

TERMS AND CONDITIONS OF GRANT AGREEMENT

I. RECITALS

1. This Agreement, is entered into between the State of California, by and through the California Department of Forestry and Fire Protection (CAL FIRE), hereinafter referred to as "STATE" and City of Tracy, hereinafter referred to as "GRANTEE".
2. The STATE hereby grants to GRANTEE a sum (hereinafter referred to as "GRANT FUNDS") not to exceed three-hundred thousand, two-hundred fifty-three dollars and fifty cents (\$300,253.50).
3. In addition to the terms and conditions of this Agreement, the STATE and GRANTEE agree that the terms and conditions contained in the documents set forth below are hereby incorporated and made part of this agreement.
 - a. Department of Forestry and Fire Protection Urban and Community Forestry Program California Climate Investments Grant Guidelines 2016/2017
 - b. California Air Resources Board Greenhouse Gas Quantification Methodology for the Department of Forestry and Fire Protection (CAL FIRE) Urban and Community Forestry Program
 - c. The submitted Application, Scope of Work, Budget Detail, GHG Emissions Reduction Methodology and Exhibits
 - d. Addendum for California Climate Investments (CCI) Grant Projects

II. SPECIAL PROVISIONS

1. Recipients of GRANT FUNDS pursuant to California Public Resources Code Section 4799.06-4799.12 shall abide by the provisions in this Agreement. This includes the requirement that work shall not commence prior to the execution of this Agreement by both parties. Any work started prior to the execution of this Agreement will not be eligible for funding under the terms of this Agreement.
2. As precedent to the State's obligation to provide funding, GRANTEE shall provide to the STATE for review and approval a detailed budget, specifications, and project description. Approval by the STATE of such plans and specifications, or any other approvals provided for in this Agreement, shall be for scope and quality of work, and shall not relieve GRANTEE of the obligation to carry out any other obligations required by this Agreement, in accordance with applicable law or any other standards ordinarily applied to such work or activity.

3. All informational products (e.g., data, studies, findings, management plans, manuals, photos, etc.) relating to California's natural environment produced with the use of GRANT FUNDS shall be available for public use.

III. GENERAL PROVISIONS

1. Definitions

- a. The term "Agreement" means grant agreement number 8GG16429.
- b. The term "GRANT FUNDS" means the money provided by the STATE to the GRANTEE in this Agreement.
- c. The term "GRANTEE" means an applicant who has a signed Agreement for the award for GRANT FUNDS.
- d. The term "Other Sources of Funds" means all matching fund sources that are required or used to complete the Project beyond the GRANT FUNDS provided by this Agreement.
- e. The term "STATE" means the State of California, Department of Forestry and Fire Protection (CAL FIRE).
- f. The term "Project" means the development or other activity described in the "Project Scope of Work".
- g. The term "Project Budget Detail" as used herein defines the approved budget plan.
- h. The term "Project Scope of Work" as used herein means the individual scope of work describing in detail the approved tasks.

2. Project Representatives

The project representatives during the term of the agreement will be:

STATE: CAL FIRE	GRANTEE: City of Tracy
Section/Unit: Urban and Community Forestry	Section/Unit: Boyd Service Center
Attention: Greg Dion	Attention: Brian MacDonald
Mailing Address: 1234 E. Shaw Avenue	Mailing Address: 520 Tracy Boulevard
Fresno, CA 93710-7899	Tracy, CA 95376
Phone Number: (559) 243-4156	Phone Number: (209) 831-6233
Email Address: Greg.Dion@fire.ca.gov	Email Address: brian.macdonald@cityoftracy.org

Changes to the project representatives during the term of the agreement shall be made in writing. Notice shall be sent to the above representative for all notice provisions of this Agreement.

