

Compliance Offset Protocol Urban Forest Projects

California Air Resources Board
June 6, 2012

California Air Resources Board

The Urban Forest Protocol

What is the Urban Forest Protocol

- A prescribed set of requirements and methodologies to quantify and report permanent increases in stored carbon (GHG removal enhancements) resulting from tree planting and maintenance activities

The Protocol Includes

- Eligibility rules, methods to quantify carbon, offset project monitoring instructions, and reporting procedures

California Air Resources Board

2

An Urban Forest Project

- Is a planned set of tree planting and maintenance activities that permanently increase carbon storage
- Is an opportunity to generate offset credits which can be sold to covered entities subject to Cap and Trade

Defined by

- The number of project tree sites that will be planted and maintained within the project boundaries

Limits on the Urban Forest Protocol

- The Protocol cannot be applied to forest management activities that occur on large natural forested tracts within cities (≥ 100 acres)
- An Urban Forest Project may supplement but cannot replace existing tree planting budgets
- Offset credits cannot be obtained from existing trees, only newly planted "Project Trees"

Eligible Project Types

Three project types

- Municipalities
- Educational campuses
- Utilities

Eligible entities

- Local Government (city, county, special districts, etc.)
- Educational campuses
- Utilities
- Non-eligible entities who partner with an eligible entity

Eligibility

Location

- Projects must occur within the United States and its territories and must be within the Project entity's legal jurisdiction. Projects may be on Tribal lands with a waiver of sovereign immunity
- Along streets, parks, city golf courses, cemeteries, near city buildings, greenbelts, city parking lots, public open space, office buildings, recreational fields, private property, near classrooms, dorms, facilities, open space on educational campuses and open space operated by utility
- Project Trees may be planted on private property in the entity's boundary

Eligibility

Project Commencement

- The date when trees are planted and regular maintenance begins

Crediting Period

- 25 years, unlimited renewals

Additionality

- Exceeds what is required by law, regulation, or legally binding mandate and business-as-usual
- Protocol contains language to identify business as usual for the three project types

What is Quantified

- Carbon stored in standing trees
- CO₂e emissions from motor vehicles related to initial tree planting and monitoring
- CO₂e emissions from equipment use related to ongoing replacement, maintenance and care

What is Not Quantified

- Indirect emission reductions do not count toward GHG reductions/removal enhancements
 - E.g. reduced electricity consumption for A/C due to shade
- Large forested tracts of land ≥ 100 acres of contiguous forest are not eligible
- Modeling is not allowed under the Urban Forest Protocol

The Process

- Develop Urban Forest Project based on Protocol
- Register with ARB (using CITSS, available July 2012)
- List the offset project with approved Offset Project Registry
 - attestations to ARB
- Annually report via submittal of Offset Project Data Report
 - First report must be submitted within 24 months of listing
 - First report may cover 6-24 months
 - Report must be submitted within 4 months of the Reporting Period
- Verify
 - Offset Project Data Report must be verified within nine month of end of crediting period

Offset Project Listing Requirements

Listing Information requirements include:

- General Information
- Offset Project Summary
- Offset Project Boundaries
- Offset Project Eligibility
- Tree Maintenance Plan
- Project Tree Monitoring Plan

Urban Forest Protocol

The Mechanics and Requirements

Determining Business-as-Usual

- Offset Project Operator (OPO) or Authorized Project Designee (APD) must demonstrate that their project will exceed business-as-usual
- Business-as-usual is based on an inventory of trees from within the offset project boundary

Municipalities/Educational Campuses (Net Tree Gain (NTG))

- Must maintain a stable population by demonstrating that the annual number of trees planted minus the annual number of trees removed is greater than zero

Utilities

- All tree planting activities may be considered additional

California Air Resources Board

13

Municipalities and Educational Campuses - Net Tree Gain

When NTG is positive or 0

- Trees planted in excess of those removed determines how many project trees can be designated as eligible project trees that year
- Eligible project trees are identified each year and tracked individually

California Air Resources Board

14

Municipal/Educational Campus Urban Forest Projects

If NTG is negative

- No new trees planted that year can be considered eligible project trees
- No offset credits may be issued until the average annual NTG returns to zero or greater
 - Credits may be issued for up to 5 years ex-post upon verification

Offset Project Boundary

Urban Forest Offset Project Boundary

- Carbon stored in standing trees, emissions from motor vehicles and equipment related to tree planting and care

Physical Boundaries

- Area owned and/or controlled by a municipality or educational campus
- The service area covered by a utility

Leakage

- Increase in GHG emissions or decrease in sequestration caused by the project but not accounted for within the offset project boundary
 - Most likely form of leakage is the shifting of funds and maintenance from non-project tree resources to project trees

Budget Shifts Away From Existing Tree Planting Programs

- Shifting of funds is determined as part of verification, determined through review of annual levels of expenditure
- Tree Maintenance Plan is used to assess activity-shifting leakage

Leakage

If Verifier finds a Budget Decrease \geq 10%

- If annual expenditures in one program area decreases **by 10% or more** from a previous year, changes must be explained
 - If they cannot be adequately explained, leakage must be assumed
 - No credits may be issued for that year

