

Don't Blame the Negotiators Change the Climate Game: Price Carbon

5 May 2014

3rd Mannheim Energy Conference

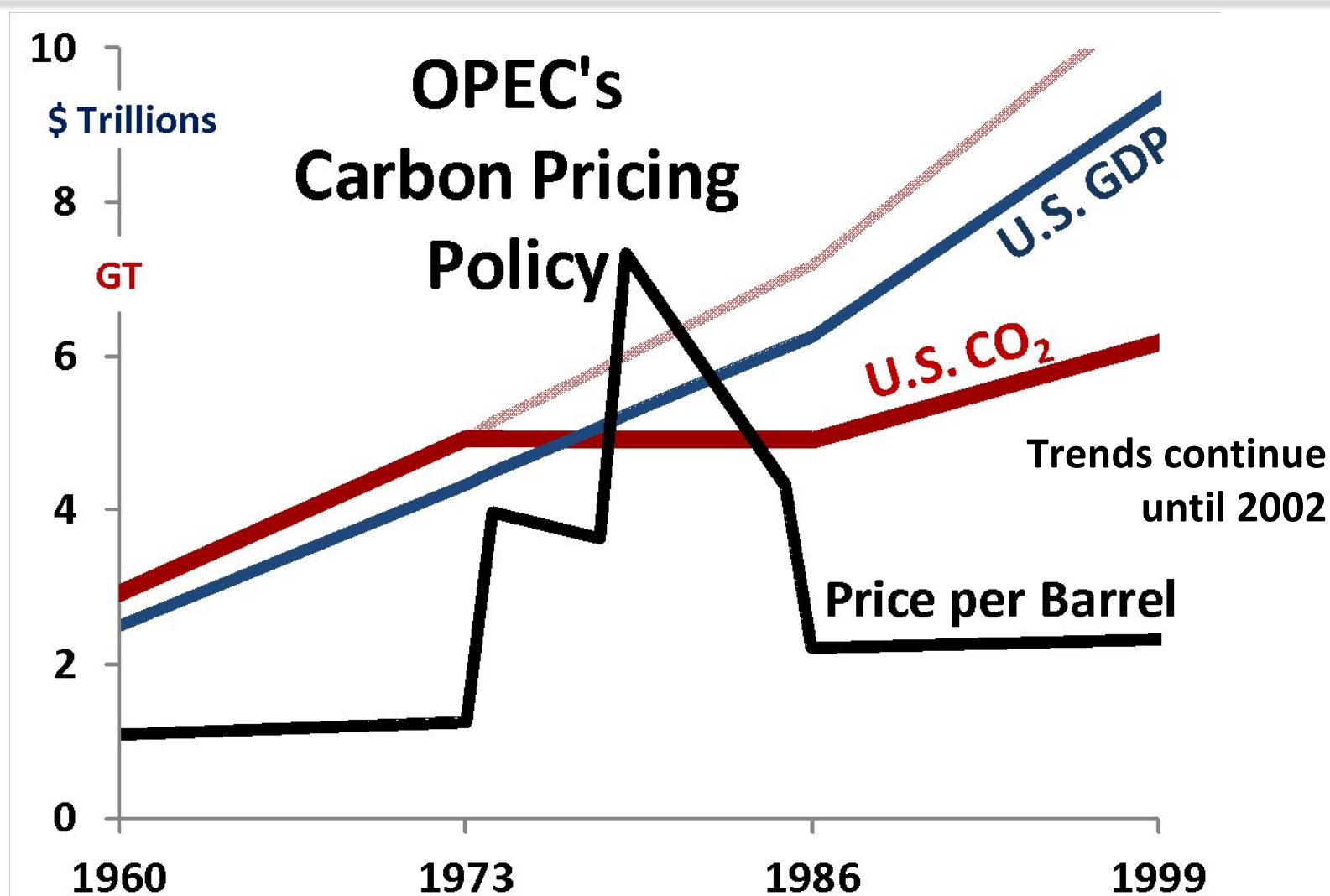
Steven Stoft

For details see: carbon-price.com

A Short History of Carbon Policy

- **1974 — The first carbon crisis (OPEC)**
 - IEA formed. Quantity limits failed. Switched to price.
 - OPEC pushed the price higher.
 - The best climate policy ever & OPEC was squashed.
- **1988 Cap & trade was invented because**
 - Economists want a price
 - Environmentalists want caps (= command and control)
- **Caps failed in Kyoto (1997) and Copenhagen (2009)**
 - So environmentalists are no longer interested in price
 - Leaving “sporadic regional volunteerism” —Weitzman
- **Earth is cooked (2009)**

