

Kyoto: What Went Wrong?

And how to fix it

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Summary: The Kyoto Protocol failed because the economic instrument selected for its operation turned out to be completely unworkable. That instrument was cap & trade. A better solution would be to use a *Common Carbon Price Commitment*. However, nations could implement their national price using whichever instrument they want, including cap & trade.

In 1997 the US Senate rejected the flawed Kyoto protocol before its text was even finalized because, they said, it required no commitments from developing countries.

NINETY-FIVE U.S. SENATORS rejected a Kyoto type of treaty in July 1997, five months before 150 nations completed the text of the Kyoto Protocol—the actual rules for curbing emissions. The senators said they would not sign a treaty based on the protocol unless it imposed commitments on developing countries. They took a reasonable position, but one that closed the lid on a box the United States had built around the Kyoto process. No one conspired to build this box; it was just the result of unintended consequences.

The reason cap & trade was selected for Kyoto was because it had worked very successfully to reduce sulphur emissions from US coal power stations.

Ironically, a great environmental victory in the early 1990s was the first step in constructing the box. Environmentalists and then-President George Bush ended a multiyear stalemate over acid rain by getting coal-fired power plants to accept emission caps imposed under a cap-and-trade policy. That success earned cap and trade the title of most successful market-oriented approach to emissions control. So when the U.S. team went to Kyoto, that was its proposal—to cap and trade greenhouse gas emissions. In the abstract, it made a lot of sense. But the countries of the world proved to be more complicated than coal-fired power plants.

Countries were all given different caps, and this led to a lot of squabbling.

Countries vary enormously in their levels of greenhouse gas emissions, so it's impossible to cap them all at the same level, and no one suggested that. Instead, the treaty gave every country its own cap. That caused a lot of squabbling and naturally enough led to no caps for countries with low levels of per capita emissions—the poor countries. In effect, China, India, Brazil, and others argued that just because the rich countries started polluting first, they should not get to emit ten times more than poor countries, which have done less damage.

Unfortunately, in a setting where countries are at very different stages of development, it turned out that cap & trade cannot work fairly.

They have a point. But this leaves the Kyoto Protocol with an impossible contradiction. It's unfair to give poor countries caps that are five, ten, or even twenty times lower, on a per-person basis, than those of rich countries. But without such caps, poor countries have no obligation at all, and unfortunately, developing countries have the fastest-growing levels of emissions. China by itself emits more carbon dioxide than any other country, although its per-person emissions are low. Cap and trade sets up a clash between fairness and effectiveness. What is fair doesn't work, and what works is not fair. This is the box that the United States has built around the Kyoto Protocol.

The remainder of this document explains why we must abandon *global* cap and trade in order to begin to solve the problems of climate change and energy security.

Not the “You First Principle”

An early problem with Kyoto was long delays. Negotiators bemoaned countries shying away from being the first to commit.

The International Herald Tribune called it the “You First principle” in June 2008 but says it’s been the main reason for the Kyoto deadlock from the start. Developing countries say “You first,” and we reply, “No, you first.”

Some say that’s why the United States should pass one of the cap-and-trade bills before Congress. The problem seems easy to solve. We go first, and a year later they go. If they don’t go, we have time to back out. Could such a little problem really explain a fifteen-year deadlock?

You would think that if You First is the problem, someone would say, “If you go first, then I’ll follow.” No one is saying that, particularly not the developing countries. They’re saying, “You go, and we won’t go.” That’s a problem that could cause a fifteen-year deadlock—or a fifty-year deadlock.

But the problem was simply that developing countries – including China – refused point blank to adopt any emissions cap at all.

In June 2007, China published its National Climate Change Programme, which says China will follow the U.N.’s principle of “common but differentiated responsibilities.”

China spelled out “differentiated responsibilities” for the Bali Climate Change Conference in December 2007: “The developed countries, whose emissions of GHGs [greenhouse gases] are the main cause of climate change, should have the primary responsibility to cut their high GHG emissions and to channel adequate financial resources and to transfer low-carbon technologies to developing countries. ... On the other hand, the developing countries, who are innocent in terms of responsibility for causing the problem, are by far the biggest victims.”

That’s it for developing-country responsibility. We “have the primary responsibility,” and they “are innocent in terms of responsibility.” That certainly is differentiated. But in case it’s still not quite clear, Ma Kai, head of China’s powerful economic-planning agency, explained it to the New York Times: “Our general stance is that China will not commit to any quantified emissions reduction targets.”

