

How Offsets Defeated the Kyoto Protocol And Left Only One Choice

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Abstract

Developing countries sell carbon offset credits at a profit, but that profit would be reduced if they accepted a cap on emissions. This linkage increases their resistance to accepting such caps. Also, the profitability of offsets motivates developing countries to insist on stricter caps on industrialized nations, because stricter caps increase the demand for offset credits supplied by developing countries.

Caps on their own emissions, however, have now been rejected by developing countries. This leaves offsets, on a massive scale, as the only path within the Kyoto framework for restraining the bulk of emissions growth. But offsets over-pay for emission reductions, and are inefficient and often corrupt. Hence offsets could never be implemented on a sufficient scale to succeed. Instead, a new path to international commitment is required.

The remaining possibility for commitment is flexible global carbon pricing, which allows a choice of cap or tax. Developing countries could accept an equal tax, because it leaves them room to grow to the level of developed countries instead of temporarily capping their growth. The lowest emitters would receive international assistance conditional on the implementation of a carbon tax, and Europe could keep its caps.

Introduction

INTERNATIONAL OFFSET CREDITS have derailed climate negotiations. The United Nations' Clean Development Mechanism (CDM) allows emission-reduction projects in developing countries to issue Certified Emission Reduction credits (CERs). European emitters buy these credits and thereby pay poor countries to emit less.² Credits like these are termed "international offset credits" by the Waxman-Markey bill now before the U.S. Congress. According to the Environmental Protection Agency, if this bill becomes law, the United States will spend \$20 billion to \$100 billion annually through 2050 on such "offsets."

The hope of cashing in on CDM payments encourages poor countries to refuse to be capped and to demand that ever tighter caps be placed on industrialized nations. These are the two points of contention blocking the progress of international climate negotiations. Stanford researchers Michael W. Wara and David G. Victor (2008) pointed out the first of these two problems over a year ago: "The actual experience under the CDM has had perverse effects in developing countries—rather than draw them into substantial limits on emissions it has, by contrast, rewarded them for avoiding exactly those commitments."

As is well known, offset markets invert the normal market relationship, paying for lack of harm rather than for goods. Inevitably, such markets provide incentives for the type of corruption that haunts the CDM. But this paper considers, instead, the incentives that such offsets provide for developing countries to alter their negotiating positions in the next step of the Kyoto process.

International offsets provide a potentially significant source of revenue and foreign exchanged for developing nations. However, if a developing nation accepts a tight enough cap on emissions it will find itself importing carbon allowances instead of exporting offsets. In fact, any effective cap will reduce offset profits. This loss of profits provides one reason for developing countries to refuse meaningful caps.

¹ I would like to thank Dan Kirshner for his comments and corrections. Remaining errors are my own.

² Within limits set by the purchasing nation, offsets are interchangeable with cap-and-trade allowances. A one-tonne offset allows an emitter to emit one CO₂-equivalent (CO₂e) tonne of greenhouse gas.

Note that this incentive is generated by the prospects of future profits and not by the realization of past profits. Consequently the incentive to refuse caps has already been augmented by the U.S. cap-and-trade legislation, still before Congress, with its potential trillion-dollars' worth of offset payments.

TWO PREDICTIONS follow from this analysis. First, nations which benefit significantly from offsets will take strong positions against accepting meaningful caps. Second, developing countries will demand that developed countries accept caps that commit them to dramatic emission reductions. This second prediction follows from the observation that tighter caps on industrial nations channel more of their compliance effort into the purchase of foreign offsets, which means greater profits for developing countries.

THE LEADER-FOLLOWER HYPOTHESIS predicts, in opposition to the offset hypothesis, that China will accept a meaningful cap once the United States has done so. This popular view was recently expressed by Al Gore (Guardian, 2009), "If the United States leads, China will follow." However, on June 11, after a U.S. cap had become likely, the Associated Press (AP, 2009) reported that President Barack Obama's climate envoy, Todd Stern, acknowledged that China would not accept a cap.

