Economic Development, Placemaking and Branding/Marketing Committee

TO: **ECONOMIC DEVELOPMENT, PLACEMAKING AND BRANDING/MARKETING COMMITTEE MEMBERS** **DATE: JUNE 23, 2022**

FROM: **CHAIR RONALDO FIERRO** **WARDS: ALL**

SUBJECT: ***REACH RIVERSIDE*** **BUILDING DECARBONIZATION ORDINANCE**

ISSUE: Update on activities of Decarbonization Advisory Group and proposed building electrification and decarbonization strategies via reach code process.

RECOMMENDATIONS:

That the Economic Development, Placemaking and Branding/Marketing Committee:

1. Recommend that the City Council adopt a Reach Code Ordinance that provides a local amendment to the California Building Standards Code to require the following:
    a. Newly constructed buildings three-stories or less (low-rise) with a building permit filed on or after January 1st, 2023, to be all electric buildings.
    b. Newly constructed buildings four stories or more (high-rise) with a building permit filed on or after January 1st, 2026, to be all electric buildings; and

2. Review the following exemptions to the reach code: (a) Cooking equipment exemption for commercial kitchens. (b) Process load exemption for manufacturing facilities. (c) Water heating exemption for regulated affordable housing due to state requirement; and provide direction on an appeal process for additional infeasibility scenarios to allow for the building official to waive the all-electric requirement when there is verifiable proof that the type of building, physical site conditions, commercial availability of electric appliances, electrical infrastructure requirements or public safety conditions would make the project infeasible; and

3. Provide direction on the exploration of an Electric Vehicle Infrastructure Reach Code to require new buildings to provide a certain percentage of parking spaces to be capable to support Electric Vehicle Supply Equipment (EVSE) and

4. Recommend that staff hire a consultant to assist in the drafting of a retrofitting strategy (existing buildings) that would pair electrification retrofits with other needed upgrades and prioritize high-carbon emitting building types; and

5. Direct staff to prepare and return with a comprehensive report on carbon reduction strategies already in place within the municipal organization that complement this effort.

BACKGROUND:

On November 17, 2020, the Riverside City Council adopted the Envision Riverside 2025 Strategic Plan that included an ambitious yet achievable goal of reaching citywide carbon-neutrality by 2040 – 5 years ahead of California's statewide goal established by former Governor Brown's administration.

The Intergovernmental Panel on Climate Change (IPCC) has made it abundantly clear that to avoid the worst impacts of climate change, we must act to dramatically reduce our carbon emissions and prevent global warming from exceeding 1.5 degrees Celsius. To achieve this, global carbon emissions by 2030 will need to be nearly halved, with full decarbonization by 2050.

The reasoning behind the City Council adopting this climate goal is already exemplified in the risks impacting our community's public health and safety, and our life-sustaining ecosystems. From rising temperatures that cause more extreme heat waves to drier landscapes that cause more intense droughts and more frequent and larger wildfires.

The City of Riverside has fully embraced sustainability into the identity and brand of the organization. With a silo-breaking Office of Sustainability advancing through the budgetary process, a solar self-generation program that ranks 9th in the Nation per capita recently approved by the City Council, a municipal fleet ranking #13 in the National Fleet Management Association's Green Fleet rankings and the Council adopting one of the only Good Neighbor Policy for warehouses in the region among other efforts – we are leading the way towards a clean and sustainable future.

While the transportation sector makes up a significant portion of carbon emissions throughout the country, the built environment accounts for nearly 25% of carbon emissions in California and gas appliances within buildings account for over 50 million tons of emissions annually.[1] In order to reach both local and state carbon reduction goals, building decarbonization must be addressed.

On April 22, 2021, to begin to bring this strategic goal to fruition, Councilmember Fierro brought forward an item to the City Council's Economic Development, Placemaking, Branding/Marketing Committee to discuss strategies related to building decarbonization. The Economic Development, Placemaking, Branding/Marketing Committee unanimously approved a motion to (1) direct staff to move forward with the discovery phase of a building decarbonization reach code that would include an all-electric mandate for new construction beginning in January 2023 and to explore incentives and potential requirements for EV charging spaces for multi-unit residential developments and non-residential developments; and (2) form a Decarbonization Advisory Group made up of representatives from the development community, organized labor, environmental justice and community groups to inform the development of the reach code. (The official roster is attached.)