Instead they wanted to tackle climate change in other ways.

This does not mean developing countries will not assume responsibilities. It just means they will not accept emission caps. Caps are out. They’ve been telling us for fifteen years, and they have good reasons. They are not going to change their minds just because we cap ourselves.

But I cut Ma Kai off in mid-sentence. He went on to say, “But that does not mean we will not assume responsibilities in responding to climate change.” In fact, China is probably doing more than the United States is doing. It has adopted stricter fuel-efficiency standards, a more aggressive reforestation program, and a tougher energy-intensity reduction goal than George W. Bush’s.

But according to that same Tribune article in June 2008, developing countries still won’t “accept binding national emission caps.” The trouble is not the You First principle. The trouble is caps.

Caps Evince Unfairness

A tight emissions cap is a burden. Conversely a loose cap can be worth a lot of money.

Caps on emissions are a burden, and the tighter the cap, the bigger the burden. On the other hand, getting a high cap can be worth a lot of money. That's because each country issues carbon permits up to its cap and can sell extra permits to companies in other countries for hard cash. In Europe people call this "selling hot air," and some Eastern European countries, including Russia, have lots of it to sell.

By holding out from signing the treaty until it was last, Russia received a loose cap. This was unfair.

Russia gained a lot of its hot air by holding out and not signing the treaty until the country received an extra helping of free permits—that is, a higher cap. Because the United States would not sign the treaty, it could not go into effect without Russia's signature, which gave Russia a lot of leverage. This was a double win for Russia—the extra permits are valuable and they loosen the overall cap. As the world's number-two oil producer, Russia would be hurt by a tight overall cap, which inevitably would reduce world oil use and the price of oil.

After realising they had issued permits unfairly, the Protocol's architects tried hard to fix it.

The architects of the Kyoto Protocol were accused of issuing permits unfairly. They then tried about a dozen ways to fix that, all of which failed. Let's consider some specifics.

Caps based on historical emissions are unfair to developing countries.

The Kyoto Protocol sets emission caps relative to a country's emissions in 1990. In that year, the Chinese were emitting about 2.5 tons of carbon dioxide per person per year, and Americans were emitting about 23.4 tons per person. Even in 2008, India emits only 1.1 tons per person. I'm not criticizing Americans or complimenting the Chinese. This is just the situation we're in. It happens to make it impossible to set caps fairly and effectively. To be effective, caps must be set low, near 1990 emission levels. That is possible, but how would such caps be adjusted? If India's and China's caps adjust down, they will forever be stuck a century or so behind us on carbon emissions. That's unfair. So their caps must be able to adjust up. But no one has figured out how to do that fairly and effectively.

Caps based on what 'would have been' emitted are based on subjective speculation.

Perhaps some mathematical trick would help us set fair caps. China could be capped relative to what it "would have emitted" if it had not been capped. The cap could be set farther below that would-have-emitted level each year—2 percent less, then 4 percent, then 6 percent, and so on. Unfortunately, as time goes on, we know less and less about what would have happened if China's emissions had not been capped. China might argue that, without a cap, it would have been emitting 127 percent more in 2010 than in 2000, as the DOE predicts. But environmentalists might argue that China would have been emitting only 27 percent more. That was China's emissions increase between 1990 and 2000. So China and the environmentalists might disagree by 100 percent on how tight a cap should be. Who is to decide?

In any case, developing countries have been rejecting caps consistently and vigorously for fifteen years.

If the cap is set 50 percent too high, it will have no effect. If it's set 50 percent too low and enforced, it will curb China's growth drastically. The latter outcome is unfair, and the former is ineffective. Caps based on predictions break down quickly. Besides, developing countries have been rejecting caps consistently and vigorously for fifteen years.

The Mischief of Carbon Credits

A way to reduce emissions in developing countries was invented, called 'carbon credits' (CERs). These are equivalent to emission permits and paid for by companies in capped countries who need to exceed their cap.

Without any way to cap developing countries fairly, the Kyoto Protocol takes another approach. It allows them to sell certified emission reductions, or CERs, to companies in capped countries. As the name implies, this is a certification that the uncapped country is making emission reductions that it would not otherwise make. I will call these CERs carbon credits.¹ A business in a country with a cap can buy carbon credits to help meet its permit requirement under its national cap-and-trade system. Each credit, like each permit, allows the emission of greenhouse gases equivalent to a ton of carbon dioxide.

Billions Wasted

However, carbon credits turned out to be not only ineffectual but overly expensive.

