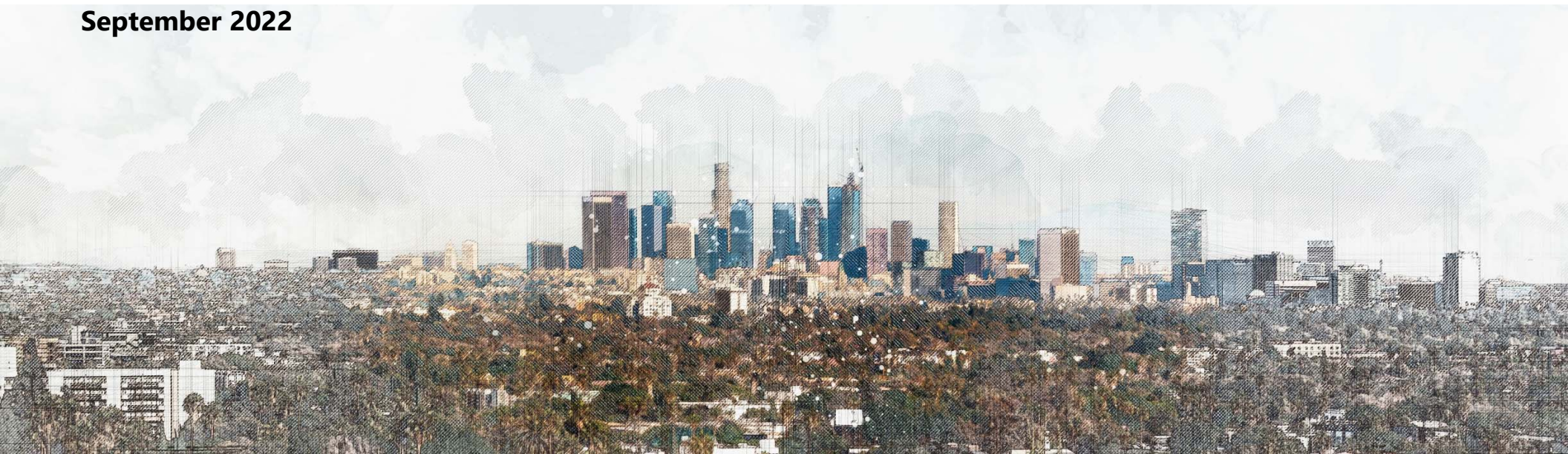


City of LA Decarbonization Motions

September 2022



City of LA Decarbonization Motions

New Construction

- **CF 22-0151 (Harris-Dawson/Koretz/Martinez/O'Farrell/Raman)**
- **Timeline:**
 - Motion introduced 02/09/2022
 - Adopted by Council 05/27/2022
- **Lead: LADBS**
 - Report on a plan for the implementation of an ordinance/framework, effective or before January 1, 2023, that will require all **new residential and commercial buildings in Los Angeles to be built so that they will achieve zero-carbon emissions**
 - Analyze impacts to construction costs and timelines for publicly-funded residential buildings and recommendations for mitigating measures
 - Strategies to mitigate and offset any potential impacts to construction jobs through programs and/or policies

Existing Buildings

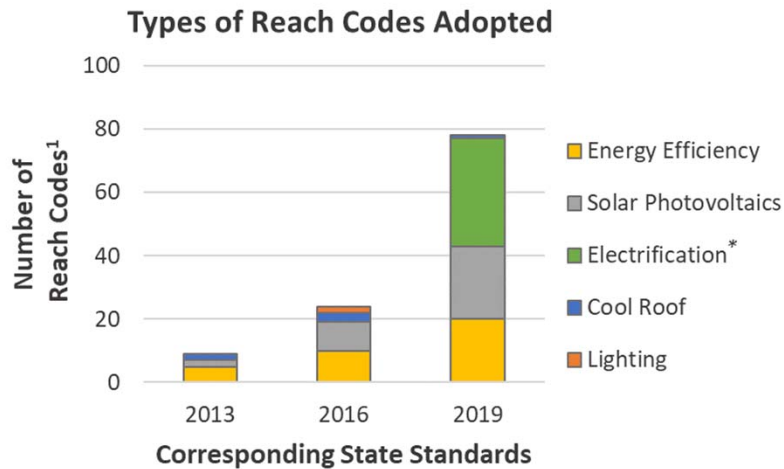
- **CF 21-1463 (Koretz/Krekorian/Raman)**
- **Timeline:**
 - Motion introduced 12/08/2021
 - Adopted by Council 03/09/2022
- **Lead: CEMO, LADBS, LAHD, DWP**
- **LADBS:**
 - Participate in CEMO Community Assemblies and report on meeting the energy and water efficiency goals outlined in LA's Green New Deal
 - **Report on recommendations and best practices for revisions to the City's existing Buildings Energy and Water Efficiency ordinance**
 - Consult with workers and labor union representatives to develop strategies to mitigate and offset any potential impacts to construction jobs

