



Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

Memorandum

TO: Interested parties

FR: Chris Busch, Union of Concerned Scientists

RE: Notes on Analysis of 10% of Emissions Offset Limit in WCI

DT: 15 August 2008

| |
|----------------|
| PURPOSE |
|----------------|

This memo reports some rough analysis related to the WCI's proposed offset policy. (Given the lack of any more comprehensive analysis, a rough analysis is a significant step forward.) The WCI has suggested that the quantitative limit on offsets could be as much as 10% of emissions: 10% of emissions, not emission reductions. Such a limit sounds like a relatively small number, but here we show that the result could be a huge reliance on compliance offsets in achievement of WCI reductions. The memo also provides explanation of analysis contained in the associated spreadsheet. We circulate this memo to present findings, explain assumptions and to invite feedback and ideas for improvement.

First we discuss findings. Then we explain the assumptions underlying the calculations carried out in the attached spreadsheet.

Acknowledgements

Thanks to Erin Rogers for her many insights and for being a valuable collaborator in the production of this memo and the accompanying analysis. Thanks to Fred Huette of the Sierra Club for conceptualizing the analytical framework that we have used as the foundation for our analysis. We made some modifications from his original model, but nonetheless he deserves credit for sketching the outlines of a reasonable, back of the envelope approximation of how compliance offsets could interact with the rest of the WCI program.

FINDINGS

According to the analysis we have carried out – an analysis that requires a number of assumptions to make the problem tractable; assumptions described below – a limit of 10% of emission would allow for a heavy reliance on offsets as a substitute for emission reductions in capped sectors. The variation in our estimates of the impact of offsets is due to different assumptions about the extent to which complementary policies play a role as illustrated in the tables and accompanying graphs.

Offsets as a proportion of total reductions

Our analysis finds that an offset limit of 10 percent of emissions implies

- Between a quarter and two-thirds of the *total* expected reductions (not just reductions from cap and trade) could be met through offsets in the early years of the program (through the end of 2016) – see Table 1
- Somewhere between a quarter and a third of the cumulative reductions through 2020 could be met through offsets– see Table 2.

Offsets as a proportion of reductions from *cap-and-trade*

When the reductions produced by cap-and-trade alone are considered. A 10% of emission limit implies that

- In the 2012-2016 time period, the early years of the program, between 80-100% of reduction could occur through offset projects instead of through direct reductions achieved in capped sectors.
- Over the currently envisioned lifetime of the cap-and-trade program, 2012-2020, from just under half to up to almost 95% of reductions could be due to offsets.

Distribution of reductions – all reductions (not just cap-and-trade)

Table 1. Cumulative reductions through 2016 (all reductions)

| Scenario | Complementary Policies | Offset | Direct cap-and-trade | Total reductions |
|----------------------------|-------------------------------|---------------|-----------------------------|-------------------------|
| 25% complementary policies | 25.0% | 64.3% | 10.7% | 100.0% |
| 50% complementary policies | 50.0% | 50.0% | 0.0% | 100.0% |
| 75% complementary policies | 75.0% | 25.0% | 0.0% | 100.0% |

Table 2. Cumulative reductions: 2012-2020 (all reductions)

| Scenario | Complementary Policies | Offset | Direct cap-and-trade | Total reductions |
|----------------------------|-------------------------------|---------------|-----------------------------|-------------------------|
| 25% complementary policies | 25.0% | 38.8% | 36.2% | 100.0% |
| 50% complementary policies | 50.0% | 34.8% | 15.2% | 100.0% |
| 75% complementary policies | 75.0% | 24.4% | 0.6% | 100.0% |

Distribution of reductions from cap-and-trade (only cap-and-trade)

Table 3. Cumulative reductions through 2016 (cap-and-trade only)

| Scenario | Offset | Direct cap-and-trade | Total |
|----------------------------|---------------|-----------------------------|--------------|
| 25% complementary policies | 80.2% | 19.8% | 100.0% |
| 50% complementary policies | 97.1% | 2.9% | 100.0% |
| 75% complementary policies | 100.0% | 0.0% | 100.0% |