A working paper from two senior Stanford University academics, David G. Victor and Michael W. Wara, examined the U.N.'s Clean Development Mechanism (CDM) market for CERs (Certified Emission Reductions), which are international carbon credits issued by the U.N. The quantity of new CERs tripled in 2007 to a value of 12 billion euros. They found that "much of the current CDM market does not reflect actual reductions in emissions, and that trend is poised to get worse." Moreover, investors paid roughly 4.7 euros for Chinese CERs corresponding to emission abatements that cost fifty times less.

Victor said, "It looks like between one and two thirds of all the total CDM offsets do not represent actual emission cuts," according to the Guardian, May 26, 2008.

On the face of it carbon credits seemed an excellent idea, but in practice they suffered from two serious problems.

Reducing emissions in China is cheaper than reducing them in Germany, for example, so carbon credits save money and seem to be an excellent idea. And sometimes they work. However, no matter how well intentioned, credits will eventually run into two serious problems. First, they will cost a lot, and second, they will be gamed or cheated on.

Paying Others Is Expensive. To see how buying foreign carbon credits gets expensive, consider how things are going. In twenty-five years China will be emitting twice as much as the United States, Europe, and Japan combined. So if we do our part to buy China back down to our level, we will have to buy credits from China equal in amount to our own emissions. At \$30 a ton, that would cost about

¹ Similar certificates in other schemes are often called offsets.

\$200 billion. I can't see us sending China that much money every year. That's more than \$2,500 paid by a family of four.

Gaming with Carbon Credits. Gaming poses an equally intractable problem. And there is no way around it—it's just in the topsy-turvy nature of paying people *not* to do bad things.

[People claimed credits for emissions reductions they had already been planning.](#)

For example, the operators of a coal-fired power plant in South Africa said they would keep using dirty coal unless they got carbon credits to buy some natural gas instead. But then someone found out that they had signed a gas contract before the CER policy went into effect. That is, they had already planned to cut their carbon dioxide emissions. They were simply hoping to defraud the United Nations, which administers the CER program.

Though someone detected the fraud in this case, eventually it will become impossible to know what the company would have done, because, with a carbon credit policy now already in place, the firm's operators have time to cover their tracks. If they plan to buy natural gas, they won't tell anyone until they lock in the credits.

[Markets rarely pay people *not* to take unwanted actions.](#)

This is why few markets sell negatives. People do plenty of annoying things, but rarely do we pay them \$20 not to do this or \$50 not to do that. Blackmail and protection rackets are two unpleasant exceptions.

[Markets for *not* doing things naturally end up in disarray.](#)

In the long run, markets for not doing things just naturally end up in disarray. Say the city paid people for not parking too long in downtown parking spaces. You pull up to the curb, and the meter maid says, "If you leave in less than an hour, I'll give you \$2." So you do, and she does. But when you get home, you tell your teenager about this, and the wheels start turning. Pretty soon your kid parks downtown, leaves his parking space after ten minutes, and collects \$2. He then parks two blocks away and collects \$2 more, and so on. Pretty soon downtown has turned into a game of musical cars for teenagers. The payments are for leaving parking spaces, but the result is parking spaces mobbed by teenagers.

[Not incinerating a ton of HFC-23 was worth close to \\$300,000 in carbon credits](#)

Perhaps you still think people wouldn't do things like that or that we could catch them. But consider this example: Certain chemical plants around the world emit just about the worst greenhouse gas imaginable. The refrigerant HFC-23 is 11,700 times worse than carbon dioxide. But a European company can pay a chemical plant in China to stop emitting HFC-23. The Chinese plant puts the gas through an incinerator to avoid emitting it into the atmosphere. Incineration is a cheap process, and for every ton a plant burns it earns 11,700 tons of carbon credits, which the European company purchases. In early 2008, international carbon credits were worth about \$25 per ton. So incinerating a ton of HFC-23 was worth close to \$300,000, while incineration cost only about \$5,000. Most of the credits granted in the first few years of the CER program have been for HFC-23 incineration.

So how is this story like the one about the teenagers parking downtown so the city can pay them not to? There are rumors that Chinese companies have built chemical plants mainly to cash in on carbon credits.

Carbon credits encourage misbehavior

But even if no one intends to misbehave, the CERs encourage it. Whoever takes most advantage of them makes the most profit and can sell their product for less and undercut their competition. Businessmen fear their competitor will employ such a strategy, and so, in self-defense, they feel they must employ it themselves. Paying for negatives—giving out carbon credits for not emitting—can corrupt honest people.