3. Project Execution

- a. Subject to the availability of grant monies, the STATE hereby grants to the GRANTEE a sum of money (GRANT FUNDS) not to exceed the amount stated on Section I. RECITALS, Paragraph 2 in consideration of and on condition that the sum be expended in carrying out the purposes as set forth in the description of the Project in this Agreement and its attachments and under the terms and conditions set forth in this Agreement.
- b. GRANTEE shall assume any obligation to furnish any additional funds that may be necessary to complete the Project. Any amendment to the Project as set forth in the Application on file with the STATE must be submitted to the STATE for approval in writing. No amendment is allowed until written approval is given by the STATE.
- c. GRANTEE shall complete the Project in accordance with the time of Project performance set forth in this Agreement, unless an amendment has been approved and signed by the STATE under the terms and conditions of this Agreement. Amendments must be requested in

advance and will be considered in the event of circumstances beyond the control of the GRANTEE, but in no event less than 90 days from the Agreement expiration date and in no event less than 60 days before the effective date of the amendment. Approval of amendment is at the STATE's discretion.

- d. GRANTEE certifies that the Project Scope of Work complies with all local, State, and federal laws and regulations.
- e. GRANTEE shall comply with the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000, et. seq. Title 14, California Code of Regulations, Section 15000 et. seq.) and all other local, State, and federal environmental laws. A copy of the certified CEQA document must be provided to STATE before any GRANT FUNDS are made available for any Project activity that could directly impact the environment (e.g. cutting, piling or burning bush, masticating, dozer work, etc.). CEQA compliance shall be completed within one (1) year from start date of the Agreement. The start date is considered the date the last party signs the Agreement. GRANT FUNDS will be made available in advance of CEQA compliance for project activities that do not have the potential to cause a direct environmental impact (e.g. project planning, locating and marking property or project boundaries, contacting and signing up landowners, etc.).
- f. GRANTEE shall permit periodic site visits by representative(s) of the STATE to ensure program compliance and that work is in accordance with the approved Project Scope of Work, including a final inspection upon Project completion.
- g. GRANTEE, and the agents and employees of GRANTEE, in the performance of this Agreement, shall act in an independent capacity and not as officers, employees, or agents, of the STATE.

4. Project Costs and Payment Documentation

- a. Payment by the STATE shall be made after receipt of an acceptable invoice and approval by a duly authorized representative of the STATE. GRANTEE shall submit an invoice for payment to the CAL FIRE Project Representative of the STATE. A final invoice shall be submitted no later than 30 days after completion, expiration, or termination of this Agreement.
- b. For services satisfactorily rendered, and upon receipt and approval of invoices for payment, the STATE agrees to compensate GRANTEE for actual expenditures incurred in accordance with the rates specified herein,

which is attached hereto, as Attachment 3 – Final Project Budget, and made a part of this Agreement.

- c. GRANTEE shall submit, in arrears, not more frequently than once a month, and no less than quarterly, an invoice to the STATE for costs paid by GRANTEE pursuant to this Agreement. Each invoice shall contain the following information: the Agreement number, the dates or time period during which the invoiced costs were incurred, expenditures for the current invoice and cumulative expenditures to date by major budget category (e.g., salaries, benefits, supplies, etc.), appropriate supporting documentation, project progress reports, and the signature of an authorized representative of GRANTEE as detailed in the Invoice Guidelines of the Procedural Guide for the CAL FIRE Urban and Community Forestry Program California Climate Investments Grant Guidelines 2016/2017.
- d. GRANT FUNDS in this Agreement have a limited period in which they must be expended. All GRANTEE expenditures must occur prior to the end of the Project performance period of this Agreement.
- e. Except as otherwise provided herein, GRANTEE shall expend GRANT FUNDS in the manner described in the Project Budget Detail approved by the STATE. The dollar amount of an item in the Project Budget Detail may be increased or decreased by up to ten percent (10%) of the budget item through reallocation of funds from another item or items, without approval by the STATE; however, GRANTEE shall notify the STATE in writing in project progress reports when any such reallocation is made, and shall identify both the item(s) being increased and those being decreased. Any increase or decrease of an item of more than ten percent (10%) of the budget item must be approved in writing by the STATE before any such increase or decrease is made. A formal approved amendment is required to increase the total amount of GRANT FUNDS.
- f. GRANTEE shall promptly submit any and all records at the time and in the form as the STATE may request.
- g. GRANTEE shall submit each invoice for payment to:

California Department of Forestry & Fire Protection
Attention: Greg Dion
1234 E. Shaw Avenue
Fresno, CA 93710-7899
- h. Notwithstanding any of the provisions stated within this Agreement, the STATE may at its discretion make advance payment to the GRANTEE, if GRANTEE is a Community-based private non-profit agency, upon written

request by the GRANTEE. Advance payment made by the STATE shall be subject to the circumstance and provisions below.

