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Investing in a Balanced Climate Policy Portfolio



by **David Weiskopf** ()



This blog is part 3 of a series on California's climate policies to meet its 2030 pollution reduction target and beyond. Read [part 1 here](https://nextgenpolicy.org/blog/getting-californias-climate-rules-right/) (<https://nextgenpolicy.org/blog/getting-californias-climate-rules-right/>) and [part 2 here](https://nextgenpolicy.org/blog/california-cap-trade-price-ceiling-design/) (<https://nextgenpolicy.org/blog/california-cap-trade-price-ceiling-design/>). This blog was co-written with Dan Lashof and Colin Murphy.

The previous posts in this series have addressed getting the cap and trade rules right to make that tool work as effectively as possible, and what the California Air Resources Board (CARB) should do if carbon allowance prices hit the ceiling it's required to set. In this post we address other tools California should use to ensure that we stay on track to meet our carbon pollution reduction targets, while staying well clear of hitting the price ceiling in the cap and trade market.

The most important role of cap and trade is as the glue that holds together our much larger system of policies and programs that produce direct reductions in carbon pollution. CARB's scoping plan (which lays out their prediction for how we will achieve our pollution reduction targets) estimates the reductions from sector-specific policies, like the Renewable Portfolio Standard or targeted reductions in climate "super-pollutants." The plan then assigns whatever reduction is still required to meet SB 32 targets to cap and trade.

The market price for cap and trade allowances provides an automatic response and window into the effectiveness of CARB's other policies. When these other policies succeed, cap and trade market prices stay low, but if these other programs under-perform or are failing to reach major sources of pollution, cap and trade prices automatically rise. So if CARB has a desire to keep carbon prices low, then it should be motivated to effectively implement direct regulations.

To date most of California's emission reductions have come from power plants. Many policies have played a role, particularly California's strong energy efficiency (<https://www.nrdc.org/experts/mohit-chhabra/california-establishes-path-energy-efficient-future>), standards and programs and its Renewable Portfolio Standard. In 2016 [half of the electricity used in California](http://www.energy.ca.gov/almanac/electricity_data/total_system_power.html) (http://www.energy.ca.gov/almanac/electricity_data/total_system_power.html) was generated by sources that don't emit carbon pollution and that share will continue to increase. The current Renewable Portfolio standard requires 50 percent of the states electricity to come from renewables by 2030. The legislature is currently considering SB 100, which would up that requirement to 60 percent by 2030 and target a 100 percent carbon-free electricity system by 2045.

Passing SB 100 would lay a strong foundation for meeting California's emission reduction targets, but with the power sector contributing a smaller and smaller share of total emissions, California must look beyond the power sector to achieve its reduction targets in 2030 and beyond. This post identifies two additional sectors where CARB can and should take bold steps to advance direct pollution reductions, and therefore take some pressure off of the cap and trade market: transportation and buildings.

Driving the Carbon Out of Transportation

Cutting pollution from transportation will be the defining challenge for the next couple of decades. Transportation is the largest source of global warming pollution in California: it accounts for over 40 percent of carbon pollution from the state. Unlike power plant pollution, which comes from a few dozen large sources, transportation-related pollution comes from oil refineries, thousands of oil wells, and more than 30 million vehicles.

Historically, California has been a global leader in reducing emissions from cars. We were the first place in the world to seriously regulate toxic air pollutants from car tailpipes, in the 1960s, and the first to regulate greenhouse gas emissions from cars, in the 2000s. But despite our leadership in clean transportation, vehicle pollution continues to rise.

One immediately available way to reduce transportation pollution is to set a more ambitious target for California's Low Carbon Fuel Standard (LCFS), which is currently up for re-adoption to extend it through 2030. The LCFS sets a carbon intensity target for transportation fuels that slowly declines over time. CARB can and should do more to leverage this powerful pollution-cutting tool.

