U.S. Forest Offset Projects

May 30, 2019

Overview of the Compliance Offset Program

- Small part of Cap-and-Trade Program that incentivizes reductions or sequestration of greenhouse gases in sectors not covered by the cap
- Distinct and separate from voluntary offset programs
- Per AB 32, all offset credits must be real, permanent, quantifiable, verifiable, enforceable, and additional
- Results in multiple co-benefits, including cost-containment
- Current Board-Approved Compliance Offset Protocols
  - U.S. Forest Projects
  - Ozone Depleting Substances Projects
  - Livestock Projects
  - Mine Methane Capture Projects
  - Rice Cultivation Projects
  - Urban Forest Projects

Overview of the U.S. Forest Protocol

- Requirements for estimating increased sequestration of carbon in trees
- Requirements for natural forest management and sustainable harvesting practices
- Requirements for calculating reversal risk rating and forest buffer pool contribution
- Requirements for long-term monitoring, reporting, and verification
- Project types:
  - Improved Forest Management
  - Avoided Conversion
  - Reforestation

U.S. Forest Projects

- A forest offset project is a planned set of activities that increases carbon storage in trees or prevents the loss of carbon stored in trees, compared to what would have occurred in the forest absent project activities
- For an Improved Forest Management project, these activities would include:
  - Increasing rotation ages (timing between harvest)
  - Increasing productivity by thinning diseased and suppressed trees
  - Increasing productivity by managing brush and short-lived forest species
  - Increasing stocking on understocked areas (planting more trees)

Quantification of Stored Carbon

- Offset credits are awarded to forest projects for the difference between the carbon in trees using a conservative business-as-usual baseline and the actual carbon in trees
- This requires rigorous:
  - Estimates of the amount of carbon in trees
  - Development of a project baseline
  - Estimates of harvest volumes
  - Estimates of long-term storage in wood products
  - Estimates of leakage
  - Verification of increased sequestration of carbon in trees

Quantifying the Carbon in Trees

- Projects must estimate total amount of carbon stored in trees in the project area
- It is not physically possible to weigh or measure every tree
- Statistical methods help assure an accurate carbon inventory
  - Plots – a subset of trees are selected systematically or randomly for sampling
  - Volumes – measured diameters and heights are used with Board-approved equations to calculate the volume of all trees in the plots
  - Carbon – derived from equations used to convert volumes into carbon
  - Expansion Factor – since only a subset of trees were measured, each tree represents numerous other trees
- Confidence deduction to account for measurement uncertainty

Determining the Project Baseline

- Baseline establishes a conservative business-as-usual scenario
- Must incorporate all legal constraints that could affect growth and harvesting scenarios (e.g., Endangered Species Act protections, stream protection requirements, other timber retention requirements)
- Must demonstrate the baseline growth and harvesting regime is financially feasible
- Must be higher than carbon storage in trees on neighboring properties (determined using U.S. Forest Service data)
- Modeled over 100 years using growth and yield models included in the Protocol

Accounting for Harvests

- Annual inventory must account for harvesting
  - Identify project areas that were harvested and update carbon measurements
  - Subtract harvest volumes from inventory
- Provide documentation of actual harvest volumes annually
- Estimate the amount of carbon that will remain stored in wood products over 100 years
  - Conservative estimates to account for uncertainties

Accounting for Leakage

- Leakage is a quantification of emissions (harvesting) that move to other properties as a direct result of implementing the Protocol
- If fewer trees are cut in the project, demand for wood products will likely cause increased harvest on other properties
- Protocol accounts for this in two ways:
  - Activity-shifting leakage – the shifting of harvest activities from within the project boundaries to areas outside the project boundaries
  - Market-shifting leakage – the increase of harvest activities outside the project's boundaries as a result of the project's effects on market demand (wood products)

Leakage Equations in the Protocol

- Equation 5.10 Secondary Effects (2015 Forest Protocol)
  - Activity-shifting leakage
  - If actual harvests are less than baseline harvests, then leakage equal to 20% of the difference is subtracted from the offset credits issued
- Equation 5.1 (2015 Forest Protocol)
  - Market-shifting leakage
  - Leakage equal to 80% of the reductions in wood products is subtracted from the offset credits issued
- Leakage factors were determined through a robust public process based on best information available

