UCLA Energy Atlas

LGSEC June Quarterly Meeting
June 2, 2017
San Diego

California Center for Sustainable Communities at UCLA
Stephanie Pincetl, PhD., *Director & Professor*
Felicia Federico, D. Env., *Executive Director*
Hannah Gustafson, *GIS Analyst*

CCSC
at UCLA

First of its kind interactive web Atlas that provides access to the largest and most disaggregated building energy data available in the nation.

SB 350

Increases California's renewable electricity procurement goal from 33% by 2020 to 50% by 2030.

AB 758

Requires the state to double statewide energy efficiency savings in electricity and natural gas end uses by 2030.

AB 802

Energy-use benchmarking and disclosure program.

Prop 39

Energy Efficiency in K-12 Schools

The Atlas is a tool for local governments!

- Fills gap between policy requirements, program aims, funding opportunities and implementation

- Provides ability to quantify need, target programs, and evaluate results

- Provides granular data aggregated to meet PUC regulations to protect customer privacy

- Useful for implementing:
  - state legislation
  - local conservation
  - efficiency and GHG reduction goals
  - improving building performance and quality of life
  - environmental justice concerns
  - implementing CCA/CCE programs
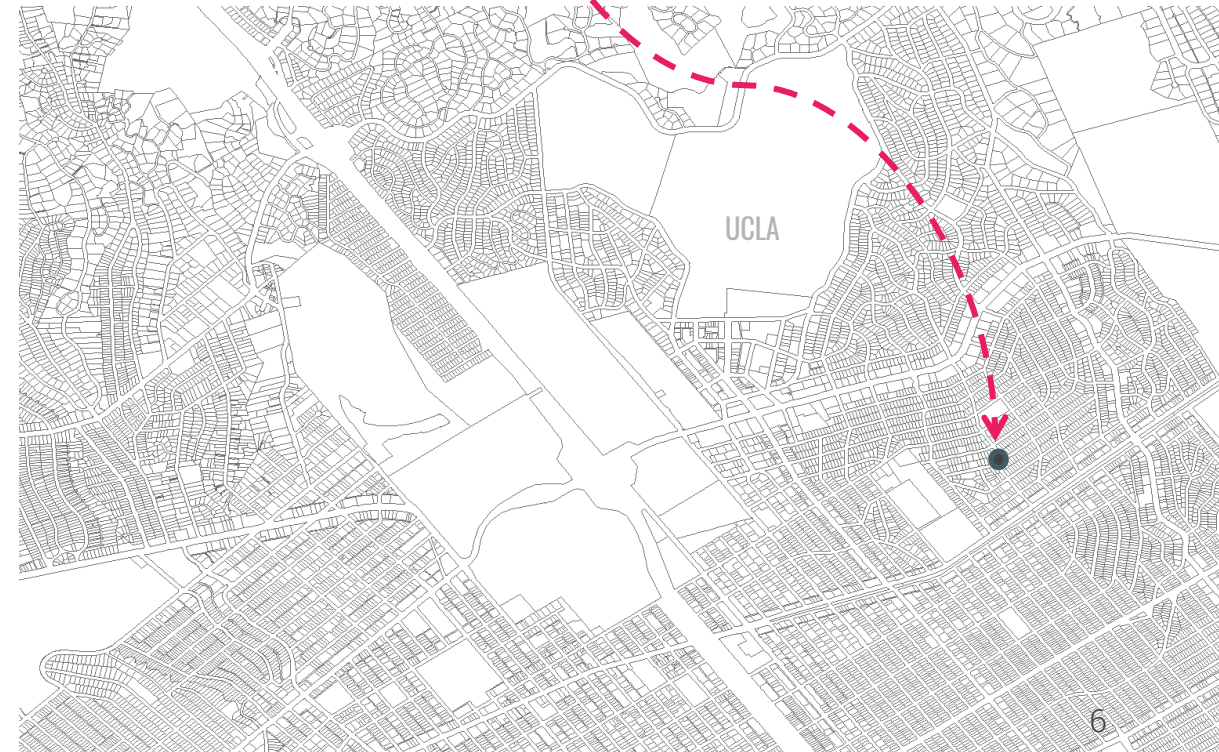
www.energyatlas.ucla.edu

Raw Utility Data

Account ID	Billing Address	Energy Consumption
9876543421	1234 Example St., Los Angeles	xx (kWh & therms)

