

Cap and Trade in Practice: Barriers and Opportunities for Industrial Emissions Reductions in California

Climate Policy Initiative
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235 Montgomery St. 13th Floor
San Francisco, CA
94104, USA
climatepolicyinitiative.org

Key findings

The Cap and Trade Program is making a difference in how firms approach emissions reductions.

Cement firms are factoring the carbon price into investment decisions and are exploring options to reduce emissions.

However, the impact of the carbon price on a decision to abate emissions also depends on a range of other factors. In most cases, the carbon price is not the most important factor in making an emissions reduction decision financially attractive.

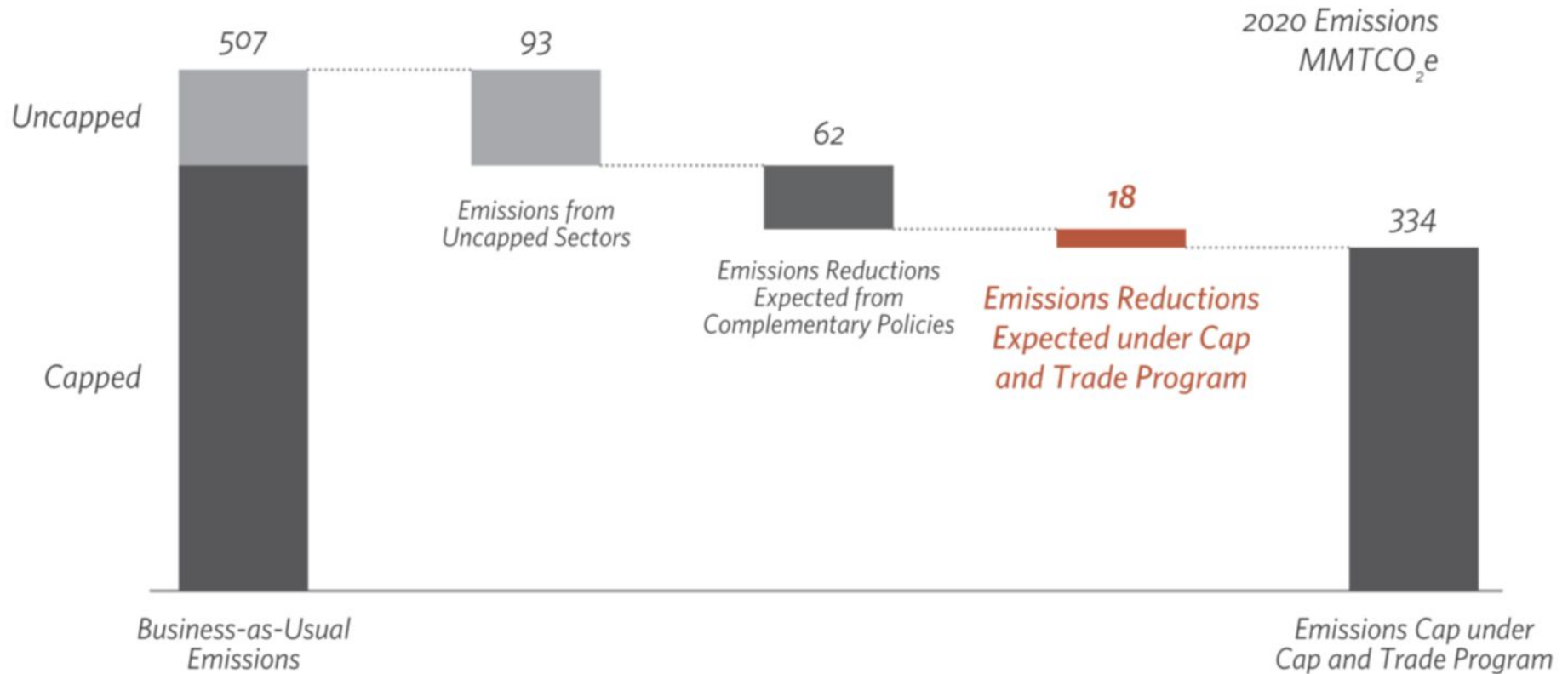
Key findings

Under the Cap and Trade Program, California will meet its emissions reduction target as long as the cap is enforced. But policymakers can reduce the cost of meeting the target by taking further action to lower barriers to low-cost or cost-saving abatement options.

AB32 already takes this approach through sector-specific “complementary policies,” but policymakers can do more.

Background

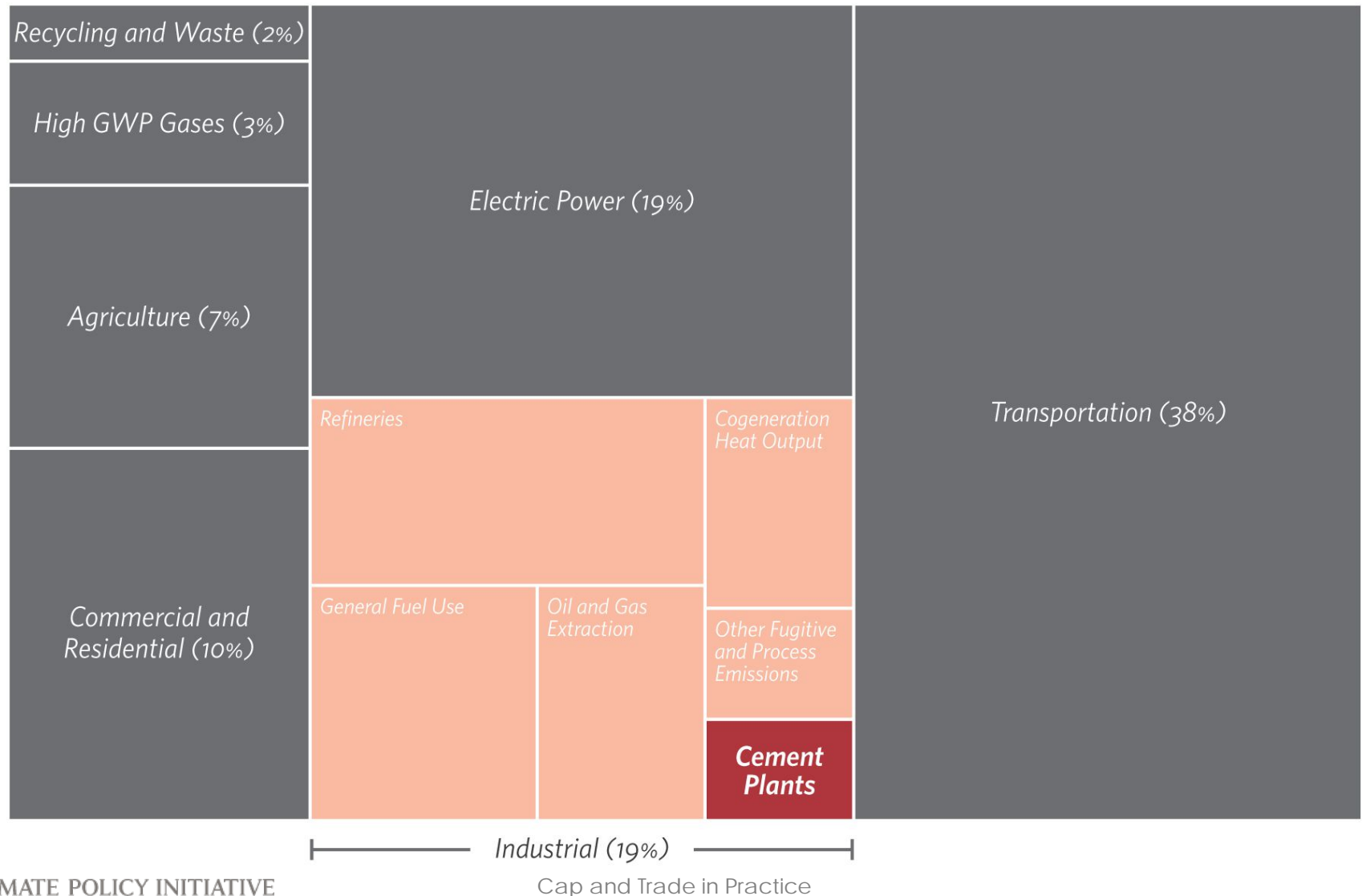
The Cap and Trade Program is a relatively small but important part of California's climate strategy