Over the course of ten months spanning between July 2021 and May 2022, the Decarbonization Advisory Group (DAG) held eight meetings and heard from a wide array of experts, including representatives from the one of the main architects behind the City of LA's Green New Deal -- ARUP Consulting, the American Institute of Architects, the California Building Industry Association and Southern California Gas Company, among others. (See full list attached).

While the Decarbonization Advisory Group did not provide official recommendations, as it was

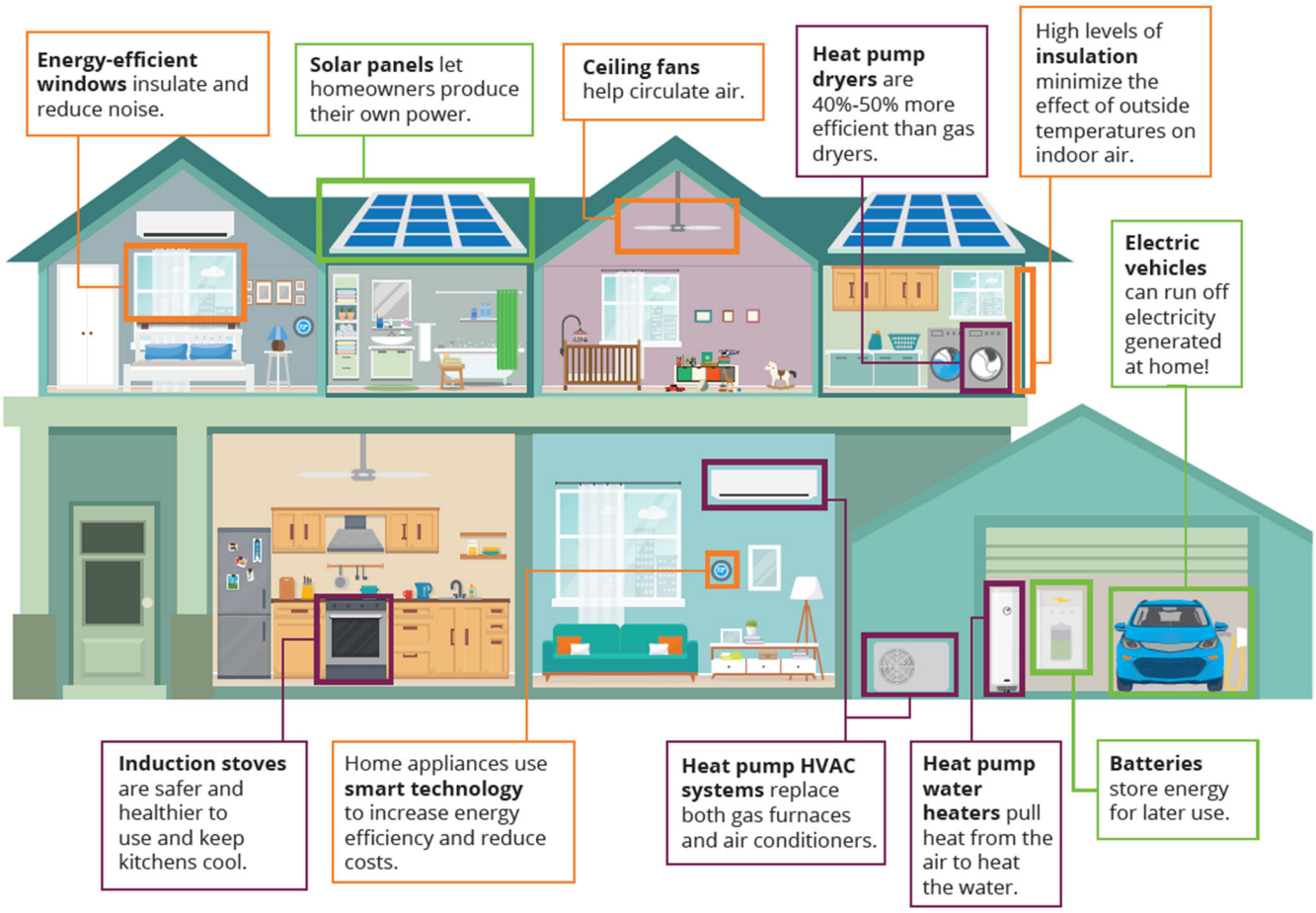
[1] Environmental and Energy Study Institute; "Buildings and Built Infrastructure"

not within their purview and as requested by several members, the group largely agreed that electrifying and decarbonizing new buildings starting with the 2023 building code cycle is an essential step towards achieving our carbon neutrality goals.