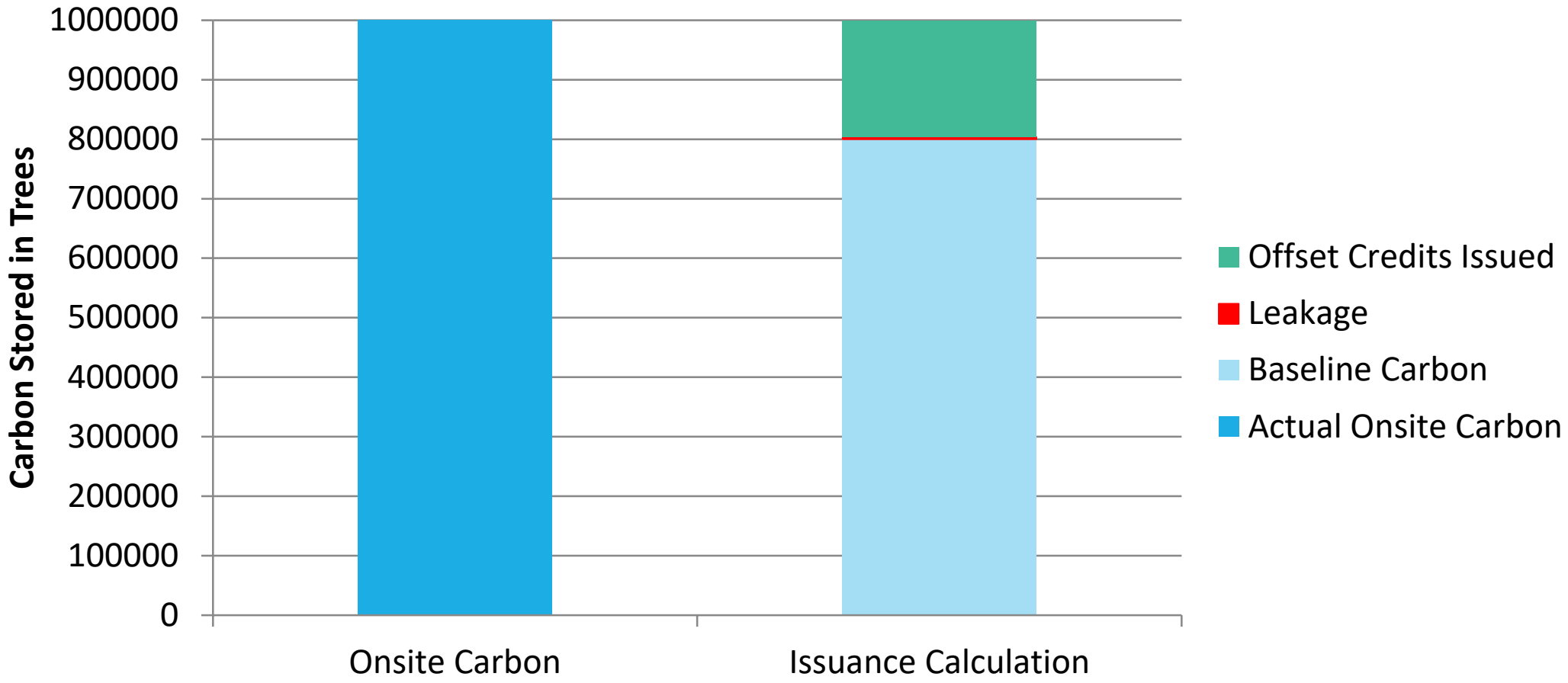
First Year Offset Credit Calculation

- Offset credits = (Actual stored carbon – Baseline stored carbon) – Market-shifting leakage – Activity-shifting leakage
- Baseline stored carbon = conservative 100-year averaged baseline value for carbon stored in trees (without project)
- Actual stored carbon = inventoried carbon in trees – harvest volumes
- Market-shifting leakage = emissions moving outside the project area as a result of wood products being supplied by another source (80% leakage rate)
- Activity-shifting leakage = emissions moving outside the project area as a result of harvests occurring on other forest lands (20% leakage rate)
- Difference between actual and baseline carbon stored on the project area is creditable because it is additional to business-as-usual and a direct result of better forest management practices
- After the first year, offset crediting is based on tree growth during the previous year minus harvest and leakage

Example: First Year Offset Credit Calculation

- Offset credits = (Actual stored carbon – Baseline stored carbon) – Market-shifting leakage – Activity-shifting leakage
- Baseline for the project:
  - Average carbon stored in trees on neighboring properties is 800,000 tons
  - 20,000 tons of carbon in trees would have been harvested
  - 4,500 tons of wood products would have been supplied
- Actual inventory shows project has 1,000,000 tons of carbon in trees
  - During the year, 10,000 tons of carbon in trees were actually harvested
  - Project actually supplied 2,000 tons of wood products
- Offset credits = (1,000,000 – 800,000) – (80% x (4,500 –2,000)) – (20% x (20,000 – 10,000))
- Offset credits = 196,000 additional tons of carbon stored in trees

Can you explain first year offset crediting using a graph?