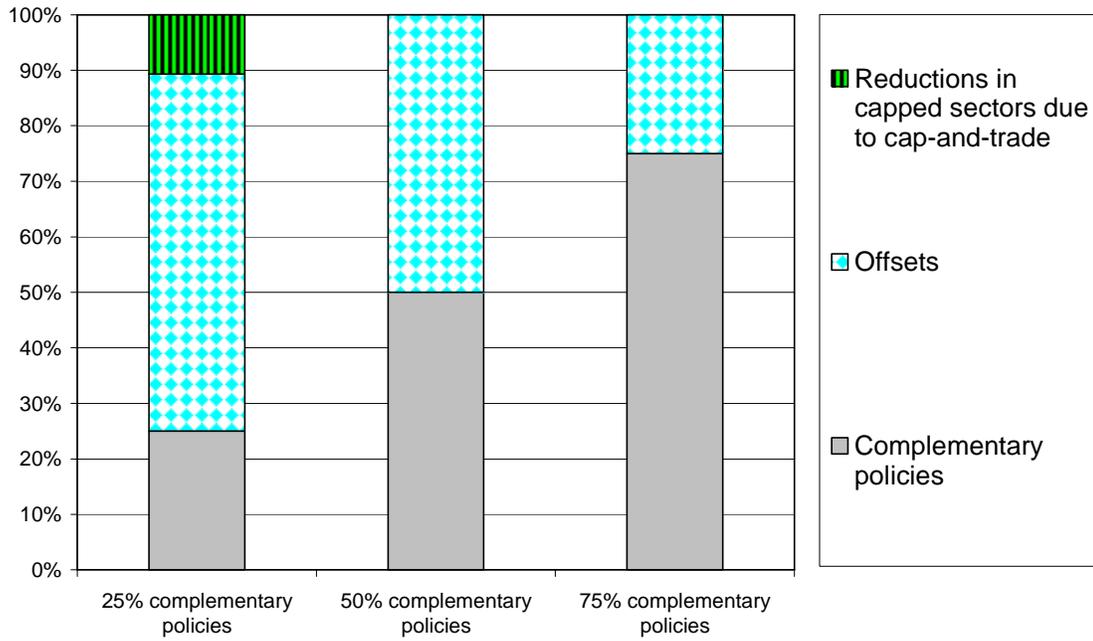
Table 4. Cumulative reductions: 2012-2020 (cap-and-trade only)

| Scenario | Offset | Direct cap-and-trade | Total |
|----------------------------|---------------|-----------------------------|--------------|
| 25% complementary policies | 47.3% | 52.7% | 100.0% |
| 50% complementary policies | 64.7% | 35.3% | 100.0% |
| 75% complementary policies | 94.9% | 5.1% | 100.0% |

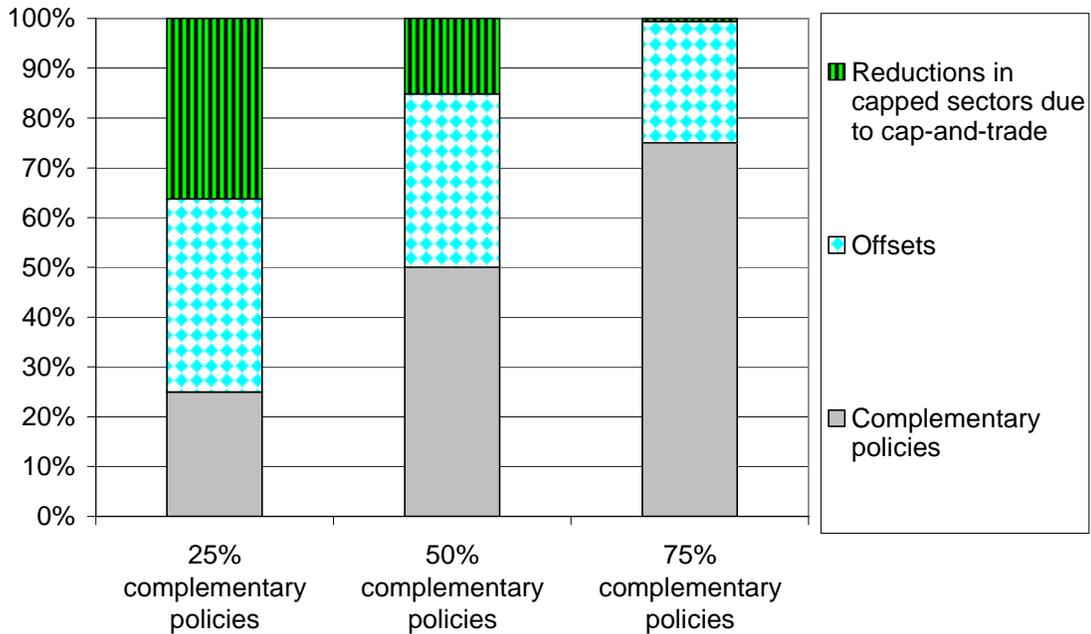
Now we provide some graphical illustrating of these results

