

## **C-AGG Meeting Summary**

Monday-Tuesday, March 9-10, 2015

**Hyatt Regency**

Sacramento, CA – USA

### **Executive Summary**

C-AGG's Executive Director, Debbie Reed, opened the meeting by laying out the themes for the two day meeting, which included a continued discussion of the permanence issue as it relates to biological emissions reductions and new science on the global warming potentials of climate forcing agents; an update on the California (CA) climate change program, including updates to the rice cultivation offset protocol, a new focus on short-lived climate pollutants, and the agricultural programs funded to date with proceeds from the cap and trade program. After Debbie's introduction, participants shared the current issues that are top of mind in their current positions. These ranged from a continued desire to include offsets more prominently in the new Clean Power Plan to tweaking the business case for agricultural offsets to make them more compelling to a wider audience of buyers. The group agreed that the additional costs associated with reporting and verification create a challenging hurdle to overcome with land based projects. The diverse ideas put forward exemplify the range of parties and perspectives attracted to C-AGG's collaborative process. These diverse perspectives pushed for C-AGG to narrow the gap between what people perceive in the markets and what the reality is.

Ken Alex of Governor Jerry Brown's office set the stage for the rest of the meeting by providing an update on the Governor's plans related to climate change and agriculture's role in reducing GHG emissions in the state. CA produces over 400 different crops and is the leading US milk producing state. In the current scoping plan being developed by CA's Air Resources Board (ARB), agriculture's role as a GHG sink is noted. The scoping plan will include a focus on short lived climate pollutants, such as methane from dairies, and the role of healthy soils in the carbon cycle. Ken closed the discussion by asking participants for additional advice and suggestions for key policies to move the CA agriculture sector forward. Most agreed that the price signal and economics needed to increase to make the markets work for the sector.

After the broad overview of CA's policy priorities, Dr. Alissa Kendall of UC Davis presented her continued research on a specific CA crop, almonds. Dr. Kendall's research focuses on the implications surrounding new calculations for carbon sequestration in life cycle assessment (LCA) models created for projects that include biomass. Traditionally, LCA's use a static global warming potential (GWP) value and a 100 year time horizon to capture carbon emissions. However, she proved that using this static metric versus a more dynamic time adjusted warming potential (TAWP) metric can underestimate the carbon sequestration benefits of biomass, in this specific case the sequestration impacts of almond trees over their life cycle. Her results showed that using the TAWP reduced emissions in the system 20% compared to non-adjusted static approaches, which underscores the need to ensure correct metrics are used for appropriate policy development.

Ryan McCarthy from ARB added further details to the governor's plans to address short lived climate pollutants, as highlighted earlier by Ken Alex. Ryan outlined the state's plans for managing methane, the most relevant short lived climate pollutant for the agriculture sector. The state is in the process of developing a roadmap for managing methane into the future. The roadmap will likely include an increase in anaerobic digesters on dairies and the steps needed to make this process more cost effective, including subsidies from the state.

The final session of the day was a panel discussion that brought together experts from the water quality and carbon market communities to probe overlaps, distinctions, and collaborative approaches to payments for ecosystem services. The four panelists, Alex Johnson, Jessica Fox, Elizabeth Hardee, and Bobby Cochran, provided overviews of their organizations and the current projects they are working on related to stacking. All participants agreed it is time to stop debating academic arguments for and against stacking, and to implement projects to test drive them and test conceptual approaches.

The second day of the meeting opened with a recap of thoughts and reactions to the information presented on day one. Participants called for C-AGG to begin looking to other markets and other methodologies for inspiration. The group debated means to further develop ecosystem service markets and demand by reducing project risks in order to make offset credit development more economically viable and robust. The new round of Conservation Innovation Grants (CIG) has a specific focus on market development, so this infusion of funds should help move this issue to the next level. The group also discussed the short lived climate forcers' discussion to understand what C-AGG and each participant can do to raise more awareness of these issues particularly with respect to future policy decisions. C-AGG will continue to push the issue with the agencies and encourages all participants to do the same within their spheres of influence.

The remaining morning sessions focused on updates from ARB and California's Department of Food and Agriculture (CDFA). ARB provided an update on the status of the rice protocol, which will go before the board in June for final approval. Once approved, ARB will spend the year focusing on implementation before undertaking another protocol. ARB strongly encouraged project developers working in the voluntary space to continue developing agriculture projects using current protocols since ARB will rely heavily on these implemented projects for lessons learned for their future protocol development. CDFA presented two agriculture emission reduction programs that are utilizing funds from CA's cap and trade program: a dairy digester R&D program and a water efficiency and GHG emissions reductions program. Both focus on decreasing GHG emissions in the agriculture sector by providing seed funding for new technology adoption.

Alexia Kelley presented on the current status of negotiations within the UNFCCC framework and The International Civil Aviation Organization (ICAO). ICAO has committed to neutralize growth in its GHG emissions from a 2020 baseline, and declared an intent to utilize offsets to help meet this obligation. The ICAO process is 2-4 years ahead of the UNFCCC in terms of market framework development, and it is thus likely that the rules established under ICAO will lay the foundation for post-2020 market development under the UNFCCC.