The main concerns articulated in the group discussions revolved around housing affordability, the cost of electricity, the impact of an increased load on the electric grid, the cost of infrastructure, and market-readiness of all-electric appliances. Some if not all of these concerns are addressed within this report and will be further addressed and researched as a part of our stakeholder engagement during the outreach period.

What is Building Electrification?

Building electrification, or "building decarbonization" refers to the process of phasing out gas infrastructure utilized for cooking and heating in buildings – which are powered by fossil fuels – and instead transitioning to the use of electricity – mainly powered by solar, wind and other sources of zero-carbon electricity.



Cost-Effective and Affordable for Housing: All-electric buildings have been proven to be cost-effective for new construction for nearly all building types since most electric appliances have similar or lower operating costs compared to natural gas appliances. All-electric homes can be cheaper to construct than traditional homes. California homeowners could save an additional $1,500 upfront, and hundreds of dollars annually with the installation of electric heat pumps instead of gas furnaces in new construction. However, the alternative of retrofitting can require significant and costly upfront investments.

New buildings and homes currently lacking natural gas service avoid the cost of gas mains,

service and meters not needed in all-electric homes. In addition, on April 07, 2022, the California Public Utilities Commission (CPUC) took steps to address climate change and promote building decarbonization by expanding incentives for electric appliances.

The CPUC adopted budgets, incentive levels, and other program requirements for the Self-Generation Incentive Program (SGIP) Heat Pump Water Heater (HPWH) program that was authorized in prior CPUC Decisions. Half of the incentive funds are reserved for low-income utility customers. The incentive amount for single-family residential customers is capped at $4,885 for low-income customers and $3,800 for other customers. Incentives are also authorized if an electric panel upgrade is needed to install the HPWH. An additional incentive of $1,500 is authorized for systems using "low global warming potential" refrigerants to reduce GHG emissions even further.

According to an Energy and Environmental Economics report commissioned by the California Energy Commission, building electrification is a lower-cost, lower-risk, and longer-term strategy in comparison to "renewable natural gas" (RNG; biomethane, hydrogen and synthetic natural gas, methane produced by combining hydrogen and carbon).

According to the California Air Resources Board, by electrifying heating, ventilation, and air conditioning (HVAC) and water heating systems in existing homes, bill savings can be up to $750 per year in single family homes and up to $300 per year in low-rise multifamily buildings.[2] Retrofitting existing residential buildings with electric end uses has the potential to reduce GHG emissions by about 30-60% compared to mixed-fuel homes.

Benefit of All-Electric vs Electric Ready: Starting in 2023, the California Energy Code as adopted by the California Energy Commission (CEC) will require all new single-family homes in California to be "electric-ready" and would include heat pumps and spaces pumps as performance standard baseline for single family, multi-family, and certain commercial buildings.

"Electric-ready" means that a home built with gas or propane can easily accommodate future electric appliances. This means that essentially a builder would be installing electric circuitry and panels to accommodate electric appliances while also building lines for gas or propane infrastructure. According to a cost comparison completed by the Pacific Northwest National Laboratory, under contract by the US Department of Energy (DOE), the cost of installing heat pumps for space conditioning and water heating during a retrofit is over four times the cost of if done as an original installation in new construction.[3]

Early implementation of building electrification will provide cost-savings to developers, builders and eventual tenants and homeowners in the long run. An earlier effective date will also avoid the construction of "stranded assets" (obsolete gas infrastructure) that will eventually require retrofitting once federal and state mandates go into effect.