These first two graphs show the distribution of all WCI reductions across complementary policies (CP), offsets, and reductions in capped sectors attributable to cap-and-trade (CT).

Cumulative reductions through 2016

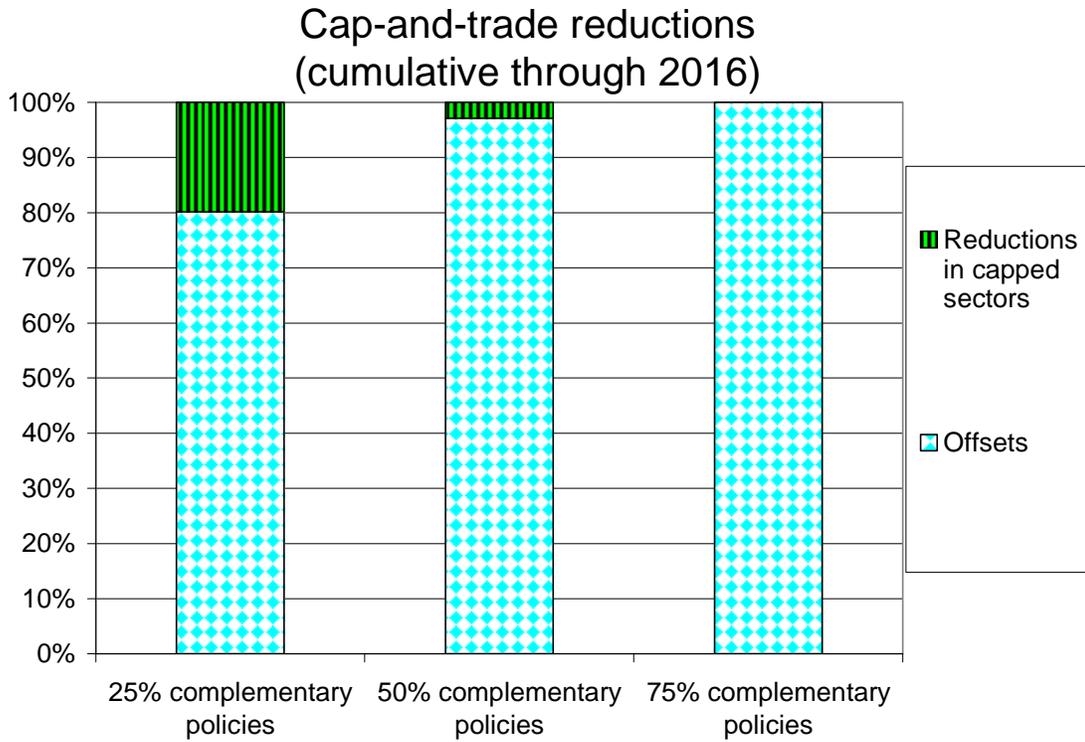


Cumulative reductions (2012-2020)