The LCFS has reduced emissions by over [30 million metric tons of carbon dioxide equivalent since its inception in 2011](https://www.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm) (<https://www.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm>) by incentivizing transportation fuel producers to bring to market cleaner alternatives to petroleum like biodiesel, renewable diesel, ethanol, renewable natural gas and electricity. CARB's draft plan to extend the program calls for the carbon intensity reduction target to rise from 10% in 2020 to 18% by 2030. This is an extremely conservative target and [recent research](https://www.theicct.org/publications/potential-low-carbon-fuel-supply-pacific-coast-region-north-america) (<https://www.theicct.org/publications/potential-low-carbon-fuel-supply-pacific-coast-region-north-america>) indicates that there will be enough low-carbon fuel available to aim for a [higher goal](https://www.ucsusa.org/clean-vehicles/california-and-western-states/west-coast-oil) (<https://www.ucsusa.org/clean-vehicles/california-and-western-states/west-coast-oil>), which will reduce emissions by millions of tons.

We can also get smarter and more equitable in the way we think about transportation in the first place. California's Sustainable Communities and Climate Protection Act (aka, SB 375, passed in 2008) requires city transportation planners to improve access to transit, change zoning to bring people closer to jobs and services, and encourage more walking and biking.

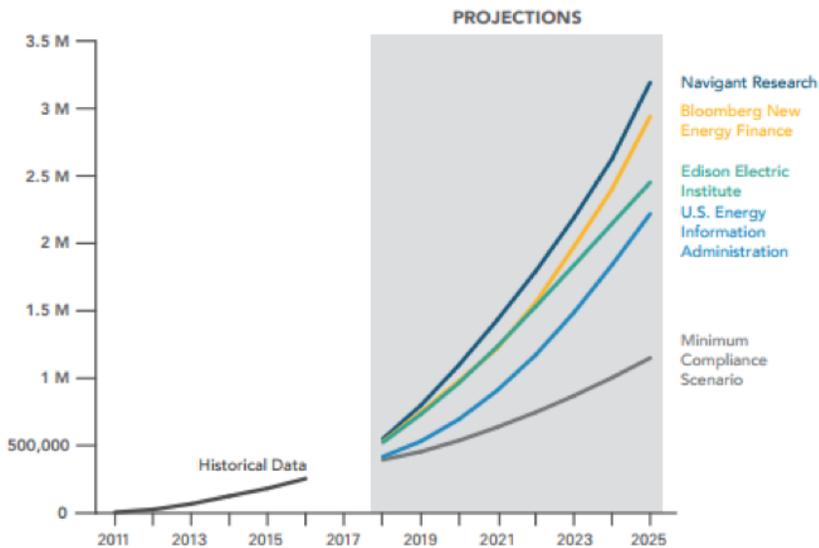
SB 375 sets a good goal, but more is needed to achieve it. California should invest more in programs like [Transformative Climate Communities](http://sgc.ca.gov/Grant-Programs/Transformative-Climate-Communities-Program.html) (<http://sgc.ca.gov/Grant-Programs/Transformative-Climate-Communities-Program.html>), which creates a pool of funding from cap and trade that neighborhoods can use to help make walking, biking, carsharing, and transit the best transportation option for people in their communities. Neighborhoods can begin to guide their own process of transforming their mobility by adopting innovative solutions, while serving as living laboratories for novel ideas.

California can do more to clean up the fuels our vehicles run on and to help us find better ways to meet our transportation needs in our communities, but we can and must also make our vehicles run more cleanly and efficiently. California's special status under the federal Clean Air Act [allows](https://www.epa.gov/state-and-local-transportation/vehicle-emissions-california-waivers-and-authorizations) (<https://www.epa.gov/state-and-local-transportation/vehicle-emissions-california-waivers-and-authorizations>) us to set more stringent pollution standards than the federal baseline. That means California now plays a more critical role than ever in protecting Americans from the fossil-backed predations of the Trump administration, which is [attempting to make cars more polluting](https://nextgenamerica.org/act/clean-car-standards/) (<https://nextgenamerica.org/act/clean-car-standards/>).

