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Article

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Charles D. Kolstad Subnational Carbon Pricing in the US



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INTRODUCTION AND BACKGROUND

The US has played an important role in addressing the global heating problem, although the intensity and direction of action to reduce national US carbon emissions has varied considerably over time – ranging from supportive (George Bush the elder, Obama) to strongly opposed (George Bush Jr. and Trump). Although early efforts at controlling carbon emissions nationally were bipartisan (e.g., the 2003 Climate Stewardship Act, sponsored by Republican Senator John McCain and Democratic Senator Joseph Lieberman), the issue turned partisan as soon as the Democrats embraced climate action with the election of President Obama in 2008. Reflecting this, the American Clean Energy and Security Act of 2009 (known as the Waxman-Markey bill) failed to be passed by Congress. From that point forward, climate action at the federal level has been modest and partisan (e.g., Obama's Clean Power Plan) to virtually nonexistent (Trump).

But the US is a federal system and states of the US have significant power, as do sub-state jurisdictions (counties and cities). In fact, states have always had a major role to play in air and water pollution regulation – the structure of Federal regulations relies heavily on federalism. The governing air pollution law, the 1963 Clean Air Act (and its amendments), specifically delegates the regulation of emissions from existing pollution sources to the states – the federal government sets goals for air quality.

Thus, it was natural that the challenge that emerged from the failure to regulate carbon at the federal level was taken up by some states. Keeping in

mind that states are quite different from one another, the response has also been varied. California is a rich state with a strong environmental ethic, no coal and a fairly progressive electorate. Some Midwestern states have significant coal industries and by implication have a more politically difficult time supporting cuts to carbon emissions (which generally translate into reducing the use of coal in electric power generation). This explains why California, under the Republican governor Schwarzenegger, enacted the first major carbon reduction legislation in the country, the Global Warming Solutions Act of 2006 (known as Assembly Bill 32 – AB32). At approximately the same time (2005) several (now ten) northeast states banded together into the Regional Greenhouse Gas Initiative (RGGI), mutually agreeing to a cap and trade system for CO₂ from electricity generation. This reflects progressive traditions in these states.

If one reflects on what different countries are doing to curb emissions, why should there be any less incentive for action from a state like California with 40 million residents and an economy of size roughly on a par with major economies of Europe (rankings fluctuate with the exchange rate).

Market forces have also played a role in reducing carbon emissions. Figure 1 shows US carbon emissions over the past 30 years. Note that emissions peaked in 2007 and by 2018 had almost been reduced to 1990 levels, despite significant population and economic growth. A major reason for this is the technological advance of fracking, which has reduced the cost of extracting natural gas and oil, forcing out coal as an electricity generation fuel (see Kolstad, 2017).

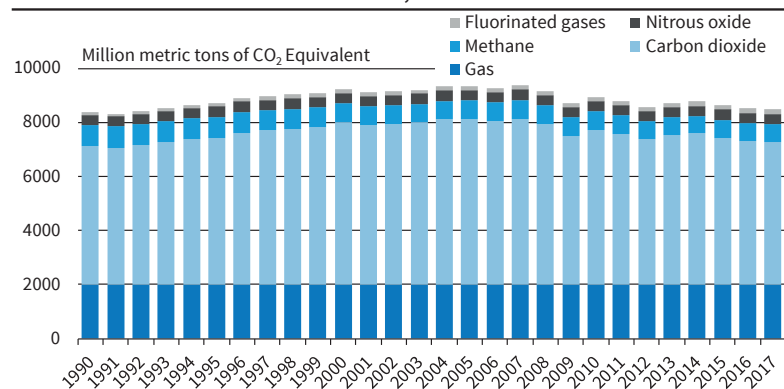
CALIFORNIA

California has a tradition of environmental leadership. Beginning in the 1940s, the state was plagued by smog. Although a mystery at first, eventually research pointed to the culprit – automobile emissions. As a consequence, the state began regulating emissions from automobiles in 1961 (National Research Council, 2006). A few years later the federal government enacted the

Clean Air Act of 1963 and the Motor Vehicle Air Pollution Act of 1965. In 1970 President Nixon established the US Environmental Protection Agency. Also in 1970, the US Congress significantly strengthened the Clean Air Act, setting up the structure we have today of federal air pollution goals and state implementation plans for regulating local sources.

