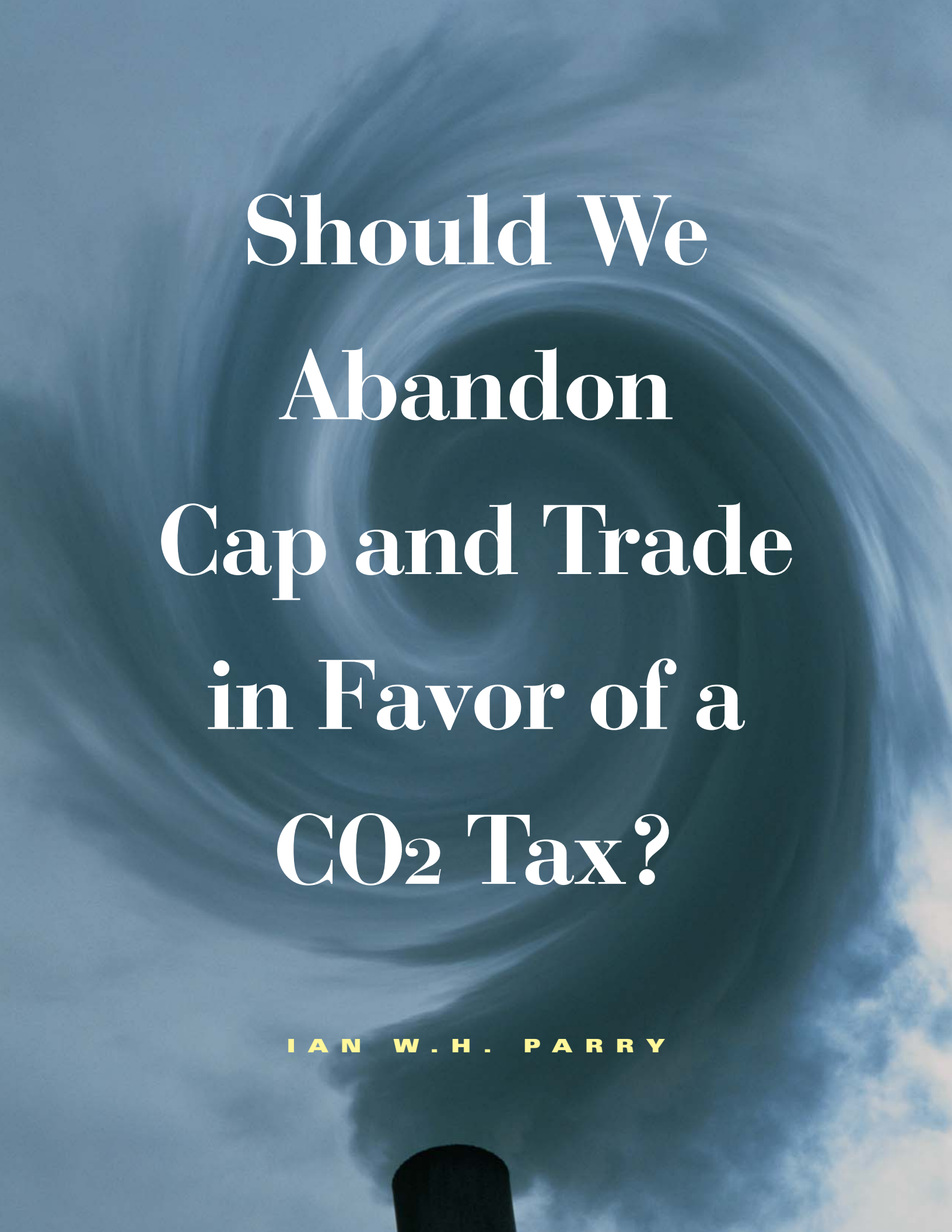

Should We Abandon Cap and Trade in Favor of a CO_2 Tax?

