UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

Barbara Haya, PhD
Research Fellow
Berkeley Energy & Climate Institute
University of California, Berkeley
454 Sutardja Dai Hall
Berkeley, CA 94720
bhaya@berkeley.edu

November 21, 2016

RE: Comments on the ARB November 7, 2016 Scoping Plan Workshop—Support for a much smaller carbon offset program

Dear ARB staff:

I first wish to thank ARB for its strong climate targets and efforts at the UN level. Following the recent election, it has become clear that climate action in the United States is now in the hands of states and cities. California's climate policy leadership role couldn't be more important and urgent.

It is also ever more important to get it right in California, with careful design and review of outcomes so that other states and jurisdictions can build off of our work and experience. California has the capacity to do the design analysis needed for sound reproducible policy, not only in setting a stringent target, but in designing policies and programs that will effectively meet that target.

These comments focus on California's offset program, and discuss a number of reasons supporting ARB's decision to shrink the size of this program. If the offset limit isn't substantially reduced, offsets could provide a large portion of reductions required through 2030. While an offset program lowers compliance costs, it does so with a high risk of false crediting and uncertainty in the reductions actually achieved. A large offset program could potentially depress the cost of carbon in California to levels well below those needed to drive meaningful reductions in the state and well below the social cost of carbon. On the other hand, if California meets its stringent 2030 target itself, without relying substantially on out-of-state offset credits, California would play an important role globally by modeling a strong low-carbon economy and demonstrating how to make the transition that must be made throughout the world; California would also capture the benefits of lowered emissions locally. I go through each of these points in turn in the comments that follow.

If the offset program is allowed to continue to be used to meet 8% of permitted emissions (compliance obligations), offsets could make up close to one third of all reductions during 2021 to 2030.

ARB estimates that the total reduction needed is 671 million tonnes of CO_2-equivalent ($MTCO_2e$). If the maximum limit on the use of offsets continues to be 8% of compliance obligations, and if the cap were to cover 77% of California emissions (as is expected in 2020) and decline linearly from

2020 to 2030, then maximum offset use would equal almost a third of all reductions needed in that period. The quality of the credits generated under the offset program would play a large role in determining the success of California's efforts to reduce emissions.

Offset reductions are uncertain and the risk of substantial false crediting is high.
Under the UN's offset program—the Clean Development Mechanism (CDM)—the majority of projects generated credits that do not represent real additional emissions reductions. While California has adopted a more promising approach to offsets, the challenges that so weakened the CDM are fundamental risks for any offset program, including California's. Offsets replace certain reductions under the cap with an uncertain amount of reductions outside of the cap. The quantity of reductions resulting from an offset program is uncertain for two main reasons.

First is additionality. Under the CDM, the majority of projects generating credits are most likely non-additional (Haya 2009). That is, instead of reducing emissions in developing countries the majority of CDM offset funds paid project developers to build projects they were already building. While the CDM certainly did have some influence on project development, its effect on emissions was only a portion of the reductions claimed and credited (Haya 2009, He & Morse 2010, Wara 2008). This means that countries and companies exceeded their emissions limits, but without reducing equivalent emissions elsewhere, weakening countries' Kyoto Protocol targets.

ARB has decided to address additionality with a common practice test. Only project types that are not common practice are allowed to participate. Even if the project types are not common practice, most of the protocols ARB adopted credits activities that were already being built each year on their own before the offset program was implemented. Going forward, new projects that would have been built regardless of California's offset program can now generate credits. So far, California's Forest Projects and Livestock Projects protocols credit activity types that were already occurring without the offset program without a clear increase in those activities due to the offset protocol. In fact, the rate of implementation of livestock digesters in the United States decreased since the livestock protocol was adopted. The extent to which California offset credits are generated from livestock digester projects and sustainable forest management activities that would have occurred regardless of the offset program is unknown. To what extent would the participating activities have happened otherwise, and to what extent is the program changing the decisions of forest owners and dairy owners? Such analysis has not yet been completed, and any assessment would involve substantial uncertainty.

A second risk posed by offsets is that the profit motive used to encourage emitters outside of the cap to reduce emissions could also create an incentive to increase their overall production. For example, due to the very high global warming potential of HFCs, the CDM created the incentive for refrigerant manufacturers to produce more refrigerants than they otherwise may have, in a less efficient manner, to destroy an increased amount of HFC byproduct for large offset profits (Wara 2008, Schneider & Kollmuss 2015). Under California's offset program, since the costs of reductions vary among project types and facilities, and since offset prices could increase if allowance credit prices increase, there is a potential for California's offset program to create profits large enough to change business decisions in the facilities implementing the projects. When the underlying products are more emissions intensive than their alternatives, like coal and livestock, the offset program can thus lead to net increases in emissions. This potential effect is inherent to offsets, could have a deleterious effect on emissions, but can be hard to identify.