Mapped to parcel-level
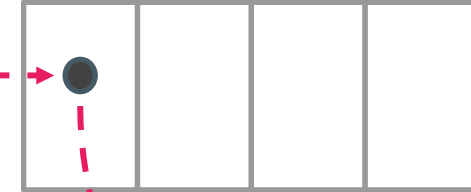
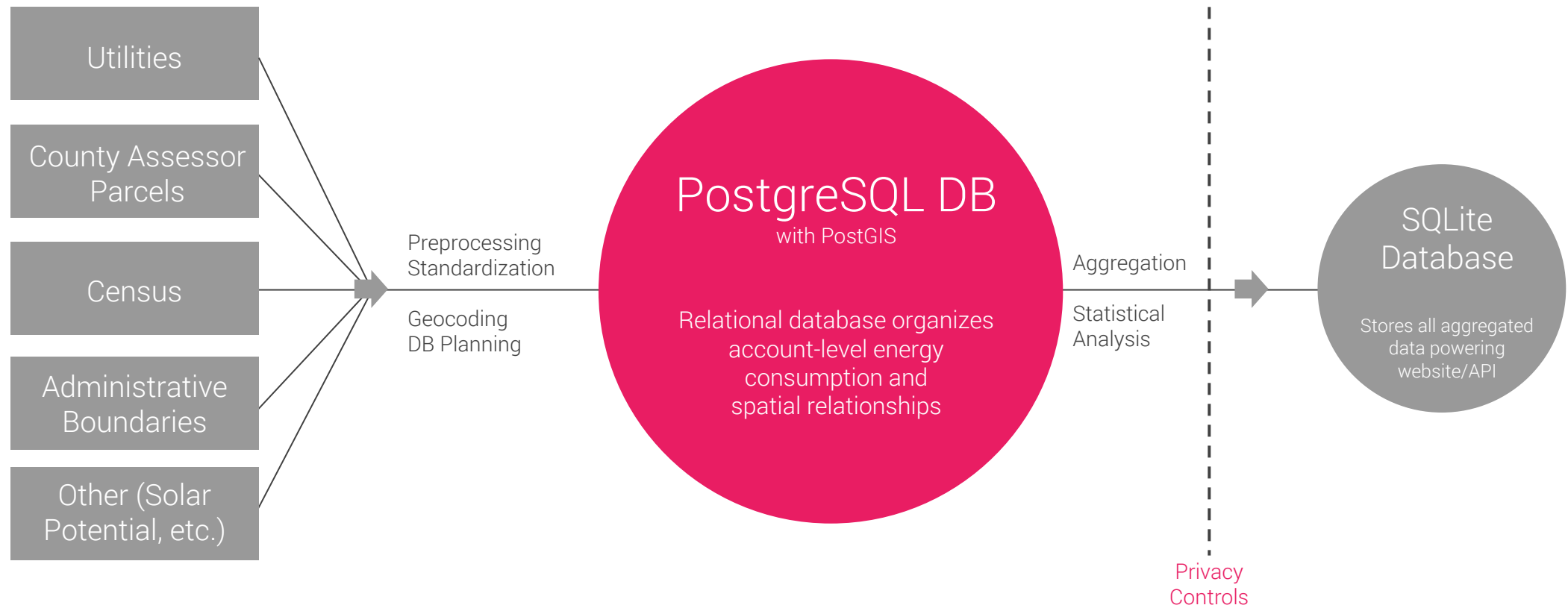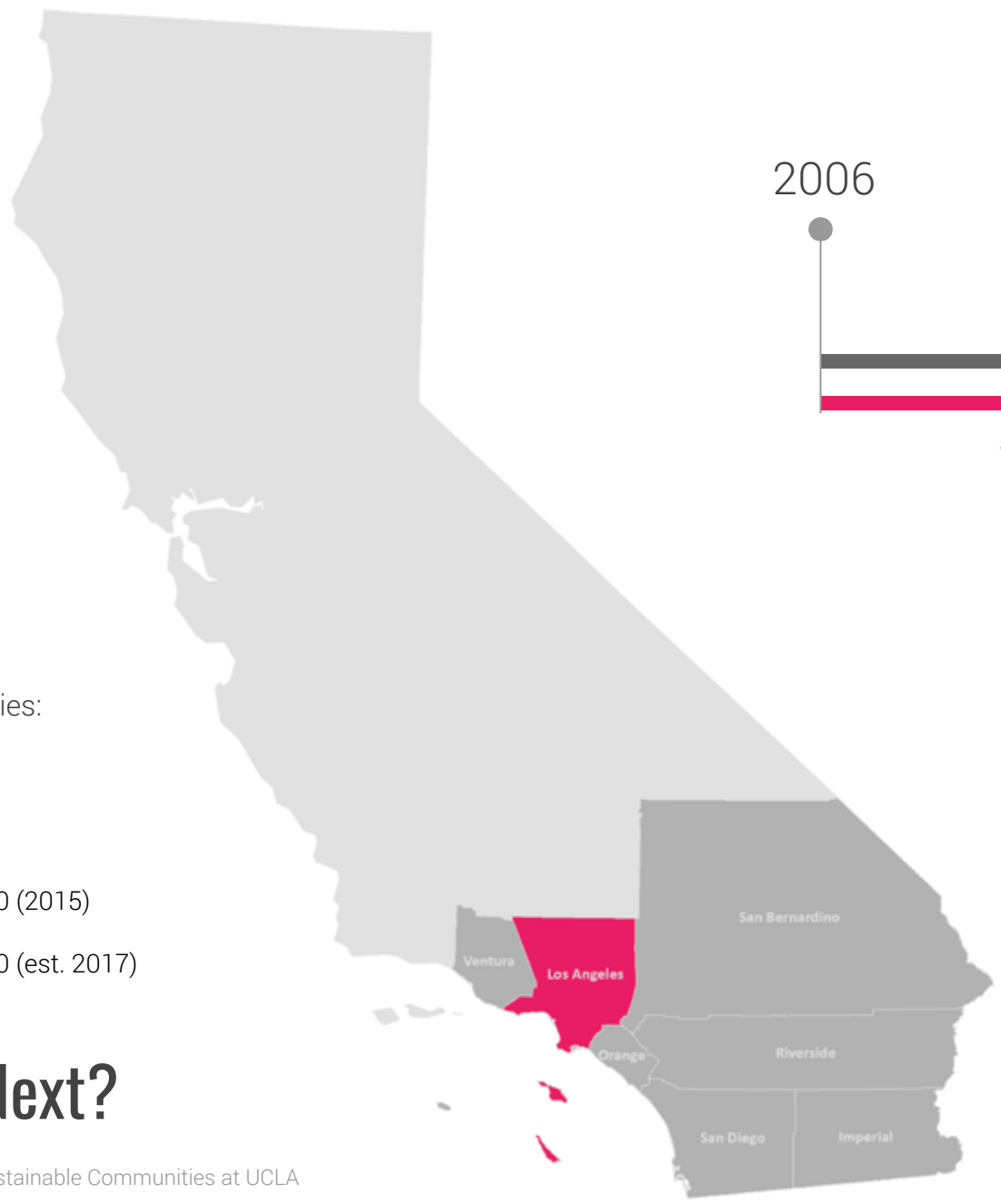
UCLA has mapped 27+ million raw utility addresses to the parcel level. This allows for energy consumption to be analyzed by:

- Parcel data (sqft, vintage, use type)
- Census characteristics
- Any geographical aggregation beyond parcel (block groups, neighborhoods, council districts, etc.)