Under AB32, the Cap and Trade Program wraps around a set of sector-specific policies, including the Renewable Electricity Standard and vehicle GHG standards. The Cap and Trade Program serves as a backstop to ensure that California meets its emissions reduction goals.

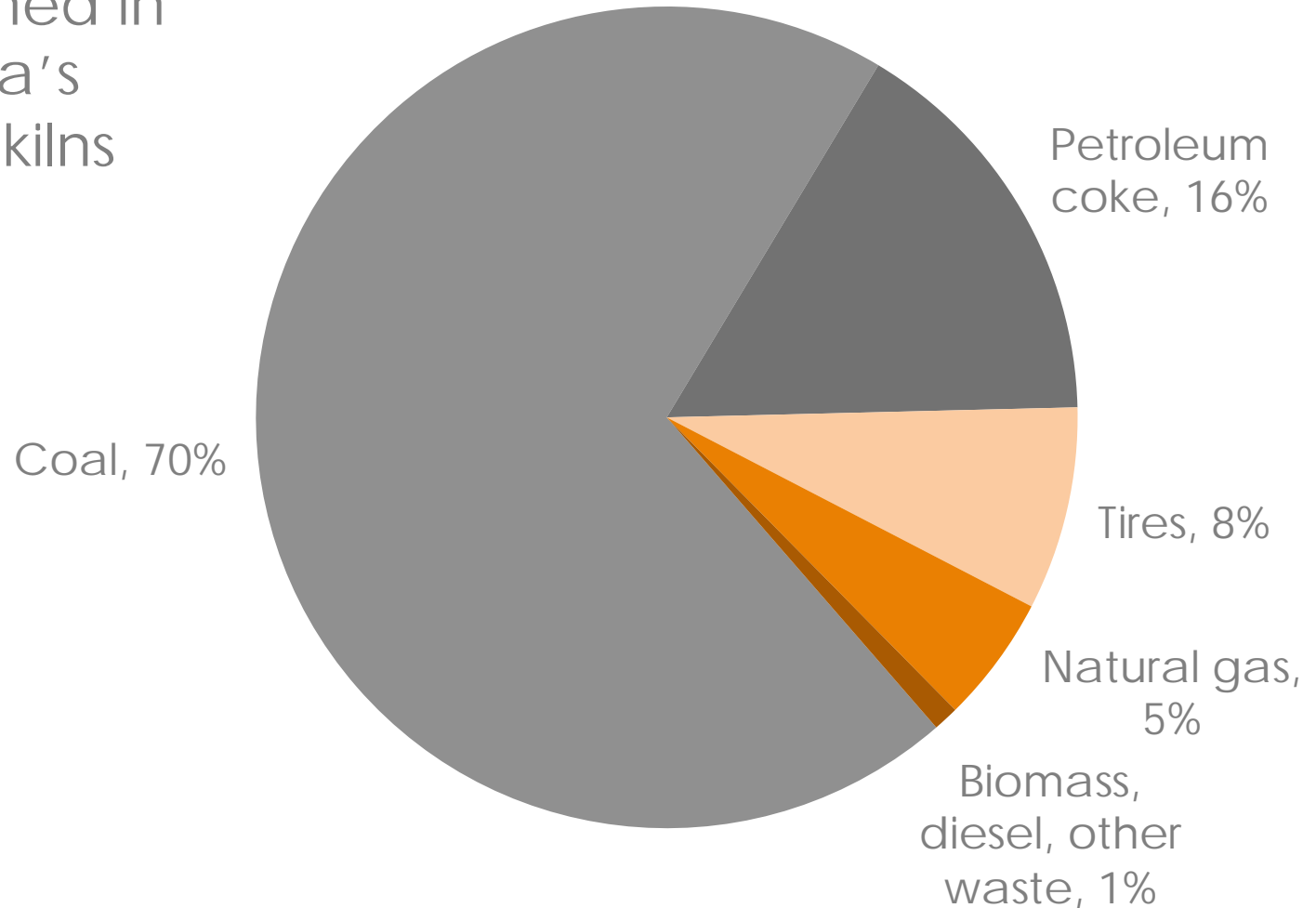
The cement industry is a key industrial emitter in California and many other states

~2% of emissions statewide; similar to national figure



Cement plants are the largest coal consumers in California

Fuel burned in
California's
cement kilns
(2009)



Methods

How do business decisions influence achievement of emissions reductions under cap and trade?

Our research questions:

- Are California's cement firms likely to take the steps commonly discussed as abatement options for their industry?
- How large a role does the carbon price play in driving abatement decisions, relative to other factors such as energy prices and non-price barriers?
- What are the barriers to abatement in the cement industry that are not addressed by the carbon price? What other policy levers could address these barriers?

We modeled a set of representative abatement options under a range of carbon price scenarios

