ENERGY INNOVATION
POLICY & TECHNOLOGY LLC

www.energyinnovation.org
98 Battery Street, Suite 202
San Francisco, CA 94111

Evaluating Policies for California to Reach 55 Percent Reductions by 2030 using the Energy Policy Simulator

PRELIMINARY RESULTS

Policymakers in Sacramento are considering updating California's 2030 decarbonization target, currently set at 40 percent below 1990 emissions by Senate Bill 32 (2016).[1] A recent package of gubernatorial legislative proposals and Assembly Bill 2133 have each considered reductions of 55 percent below 1990 emissions by 2030.

The California Energy Policy Simulator (EPS) identifies a 55 Percent Reduction Scenario that yields economic gains worth billions annually and even larger social benefits. Another valuable payoff, the acceleration of international climate action—is difficult to quantify but should not be discounted. It will be challenging to mobilize resources and infrastructure quickly enough to reduce emissions 55 percent below 2030 levels, but no new technologies are required.

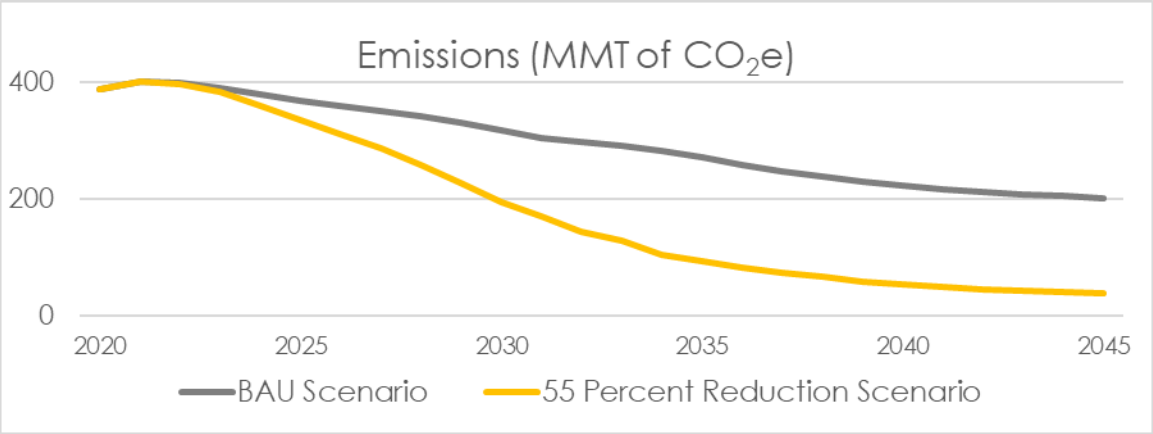
Remarkable technological innovation has opened new possibilities for clean energy, and humanity still has a chance to achieve a 1.5°C future. Success will hinge on innovations hatched in California labs and fabricated on California shop floors. If California chooses to adopt a 55 percent below 1990 by 2030 target, it will signal a new level of commitment, spurring others to strengthen their decarbonization programs.

RESULTS

Emissions

A 55 percent reduction implies statewide emissions must fall to 194 million metric tons (MMT) of CO_2e or less since 1990 emissions are estimated as 431 MMT of CO_2e. The California EPS's 55 Percent Reduction Scenario lowers 2030 emissions to 194 MMT (Figure 1).