Database Development

Utilities

County Assessor Parcels

Census

Administrative Boundaries

Other (Solar Potential, etc.)

Preprocessing Standardization

Geocoding DB Planning

PostgreSQL DB
with PostGIS

Relational database organizes account-level energy consumption and spatial relationships

Aggregation

Statistical Analysis

SQLite Database

Stores all aggregated data powering website/API

Privacy Controls

What's Next?

2006 — Data Years Available — 2014

Atlas 2.0 (est. 2017)

Atlas 1.0 (2015)

2010

Energy Efficiency Program Data

Territories:
SCE
SCG
SDG&E

● Atlas 1.0 (2015)

● Atlas 2.0 (est. 2017)

San Bernardino
Ventura
Los Angeles
Orange
Riverside
San Diego
Imperial

The Energy Atlas provides data for critical research and planning.

1. Advanced Energy Communities
2. Energy Efficiency Program Evaluation
3. Solar Potential/Prioritization

Advanced Energy Communities

- $1.5M <u>planning</u> grant

- California Energy Commission

- Accelerate deployment of "Advanced Energy Communities"

- Disadvantaged category

Team

————

- The County of Los Angeles/SoCal Regional Energy Network

- The Energy Coalition

- Day One, a community outreach group serving the San Gabriel Valley

Advanced Energy Community (AEC) Desired Characteristics

— — — —

- Affordable access to renewable energy generation / EE

- Energy savings and GHG emissions reductions

- Improved health, comfort, and standard of living

- Improved reliability / resiliency

- Minimize grid impacts / support grid reliability

- Financially attractive

- Scalable and replicable
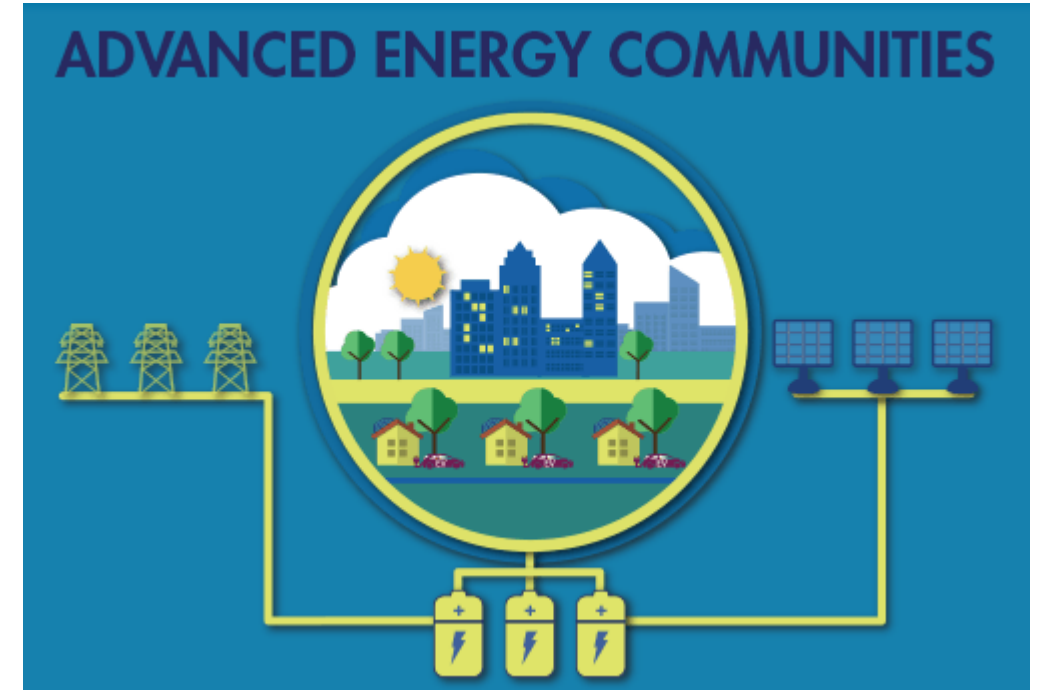
Key Planning Questions

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1. To what extent can a community's energy needs be met from rooftop and or/community solar gardens?

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1. To what extent can a community's energy needs be met from rooftop and or/community solar gardens?