The second day of the meeting concluded with a program update from Adam Chambers of USDA NRCS. USDA is continuing to support the development of carbon and water quality markets through a second round of CIG funding and through the continued development of tools and methodologies that support easy quantification of GHG emissions on farm.

### Action Items/ Key Takeaways

- To stay up to date on ARB's short lived climate forcers plan development and to read more about short lived climate forcers, visit ARB's website (<http://www.arb.ca.gov/cc/shortlived/shortlived.htm>).
- Peter Byck presented his new Soil Carbon Cowboys video at the end of Day 1, which can be found at: <http://www.carbonationmovie.com/about/clips/225-new-video-soil-carbon-cowboys>.
- Alexia Kelley asked for C-AGG participants to keep her and her colleagues at ICAO informed on the current status of protocol and methodology development as they develop the aviation sector's market based mechanisms.
- There is currently no formal way to follow the ICAO process, so C-AGG will periodically provide updates to the group via the C-AGG list serve and at C-AGG meetings.
- C-AGG is forming working groups to continue collaboration between meetings! Please see below for additional information on the working groups and contact information for each chair. If you are interested in joining a working group please reach out to the chair and Monica McBride ([monica@c-agg.org](mailto:monica@c-agg.org)).
  - **Working Group:** Project Implementation and Credit Delivery
    - **Chair:** Alastair Handley ([alastair@carboncreditsolutions.ca](mailto:alastair@carboncreditsolutions.ca))
    - **Focus:** Identify agricultural offset marketplace challenges, prioritize them, and work to collectively develop solutions to overcoming them in order to better enable agricultural offset project development and implementation at scale. For example, voluntary GHG registries in N. America have different contractual requirements for growers. Clarity regarding these requirements could help project developers create contractual templates to speed project implementation. Other suggested topical areas for working group consideration include risk mitigation; verification; producer outreach and education; overlap and coordination with sustainable supply chain and other industry initiatives.
  - **Working Group:** New Financial Instruments
    - **Chair:** Karen Haugen-Kozyra ([karenhk@prasinogroup.com](mailto:karenhk@prasinogroup.com))
    - **Focus:** There is growing momentum in some sectors (agriculture, water, and forestry) to seek alternative financial instruments to offset or credit trading mechanisms in order to incentivize best management practices in agriculture. For compliance-based systems in particular, the systems are fraught with restrictive policy decisions that either (a) inhibit offsets occurring at scale, or (b) are ineffective at incentivizing offsets, for instance, by creating high transaction costs that prohibit entry into the marketplace. The focus will be

on alternative financial instruments within existing frameworks (i.e. not starting from scratch) to explore and develop options for consideration by treasury departments and agriculture, energy and environmental agencies to deliver reduced GHG, improved water quality and other desired environmental outcomes.

Monday, March 9, 2015

### **Welcome and Introductions: C-AGG Overview and Background**

Debbie Reed, C-AGG's Executive Director, opened the meeting with an introduction to C-AGG. The introduction included a description of C-AGG's Executive Team, Steering Committee, and overview of C-AGG as an organization including how it operates, its focus on advancing the development and adoption of science-based policies, methodologies, protocols, projects, tools and decision support systems for GHG emissions reductions and carbon sequestration within the agricultural sector, and its future goals and activities. While C-AGG has three meetings a year, these meetings are complemented by intermittent workshops to dive deeper into emerging topics. Debbie concluded her opening remarks by highlighting the objectives for the Sacramento meeting, which included:

- Expanding our circles and partners to have greater influence and impact;
- The issue of permanence in agricultural and biological GHG projects and understanding the temporal impacts of updated climate science and the implications for policy making;
- An update on CA activities under AB 32 including an update on the rice protocol and highlights of programs being funded through this program;
- A discussion of short lived climate pollutants and how CA is planning to address them; and
- Thinking about all of these ideas from a global context especially as the Paris UNFCCC meetings approach.

### **Assessing the Landscape: A C-AGG Discussion of Critical Issues and Trends in Agriculture and Climate Change**

Chris Chopyak led the group in a discussion around the current trends and themes that the group is seeing in their daily activities. Numerous attendees brought the conversation back to the farm level and highlighted the fact that farmers are beginning to understand the value of low carbon agriculture practices and are seeking additional opportunities to participate. Once one farmer demonstrates that a practice change can be successful, others quickly come to the table. Farmers are innovators who have risen to the challenge of managing biological ecosystems and it is important that incentives remain in place to further this innovation. In CA, regulations are on the horizon that could stifle this innovation, so it is important to remember that farmers provide a vital service to this country and should not be looked at like other large industries.

In the CA context, questions surrounding how aggressive air quality targets in the San Joaquin valley will be met in the coming years was top of mind. The federal Environmental Protection Agency (EPA) has proposed lower ozone standards that would require an increase in the use of fossil free fuels. However, the technology for farm equipment currently does not exist to meet these standards, since the use of an electric engine at this point in time would not meet the performance standards required on many farms.