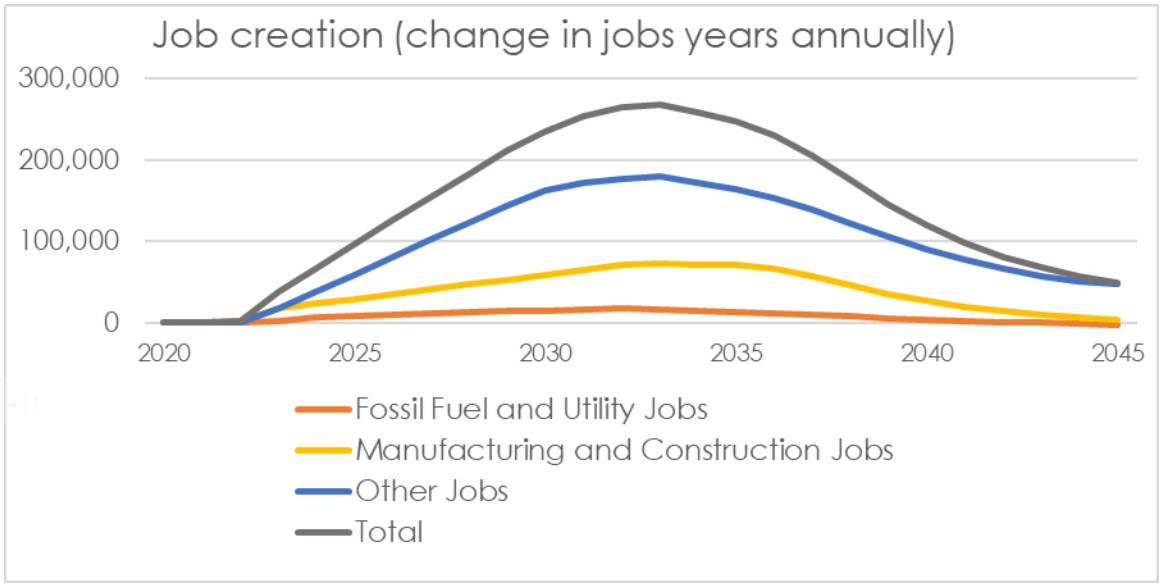
Figure 1. Emission in Business-as-Usual and 55 Percent Reduction Scenarios



Economics

California EPS modeling finds the 55 Percent Reduction Scenario creates hundreds of thousands of jobs overall, including tens of thousands of jobs in the manufacturing and construction sectors (Figure 2).

Figure 2. Change in Employment in the 55 Percent Reduction Scenario



California EPS modeling finds the 55 Percent Reduction Scenario increases state Gross Domestic Product by $55.4 billion (2021 $s) in 2030 (Figure 3).