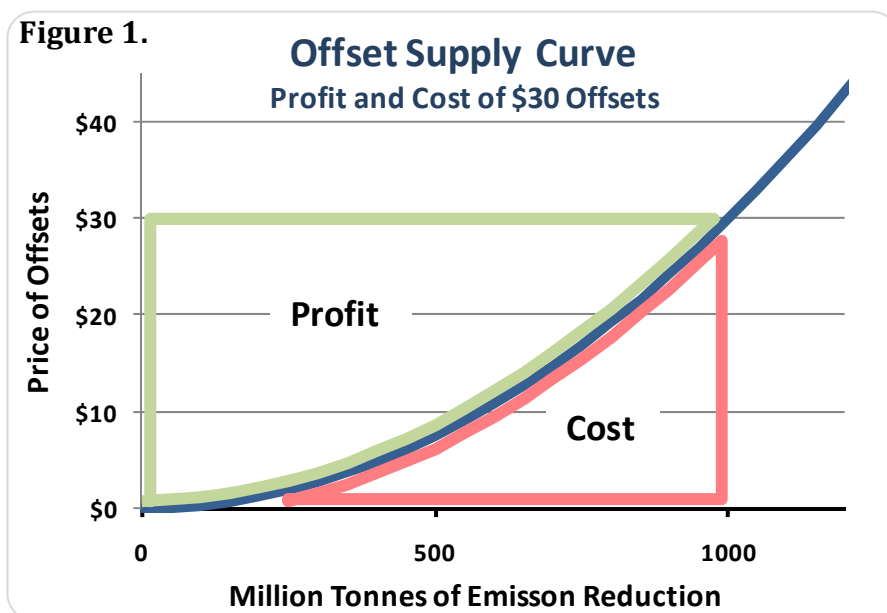
At this time the anecdotal evidence seems to be running strongly in favor of the offset hypothesis. As Reuters (2009) reports, "China and many other developing countries want the rich to cut by at least 40 percent below 1990 levels by 2020." Hence it seems prudent to accept the offset hypothesis as our working hypothesis when considering national policies and future negotiating positions. This leads to two policy recommendations. First, foreign offsets should be phased out as quickly as possible. Second, foreign climate assistance should be tied to the acceptance of a binding commitment. And since caps are now out of the question, those commitments should be to place a price on carbon.

The first policy recommendation may now be underway in Europe as reported recently in the New York Times (Gronewold, 2009).

In a bid to pressure major polluters from the developing world to adopt binding emission reductions, E.U. regulators are threatening to ban the import of CERs from all but the poorest nations and small island states in future rules proposed for the European Union's own Emission Trading Scheme.

Paying Nations Not to Cooperate

THE INCINERATION OF HFC-23 has provided the most prolific source of offsets to date. This chemical, a by-product of refrigerant production, is rated as 11,700 times worse than CO₂. So incinerating one ton allows the owner of the incinerator to sell 11,700 tons of offsets at something like \$15 per ton. The cost of incineration is a few percent of the generated revenues.



HFC-23 incineration illustrates the low-cost tail on the offset supply curve, which is available for offset projects when a country is not committed to reducing greenhouse gas emissions on its own. Typically the beginning of a supply curve might be modeled as quadratic as shown in Figure 1. In fact both empirical studies, such as one by McKinsey & Company (Enkvist, 2007), and theoretical studies, such as one by MIT researchers (Paltsev, 2007), find that the tail is longer and lower than indicated by a quadratic supply curve.

OFFSETS MAY TRIPLE THE INCENTIVE to reject a cap. If the global market clearing price of offsets is \$30, then a country with the illustrated supply curve can sell about 1,000 million tonnes of offsets and earn \$30 billion in revenues. But, after subtracting costs, its profit will be only \$20 billion. On the other hand, if it commits to a cap or a tax with a \$30 price of carbon, it will need all these carbon reductions to meet its cap and it will bear the \$10 billion cost itself. The incentive to avoid such a cap is the lost profits plus the costs, or the full \$30 billion. Were it not for offsets, the incentive to avoid a cap would be only the abatement cost of \$10 billion. For a quadratic supply curve, the full cost of implementing a cap when offsets are available is three times the full cost of implementing a cap when offsets are not available.³

Hence the availability of offsets increases the resistance of developing countries to accepting a binding cap or a mandatory carbon tax. And corruption in the offset market, which makes offsets more profitable, will increase this disincentive to commitment. Other deficiencies of caps may already have ruled them out for developing countries, but a carbon tax lacks most of these deficiencies. So, a tax may well prove acceptable, provided the offset disincentive to commitment has been removed.

Huge Emission Reductions

FORTY PERCENT BELOW the 1990 level by 2020—that is the emissions target frequently set for Industrialized nations by developing countries. Meanwhile, according to the Environmental Protection Agency, the Waxman-Markey bill is estimated to achieve a return to the 1990 level only after 2030. Of course, it claims to accomplish much more. The discrepancy is largely due to foreign offsets.

Europe has also relied significantly on foreign offsets. In other words, even for modest emission cuts, developed countries turn to foreign offsets to keep the price of carbon allowances low. As caps are tightened, the cost of domestic reductions will grow, and with it the pressure to allow offsets. Already, under the Waxman bill, foreign offsets range from 27 percent of the cap near the beginning to 147 percent in 2050. It seems likely that the bulk of any tightening of the cap would be met mainly with increased foreign offsets.