While technological limitations to reduce emissions from on farm equipment currently exist, opportunities for farmers to reduce emissions using variable rate technologies for nitrogen and through new manure management options do exist. However, the upfront costs of these practices are still a challenge to implementing the changes. Companies continue to seek greater sustainability from the supply chain but are hesitant to pay for necessary monitoring, measurement and verification required to ensure sustainable actions have been undertaken and resulted in measureable improvements. If companies are willing to pay for credits and help develop functioning markets these additional transaction costs would eventually come down to manageable levels. One path forward is working with Carbon Disclosure Project (CDP) and other voluntary reporting frameworks to incorporate the purchase of offsets and stewardship credits into their voluntary reporting requirements, to allow companies to use the purchase of these credits to meet their sustainability goals. However, it is clear that branded consumer product companies are struggling to compete in global markets, resulting in pressure to cut costs where they can. Therefore, asking them to spend money on credits can be a hard sell.

It is clear that work still needs to be done on the business case to attract the private sector to the market. The lack of funding in the system seems to be a theme that ties each meeting together. While the market has seen small successes, it is still a bumpy road to bring these efforts to a scale that matters.

### **Climate Change and Agriculture: Governor Jerry Brown's Plan**

Ken Alex, the Senior Policy Advisor in the Office of Governor Jerry Brown, opened the morning session with an overview of the governor's plan to combat GHG in California. He began the conversation by acknowledging that the agriculture sector is often left out of conversations involving emissions given the sector's contribution compared to that of energy and transport. However, the conversation is starting to change and agriculture is now being viewed as a GHG sink, and a source of additional offset credits for regulated entities. Ken provided an introduction to the governor's 5 pronged plan. The plan includes the following objectives:

- A 50% renewable energy portfolio by 2030;
- Reduction in oil and transportation fuels by up to 50% by 2030;
- Doubling the efficiency of buildings by 2030;
- Reducing short lived climate forcers in all sectors; and
- Increasing the attention paid to working and natural lands as they are a part of the solution (e.g. managing forests and working rangelands and containing sprawl).

Currently, the state is on track to meet the 2030 renewable target with a current portfolio of around 25% renewable energy in the state with an interim regulatory requirement of a 33% renewable portfolio by 2020. To meet the second goal, the state is working on converting as many diesel sources to other options as quickly as possible. However, they will need 3-7 million electric vehicles by 2030 to truly meet this goal, which is a significant increase from the 100,000s vehicles currently on the road. To advance the final two goals, the state needs to support the robust agriculture sector that is producing over 400 commodities and the largest volume of milk in the country.

This year AB32 will generate \$850 million for the GHG Reduction Fund (GGRF) that will be used to reduce GHG emissions across the state. This year, \$12M is being utilized for the CDFA Dairy Digester R&D Program and \$10M was awarded to the state water efficiency and enhancement program (SWEEP) focused on electrifying pumping systems to reduce GHG and conserve water. Starting in 2015, the cap will include transportation fuels, which should increase the amount of money in the fund. These increased funds should lead to an increase in funding for the agriculture sector to be spent on improving the socioeconomic conditions of farming regions and preserving lands at high risk of conversion from cropland to urban uses to turn potential emission sources into sinks.

CA ARB is currently undertaking another update to the scoping plan to lay out post-2020 goals. This new plan will include 7 new recommendations with an increased focus on the agriculture sector. In addition to the scoping plan, other priorities for the administration include drafting of the 4<sup>th</sup> Climate Assessment, managing short lived climate pollutants, implementing the healthy soils initiative, and working with the international community. The 4<sup>th</sup> Climate Assessment will be focused on resilience and adaptation in the state with the agriculture sector being a big priority area. The report will highlight the GHG reduction potential from composting of manure and food waste in addition to the use of biochar to help with soil carbon sequestration.

The administration understands the large impact and opportunity short lived climate forcers play in climate change mitigation. About 60% of methane emissions in the state come from the agriculture sector and eliminating these emissions will start to have an impact within the next 30 years compared with reducing CO<sub>2</sub> emissions, which have a much longer residence time. The administration will release a strategy for handling these emissions by the end of 2015.

Secretary Karen Ross of CDFA is leading the state's Healthy Soil Initiative focused on improving soil organic matter and building soil carbon. This is a nice complement to the UN 2015 International Year of Soils program.

Finally, the state has been focused on engaging other sub-nationals (e.g. states in China, Brazil, Peru, and Mexico) around the world that want to move faster than their respective countries in combating GHG emissions. CA is hoping to bring together a large group of sub-nationals in Paris to draw attention to the strides they are making despite the challenges at the national level. Since a number of these sub-national economies are heavily reliant on agriculture, the sector could have more at play in this year's negotiations.

The audience challenged Ken's assumption that absolute emissions reductions in the agriculture sector are possible when food production will need to increase to feed 9 billion people by 2050. He believes huge opportunities still exist to reduce emissions before the state reaches a point of diminishing returns. For example, current strategies for waste management in agriculture have not been optimized and represent a large possible GHG reduction opportunity. Additionally, he thinks opportunities to preserve open space and agricultural land could help increase the GHG sinks in the state. It will be important to work with the international community on these issues to find a balance between sustainable forestry, agriculture, and community development. Acre, Brazil was pointed to as a model for this type of sustainable development.