- The Department hired Buro-Happold to help with research
- Participated in the Climate Equity LA Series held the **Climate Emergency Mobilization Office** (CEMO)
- Will work with CEMO regarding some of the recommendations in their report as it pertains to DBS
- The Los Angeles Housing Department (**LAHD**) did a series of stakeholder meeting regarding this issue. DBS will work with LAHD regarding the recommendations in their report as it pertains to DBS.

- Benefits of electrification:
 - Improved indoor air quality: Gas stoves produce nitroges dioxide (NO₂)
 - Reduce climate-warming greenhouse gas emissions

California Electrification Codes

- To date **55 cities and counties** have adopted electrification reach codes in California

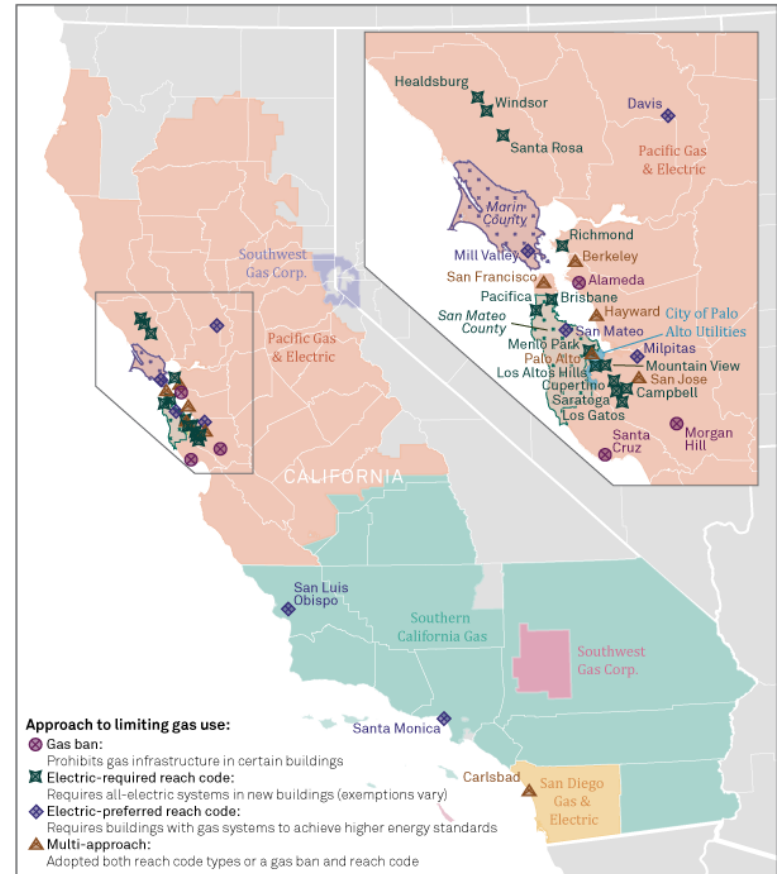


¹ Some reach codes can have multiple requirements. A reach code that requires both greater energy efficiency and solar photovoltaics is counted twice, once for each.

* Electrification includes those that require (1) electrification of one or more appliances, (2) all-electric construction, and (3) natural gas bans.

