



# ANALYSIS OF THE IMPACT OF SB 605 ON THE CALIFORNIA CARBON MARKET

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## Executive Summary

*SB 605 as revised July 3<sup>rd</sup>, 2013 would restrict offset projects in the AB 32 cap-and-trade regulation to projects based in California. Such a restriction would cut available offset supply by 70 to 90 percent compared to current projections, worsening the expected shortage of credits available for use in the California carbon market, and escalating credit and allowance prices.*

*While offset protocols for U.S. projects approved and under consideration are forecasted to meet between 30 and 70 percent of total demand, supply from California-based projects would likely meet no more than 6 to 16 percent of cumulative demand for credits through 2020. The offset shortage makes it very likely (over 60 percent chance) that prices would reach the highest tier of the APCR in 2020, \$82 a ton.*

*Yet higher prices in the carbon market are unlikely to incentivize a significant number of new offset projects in California due to institutional, regulatory and technical hurdles.*

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## Offset Provisions In Current AB 32 Regulations

The California cap-and-trade program currently allows four different offset protocols: Ozone Depleting Substances (ODS), U.S. Forests, Urban Forests, and Agricultural Methane (also called Livestock). Two more protocols are currently under review and may be eligible for compliance: Mine Methane and Rice

Management. Additionally, the Air Resources Board (ARB) has stated it may consider protocols for Fertilizer Management and international sectoral projects such as Reduced Emissions from Deforestation and forest Degradation (REDD) in the future.

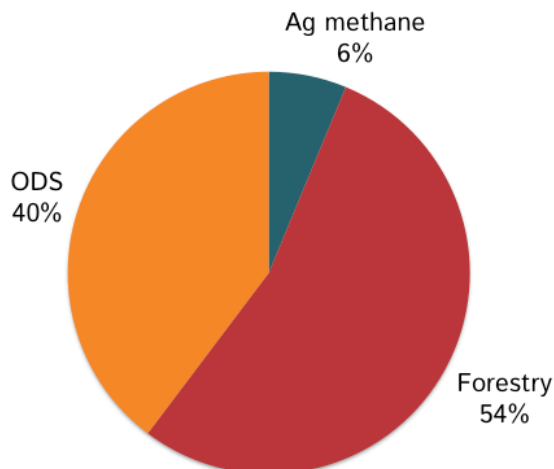
Of the protocols currently approved by ARB, two project types provide the bulk of the credit supply – U.S. Forests and ODS,

with forestry projects accounting for over half of the credits issued by the Climate Action Reserve so far.<sup>1</sup> No credits have been issued for the Urban Forestry protocol.

Amongst protocols under consideration, Mine Methane is expected to provide a large volume, while Rice Management has a comparatively limited credit generation potential.

These projects are located across the United States, some in California, and others in states such as Arkansas (ODS), North Carolina, Michigan and Arizona, (forestry), and northeastern and mid-western states (forestry, agricultural methane).

**Figure 1. Offsets credits issued by approved registries for projects eligible under the California cap-and-trade program.**



Data source: Climate Action Reserve

## How SB 605 Would Affect Current AB 32 Cap-and-trade Regulations

SB 605 proposes to restrict eligible offset credits to “those offsets originating or achieved in the state.” An earlier version of the bill added “to the maximum extent feasible” as a qualifier to the restriction, leaving more flexibility for the Air Resources Board to let in some credits from out-of-state projects if necessary.

However, this provision was struck from the bill in amendments dated July 3<sup>rd</sup>, 2013. Pursuant to the text of the bill (revised July 3, 2013), the modification of the offsets provision pertains to updating the AB 32 scoping plan.

This likely means that once the scoping plan document is approved in 2014, offsets from projects originating outside California would no longer be permitted. It is unclear whether this provision, if enacted, would apply to offset credits issued for compliance for 2013 and 2014 emissions.

## Current Offset Supply And Demand Balance Projections

Current projections for offset supply through 2020 range from 64 to 102 Mt cumulative for approved protocols.<sup>ii, iii</sup> When including protocols under consideration - rice cultivation, mine methane and nitrogen management - the potential supply of offset credits increases to an estimated 109 to 147 Mt cumulative by 2020.<sup>iv, v</sup>

According to the cap-and-trade regulation adopted by the Air Resources Board, the use of offsets is limited to 8 percent of an emitter's compliance obligation. For example, a regulated entity that emits 100,000 tons of CO<sub>2</sub>e in 2013 may only use 8,000 offset credits for compliance that year - the rest of its compliance obligation must be met using state-issued carbon allowances.