Ken turned the questioning around and asked the audience to propose key policies CA should be considering to make the state a leader in the agriculture sector. One suggestion offered was that the current price signal in the market is too low at \$12.50 a ton and that a price closer to \$25-\$30 a ton would start to motivate people to act, creating greater demand for offsets. To prevent market failure, CA is slowly increasing the price of carbon, so it will not reach these higher levels until 2022. The audience also suggested an increase in ARB staff focused on offset protocol development to increase the speed at which agriculture protocols can be developed and implemented. Finally, participants representing various agriculture sectors cautioned the administration against a one size fits all approach given agriculture in the state is very diverse and will thus require a diversity of options. Participants further encouraged the administration to focus on both the biological systems and the technologies (i.e. farm engines) used on farm when looking for reduction opportunities. Ken agreed and highlighted that ports will serve as a test case for new technologies in electric engine development, for example.

### **Temporary Carbon Storage and a Case Study for Orchards**

Dr. Alissa Kendall, UC Davis, continued the permanence conversation that started at the November C-AGG meeting with the presentation of a case study from the almond industry. She has been working with the almond industry on the development of a life cycle assessment (LCA) of almond production. Her presentation started with an introduction to LCA methodology and highlighted the differences between an LCA and a carbon footprint or other inventory. An LCA is a method for characterizing and quantifying the environmental sustainability of a product or system across its entire life cycle from cradle to grave and incorporates more than one indicator. A carbon footprint or inventory is an annual snapshot of emissions that occur at a site or over a region for only one indicator.

LCA is governed by the ISO14040 series, which outlines the processes and requirements for conducting an LCA. Both LCAs and footprints characterize GHG emissions using the same unit of measure, CO<sub>2</sub>-equivalence (CO<sub>2</sub>e), and use the Intergovernmental Panel on Climate Change's (IPCC) 100-year global warming potential (GWP) factors to convert non-CO<sub>2</sub> GHG's to CO<sub>2</sub>e. The GWP factor is based on the radiative and cumulative radiative forcing of a gas compared to CO<sub>2</sub>. To calculate a gas's GWP, the integral of radiative forcing for the gas over some period of time is divided by the integral of radiative forcing for CO<sub>2</sub> over that same period of time. For the purposes of LCA and carbon footprints, that period of time has been arbitrarily chosen to be

100 years. Additionally, accounting for carbon sequestration in both of these methodologies requires the carbon to be considered 'stored' for at least 100 years. There are countless scenarios where emissions timing matters in LCA and carbon footprints, but the one most relevant to this discussion is when CO<sub>2</sub> is sequestered for less than 100 years.

Dr. Kendall's research is currently focused on developing a new CO<sub>2</sub>e metric that includes timing while maintaining a simple calculation process to allow for easy use by practitioners and policymakers. Two of the leading alternatives to GWP are the time-adjusted warming potential (TAWP) and the time correction factor (TCF). The TAWP is similar to the net present value in accounting and yields units of CO<sub>2</sub>e today for various analytical time horizons and GHGs. The TCF is useful for calculating emissions intensity estimates using amortized CO<sub>2</sub> emissions. She has created an excel tool for calculating the TAWP since it changes the integration period and is no longer just one number, but a series of possible numbers depending on time.

Dr. Kendall used this new metric approach in her almond LCA to determine how it would change the GHG value results. The almond orchard LCA's scope included orchard establishment, the orchard phase, and the orchard removal for a time horizon of roughly 25 years. The LCA tracked all useful co-products and included all upstream impacts associated with equipment and materials used on farm. The study assumed all prunings were either mulched or burned and all trees were used to create bioenergy at the end of their life. The study looked at both economic allocation<sup>1</sup> and displacement methods<sup>2</sup> for the co-products and given the high economic value of the kernel found very different emission results depending on the method used. The economic allocation method resulted in higher GWP and total energy values since the credit for co-products was significantly discounted. In addition to running these two scenarios, Dr. Kendall's group also ran various scenarios for differences in production operations to see how sensitive the system was to certain changes. The biomass fate had the biggest impact on the final results with the use of a gasification and stable C biochar as the most favorable end of life option.

After the traditional LCA results were finalized, the group applied the new TAWP accounting metric to the results. When using this new metric to take into account the carbon sequestration over the lifetime of the orchard it reduces the final GHG emissions by 21%. Therefore, using this new metric to calculate GHG emissions for biological systems could help policy and decision makers choose the best uses for biomass. The model does not include short lived climate forcers, which is a recognized gap and next step for the research group. Dr. Kendall has presented these findings to policymakers, who have been receptive but slow to act given the complexities. Her group plans to build a robust library of CA crop LCAs to provide a better science base for decision making.

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<sup>1</sup> Economic allocation allocates all the inputs among the various co-products using the economic value of each co-product. For example, the almond kernel is 94% of the value of the outputs from an almond orchard, so 94% of the impacts from that orchard would be assigned to the kernel.

<sup>2</sup> The displacement method models co-products as if they are preventing the production of producers that are substitutable in the market. If almond trees are used for energy at end of life they would be displacing the use of the grid electricity and therefore would receive an emissions credit for displacing this electricity.

