

## IEMAC Chapter Outline: Federal and State Climate Policy Interactions

### DRAFT

California has long been a leader in domestic efforts to mitigate climate change. In 2006, AB 32 formally acknowledged this leadership role, committed the state to climate policy leadership going forward, and encouraged other jurisdictions to follow this lead. There are now several examples of how California's climate ambition and climate policy experimentation has shaped policy choices and outcomes in other jurisdictions. For example, California was the first state to mandate a phase-down hydrofluorocarbons (HFCs) in 2018. Nine states were quick to follow California's lead. Then, in 2020, a Federal HFC phase-down policy passed with bipartisan support.

With the recent passage of the Infrastructure Investment and Jobs Act (IIJA) and the Investment Reduction Act (IRA), the federal climate policy landscape has been transformed. The infrastructure bill provides \$65 billion in transmission infrastructure. The IRA directs an estimated \$369 billion towards clean energy investments using an array of incentives including clean energy tax credits; tax credits for carbon capture and storage; incentives for domestic clean tech manufacturing; credits and rebates targeted primarily at low-income households; loan guarantees; and grants to states, communities, rural utilities, and nonprofit organizations.

Now that the scoping plan has been approved, California is entering into a regulatory process that will identify the policy and programmatic changes we need to meet our climate goals. Most of California's existing policies and programs pre-date the IRA and IIJA, and they will interact with federal incentives in potentially significant ways. Proceeding as if nothing has changed will undermine the effectiveness of climate programs and increase costs for Californians.

This chapter considers the implications of the IIJA and the IRA for California's climate policy design and leadership going forward. We underscore the importance of accounting for these policy interactions as California charts its next policy steps. As it navigates the regulatory process, CARB should assess and anticipate how its existing and planned policies will interact with new federal incentives. Going forward, California's climate strategy should be to amplify and leverage -- versus duplicate and dilute-- the role of federal incentives in our decarbonization efforts.

#### 1. **Interactions with California's GHG market**

With passage of the IRA and the IIJA, the federal climate policy landscape now features many carrots (e.g., tax credits, rebates) and few sticks (e.g., the methane fee). California has similarly relied heavily on subsidies and rebates. But the California strategy has involved pairing these incentives with binding standards such as the renewable portfolio standard (RPS) and a carbon price.

Previous IEMAC reports have provided analysis of and commentary on the first-order interactions between California programs that are targeted at specific investments (e.g. funding for energy efficiency investments and binding standards such as the RPS, LCFS, ZEV standards) and the GHG cap and trade

program. This report now considers the likely implications of over \$400 billion in federal spending for California’s carbon market. We focus on two considerations in particular: policy complementarities and offsetting effects.

*Policy complementarities:* An important limitation of relying exclusively on tax credits and subsidies to meet our GHG reduction targets is that polluters can keep polluting for free. Energy sector modeling has shown that even a modest carbon price can act as a powerful complement to tax credits and subsidy programs because it directly penalizes GHG emissions (see, for example, Stock and Stuart 2021). Combining subsidies with a carbon price addresses the carbon “blind spots” in a subsidy-based regime.

The incentives embedded in the IRA are designed to increase investments in clean energy resources and accelerate electrification of buildings and transportation. IRA incentives are *not* designed to target or penalize GHG emissions directly. In the absence of carbon pricing, GHG emitters can keep polluting without penalty, no matter how carbon intensive they might be. Just as California’s carbon price has compensated for blind spots in California’s technology-targeted policies, the carbon price can also improve/amplify the effectiveness of federal incentives in achieving emissions reductions in the western power grid that serves California. In short, the carbon market is an essential complement to the subsidies embedded in federal programs.

*Mitigating “waterbed” effects:* A second concern pertains to the impact that IRA incentives will likely have on California’s carbon market. IRA incentives accelerate investments in clean technologies. This will reduce demand for GHG abatement in the carbon market; and allowance prices will fall. A lower carbon price reduces the economy-wide incentives for GHG abatement at all sources covered by the cap. This can result in the so-called “waterbed effect” if emissions reductions at some sources and the resulting lower carbon price cause GHG emissions among other capped sources to increase (Perino et al. 2022). If the allowance price remains above the price floor, this shift in allowance use will displace emissions reductions that were induced by federal IRA incentives. If the allowance price falls to the auction reserve price (i.e., the price floor), then any allowances that are not sold will be moved into the cost containment reserve — leading to a delayed waterbed that would manifest when these allowances ultimately re-enter the market.

