

In late October, California Air Resources Board (CARB) released their [draft regulations](#) for cap-and-trade under AB 32. I looked at CARB's proposed allocations: the cap, the offset percentage, the reserve percentage and the projected emissions level. Running the numbers allows a few general observations:

1. If covered emitters take full advantage of the 8% allowed offsets, the first year when emitters will need to reduce their actual business as usual (BAU) emissions is 2017. This assumes efficient use of banking and full offsets.
2. If covered emitters also tap into the CARB reserve along with the 8% offsets, then 2019 is the first year when the cap will be low enough to require more than offsets and reserve credits to meet the cap.
3. If covered emitters reduced emissions 6.6% below the BAU forecast each year, the rest of reductions could be met through offsets and banking through 2020.
4. 2015 is a crucial year for the cap-and-trade program. The expansion of the cap to accommodate emissions from distributed use of fuels more than doubles the cap and therefore the amount of emission allowances (and offsets) in play. Over- or under-allocation in 2015, along with banking, could destabilize the price of allowances. (As pointed out by [Michael Wara](#) and our own [Ethan Elkind](#), the market for emission allowances is sensitive to the cap and initial allocation.)

To explain how I came to those observations, we need to look at the numbers in more detail...

I created a [spreadsheet](#) that details the emissions forecast, cap, abatement, reserve and offsets for 2012 through 2020 of the CA cap-and-trade program, if you want all the details. ([Excel version](#)) But CARB has a nice figure that conveys the main points (from their Proposed Regulations Appx. E):



The BAU is the relatively flat gray and red lines (corresponding to narrow and broad scope emissions, respectively). The allowances increases dramatically in 2015 because that is the first year that CARB will incorporate distributed fuel emissions into the cap-and-trade program ("broad scope" emissions). Notice that the offsets, in orange, rise above the BAU lines until 2017. (Offsets are emission credits issued for certain recognized projects, for example, reductions from forestry conservation programs.) Offsets are allowed for 8% of an emitter's compliance obligation. Until

2017, allowances plus offsets will exceed the cap. And banking will allow emitters to save these excess allowances obtained in early years.

If you move the BAU down, that is equivalent to decreasing the predicted actual emissions for a given year. Any allowances above that BAU line then get banked and can be used in future years. So the cumulative allowances spent or saved is important to track.

CARB also established a tiered price reserve. Approximately 5% of total allowances between 2012 and 2020 will be placed in reserve (1% for 2012–14; 4% for 2015–17; 7% for 2018–20). And of the total allowances available, one-third would be available at \$40/metric ton, one-third at \$45 and one-third at \$50 (increasing by 5% plus inflation each year).

What does that price reserve mean? Well, you might think that a 5% increase per year, plus inflation, for allowances sounds pretty good compared to your savings account rate. Unfortunately for the average consumer, the allowance would only be *worth* as much as the market is willing to pay. So if you bought a reserve allowance for \$40 in 2012 and saved it, you would be betting that when you go to sell it (say, in 2015) that: (a) offsets and (b) reductions of actual emissions would cost, on average, more than your reserve allowance. Otherwise, the market price of that allowance will be less than \$40, and you would lose money.

So, we can predict that offsets will be valuable if they can be obtained for less than the reserve price (~\$45/ton in 2012). And an emitter will surely look to decrease its own emissions first, if that decrease can be had for less than \$45/ton.

If offsets are cheap, CARB's cap-and-trade program will more like an offsets subsidy program than an emissions reduction program. That is because, as can be demonstrated in the figure above, offsets can be used in lieu of actual emissions reduction until around 2017. Nevertheless, the steadily-decreasing cap in emissions means that the actual emissions reductions will come. Eventually.