Source: <https://epicenergyblog.com/2021/08/16/the-rise-of-reach-codes/>

Building gas bans and all-electric reach codes passed in California
Natural gas utility service areas as defined by California Energy Commission



Data as of April 3, 2020.
Map credit: Elizabeth Thomas and Jose Miguel Fidel C. Javier
Sources: Building Decarbonization Coalition; Sierra Club; California Energy Commission

S&P Global
Market Intelligence

Peer City Approaches

2019 Code Cycle

A peer assessment of 11 Californian electrification reach codes are detailed below. **Findings are based on 2019 title 24** and the associated reach code codified for each city. In total over 55 municipalities in California have implemented electrification reach codes with similar requirements and exemptions. **The below table details the typical requirements for each building use type** seen in other cities.

Peer City Electrification Approaches				
Building types	Requirements	Exemption	Condition	Opportunities (labor)
SFD & Duplex	Electric-only, Solar PV, & EV	Accessory Dwelling Units	N/A	Solar Water-heating
Low-rise Residential	Electric-only, Solar PV, & EV	Accessory Dwelling Units	N/A	Solar Water-heating
High-rise Residential	Electric with exemptions, Solar PV, & EV	For-profit kitchen, Affordable Housing	Electric-ready (For-profit kitchen)	Solar Water-heating, Dual Piping, rainwater
Non-Residential	Electric with exemptions, Solar PV, & EV	For-profit kitchen, Certain use types*	Electric-ready (For-profit kitchen)	Solar Water-heating, Dual Piping, rainwater

*Additional property exemptions

- Manufacturing & Industrial Processes
- Hospitals & Laboratories Processes

2022 Energy Code updates | What is new for LA?

The updated 2022 Title 24, Part 6 Standards were formally adopted by the Building Standards Commission in a formal hearing in August 2021. The standards will go into effect on January 1, 2023. Updates are made every 3 years.

Single Family Requirements

Electrical wiring and panel capacity are required for water heating, space heating, cooktops, and clothes dryers serving the dwelling

2022 Multifamily Requirements

- Electrical wiring and panel capacity are required for water heating, space heating, cooktops, and clothes dryer located inside the dwelling units
- Electrical wiring or raceway and panel capacity are required for clothes dryers in common use areas

2022 Non-residential Requirements

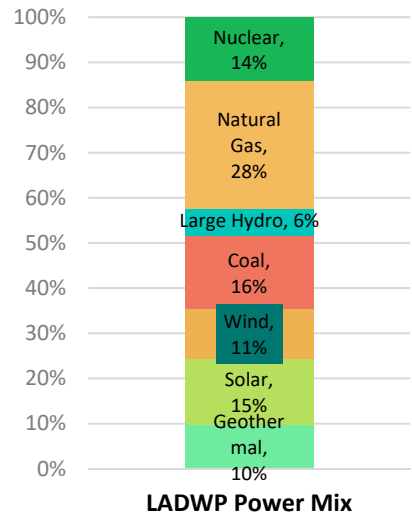
- **Electric-ready:** No new relevant requirements

*Compliance Manuals:

- 2022 Single-Family Residential
- 2022 Non-Residential & Multifamily

City of LA | Existing Building Emissions

- **Single Family:** Single family homes represent the largest percentage of CO₂ emissions at 43%
- **Building over 50K sq. ft.:** 22% of CO₂ emissions are from buildings over 50K sq. ft.
- LADWP Power Mix: 579 lbs CO₂e / MWh

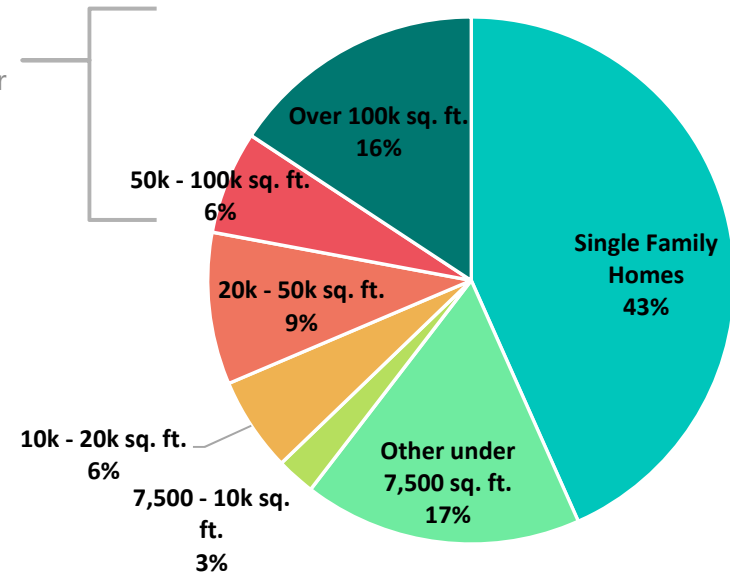


42% from renewable energy sources

Source: LADWP 2020 Power Label

Los Angeles Citywide Building Emissions

22% GHG emissions building over 50K sq. ft.