1. Energy efficiency
2. Fuel switching: biomass, tires, natural gas
3. Blending of alternative materials

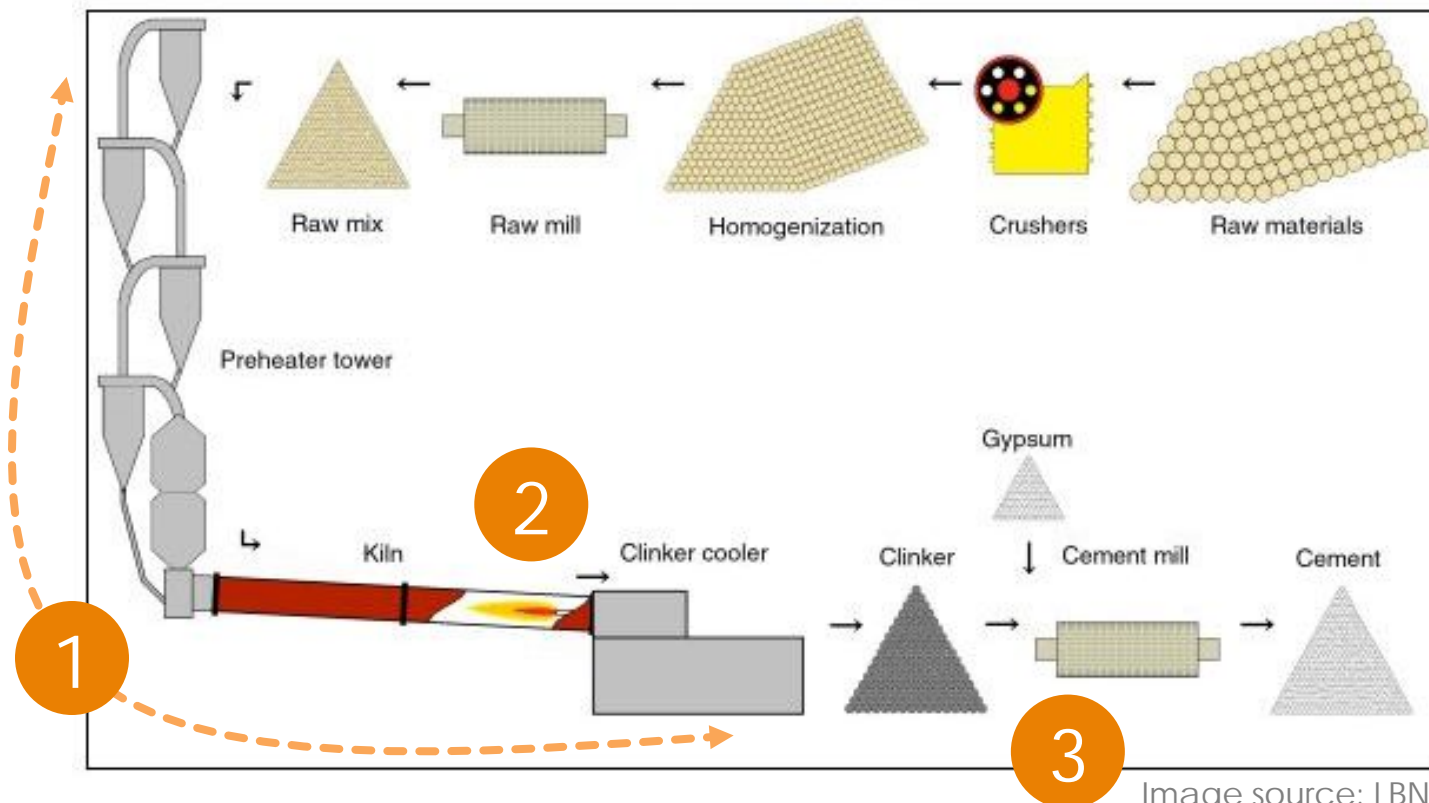
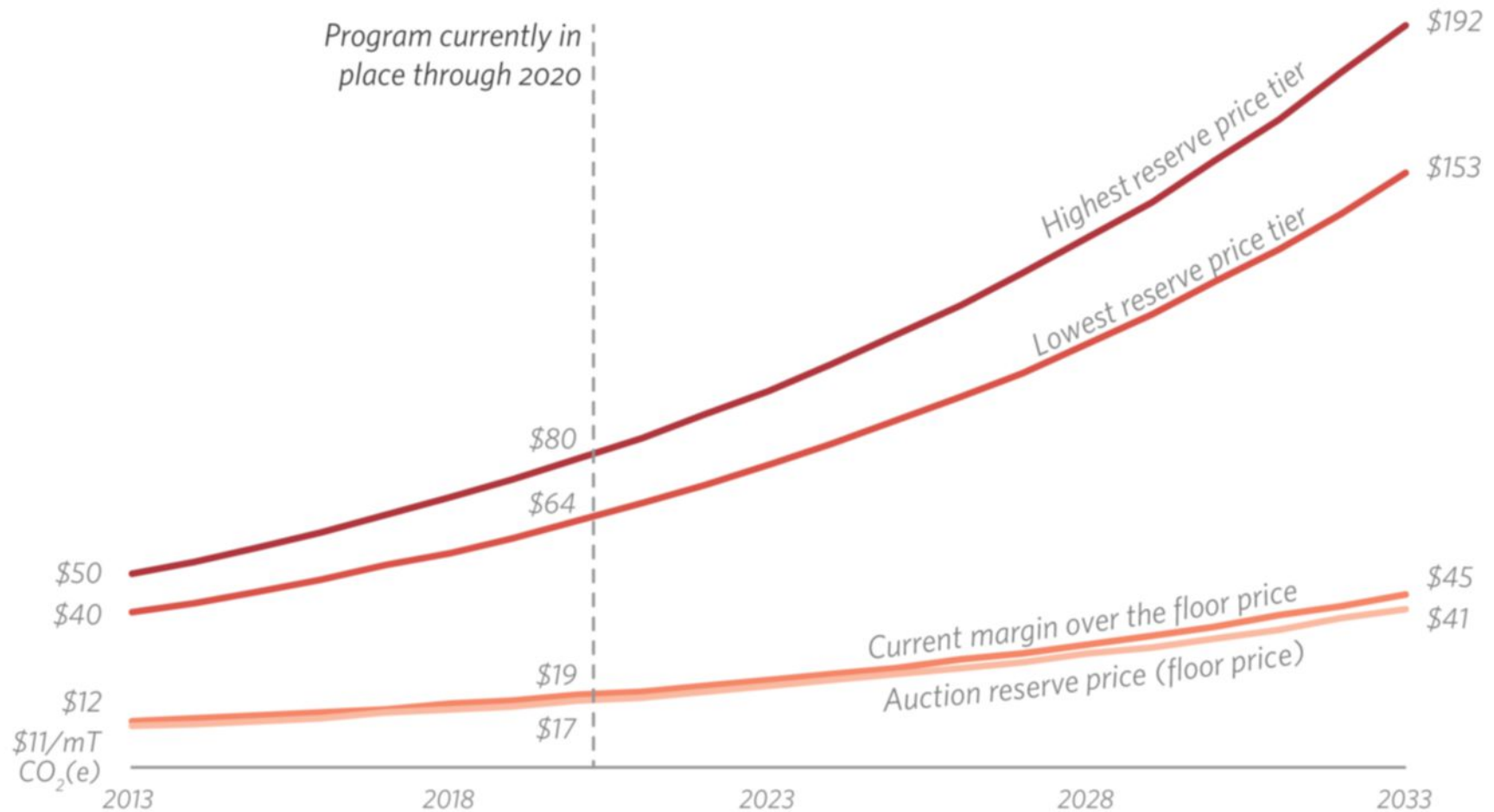


Image source: LBNL, "Opportunities for Energy Efficiency and Demand Response in the California Cement Industry"

Carbon price scenarios based on Cap and Trade Program regulation



Findings

The Cap and Trade Program is a salient factor in business decisions.

California's cement firms factor the carbon price into their investment models and are exploring options to reduce emissions.

Most abatement options do not meet firms' investment criteria at low carbon prices, but more do at high carbon prices.