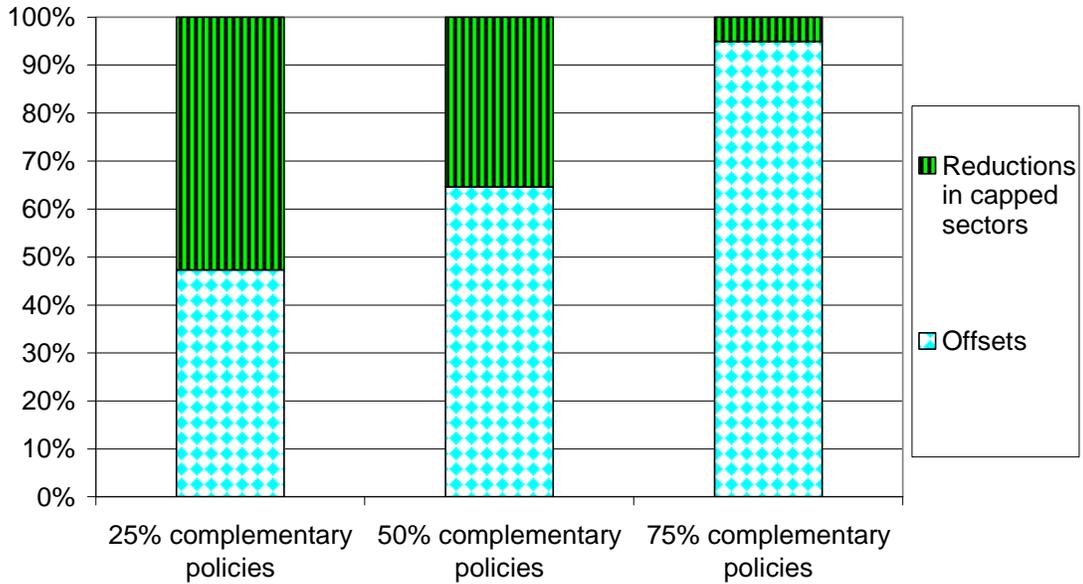


These next two graphs focus *only on reductions from cap-and-trade*. They show the distribution of all WCI reduction from cap-and-trade between compliance offsets and direct reductions from cap-and-trade (CT). Again we run three different scenarios

according to different levels of reductions from complementary policies because this affects the extent to which offsets are relied upon or not.

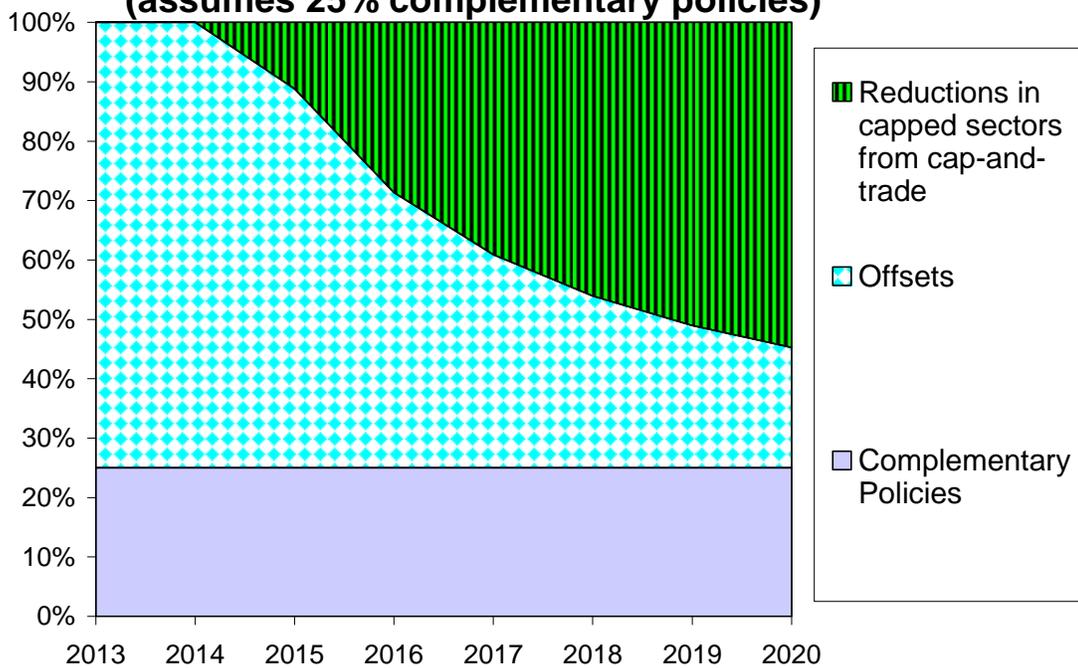


Cap-and-trade reductions: Cumulative (2012-2020)

