2022-23 Reach Codes Initiative

Advancing safer, healthier and more affordable buildings and vehicles

City Staff Meeting - February 17, 2022
Team Introductions

**LEADERSHIP**

Peninsula Clean Energy
- Rafael Reyes
- Blake Herrschaft
- Phillip Kobernick
- Zoe Elizabeth
- Peyton Parks
- Peter Mustacich
- Eryn Kim
- Beckie Menten

Silicon Valley Clean Energy

East Bay Community Energy

**COLLABORATORS**

Santa Clara County
- Breann Boyle
- Alero Moju

San Mateo County

**CONSULTANTS**

TRC
- Farhad Farahmand
- Mayra Vega

DNV
- Thor Frantz
2022-23 Initiative Goals and Objectives

Electrify
- Emissions reductions
- Economical
- Healthy air
- Job creation

Continue
- Re-adopt by Jan 2023
- Avoid enforcement gaps

Simplify
- Less complex code language
- Reduce permitting barriers

Expand
- New city participation
- Existing buildings policy and programs
Tools, Services, and Resources

1. **Model Codes**, the topic of discussion today

2. **Stakeholder meetings**
   - Please reach out when you would like support, with dates in mind, and we will do our best to support you.
   - We may hold regional public meetings for efficiency and for ‘strength in numbers.’

3. **Tech assist via email / phone**
   - Code customization
   - Permit simplification support, for example
     - Share state-mandated expedited review requirements and resources
     - Share city staff trainings for electrification technologies
     - Develop application resources specifically for electrification projects

4. **BayAreaReachCodes.Org**
   - Templates (i.e., staff reports, PPT decks) for city staff to leverage will become available Q1 2022
   - Cost-effectiveness studies as they become available (March through May 2022 for initial draft results)

5. **New Adopters in PCE/SVCE service area**: $10k grant for city-staff time if reach codes are brought to a vote at your Council
Collaborator Resources

Reach Codes Newcomers Webinar Series

- Hosted by Statewide Reach Codes Program, BayREN, and CCEC
- [Registration Link](#)
- Next meeting Feb 22 on Reach Code Process and Timing
- Future meetings cover cost-effectiveness, ordinance options, and implementation

BayREN Existing Buildings Resources

- [Policy Calculator](#)
- Energy Atlas building stock energy data
- Engineering Technical Assistance for municipal building efficiency and electrification
Meeting Overview

Objectives
- Deep dive into model code language
  - Building electrification
  - EV infrastructure
- Briefing on Existing Building Electrification
- Feedback and discussion on how to enhance model code

Agenda
1. Recap of Industry and Community stakeholder events 5 min
2. Building electrification, existing building strategy 30 min
   + Guest Speaker: Kevin Jackson
3. Building electrification, new construction code 30 min
   + Breakout session
4. Electric vehicle charging infrastructure code 30 min
   + Breakout session
5. Open discussion 20 min
Feedback from Feb 15/16 Stakeholder Meetings

**Building Industry**
- Electrical capacity concerns
  - Electrical code formulas may be overly conservative
  - Automatic Load Management for EV charging is new to the industry and should be more readily invoked
- Requests and suggestions for existing building code language

**Community**
- Further resources necessary for public outreach and education
- Grid capacity concerns
- Environmental degradation of renewable power plants and EV batteries
- Request for code requirement of routing EV chargers through the multifamily meter
Existing Building Electrification
Poll
Existing Buildings Policy

- Inequitable histories
- Financing and incentive programs
- Outreach and education strategy
- Supplier and workforce availability
- Coordination with regional agencies (e.g., BAAQMD)
- Code concepts and language
- On and on...

Today’s Focus
Reflections on Existing Building Policies

Kevin Jackson, AICP
Planning & Building Director
City of Piedmont
120 Vista Avenue, Piedmont, CA 94611
Tel: (510) 420-3039

Google “Piedmont Reach Code”
https://www.piedmont.ca.gov/services_departments/planning_building/about_building/reach_code_information
BayREN Policy Calculator

Forecast of Cumulative GHG Emission Impacts from Selected Policy Options

- New Construction Reach Code
- 2. Energy Assessment
- 3. Upgrade at Equip't Replacement
- 4. Upgrade at Major Renovation
- 5. Performance Standards
- End of Flow
- Unabated Emissions
- Zero Emissions Building Goal

Building Emissions (tons CO2e) vs Year

Unabated GHG emissions
Existing Building Code Approaches

Building Types

- Municipal and Commercial
  - Owner access to financing
  - Partially electric-ready
  - Regular maintenance and replacement
  - Construction management