California does not intend to strengthen its standards for vehicles sold through 2025 and will fight any attempt by the Trump administration to roll them back. California should also lay the groundwork for what comes after Trump by beginning the process to set targets for when the current federal standards expire in 2026. More ambitious targets would encourage exploration of novel ways to further increase engine efficiency as well as shift more miles from dirty petroleum fuel to electricity, which is only going to get cleaner as California moves farther along its pathway towards a carbon-free grid.

In addition to fighting for strong federal standards, California can also begin charting its own course to the future by increasing our commitment to developing a modern, zero-emission vehicle economy. California's current policy calls for 1.2 to 1.5 million zero-emission vehicles and plug-in hybrids to be on the road by 2025 (https://www.arb.ca.gov/msprog/acc/mtr/appendix_a.pdf). Since that rule was written, though, battery costs have dropped much faster than anticipated (https://s3.amazonaws.com/files.technologyreview.com/p/pub/legacy/jan11_feature_electric_cars_p61.pdf) and it looks like we could outperform that pace. It's time to increase that target to match the pace of change that will be needed to protect our climate. The legislature is currently considering the Clean Cars 2040 bill (AB 1745), which would ensure that by 2040 every new car registered in California is a zero-emission vehicle. CARB should take steps now to make sure we are on that trajectory.

CUMULATIVE CALIFORNIA ZEV SALES PROJECTIONS



Finally, we must do more to clean up heavy-duty trucks and other freight vehicles, which account for about 30 percent of transportation emissions. The last few years have begun to hint at what a cleaner future for freight could look like. Several very-low or zero-emission designs for freight trucks have been demonstrated by established manufacturers like Volvo (<https://www.trucks.com/2017/03/02/volvo-truck-hybrid-alternative-powertrain-technology/>), Cummins (<https://www.forbes.com/sites/joannmuller/2017/08/29/take-that-tesla-diesel-engine-giant-cummins-unveils-heavy-duty-truck-powered-by-electricity>) and Daimler (<https://www.reuters.com/article/us-autos-electric-truck/daimler-delivers-first-electric-trucks-the-game-has-started-idUSKCN1BP1OH>), as well as newcomers to the heavy-duty landscape like Tesla (<http://www.latimes.com/business/la-fi-hy-tesla-truck-preview-20171114-story.html>), Nikola (<https://nikolamotor.com/motor>) and Toyota (<https://www.trucks.com/2017/10/12/toyota-hydrogen-fuel-cell-electric-truck-hits-road/>). California's heavy-duty truck regulations have, historically, been focused on reducing harmful air pollution by requiring cleaner engines. Now, rather than trying to make diesel slightly less dirty, California can improve air quality and reduce harmful climate pollution at the same time by ensuring that as old diesels retire, they're replaced with zero-emission or plug-in hybrid options. California has incentive programs to help bring clean trucks into service; going forward, these should be subject to a clear rule: state incentives should be provided only for the cleanest available technology for a given heavy-duty vehicle's actual use. If the job can be done by a ZEV truck, then that's what state money will support. If it can't, then the cleanest possible alternative, like a plug-in hybrid fueled by renewable natural gas, is next in line.

There is no single solution which can bring transportation emissions down to a sustainable level. Taken together, a portfolio of solutions can succeed. California should begin building this portfolio now, to give markets and consumers time to adapt. Our history of innovation and effective regulation gives us a lot of reason to believe that we will succeed.

Squeezing the Fossil Gas out of Buildings

In addition to cleaning up our electricity and our transportation sector, we must also address how we heat our buildings and how we get hot water. Homes and commercial buildings (restaurants, hospitals, stores, offices, etc.) were responsible for 11 percent of California's heat-trapping pollution in 2015 (<https://www.arb.ca.gov/cc/inventory/data/data.htm>), as much as emissions from in-state electricity generation.

Building pollution results mostly from burning natural gas in furnaces and water heaters, and has held relatively steady since 2000. This "steady" level actually represents a significant improvement in efficiency, as both the number of housing units and the amount of commercial floor space has grown during this period, but it does not put us on course to meet our emission reduction goals. More aggressive efficiency

improvements required under current laws can help, but it will also be essential to swiftly implement and build on current standards, and to clean up the fuels used in buildings, just like we are doing in vehicles.