While natural gas currently plays an integral role in California's energy grid (80% of all California homes are connected to the natural gas grid) – consumer behavior is shifting as customers wean off gas usage and federal and state climate mandates come into play, causing large reductions in gas demand across the State of California over the next 10 years. Over time, as costs become reliant on a decreased ratepayer base, unstainable increases in gas rates will become inevitable. Without policy intervention, a small share of ratepayers, mainly low-income residents, and

[2] Mahone, A., Li,C.,Subin,Z Sontag, M., Mantegna, G. (2019). Residential Building Electrification in California: Consumer economics, greenhouse gases, and grid impacts. Energy and Environmental Economics, Inc.
[3] Group-14 Engineering. 2020. Electrification of Commercial and Residential Buildings: An Evaluation of the System Options, Economics, and Strategies to Achieve Electrification of Buildings

renters, will be forced to bear the brunt of increased gas costs. The E3 report found that given this risk, early implementation of building electrification mandates can serve as a risk-reduction strategy to protect vulnerable communities from increased energy costs. Electrifying during new construction has been shown to be more cost effective than implementing electrification readiness as already required by the 2022 Building Standards Code Update.

Improves Indoor Public Health: In addition to the emission impacts of transitioning away from gas to electrification, research has shown significant public health benefits to the transition to electrification. According to a UCLA Fielding School of Public Health Report titled, "Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California," replacing all of California's gas appliances with electric appliances would prevent 900 cases of respiratory illnesses, lower health care costs by $3.5 billion and save 350 lives every year. These co-benefits make building electrification a highly compelling strategy for emissions reductions, especially compared with alternatives that rely on higher levels of combustion.

According to the study, cooking with gas appliances for over an hour can cause carbon monoxide and nitrogen dioxide levels to increase above the acute national and state-based ambient air quality thresholds in over 90% of scenarios modeled by the research team. It was also found that those concentrations are the highest for those that live in apartments due to the smaller space of the residency. A 2013 study in the International Journal of Epidemiology showed that living in a home with gas cooking increased children's chance of having asthma by 42%.

Ensures Just Transition to Clean Jobs: Riversiders should not have to choose between economic prosperity and protecting our environment. Inland working families are struggling on both fronts – from economic and job insecurity due to the pandemic to asthma and polluted neighborhoods because of worsening impacts of climate change. As this Committee considers phasing out fossil fuel infrastructure as a critical climate change action item, it is important for the Committee to ensure that there is a just transition and comprehensive mitigation efforts taken to ensure that local jobs are retained in clean energy and sustainability-focused job fields.

A UCLA Luskin Center for Innovation Report about building decarbonization workforce needs and recommendations found that electrifying 100% of California's existing and new buildings by 2045 would create over 100,000 full-time equivalent jobs, even after accounting for losses in the fossil fuel industry. To ensure this type of outcome, the report recommended that policymakers engage fully with affected unions to grow high-road jobs and minimize job losses; prioritize demand-side strategies; and target investments in supply-side strategies, such as workforce training.

DISCUSSION:

The City of Riverside is the twelfth largest City in California and the County Seat of the third most populous County in California. Riverside has long been a leader in the sustainability arena and can continue to leverage this branding for economic development efforts, like the effort to bring the State's carbon regulator, The California Air Resources Board (CARB), to move their Southern California Headquarters to Riverside.

Building Electrification is a key decarbonization strategy that is critical to achieving the City and the State's carbon reduction goals. To achieve the State of California's long-term carbon neutrality goals, CARB is focused on advancing towards zero emission buildings. Building electrification provides a low-cost, low-risk strategy to decarbonize buildings and achieve climate

goals.[4] So far, 55 cities in California have adopted reach code ordinances that would phase out gas infrastructure in new buildings. The California Energy Commission's 2023 update to the statewide building standards code will require new buildings to be "electric ready" and will encourage builders to adopt all-electric designs.

The City of Riverside can reach the carbon-neutrality by 2040 goal and avoid the construction of stranded assets by reaching beyond the statewide building code and require all-electric new buildings through the following decarbonization strategies as deliberated by the Decarbonization Advisory Group:

- **All-Electric New Buildings Reach Code Ordinance**

Local governments have the authority to establish standards that go beyond the minimum requirements in the California Green Building (CALGreen) code because of local climatic, geological, or topographical conditions. This proposed ordinance would go beyond or be a "reach code", defined as a local building energy code that "reaches" beyond State minimum requirements for energy use in building design and construction. The Ordinance would support the City's Strategic Plan by reducing greenhouse carbon emissions and air pollution from fossil fuel combustion within buildings by requiring new buildings in Riverside to be constructed as all-electric.

