Yesterday, I described California’s GHG cap-and-trade auction and the likely constraints on the auction clearing price. Today I want to switch gears to the allowance distribution. As summarized in our recent paper on California’s auction revenue, once you know the number of allowances available at auction and the auction clearing price, you can estimate revenue. Describing the constraints on revenue is our eventual goal.

Unfortunately, there are several categories of allowances in California’s program and the formulas for distributing those allowances are anything but simple. So I am going to start by describing the various categories of allowances and quantifying the amounts that are known with reasonable certainty. The big unknown is the total number of allowances to be given to industry each year; I leave that quandary for tomorrow.

Total number of allowances for California's cap-and-trade program, by vintage year and category

The above chart breaks down the allowances in California’s program by category and vintage year. An allowance can only be used for emissions on or after its vintage year. Note the big jump in 2015, when the cap is increased to encompass fuel distributors. A quick summary of each category:

- **Advance allowances**: Ten percent of all allowances in 2015 and later are designated for advance auctions that occur three years prior to these allowances’ vintage year. So 2015-vintage advance allowances will be auctioned in 2012.
- **IOU**: Allowances granted to investor-owned utilities. These allowances are sold at consignment auctions, with revenue used to benefit ratepayers.
- **POU**: Allowances granted to publicly owned utilities or co-ops. POUs and co-ops can choose to either consign their allowances to auction or use them for compliance obligations (*i.e.* to cover their GHG emissions).
- **VRE**: Voluntary renewable electricity reserve allowances. A small number of allowances used to encourage voluntary renewable energy generation.
- **Reserve:** A percentage of allowances from each year (approximately 4% total) are pooled and offered at fixed prices in order to put a soft ceiling on auction prices. Reserve allowances should be available beginning in 2013 and do not have a vintage (thus they can be used for emissions in any year). Barring

extended allowance price spikes, these should remain unused.
- **Industry and remainder**: Allowances not devoted to one of the above categories are available to be given freely to certain industries using a complicated formula that I will not go into yet. The remainder of allowances, if any, will be auctioned.

In total, CARB will receive auction revenue from the sale of two categories of allowances: advance and remainder allowances. The California Public Utilities Commission will oversee auction revenue generated from the sale of utility allowances (mainly IOUs). If allowance prices rise above the reserve price (unlikely), then CARB could also receive revenue from reserve sales.

Below is a breakdown of the advance allowances by auction year. Remember that advance allowances go to auction three years ahead of their vintage year.

Advance allowances for California's cap-and-trade auction

And finally, here is a breakdown of the allowances devoted to IOUs and POUs. These amounts are calculated using tables from the cap-and-trade regulation.

Allowances for POUs and IOUs by vintage/auction year

Code and data are available at Github. Figure created using the ggplot2 package in R.