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A Price on Carbon May Be Coming Soon to the U.S.

After years of debate, says Amy Myers Jaffe, the likelihood of a U.S. carbon tax or cap-and-trade program is greater than ever



The time for a price on carbon in the U.S. may be coming partly for economic reasons, argues Amy Myers Jaffe.
ILLUSTRATION: ANASTASIA VASILAKIS FOR THE WALL STREET JOURNAL

By **AMY MYERS JAFFE**

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For years, U.S. politicians have debated whether to impose a price on carbon. The time may finally have come.

That might seem hard for most people to fathom, given the yearslong, seemingly intractable political deadlock on the issue in the U.S.

COUNTERPOINT

- George David Banks argues that a carbon price is unlikely in the U.S. anytime soon

But I believe we've reached a tipping point, where a tax on carbon emissions or some other price for

emitting the gas is close to inevitable.

What has changed?

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George David Banks, a climate adviser to President George W. Bush, cites a number of obstacles to carbon pricing, starting with GOP opposition in Congress.

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For one thing, the economic rationale for a carbon price is stronger than it ever has been. At the same time, technological advances have made it much cheaper to move away from carbon-emitting technologies, making a carbon price less punitive than it would have been in the past. Meanwhile, one of our biggest global rivals, China, is about to impose a carbon-pricing plan, meaning that the U.S. may not be at a competitive disadvantage if it institutes a similar program.

But the most important reason is that big market players and the investors who back them are

changing their minds on the issue—and they're prepared to use their muscle to try to make a carbon price happen. Companies and investors, after all, thrive on transparency and predictability, and they fear that the current state of carbon regulations is too convoluted, making planning difficult and exposing them to risk. They see a price on the emission of carbon as a way to resolve that uncertainty and get some clarity once and for all.

It's impossible, of course, to say precisely when a carbon price will come to pass. Much depends on the politics: It's more likely to happen, for instance, if Hillary Clinton becomes president. But I believe that the momentum has shifted markedly in the direction of a price, and that the pressure will be hard for legislators to resist in the next few years.

A history of standoffs

For years, the U.S. and other nations have been struggling to find the best way to regulate carbon emissions. Scientists link accumulations of carbon in the Earth's atmosphere to dangerous changes taking place in the world's climate.

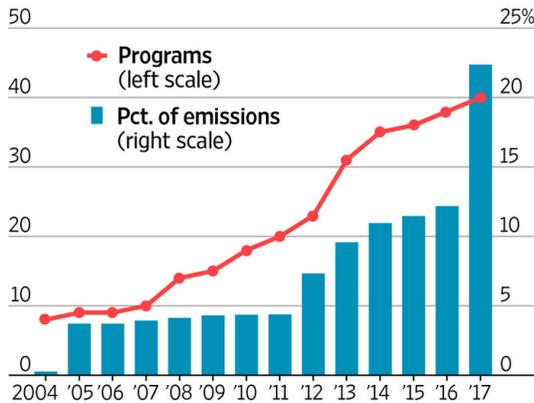
In December, the U.S. and 194 other nations reached a landmark global accord to reduce carbon emissions to limit global warming to 2 degrees Celsius (3.6 degrees Fahrenheit). But agreeing on how to do that has proved difficult, since carbon is emitted in almost every aspect of economic activity, most notably in the use of fossil fuels for energy and in the production of such building materials as cement and steel.

A carbon price can be achieved in a number of different ways. A carbon tax involves companies paying for every ton of carbon they emit. Under another plan, cap and trade, companies must buy from a fixed pool of permits to emit carbon, which they can then trade with other companies on a market. In a cap-and-trade system, government can distribute some permits free of charge to targeted industries to ease the transition.

Proponents argue that some sort of carbon price is needed because emissions have costs—such as rising sea levels caused by climate change—that aren't borne by the carbon-emitting companies. Putting a price on carbon would reflect the true impact of carbon emissions on the world, proponents argue, and spur companies to make more economically efficient decisions regarding their use of fossil fuels, particularly spurring

Pricing Power

The number of regional, national and subnational carbon-pricing programs in place world-wide, and the percentage of global greenhouse-gas emissions covered. China's plan to implement a cap-and-trade system next year would raise the share of emissions subject to a pricing program to nearly a quarter of the global total.



Note: Figures are as of Dec. 31 of each year, and figures for 2016 and 2017 are projections. Emissions are given as a share of global greenhouse-gas emissions in 2012; annual changes in GHG emissions aren't shown.

Source: "Carbon Pricing Watch 2016," World Bank and Ecofys

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greater use of renewable energy sources.

Having a carbon price, in other words, would allow the free market to do its best work.

Opponents argue that putting a price on carbon is too complex to implement and is bound to be plagued with problems. They point out that Europe's emissions-trading program is struggling with a number of issues—for instance, the program distributed too many permits to companies at the outset, which then overly depressed prices for permits on the market, especially now in light of Europe's sluggish economy.

Opponents also contend that requiring companies to pay to emit carbon could harm economic growth and that U.S.

emissions reductions could prove meaningless if emissions from other countries are still high enough to cause global climate damage. Countries with a carbon price could also be disadvantaged in global trade if other large economies don't follow suit.