- Abatement option meets firms' stated criteria for investment:
 - Payback under 3 years (capital investments)
 - Profitable immediately (operational changes)

GREENHOUSE GAS ABATEMENT
OPTIONS FOR CEMENT
MANUFACTURING FIRMS



THERMAL ENERGY
EFFICIENCY INVESTMENT

FUEL SWITCHING OPTIONS:
TIRES

BIOMASS
INVESTMENT

BIOMASS
CO-FIRING

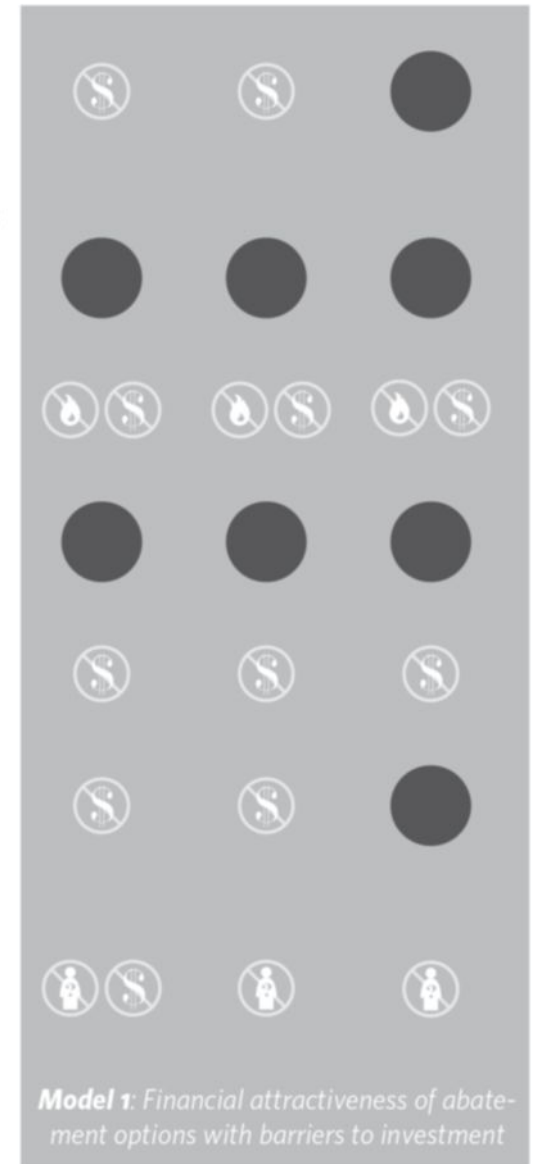
NATURAL GAS
INVESTMENT

NATURAL GAS
CO-FIRING

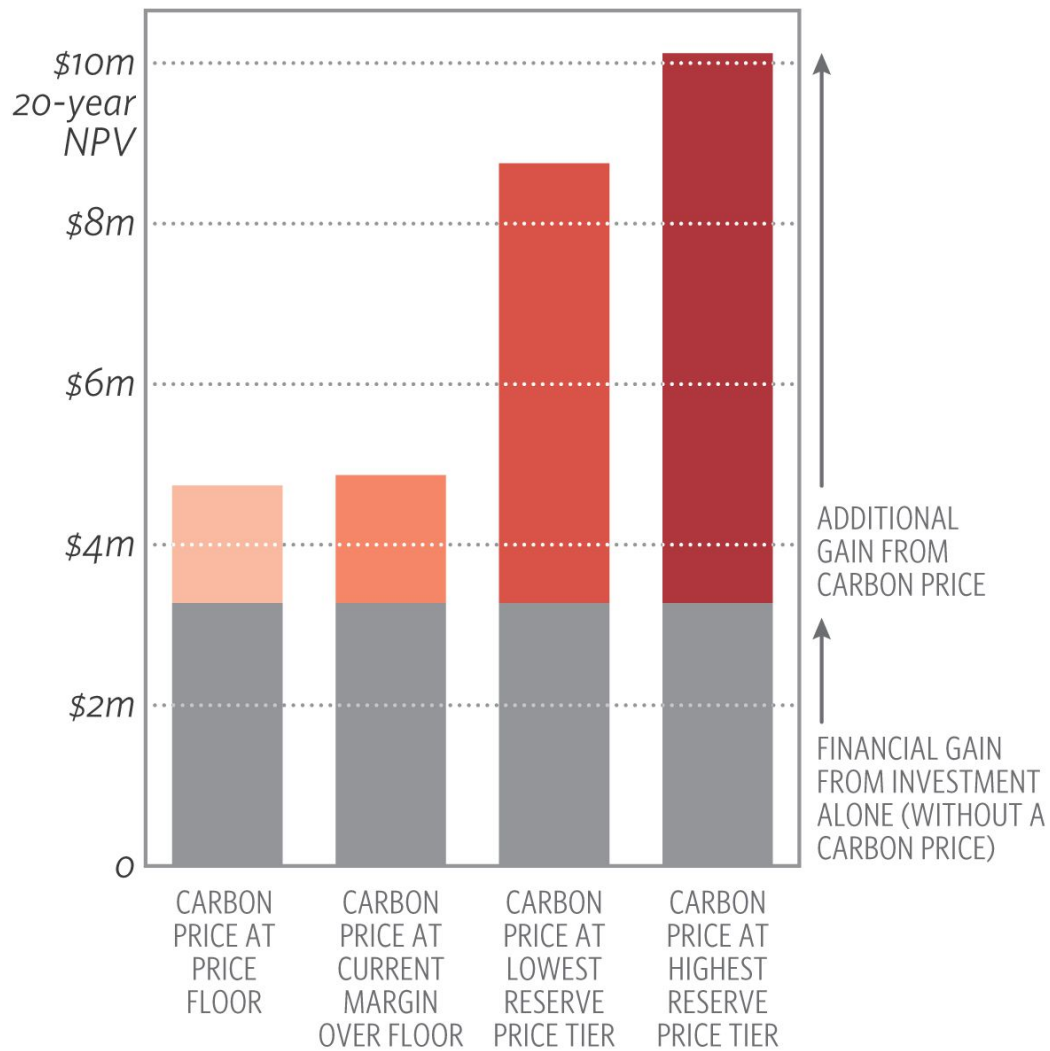
INCREASE BLENDING
OF ALTERNATIVE
MATERIALS (SCMs)

CARBON PRICE SCENARIOS →

None Low
\$10-12/
mT CO₂(e) High
\$40-50/
mT CO₂(e)