OFFSET PROFITS spur the demands for emission cuts. Surely the developing countries that are demanding emission cuts are well aware that the developed countries will not cut their domestic emissions that much. So, in effect, developing countries are demanding that developed countries buy more offsets. Deeper cuts mean more offset purchases, which mean greater payments from rich to poor nations. Because of the effect demonstrated in Figure 1, this means more profits for developing countries.

Hit the Reset Button

WITHOUT CAPS, only voluntary measures and offsets remain. At this point it appears certain that the developing countries will not accept caps. Within the limits of the Kyoto approach, that leaves only two methods for reining in emissions growth in developing countries—voluntary national programs and foreign offset programs. Since the Kyoto conference in 1997, the United States and China, along with most other nations, have tested the voluntary approach with remarkably little success. Developing countries have a strong focus on growth, and while foreign offsets are in play, they have an extra disincentive to take voluntary measures. So both experience and logic suggest that, within the Kyoto framework, foreign offsets are the only remaining option for significant reductions in greenhouse gas emissions.

ONLY A MASSIVE RAMP-UP of the troubled Clean Development Mechanism (CDM) administered by the United Nations could take the place of emission caps on developing countries. To gain perspective on the re-

³ The effect shown in Figure 1 is not a new discovery but an old concept known to economists as “infra-marginal rent.” Figure 1 simply applies this concept to the production of offset credits.

quired volume of offsets, consider the Environmental Protection Agency's estimate of what will happen by 2030 under the Waxman-Markey draft bill (EPA, 2009). The EPA estimates that the United States will achieve a 24 percent emission reduction from business as usual with an allowance price of \$41/tonne of CO₂e. By analogy, achieving a 24 percent emission reduction from business as usual for the non-OECD countries would cost \$250 billion in annual offset payments. This would still leave these countries with a 12 percent emissions increase over 2010.⁴

LACK OF EFFICIENCY is the first of two reasons that the \$250-billion cost estimate is likely to be significantly understated. The offset approach lacks the efficiency of carbon pricing because it cannot reach the billions of small decisions that drive most energy efficiency choices. For example, offsets cannot reward choosing a smaller car, sharing a ride, or designing an energy-efficient building—the administrative process is simply too cumbersome.

CORRUPTION is the second cost amplifier. It takes the form of offsets issued for projects that are part of business as usual. An offset program is a market that pays people not to do harm—emit carbon. This is the inverse of a market for “goods.” In the private sector, a market that pays someone not to do harm is known as a “protection racket,” and without tight U.N. supervision, the CDM would quickly become such a racket. Fully overcoming such perverse incentives through tight regulation is simply impossible, and consequently the CDM has produced a myriad of questionable projects. Even the U.N.'s most trusted verifier of such projects, Det Norske Veritas, had to be suspended for faulty verification just last December (Young, 2008). The economic incentives of the CDM, or any other offset program, are misaligned from top to bottom.

THE COSTS ADD UP. Quite likely, inefficiency and corruption will at least double the cost of offsets for the level of abatement described above, and the damage could be much worse. Also, as shown in Figure 1, even completely legitimate offset costs will be roughly triple the cost of the emissions abatement itself. When these three factors are combined, inherent overpayment, inherent inefficiency and corruption, long-term public acceptance of a half-trillion-dollar-per-year transfer to foreign countries seems completely out of the question.

Non-OECD countries already account for over half of global emissions, and between now and 2030, their business-as-usual emissions are expected to grow seven times faster than those of OECD countries. With caps off the table, voluntary controls inadequate, and offsets impossibly costly and unpopular, only one option remains. Hit the reset button.

Rethinking Kyoto

A GLOBAL EXTERNALITY problem, such as climate change, causes every nation to prefer to do almost nothing. Most of the benefit of individual action accrues to others. This problem can be solved only by having each country commit to “doing its part” provided that all of the others—or at least most of them—do their part. This was the point of the Kyoto process and is still the only goal worth pursuing.

But if “doing its part” does not mean accepting a cap, what can it mean? The answer according to almost every economist is taxing carbon. Such a universally acclaimed answer should not be ignored. But because of entrenched cap-and-trade systems, a more flexible answer is required. That would mean a commitment to carbon pricing.

Carbon pricing can mean either a carbon cap or a carbon tax. One requires emitters to pay for emission permits; the other requires them to pay a tax.⁵ Developing countries will not accept caps, but a carbon tax avoids their main objection to caps. Unlike an effective cap, which, must be set many times lower than the caps of developed countries, the same tax is appropriate for every nation. Since the tax is compatible with every level of development, it will not be viewed as capping or stopping the development of poor countries.

⁴ The OECD (Organization for Economic Co-operation and Development) includes North America, most of Europe, Japan, South Korea, Australia and New Zealand (DOE, 2009, Table A10).