- Multifamily
  - Owner access to financing
  - Regular maintenance and replacement
  - Construction management

- Single Family
  - Some owners have access to financing

Appliance Upgrade Code Triggers

- Building Performance Standards
  - Periodic benchmarking report
  - Emissions or energy metric
  - Penalties / fees

- Time of Permit Menu Options
  - Major Alteration
  - Burnout

- Time of Permit Electric-required
  - Major Alteration
  - Burnout

Time of Sale Models

- Energy Assessments
  - Increases market transparency

- Transfer Tax Rebate
  - Emissions measures among menu of other important requirements (e.g. seismic)

- Code Compliance
  - Fees / penalties
  - May be tied to business licenses or rental licenses

Decreasing owner financing access, increasing equity considerations

Time certain

No Missed Opportunities

Monitoring

Incentivizing

Mandating
Existing Building Code Approaches

**Building Types**

**Appliance Upgrade Code Triggers**

- Owner access to financing
- Partially electric-ready
- Regular maintenance and replacement
- Construction management

**Code Compliance**

- Fees / penalties
- May be tied to business licenses or rental licenses

**Time of Sale Models**

- Increases market transparency

**Time of Permit**

- Electric-required
  - Major Alteration
  - Burnout

**Time certain**

- No Missed Opportunities

**Building Performance Standards**

- Periodic benchmarking report
- Emissions or energy metric
- Penalties / fees

**Transfer Tax Rebate**

- Emissions measures among menu of other important requirements (e.g. seismic)

**Menu Options**

- Major Alteration
- Burnout

**Monitoring Incentivizing Mandating**

- Over $25k
- Laundry, Kitchen & Panel Readiness

Piedmont

- Emissions measures among menu of other important requirements (e.g. seismic)
- Fees / penalties
- May be tied to business licenses or rental licenses

- Increases market transparency
Existing Building Code Approaches

**Building Types**
- **Municipal and Commercial**
  - Owner access to financing
  - Partially electric-ready
  - Regular maintenance and replacement
  - Construction management

- **Multifamily**
  - Owner access to financing
  - Regular maintenance and replacement
  - Construction management

- **Single Family**
  - Some owners have access to financing

**Appliance Upgrade Code Triggers**
- **Building Performance Standards**
  - Periodic benchmarking report
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**Time of Sale Models**
- **Energy Assessments**
  - Increases market transparency

- **Transfer Tax Rebate**
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- **Code Compliance**
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**Time of Permit Menu Options**
- **Major Alteration**
- **Burnout**

**Time of Permit Electric-required**
- **Major Alteration**
- **Burnout**

**Decreasing owner financing access, increasing equity considerations**

**Monitoring**

**Incentivizing**

**Mandating**

> 20k ft²

**Chula Vista**
Time of Permit – Electric Required, Burnout

A/C Upgrade to Heat Pump

At the Time of Permit, all-electric is required (new installation, relocation, or replacement)

First Cost, Per System
- Single family
  - Cost Neutral $2,000-$5,000 if scope was only A/C relocation
- Multifamily In-unit
  - Cost Neutral $2,000-$5,000 per dwelling if scope was only A/C relocation
- Commercial - Single-zone
  - Cost Neutral up to 30 tons
- Commercial - Multi-zone
  - Cost Neutral up to 30 tons

Life-Cycle Cost Effective?
- Yes, with incentive.

Additional Financing Needed?
- No

Ready to Adopt?
- Yes

FINANCING AVAILABLE
- BayREN + TECH $3,000
- BayREN + TECH $2,000

< 5 tons - YES, i.e., Hotel. Needs efficiency or PV, i.e., Retail, Restaurant
< 30 tons - CLOSE. Needs efficiency or PV, i.e., Large Office
MAYBE - costs unlikely to be major impediment
MAYBE - costs unlikely to be major impediment
YES
Resources and Next Steps

Equitable Approaches

- **Existing Building Electrification Strategy** – City of Berkeley
- **Equitable Electrification Framework** – Greenlining Institute
- **Equitable Development Scorecard** – The Alliance for Advancing Regional Equity
- **Tenant Impact Recommendations** – Natural Resources Defense Council for Los Angeles
- **Zero Cities Project** – Urban Sustainability Director’s Network

Model Codes

- **Building Performance Standards** – Institute for Market Transformation, used by Denver
- **Building Performance Standards, Local Government Processes, and Grid Implications** – Local Government Sustainable Energy Coalition
- **Time of Permit – Menu Option** – Statewide Reach Codes Program, draws from Chula Vista
- Time of Permit – Electric-Required – TBD on BayAreaReachCodes.Org