The UN's response to the unworkability of carbon credits was to describe them as "additionality".

In fact, the United Nations has known of the CER problem from the beginning and terms it "additionality." That is, the United Nations requires projects to be "additional" reductions to emissions. Now my copy editor asks "additional to what," and that is exactly the question the United Nations did not, and can never, answer clearly. The answer will always be, "additional to some hypothetical future world." The idea of enforcing an "additionality" requirement is just wishful thinking.

A \$1/tCO₂e tax would have eliminated China's HFC-23 carbon credit ruse

For comparison, consider what would happen if instead of the United Nations giving China carbon credits, China had agreed to put a tiny \$1-per-ton tax on greenhouse gas emissions. That would mean \$1 per ton of carbon dioxide and \$11,700 per ton of HFC-23 emissions. That's more than it costs to incinerate HFC-23, so chemical plants would incinerate and pay no tax at all.

Elimination of fossil fuel subsidies would be a huge forward step

In fact, many developing countries—and, to some extent, the United States as well—subsidize fossil fuel. A requirement to stop subsidizing greenhouse gas emissions and to impose even a small tax would be a huge step in the right direction—not least because developed countries would then meet their caps by cutting emissions at home.

If you want less of something charge for it

Charging people who park too long is a better idea than paying them to leave sooner. Every city in the world has figured this out. The same principle holds for taxing emissions instead of paying people not to emit. Sooner or later, this will become all too apparent.

Conclusion – use explicit carbon pricing

Capping emissions country by country boxes us in. It's unfair to cap poor, rapidly growing countries. But paying them not to emit is too expensive for the rich countries because of waste and overpayment. We need a fair and effective way to include the developing nations. Since caps don't work, the obvious alternative is explicit carbon pricing. In fact, that should have been the first choice.

Explicit carbon pricing would work much better internationally

Explicit carbon pricing translates to setting the level of *effort*.

Instead of a requirement that every country stay under a certain cap, the rule would be that every country must put a certain price on carbon. Countries could achieve that price with a self-imposed cap, a tax, or an untax (feebate). Each country would be free to choose. Global carbon pricing is inherently fairer because it requires a level of effort instead of a specific cut in emissions.

If your family is weeding the garden, a requirement that each person pull 30 pounds of weeds may be next to impossible for the little kids. But a requirement that everyone pull weeds for thirty minutes may be reasonable. In any case, it has a better chance of being fair.

A carbon price of \$30 per ton scales automatically to a country's carbon level.

In a country where people use 1 ton per person per year, the average cost will be \$30 per person per year. In a country where people use 20 tons, the cost will be \$600 per person per year. Of course, the money stays in the country, so this is not a cost to the country. The government can, if it wishes, give it all back—via an untax or another method—as long as it does not disproportionately reward those who emit more carbon. If a nation adopts an untax, it helps the poorest people in that country.

This approach ensures that carbon control does not limit economic growth.

With a carbon price of \$30 per ton, nothing stops India from becoming richer than the United States. But if India's emissions are capped at their present level, it makes it almost impossible for India to catch up economically.

Explicit carbon pricing helps to avoid people becoming unduly cautious

At this point, some people will conclude that explicit carbon pricing seems fairer simply because it's weaker. But that is not the case. A cap that causes a \$30 carbon price has exactly the same effect as a \$30-a-ton carbon tax. Both a cap and a tax put a price on carbon, and the price—and nothing else—does the work. A cap is only stronger if it tricks the world into accepting a higher carbon price. But the opposite is more likely. People are afraid a cap might push carbon permit prices too high, so they set caps cautiously and build in loopholes. In any case, if caps push carbon prices to \$100 while the world is only willing to accept \$50 carbon prices, the world will change the cap and not the other way around.

Nations adopting a global carbon price could still choose whichever method they want to set their national carbon price.

It would make little sense to suggest such a radical new course—global carbon pricing—if the old system of national carbon caps were viable or needed only minor adjustment. But an international system of capping has in practice turned out to be neither workable nor fair. That does not mean individual nations need to stop using cap-and-trade systems internally. Nations can still choose whichever method they want, to set their national carbon price to an agreed global-carbon-pricing target.

Conclusion

For good reasons, developing countries will not accept internationally set caps. But paying them to curb emissions with carbon credits will prove too expensive, especially because payments not to emit are ineffective and lead to gaming and fraud. Fortunately, a global carbon price can provide a fair and effective standard. It remains the best hope for eliciting the international cooperation needed to solve climate change.