2. What has been the effectiveness of utility energy efficiency programs ?

3. How can we guide municipalities in prioritizing disadvantaged neighborhoods for investments in AECs?

AEC Project Site

Avocado Heights/Bassett,
Unincorporated East Los Angeles County
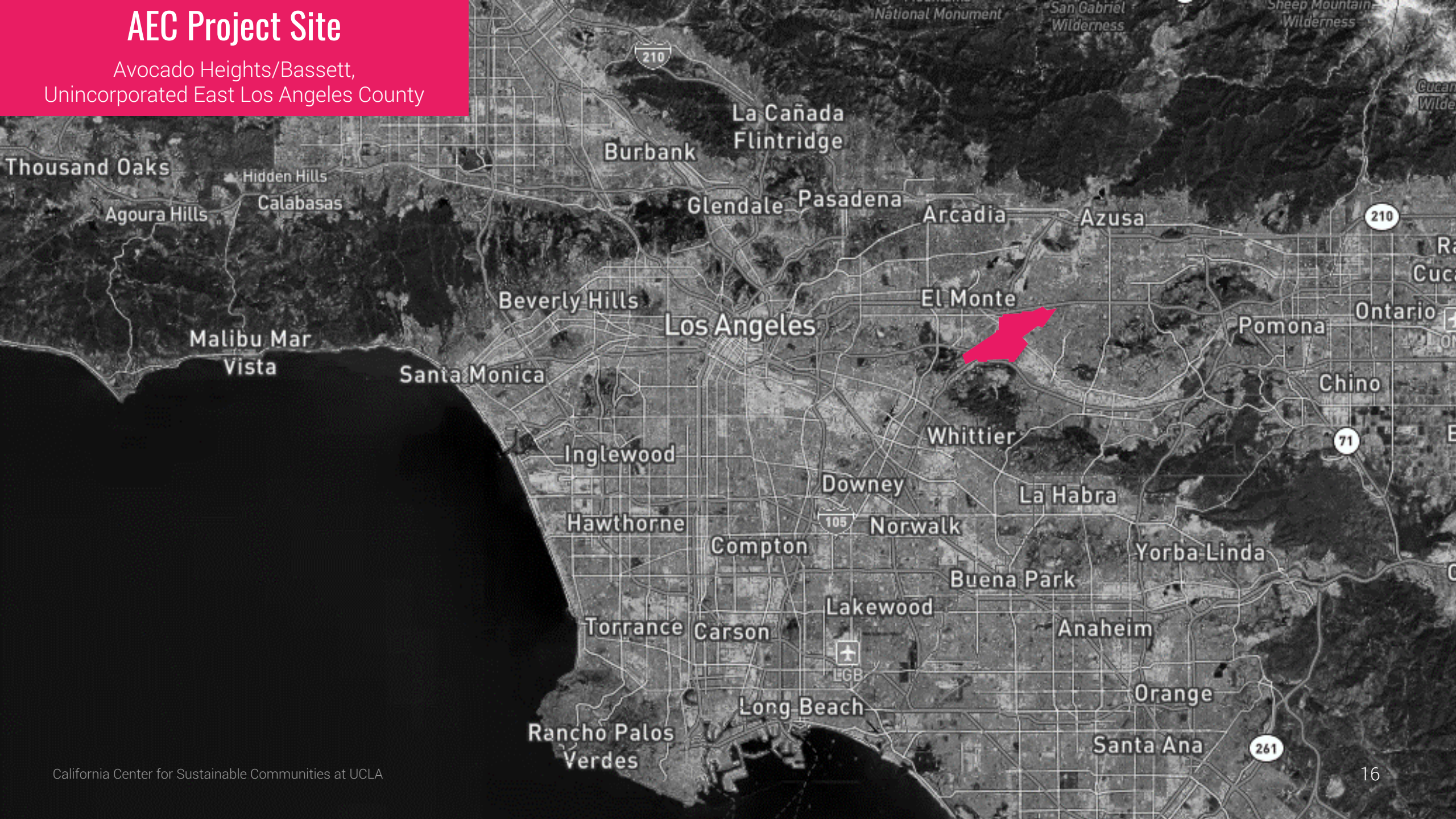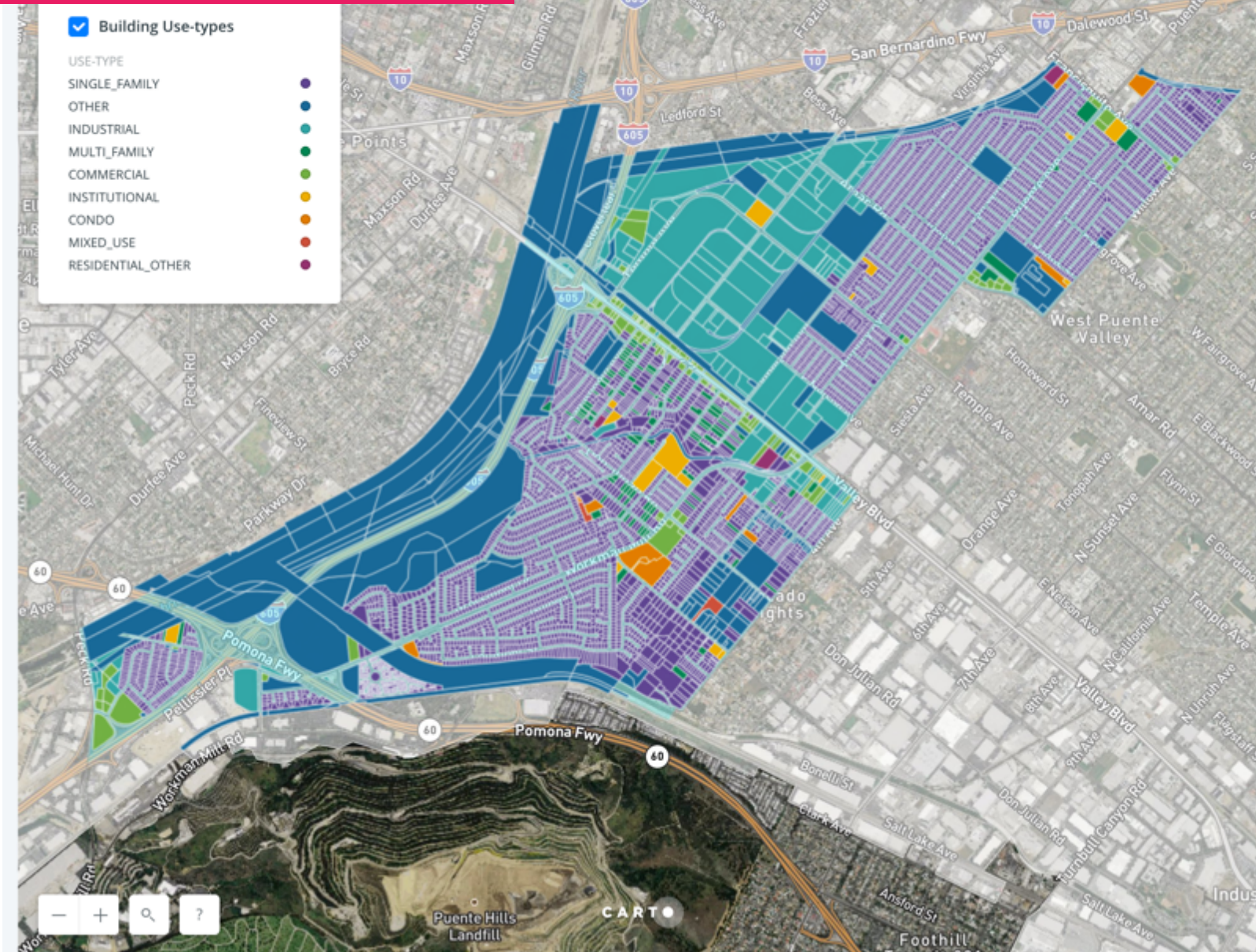
AEC Project Site