**Webinar on Existing Building Electrification:** Date TBD
2022-23 Initiative Timeline

Existing Buildings

January
Kickoff

February
Begin on-going outreach

March 22
10A-12P
Existing Building-specific meeting

April-May
1st draft of tools, permitting codes

September-October
Local adoption

January 1, 2023 (or later)
Codes take effect
New Construction Building Electrification

Integrated Genomics Laboratory, Lawrence Berkeley Labs

Source: Rutherford + Chekene
## Building Electrification – New Construction

### Code Approach

<table>
<thead>
<tr>
<th>Code Approach</th>
<th>Pros</th>
<th>Cons</th>
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# Building Electrification – New Construction

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<td>CALGreen – All-Electric amendment</td>
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<td>• Requires triennial update or more if intervening cycle</td>
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<td>Energy Code – All-Electric amendment</td>
<td>• Effective&lt;br&gt;• May include efficiency and load management</td>
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## Building Electrification – New Construction

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• Flexible (i.e., time-certain or existing buildings policies can be included)  
• Avoids triennial cycle | • Limited efficiency options |
| CALGreen – All-Electric amendment          | • Effective                                                          | • Requires triennial update or more if intervening cycle  
• Limited efficiency options            |
| Energy Code – All-Electric + efficiency amendment | • Effective  
• May include efficiency and load management | • Requires CEC approval |
| Energy Code – Electric-preferred amendment  | • May include efficiency and load management | • CA Energy Code is already electric-preferred  
• Requires CEC approval  
• Enforcement complexity                |
Building Electrification – New Construction

All-Electric Municipal Ordinance

All-electric construction required

- Also restricts extension of any existing gas infrastructure

New construction definition

- If either of the below are replaced over 3 years for purposes other than repair or reinforcement
  - 50% of above-sill framing, or
  - 50% of foundation

Optional exceptions

- Infeasible to construct according to CA Energy Code
- “Public interest”
- Technology-specific exceptions expiring in 2025
- Electric-readiness required
  - Pre-wiring
  - Physical space
Review Code Language (screenshare)
Breakout Discussion

How do these codes reflect your city’s aspirations?

What policies would decarbonize new construction best?

What analysis would your Council or City Manager like to see?
EV Charging Infrastructure Code
EV Infrastructure – New Construction

### Code Approach

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<tr>
<td>Zoning Code amendment</td>
<td>• Flexible (i.e., time-certain policy can be included)</td>
<td>• Should comprehensively replicate or exceed all CALGreen mandatory req’s</td>
</tr>
<tr>
<td>Posted on BayAreaReachCodes.Org</td>
<td>• Developer is aware at time of land-use permit</td>
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<td></td>
<td>• Alignment with other land use regulations</td>
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<tr>
<td>CALGreen amendments</td>
<td>• May be adopted simultaneously with CALGreen All-electric building amendments</td>
<td>• Complex strikethrough/underlines</td>
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<td></td>
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<td>• Requires triennial adoption</td>
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### Considerations

- How does your city commonly perform on-site EV infrastructure inspections?
- What is the best approach given your city’s staff and community culture?
**EV Code Terminology**

**Speed**

**Level 1**
3-4 miles per charging hour

**Level 2**
10-20 miles per charging hour

**Level 3**
150+ miles per charging hour

**Readiness**

**EV Capable**

**EV Ready**

**EV Charging Station**

**Number**

Percent of Parking Spaces
## EV Infrastructure – New Construction

### 2022 Initiative - Key Concepts

<table>
<thead>
<tr>
<th>Single Family Homes and Two-Family Townhomes</th>
<th>2019 CALGreen</th>
<th>2022 CALGreen</th>
<th>Model Code</th>
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<tbody>
<tr>
<td>Mandatory</td>
<td>Mandatory</td>
<td>2 EV spaces total:</td>
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<tr>
<td>(1) Level 2 EV Capable for one parking space per dwelling unit</td>
<td></td>
<td>• 1 Level 2 EV Ready circuit</td>
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<tr>
<td></td>
<td></td>
<td>• 1 Level 1 EV Ready circuit</td>
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![Diagram showing EV infrastructure](image-url)
### EV Infrastructure – New Construction

#### 2019 CALGreen vs 2022 CALGreen

<table>
<thead>
<tr>
<th></th>
<th>Multi-Family</th>
<th>Model code</th>
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<tr>
<td>2019 CALGreen</td>
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<tr>
<td></td>
<td>Mandatory</td>
<td>% of Dwelling Units with Parking Spaces</td>
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<tr>
<td></td>
<td>% of Parking Spaces</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10% Level 2 EV Capable</td>
<td>Entirely affordable housing:</td>
</tr>
<tr>
<td></td>
<td>5% Level 2 EV Capable</td>
<td>15% Level 2 EVCS</td>
</tr>
<tr>
<td></td>
<td>25% Level 2 EV Ready (low-power)</td>
<td>25% L2 EV Ready (low-power)</td>
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<tr>
<td></td>
<td>10% Level 2 EV Capable</td>
<td>60% Level 1 EV Ready</td>
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LOAD MANAGEMENT ENCOURAGED
100% Access Doesn’t Need to Cost More