⁵ The European Union will probably retain its caps, although when Sweden takes over the presidency in July, its Prime Minister, Fredrik Reinfeldt, says he will push for carbon taxes instead.

UNLIKE A CAP, a policy of taxing carbon requires no offsets, because offsets are only needed to tamp down allowance price fluctuations. Moreover, it is crucial for nations that retain caps under a global pricing system to stop their use of offsets. International offsets discourage developing nations from committing to a tax just as they discourage them from committing to a cap.

But even with global taxing, the poorest countries, such as India, will deserve some help. They have contributed almost nothing to the climate-change problem, and they are much poorer than even China. Fortunately, helping poor countries with below-average emissions per capita is far cheaper than paying for an equally effective level of offsets. This is because paying even the full cost of a carbon tax would avoid paying for the profits, inefficiencies and corruption that must be paid for with offsets. But payments to low-emission countries must follow one key principle. Pay for cooperation and do not reward lack of cooperation.

TRANSFER PAYMENTS of any kind will be subject to intense political pressure. To avoid manipulation and endless negotiation, there should be a simple formula that applies to all countries. High emissions-per-capita countries would pay low-emission countries—provided they implement the required carbon tax.⁶ This would likely mean that China would not be paid—savings much of the cost of offsets—because China's emissions per capita are already above the world average.

But then why should China participate? Consider its choices. If it refuses participation, global cooperation becomes unlikely. But if China joins a global effort, it reaps the rewards of efforts by all the other nations that participate in the effort.

A LOWER WORLD PRICE OF OIL is one of these rewards, and it has been overlooked. China would find a lower and more stable world price of oil most attractive, since it is projected to import 80 percent of its oil by 2030. Unfortunately the environmental movement appears to have misunderstood, and has almost entirely ignored, the benefit of lower world oil prices. (The misunderstanding is likely caused by forgetting that the world prices of oil can be low while the domestic price is high—if domestic oil is subject to a carbon tax or a cap-and-trade policy.)

World oil prices can only be reduced by reducing the global demand for oil. Climate stability can only be achieved by reducing global carbon emissions. These goals are not antagonistic, but rather, highly aligned. Emphasizing the oil-price benefits of climate-driven fossil-fuel reductions is essential to winning China's acceptance (Stoft, 2008, p. 245).

At least three discussions of global carbon pricing are already available. William Nordhaus (2008) gives an excellent theoretical overview with little detail. Richard Cooper (2009) describes a system of global carbon charges that accommodate the E.U.'s carbon caps, provided the E.U. limits the price-fluctuations of allowances. And Stoft (2009) describes a yet more flexible approach.

Summary and Conclusion

INTERNATIONAL OFFSETS CREDITS, a system of paying companies in poor countries not to emit, leads to corruption at the project level. But more importantly, large foreign offset programs, such as the Waxman-Markey bill, act as an inducement for poor countries not to commit to reducing emission on their own, because such commitments would reduce their profits from offsets.

The huge increase in offset demand that could result from the Copenhagen round of negotiations, is also being reflected in the bargaining positions of developing countries. It has likely played a significant role in preventing any commitment to caps, and it is now fueling the excessive demands for extremely tight caps on emissions from developed countries. Such caps would multiply the flow of foreign offset payments many times over. In effect, the demand for tight caps is a demand for more offset profits.

THE REJECTION OF CAPS by developing nations requires a rethinking of the basis of the Kyoto protocol. At best, over half of all emissions will remain uncapped and these will be by-far the largest source of growth in emissions. Since voluntarily restraint has proved to be inadequate, the only remaining option for controlling developing country emissions within the Kyoto framework is a massive escalation of offsets.

⁶ A sliding scale that made the payment proportional to the compliance level would be better.

But offsets are only sold when they make a profit, which means that offset purchasers must fund both profits and the costs of abatement. From the purchaser's point of view this will roughly triple the cost of abatement. On top of that, add the inherent inefficiency of the offset approach and the accompanying corruption. All told, the offset approach is far too costly and far too vulnerable to criticism to succeed at anything close to the required level.

INTERNATIONAL COMMITMENTS provide the only hope for solving a global externality problem such as climate change. And with commitments to caps ruled out, there is only one remaining choice—commitments to flexible global carbon pricing. This would allow Europe to continue with caps and would allow developing nations to commit to the same carbon price as the United States instead of to caps that are four to ten times stricter.

The offsets used by Europe should be curtailed as soon as possible since they undermine commitment by poor countries to carbon pricing of any kind. And the U.S. Senate should avoid international offsets in its rejoinder to the Waxman-Markey bill. With global carbon pricing, some payments from high emission countries to low emission countries will still be required, but far less than with offsets. And most important, these payments must reward commitments and not discourage them as do offsets.

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