### **CA Air Resources Board Focus on Short-Lived Climate Pollutants**

Ryan McCarthy, CA ARB, presented a high level overview of CA's plan for a short lived climate pollutants roadmap. CA has always been a leader in regulating air pollution due to the state's history of air quality problems. Since CA started strictly regulating air pollutants, the state has seen a 50% reduction in particulate matter and a decrease of 30% in severely impaired lung health. He noted that if CA's efforts were replicated around the world it would save around \$5 trillion. If the state took similar steps to cut methane emissions studies have shown it could save an additional 50,000 lives in the state. Studies have also shown that focusing on black carbon and methane has the potential to significantly slow the impacts of climate change. Therefore, CA ARB has turned its attention to focusing on short lived climate pollutants including methane, fluorinated gases, black carbon, brown carbon, and tropospheric ozone. Black carbon will be one of the more challenging forcers to estimate and track since methods for monitoring the smallest particles are still in their infancy.

Under senate bill 605, ARB is required to complete a short lived climate forcers plan by January 1, 2016. The state has already been tackling black carbon, fluorinated gases, and methane from natural gas, so the plan will highlight additional actions that can be taken to address the sources that have received less attention to date, including methane from dairies. The first step will be to complete an inventory of all short-lived forcers. This will then lead to a research gap analysis to identify additional research needs for new control measures. During the roadmap development, ARB will be coordinating with other agencies that have jurisdiction over some of these emissions sources and consulting with academia and industry experts to fully understand all of the options on the table. The multi-stakeholder process will include public workshops to include all interested parties outside of ARB's targeted group. The goal is to develop a draft roadmap by spring or summer and then a final roadmap by the end of the summer for the board to hear in late fall.

The roadmap will focus on short term opportunities and will be looking to realize significant emissions reductions by 2030. Since 62% of methane emissions in the state's 2012 inventory resulted from agriculture, the sector represents a big opportunity for savings through compost, energy production, and waste application to land. The roadmap will take a systems wide approach to managing these emissions, but will fall short of being all encompassing given the short time horizon. In terms of requiring any technologies on dairies, those opportunities will be presented in the regulations and incentives portion of the roadmap. To keep informed on the progress, individuals can sign up for the short lived climate forcer's list serve.

The group encouraged Ryan and ARB to strongly consider incentives over regulations, specifically incentives for using compost and biochar on the landscapes and for dairies to reduce methane emissions from manure and enteric fermentation.

### **Water Quality and Carbon Credit Trading: A Panel Discussion**

Alex Johnson from The Freshwater Trust opened the water quality and carbon credit stacking panel with an overview of the activities The Freshwater Trust is engaged in, including restoration of habitat species for fish in the Pacific NW, water quality issues, and the generation of water quality and temperature credits for trading. Water quality trading is much more localized than carbon, meaning that trading occurs within the same watershed. Additionally, the credits being traded are part of a regulatory compliance system, which outside of a few states in the US does not exist for carbon. Under the Clean Water Act, regulatory entities along rivers are required to meet total maximum daily load (TMDL) requirements for pollutants such as nutrients, temperature, and sediment. For some entities within the watershed, meeting these requirements could require expensive capital investment to mitigate the impacts of their discharge at certain times of the year. Since the TMDL requirements cover an entire watershed, this gives regulated entities the option of working with others in the watershed to restore the river or improve practices along the river at a lower cost. The Freshwater Trust helps coordinate these entities and track the impacts of the restoration projects within the watershed. Currently, the additional benefits associated with these projects are not being quantified, which Alex sees as a lost opportunity.

Bobby Cochran with the Willamette Partnership discussed the origins of the non-profit founded in 1980 with a mission to build collaborative solutions to complex conservation problems. Currently, the water quality market is in its nascent stage with a country full of pilot projects. Willamette is working to create consistency for quantification and implementation across projects for both the environmental and public health benefits associated with watershed restoration. Willamette has also been working at the national level with a network of other water quality specialists facilitated by the World Resources Institute (WRI) to develop a handbook of options and considerations for water quality trading program development. The document will include options for program developers to consider when beginning these initiatives and the pros and cons associated with the different options. Use of the document will likely shave 3 years off the process of setting up new water quality trading programs in other places. With respect to water quality stacking, Willamette believes that the methodologies can support it, but no one is currently demanding stacked credits.

Jessica Fox with the Electric Power Research Institute (EPRI) discussed the origin of the water quality trading program she manages in the Ohio River Basin. In 2005, utility companies were starting to comply with new NO<sub>x</sub> requirements by installing SCRs on their scrubbers. However, installing this technology transferred the nitrogen from the air to the water creating a water quality issue for the power plants that had to be regulated. EPA drafted guidelines for power plant effluent that included restrictions on the levels of nitrate and nitrite in the effluent and required technology solutions to meet these new restrictions. Since the bill included technology requirements, this normally would have excluded the use of credits. However, the industry pushed for a systems approach and the allowance of credits for offset projects. It has now been 6 years since EPRI started working in the Ohio River basin on these issues and they have seen permanent reductions from around 70 farmers through this program. EPRI is now on the cusp of testing the economic viability of the credit system in the absence of state mandated

targets. The first credit auction will take place later this spring to test the Corporate Social Responsibility business case for the credits.

Elizabeth Hardee from the Climate Trust (TCT) provided the buyer and investor's perspective. The Climate Trust was established to manage an emissions offset fund under the Oregon Carbon Dioxide Standard that requires power plants to meet set GHG emissions intensity standards. If the power plants are unable to meet these emission standards they are required to purchase carbon offsets, which can be handled through TCT. TCT has recognized that this is not a truly sustainable business model and is in the process of implementing a new fund management strategy. Over the course of TCT's 17 years of managing offsets, they have identified two major risks: (1) delivery risk defined as not being able to acquire the volume of offsets in the timeline expected, and (2) market risk characterized by price and policy changes that can put market stability at risk.