Figure 3. GDP Effects in the 55 Percent Reduction Scenario

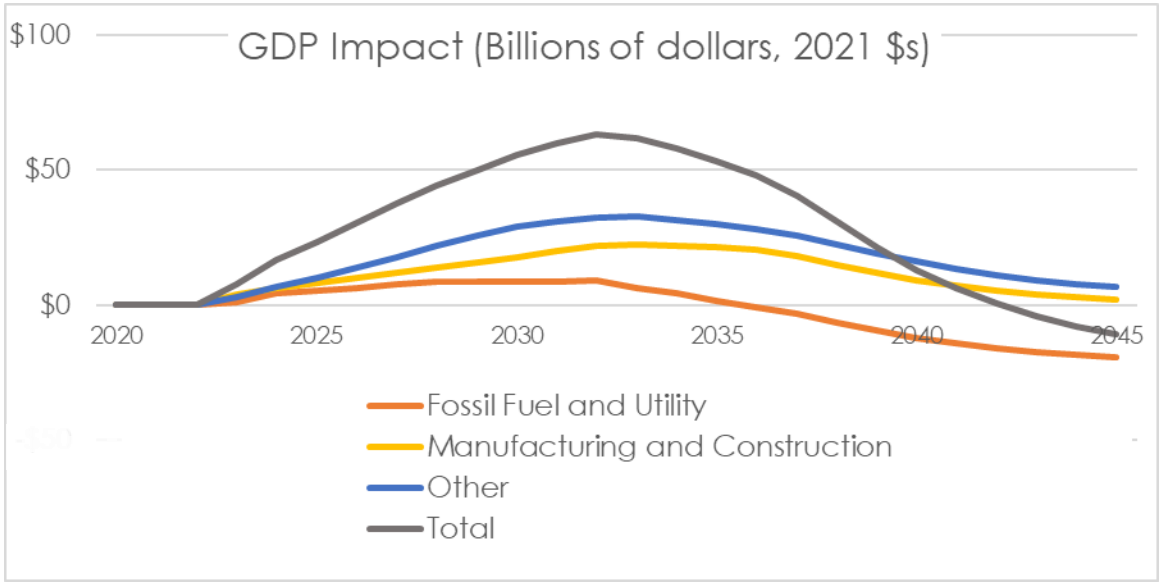


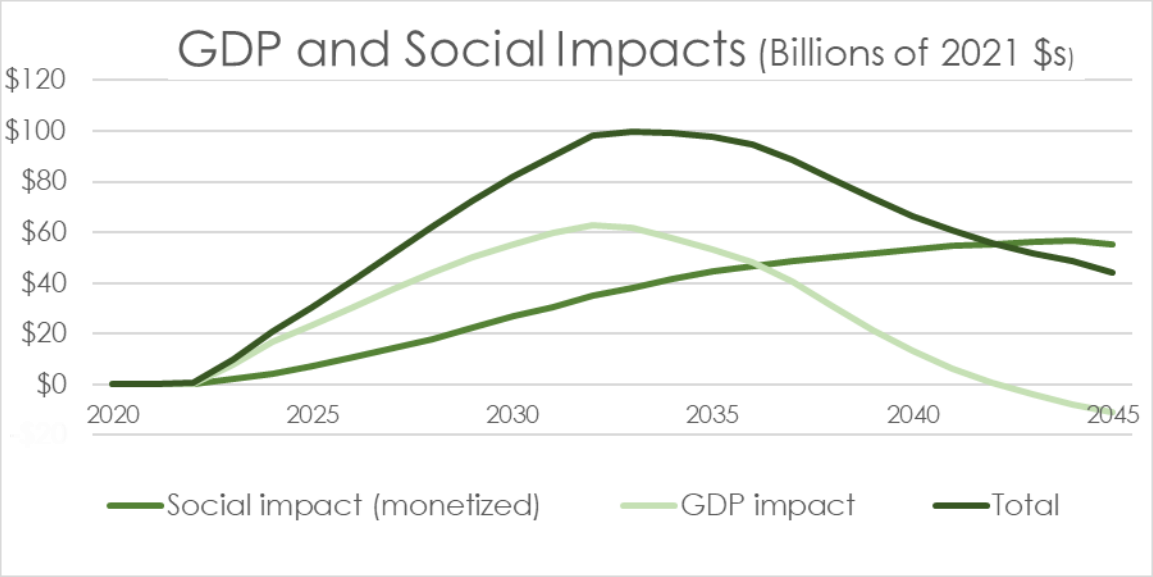
Table 1. Summary Economic Effects

	Effects of 55% Reduction Scenario in 2030
Change in total jobs	+235,000
Change in manufacturing and construction jobs	+59,000
Change in California Gross Domestic Product	+55.4 Billion (2021 $s)

Social Impacts

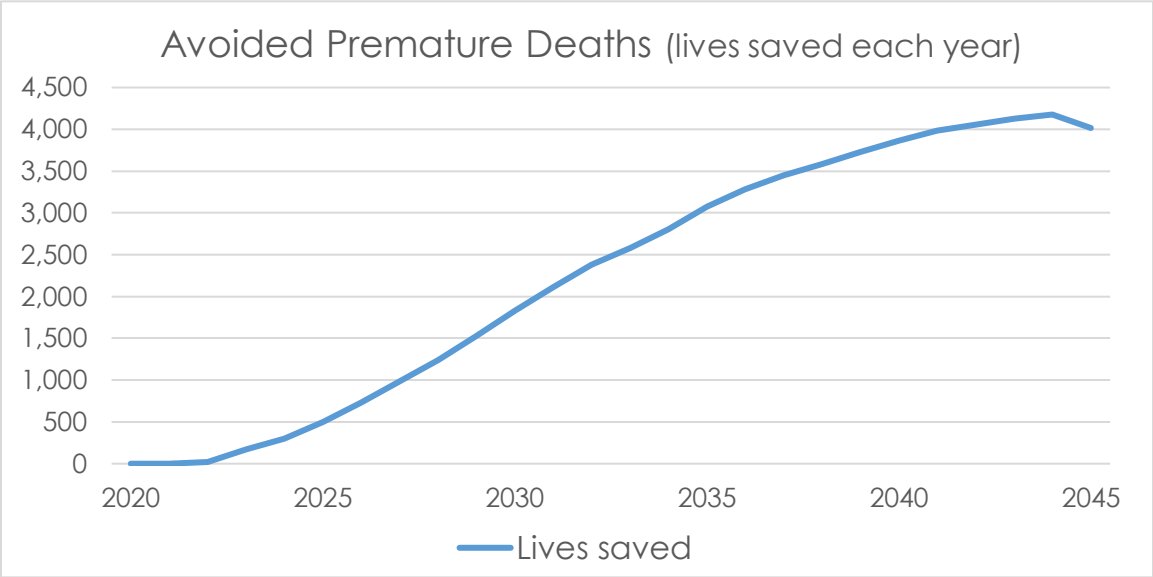
The California EPS estimates social benefits by applying widely recognized economic valuations to climate and public health benefits. Modeling results estimated the value of social benefits in 2030 at $26.9 billion, graphed together with total GDP impacts in Figure 4.