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With solidifying scientific evidence that global warming is occurring, the birth of carbon emissions trading in Europe, and various mitigation initiatives at the state level, pressure on the federal government to control carbon dioxide (CO_2) has reached fever pitch. In May, President Bush announced that the United States will work with other nations to establish a new, post-2012 framework on greenhouse gas emissions, with an emphasis on adaptation and energy-efficient technologies. Meanwhile, following the success of the sulfur-trading program imposed on the power sector, the momentum in Congress is clearly for some form of cap-and-trade permit system: at least half a dozen climate proposals active in Congress mandate or recommend such systems. But before Congress passes new legislation, there is a serious alternative to consider: a CO_2 tax.

A CO_2 tax has a number of advantages over pure emissions trading systems. In particular, if the revenues are used to reduce other taxes, the policy may benefit the economy overall. And by fixing the price of CO_2, the tax also avoids problems that might be caused by permit price volatility under an emissions trading regime.

How to Design a CO_2 Tax

Ideally, a CO_2 tax would be imposed on fossil fuel suppliers according to the amount of carbon that will be released into the atmosphere when the fuel is combusted. As with the permit price under the alternative cap-and-trade system, the tax would be passed forward into the prices of coal, natural gas, and petroleum products, and ultimately in the price of electricity and other energy-intensive goods. Higher prices would encourage the adoption of fuel- and energy-saving technologies across the economy and a shift from carbon-intensive fuels, like coal, to natural gas and renewable fuels. A system of tax credits could also be incorporated to encourage forestry expansion to sequester CO_2 or the inclusion of carbon capture and sequestration technologies in the construction of new power plants.

From an economist's perspective, the tax should reflect the costs to the world from the future global warming potential of CO_2. These costs encompass damages to agriculture, protection of valuable coastal land against sea-level rises, health impacts from the spread of tropical diseases, the risk of extreme climate change scenarios, and so on. Estimating these costs is a formidable and controversial challenge, given the enormous uncertainty over future climate change scenarios. Most mainstream economic assessments value the damages from today's emissions at around $\$5–\$15$ per ton of CO_2. But obviously damages could be much

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greater if, as many argue, more weight should be given to ecological effects, the well-being of future generations, or the risk of abrupt climate change. The damage per ton of CO_2 increases over time, meaning that the tax should ramp up each year. Congress could periodically review this CO_2 tax "escalator" and adjust it in light of new evidence on the seriousness of global warming.

Suppose, for the sake of argument, that a tax of $10 per ton of CO_2 were implemented now: it would reduce annual CO_2 emissions by roughly 5 percent and currently raise annual revenues of about $55 billion, or about 6 percent of federal receipts from individual income taxes. If all this CO_2 tax revenue is recycled in an across-the-board cut in income taxes, how would this affect the economic impact of the tax?

Economic Effects of CO_2 Taxes

Income taxes impose costs on the economy as they distort household behavior in a variety of ways. For example, by lowering take-home pay, they can encourage some people to stay home rather than go out to work, and they discourage people from saving because part of the returns are taxed away by the government. Taxes also encourage too much spending on goods that receive special tax preferences. For example, the deductibility of mortgage interest from income taxes encourages people to spend more on housing than they otherwise would, while the exemption of employer-provided medical insurance from income and payroll taxes leads to an excessive amount of workplace compensation provided in the form of these fringe benefits.

Leaving aside the benefits from slowing climate change, CO_2 taxes also distort the economy in different ways. In particular, they induce costly investments throughout the economy to conserve on energy, and they induce industry to use cleaner, more expensive fuels than they otherwise would. And by driving up energy costs, CO_2 taxes would also have a harmful impact on economic activity and employment, which exacerbates some of the distortions created by income taxes.

Although there has been some dispute among analysts, recent research studies suggest that up to a point, raising extra revenue from CO_2 taxes may involve smaller overall economic costs than raising that extra revenue from income taxes. This means that shifting some of the tax burden off income and onto CO_2 may reduce the overall distortions created by the tax system, providing a positive economic benefit (in addition to the climate benefit); put another way, moderate CO_2 taxes of $10 or $20 per ton may have very small and perhaps even negative costs.