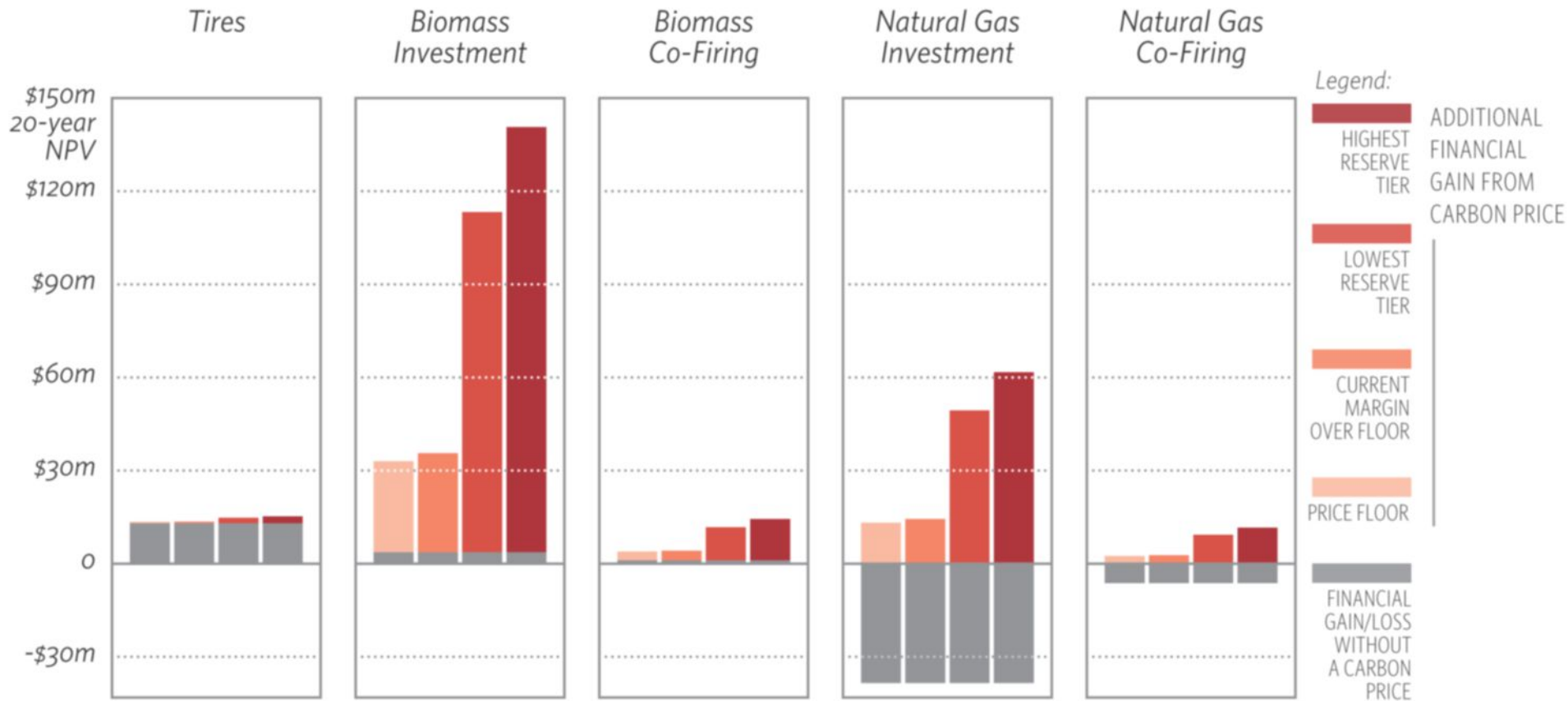


Energy Efficiency



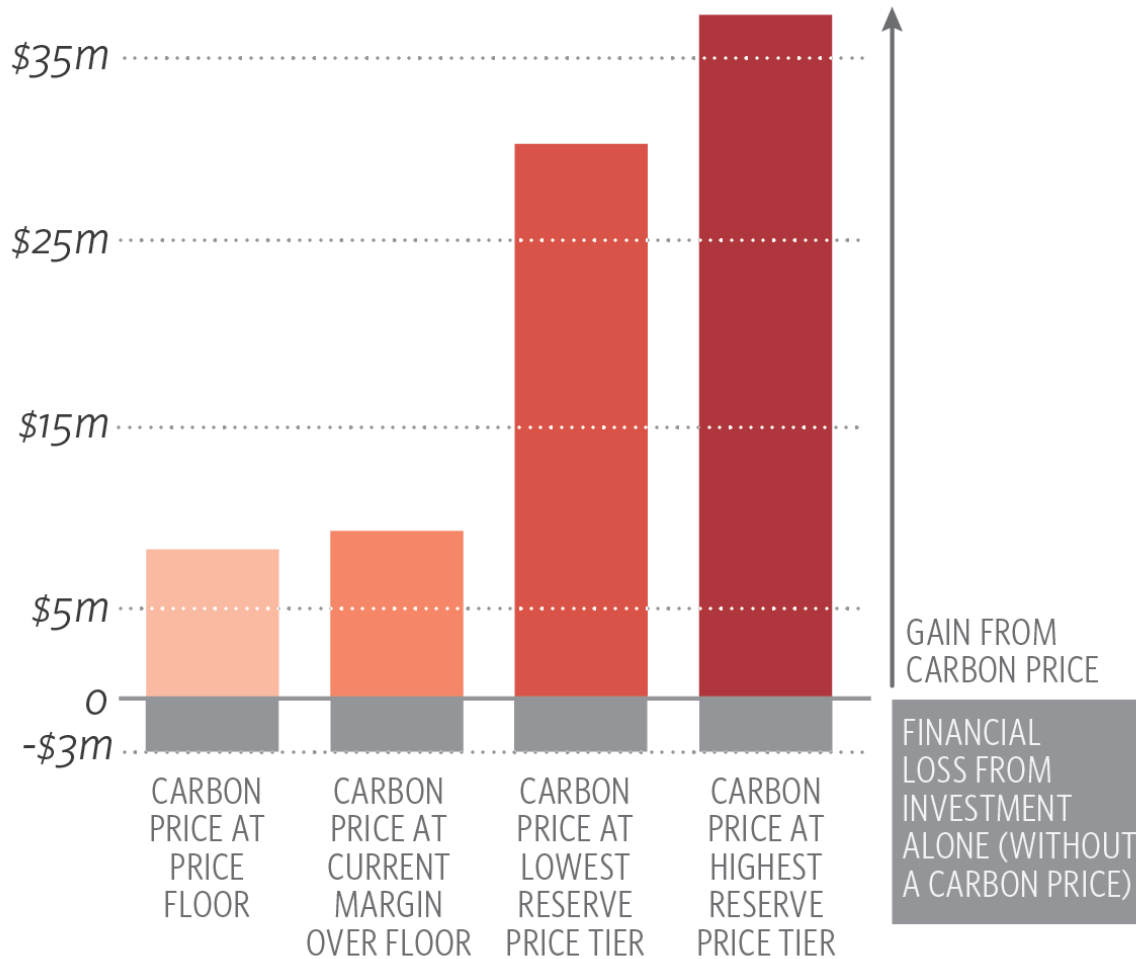
The carbon price makes already-profitable investments in energy efficiency more financially attractive. However, firms' internal priorities and short required payback periods for investment will continue to limit investment, especially if carbon prices remain low.