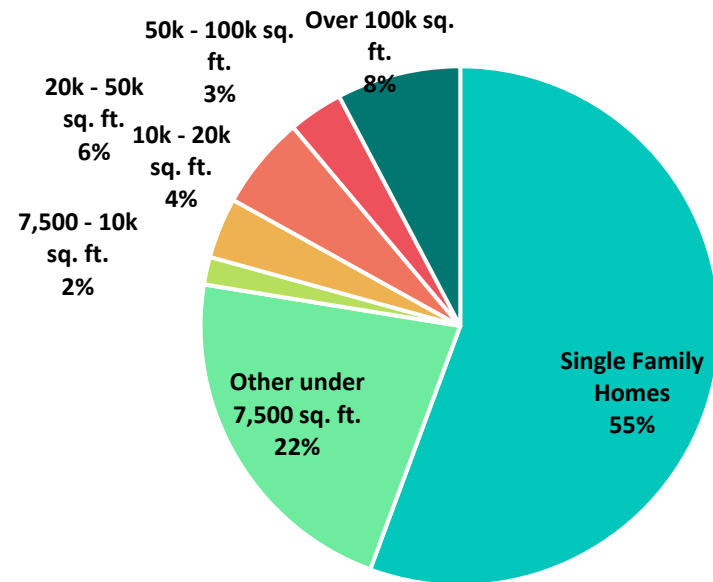
Source: EIA and Buro Happold

LADWP | Generation Mix Projections

Los Angeles Department of Water and Power will pursue an **80% renewable and 97% carbon free grid by 2030, and 100% carbon free energy by 2035**

If the City of LA did nothing as of today grid emissions would reach carbon free by 2035 however existing buildings would still be using Natural Gas unless retrofitted to All-electric

CARBON FREE GRID – NG USE IN EXISTING BUILDINGS REMAIN THE SAME



Source: EIA and Buro Happold

Electrification Costs | 2019 CPUC Lifecycle Studies

Red indicates increased cost
Green indicates savings

2019 New Construction Cost Comparison – Code Compliant – Los Angeles: CZ 6,8,9						
<i>Savings Range due to rate types and climate zone variability</i>		Incremental Savings: All-Electric Costs vs Mixed Fuel Baseline				
	Initial First Cost Savings	Incremental Cost Savings	Year 1 Utility Savings (\$/year)	Lifecycle Utility Cost Savings (on-bill)	On-Bill Lifetime Cost Savings (NPV)	
Definitions	Equipment, materials, and installation	Equipment, installation, replacement, and maintenance costs. Replacement costs are applied to HVAC and DHW equipment, PV inverters, and battery systems over the 30-year evaluation period	First year utility savings	Energy usage and customer utility bill savings using today's electricity and natural gas utility tariffs. Total savings are estimated over a 30-year duration and include discounting of future costs and energy cost inflation	Savings from Incremental Cost and Lifecycle utility Cost Savings over the 30 years	
Single Family <i>Single Family - 1 story</i>	\$5,288 (\$/dwelling unit)	\$5,234 (\$/dwelling unit)	+\$264 - \$269 (\$/dwelling unit/yr)	+ \$4,864 - +\$5,120 (\$/dwelling unit)	\$114 - \$370 (\$/dwelling unit)	
Low Rise Multi-Family <i>2 stories, 8 units</i>	\$3,361 (\$/dwelling unit)	\$2,337 (\$/dwelling unit)	+\$12 - +\$30 (\$/dwelling unit/yr)	+ \$349 - +\$902 (\$/dwelling unit)	\$1,435 - \$1,988 (\$/dwelling unit)	
Mid-rise Multi-Family <i>6 stories, 88 units</i>	Not Accounted For	\$606 (\$/dwelling unit)	+\$7 - +\$28 (\$/dwelling unit/yr)	\$153 - \$227 (\$/dwelling unit)	\$759 - \$634 (\$/dwelling unit)	
High-rise Multi-Family <i>10 stories, 117 units</i>	Not Accounted For	\$715 (\$/dwelling unit)	+\$39 - +\$41 (\$/dwelling unit/yr)	+\$71 - \$67 (\$/dwelling unit)	\$644 - \$782 (\$/dwelling unit)	
Office <i>3 stories</i>	Not Accounted For	\$63,102 - \$76,153	\$1,432 - \$2,538	\$18,603 - \$26,366	\$81,705 - \$102,519	
Retail <i>1 story</i>	Not Accounted For	\$21,762 - \$32,113	\$725 - \$1,922	\$17,130 - \$19,309	\$38,892 - \$51,422	

