China’s emissions trading program is slowly forward toward implementation. It’s by no means a perfect program, but it should result in significant emissions reductions.

The Chinese program has some features that make it less cost-effective. Nonetheless, researchers at RFF concluded that the climate benefits will be three times the cost of emission reductions. They didn’t try to model the benefits of reduced air pollution, which would make the ratio even more favorable.

The Standard Approach to Emissions Trading.

n trying to understand the Chinese system, it’s helpful to start with California’s version of emissions trading. There are lots of bells and whistles, but the basic idea is simple. California sets a cap on total carbon emissions in a given year. That converts into a fixed number of “allowances,” which are permits to emits one ton of carbon. The 2020 cap is about 325 million tons of carbon, so the state issues 325 million allowances.

California firms are given some allowances for free and have to buy others at auction. No matter who gets the allowances, the total emissions are going to equal the cap. Some firms may be able to lower emissions cheaply. They’ll need to buy fewer allowances, and if they received any for free that they don’t need, they can sell them. Other firms that can’t lower emissions will be buying allowances to try to cover their shortfalls.

The California system creates two incentives. First, any firm whose emissions are above zero has an incentive to reduce production. Every additional unit of production means more emissions, which have to be paid for. (If the firm happens to have more free allowances than it needs, every unit of production means fewer allowances to sell, thereby foregoing income from the sales.) Second, firms have an incentive to reduce the amount of emissions per unit of output. For instance, if a utility can replace a coal-fired plant with a natural gas plant producing the same amount of power, it can cut its emissions dramatically and save money on allowances. Because everything depends on the amount of carbon emitted, which is capped, this is called a mass-based system.

A Variant Trading System: CAFE Standards.

Another approach to reducing emissions is to focus solely on reducing the rate of emissions per unit of output. That’s what the U.S. does with cars. By requiring that cars getting higher mileage per gallon, the government in effect reduces the amount of carbon emissions per mile. Some trading is allowed between companies. You’ll notice, however, that this

creates no incentive on car owners to drive less. It also creates only a small incentive to buy fewer cars, because the standards are deliberately set at a level that won’t raises new car prices enough to substantially impact sales. Thus, energy efficiency standards have little effect on output of a product, but per-unit emissions go down, in this case in terms of carbon emitted per mile traveled.

The Obama Administration’s Clean Power Plan gave states the option of adopting something like the CAFE approach for electricity generators. This option involved setting requirements based on emissions intensity (carbon emissions per megawatt) rather than on the total amount of carbon emitted. This was one of many reasons why the Clean Power Plan was really a very moderate effort, although you wouldn’t know that from the fossil fuel industry’s howls of outrage.

China’s Emissions Trading System.

The Chinese system is basically like the U.S. fuel efficiency standard. Rather than setting an overall cap, it sets benchmark emission rates for certain categories of facilities. (For that reasons, it’s called a “rate-based” approach, unlike California’s mass based approach.) For instance, coal-fired plants might have a bench mark rate of *X* tons of carbon per megawatt of power, while for natural gas plants the benchmark might by *Y* tons per megawatt. Except to the extent that efficiency improvements raise the cost of generation, there’s no incentive for consumers to buy less power or for producers to sell less. The total amount of power (and hence emissions) will mostly be dictated by economic forces, but given that total amount, there will be fewer emissions than there would be otherwise. So basically, the Chinese system gives up on one channel for reducing emissions by reducing power generation.

How does trading come into this? Plants get emissions allowances based on the benchmark emissions rate times their actual amount of output. (Again, you can see that there’s nothing here to discourage output.) They can then trade those allowances. This actually makes the output problem worse. The reason is that if you have an unusually efficient plant, to pays to increase your output. Every unit of extra output is freeing up emissions that you can then sell to other plants. So rather than being neutral about the level of a plant’s output, like a pure efficiency standard, the Chinese plan actually encourages some plants to increase their output and their emissions.

The result of this is that reaching any given level of national emission reductions costs more than it would under the California system. Since the Chinese aren’t using the output

channel for reducing emissions, they have to lean extra hard on the efficiency standard, which adds to costs. Another problem with the system, if I understand it right, is that undermines incentives to switch technologies. If you have very efficient gas-fired generators, you get allowances to sell, whereas if you switch to renewables, you don’t get the allowances.

The Chinese have reasons for taking this less cost-effective approach. First, unlike the California approach, this system automatically adjusts to changes in economic conditions. In California, if there’s high economic growth, this will tend to raise the allowance prices becomes firms are trying to increase production. The opposite is true in a downturn. China avoids those fluctuations. Second, the Chinese system has less impact on prices. China has reasons to keep electricity prices down, partly to avoid public dissatisfaction and partly to avoid burdening its export industries. And third, the costs of reducing emissions are more evenly spread. For instance, rather than reducing emissions by shifting generation to gas-fired plants and thereby whacking coal-fired plants, plants in both categories have to share in emission reduction efforts because the two categories have different benchmarks. So the Chinese approach does have its good points, but they come at the expense of higher overall costs.

Conclusion

Economists would much prefer the California plan because its more cost-effective. But as the Chinese approach indicates, that’s not the only way of doing things. If you want to reduce emissions but have other policy goals as well, there are ways of making that work. I

Chinese has moved more slowly on implementing the plan than most of us would like. The coronavirus epidemic may result in further delays. But we’re hardly in any position to complain about the slow pace. Better to move forward slowly than to furiously race backwards, as our own federal government is doing.