Avocado Heights/Bassett,
Unincorporated East Los Angeles County

- **Top 10%** of disadvantaged communities under CalEnviroScreen

- **>40 additional extreme heat days per year** by 2050 predicted

- 4.7 sq-mi

- Population of ~28,000

- Bordered by 3 major freeways

- Adjacent to La Puente Landfill

- Nearby Quemetco Battery Recycling Facility (lead, arsenic)

AEC Project Site

Avocado Heights/Bassett,
Unincorporated East Los Angeles County

Building Use-types

USE-TYPE
SINGLE_FAMILY
OTHER
INDUSTRIAL
MULTI_FAMILY
COMMERCIAL
INSTITUTIONAL
CONDO
MIXED_USE
RESIDENTIAL_OTHER

Square Footage Counts

Vintage Counts

Use-type Counts

ALL SELECTED

SINGLE_FAMILY	5.5k
OTHER	302
INDUSTRIAL	152
MULTI_FAMILY	120
COMMERCIAL	113
OTHER	34

SEARCH IN 9 CATEGORIES

Eric Fournier(June 2017)

Natural Gas
Parcel Level
Data Coverage
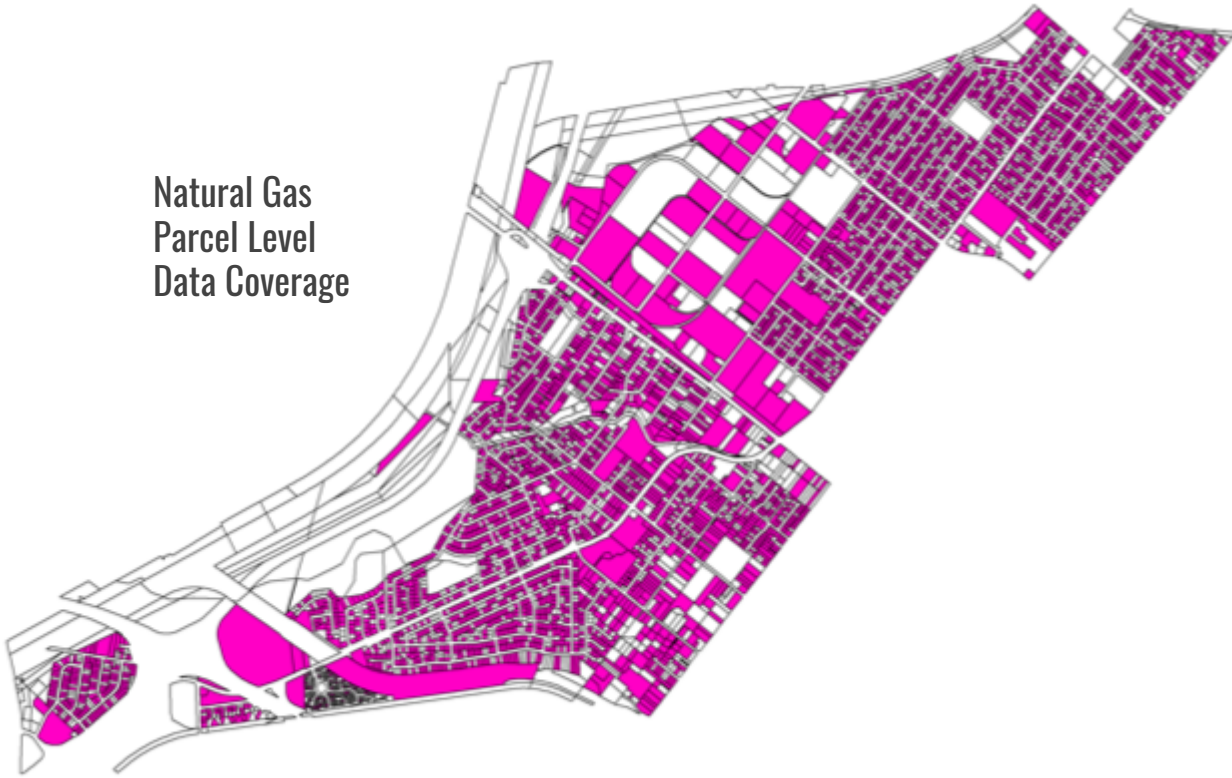
Electricity
Parcel Level
Data Coverage