Source 2019 CPUC Studies & Buro Happold

- [Non-residential Cost Effectiveness](#)
- [Low-Rise/Single Family Cost Effectiveness](#)
- [Mid-Rise Residential Cost Effectiveness](#)
- [High-Rise Residential Cost Effectiveness](#)

¹Considers electrical upgrade requirements and reduced need for gas infrastructure

²Lifecycle savings = capital and utility savings/costs over 30 years at 2020\$ Net present value (NPV)

Cost for a new ADU for all-electric and natural gas

All-electric detached ADUs can **cost effective in all climate zones** through either the utility bill or TDV metrics when compared to a mixed fuel baseline.

New Construction Costs: Detached ADU			
Construction Item	Mixed-Fuel Cost	All-Electric Cost	Difference in cost for All-Electric
Appliances	See Previous Table		-\$200
In-house gas plumbing	\$540	\$0	-\$540
In-house electrical upgrades	\$0	\$600	\$600
Site gas service extension	\$1,998	\$0	-\$1,998
Site electrical service connection	\$3,500	\$3,500	\$0
Feeder and subpanel	\$1,666	\$2,152	\$486
Total	\$7,704	\$6,252	-\$1,673

Source: [California Energy Commission - Detached Accessory Dwelling Units Cost Effectiveness Study](#)

On average **All-Electric Detached ADUs are less expensive** to build than similar mixed-fuel ADUs

- **Effect on Natural Gas Service pricing:** New building are less than 0.5%, no significant effect on natural gas service pricing

- **DWP New Development issues:**
 - Electrical ditribution does not exist
 - Existing electrical distribution to the site is not sufficient
 - The cost of providing electrical distribution is charged to the developer

Potential Impacts to Construction Jobs

- The transition away from natural gas in has the potential to impact construction jobs for workers in the plumbing sector.
- Electric ready by CEC will encourage developers to discontinue gas appliance and equipment inside the units
- The requirement for Solar thermal systems and the grey water option as well as “greywater ready” may help make up for some of the displaced work

The Case for Solar Thermal Water Heating

- High efficiency
- Provide resiliency benefits to the electric grid.
- Solar thermal water heating systems will provide annual cost of fuel savings
- The cost will be **offset by the construction cost savings**

Building Decarbonization

Recommended Approaches

Summary of Recommendations		
Building Type	Requirement	Exemption
Single-Family Dwelling & Duplex	All-Electric	Attached ADU when using existing systems
Hotel, Motel, Residential under threshold (see note below)	All-Electric	Cooking equipment in Restaurants/Cafeterias
Hotel, Motel, Residential over threshold (see note below)	All-Electric, Solar water heating system (unless greywater/dual plumbing system)	Cooking equipment in Restaurants/Cafeterias
Non-Residential	All-Electric	Cooking equipment in Restaurants/Cafeterias, Process Gas Systems

- REQUEST the Los Angeles Department of Water and Power (LADWP) to explore the establishment of a financial incentive program for the installation of solar thermal water heating systems in buildings subject to the above requirements.
- DIRECT the Los Angeles Department of Building and Safety (LADBS) to work closely with the Los Angeles Department of Water and Power (LADWP) to leverage existing and future rebate programs to help customers address any potential increases in utility cost during the transition to electrified buildings.

Thank you!!