This offset limit, which applies to each emitter individually, means that total aggregate use of offset credits in the California market is also strictly limited. Based on the overall declining statewide emissions limit, the aggregate offset quota (e.g. offsets use) for the entire AB 32 cap-and-trade regulation equals about 208 Mt cumulative through 2013-2020.

Based on the projected supply of 109 to 147 Mt (including the three additional protocols), and a potential demand of 208 Mt, the amount of available offset supply is

expected to be substantially lower than expected demand from compliance entities - about 50-70 percent of the maximum potential demand will be met. If ARB declines to approve new protocols, existing and future projects accruing under the four existing protocols would meet only 30-50 percent of potential demand.

Future supply of ARB-certified offsets might also be bolstered by the inclusion of international sectoral credits from projects related to Reduced Emissions from Deforestation and forest Degradation (REDD). However, pursuant to the existing cap-and-trade regulation, only 2 percent of a regulated entity's compliance obligation may come from these credits in the second compliance period (2015 - 2017) and only 4 percent in the third compliance period (2018 - 2020).

Although offsets prospects for REDD are not as fully developed as domestic offsets protocols, based on the significant amount of deforestation emissions occurring annually throughout the world, inclusion of this mechanism at full potential has the ability to provide sufficient supply and help bridge the gap to reach the full offset quota.<sup>vi</sup>

## Impact of SB 605 on Future Offset Supply

Limiting offsets to projects originating in California would significantly reduce credit supply to the California market. Currently, about 34 percent of credits (3 Mt) issued by certified offset registries come from projects located in California. However, this is not indicative of long-term projections.

Under current credit development projections, the total supply of credits to the California market would fall to 12 to 32 Mt cumulative by 2020,<sup>vii</sup> a decrease by 70 to 90 percent compared to projections for US-wide supply (including California). The limited supply from California-based projects would meet between 6 and 16 percent of potential demand over that period. Table 1 compiles available forecasts and analysis of SB 605 impact by project type.

The impact is particularly dramatic because the geographic restriction eliminates altogether two project types that are expected to generate a large volume, but exclusively from out-of-state projects – ODS and mine methane.

ODS supply would likely be reduced to zero as only three facilities are certified under federal law to incinerate refrigerant gases in the U.S., none of which are located in California. Regulators could decide that refrigerant gases originating from California appliances might still count, even if the

Table 1. Cumulative Offset Supply through 2020 by Project Type for the U.S. and California

| Project type        | U.S.-wide supply | CA-only supply  |
|---------------------|------------------|-----------------|
| U.S. forestry       | 34-55 Mt         | 12-28 Mt        |
| ODS                 | 8-38 Mt          | 0-3 Mt          |
| Ag Methane          | 4-10 Mt          | 0.4-0.8 Mt      |
| Mine methane        | 29-34 Mt         | 0 Mt            |
| Rice Management     | 0.5-0.9 Mt       | 0-0.6 Mt        |
| Nitrogen management | 6-10 Mt          | 0 Mt            |
| <b>Total*</b>       | <b>64-147 Mt</b> | <b>12-32 Mt</b> |

\* Total numbers reflect total estimates by data source, not the sum of each lowest/higher estimate by project type. Data sources: CAR, ACR, and Thomson Reuters

destruction of the gas takes place out of state, but this is highly uncertain and would still dramatically cut supply, to 3 Mt at most.

Similar to ODS, mine methane destruction projects, also potentially a supplier of a large volume, would be brought down to zero as there are negligible mine methane sites in California.

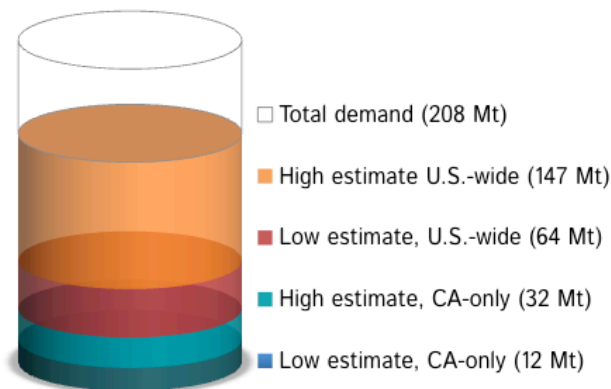
Unlike other offsets project types, forestry and ag methane would continue to generate credits under the current version of SB 605, but only from projects located in California. Most estimates for forestry supply point to a drop by two-thirds, down to 12-19 Mt. Aggressive in-state forestry project development could limit this decrease to a 20 percent drop (28 Mt) compared to current US-wide projections.