Where hardship circumstances exist for the GRANTEE, the STATE will consider authorizing advance payments. The STATE will consider the following factors in determining whether a hardship situation exists:

- Modest reserves and potential cash flow problems of the GRANTEE including the need for advance funding in order to initiate a project. A justification for advance payment may include items such as the inability to pay for staff, supplies, administration expenses, and to secure contractors for Project work.

The following guidelines will be applied to advance payments:

- Multiple advance payments may be made to a GRANTEE over the life of a project.
- No single advance payment shall exceed 25% of the total grant amount and must be spent on eligible costs within six months of the advance payment request. The balance of unspent advance payment funds not liquidated within the six month spending period will be billed for the return of the advanced funds to the STATE. The amount will be returned to the grant balance.
- A request for advance payment must include the same level of expenditure detail and justification as a regular invoice.
- All work under a previous advance payment must be fully liquidated via an invoice and supporting documentation and completed to the STATE's satisfaction before another advance payment will be made.
- Any advance payment received by a GRANTEE and not used for project eligible costs shall be returned to CAL FIRE.
- Advance payments must be deposited into an interest-bearing account. Any interest earned on advance payment funds must be accounted for and reported as program income used toward offsetting the project cost or returned to the STATE.

5. Budget Contingency Clause

- a. If STATE funding for any fiscal year is reduced or deleted for purposes of the Urban and Community Forestry Program California Climate Investments Grant Program, the STATE shall have the option to either

cancel this Agreement with no liability occurring to the STATE, or if possible and desirable, offer an Agreement amendment to GRANTEE to reflect the reduced amount available for the Project.

6. Project Administration

- a. GRANTEE shall provide the STATE a written report showing total final Project expenditures and matching funds before work on the Project begins. GRANTEE must report to the STATE all sources of other funds for the Project. If this provision is deemed to be violated, the STATE will request an audit of GRANTEE and can delay the disbursement of funds until the matter is resolved.
- b. GRANTEE shall promptly submit written Project reports as the STATE may request throughout the term of this Agreement.
- c. GRANTEE shall submit a final accomplishment report, final invoice with associated supporting documentation, and copies of materials developed using GRANT FUNDS, including but not limited to plans, educational materials, etc. within 30 days of Project completion.

7. Financial Records

- a. GRANTEE shall retain all records described in Section 7(c) below for three (3) years after final payment by the STATE. In the case an audit occurs, all such records shall be retained for one (1) year from the date is audit is completed or the three (3) years, whichever date is later.
- b. GRANTEE shall maintain satisfactory financial accounts, documents, and records for the Project and make them available to the STATE for review during reasonable times. This includes the right to inspect and make copies of any books, records, or reports of GRANTEE pertaining to this Agreement or matters related thereto.
- c. GRANTEE shall keep such records as the STATE shall prescribe, including, but not limited to, records which fully disclose (a) the disposition of the proceeds of state funding assistance, (b) the total cost of the Project in connection with such assistance that is given or used, (c) the amount and nature of that portion of the Project cost supplied by other sources, and (d) any other such records as will facilitate an effective audit. All records shall be made available to the STATE, other State of California agency, or other entity as determined by the State of California for auditing purposes at reasonable times.
- d. GRANTEE shall use any generally accepted accounting system.