Carbon Pricing Is Powerful



Nuclear assumed to emit 1 tonne CO₂ / MWh

Quiz: What's the cost of a price?

- Say the US is emitting 5 Gt (Billion tonnes).
- It imposes a \$30/t carbon tax.
- Emissions drop to 4 Gt.
- How much does this cost the US?
 - a) \$10 to \$25 Billion / year
 - b) \$25 to \$50 Billion / year
 - c) \$50 to \$100 Billion / year
 - d) \$100 to \$150 Billion / year
 - e) None of the above

Carbon Pricing Is Cheap

- Carbon tax revenues are all used or returned.
- Everyone gets at check = $(\$30 \times 4 \text{ billion})/\text{pop}$.
 - $120/0.3 = \$400$ per year per person.
- The tax is free.
- But the abatement is costly.
- 1 billion tons abatement at a cost of \$0 to \$30/ton
 - \$15 Billion
 - \$50 per person per year. (7¢/day)

Economists' Statement on Climate Change

Released on March 29, 1997. Endorsed by over 2500 economists, nine Nobel Laureates:

The United States and other nations can most efficiently implement their climate policies through market mechanisms, such as carbon taxes or the auction of emissions permits.

<http://rprogress.org/publications/1997/econstatement.htm>

Now, Here's the New Idea

1. Country's should **NOT** commit to individual caps or try a global capping formula.
2. They should
commit to a global carbon price.

Why is this new?

Because “**a global carbon price**” has a new meaning.

“A Global Carbon Price”

One old meaning:

Use global cap and trade.

Another old meaning:

Use a harmonized carbon tax.

What it really means:

**You choose whichever you want
cap or tax (or a mix). They both
give us global carbon price.**

But Which Works Better: Caps or Taxes?

That misses the point —

agreement is what matters.

Poor countries will not have caps:

“At the very least they argue, they should have the right to emit the same amount per capita as the United States.” —Stiglitz

But, Europe will not give up cap and trade.

So allow caps **OR taxes.**

Why Was that Hard to Figure Out?

Because it seems like if you commit to \$30/ton

- **you have to use a tax because**
- **with a cap, the price is totally unpredictable.**
- **So there would be no way to commit.**

There are a many ways to accommodate caps.

- See <http://carbon-price.com/climate/overview/treaty/cap-trade/>

Who Agrees: Joseph E. Stiglitz

Nobel prize 2001. Writing about climate change since 2001.

“Perhaps it is time to try another approach: a commitment by each country to raise the price of emissions (whether through a carbon tax or emissions caps) to an agreed level, say, \$80 per ton.”

Who Agrees: Martin L. Weitzman

Harvard economist specializing in
environmental and climate economics

“The important thing is acquiescence by each nation to a **binding minimum price** on carbon emissions, ... Nations or regions could meet the obligation of a minimum price on carbon emissions by whatever internal mechanism they **choose**: ☐ **a tax, a cap-and-trade** system, a hybrid system, or whatever else results in an observable price of carbon.”

Who Agrees: **Stéphane Dion**

Minister of the Environment for Canada (2006 – 2008) and Chair of COP 11/MOP 1.

“We propose: countries would each make a commitment to introduce, in their respective jurisdictions, a carbon price aligned with a scientifically-validated international standard. ... In pricing carbon emissions through a tax or a cap and trade, of course we must gradually eliminate fossil fuel energy subsidies.”

Who Agrees: William D. Nordhaus

President, American Economics Association. Has been publishing on climate change since 1977.