But the debate over what to do with the revenues from a CO_2 tax goes beyond offsetting incomes taxes. Some analysts have suggested that the revenues should instead be used to reduce the federal budget deficit, which would lower the burden on future, rather than current, taxpayers. However, when new revenue sources accrue to the Treasury, rather than being automatically offset by tax reductions elsewhere, some of the extra revenue might ultimately finance more public spending, which may not have the same social value as cutting distortionary taxes. Moreover, cutting the deficit might have the perverse effect of reducing pressure for badly needed reforms to the entitlement system.

Is It Feasible?

Three practical arguments are made against the CO_2 tax shift. First is that influential producer groups—refineries, steel companies, airlines, and electric utilities, for example—must be compensated if climate legislation is to go forward, and that this compensation is easily

provided by giving away free permit allowances to firms under a cap-and-trade system. Second is that voting for any new tax—even if offset by tax reductions elsewhere—can be electoral suicide for members of Congress. For example, the first Clinton administration failed to implement a broad energy tax, despite a major effort. Third, even if a tax regime does go forward, based on how Congress has used new revenue sources in the past, CO_2 tax revenues may end up being wasted in special-interest spending, rather than being used to substitute for other taxes.

Transitory tax relief and exemptions could also be provided to adversely affected industries under a CO_2 tax. However, a danger here is that such compensation schemes open up the floodgates to any number of lobby groups claiming to be deserving of compensation. One of the key arguments for CO_2 taxes over cap and trade is seriously undermined if a large portion of the revenue is used up in compensation schemes rather than used to cut other taxes.

Perhaps the revenue-neutral CO_2 tax will be in the political wilderness for some time, though no one can predict what might be politically feasible down the road with different leadership and more concern among the general public about global warming. Al Gore, at least, argues for using CO_2 tax revenues to lower payroll tax rates. But in the meantime, it is critical that policymakers fully appreciate the magnitude of the additional economic benefits that could be exploited if we were to go the tax route, with judicious use of revenues.

Taxes versus Permits: A Closer Look

If a cap-and-trade system is implemented with all permit allowances given away for free, instead of a revenue-neutral CO_2 tax, the cost to society is the economic efficiency gains that could have been realized from recycling new revenues into income tax reductions. I would put this extra cost at roughly $20 billion per annum, for a near-term 5 percent emissions reduction, and around $35 billion for a 10 percent emissions reduction. Clearly, there is an awful lot at stake here.

Another advantage of using CO_2 tax revenues to lower personal income taxes is that the benefits are spread over most households as compensation for higher electricity and fuel prices. And the tax cuts could be tilted in favor of lower-income groups by extending the earned income tax credit, for example. In contrast, studies have shown that freely allocated permit systems can be highly inequitable; the reason is that firms receiving allowances reap windfall profits, which ultimately accrue to individual stockholders, who are concentrated in relatively high-income groups.

The potential volatility of carbon permit prices (if not addressed through other design features) is another potentially serious problem with emissions trading programs. Price volatility can arise because the supply of permits is fixed by the government but the demand for permits may vary considerably year-to-year with changes in fuel prices and the demand for energy. In contrast, a CO_2 tax fixes the price of CO_2, allowing the amount of emissions to vary with prevailing economic conditions. Uncertainty over the future price of CO_2 may deter CO_2-saving investments with high up-front capital costs, such as carbon capture and sequestration technologies. CO_2 price volatility may also deter applied R&D efforts at firms to develop cleaner technologies for the future.