8. Project Termination

- a. This Agreement may be terminated by the STATE or GRANTEE upon 30-days written notice to the other party.
- b. If either party terminates the Agreement prior to the completion of the Project, GRANTEE shall take all reasonable measures to prevent further costs to the STATE under the Agreement and the STATE shall be responsible for any reasonable and non-cancelable obligations incurred by GRANTEE in the performance of this Agreement prior to the date of the notice to terminate, but only up to the undisbursed balance of funding authorized in this Agreement.
- c. Failure by GRANTEE to comply with the terms of this Agreement may be cause for suspension of all obligations of the STATE hereunder at the discretion of the STATE.
- d. Failure of GRANTEE to comply with the terms of this Agreement shall not be cause for the suspension of all obligations of the STATE hereunder if in the judgment of the STATE such failure was due to no fault of GRANTEE. At the discretion of the STATE, any amount required to settle at minimum cost any irrevocable obligations properly incurred shall be eligible for reimbursement under this Agreement.
- e. Final payment to GRANTEE may not be made until the STATE determines the Project conforms substantially to this Agreement.

9. Hold Harmless

- a. GRANTEE shall defend, indemnify and hold the STATE, its officers, employees, and agents harmless from and against any and all liability, loss, expense (including reasonable attorney's fees), or claims for injury or damages arising out of the performance of this Agreement but only in proportion to and to the extent such liability, loss, expense, attorney's fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of GRANTEE, its officers, agents, or employees. The duty of GRANTEE to indemnify and hold harmless includes the duty to defend as set forth in Civil Code Section 2778. This Agreement supersedes GRANTEE's right as a public entity to indemnity (see Government Code Section 895.2) and contribution (see Government Code Section 895.6) as set forth in Government Code Section 895.4.
- b. GRANTEE waives any and all rights to any type of express or implied indemnity or right of contribution from the STATE, its officers, agents, or employees for any liability resulting from, growing out of, or in any way connected with or incident to this Agreement.

- c. Nothing in this Agreement is intended to create in the public or in any member of it rights as a third-party beneficiary under this Agreement.

10. Tort Claims

FEDERAL:

The United States shall be liable, to the extent allowed by the Federal Tort Claims Act 28 United States Code 2671-2680, for claims of personal injuries or property damage resulting from the negligent or wrongful act or omission of any employee of the United States while acting within the scope of his or her employment, arising out of this Agreement.

STATE:

The State of California shall be liable, to the extent allowed by law and subject to California Government Code, Title 1, Division 3.6, providing for the filing of tort claims against the State of California, for personal injuries or property damage resulting from the negligent or wrongful act or omission of State of California employees while acting within the scope of his or her employment, arising out of this Agreement.

11. Nondiscrimination

The State of California prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, sex, marital status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. GRANTEE shall not discriminate against any person on any of these bases.

12. Incorporation

The grant guidelines, quantification methodology and the Project Scope of Work, Project Budget Detail and any subsequent amendments or modifications to the Project Scope of Work and Project Budget Detail approved in writing by the STATE are hereby incorporated by reference into this Agreement as though set forth in full in this Agreement.

13. Severability

If any provision of this Agreement or the Project Scope of Work thereof is held invalid, that invalidity shall not affect other provisions or applications of this Agreement which can be given effect without the invalid provision or application, and to this end the provisions of this Agreement are severable.

14. Waiver

No term or provision hereof will be considered waived by either party, and no breach excused by either party, unless such waiver or consent is in writing and signed on behalf of the party against whom the waiver is asserted. No consent by either party to, or waiver of, a breach by either party, whether expressed or implied, will constitute consent to, waiver of, or excuse of any other, different, or subsequent breach by either party.

15. Assignment

This Agreement is not assignable by GRANTEE either in whole or in part.

ADDENDUM – CALIFORNIA CLIMATE INVESTMENTS (CCI) GRANT PROJECTS

I. SPECIAL PROVISIONS

1. Grant funds shall be used on projects with the primary goal of reducing greenhouse gases (GHGs) and furthering the purposes of AB 32 (Chapter 488, Statutes of 2006), California's Global Warming Solutions Act of 2006.
2. Grant funds shall be used on projects limited to specific activities as described in GHG Grants Procedural Guides.
3. Greenhouse gas reduction must be calculated using the ARB Greenhouse Gas Quantification Methodology (https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/calfire_ucf_16-17.pdf).
4. Grantee shall report project and benefits information when requested by the State (e.g., GHG reductions, disadvantaged community benefits, energy/water savings, and other co-benefits).
5. Grantee shall maintain accurate and detailed records documenting project description, project location, and schedule, GGRF dollars allocated, and leveraged funds throughout the duration of the project.
6. Failure of Grantee to meet the agreed upon terms of achieving required GHG reduction may result in project termination and recovery of funds.