Ag methane supply would likely decrease by 90-95 percent, as permitting issues have constrained supply in California to a few projects so far.

Fertilizer management protocols are much further away than other protocols in terms of readiness in adoption for compliance. Furthermore, voluntary protocols for fertilizer management, existing or in development, would generate none to very small volume in California. Accordingly, it is expected that supply under this protocol would also drop to zero.

This lower supply would be even further from meeting expected demand, as illustrated in Figure 2.

**Figure 2. California Offsets – Supply as a Proportion of Total Demand Due to SB 605**



Data source: CAR, ACR, and Thomson Reuters

## Impact of SB 605 on the California Market and Prices

In addition to establishing a market signal to achieve pollution reductions throughout the entire economy, offsets can play a key role in keeping compliance costs down within cap-and-trade as a whole. However, when offsets are available for use in only extremely low volumes, this cost minimization effect is hampered.

According to supply estimates referenced above, well over two-thirds of the potential offset supply within the AB 32 cap-and-trade regulation may be removed by passage of SB 605, limiting the ability of offsets to manage greenhouse gas allowance prices.

California must reduce emissions by about 80 Mt below business-as-usual forecasts to reach the AB 32 target of 427 Mt (1990 emissions level) in 2020.<sup>viii</sup> Of these 80 Mt, two-thirds will likely be achieved by complementary policies other than cap-and-trade including the Low Carbon Fuel Standard, Sustainable Communities program (SB 375) and vehicle efficiency measures. Based on the expected performance of these measures, cap-and-trade will deliver approximately 26 Mt of reductions in 2020.<sup>ix</sup> This may seem small, but in reality options are very limited for emitters.

According to published abatement cost analysis for California, the potential for emission reductions at a cost below \$100 a ton from covered sectors is very limited. Many reductions are already mandated by complementary policies, and therefore already accounted for. Potential emission reductions from the industry sector under \$50 a ton are below 5 Mt in 2020.<sup>x</sup> Reductions from consumer response to higher energy costs will likely also yield very limited reductions for transportation fuels and natural gas, on the order of 5-10 Mt annually.<sup>xi</sup>

When considered in the context of high abatement costs for emission sources covered by the AB 32 cap-and-trade regulation, limiting the potential offset supply to a fraction of the overall demand means the market will fall very short of the available reduction credits needed to mitigate overall program prices.

With current offset regulations allowing for a moderate supply of offsets, recent analyst forecasts estimate AB 32 allowances prices at \$30-60 in the year 2020.<sup>xii</sup> However, if offsets were limited to only California projects, emitters would in all likelihood need to purchase allowances from the Allowance Price Containment Reserve (APCR).

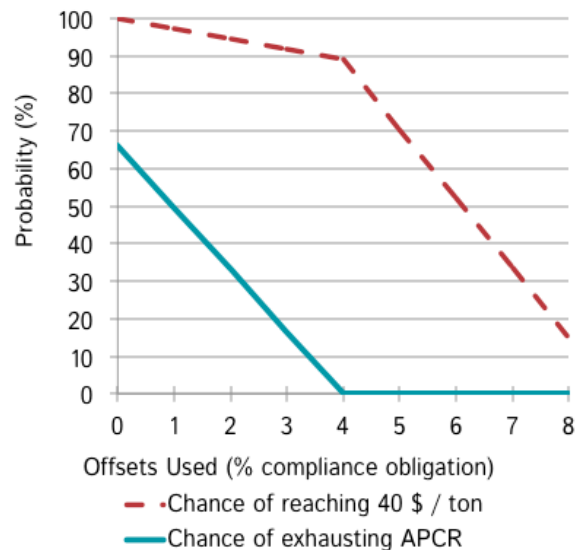
The fewer offsets on the market, the more emitters will need to rely on the APCR. Previous estimates showed that if, in

aggregate, emitters were able to use offsets for up to 6 percent of their compliance obligation (which is roughly equivalent to the high supply estimate of 147 Mt), there would be a 52 percent chance the APCR would be needed, but a negligible chance it would be exhausted.<sup>xiii</sup>

In contrast, 50-90 percent decrease in supply driven by a restriction to California-only projects means emitters would only be able to satisfy 0.5 to 1 percent of the aggregate compliance obligation with offsets. This would raise the probability that the APCR would be fully subscribed – and possibly exhausted to over 60 percent.

Figure 4 shows the relationship between offset supply and demand for APCR allowances.