Fuel Switching



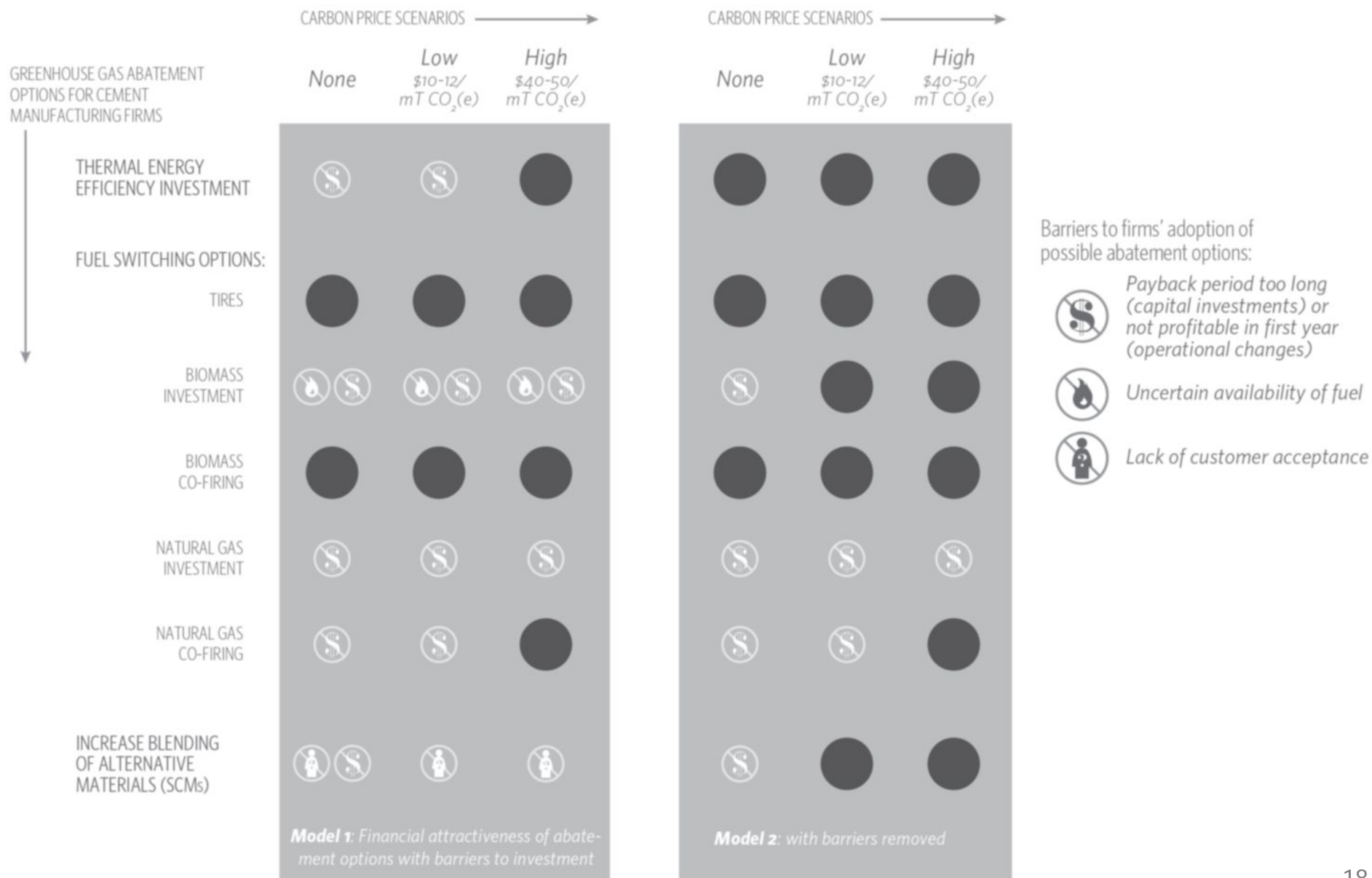
Some fuel switching options appear very financially attractive with a carbon price. However, some promising options involve lower-carbon fuels that are not yet widely used in California. Firms require more certainty about future fuel availability and prices before making major investments.

Blending of Alternative Materials



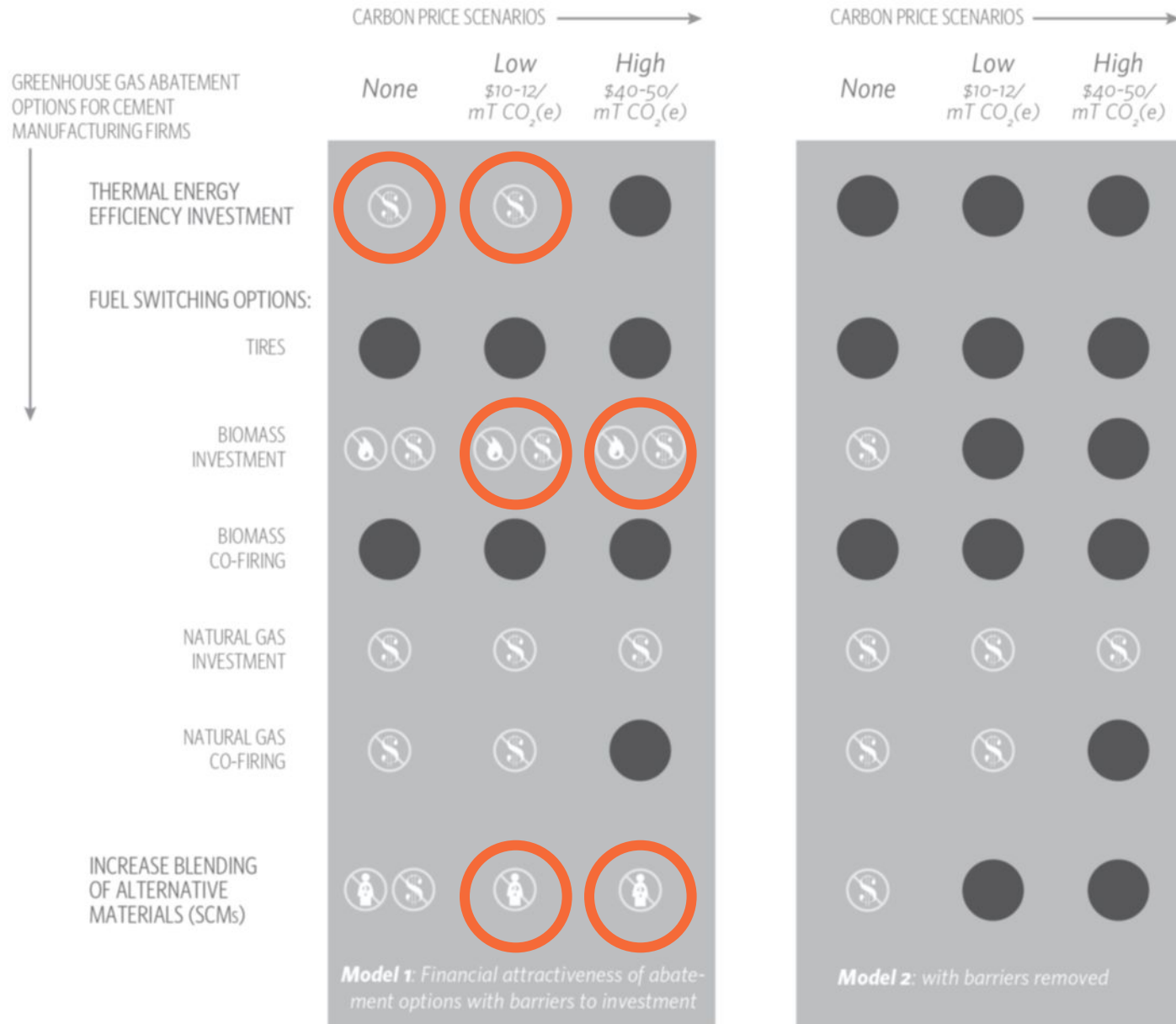
The carbon price makes blending of supplementary cementitious materials (SCMs) financially attractive. However, the primary barrier to increasing SCM blending is technical specifications used by state agencies and other customers, which the carbon price alone will not address.