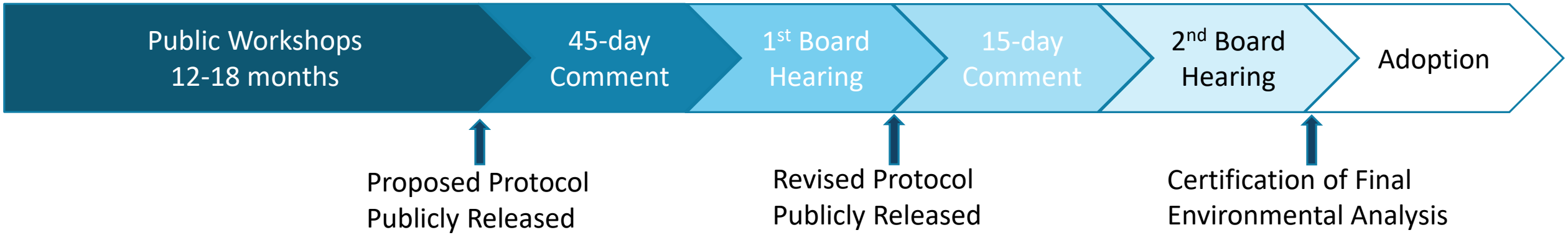


Offset Project Verification

- Every project must be verified by an ARB-accredited third-party verifier
  - Verifier accreditation requires training on the Regulation and Protocol as well as extensive forestry experience
  - Verification team required to have extensive technical expertise
  - After first verification, additional verifications required at least once every six years during project lifetime
- Prescriptive verification standards in the Protocol and Regulation
- Requires site visit for confirmation of inventory accuracy through sample remeasurement

Periodic Amendments to Reflect Latest Science

- Protocol has been amended twice since initial adoption
- This is done through a formal public process, which ensures all interested stakeholders are involved, that the most recent and relevant information and science is incorporated into the discussion, and that final adoption is conducted transparently in accordance with legal requirements
- The process is as follows:



Ensuring Permanence and Enforceability

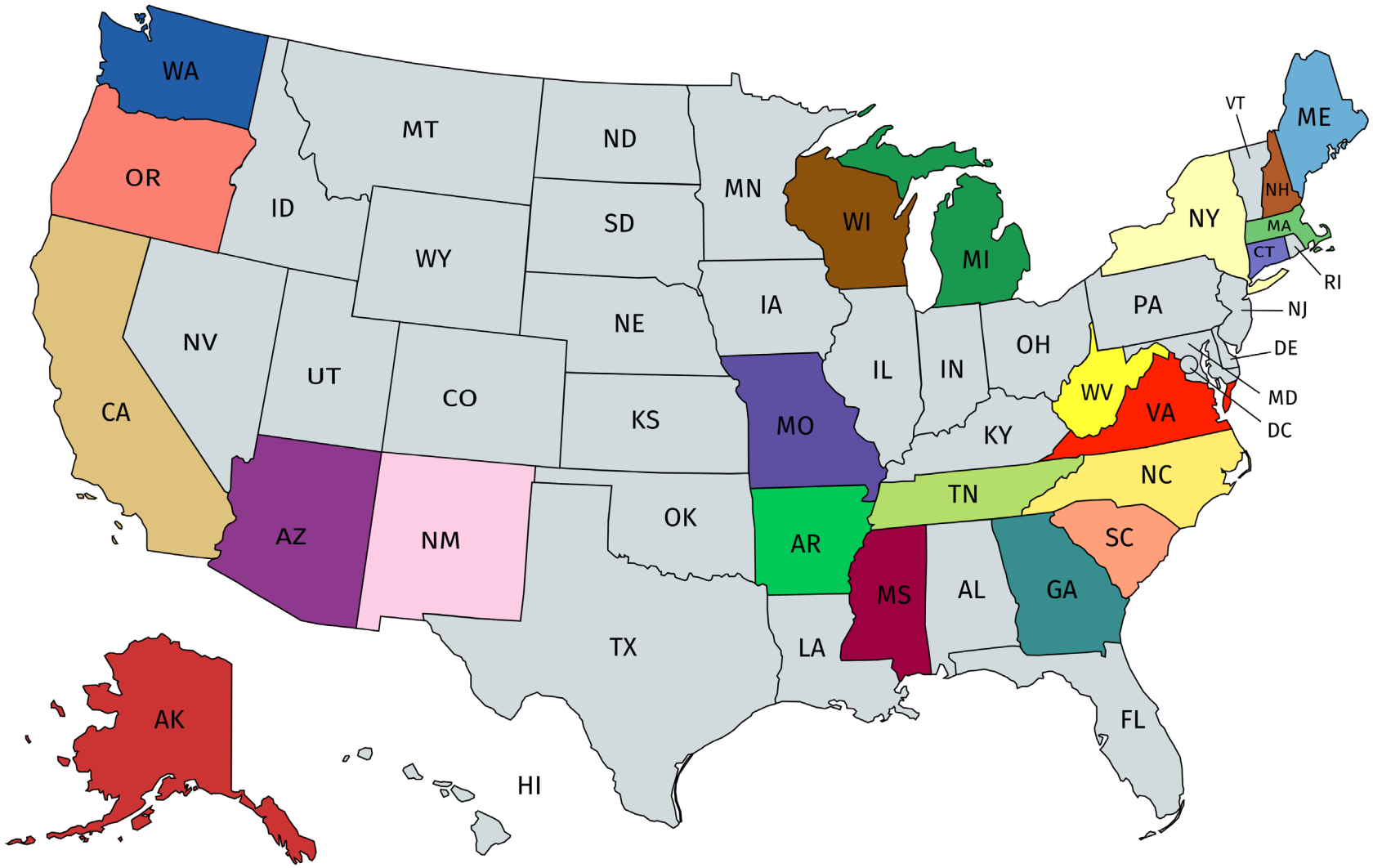
- Program requirements assure carbon will remain stored in trees for at least 100 years using three mechanisms:
  - Required monitoring reporting and verification for 100 years after credit issuance
  - Contribution to a buffer pool to compensate for unintentional reversals
  - Requirements for offset credit replacement by forest owners for intentional reversals
- All projects are subject to CARB regulatory oversight and enforcement actions
  - Subject to the jurisdiction of the State of California, including civil penalties
  - If an offset project is found to be out of regulatory conformance, CARB may invalidate any offset credits issued to the project and require them to be replaced

Courts have upheld the design of the Compliance Offset Program

- In 2012, CARB was challenged in a lawsuit contending the design of the Cap-and-Trade Regulation and Compliance Offset Protocols did not conform to statutory and regulatory requirements, particularly related to permanence and additionality
- **Results**
  - Trial court found CARB's design and implementation met AB 32
  - Appellate court found CARB's design and implementation met AB 32
  - California Supreme Court denied petition for review

Our Children's Earth Foundation v. California Air Resources Board (1st Dist. 2015) 234 Cal.App.4th 870 (upholding *Citizens Climate Lobby and Our Children's Earth Foundation v. California Air Resources Board* (2012) Case No. CGC-12-519554; 2013 WL 861396) (petition for review by California Supreme Court denied June 10, 2015)

Forest Projects Across US



Forest Offsets Issued

- Alaska - 26,271,841
- Arkansas - 350,119
- Arizona - 10,744,653
- California - 23,824,973
- Connecticut - 356,710
- Georgia - 1,716,163
- Massachusetts - 811,941
- Maine - 5,217,036
- Michigan - 3,112,123
- Missouri - 170,586
- Mississippi - 21,319
- North Carolina - 1,246,039
- New Hampshire - 1,934,386
- New Mexico - 4,417,068
- New York - 3,799,948
- Oregon - 2,747,197
- South Carolina - 2,421,055
- Tennessee - 3,855,879
- Virginia - 4,572,082
- Washington - 14,404,662
- Wisconsin - 2,258,147
- West Virginia - 9,452,747

Does UC Berkeley policy brief accurately portray Forest Protocol leakage considerations?