An all-electric building means a building that does not have natural gas piping or propane plumbing installed on a lot or within the building and uses electricity as the sole source of energy for its space heating, water heating, cooking appliances and drying appliances.

The effective dates for the New Building Electrification Ordinance would be as follows:

- New buildings which are 1-3 stories: January 1, 2023
- New buildings which are 4-stories or more: January 1, 2026

Projects that have a building permit application submitted, deemed complete with paid plan check fees and submitted plans prior to the effective dates above will be exempt from the all-electric requirement.

Additionally, the proposed ordinance will provide for the following exemptions from the all-electric requirement.

- Cooking equipment exemption for commercial kitchens.
- Process load exemption for manufacturing/industrial facilities.
- Water heating exemption for regulated affordable housing due to state requirement.

These three exemptions account for commonly known scenarios where all-electric appliances is infeasible or incompatible with the building's intended use. Because these three exemptions do not account for all scenarios where this may be the case, the proposed ordinance will provide for a waiver process that will allow for the building official to waive the all-electric requirement when there is verifiable proof that the type of building, physical site conditions, commercial availability of electric appliances, electrical infrastructure requirements or public safety conditions would make the project infeasible.

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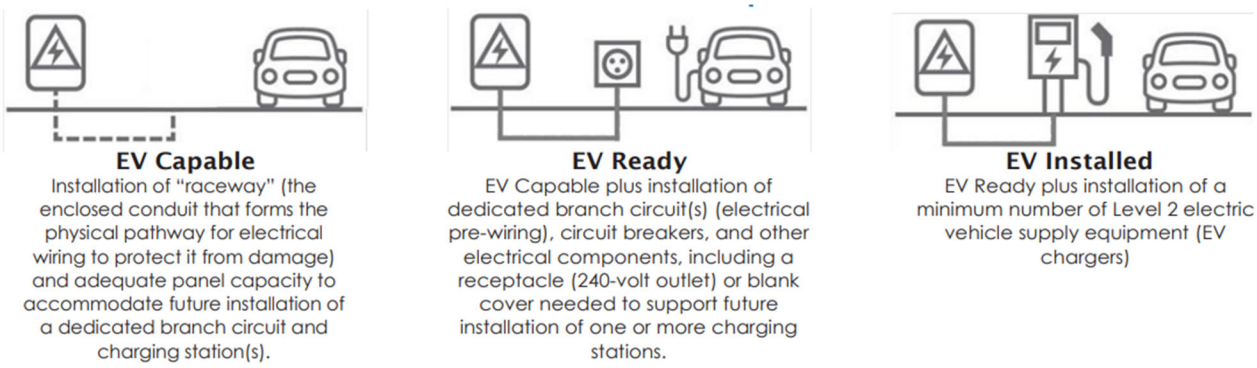
[4] Mahone, A., Subin, Z., Kahn-Lang, J., Allen, D., Li, V., De Moor, G., . . . Price, S. (2018). *Deep Decarbonization in a High Renewables Future: Updated Results from the California PATHWAYS Model.* California Energy Commission.

- **Electric Vehicle (EV) Infrastructure Reach Code Ordinance**

In response to feedback to look further than just building electrification, an Electric Vehicle Infrastructure requirement for new buildings was also considered by the Decarbonization Advisory Group. According to the California Energy Commission, California has a large gap in the number of level 2 chargers expected to be installed by 2025 to provide the adequate amount of infrastructure to support California's goal of reaching 5 million zero-emission vehicles by 2030 and 100% sales of electric vehicles by 2035.

The existing State Building Standards require that 10% of parking spaces at new buildings be "EV Capable" meaning that they are equipped with Electric Vehicle Supply Equipment (EVSE).

It is expected that the State Building Standards Commission's 2022 Code Update will require that 5% of new parking spaces be "EV-Ready" at new non-residential buildings with 26 parking spaces or more and be equipped with Level 2 Charging Stations (EVSE rated at 208/240 Volts with 40 Amp Supply Circuit.) and that 25% of new parking spaces in general be "EV Capable."



