

# Climate Change: Why a Carbon Tax Makes Sense

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Global warming is a serious problem and strong measures are necessary to counter it. This brief document focuses on what we should do about it. For more details, see [1, 2] and my longer essay, [http://www.cs.brown.edu/~ws/climate\\_change.pdf](http://www.cs.brown.edu/~ws/climate_change.pdf).

The best way to limit the amount of carbon dioxide released into the atmosphere is to require permits to emit it and ensure the permits are scarce. This encourages everyone to discover and deploy cost-effective green technologies.

Three major choices must be made when designing a permitting scheme:

- **Expiration.** Do permits give the holder the right to emit a certain amount each year forever or are they only valid for a year and need to be reacquired?
- **Distribution.** Are permits sold or given away?
- **Number of permits.** Do we target a certain quantity of emissions or a certain price for permits?

Giving away permits that expire does not work because people would concentrate on lobbying to get a better allocation during the next round of gifts rather than cutting emissions, but the other combinations of these three factors are possible<sup>1</sup>. Two combinations of these choices are commonly proposed:

- **Emissions taxes.** The combination of *permits that expire* that are *sold at a fixed price* is often called emissions taxes. With this scheme, polluters buy permits to emit 1 ton of carbon dioxide, at a fixed price of say \$30 each. When polluters use up their permits, they buy more.
- **Cap and Trade.** The combination of *permits that don't expire* that are *given away at a fixed quantity* is often called cap and trade or tradable emissions permits. This is something of a misnomer, since other combinations allow tradability too. With this scheme, the government gives away permits to past polluters based on some formula. Each permit allows the holder to emit 1 ton of carbon dioxide *per year, indefinitely*. The number of permits is designed to be less than current emissions, so polluters must either cut their own emissions or buy permits from someone else that does.

These three decisions are somewhat independent, so I consider each separately.

## Distribution of permits

Selling permits is much better than giving them away because:

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<sup>1</sup> Some combinations require a little creativity. For example, to fix the quantity while selling permits, use an auction. To target a price for perpetual permits, the government buys or sells permits on the open market to regulate the price.

- The revenue from selling permits can be used to lower income taxes, stimulating the economy and thereby dramatically reducing harm to the economy. [1]
- Prices of energy intensive goods will rise regardless of how permits are distributed. [1]
- Giving away permits gives the government a lot of discretion in who to give them to, encouraging corruption and lobbying.
- Selling permits is fairer. Either way, energy companies can pass much of the cost on to consumers. With permits given away, energy companies make large windfall profits, while if permits are sold, energy companies are only mildly hurt as the demand for their products falls. Selling permits ensures that the costs of greening our economy are more evenly spread. [1]

### **Expiration of permits**

Make permits expire after a relatively short period of time such as 1 year. This makes it easy to adjust the level of emissions later as science progresses and we better understand what is needed. If permits do not expire, permit owners will demand compensation for lost property when further cuts are made, making adjustments much harder.

### **Number of permits**

Determine the number of permits by fixing the price rather than fixing the quantity. We have a decent idea of what the price should be, but a very poor idea what the quantity should be because it is very hard to predict how much emissions reduction can be done for a reasonable price. [1]

### **Summary**

We can best limit carbon dioxide emissions with a carbon tax: *selling* emissions permits that *expire after a year* with the *price* of permits, not the quantity, fixed. It is particularly important to resist the energy companies and sell permits rather than giving them away.

### **Other Issues**

Permits should be required for the importation or production of fossil fuels. This is much simpler and more efficient than requiring permits for some uses and not others.

### **Bibliography**

My [essay](#) has a much longer list of references. The references here are the two I recommend reading first.

[1] The Economics of Climate Change: A Primer. A Congressional Budget Office study. April 2003. <http://www.cbo.gov/showdoc.cfm?index=4171&sequence=0>

[2] National Academy of Science. Understanding and responding to climate change. March 2006 Edition. <http://dels.nas.edu/basc/Climate-HIGH.pdf>