II. MONITORING AND REPORTING REQUIREMENTS

All Greenhouse Gas Reduction Fund (GGRF) projects are required to monitor and report on carbon flux. This includes direct emissions, avoided emissions and sequestration. All such emissions should be monitored and reported separately. In addition, the Urban & Community Forestry and Forest Legacy Program Grants have to monitor and report on other metrics. Monitoring should be done at sufficient intervals to allow periodic reporting per the specific requirements of the individual grant program. Carbon flux should be expressed as the difference between the pre-project baseline and the in-progress or completed project at the end of the given monitoring period. This will require the establishment of a pre-project baseline from which direct emissions, avoided emissions and sequestration can be periodically measured throughout the crediting period¹ on the project area. Emissions and sequestration measurements should be expressed as metric tonnes of carbon dioxide equivalent [MTCO₂e]. Net Greenhouse Gas (GHG) benefit of the project will be determined by the sum of the GHG emissions

¹ The crediting period is the time period over which the project accrues GHG benefits.

reductions and sequestration less any GHG emissions resulting from project implementation. All other metrics should be reported in the appropriate units of measure. The reporting requirements should determine the timing and frequency of monitoring actions as described in Table 1.

a. TABLE 1 CCI GRANT REPORTING REQUIREMENTS

Grant Program	What to Report	Reporting Frequency	Report Due
Urban & Community Forestry	1, 3, 6, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20	Quarterly, At Completion	January 1, April 1, July 1, September 1, At Completion with final invoice
Forest Health	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 19, 20	Annually, At Completion	September 1, At Completion with final invoice

b. CCI GRANT REPORTING REQUIREMENTS

1. Increased carbon sequestration through tree growth.
2. Increased carbon sequestration through tree growth and timberland management.
3. GHG emissions resulting from project implementation actions (fuel reduction activities, timber harvesting, sanitation harvesting, site preparation, research activities, etc.)
4. Avoided GHG emissions resulting from reducing hazardous fuel load potential that could lead to large wildfires.
5. Avoided GHG emissions resulting from retaining the forest and avoiding conversion to another use.
6. Avoided GHG emissions resulting from utilization of the removed trees or other vegetation for biomass energy, solid wood products or other products.
7. Avoided GHG emissions resulting from preventing spread of disease to healthy forests by selectively removing pest- or pathogen-infected trees.
8. Avoided GHG emissions resulting from research activities.
9. Estimated net GHG benefit achieved to date.
10. Estimated net GHG benefit for entire project to date [provide total MTCO_{2e} over the project life].

11. Project status [provide one of the following: (a) started during reporting period; or (b) in progress.]
12. Project activities completed [e.g., milestones achieved].
13. Additional project benefits and results [if applicable, provide estimated totals, if available, or qualitative descriptions, of the following: (a) vehicle miles traveled reductions; (b) open space or greenbelt creation or preservation; (c) wildlife habitat preservation; (d) tons of biomass generated from forest easements and delivered to a renewable energy facility; (e) tons of harvested wood generated from forest easements and delivered to a mill; and (f) property acquired to be repurposed as an urban forestry project site.]
14. Number of trees planted and location.
15. Vegetation planted and location.
16. Maintenance activities conducted.
17. Verification that the land is still being managed in accordance with the terms of the forest conservation easement.
18. Verification that the site is still being maintained in accordance with the terms of the grant agreement.
19. At completion, summarize project accomplishments, including benefits to disadvantaged communities.
20. At completion, summarize co-benefits for entire project [if applicable, e.g., vehicle miles traveled reductions; open space creation or preservation; wildlife habitat preservation].
21. Grantee shall provide photos, literature, presentations and other media developed concerning the Project to the Grantor when requested.