The Cap-and-Trade Approach to Pricing Carbon

Cap-and-trade systems and carbon taxes put a price on carbon in different ways. Here's how cap-and-trade, the more common of the two approaches, works:

Laws or regulations cap the amount of carbon-dioxide emissions allowed from sectors of the economy or the whole economy.

The government auctions allowances (permits to emit carbon) or distributes them free of charge. The total amount of carbon emissions permitted under the allowances matches the cap on emissions.

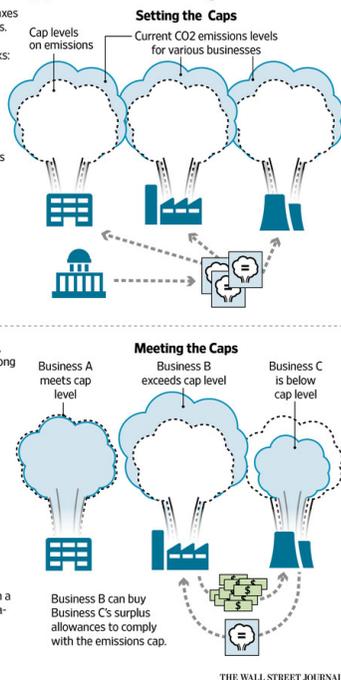
Every source of emissions subject to the cap (such as power plants or refineries) must hold allowances equal to the emissions they produce.

Once these entities have allowances, they can buy and sell them freely among themselves. Supply and demand determines the price of allowances (also known as the carbon price).

Because the allowances are limited and therefore valuable, many of those subject to the cap will try to cut their emissions and reduce the number of allowances they need, selling the rest. Those who find it less costly to buy more allowances than reduce emissions can do so.

The emissions cap can be lowered on a regular annual schedule, giving companies time and incentive to continue innovating and reducing emissions.

Source: Union of Concerned Scientists



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For years, this has largely been a theoretical debate, with the politics of imposing a carbon tax too daunting for many countries, including the U.S. Instead, they have focused on reducing fossil-fuel use, and thereby carbon emissions, through promotion of low-carbon, renewable energy and energy-efficiency standards for industry, government and personal automobiles.

Now, though, there are forces at work that smash old arguments against carbon pricing and make a change much more likely.

A de facto price

For starters, the economic argument for a price on carbon is getting more compelling, as fears grow that

a carbon-related event could pose an increasing threat to the economy. Without a transparent, unified market value on carbon, there is no way to determine or offset the full extent of the risk, or to know when a risk could arise. Guessing at that value means that an unexpected trigger event—such as a flight from stocks of companies that depend on carbon-based assets, or a steep drop in the price of carbon-based assets—could create

a shock that cascades through the economy.

A price on carbon is also likely because there is *already* a de facto price on carbon, and energy companies have already accepted it as part of the cost of doing business—so accepting an official cost isn't a huge leap to make.

The de facto price comes from a web of regulations at the federal and state levels. We say utilities must use renewable energy. Or cars must meet higher miles-per-gallon targets. Or the methane from a shale well cannot be vented or flared. California, meanwhile, has created an outright cap-and-trade system. (A vote to extend the system past 2020 failed in the Legislature last week, but new, harsher climate rules might give the extension a better chance to pass next year.)

The cost of complying with all these regulations amounts to a “shadow” carbon price that companies must pay, whether they call it a tax or not, and they are already baking it into their calculations. From my research and interviews, for instance, I estimate that oil companies assume a long-run carbon price of \$40 to \$80 a ton on their carbon emissions when weighing a new oil-field development. If the project won't return 15% under those conditions, it doesn't get the green light.

In addition, other major U.S. trading partners have priced carbon, and so Americans already pay for carbon in goods from those countries, which include European Union countries, Japan and South Korea.

Meanwhile, the cost of technology that helps companies comply with those regulations and cut emissions has fallen drastically—and is much less burdensome than critics used to claim. The cost of solar panels, for example, has dropped by more than 70% since 2009 and puts the cost of solar power at parity with natural gas in some markets. The cost of battery packs for electric cars or backup solar-energy storage, storing solar power for later use, has declined by 50% or more. The Internet of Things is also enabling efficiency in a manner that is highly cost-effective and accessible.

In addition, the argument that such a climate policy would disadvantage the U.S. economy against competitors such as China has lost a lot of its punch. At the recent meetings of the World Economic Forum in Tianjin, China, the host nation announced its intention to launch a nationwide cap-and-trade carbon-pricing market. Scholars working on the plan say it will take into account lessons from California's relatively new carbon market and a similar system in the European Union.

Rather than hurt China economically versus the U.S., the cap-and-trade system might arguably promote China's burgeoning but already strong clean-tech industry and help it scale up and grab market share, as it has already done with photovoltaic solar panels. That will be a salient precedent for U.S. lawmakers, energy companies and other parties with a stake in carbon pricing and will create a strong incentive to push carbon pricing forward in the U.S.

