Last week I did a series of posts examining the amount and potential price ranges for allowances in California's upcoming cap-and-trade auctions for greenhouse gas emissions (GHGs). Knowing the estimated auction clearing price plus the estimated number of allowances to be sold at auction tells us the estimated revenue from that auction.

Several estimates of California GHG auction revenue have surfaced recently. Most prominent is probably the Governor's budget, which assumes that the auctions will generate $1 billion in state revenue in 2012–13. The Legislative Analyst's office puts the range somewhere between $1 and $3 billion in fiscal year 2012–13. And the San Jose Mercury News recently said the figure is "[a]nywhere from $2 billion to $14 billion a year" that could be earmarked for California's high-speed rail project.

Without knowing the auction clearing price, only a broad estimate is possible. But assuming a relatively conservative $15 / ton auction price, California could surpass the $1 billion mark in cap-and-trade auction revenue sometime in 2013. (Remember that $10 / ton is the price floor for the auctions through 2013.) At $15 / ton, CARb could receive approximately $1.7 billion in revenue by the end of 2013, with utilities receiving an additional $1 billion. The big jump in revenue will not come, however, until 2015 when significantly more allowances are made available to auction. (See graph below.)

It is important to remember, however, that some of the auction revenue comes from utility allowances consigned to auction. These consigned allowances will be sold at auction, but the revenue will be used by the utilities to benefit ratepayers. Thus, some of the auction revenue is already spoken for and is unlikely to be available for other projects such as high-speed rail. (The graph below shows how many potential auction allowances are consigned utility allowances.)

Potential California GHG trading auction allowances by type. Industry allowances are not eligible for auction. POUs may choose to either consign their allowances to auction or use them for compliance.

It is also important to realize that California may be legally limited in how it uses the auction revenue, thanks to Proposition 13 and the tax/fee issue. For more on that, see our recent report, Spending California's Cap-and-Trade Auction Revenue.

Details on that $1 billion of revenue are below.

Only three categories of allowances will be auctioned in California's trading program: advance allowances, remainder allowances and utility allowances. Beginning in 2012, advance allowances will be auctioned. Each advance allowance cannot be used for emissions until 3 years after the advance auction date. Beginning in 2013, any allowances that have not been distributed to utilities, industry or other specified categories will be auctioned. The graph above shows the total number of remainder plus industry allowances and shows an estimate of the total number of industry allowances. For more on this industry estimate, see my post from last week. Also beginning in 2013, allowances consigned to auction by the electrical utilities will be sold. As I explained previously, only investor-owned utilities (IOUs) must consign their allowances to auction. Publicly-owned utilities may also choose to consign allowances to auction if they wish.

Assuming my industry estimate is reasonably accurate, and that no POUs consign allowances, we now know the total number of allowances available at auction. I will use an auction clearing price range of $10 to $20 as a conservative estimate to illustrate the amount of revenue at stake.

Breaking down the potential revenue generated in 2012–13 with those assumptions shows that $1 billion is within reach. The following graph shows potential revenue at each auction in 2012 and 2013:

Potential auction revenue from California's GHG trading program in 2012 and 2013.

CARB will only control revenue from advance and remainder allowances; utility allowance revenue stays with the utilities (for the benefit of the ratepayer). But, as you can see in the graph above, advance allowance revenue alone totals between $775 million and $1.5 billion by 2013. Depending on the exact number of remainder allowances, CARB could see an additional $375 to $775 million in revenue by 2013.

Considering revenue only in California's fiscal year (July 2011 to June 2012) would include three auctions: Nov 2011, Feb 2012 and May 2012. Those three auctions alone could generate between $585 million and $1.1 billion in advance allowance revenue plus an additional $150 to $300 million in remainder allowance revenue. So it is fair to say that California's cap-and-trade could generate $1 billion in revenue for FY 2012–13.

A few notes and caveats: If CARB gives away all remaining allowances to industry in 2013, then revenue from remainder allowances accordingly goes to $0. Utility revenue, on the other hand, could increase if POUs choose to consign their allowances. And in all of these auctions, there is no guarantee that all allowances will be sold. With a $10 price floor, some may choose not to bid at all for allowances. In this scenario, less participation results in less revenue as some (or all!) allowances would remain unsold.

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