UCLA Energy Atlas

LGSEC June Quarterly Meeting
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San Diego

California Center for Sustainable Communities at UCLA
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Website: ioes.ucla.edu/ccsc
Atlas: energyatlas.ucla.edu
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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
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.)

PostgreSQL DB with PostGIS
Relational database organizes account-level energy consumption and spatial relationships

Preprocessing
Standardization
Geocoding
DB Planning

Aggregation
Statistical Analysis

SQLite Database
Stores all aggregated data powering website/API

Privacy Controls
What’s Next?

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Data Years Available

- Atlas 1.0 (2015)
- Atlas 2.0 (est. 2017)

Territories:
- SCE
- SCG
- SDG&E

Energy Efficiency Program Data
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 planning 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

1. To what extent can a community's energy needs be met from rooftop and or/community solar gardens?
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2. What has been the effectiveness of utility energy efficiency programs?
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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
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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

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Eric Fournier (June 2017)
AEC Project Site Analysis

Single Family Megaparcel NZE Potential

- On-site Supply to Demand Ratio
- NZE Threshold

Ratio of On-site Solar Electricity Supply to On-site Combined Energy Demand

Single Family Megaparcel Counts

Eric Fournier (June 2017)
California Center for Sustainable Communities at UCLA
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

<table>
<thead>
<tr>
<th>Grid Capacity (DERiM)</th>
<th>Net Solar Potential</th>
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<tr>
<td>CalEnviroScreen</td>
<td>Census</td>
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<tr>
<td>Disadvantaged</td>
<td>Demographics</td>
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<tr>
<td>Communities</td>
<td>(Income, Population)</td>
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</table>
Where to Install Solar? A Spatial Prioritization Tool (In Development)
Thank You

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