Figure 4. Graphing Monetized Social and GDP Impacts Together



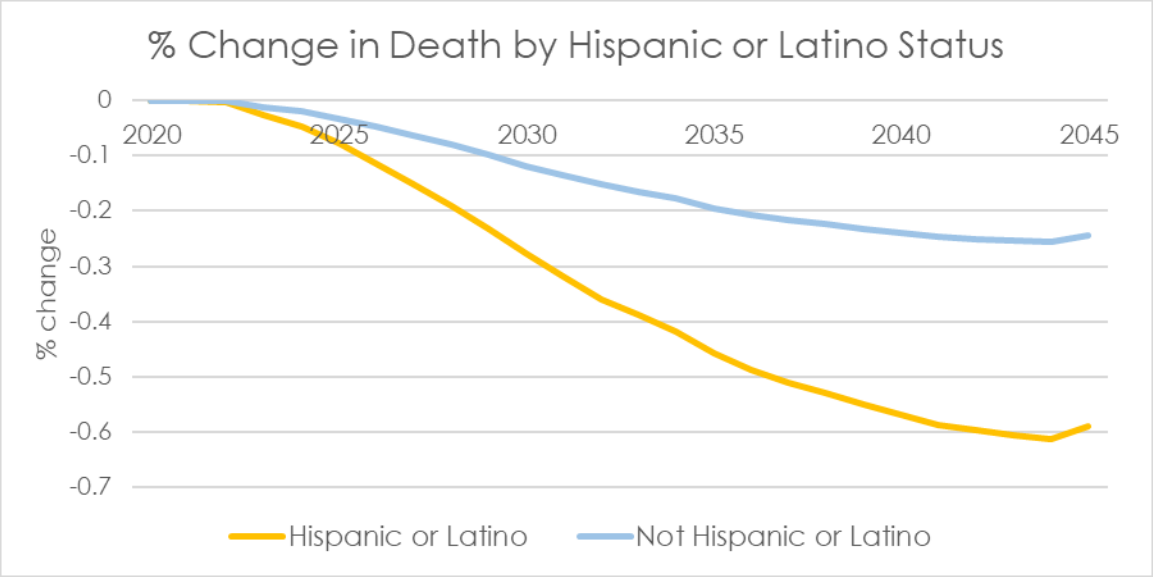
Public health benefits are the largest component of quantified social benefits. Avoided premature deaths reach 1,829 in 2030 (Figure 5).

Figure 5. Avoided premature deaths due to air pollution exposure



Relative to population, public health benefits accrue disproportionately to people of Hispanic or Latino status (Figure 6).

Figure 6. Avoided premature death benefit by Hispanic or Latino status.



METHODOLOGY

The focus of this methodology description is to cover changes since the June 2022 update to the EPS 3.3.1 platform, which is documented in a report and online.[2] Policy impacts are calculated as the difference between scenarios. As is typical, discussion of 55 Percent Reduction Scenario results are measured compared to a Business-As-Usual (BAU) Scenario.