GHG Calculation Methods

$$\text{Project GHG Reductions} = \text{Project Tree CO}_2 \text{ Sequestration} - \text{Vehicle CO}_2 \text{ Emissions} - \text{Equipment CO}_2 \text{ Emissions}$$

Quantifying Tree Carbon Stocks

- Based on direct measurement of trees (Appendix A)
 - Complete (census) Inventory
 - Sampling Inventory
 - Protocol requires stratified random sampling
 - Species
 - Age-class (5 year)
- Uses allometric equations (Appendix B) to calculate carbon

Motor Vehicle Emissions

- Transport of personnel, supplies, and trips to/from project tree sites
- CO₂ emissions based on actual fuel use and an emission factor for fuel
- Fuel volume determined from:
 - Fuel records data
 - Vehicle information (make, model, year, fuel type) and annual mileage estimates; or
 - Prorating total fuel usage for tree maintenance and monitoring by number of eligible project tree sites relative to total trees

Equipment Emissions

- Equipment emissions associated with back hoes used in planting, chain saws, aerial lifts, chippers used during tree removal and pruning activities
- **If total fuel use is known**
 - Calculated using fuel specific emission factors in protocol
- **If fuel is tracked by hours**
 - Typical load factors, horsepower, average emissions, and EFs for equipment are given in Table 5.3 and typical hours required for pruning and removal for maintenance equipment are in Table 5.4

Insufficient Data

- When an entity does not have data to calculate GHG emissions, use default factor
 - 4.17 kg CO₂/project tree
- Entity may only elect use of default emissions factor if no data are available, otherwise methods described previously must be used

Permanence

Project Life

The period between offset project commencement and 100 years following issuance of offset credits

- If credits are issued for 25 years following project commencement, Project Operator must monitor, report and verify project data to year 125
- Projects must monitor, annually report and verify once every six years for the Project Life
- Dead trees must be replaced within one year from when they were removed
 - Prior to removal, dead trees must be measured and their carbon content calculated and recorded

Reversals

How does the Protocol address Reversals?

- If a tree is not replaced, offset credits must be retired in proportion to the reversal
- Issued offset credits can never be more than the total carbon stored since project commencement date

Reporting Requirements

- Offset Project Data report must be submitted annually
- Reports must be submitted after review by a:
 - Professional Urban Forester

or

 - Certified Forester (Society of American Foresters),
 - California Certified Urban Forester (California Urban Forests Council)
 - Certified Arborist (American Society of Consulting Arborists)
 - Professional Forester, Arborist, Landscape Contractor, Landscape Architect, or Planner

Verification Requirements

Urban Offset Projects Must be Verified:

- After the first Offset Project Data report is submitted
- At least once every six years subsequently
- Each Urban Forest Offset Project Verification Team must include:
 1. At least One Professional Urban forester
 - Conducts site visit
 - Reviews project tree biomass, carbon inventory, tree maintenance plan, tree monitoring plan
 2. One ARB-accredited Forest or Urban Forest Offset Project Specialist
- Written description of the team's experience must be included in the Notice of Verification Services (may be represented by one person or a combination of individuals)

Monitoring

Monitoring is required for urban offset projects for the Project Life and includes the following 3 elements:

1. **Tree Maintenance Plan (TMP)** - TMP is used to assess leakage potential and project performance
2. **Project Tree Monitoring Plan** – all inventory, quantification, and sampling techniques explained
3. **Activity Data sheet** - GHG emissions and sequestration activity including data on species and equipment related to project

Tree Maintenance Plan

A Tree Maintenance Plan describes annual tree maintenance levels of services and associated expenditures.

- Planning document used to guide tree planting activities for the Project. It must include the following 5 program areas:
 1. Tree planting
 2. Young tree care for tree under 5 years
 3. Mature tree care for trees over 5 years old
 4. Tree removal
 5. Administration / other (clerical, training, outreach)

Also Includes:

- Expenditures for a 10 to 20 year period and project level activities for the reporting period
- The most recent annual levels and expenditures and estimate of anticipated annual levels and expenditures for each of these categories

Project Tree Monitoring Plan

- Methods used to quantify carbon stocks (sampling, measurements, details) so verifier can understand and interpret
- Identifies and describes the inventory method used to quantify carbon stocks
- Methods to measure and record tree size
- Methods used to, collect tree survival and health information
- Statistical methods used to extrapolate sample data
- Estimated sampling error

Activity Data Sheet

Required inputs for estimated project GHG reductions are included in the GHG Emissions and Sequestration Activity Data:

- Data on species, dimensions, date of measurement, location of measured trees
- Equations used to determine tree volume, biomass, carbon
- Make and model year and annual amount and type of fuel used for vehicles used for tree planting
- Equipment type, horsepower rating, annual amount and type of fuel consumed by equipment for maintenance

Contacts & Information

- Barbara Bamberger (Project Lead)
 - 916.324.2303 bbamberg@arb.ca.gov
- Greg Mayeur (Manager)
 - 916-324-8031 gmayeur@arb.ca.gov
- ARB Compliance Offset Program
 - <http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm>
- Cap and Trade Listserv
 - http://www.arb.ca.gov/listserv/listserv_ind.php?listname=capandtrade