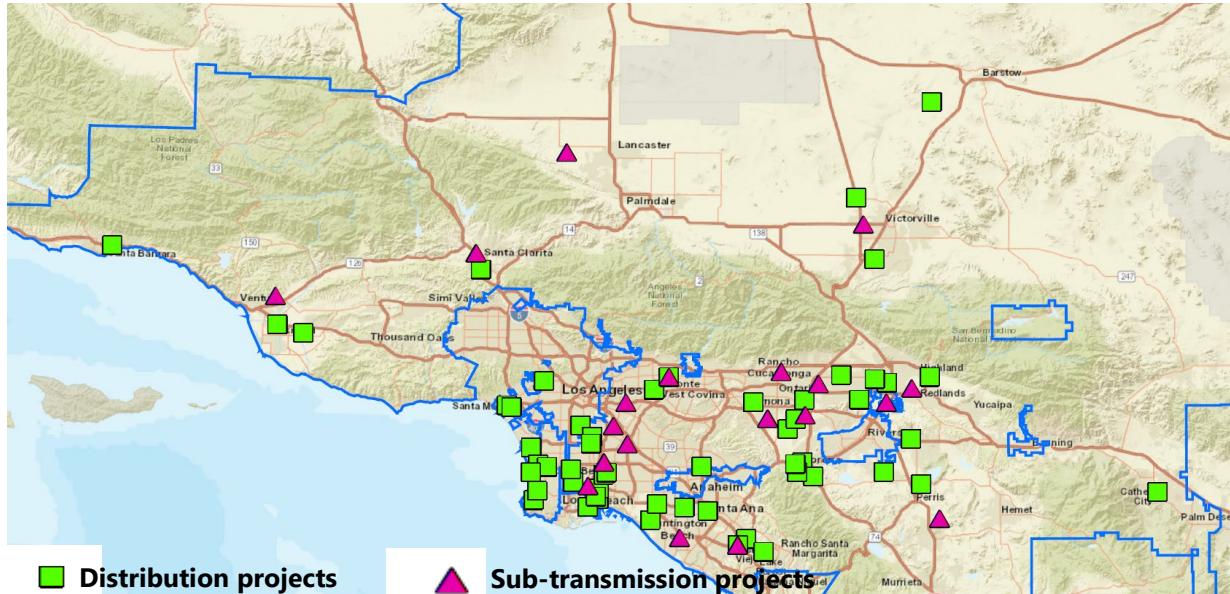
- Large uncertainty on where and when the EV charging demand will materialize
- Large demand that would likely trigger capacity upgrades that can take years to build, seeking quick service

**How do we plan for infrastructure of new large uncertain demand, to ensure timely energization service but still affordable?**

# Readying the Grid for Long-term - TE Grid Readiness (TEGR)

SCE has taken proactive steps on TE-focused grid investments to prepare for a high electrification future.

## Geographic Representation of Needed TE Upgrades



**Beyond the annual 10-year grid planning:**  
SCE undertook TE Grid Readiness (TEGR) analysis in SCE's recent 2025 GRC filing

- Augments state policy-based forecast with bottom-up scenarios at high TE potential locations:
  - **Freight Corridors**
  - **Truck Stops**
  - **Distribution Centers**
- Identify areas requiring additional readiness work to prepare for reasonably expected TE Load Growth.

Approximately, **10-15 % of SCE's Sub-Transmission & Distribution Systems Being Included for Proposed Grid Development** as part of the TEGR Analysis

**More Than 90% of the Selected Locations are Along Major Transportation Corridors or Have Proximity to the Ports;** Close to 70% of the Selected Locations are in Disadvantaged Communities.



\*CPUC introduced **"pending load"** under the high DER OIR. TEGR is essentially a form of "pending load". SCE will continue enhancing SCE's "pending load" implementations for long-term grid capacity planning.

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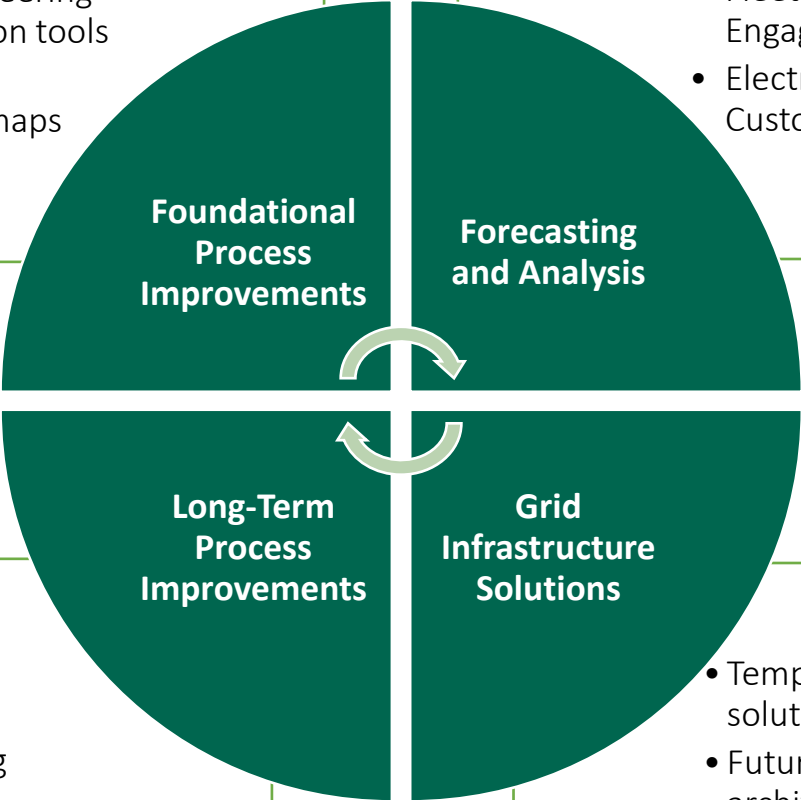