A commonly articulated reason for federal regulations as opposed to state re-

Figure 1
Gross Annual US Greenhouse Gas Emissions, 1990–2017



Source: US EPA Greenhouse Gas Data Explorer.

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gulations is that commerce between states is easier with one national standard. In fact, the Clean Air Act prohibits states from setting different standards for automobile emissions. Thus the auto manufacturers need not worry about making a different car for every state. There is one exception: the law allows more flexibility to any state that had regulations on automobile emissions prior to 1966 (i.e., California). These states could apply for a waiver

from meeting federal emissions standards, provided the state's regulations were at least as strict.

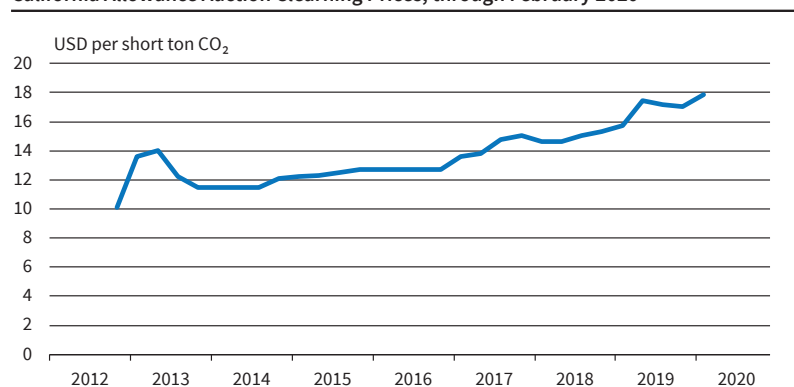
The point is that California has a tradition of being a leader when it comes to environmental protection – the federal government and other states typically follow California's lead. It is thus not too surprising that in the early part of this century (2002), California first ratcheted up fuel economy standards for new cars sold in the state. This was followed in 2006 by the setting up of a cap and trade system for reducing carbon emissions to 1990 levels by 2020.¹ Both actions were explicitly intended to address climate change. A debatable criticism levied at the California program is that it will cost a lot and have very little effect on global carbon emissions (because of the size of California as a proportion of the global market). But many supporters of the California initiatives argue that if the state can show that regulations can work without damaging the economy then it is likely other jurisdictions will follow suit. California regulations serve as a lever for other jurisdictions to reduce emissions.

The cap and trade program became operational in 2013, initially covering electric power generation facilities (including sources of power that are located out of state) and other large stationary sources. Gradually coverage was expanded to now include 85 percent of the state's emissions, including transportation fuels. Furthermore, the fraction of allowances freely allocated has gradually shrunk over time, with remaining allowances auctioned. The price of allowances is shown in Figure 2.

Through 2016 the auction reserve price was between \$12 and \$13 per ton, rising to just over \$15 in 2019. Note in Figure 2 that in early years of the auction, price was close to the reserve price (stipulated minimum bid) but over the past year, as the cap has tightened, the prices are beginning to diverge from the reserve price. We would also note that the price is

Figure 2

California Allowance Auction Clearing Prices, through February 2020



Source: California Air Resources Board.

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lower than the EU ETS price (approximately USD 30 in February 2020²) but the gap is narrowing. However, both systems are generating prices that are significantly short of the social cost of carbon, at least as computed prior to the Trump administration revisions (i.e., approximately USD 40 per ton: Greenstone et al., 2013 and updates).

The California cap and trade system appears to be working well, though the real test will occur in the post-2020 period as the cap is ratcheted down. The goal for 2020 was to reduce emissions to 1990 levels. The goal for 2030 is 40 percent below 1990 levels. Unless the legislature relaxes this target, expect the price of allowances to increase significantly.

NEW ENGLAND RGGI

Although California has a long tradition of leadership in environmental protection, it was a set of New England states that moved before California to implement a greenhouse gas cap and trade system. The Regional Greenhouse Gas Initiative (RGGI) started in 2009 and originally covered the power sector in ten northeastern states (Schmalensee and Stavins, 2017). The goal was to limit growth in power sector carbon emissions through 2014 and then to reduce the cap so that 2020 emissions would be 13 percent below 1990 emissions. As discussed earlier, the dramatic drop in natural gas prices, coupled with the Great Recession created a surplus of permits. Consequently the cap was rethought in 2012 and tightened significantly, so that by 2020 the cap would be nearly one third lower than previously planned.