“At a minimum, all countries should agree to penalize carbon and other GHG emissions by the **agreed-upon minimum price. ... Some countries might simply use **carbon taxes**. Others might implement their commitment using a **cap-and-trade** mechanism.”**

Who Agrees?

Axel Ockenfels (Director of the Cologne Laboratory for Economic Research. Leibniz Prize in 2005, and Contributing Author for IPCC.)

Peter Cramton (Professor of Economics, University of Maryland)

Éloi Laurent (senior economist and scientific advisor at Sciences-Po Center for economic research and visiting professor at Stanford University)

Richard N. Cooper (Maurits C. Boas Professor of International Economics at Harvard University.)

Why Is **Cap-or-Tax** so Important?

1. Because it avoids the cap-tax fight.
2. And it let's us find a “focal point”—a point of natural agreement.
3. A **focal point** is the key to cooperation.

(Focal point: Thomas Schelling, Nobel prize, 2005)

End of Introduction

Now, a Systematic Approach

Roadmap

1. Climate problem = Free Riding (self interest)
2. Altruism is too weak to stop self interest
3. Instead: Change self interest
I will do X if you will.
4. For a public good, X should be a focal point
5. A global price is the only focal point
6. A Green Fund helps poor countries comply

#1. The Problem: Climate = Public Good

1. This the only reason for UN negotiations.
2. If the climate were not a public good
 - US emissions would have no impact on the EU
 - Same with China, etc.
3. There's no need for a UN conference to tell the US to clean up smog in Los Angeles!
 - **Everyone agrees.**
4. Everyone wants a **free ride** on the public good.

#2. Altruism

- Negotiators tell us the problem is:
 - “lack of leadership”
 - “lack of political will”
 - “lack of ambition”
- They don’t say “lack of altruism.”
- That would sound naïve because—the world is unlikely to become altruistic by 2015.

How well does altruism work?

- **“If the United States leads, China will follow.”**
—Al Gore (Guardian, 24 April 2009)
- **“Leading”—cooperating first—has been checked experimentally.**
- **Experimental results range from:**
 - It makes free riding a bit worse, to
 - It helps just a bit, but the leader is worse off.
- **Al Gore did not check the science.**

Why some hope for global altruism

Because they don't know that **self interest can be changed.**

1. If they knew we could change it from
“Free ride” to “cooperate”
They would stop talking about “ambition”.
2. You don't need ambition to act in your own self interest.

So Don't blame the negotiators

1. They are stuck in a repeated prisoners' dilemma with 200 prisoners.
2. This is the worst game imaginable.
3. Altruism is too weak a force.

So change the game

to “I will commit to X if you will.”

- **Then cooperation = self interest.**

Changing Self Interest: Private Goods

If we don't make an agreement with Starbucks:

- **Starbucks' self interest** = keep the cappuccino.
- **My self interest** = keep my money.
- So they say: “**We will** give you a cappuccino **if you will** give us \$4.”

We will if you will.

- **That changes our self interests.**

Public Goods Are More Difficult

- For a private good, sign a two-party contract
- For public goods, we need a special kind of agreement based on a **common commitment**.

Highways Are a Public Good

If we want to build highways. Do we put a donation box at every petrol station?

Do we ask for altruistic contributions to the highway fund?

No, we vote for a **common commitment to a price (tax) on gasoline for building highways.**

When we vote we are saying:

I will **pay an \$X tax if you will.**

It is in your self interest to vote for \$X, but not to put \$X in a donation box.

At the National Level

We solve many public-goods problems:

- | | |
|--|---|
| <ul style="list-style-type: none">• Parks• Highways• Military | <ul style="list-style-type: none">• Education• Toxic cleanup• Courts |
|--|---|

(But not with altruistic “pledge and review.”)

International agreements are more difficult because we do not have a global government.

Conclusion #3: Change Self Interest

To change self interest we need to agree **on a Common Commitment**, such as:

- All countries will reduce emissions to 10% below the 2000 level.

OR

- All countries will set an average carbon price starting at \$30/ton and increasing.