The potential for these interactions between IRA subsidies and the California carbon market further elevates the importance of allowance market reform (see chapter ###). IRA incentives will almost certainly reduce demand for GHG allowances. A weak carbon price signal will leave cost-effective abatement potential untapped, increasing the overall costs of meeting our GHG reduction goals.

## **2. Interactions with regulatory standards such as the RPS, storage mandate, and other programs**

In the electricity sector, which receives most of the support provided by recent federal legislation, California has a renewable portfolio standard (RPS) that sets continuously escalating renewable energy procurement requirements for the state’s load-serving entities. The state has also implemented

mandates for utility-scale investments in clean technologies that will be needed to integrate high levels of renewable energy penetration (e.g., energy storage). The costs of complying with these mandates are typically recovered from California rate payers in the form of higher electricity prices.

Billions of dollars of federal incentives for clean energy investments provide an important opportunity to finance some of the costs of meeting California’s clean energy goals with Federal tax dollars. Importantly, the IRA promises to be progressive distributionally (RFF, 2022). IRA incentives are funded by increasing the corporate income tax that falls most heavily on owners of capital (75%) who are most concentrated in the higher income quintile, with the remaining falling on labor (25%). Thus, if California entities use IRA tax credits to offset some of the costs of complying with California technology mandates, this will shift some of the cost recovery burden off of California utility customers at a time when affordability concerns loom large. In addition to addressing concerns about affordability, lower retail electricity prices will help accelerate the electrification of buildings and transportation.

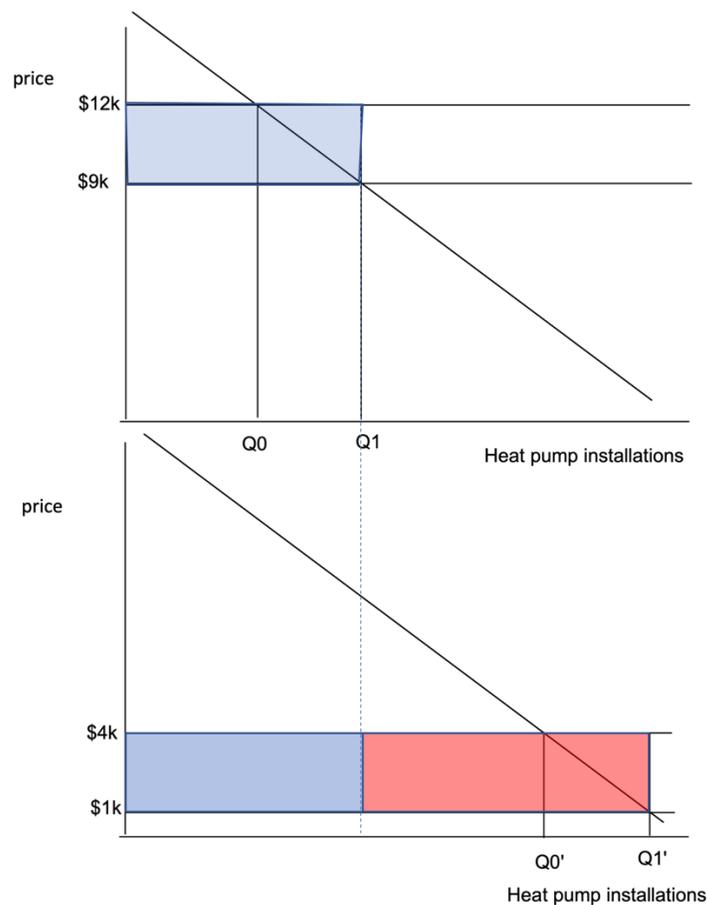
Notably, the IRA financial incentives are designed to be effectively unbounded for two decades. Thus, when a California clean energy project takes advantage of IRA subsidies, this reduces the investment costs incurred in California, but it does not “crowd out” or displace GHG abatement investments elsewhere.

In sum, clean tech investment projects in California should take full advantage of the federal subsidies on offer. Proactive interventions and regulatory reforms will likely be required to unlock the full potential of this process. The state should identify and designate initiatives within the various agencies and local governments to ensure that project developers, utilities, and other stakeholders are taking maximal advantage of the federal programs.

### **3. Interactions with consumer subsidies**

In addition to policies that mandate increased *utility-scale* investments in clean technologies, California has several incentive programs that target residential and commercial investments in clean technologies such as electric vehicles and heat pumps. There is an important design-difference between these two kinds of policies. Under technology mandates, policymakers set the target level of investment (e.g., 50% renewable electricity generation) and leave it to the market to determine the cost of hitting this target. Under subsidy/rebate programs, California policy makers set the consumer subsidy level and the market determines the quantity of investment (e.g. number of heat pumps installed).