Moreover, ideally the marginal costs of reducing emissions should be equated from year to year, accounting for discounting of future costs to the present. This equality is roughly achieved under a CO_2 tax that rises at the rate of interest over time because in each period firms should reduce emissions until the cost of extra abatement equals the savings in tax payments. However, it is not achieved under a cap-and-trade system. For example, in years when

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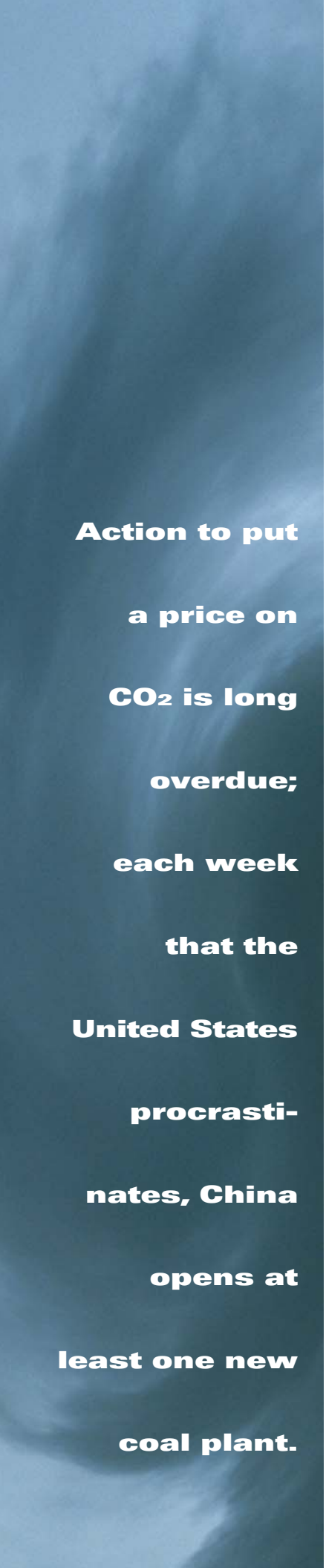

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the demand for energy is strong, the marginal costs of meeting the cap may be very high, implying that the cap is too tight; in contrast, when the demand for energy is slack, the marginal costs of meeting the cap may be very low, implying that the cap is too lax. In this regard, an influential study by my colleague William A. Pizer, an RFF Senior Fellow, suggests that the net benefits over time (climate change benefits less emissions compliance costs) under a cap-and-trade system might be only a small fraction of the net benefits under an appropriately scaled CO_2 tax.

At first glance then, the economic arguments for abandoning cap and trade in favor of a CO_2 tax shift appear to be overwhelming. However, permit systems can be designed to at least partly, if not fully, overcome some of their handicaps. Revenues can be raised under a permit system if the government auctions allowances rather than giving them away for free. Most climate bills now under consideration envision a transition to more permit auctioning over time. But, unfortunately, the transition to permit auctioning is slow, and at the moment the bills do not offset the auction revenues with other tax reductions.

As for permit price volatility, this can be contained to some extent by including a "safety valve" provision and allowing firms to bank unused permits. With a safety valve, firms can buy additional permits from the government in periods when the permit price reaches a trigger level; this keeps a cap on prices when the demand for permits is high. And with permit banking, in periods when the demand for permits is slack because abatement costs are low, firms have an incentive to hold over some allowances for use in future periods when higher permit prices are expected. This mechanism helps to create a floor under permit prices.

An Opportunity for American Leadership

Although the appropriate design of cap-and-trade systems can help to blur some of their differences with tax-based approaches, in my view, the economic case for a revenue-neutral CO_2 tax is overwhelming. The costs of the policy are small, perhaps even negative, and it provides a stable business environment for long-term investment decisions.

Clearly, the practical obstacles to any policy placing a price on CO_2 emissions, let alone a revenue-neutral CO_2 tax, are very challenging. Nonetheless, action to put a price on CO_2 (through either taxes or permits) is long overdue. Each week that the United States procrastinates, China opens at least one new coal plant. Given that the United States is currently the world's largest producer of CO_2 and not part of the Kyoto system, it is the obvious country to lead the world into a successor to Kyoto. And the sooner the United States acts, the sooner international attention will shift toward bringing the rapidly developing nations into an international emissions control regime. ■

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Further Reading

For more discussion of the differences between CO_2 taxes and cap and trade, particularly as part of an international agreement, I recommend William D. Nordhaus, 2007, "To Tax or Not to Tax: Alternative Approaches to Slowing Global Warming," *Review of Environmental Economics and Policy* 1: 26–44.