# Readying the Grid for the Near-term – Power Service Availability (PSA)

Power Service Availability (PSA) is focused on improving internal processes to streamline interconnection, engaging fleet operators to better understand their plans for electrification, improving our ability to forecast and assess the impacts of TE growth, and leveraging new technologies as grid infrastructure solutions.



- Enhance engineering and energization tools and processes
- Grid capacity maps



- Fleet Operator Engagement
- Electrification Customer Early Insight



- Streamline Permitting
- Master Planning

- Temporary bridging solutions
- Future grid architecture design



# PSA Highlights – Grid Capacity Maps

- Provides available load capacity information on both circuit and substation levels for 5 years
- Incorporates new load growth projects to give a better estimate of feeder/substations ability to host load with **daily** refreshes

[Southern California Edison DRPEP \(sce.com\)](http://sce.com)

The screenshot shows a software interface with a map and a data table. The map, titled "Southern California Edison DRPEP", displays a grid of colored zones representing different capacity levels. The table, titled "Load ICA - Substation and Circuit", provides detailed capacity information for various systems, substations, and circuits from 2023 to 2027.

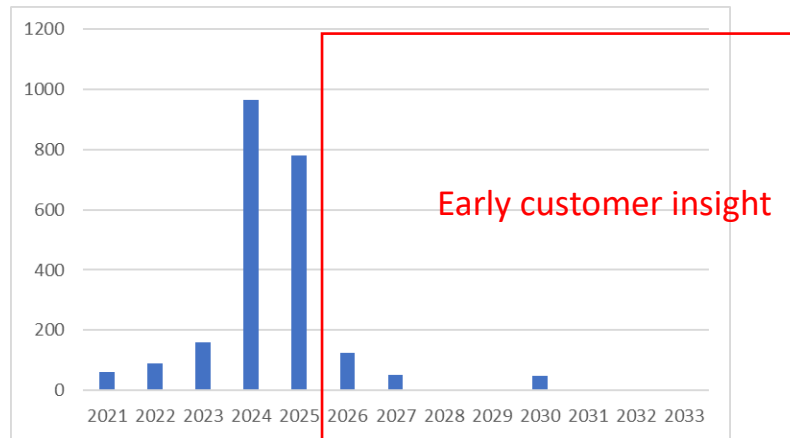
SYSTEM NAME	SUBSTATION	CIRCUIT	2023	2024	2025	2026	2027
<b>Circuit Reserve Load Capacity (MW)</b>							
GNA – Circuit Reserve Load Capacity			0.16	0.15	0.14	6.33	6.18
Post GNA – Circuit New Customer Demand			0	2.978	2.978	2.978	2.978
LOAD ICA – Circuit Reserve Load Capacity			0.16	0	0	3.352	3.202
<b>Substation Reserve Load Capacity (MW)</b>							
GNA – Substation Reserve Load Capacity			0.0	0.0	0.0	33.57	32.94
Post GNA – Substation New Customer Demand			0.15	5.461	7.844	7.844	7.844
LOAD ICA – Substation Reserve Load Capacity			0	0	0	25.726	25.096



# PSA Highlights – Forecasting and Analysis

- **Fleet operator engagement workshops** (20+)
  - Mostly targeted, but also with broader audience. Example: [Readying Southern California Edison's Grid for Our EV Future - ACT News \(act-news.com\)](#)