This design difference is critical when thinking about interactions between state and federal incentives. As we note above, the IRA will lower the cost to Californians of a given renewable energy mandate. In contrast, IRA incentives can dilute the cost effectiveness of California’s consumer-targeted subsidies. Figure 1 illustrates a stylized example of how this works. The horizontal axis in the figure illustrates the quantity of heat pump installations and the vertical axis illustrates their price. The downward sloping line represents aggregate consumer demand for heat pumps.



**Figure 1: “Stacking” Consumer Subsidies for Heat Pump Installations**

California currently offers single-family households a subsidy of \$3,000 per unit for heat pump installation (up to \$6,000 in “enhanced” regions). The top panel of the Figure 1 illustrates the effects of a \$3k California subsidy prior to the introduction of the IRA. The blue area represents the subsidy costs. The benefits are the increased level of adoption from Q0 to Q1.

With the introduction of the IRA, households are now eligible for federal heat pump subsidies up to \$8,000 (subsidies vary with household income). The lower panel illustrates the effects of stacking the California incentive on top of this federal subsidy. The federal subsidy alone can be expected to expand the installation of heat pump to Q0'. Augmenting the federal subsidy with the current California incentives will still induce additional investment (so long as the demand curve slopes down). But this comes at significant cost of paying \*all\* the inframarginal consumers the \$3,000 subsidy (\$6,000 in enhanced regions). For many households, this is more than they actually need to make the investment. With linear demand, the red rectangle indicates the additional subsidy expenditures required to achieve the same increase in heat pump adoption.

The true costs and benefits of this kind of “subsidy stacking” will depend on how appliance demand increases with investment cost reductions. Now that IRA subsidies for all sorts of investments (EVs, heat pumps, electric stoves, home insulation) are in play, California should re-evaluate—and possibly re-calibrate—its consumer subsidy programs in order to complement and leverage federal subsidies. In particular, California should identify and enable agencies that are well-positioned to encourage targeting and take-up of federal subsidies.

*Federal subsidy targeting:* The benefits generated by new investments in heat pumps or EVs or battery storage can vary significantly across locations. Federal subsidies are not calibrated to reflect these heterogeneous benefits. State agencies are in a better position to target subsidies more surgically. For example, California is embarking on a process of “strategic decommissioning” which involves identifying portions of the natural gas distribution system that will likely need upgrading or repair, and trying to convert all customers served by that portion of the system to fully electric buildings at once so the gas line can be capped off. California subsidies for home electrification investments could be stacked atop federal dollars to support this decommissioning process.

*Federal subsidy take-up:* Offering households financial incentives to adopt new technologies is just the first step towards accelerated technology adoption. The literature on the energy efficiency gap has documented a range of non-monetary barriers that can slow the pace of adoption (e.g., information frictions, principal-agent problems, hassle costs). Some California agencies are well positioned to implement programs that are designed to identify and reduce *non*-monetary barriers. For example, the state’s Employment Development Department is projecting that we will need to see a 15% increase in HVAC mechanics and installers to keep up with the pace of building electrification. The IRA provides \$200 million for state developed workforce development programs. California agencies could be well-positioned to leverage these funds into expanded workforce training and development.

## **Summary and Recommendations**

A transformed federal climate policy landscape presents a valuable opportunity for California to accelerate progress on its climate goals. Proceeding as if nothing has changed will undermine the effectiveness of climate programs increase energy costs for Californians. It is imperative that California agencies act on this opportunity to leverage major federal investments in the clean energy transition. What form these actions will take depends on the nature of the policy interactions. We conclude with three specific recommendations pertain to three forms of policy interactions.

1. **The GHG allowance market:** Positioning the carbon market incentivize cost-effective GHG abatement opportunities that are not directly targeted by subsidies and mandates contributes importantly to the cost effectiveness of California’s overall policy portfolio. Chapter X discusses the reforms that will be needed for the carbon market to fulfill this role. These reforms become all the more urgent as federal incentives reduce demand for GHG allowances in California.

2. **Technology mandates:** Because the IRA is progressive distributionally, and effectively unbounded in amount over two decades, state policy makers should focus on encouraging project developers to take advantage of IRA tax credits and rebates. This will shift some of the cost recovery burden off of California utility customers at a time when affordability concerns loom large. Lower electricity prices should also accelerate the pace of electrification in the residential and commercial sectors.
3. **Consumer incentive programs:** California subsidies stacked atop federal can be less cost-effective. State-level subsidies should be designed to complement IRA programs. This could involve targeting state subsidies at investments that deliver the greatest value and/or developing strategies to reduce non-monetary barriers to adoption.

## References

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