# Carbon Cap & Trade Versus Energy Efficiency

Carbon Lighthouse

There is a lot of talk about carbon cap-and-trade and energy efficiency. Carbon cap-and-trade is hailed as a market mechanism for reducing carbon dioxide emissions. Nine States in the Northeast and California all have statewide cap-and-trade systems operating. Energy efficiency is one of the most profitable investments most companies can make at all, reliably providing returns in excess of 30%. Efficiency is also a great way to reduce energy consumption and hence carbon emissions as well. So what happens when you combine a carbon cap-and-trade with energy efficiency?

Surprisingly, the answer is that while efficiency still provides great economic returns to those who do it, it stops reducing carbon emissions. Here's why:

In a carbon cap-and-trade, the government requires every power plant to purchase one allowance for every ton of CO2 it emits. There is a set and limited number of allowances (hence the term cap), and power plants need to acquire one allowance for each ton of CO2 they emit and can sell the allowances they do not use (hence the term trade). There are hundreds of potential iterations on this – the government could require utilities instead of power plants to buy the permits, the government could give a certain percent of permits away, certain plants could be exempt because they have effective lobbyists, etc. – but in short power plants buy allowances for each ton of CO2 they emit and the supply is limited.

Under a cap-and-trade system, efficiency creates a bizarre feedback loop:

1. If you reduce the demand for power through energy efficiency, fewer power plants will run.
2. If fewer power plants run, there will be less demand for carbon allowances.
3. When there is less demand for the same amount of supply (the supply is fixed by the cap), the price per allowance will fall. *Here's where the anti-magic happens...*
4. As the price for carbon allowances fall, dirtier power plants are able to buy more allowances.
5. Now that dirtier power plants have more allowances, they run a little bit more.
6. How much more? Exactly enough to make up the difference in carbon savings you received from energy efficiency.

So energy efficiency saves money by reducing the amount of energy consumed total, but it also enables dirtier power plants to deliver that power by reducing the cost of carbon allowances. Weird right? Right.

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