Eric Fournier(June 2017)

California Center for Sustainable Communities at UCLA

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Average Total Monthly Electricity Consumption [Masked]

Eric Fournier(June 2017)

Single Family Megaparcel NZE Potential
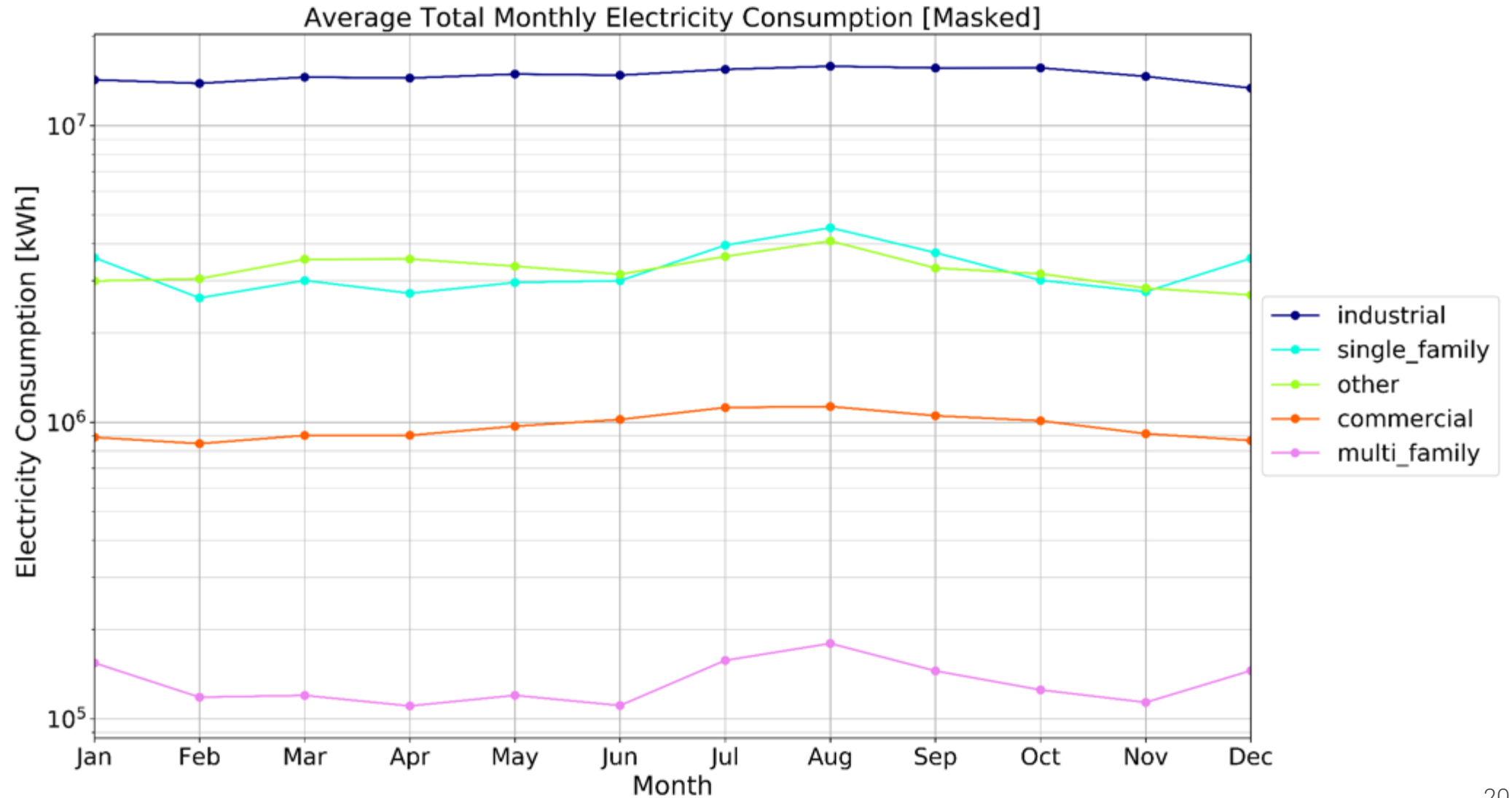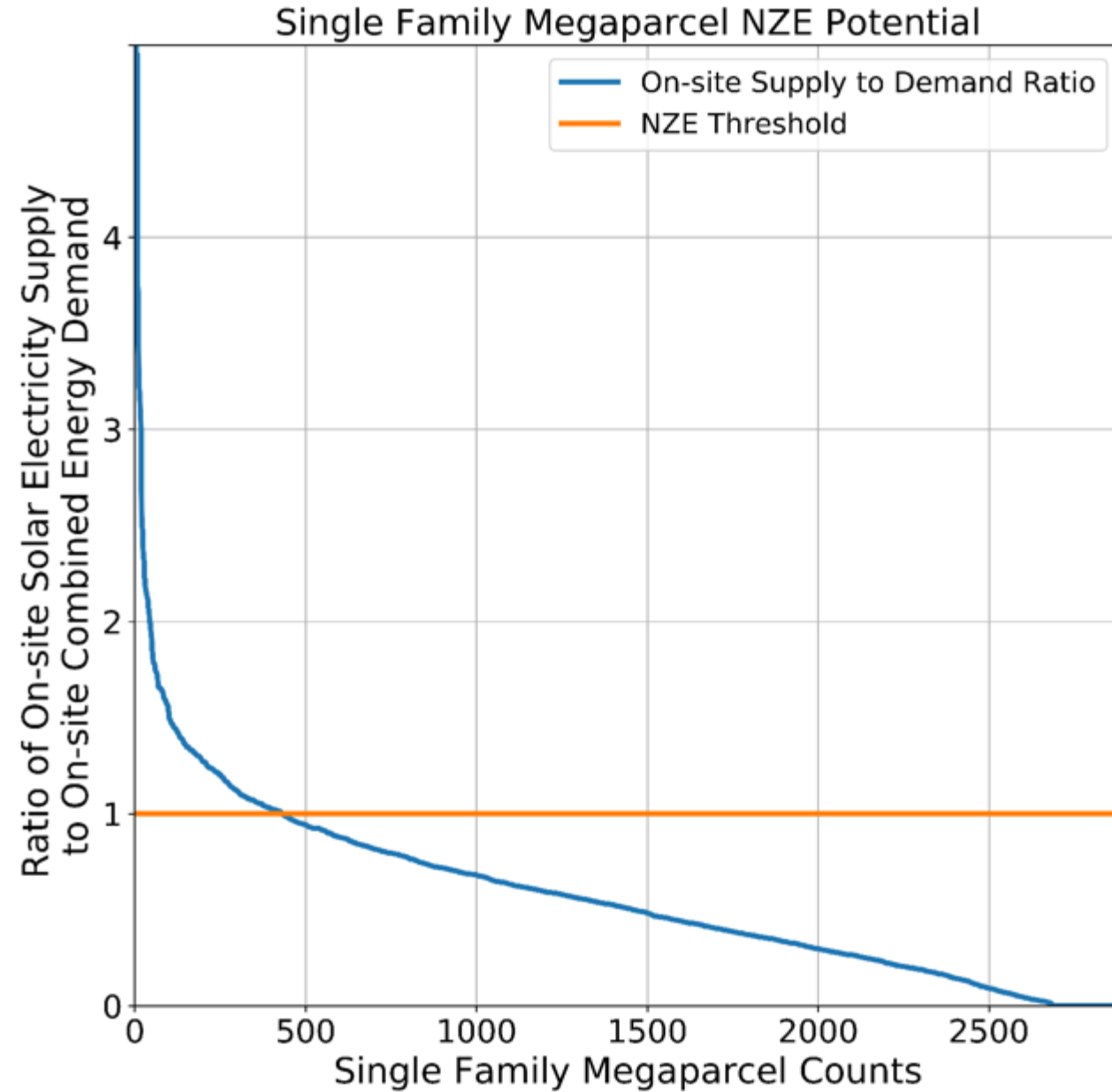
Effectiveness of Energy Efficiency Programs