Non-price barriers are a significant obstacle to cost-effective abatement options

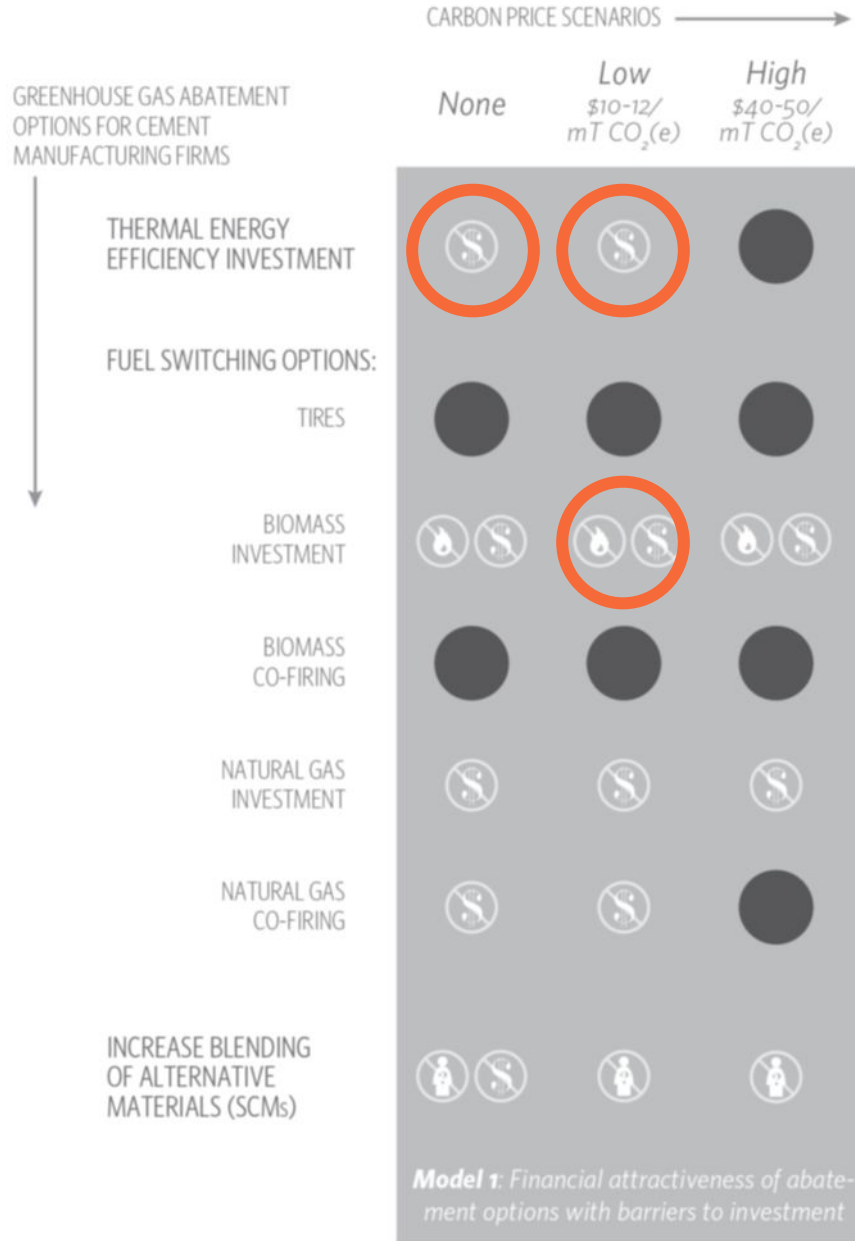


Policy Implications and Recommendations

The carbon price alone will not address these barriers, but other policy measures could help bring them down



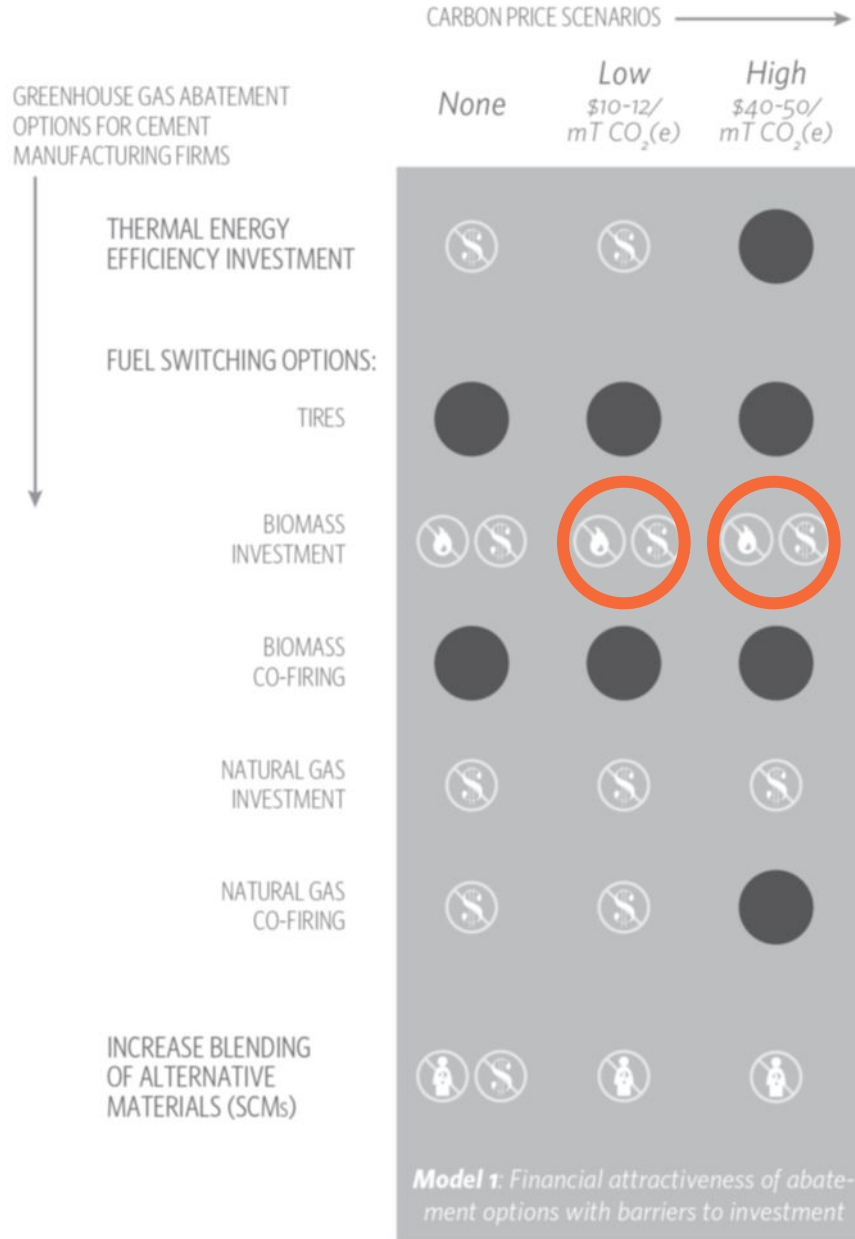
Barrier: Short required payback period



Solution:

Financial support (e.g., subsidized loans, leases) could give firms an incentive to invest in projects that reduce emissions and save money, but take longer to pay back