In sum, the reductions of any offset program are uncertain due to uncertainty in the proportion of non-additional projects. In addition, offsets could risk generating profits large enough to increase production of high emitting products. These effects are hard to accurately assess and prevent.

Carbon prices need to be much higher to drive substantial reductions and to reflect the social cost of carbon.
The main function of offsets is cost containment. But to drive reductions, allowance prices need to rise. A number of modeling studies predict that carbon prices could need to rise well above $50 per tCO_2e for the carbon price itself to make a substantial contribution towards meeting California's 2030 target (Borenstein et al. 2014, Regional Economic Models Inc. (REMI) 2014, McCollum et al. 2012).

Also, the cost on society for each tonne of carbon dioxide-equivalent emitted (the social cost of carbon) is much greater than today's allowance prices. Three integrated assessment models have been used to estimate the global social cost of carbon. The average values they have generated, using different discount rates, range from $12 to $128 per tCO_2e (U.S. Environmental Protection Agency 2013 (revised 2015)). The actual social cost of carbon in California should be higher than these values for two reasons. First, these values only include damages that were monetized by the models and leave out important damages that have not yet been monetized (effectively treating these damages has having zero cost). Examples of damages left out of the models are the effect of climate change on conflict and the effect of ocean acidification (Anthoff & Tol 2013). Second, the value of life and wellbeing of a poor person are considered by these models to be less than the value of a wealthy person's life. This is because sickness or mortality of a poor person has less absolute impact on global GDP than that of a wealthy person. The ethical challenge of treating different people's lives and wellbeing as having different value while assuming the cost per tonne CO_2 they emit is the same can be remedied with an equity-weighted social cost of carbon. Under an equity-weighted model, the social cost of carbon would be higher for countries with greater per capita wealth, better reflecting the different value of money in different countries. One of the three models (FUND) was run with such equity weighting. Under this run, the social cost of carbon in the United States was two to eight times higher than the non-equity weighted estimate, depending on the equity principle used (Anthoff & Tol 2010).

California can play an important role globally as a wealthy advanced economy that reduces emissions substantially through 2030; a large offset program would weaken our model policy. Around the world, jurisdictions need to reduce emissions substantially and quickly. Putting our global warming law in the context of the international climate agreements, wealthy countries have a dual obligation to reduce their own emissions, and to support reductions in poorer countries. California's greatest potential to be a model is demonstrating how a wealthy advanced economy can substantially reduce its emissions. If we meet a large portion of our reductions by buying credits from out-of-state, the message we are sending to the rest of the world is that a low carbon economy reflecting the reductions needed to keep global temperatures in a range considered relatively safe is too expensive.

For these reasons together, ARB is wise to reduce its reliance on offsets.

Sincerely,

Barbara Haya

References:

Anthoff, D. & R. S. J. Tol. 2010. On international equity weights and national decision making on climate change. *Journal of Environmental Economics and Management,* 60(1)**,** 14-20.

---. 2013. The uncertainty about the social cost of carbon: A decomposition analysis using fund. *Climatic Change,* 117(3)**,** 515-530.

Borenstein, S., J. Bushnell, F. A. Wolak & M. Zaragoza-Watkins. 2014. Report of the Market Simulation Group on Competitive Supply/Demand Balance in the California Allowance Market and the Potential for Market Manipulation.

Haya, B. 2009. Measuring emissions against an alternative future: fundamental flaws in the structure of the Kyoto Protocol's Clean Development Mechanism. *Energy and Resources Group Working Paper, ERG09-001*. University of California, Berkeley

He, G. & R. K. Morse. 2010. Making Carbon Offsets Work in the Developing World: Lessons from the Chinese Wind Controversy. Palo Alto. Program on Energy and Sustainable Development, Stanford University

McCollum, D., C. Yang, S. Yeh & J. Ogden. 2012. Deep greenhouse gas reduction scenarios for California – Strategic implications from the CA-TIMES energy-economic systems model. *Energy Strategy Reviews,* 1(1)**,** 19-32.

Regional Economic Models Inc. (REMI). 2014. Environmental Tax Reform in California: Economic and Climate Impact of a Carbon Tax Swap. Washington, DC

Schneider, L. & A. Kollmuss. 2015. Perverse effects of carbon markets on HFC-23 and SF6 abatement projects in Russia. *Nature Clim. Change,* 5**,** 1061–1063.

U.S. Environmental Protection Agency. 2013 (revised 2015). Technical Support Document: -Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis -Under Executive Order 12866. Washington, DC

Wara, M. 2008. Measuring the Clean Development Mechanism's Performance and Potential. *UCLA Law Review***,** 1759-1803.