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This committee could direct staff to explore how the city could reach beyond the 2022 Building Standards and mandate/incentivize more EV Capable and EV Ready parking spaces to meet current demand and service ZEV owners in Riverside.

- **Retrofitting Strategy (Existing Buildings)**

A common thread in the Decarbonization Advisory Group's meetings revolved around the more difficult aspect of building electrification: existing buildings. According to the California Air Resources Board, more than 75% of California's existing homes and commercial buildings were built before the State developed by Building Energy Efficiency Standards in 1978.

Electrifying and retrofitting existing buildings to be more energy efficient and reliant on clean energy will require a more costly investment that is often incumbent on the homeowner or building owner. Because of this, historically marginalized communities, low-income communities are unable to afford to hire contractors to retrofit their home and reap the health and cost benefits of all-electric appliances.

We are recommending that the city hire and retain a consultant to assist in the drafting of a retrofitting strategy for existing buildings. The consultant would be asked to potentially map locations of high-carbon emitting buildings for prioritization. The retrofitting strategy would likely pair electrification retrofits with other needed upgrades such as energy efficiency and weatherization. It is critical that the strategy ensures equitable access and financial assistance for low-income households and small businesses.

Impact to the Electric Grid: The future electricity grid is being prepared to integrate and fully transition to renewable and zero-carbon electricity in the future. This new grid will transition to a mix of renewable and zero-carbon generation, battery energy storage, distributed resources, incorporation of energy efficiency, and more. These are evaluated as part of RPU Integrated Resource Plan - last completed in 2018 and being update for 2023. RPU, if approved by the RPU Board and City Council, is also planning to develop a Carbon Neutral Energy by 2040 study with the National Renewable Energy Lab (a lab under the U.S. Department of Energy) that will identify different ways in which RPU will be able to provide electricity that will support not only new building electrification but also existing building electrification and the electrification of the transportation systems.

The Riverside Transmission Reliability Project (RTRP) is expected to be completed in 2026. Currently and until the completion of the RTRP, RPU has sufficient capacity and resources available (including through market purchases) to support electricity demand, including the additional electricity demand from the electrification requirement in the Decarbonization ordinance. New buildings increase electricity load as it is and adding full electrification will be incremental to the already occurring additional new load.

The statewide energy shortages are a regional concern and RPU along with the State and all utilities in the state are working to address the potential shortfalls which are occurring during summer peaks. RPU cannot function alone in meeting this need, as it will impact all entities that participate in the California Independent System Operator or CAISO. Regardless of these activities, RPU will ensure that we have procured sufficient electricity to serve the City's electricity needs, existing or future, as it develops. Also, RPU's interconnection rules will not change. Under the existing RPU interconnection rules, as developers add new buildings, they will continue to be responsible for connecting to the electric distribution grid and making necessary distribution system upgrades that will support the new load.

Timeline and Next Steps:

Summer 2022: The City of Riverside will engage with the community through public workshops, project demonstrations and townhalls in line with the Citywide Community Engagement Framework to inform residents, business owners and the development community of the upcoming changes to the building code and our efforts to reach City carbon reduction goals. The city is also engaging with the Local Energy Codes team to complete a cost-analysis study for the California Energy Commission's Climate Zone 10 which will include data on cost-feasibility for all-electric requirements. The 2019 study proved cost-effectiveness for all-electric for low-rise construction within our climate region.

Fall 2022: The City Council will hold a public hearing on the Triennial Building Standards Code Update which will include the recommended reach codes.

January 1st, 2023: The Triennial Building Standards Code Update goes into effect with an all-electric requirement for new low-rise buildings.

FISCAL IMPACT:

There is no direct fiscal impact associated with the recommendations in this report. If new programs or policies are recommended and implemented, the fiscal impact, if any, will be defined during City Council review and approval of this item.

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Chair, Economic Development, Placemaking and Branding/Marketing Committee

Attachments:

1. Draft Ordinance
2. Decarbonization Advisory Group Roster
3. Decarbonization Advisory Group Invited Speakers
4. Presentation