- $1 BILLION spent annually in CA on building energy efficiency upgrades

- The Energy Atlas is allowing us to conduct the first analysis of actual usage data on a large geographic scale and granularity.

- Data from SCE
  - EE programs from **2010-2015**
  - CARE data from **2010-2015**

- **10+ million** unique residential accounts
  - Monthly electricity (kWh) consumption data
  - 6 Counties in Southern California

- With the Atlas, we are able to control for:
  - Building characteristics (size, vintage, use type)
  - Socio-economic data (census and CARE)
  - Climate
  - Etc.

Where to Install Solar? A Spatial Prioritization Tool

Integrating data sets: Grid capacity (DERiM),
Net solar potential, Demographics

Grid Capacity (DERiM)	Net Solar Potential
CalEnviroScreen Disadvantaged Communities	Census Demographics (Income, Population)
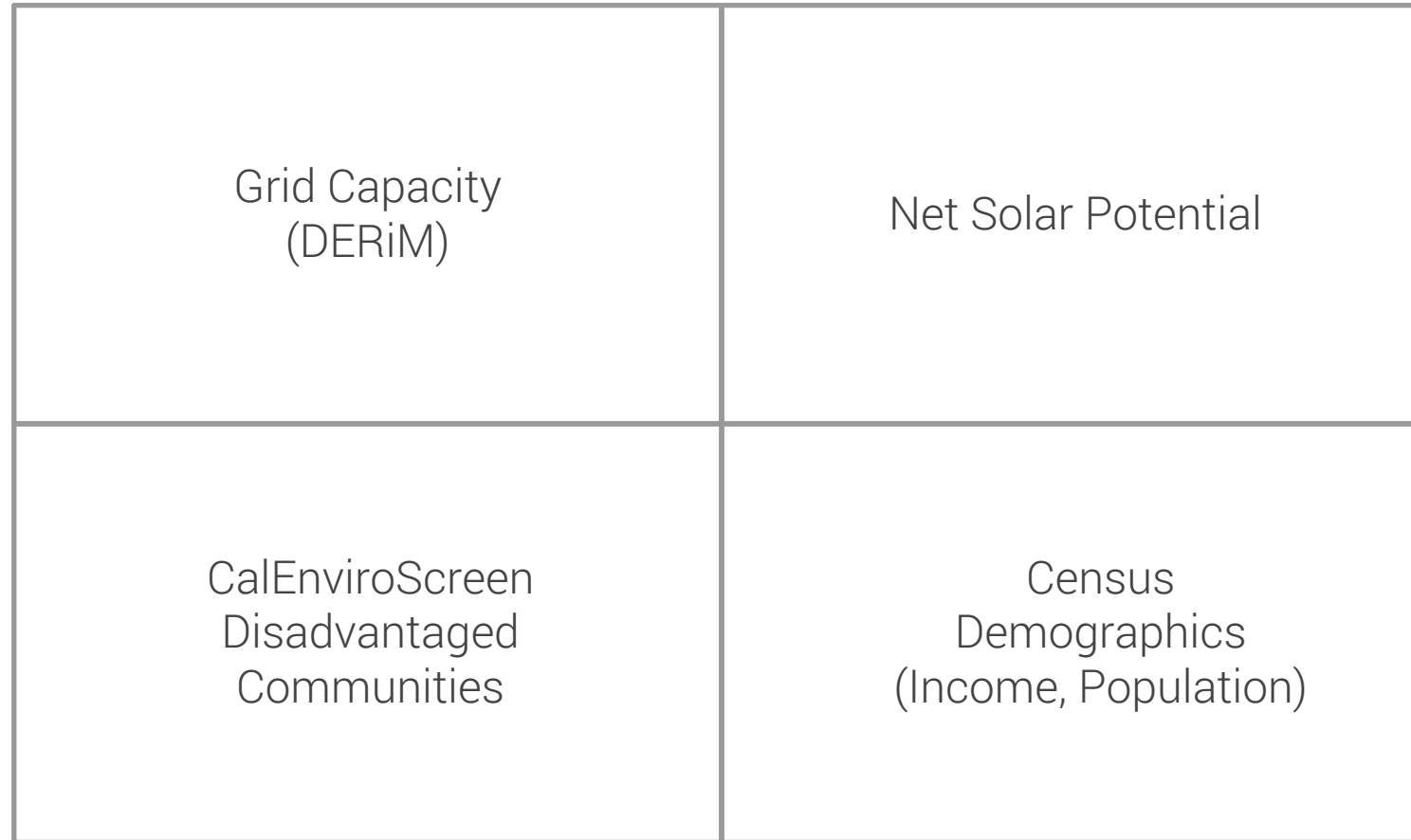
Where to Install Solar? A Spatial Prioritization Tool (In Development)
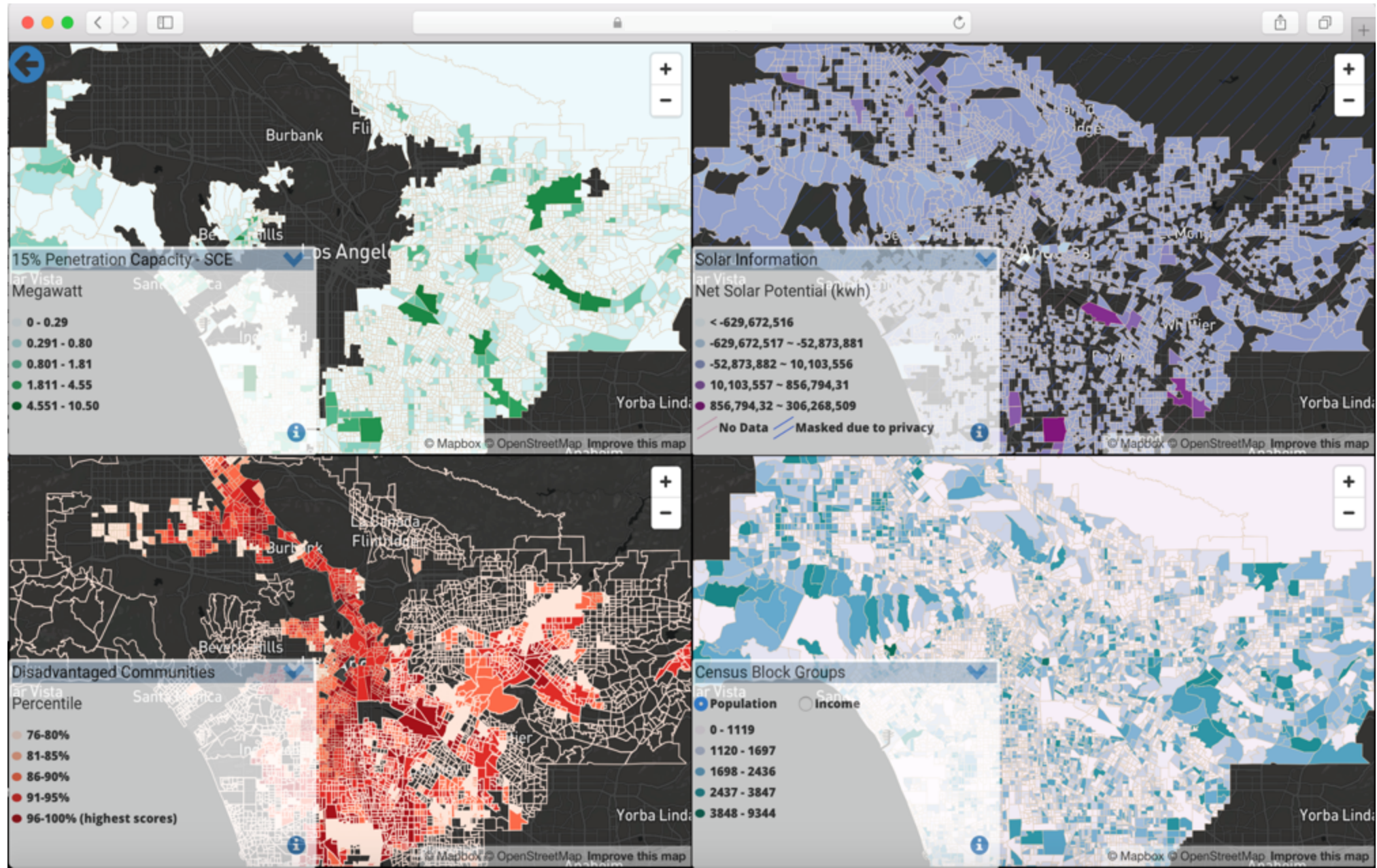
Thank You

Website: ioes.ucla.edu/ccsc

Atlas: energyatlas.ucla.edu

Contact: ccsc@ioes.ucla.edu

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