

# Urban forests and climate change: Project Reporting Protocol

Urban forests have a role to play in reducing levels of carbon dioxide and other greenhouse gases (GHG) in the atmosphere. However, very few GHG tree projects have been undertaken because of uncertainty regarding their performance and permanence. The Urban Forest Project Reporting Protocol was developed to reduce this uncertainty by providing a standard set of guidelines for use throughout the United States.

## What Does This Protocol Do?

The protocol provides detailed guidance to ensure that tree projects meet eligibility requirements, produce GHG reductions that are additional to a baseline, are sustained for at least 100 years, and do not detract from management of existing trees. The protocol also describes how to calculate and report **carbon storage** by project trees, as well as emissions associated with their maintenance. A separate verification protocol is used by independent verifiers to confirm that results are accurately reported.

The protocol was adopted by the California Climate Action Registry, a private nonprofit organization that serves as a voluntary registry for GHG offset projects in the U.S. Its protocols are widely regarded as meeting the highest quality standards, and their accuracy, transparency, and integrity have earned the Registry a reputation as a respected and internationally recognized leader in climate change issues. Urban forest projects that follow the new protocol will be reported to the Registry's Climate Action Reserve, which will register and serialize GHG reductions. Once these GHG reductions (offsets) are sold or retired, the Climate Action Reserve will track the transaction, adding confidence and credibility to the voluntary carbon market.

## Why Is the Protocol Important?

Adoption of the urban forest protocol sets the stage for investment in large-scale tree planting and stewardship projects because projects that adhere to the protocol's guidance will generate real, reliable, additional and credible **GHG reductions**. Registered carbon reductions are "quality offset credits" that pose less risk



to investors than unregistered credits. The market for quality offset credits is growing as corporations, utilities, and individuals purchase credits to offset their emissions or become carbon neutral.

## What is the Return on Investment?

Although complying with the protocol reduces risk to investors, it can increase project costs because of additional expenses for reporting, verification, and long-term monitoring. Project developers can defray these costs by selling quality offset credits. Currently, offset credits sell for \$5–15 per metric ton (t), but the price is expected to increase to \$50–60 per t by 2020. Credits may be bought for \$100 per t or more to meet the most ambitious reduction targets, such as California's.

It is estimated that for every 1,000 tree sites planted under this protocol, on average about 40–80 t of net CO<sub>2</sub> storage could be registered annually, assuming trees are maintained and kept healthy. This amount could be increased substantially if the reduction in GHG emissions at power plants from cooling savings by tree shade could be included. Because of difficulties with verification and double-counting, however, this energy conservation reduction can be reported but not registered.

To estimate the cost per ton of carbon stored for a hypothetical urban forestry project, assume that 1,000 tree sites are planted at \$75 each. On average, trees are removed and replaced once at each site over the 100 year period at \$175 unit cost. The average annual cost per tree site for maintenance (pruning/inspection/watering), monitoring, and verification is \$10. The total project

cost for 100 years is \$1,250 per site or \$1,250,000. If we conservatively estimate that the average amount of net CO<sub>2</sub> stored annually and registered for the 1,000 sites is 50 t, the total reduction is 5,000 t over the 100-year lifetime. Given these assumptions, the project cost is \$250 per t of carbon offset credit (\$1,250,000/5,000 t).

This example suggests that urban forestry projects will not be the most cost-effective option for climate protection based solely on net carbon storage. However, city trees provide other services, or co-benefits, that make them **attractive investments**. Utilities may reimburse projects for the GHG emission reductions that trees produce through energy conservation. Stormwater management agencies and air quality districts may purchase runoff reduction and pollutant uptake services. Urban trees produce a host of other local benefits that people easily understand and experience first-hand. These “charismatic” qualities of urban forestry offset credits will make tree projects attractive for some investors, even though their cost per ton may be relatively high.

## What the Protocol Means for You

Adoption of the protocol means that the services of professional arborists and urban foresters will be needed for planning and implementing tree projects. Management practices that increase tree growth and performance cost effectively over the long term will be highly valued. Also, employment opportunities will grow for independent verifiers of urban forest projects.

The Urban Forest Protocol is especially valuable to local governments interested in sustainable activities for their communities. Cities can reap **multiple benefits** from tree projects, and collect on financial rewards through selling carbon offset credits. For the first time, municipal foresters will be able to sell some of the services their trees provide to defray the costs of management.

Utilities will be under considerable pressure to reduce their emissions and are likely to ramp up their investment in carbon offset credits and in energy conservation efforts. Some will institute their own tree projects, providing new leadership opportunities for utility arborists. Other utilities will purchase carbon offset credits from local tree projects led by different project developers.

Colleges and universities that are integrating **sustainability** as a core value in campus operations will start tree planting and stewardship projects. Grounds

managers, students, and faculty can share learning opportunities as they select and locate appropriate species, properly plant trees, and implement exemplary maintenance and monitoring programs.

Nonprofit tree groups can partner with cities and utilities to create cost-effective projects that foster community goals, such as increasing tree canopy in areas with the fewest trees.

You can download a copy of the protocol at: <http://www.climateregistry.org/tools/protocols/project-protocols/urban-forest.html>.

## Considering a Tree Project?

Thinking about starting a GHG tree planting and stewardship project **in your community?** Here are some questions and answers.

- Am I an eligible project developer? At this time only cities/counties/special districts, utilities, and educational campuses are eligible project developers. Non-profits, corporations, and others can participate as project partners.
- Can I meet the baseline by maintaining a stable population of existing trees? On average, cities and campuses must plant a new tree for every tree they remove. Once this baseline is attained, net carbon stored by project trees can be reported as additional to the baseline.
- Where will my tree sites be located? Tree sites must be spaced at least 5 m (16 ft) apart. Careful site selection will improve cost-effectiveness. Projects are not restricted to California, but can be implemented anywhere in the U.S.
- How will I quantify carbon storage? The CUFR Carbon Tree Calculator (CTCC) is a spreadsheet tool that can be used to estimate tree carbon based on field measurements and growth models.
- What level of tree monitoring is required? A full inventory of project tree sites is required every 10 years, using either field surveys or remote sensing.
- How often will I report project activity? Before registering reductions from a project you prepare a Project Submittal Form to list your project. Then, annually, you submit reports through the Registry’s online registration software and have the project verified.

For more information on urban trees and climate change, visit: <http://www.fs.fed.us/psw/programs/cufr/>