Each scenario is ~0.3% of construction cost

Source: Turner and Townsend, 2021
## EV Infrastructure – New Construction

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<th>2022 CALGreen</th>
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<td><strong>Non-Residential</strong></td>
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<tr>
<td></td>
<td>6% Level 2 EV</td>
<td>5% Level 2 EVCS</td>
<td>15% Level 2 EVCS</td>
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<tr>
<td></td>
<td>Capable</td>
<td>15% Level 2 EV Capable</td>
<td>30% Level 2 EV Capable</td>
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<tr>
<td></td>
<td>6%</td>
<td>5%</td>
<td>20%</td>
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<td></td>
<td>Level 2 EV</td>
<td>Level 2 EV Capable</td>
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<td>10%</td>
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LOAD MANAGEMENT ENCOURAGED
Alterations or additions

• **Single Family** – Parking additions or electrical panel upgrades must meet new construction requirements

• **Multifamily** ➔ When new parking facilities are added, or electrical systems or lighting of existing parking facilities are added or altered and the work requires a building permit, ten percent (10%) of the total number of parking spaces added or altered shall be EVCS.

• **Nonresidential** ➔

Time certain policy

• By January 1st, 2025, multifamily and nonresidential properties shall upgrade existing EV Capable spaces required by the locally adopted codes at the time the building was permitted to a minimum of Level 1 EV Ready.
Review Code Language (screenshare)
Breakout Discussion

What EV policies make most sense for your city?

What EV infrastructure analysis would your Council or City Manager want to see?
2022-23 Initiative Timeline

New Construction

January Kickoff

February Begin ongoing outreach

March-May Cost effective studies

June 2nd draft reach codes, outreach

September-October Local adoption

January 1, 2023 Codes take effect
Please share your opinions

Please review the codes posted on BayAreaReachCodes.org and share feedback

Model Reach Codes Recommendations

The following building electrification reach code language is based on the anticipated Investor-Owned Utilities Codes and Standards Program (IOU’s C&S) cost effectiveness studies. These studies will be listed under Supporting Resources.

Do you have any feedback you would like to share on our model codes or other aspects of our Initiative? We would appreciate your input!

• What opportunities and challenges do you expect in 2022-23?

• Are the code concepts appropriate for your City/County?

• What support will you need more/less of?
Thank you!
Next Meetings:

March 8 – ICC Tri-Chapter briefing
March 9 – CALBIG briefing
Date TBD – City Staff: Deep Dive into Existing Building Electrification
2022 CA Energy Code

New Construction

• Heat pumps are prescriptive baseline
  • Residential
    • Space heating in climate zone 3, 4
    • Water heating in climate zone 12
  • Nonresidential – most building types include one or both of water heating and space heating

• Residential
  • Performance credit for all-electric design
  • Electric-ready pre-wiring required for gas appliances
    • Higher ventilation rate for gas stoves

• Nonresidential - Solar PV and Battery Storage prescriptively req’d

Existing Buildings

• Prohibits newly installed ducted electric resistance space heating

• Code language simplifications to enable heat pump space heating and water heating systems
2022 CALGreen

**Energy Efficiency**

- Compliance margin assumes both heat pump space heating and water heating
- Mixed-fuel compliance path allowed (e.g., with battery storage)
- Does not mandate or encourage on electric cooking/laundry

**EV Infrastructure**

<table>
<thead>
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<th></th>
<th>Multifamily</th>
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<th>Total</th>
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<tr>
<td></td>
<td>EV Capable</td>
<td>EV Ready</td>
<td>EVSE (L2)</td>
<td></td>
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<tr>
<td>Mandatory</td>
<td>10%</td>
<td>25%</td>
<td>5%</td>
<td></td>
<td>40%</td>
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<table>
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<th></th>
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<td>EV Capable (L2)</td>
<td>EVSE (L2 + Load Management)</td>
<td></td>
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<td>15%</td>
<td>5%</td>
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<td>20%</td>
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Note: Non-residential includes EV Capable (make-ready) requirements for Medium- and Heavy-duty EVs in new grocery, warehouse, and retail buildings.

Source: **2022 CALGreen CEC Hearing**