TCT's new model attempts to address both of these risks by leveraging their current funds to attract additional capital. This additional capital would then be turned into an upfront payment to project developers transferring the risk from the developers to TCT for project delivery. TCT is willing to accept this risk since they have guaranteed funds from the state regulatory program that can be used as a buyer of last resort. The idea is to provide early stage investment to projects that has never been offered in the past to help with market development. TCT knows they have buyers for carbon credits, but are still investigating the business case for the nutrient and stewardship credits before they lend money for these project types. They are actively working on creating more demand from the federal government with the hope of creating a robust market that will then attract the corporate buyers.

Participants were very interested in the issues surrounding stacking since many were new to the C-AGG discussion and did not have a full understanding of the debate. Panelists expressed their frustration with the academic debate around credit stacking since variations of stacking are already occurring within the water quality market. For example, EPRI's program is already stacking nitrogen (N) and phosphorus (P) credits for the projects in the Ohio River basin. However, some argue that stacking benefits and selling the credits unbundled to different buyers or the same buyers is double dipping. Given this issue, both Willamette and The Freshwater Trust have shied away from selling more than one credit per project to ensure their credits are not disqualified from Clean Water Act compliance. All entities acknowledge that they are promoting and attempting to quantify the additional benefits that travel with the credits, but not always in a formal capacity.

Coming from the water sector, which has some natural regulatory incentives driving the market, the panelists were interested in understanding the carbon market drivers including the typical buyers of credits. The Freshwater Trust projects are currently too small to generate economically viable credits, however, the idea of developing carbon protocols that take into account the avoided technology solutions required to generate the same emissions impact could

change the economics. Alex acknowledged that this one off solution would be a heavy lift and likely not feasible in the near term, but something worth considering in the future.

The economics of project development and credit issuance continues to be a theme during these discussions. EPRI and others are looking at all possible tools available to make managing these landscapes and ecosystems economically viable. For credit stacking, that means having one verification and one project developer responsible for all possible credit development and registration. It also means detaching the farmers' payments from the credit sales to transfer the risks from the producer to the credit developer in an attempt to increase producer participation.

Tuesday, March 10, 2015

### **Thoughts and Reactions to Monday's Session**

Chris Chopyak opened the second day with a facilitated discussion focused on reactions and thoughts to the information presented during the first day. Participants felt it may be time to take a step back and look at some of the outputs coming from other disciplines focused on quantifying competing impacts such as the LCA community and systems thinking coming out of the European Union. Members representing the producers also cautioned that credit development is never going to work unless the conversation sector can begin speaking the producers' language.

The credit stacking discussion continued with a word of caution around the assumption that all water quality projects will always result in additional credit opportunities, which may not be the reality. The water quality sector acknowledged that projects often only optimize for one benefit, but it is rare that no other benefits occur. The group felt it was time to start investing in stacking to bring it to scale instead of finding every potential fault with it. For agriculture projects, tying all of the benefits together is the only way to make these project profitable. While it is important to start pushing for scale, it is also important to keep in mind who will own the risks and who will be rewarded in this system.

In functioning markets, risks are assumed by the entity that can most appropriately handle them. In current carbon markets that is the project aggregator and not the producer. Therefore, the aggregator will also receive a larger reward than the producer, which makes engagement challenging, especially when asking a landowner to sign a contract preventing changes on their landscape for up to 100 years. With time and market development, the risk and higher reward could be assumed by the producer allowing them to make their own decisions regarding conversation practices. The recent CIG announcement is a financial acknowledgement that the work C-AGG and partners are doing continues to be a priority for the agriculture sector and will hopefully lead to a more robust market for producers.

Finally, the group brought up the issues of short lived climate forcers to understand what C-AGG and each participant could do to raise more awareness of these issues particularly with respect to future policy decisions. Debbie mentioned that C-AGG brought this to the attention of the USDA leadership and the State Department during the November meeting, as well as the

temporal GWP-20 issue, since both have important implications for policy decisions. C-AGG will continue to raise the issue and encourages all participants to reach out to their contacts and networks to increase awareness.

### **CA Air Resources Board Update on the Rice Cultivation Offset Protocol**

Greg Mayeur, with CA ARB, provided an update on the rice cultivation offset protocol, which C-AGG has been actively engaged in from the beginning. For those who have not been following the protocol, Greg provided a quick historical overview of the process.

Three years ago ARB committed to developing a rice protocol, which is ARB's first crop based protocol. The current version of the protocol, which went for board review in December, allows for consolidated projects, granting an authorized project designee (APD) the ability to operate with multiple farmers while only submitting one Offset Project Date Report (OPDR). The project designee can include 2 crediting periods or growing seasons within a single report, or 3 if one is not a crediting period. Under the protocol, each project is required to be independently verified and an offset verification statement must be issued for each project under the consolidated OPDR. The protocol will use a simplified version of the DeNitirification DeComposition (DNDC) model to quantify baseline and project emissions. Based on the latest structural uncertainty runs, a fixed value of 0.052 metric tons/acre will be set as the uncertainty level in the calculations.