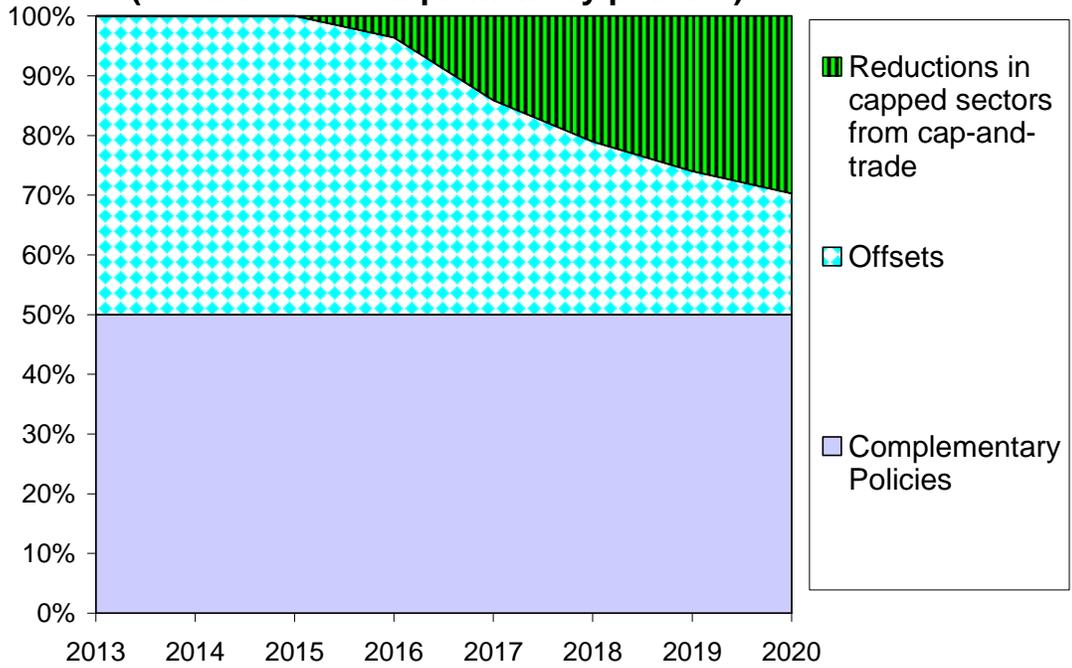


The next three graphs give a year-by-year picture of the distribution of reductions over the three different scenarios we have developed (25%, 50%, or 75% of reductions from complementary policies).

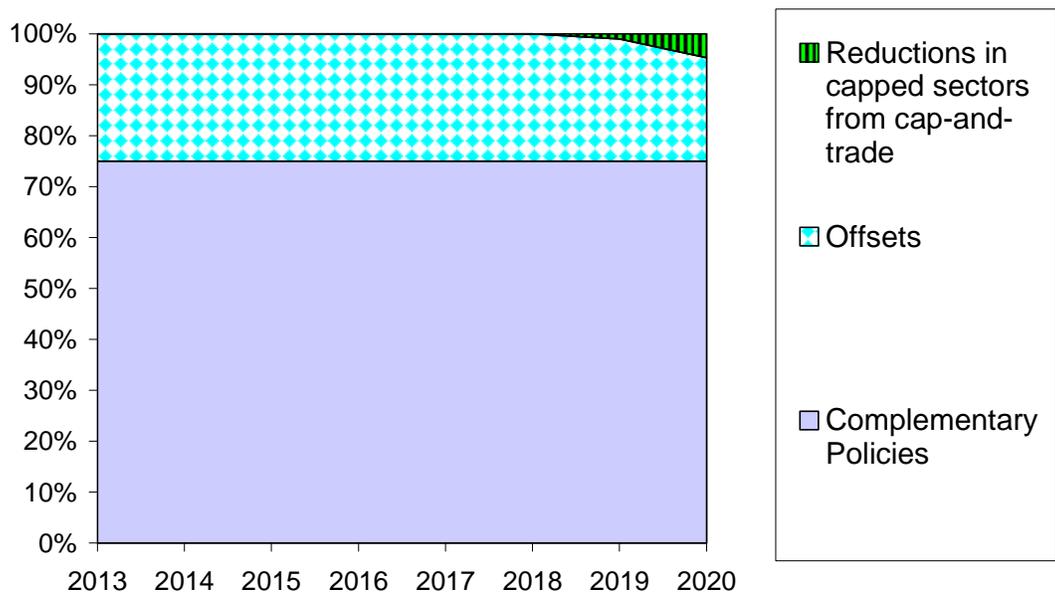
Level of effort analysis (assumes 25% complementary policies)