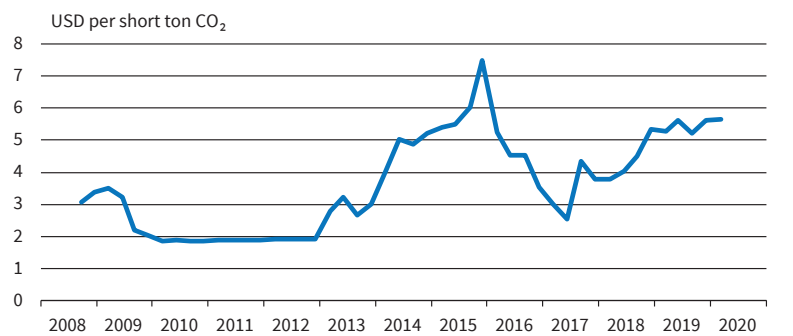
The effect of these actions can be seen in Figure 3. As with California, regular auctions are held, which allows the tracking of allowance prices. In the auctions there is a price floor, clearly seen as the flat section of prices for 2010–2013. There is also a price ceiling which has had virtually no impact yet. But

¹ The 2002, Assembly Bill 1493 (Pavely Regulations) tightened fuel economy standards in automobiles and in 2006, Assembly Bill 32 (Global Warming Solutions Act) established the cap and trade program.

² Business Insider reports a price of approximately EUR 24 per metric ton in late February 2020.

Figure 3

Regional Greenhouse Gas Initiative (RGGI) Allowance Clearing Price
Sep 2008–March 2020



Source: Regional Greenhouse Gas Initiative.

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what happens post-2020 could change that. Compared to the allowance price in California or the EU ETS or for that matter the social cost of carbon, the RGGI price is quite low. On the other hand, another conclusion is that even a price of under USD 10 per ton is sufficient to reduce emissions from the power sector significantly (with the help of low natural gas prices).

OTHER SUB-FEDERAL CLIMATE ACTION

The most significant other actions related to putting a price on carbon are failed attempts in the north-west part of the US. In 2016 Washington State tried what economists term a revenue neutral carbon tax of USD 15 per ton of CO₂, paralleling a successful carbon tax in neighboring British Columbia, Canada. Such a tax is often promoted as appealing to the politically moderate and in that sense is theoretically most likely to be politically accepted (due to the fact that the revenue generated is offset by a reduction in the sales tax). But some environmental groups opposed the initiative because of the lack of revenue which could have been used for pro-environment investments as well as helping groups which might be disadvantaged by the tax. The initiative failed with 60 percent voting against it. Another attempt was made in 2018, with the revenue generated targeted at financing specific projects, instead of returned via a sales tax reduction. The opposition to this initiative primarily came from the oil industry. The initiative was also defeated by 56 percent voting no.

Oregon has also been attempting to enact a cap and trade program for carbon, paralleling California's successful program. The effort has been opposed by Republicans, who have been creative in their opposition, at one point fleeing the state to prevent a quorum in the legislature. As this article goes to press, the Governor continues to push the legislation.

However, most action by states and localities in the US has been neither a carbon tax or a cap and trade system which induces a carbon price. Most actions are

closer to command-and-control. This would include the widespread adoption of renewable performance standards for electric power, requiring a stipulated minimum amount of electricity used in a jurisdiction be generated by renewable sources; or incentives for adopting zero emission vehicles such as electric cars; or banning the use of natural gas in new home construction; or tightened building standards – to name just a few.

CONCLUSIONS

The most visible international action to slow carbon emissions has come from nations. It is nations that belong to the Framework Convention on Climate Change. It is nations that signed the Paris Agreement. It is nations that meet every fall for a Conference of the Parties to the Framework Convention. But action at the subnational level can be both easier to implement and effective in demonstrating proof-of-concept for the very tough problem of reducing carbon emissions.

One observation, supported by the failed initiatives in Washington State, as well as wrangling in California, is that voters are suspicious of carbon prices being used purely as incentives rather than revenue raising for a "worthy" purpose. But as more and more jurisdictions adopt some sort of carbon pricing, it may be that such opposition will soften over time.

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