ARB will accept early action credits for reductions that occurred between January 1, 2005 and December 31, 2015. These credits need to be registered with ARB or an approved Offset Project Registry prior to January 1, 2016. Since the December 2014 board meeting, early action projects using American Carbon Registry's Rice Protocol with some modifications will be eligible. To further encourage participation, ARB is developing a quantification tool with help from Michigan State University and Applied GeoSolutions that will streamline quantification, record keeping, data input, and calculations.

Finally, ARB has allocated \$200,000 to support evaluation of alternative means of verification. Since this is the first proposed compliance offset protocol to rely entirely on modeled calculations not tied to direct measurement, ARB will be undertaking simultaneous verification processes for all projects to determine what level of verification is adequate to ensure reductions have occurred. The audience cautioned that extra labor will be needed on the project developer's side for two verifications, so some of the money could be set aside for these groups as well.

The next version of the protocol will be released in May 2015 for a 15-day comment period with final board consideration in June 2015. ARB encouraged the group to continue pushing forward on all voluntary agriculture offset projects and methodology development since this data will be helpful when ARB begins to undertake additional agriculture protocols. Finally, ARB will be spending the year after the release of the rice protocol on implementation and will then begin to consider their next priority protocol for adaptation.

## **International Negotiations and Carbon Offsets: The International Civil Aviation Organization (ICAO) and the UNFCCC**

Alexia Kelley, a Senior Climate Change Advisor in the Office of Global Change at the U.S. Department of State, presented the state of the current international negotiations with respect to carbon offsets within the UNFCCC and ICAO processes. In 2009 and 2010, the international community saw a sea change in global negotiations. Countries made a range of 2020 commitments ranging from absolute to intensity based using various “compliance” measures including offsets. However, there was no internationally agreed accounting system in place for these 2020 targets and as a result market development was slowed. As countries move forward to Paris to negotiate post-2020 goals, the global community is faced with a new bottom-up approach characterized by a multitude of domestic commitments that may all be quite different making it incredibly challenging to understand how to function in this global “market.” This is a very different situation than the top-down approach that occurred under the Kyoto Protocol.

Leading up to the Paris negotiations, countries have been asked to submit their Intended Nationally Determined Contributions (INDCs), so the global community has a starting point for negotiations come December. Switzerland was the first country to submit a plan, which included the use of markets to meet their goals. However, how markets may be included in the final post-2020 plan remains unclear. Currently, there are multiple offices within the UNFCCC framework discussing markets including the ADP (Ad hoc platform for advanced action in Durban) and the SBSTA (Subsidiary Body for Scientific and Technical Advice). While many bodies are working on an approach to markets post-2020, a significant amount of work will need to happen to make any progress by Paris.

The US objectives going into Paris will be to maintain flexibility for evolving domestic policy and to ensure that real emissions reduction outcomes come out of the discussions. This will be challenging given the general lack of clarity around how the UNFCCC regime will evolve and the fundamental philosophical divide regarding this party-administered system. Numerous countries have proposed post-2020 market systems, so while the accounting landscape is considerably more complex than it was under Kyoto, carbon markets are and will continue to be an important part of how countries address their GHG emissions reductions.

In 2013, the ICAO assembly agreed to develop a range of approaches to reduce emissions in the aviation sector. This is the first time the world has seen a global sector tackle global emissions. The sector is currently trying to determine how they can grow while stabilizing emissions. The sector is looking into technology options, operational changes, alternative fuels, and market based measures (MBM). The council has tasked two groups with investigating how to establish global market based measures (GMBM) for the sector. The council believes MBMs will allow the sector to achieve their goal of carbon neutral growth post-2020 at a potentially lower cost and in a more flexible manner than mandating certain technologies and fuels.

One of the groups tasked with investigating MBMs is the Environmental Advisory Group (EAG) made up of 17 member countries. The EAG recently developed a strawman outlining the advantages and disadvantages to various GMBM. The Committee on Aviation

Environmental Protection (CAEP)'s Global Market-Based Measures Technical Task Force (GMTF), the second group involved in the GMBM process, is undertaking technical work associated with developing a GMBM including recommendations on the technical aspects of design elements (i.e. offset eligibility criteria, monitoring, reporting, and verification). The GMTF delivered preliminary results to the ICAO Council in fall of 2014 and will make final recommendations on the technical aspects of the design elements in spring of 2015. The GMTF will be releasing 7 technical papers addressing the technical design elements of a market including:

- Governance and approval of systems for ICAO compliance;
- International accounting/linkages between UNFCCC and ICAO;
- Environmental Integrity/key eligibility criteria;
- Registry design and operation;
- Vintage Restrictions: Implications for ICAO;
- Role of Allowances vs Offsets; and
- Net atmospheric benefit and discounting.

Much is still unknown as to what will be proposed in the recommendation documents as they work through this very political process. ICAO is currently 2-4 years ahead of the UNFCCC process in terms of thinking through market design, so the outcomes of these efforts may inform future discussions at the UNFCCC level.