**Level of effort analysis
(assume 50% complementary policies)**



**Level of effort analysis
(assumes 75% complementary policies)**



ASSUMPTIONS UNDERLYING THE ANALYSIS

Introduction

This analysis takes a level of effort approach, which is not tied to a particular absolute level of reductions but rather looks at the extent to which different policy instruments contribute to the economy-wide regional goal— direct reductions from cap-and-trade, offset reductions, and reductions complementary policies. The approach takes as a point of departure the Partner’s prior announcement that the regional emission limit (15% below 2005 levels) implies a reduction of 33% over business as usual. We vary the role of complementary policies from 25% to 75% of the overall WCI effort. Thus, cap-and-trade is assumed to be responsible for between 75% and 25% of reductions that the WCI seeks to achieve.

BAU emissions and emission reductions implied by the regional goal

We use the projection released at the time of the announcement of the WCI regional goal as the basis for our assessment of emission reductions due to the WCI.

<http://www.westernclimateinitiative.org/ewebeditpro/items/O104F13006.pdf>

This forecast estimated that the WCI would produce reductions of 33% over business as usual. For this “level of effort analysis,” we do not attempt to represent absolute levels of emissions or reductions. We choose an arbitrary level of 100 to represent emissions in the year 2012. We suppose BAU emissions increase at a rate of 2.5% per year. So, by 2020, BAU emissions increase from 100 to 121.8. Then, based on a 33% reduction over BAU, we assume that the WCI region must reduce emissions to 81.6 by 2020.

Despite the lack of being tied to an absolute quantitative number, such an approach still provides insight into the relative reliance on direct reductions from cap-and-trade as compared to compliance offset reductions.

Policy assumptions

To make the analysis tractable, we make a variety of assumptions.

Initial cap level in cap-and-trade and trajectory over time

We understand that when the Partners say that the cap in cap-and-trade will be set at BAU emissions for 2012 that this will take into account reductions from other policies. Since we are not sure how to account for this, we make the simplifying assumption that no reductions take place in 2012. Any other approach would just mean that the assumption on complementary policies would completely determine the distribution of reductions in that year – not very illustrative. In graphs, we leave out the year 2012 for the same reason. There is no real information to be gleaned from including that year if

the Partner's intention is to rely on complementary policies in that year (recognizing that the even a BAU cap within cap-and-trade would constraint growth that could unexpectedly occur if emissions actually rise faster than expected).

The trajectory over time is then linear to a 33% reduction over BAU, which implies that the cap falls from 100 in 2012 to 81.6 in 2020.

Scope of cap-and-trade

Based on Point Carbon's October 2007 assessment of the WCI emissions ("The New Carbon Frontier: Emission Trading in the West," Carbon Market Analyst, North America, October 30), we assume cap-and-trade covers 90% of emissions. We model full coverage in the first compliance period, which is different than the proposal to phase in transportation fuels in the second compliance period – an approach we oppose. We favor full coverage from the outset.

Offset uptake

Assume that all emitters avail themselves of all allowed offsets up to the point of BAU emissions. So, emissions never exceed the BAU trend. Such an assumption is a conventional one for many economists (e.g. suggested as the reasonable outcome by Pew's Janet Peace at the Quality Offset Initiative briefing in San Diego).

Role of complementary policies

We have not had the time to research the extent to which complementary policies, policies other than cap-and-trade, will contribute to the overall effort. Accounting for complementary policies is crucial because these are not subject to offsetting, and so the more these are relied upon the smaller the amount of absolute reductions can come from offsets. (Though, as complementary policies increase, the potential percentage of cap-and-trade reductions diverted to offsets decreases.)

To explore the distribution of reductions across policy instruments – complementary policies, direct reductions from cap-and-trade, and compliance offsets – we develop a number of scenarios:

1. 25% of WCI economy-wide reductions come from complementary policies;
2. 50% of WCI economy-wide reductions come from complementary policies;
3. 75% of WCI economy-wide reductions come from complementary policies.

These different percentages of reductions/effort levels are applied on an economy-wide basis.