Step 4

1. The problem: Free riding
2. Altruism is too weak
3. Change self interest with a common commitment
 - I will do X if you will.
4. For an international agreement
X should be a focal point

What's a Focal Point

A **focal point** is a game strategy that people will tend to use because it seems natural, special or relevant to them. (Concept from Thomas Schelling, Nobel Prize, 2005)

- It can be a formula:

$$2010 \text{ Emissions} = (1 - R) \times (1990 \text{ Emissions})$$

- That's a “partial focal point,” but R can be found by majority vote or by consensus.

Kyoto searched for a focal point

At first, half of the countries wanted:

$$\text{2010 Emissions} = (1 - R) \times (1990 \text{ Emissions})$$

But Australia, Hungary et al., Iceland, Japan, Norway, Switzerland and Brazil all submitted different focal-point formulas, based on:

GDP/capita growth; emission intensity of GDP and of exports; emissions/capita, GDP/capita, share of renewables, % emission from industry, choice of variables, **pledging, relative contribution of CO₂.**

Kyoto's Outcome

After almost two years in which dozens of proposal must have been considered,
there was nothing close to agreement.

Chairman Estrada gave up.

On the final day “he invited Annex I Parties to submit their revised, final numbers to the podium.” They submitted whatever they wanted and “these numbers were simply inserted ... into the blank draft annex B.”

Official UN history, DePledge 2000

<http://carbon-price.com/climate/library/related/>

Lessons from Kyoto

- 1. A cap-style focal point does not exist.**
- 2. So a cap-style common-commitment was not made.**
- 3. So self interests were not changed.**
- 4. And the free-rider problem was not solved.**

For example:

- When the EU expected the “uniform” formula to be the focal point it offered 15%. When there was no common commitment, it accepted only 8%.**
- Iceland immediately announced its target was “unattainable.”**
- The rest is history. (US, Canada, Japan, Russia)**

The Lesson for Paris, 2015

- In Kyoto, countries tried “pledge and review” for almost two years, then committed to whatever they wanted.
- That’s the plan for the Paris Conference, 2015.
- **Paris will fail just like Kyoto and Copenhagen**

Looking for a Focal Point

We know there is no quantity-type focal point.

Kyoto proved that.

Is there a price formula that's a focal point?

#5: A Uniform Price Is Focal

$$\text{Carbon-Price}(i) = X$$

For every country i

- **The simplest price formula is focal.**
 - Of course, X should increase over time.
- The whole point of “Trading” in Cap-and-Trade is a uniform, efficient, global price.
- The whole point of a Harmonized Tax is a uniform, efficient, global price.
- **Everyone agrees: a uniform price is best.**

What about Poor Countries?

They will agree if they get some help.

That' fair.

So use the Green Fund.

This is the best use of a Green Fund:

**Buy the very best climate policy:
a high uniform global price.**

One Way to Buy a High Global Price

- **Payment Into Green-Fund = $G \times Ex \times P^*$**
 - **G** = the Generosity of the payments
 - **Ex** = Excess Emissions.
 - **P*** = the Global Carbon Price
- For poor countries, **Ex** is negative—they get paid.
- So poor countries will agree to a high **P*** so they will be paid more.
- Now **G** can be chosen objectively—it should be chosen to maximize the **P*** consensus.

Experiments (work in progress)

Axel Ockenfels, Andreas Pollak, Peter Cramton and myself are experimenting on common price and quantity commitments at the Cologne Laboratory for Economic Research.

Common Price Commitment Game

- **Carbon-Price(i) = P^***
- Three students (countries) choose a prices, $\{P_i\}$
- **$P^* = \text{Minimum of } \{P_1, P_2, P_3\} = \text{consensus}$**
- All must implement **P^*** .

Experimental Result

- If there were **no common commitment** in the game, each country would implement **Pi**.
- Then the Nash equilibrium is: **Pi = \$10.**

(Theoretical. No data yet.)

- **But with the common commitment, on average the Minimum Pi was \$29.30**
- **The optimal P* was \$30.**

“I will if you will” really works!

Summary

The problem: It's free to emit, so why abate?

The theory:

- Price Carbon and change self interest.
- Use a common commitment.

In practice:

1. Countries agree on a **global price path**
2. They can use either **Caps or Taxes** or both
3. A **Green Fund** helps poor countries afford this