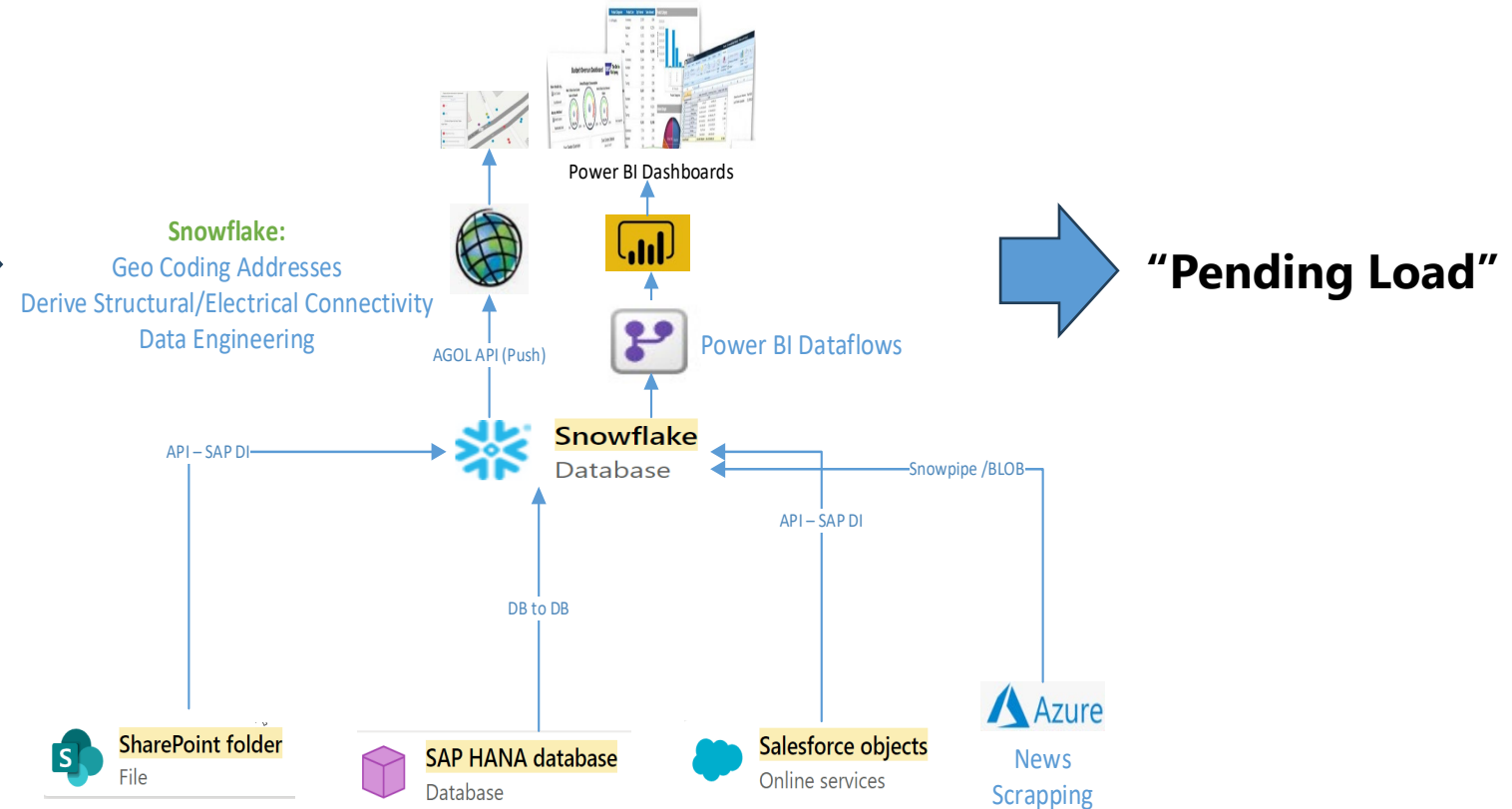
- **Community engagement**



## Electrification Early Customer Insight

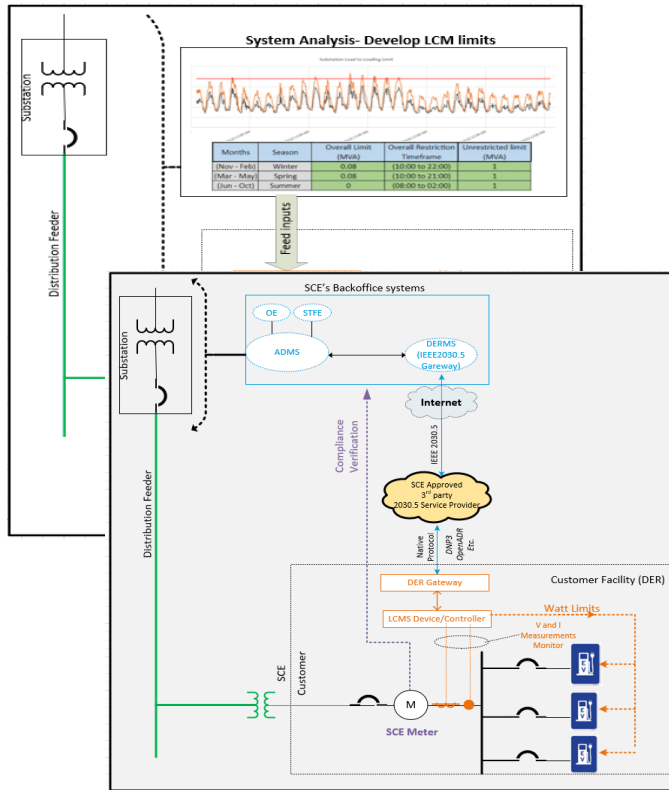
Data integration/analysis and AI web crawling

### Electrification Analytics - Snowflake



# PSA Highlights – Bridging Solutions

## LCMS (Load Control Management System)



## Relocatable Storage



## Mobile Substation



# Questions?

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