### **Dairy Digester Program**

Dr. Geetika Joshi presented the CDFA's Dairy Digester Research and Development Program (DDRDP). Emissions in CA's agriculture sector accounts for approximately 8% of total GHG emissions in the state and of those 31% are from enteric emissions. One way of mitigating these emissions is through the use of anaerobic digesters, which capture the methane and turns it into electricity, gas, or compressed fuel. CA has roughly 1500 dairies and around 20 methane digesters. The following barriers have prevented digesters from being implemented at more dairies:

- Expensive, uncertain and complex interconnection and permitting obstacles;
- High environmental compliance costs;
- Lack of long-term economical energy purchase agreements;
- High financing risk and costs; and
- Operation and maintenance of digesters (and tracking GHG emissions) require technical professionals.

To address these barriers, CA set up a federal, state and local agency partnership to identify and remove barriers. The group drafted 4 high-level recommendations:

- Consolidate permitting process and pre-certify equipment and feedstocks to ease regulatory hurdles;
- Digester Incubation Program with a dedicated funding mechanism to support digesters;
- Protection of environmental quality; and

- Research on co-benefits of dairy digesters.

These recommendations were then considered for funding under the Budget Act of 2014, which distributes money from the cap-and-trade fund. The DDRDP has received \$12 million to support projects that reduce GHG emissions from CA dairy operations by capturing GHGs, harnessing GHGs as a renewable bioenergy source and promoting low carbon fuels. The project has been split into two phases. Phase I will allocate \$11.1M to milk producers and dairy digester developers to put towards the construction of the digesters. Each project will have a \$3M cap with a minimum 50% match in funds. Phase II will use \$500,000 to start investigating research gaps related to digesters. CDFA received 12 applications as part of Phase I and will be announcing awards in June with contracts executed in July.

### **State Water Efficiency and Enhancement Program (SWEEP)**

Carolyn Cook, with CDFA, presented the impetus for the State Water Efficiency and Enhancement Program (SWEEP) funded by the GGRF. On March 1, 2014, Governor Brown signed emergency drought legislation that allocated \$10M from the GGRF for CDFA to invest in irrigation and water pumping systems that reduce water use, energy use, and GHG emissions. The agency developed an application and evaluation process for producers to apply for these funds. Ten evaluation criteria were established including activities with the largest water savings, largest GHG savings, in a D3 or D4 drought designation, the use of soil moisture sensors to track data, and the use of evapotranspiration based irrigation scheduling. Additionally, the funds from this program could not be used to expand existing agricultural operations, must be used and maintained for 10 years, and could not be combined with funding from other government assistance programs. Projects applying for SWEEP funding were given extra points if they had additional environmental and social co-benefits, benefited a disadvantaged community, and had 50% matching funds, which were encouraged but not required.

CDFA developed an online application form to simplify the process for producers. The application required detailed information on the project design, budget worksheet, and supporting documents for baseline water and GHG calculations. C-AGG participants who helped growers apply for funding provided some constructive feedback on the application process including the need for a more farmer friendly processes and space to elaborate on additional co-benefits of the proposed technology. The current application does not allow for explanation of GHG benefits beyond those occurring directly from the upgraded pumping system. CDFA did provide some online calculator tools to help farmers and other applicants determine the GHG savings from their proposed water projects, but additional outreach would have been appreciated by producers.

After funds are dispersed and projects implemented, recipients will undergo a verification process to ensure the money was used appropriately. Verification will also evaluate the realized GHG reductions and water savings. Since the program's launch in July, SWEEP distributed \$3.3 million to 85 different projects including soil moisture monitoring systems for better scheduling, micro-irrigation systems, and energy efficient pumps. While funding under

this mandate has been expended, additional funds are expected to be allocated to the SWEEP program again this year given the water situation in CA has not improved.

### **NRCS/USDA Update: GHG CIGs and Other Program Updates**

Adam Chambers of USDA NRCS provided an update on the GHG emissions activities USDA and other government entities have been working on since C-AGG's Detroit meeting the summer of 2013. The executive branch has been working to understand the government's GHG emissions and how new policies and projects will impact them. The White House Council on Environmental Quality (CEQ) recently proposed guidelines to the National Environmental Policy Act (NEPA) that outlined how GHG emission calculations could be incorporated into project proposals. The document does not set regulatory requirements, it just encourages agencies to take a holistic look at the impacts of their proposed projects. C-AGG has contributed comments in support of using the guidance during program development and implementation.

USDA has been working to streamline the GHG tools and methods the agency develops to forge a path for others to use how they see fit. USDA is hoping to integrate the recent methods report into the national inventory and the COMET-Farm tool, which is set for completion mid-spring with a final goal of becoming an open source platform. The methods report released in June 2014 will be updated by the end of 2015 to correct for calculation errors that were discovered during the first year of use with additional updates released on an annual basis to reflect the improvements in science and research.

Finally, USDA recently announced another round of Conservation Innovation Grant (CIG) funding that includes funding for GHG market projects, environmental market projects more broadly, and conservation finance projects. This round of CIG funding will distribute \$20M in funds by the end of September. The initial project proposals were due at the end of February and applicants who are chosen to submit a full length proposal will be notified in April.

The group thanked Adam and USDA for their work in this area, and suggested that opportunities and projects that focus on market maturation can help further improve project economics and economies of scale. Since the US does not have a national level regulatory market driving offsets, it is important to find other ways to create economies of scale to bring down verification and registration costs for ecosystem service and offset credits.