No, the policy brief* misrepresents how leakage is accounted for in the Protocol

- Policy brief only identifies the 20% activity-shifting leakage in the Protocol, and asserts it should be 80% based on inapplicable studies
- Policy brief neglects to mention the 80% market-shifting leakage included in the Protocol
- These two mechanisms of assessing activity-shifting and market-shifting leakage ensure the Protocol conservatively accounts for leakage

*Dr. Barbara Haya, Policy Brief: The California Air Resources Board's U.S. Forest Projects offset protocol underestimates leakage. Berkeley Carbon Trading Project Policy Brief, Center for Environmental Public Policy, Goldman School of Public Policy, UC Berkeley (May 2019)

Are cited leakage studies in the policy brief applicable to the Forest Protocol?

No, comparing the cited studies to the activities included in the Forest Protocol results in an apples-to-oranges comparison

- Both studies look at leakage effects as a result of conservation forestry
- Forest Protocol does not include conservation projects
- Conservation forestry severely restricts or eliminates harvesting, meaning any unmet demand for timber or wood products must come from other forests
- Forest Protocol requires an increase in carbon storage in trees, but places no additional restrictions on harvest volumes beyond what is already legally permissible
- This means that forest projects may continue to include harvesting (as long as carbon storage in trees increases). Allowing harvesting results in less leakage

Do leakage factors have a major impact on first year crediting?

No, contrary to the statements in the policy brief, the conservative leakage accounting does not have a major impact on crediting

- For the majority of projects, leakage has an insignificant impact on first year offset crediting, reducing crediting on the order of 2%
- Even using the overestimates of leakage proposed in the policy brief, leakage would still only reduce first year offset crediting on the order of 4%
- Leakage monitored for each year of a project's lifetime and will vary over time
- In addition, it is possible that over a project's lifetime, harvesting could equal or exceed baseline harvesting estimates
  - With better long-term management of the forest resources, actual harvesting may increase while maintaining or increasing carbon stock in trees
  - Would result in no leakage over the project lifetime

Should carbon stored above baseline in first year be considered "greenhouse gas debt"?

No, crediting is based on activities to date, not future performance

- Additional carbon stored in trees above the baseline is a result of actual good forest management and is not dependent on future actions
  - Does not represent an avoided harvest subject to leakage
  - Does not create a "greenhouse gas debt" as erroneously stated in the policy brief
- AB 32 requires CARB to recognize early actions taken to reduce GHGs
- Appropriate to issue offset credits for verified performance resulting in additional carbon sequestration
- If the policy brief were correct, there would be a massive increase in emissions outside the project area simply as a result of implementing a carbon project
  - If that were true, this would mean that areas outside the project spontaneously increased their harvest without any supply or demand signal. This simply does not occur

Is leakage only monitored for 25 years?

No. The policy brief misunderstands how leakage is monitored

- The Protocol is clear that projects must continue to monitor, report, and verify for 100 years after the last offset credits have been issued, so this is a minimum 125-year commitment
- Section 3.5(b)(1) of 2015 Forest Protocol:
  - *The requirement for all offset projects to monitor onsite carbon stocks, submit annual Offset Project Data Reports, and undergo third-party verification of those reports with site visits at least every six years for the duration of the project life;*
- Moreover, this question is not relevant to the leakage issue since projects do not begin in "greenhouse gas debt" (see previous slide)

Does the policy brief merit Protocol changes?

No, the policy brief continues to make the same inaccurate assertions that were ruled on by the courts, and is premised on an incorrect analysis of leakage and of how the Protocol actually works

- Policy brief asserts the overall leakage rate should be 80%, but cites to two studies that are not applicable to the activities of the Protocol. This assertion does not accurately characterize the leakage considerations in the Protocol, leading the policy brief to overstate the impact of leakage on project crediting
- Policy brief asserts the Protocol's mechanism for crediting should result in a "greenhouse gas debt," but misunderstands how the first year of crediting is actually conducted based on activities undertaken by forest owners
- Policy brief misunderstands that leakage is monitored over the entire project lifetime

Next Steps

- Continued implementation of the Compliance Offset Program pursuant to existing statutory and regulatory requirements, including taking oversight and enforcement actions when necessary
- Commitment to conduct periodic reviews of Forest Protocol and other Protocols to reflect latest science and other information, including any updates in leakage values
- Any updates to the Forest Protocol, or any other Protocol, will undergo robust, transparent, open public process