Barrier: Lack of alternative fuel supply

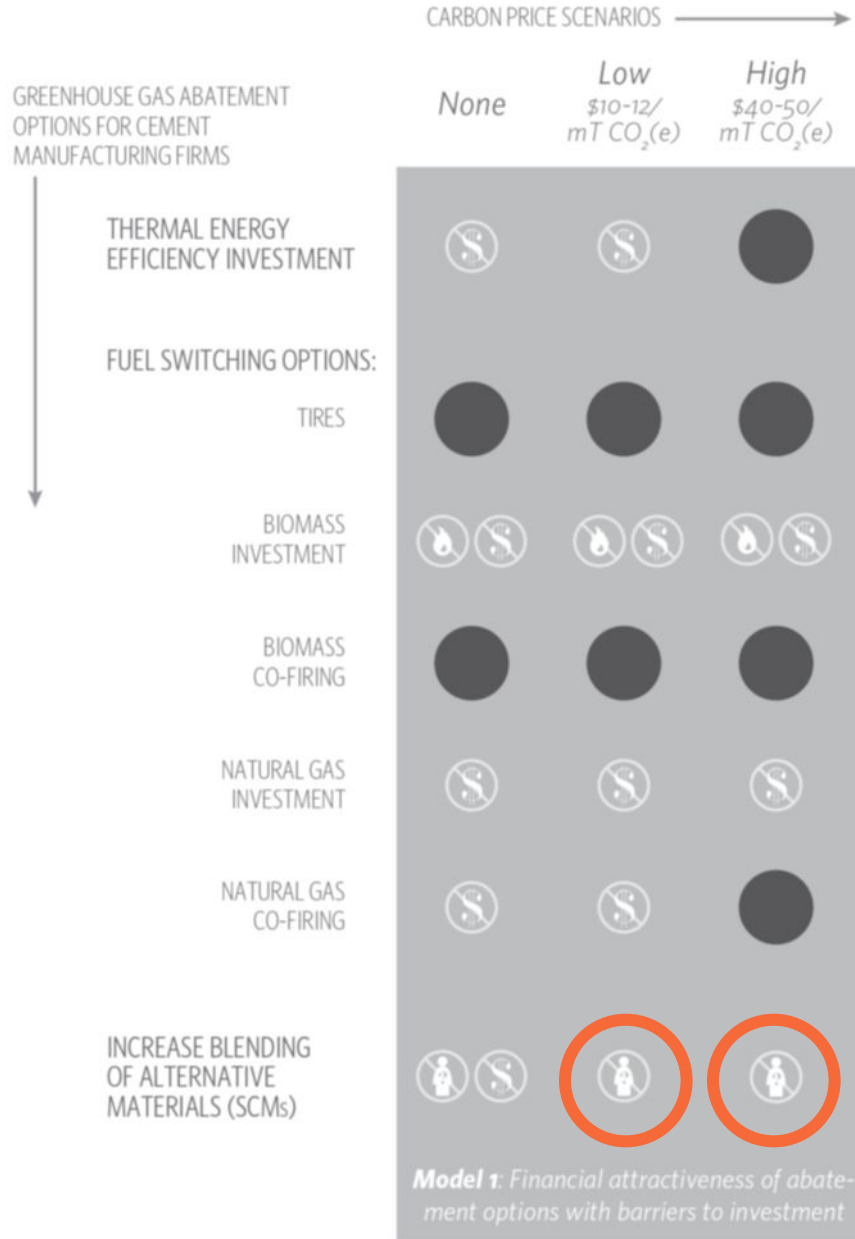


Solutions:

Public investment could accelerate commercialization of alternative fuels

Guarantees could help provide certainty to firms considering fuel-switching investments

Barrier: Inflexible customer demand



Solutions:

Customer education and outreach could promote use of performance-based rather than prescriptive standards

Government procurement could expand the market for cement with more SCMs

Research and engagement with standard-setting institutions could expand the potential uses of blended cement

Takeaway message: Think beyond the carbon price

Under the Cap and Trade Program, California will meet its emissions reduction target as long as the cap is enforced. But policymakers can reduce the cost of meeting the target by taking further action to lower barriers to low-cost or cost-saving abatement options.

AB32 already takes this approach through sector-specific “complementary policies,” but policymakers can do more.

Visit the California Carbon Dashboard for updates and information on AB32

<http://calcarbondash.org>

CALIFORNIA CARBON DASHBOARD in beta

The latest on emissions policy and cap and trade in the world's 14th largest emitter

A PROJECT OF
 CLIMATE POLICY INITIATIVE

CARBON PRICE



Price of California Carbon Allowance Futures over time from ICE End of Day Reports. The first allowance auction was held on November 14, 2012, a few months before the cap and trade program took effect on January 1, 2013. For dates prior to the first auction, this graph captures the price of 2013 vintage futures, traded before actual allowance prices could be discovered through auctions. From 2013 onward, all prices are for the current year's vintage allowance with a futures contract expiring in December of that same year. From January 1, 2014 onward, all prices are settle prices. [Download source data.](#)

NEWS



Ralph Moran @RalphJMoran

#ab32 Border Tax = supremely bad idea. Ironically would make CA consumers pay for emissions in countries from which offsets aren't allowed.

Expand



RL Miller @RL_Miller

Just got a \$40 #AB32 Climate Credit on my utility bill. Used it to pay half my Obamacare premium. Something profound goes here.

Retweeted by Cindy Rochel

Expand



Susan Frank @susanfrank88

Kudos @sacbee_news for endorsing #AB32 and #LCFS in climate change editorial that highlights CA policies. goo.gl/BuH2ue

This content is live-updated from Twitter and is not curated by Climate Policy Initiative.

CARB UPDATES

TWEETS

CAP AND TRADE

California's *Global Warming Solutions Act of 2006 (AB32)* set a series of policies and programs across all major sectors to return California emissions to 1990 levels by 2020. The California Air Resources Board, the implementing agency for AB32, updates a *Scoping Plan* every 5 years outlining its overall strategies and recommendations for meeting these goals. The *Cap and Trade Program* caps greenhouse gas (GHG) emissions from key sectors in California, ensuring that AB32 GHG reductions are met, regardless of how well the complementary policies perform.

The California Cap and Trade Program is designed to achieve cost-effective emissions reductions across the capped sectors. The Program sets maximum

COMPLEMENTARY POLICIES

EMISSIONS CAP

EMISSIONS HISTORY

AB32 relies on a number of important complementary policies to achieve the bulk of reductions to meet California's statewide 427 million metric tons of CO₂ equivalent (MMT CO₂e) emissions goal for 2020. The Cap and Trade Program acts as a backstop to these complementary policies. This graphic shows greenhouse gas emissions in 2020 under business-as-usual conditions and under AB32 implementation, and the expected contributions of each complementary policy to AB32 reductions. Mouse over to see which policies apply to a given sector. Click on any policy for CARB's most recent regulatory details. *Mouse over to see which policies apply to a given sector. Click on any policy for more details.*



Download the full report:

[http://climatepolicyinitiative.org/
publication/cap-and-trade-in-practice-
barriers-and-opportunities-for-industrial-
emissions-reductions-in-california](http://climatepolicyinitiative.org/publication/cap-and-trade-in-practice-barriers-and-opportunities-for-industrial-emissions-reductions-in-california)

Contact:

Julia Zuckerman

julia@cpisf.org

415-202-5844



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EUROPE
INDIA
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UNITED STATES

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