Changes to Business-As-Usual (BAU) Scenario

1. **Includes recent update to the Advanced Clean Cars policy.** The BAU Scenario reflects the recently adopted update to the Advanced Clean Cars policy, setting course for 100 percent of new car and SUVs sales to be electric vehicles by 2035. Previously, in the California model's initial 3.3.1 release, this policy had been included in the Committed Policies Scenario.
2. **Retention of the Diablo Canyon nuclear facilities**. The change is straightforward to accomplish with the removal of early retirement from the BAU Scenario. Nuclear generation is not subject to early policy retirement but is phased out by the model's dispatch decisions by the mid-2030s.
3. **Cleaner imported electricity due to federal Inflation Reduction Act.** The 55 Percent Reduction Scenario results discussed in this memo still assume imported electricity from natural gas reaches zero in 2045. The difference is that phased down natural gas imports are replaced by clean energy, reflecting the current mix of renewable and other zero-emission resources in imported electricity.

55 Percent Reduction Scenario

The 55 Percent Reduction Scenario is adapted from the Deeper Decarbonization Scenario, including most of the same parameters. The 55 Percent Reduction Scenario does accelerate the implementation timetable for several policies.

In the industry sector, several policies now reach full strength in 2032, specifically:

- Fuel shifting to electrification and hydrogen in industry
- Hydrogen production by electrolysis.
- Carbon Capture and Storage, for both industry and power. The 55 Percent Reduction Scenario also starts ramping up these policies immediately, instead of waiting for 2030 to do so.

In the transportation sector, the 55 Percent Reduction Scenario accelerates the schedule for achieving 100 percent zero-emission vehicles for long-haul freight trucking, reaching full strength in 2030 instead of 2035 as in the Deeper Decarbonization Scenario. Furthermore, the small amount of natural gas used in trucks is treated as zero-emission biogas, driven by the low carbon fuel standard.

In the electricity sector, the 55 Percent Reduction Scenario increases the clean energy standard shown first as measured compared to retail sales, then as a share of grid-scale generation.

Table 2. Clean and Renewable Energy Metrics in the 55 Percent Reduction Scenario

	2030 as a % of end use demand	2030 as a % of grid-scale generation
Clean energy	95%	90%
Renewables technologies	79%	74%

Achieving a 75 percent non-hydro renewable grid is achievable and reliable if California doubles down on resource diversity, as shown in a recent report from GridLab and Energy Innovation.[3] The CPUC's most recent integrated resource plan also outlines a path to achieve similar percentages of renewable energy for the regulated utility companies by 2032. The keys to achieving this goal will be continued focus on deploying solar and batteries quickly, expanding transmission and interconnection capacity, improving interstate coordination, enhancing wildfire resilience, and improving resource diversity through offshore wind, geothermal, and out-of-state wind.[4]

CONCLUSION

California EPS evaluation finds a range of positive economic and social impacts from a scenario reaching 55 percent below 1990 emissions by 2030. Achieving such ambition emission reductions would require an energy and industrial transition of unprecedented speed and scope. The challenges are not to be underestimated. Still, the 55 Percent Reduction Scenario represents a possible energy future if we choose it. A riskier choice would be slower action on climate change, and the chaotic, difficult, costly adaptions that would follow.

---

[1] Senator Fran Pavley and Assemblyman Eduardo Garcia, "California Senate Bill 32: California Global Warming Solutions Act," California Legislative Information, August 8, 2016, http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb_0001-0050/sb_32_bill_20160908_chaptered.htm.

[2] Chris Busch, Olivia Ashmoore, Robbie Orvis, and Shelley Wenzel, "California Energy Policy Simulator 3.3.1 Update: Earlier Action Delivers Social and Economic Benefits" (Energy Innovation: Policy and Technology, LLC, June 16, 2022), https://energyinnovation.org/wp-content/uploads/2022/06/California-Energy-Policy-Simulator-Insights.pdf.

[3] Stenclik, D., Welch, M., & Sreedharan, P., Reliability reaching California's clean electricity targets: Stress testing an accelerated 2030 clean portfolio, GridLab, 2022, www.gridlab.org/publications.

[4] O'Boyle, M., Gimon, E., Esposito, D., Achieving an Equitable and Reliable 85 Percent Clean Electricity System by 2030 in California, Energy Innovation, 2022. https://energyinnovation.org/wp-content/uploads/2022/05/Achieving-An-Equitable-And-Reliable-85-Percent-Clean-Electricity-System-By-2030-In-California-1.pdf.