Figure 4. Lower Offset Supply Increases Probability to Exhaust APCR



If the APCR remains as is, and is exhausted by purchases from covered entities, prices may spike as high as \$134 as prices will rise above the highest price tier<sup>xiv</sup>. Proposed amendments under consideration by ARB would significantly increase the availability of allowances in the highest tier of the APCR, which should ensure prices would be contained to \$82 a ton in 2020. Higher prices in 2020 would drive compliance costs through the entire duration of the program as market prices take into account expected future prices as well.

### Will SB 605 Incentivize New Offset Projects in California?

Higher prices in the carbon market and more demand pressure for California-based offsets could theoretically increase the number of offsets and prompt the development of new protocols focused on California. However, in reality, the upside potential is very limited for two reasons.

First, offsets projects may only take place in sectors that are not covered by the cap-and-trade program. With a cap that covers almost 85 percent of California 2009 emissions, and ambitious existing regulations for the other sectors, such as landfill waste and agriculture, options for offset protocols in California are few and far between.

Second, there are many hurdles to developing offset projects - institutional, cultural, technical, regulatory, and financial.

Higher prices may provide an added financial incentive to develop new projects – but this added incentive may not be enough to overcome other hurdles, such as landowners' reluctance to put a 100-year restriction on their land as required by the forestry protocol.

While it is possible that ARB would be able to develop new protocols, such as fertilizer management for California crops or other land-use projects such as wetland management, it is extremely difficult to evaluate how much supply these projects would bring. Regulatory delays – due to the thorough scientific research and stakeholder involvement that characterize new protocol development - would be such that the credits would not be available for use for compliance entities for many years.

Finally, because demand for offsets is uncertain after 2020, there would only a short window of guaranteed crediting for project developers after the new protocols are approved, which means that the projects would have to be economic in a short time frame, adding further hurdles to new project development.

The Air Resources Board has been extremely cautious in the offset protocols it has considered so far, and there are only few options for additional offsets it could take on in the future. Restricting offsets to California is unlikely to bring a significant number of new offset projects to the state.



## ENDNOTES

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- <sup>i</sup> The Climate Action Reserve has issued 4.65 Mt of Forestry Credits, 3.4 Mt of ODS Credits and 0.5 Mt of Ag methane Credits out of 8.6 Mt total.
- <sup>ii</sup> The Climate Action Reserve (CAR) and the American Carbon Registry (ACR), the two ARB-approved registries for eligible projects, forecast a cumulative 65 and 64 Mt respectively, by 2020. CAR uses on a “bottom-up” approach to projection, building aggregating on project-level historical data and drawing trends for future rates of project registration, performance rates and issuance timeline. In contrast, ACR quantifies the technical potential for each project type and uses a well-known marketing model to estimate project uptake and issuance of ARB Offset Credits. A description of the ACR model can be found in *Compliance Offset Supply Forecast For California’s Cap-and-Trade Program (2013-2020)* (September 2012). The CAR numbers are based on data provided by email by CAR on July 18, 2013.
- <sup>iii</sup> *Updated WCI Offset Supply And Price Forecast*, April 26, 2013, Thomson Reuters Point Carbon
- <sup>iv</sup> ACR, *op. cit.* forecasts 101 Mt, while CAR estimates 99 Mt.
- <sup>v</sup> Thomson Reuters, *op. cit.*
- <sup>vi</sup> Thomson Reuters, *California-Acre partnership - setting the stage for compliance REDD credits*, May 2012 and EDF modeling
- <sup>vii</sup> California-only supply data provided by email by the CAR on July 19, 2013, ACR on July 22, 2013 and in Thomson Reuters *Senate Bill 605: Californiating the offset supply*, published July 17, 2013.
- <sup>viii</sup> *Emission Forecast for California 2008-2020*, Air Resources Board, 2010.
- <sup>ix</sup> *2013 Update to AB 32 Scoping Plan*, Air Resources Board July 2013, and *Status of Scoping Plan Complementary Measures*, Air Resources Board, 2011
- <sup>x</sup> *Cap-and-Trade Regulations Initial Statement of Reason*, Air Resources Board, October 2010
- <sup>xi</sup> *Forecasting Supply and Demand Balance in California’s Greenhouse Gas Cap and Trade Market*, Elizabeth M. Bailey et al, Haas Energy Institute at U.C. Berkeley, March 2013
- <sup>xii</sup> Thomson Reuters *Updated WCI Offset Supply And Price Forecast*, Bloomberg, *op. cit.* and Bailey *op. cit.*
- <sup>xiii</sup> *Cost Containment through Offsets in the Cap-and-Trade Program under California’s Global Warming Solutions Act*, Environmental Defense Fund, July 2011
- <sup>xiv</sup> Thomson Reuters, *Updated WCI Offset Supply And Price Forecast*

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