Besides improving our buildings' ability to keep warm with less fuels through strong efficiency standards, there are two primary options for replacing fossil natural gas in buildings: electricity and renewable gas.

Most studies (https://www.sce.com/wps/portal/home/about-us/reliability/meeting-demand/pathwayto2030!/ut/p/b1/hdBBb4JAEAXgX8OVfbqLoN4WbdchRkOointpsMEVg6xBIL8vGi8mVef2Jt87zDDNUqar71KYEa8lss5qEgDGO_A6sO4MliVosymb6RXqDkmBKQ-hEeKOz7XIXE_cR7DUYR3gAh7uBD4Wscza4g5iAeY5plyYHBHby4ImLalHZ9-8hKVmseGKbrfJPXee2e6m69bZrD8dOBg7ZtXWotKXP3z-4d_FfZ2mPDokfJDvsUBe288jyRF3tvc24!/dl4/d5/L2dBISEvZoFBIS9nQSEh/), indicate that electrification is the preferred option. Replacing gas-fired furnaces and water heaters with heat-pumps powered by electricity from carbon-free sources is a cost-effective pathway to zero emissions. Water heaters are a great place to start. Not only will electric water heaters get cleaner every year as more and more solar and wind power are added to California's grid, but their hot water tanks can serve as a form of [energy storage](https://nextgenpolicy.org/blog/energy-storage-device-american-homes-already/) (<https://nextgenpolicy.org/blog/energy-storage-device-american-homes-already/>), lowering electricity system costs by helping match demand with supply. The case for [all electric new construction](https://www.pe.com/2015/09/03/fontana-energy-efficient-community-called-a-first-for-state/) (<https://www.pe.com/2015/09/03/fontana-energy-efficient-community-called-a-first-for-state/>) is even more compelling due to the cost savings from eliminating the need to extend gas service. CARB and California's energy regulators have taken some initial steps to recognize the benefits of building electrification and [have the opportunity](https://www.nrdc.org/experts/pierre-delforge/buildings-next-frontier-ca-clean-energy-leadership/) (<https://www.nrdc.org/experts/pierre-delforge/buildings-next-frontier-ca-clean-energy-leadership/>) to do more in 2018.

To the extent that buildings continue to use gas it is also possible to reduce emissions by replacing some fossil natural gas with renewable natural gas (RNG). For example, biogas captured from landfills, dairy digesters, and waste treatment plants can be purified to produce pipeline quality gas and injected into the existing gas distribution system. This strategy should not be considered a substitute for building electrification because using RNG does not eliminate methane leaks and RNG supplies are limited, but adopting standards equivalent to the Renewable Portfolio Standard for electricity or the Low Carbon Fuels Standard for transportation could be a useful complementary policy.

Keeping Our Eye on the Ball

California's comprehensive, innovative approach to addressing climate change is more important than ever given the Trump administration's all out effort to roll back environmental protections and promote fossil fuels. Even with three (lengthy) posts in this series we have just scratched the surface, leaving discussion of the [short-lived climate pollutant strategy](https://www.arb.ca.gov/cc/shortlived/shortlived.htm) (<https://www.arb.ca.gov/cc/shortlived/shortlived.htm>), hydrogen (<https://its.ucdavis.edu/blog-post/the-hydrogen-transition-this-time-for-real/>), biofuel blends and many other topics to another day. And we have not even touched on how to do more to cut pollution on the supply side of the fossil fuels equation and plan for the day when we no longer rely on drilling for dirty fuels to meet our energy needs. Stay tuned.

It's easy to get lost in the details, but the bottom line will show up in the atmosphere and in California's annual emissions inventory. NextGen's suggestions are designed to help CARB and other California policy makers maximize the likelihood of success by adopting a strong set of policies this year. They, and we, will undoubtedly not get everything right on the first try, but if we keep our eyes on the ball and make timely and appropriate adjustments as new information becomes available, California will lead the way to a brighter, healthier future for our state, our country, and the world.

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