Strong new advocates

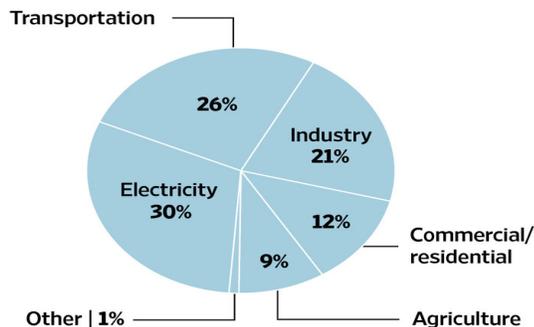
But perhaps the most important reason a carbon price is inevitable is that the big players that used to oppose it—such as utilities, oil companies and institutional investors—have started to back it, and more will follow.

Several oil companies supported the early stages of a failed cap-and-trade bill in 2009. Exxon Mobil Corp. has been actively supporting a revenue-neutral carbon tax, saying the industry shouldn't oppose all climate policies and arguing that a carbon tax would be the best way to price carbon. (Exxon says that if carbon policies are going to be put in place, it would prefer a carbon tax that is revenue neutral and that pre-empts all of the “mishmash” of carbon-reducing policies.) Likewise, Total SA has said it is categorically in favor of a price.

What is driving them? A desire for clarity. The current ad hoc nature of carbon rules leads to uncertainty. Because there's no coherent single policy, many of the rules conflict with one another and can change at a moment's notice, so projects that seem like good ideas under today's rules may turn out to be losers under tomorrow's. That

Something in the Air

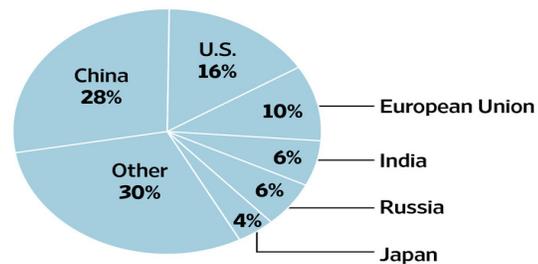
Greenhouse-gas emissions by sector in the U.S.



Note: Figures are for 2014
Source: Environmental Protection Agency

Country Count

Share of global carbon-dioxide emissions from fossil-fuel combustion and some industrial processes



Note: Figures are for 2011
Source: Carbon Dioxide Information Analysis Center,
U.S. Energy Department
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uncertainty carries a heavy price, as companies risk making disastrous investments and institutional investors hold off making bets on the energy sector.

For example, major U.S. utilities have to decide whether to shift into solar energy or continue to put investment into their newer coal plants, including coal plants with carbon capture and storage. Several major U.S. utilities have run afoul of such decision making in recent years with significant consequences to both their share prices and their customers. If these managements had had the benefit of certainty about the price of carbon, the decision about such capital investments and their payoffs would have been clearer. Long-term cash flows would be more predictable, helping shareholders and boards alike to calculate whether the firms

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could meet return expectations with one kind of fuel versus another. A settled pricing of carbon externalities might also discourage the kind of lawsuits that have dogged capital projects in the Southern U.S. and caused delays that are raising costs to customers.

Regulating carbon differently in different states is also causing costly market inefficiencies by distorting corporate incentives, leading companies to take actions today that may not make sense when a national system arrives. Brands that cater to climate-conscious millennials are taking their headquarters and manufacturing operations out of states that don't have substantial renewable-energy programs to places that do have them. Biofuels made with processes that have lower emissions are being sold to California to cash in on carbon credits, even though they could be used right where they are produced. Electric utilities that have surplus power generated by renewables have no commercial incentive to sell them across state lines, limiting their usefulness and in some cases sacrificing benefits to customers.

A federal cap-and-trade system would allow utilities to more easily trade pollution rights or renewable energy across state lines. The same is true for a carbon tax since different levels of abatement will come from different states, with the ones that can abate most cheaply doing the most.

The lack of clarity also affects investors and lenders. There are signs that they may shy away from certain segments of the energy sector if they can't make informed decisions about where to put their funds—potentially leaving energy companies undercapitalized and leading to inability to meet demands for fuel and power. In a Sector In-Depth note from June analyzing the global carbon accord, Moody's Investors Service argued that



PHOTO: BLOOMBERG NEWS

policy and regulatory uncertainty regarding the pace and detail of emissions policies “is material to credit quality now” for many companies involved in the energy business. Moody’s also said “the credit impact could become material over the next three to five years” for industries including building materials, steel and auto makers.

For all these reasons, I believe companies are wasting shareholder dollars suing to prevent or delay carbon policies. They would be better advised to prepare for the carbon-priced future that is already here. Embracing a price on carbon would go a long way toward quantifying the risks more precisely, and that would help push investment to the projects with the best long-term potential. That, in turn, will make the U.S. more competitive, reduce the risk of stranded assets and position the country to hold its lead in emerging industries such as utility-scale solar, ride sharing and batteries.

Ms. Jaffe is executive director of energy and sustainability at the University of California, Davis, and co-author of “Oil, Dollars, Debt and Crises: The Global Curse of Black Gold.” She can be reached at reports@wsj.com.