III. PROGRAM ACKNOWLEDGEMENT/RECOGNITION

All projects funded both fully and partially by the GGRF must clearly display, identify and label themselves as being part of the "California Climate Investments" program. The acknowledgement must contain the "California Climate Investments" and CAL FIRE logos as well as the following statement:

"Funding for this project provided by the California Department of Forestry and Fire Protection as part of the California Climate Investments Program."

A draft of the acknowledgement must be approved by the STATE prior to publication.

In addition, all projects funded both fully and partially by GGRF must contain the following statement in public announcements or press releases on said projects:

"The City of Tracy "Tracy Trees for Tomorrow" is part of California Climate Investments, a statewide program that puts billions of cap-and-trade dollars to work reducing greenhouse gas emissions, strengthening the economy and improving public health and the environment—particularly in disadvantaged communities. The cap-and-trade program also creates a financial incentive for industries to invest in clean technologies and develop innovative ways to reduce pollution. California Climate Investment projects include affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, more sustainable agriculture, recycling and much more. At least 35 percent of these investments are made in disadvantaged and low-income communities. For more information, visit [California Climate Investments](#)."



2016/2017 Urban & Community Forestry California Climate Investment Grants

Project Application Form

Fill out the form completely. Please see the submittal instructions at the bottom of the form. The Project Tracking Number requested is listed in the letter of invitation you received.



CAL FIRE Project Tracking Number: 16-GHG-UF-01-MGMT-010

Name of Organization City of Tracy

Project Title City of Tracy "Tracy Trees for Tomorrow"

Project Type Management Activities For GHG Reduction

Requested Grant \$ \$300,253.50 **Matching \$** \$116,300.00 **Total Project \$** \$416,553.50

Primary Source of Technical Advice ISA Certified Arborist **Explanation (if required):** West Coast Arborists Area Manager

Professional's First Name Jason **Professional's Last Name** Pinegar

1. Applicant information - Eligible applicants include cities, counties, qualifying districts, or nonprofit organizations qualified under section 501(c)(3) of the Internal Revenue Code.

Type of Organization City

1A. Primary Project Contact information

First Name Brian **Last Name** MacDonald

Email brian.macdonald@cityoftracy.org **Phone Number** (209) 831-6233

Address 1 City of Tracy, Boyd Service Center, 520 Tracy Boulevard

Address 2

City Tracy **County** San Joaquin

State California **Zip Code** 95376

1B. Secondary Project Contact information

First Name Don **Last Name** Scholl

Email don.scholl@cityoftracy.org **Phone Number** (209) 831-6360

Address 1 City of Tracy, Boyd Service Center, 520 Tracy Blvd.

Address 2

City Tracy **County** San Joaquin

State California **Zip Code** 95376

1C. Correspondence Details: List any information needed for project contacts, invoicing, etc.

All correspondence can be addressed to the primary project contact. 16-GHG-UF-01-MGMT-010

2. Partner information - List primary project partners or co-sponsors. Applicants must provide a letter of commitment from each partner organization that affirms their role in the project.

2A. Name of Organization 1

First Name Last Name

Partner Contact Title

Email Phone Number

Comments

2B. Name of Organization 2

First Name Last Name

Partner Contact Title

Email Phone Number

Comments

2C. Additional Partners: list additional partner organizations with contact person, email address, and phone number.

3. Grant Period: provide the estimated start and end dates of the grant project. This date cannot be after March 30, 2020. Final billing must be received within 30 days after the completion date.

Project Start Date Project Completion Date

4A. CES 2.0 Disadvantaged Communities (DACs): Fill in the percentages below. In the larger box, describe what ARB criteria (see grant guidelines) are being met to be considered "in" or "providing benefits to" DACs. Reference Appendix L of grant guidelines.

Percentage of project meeting definition of "in" DAC Percentage of project that "provides benefits to" DACs.

4B. DAC census tracts: In the box below list DAC census tracts for the project that will meet the definition of being "in". Census tracts should be listed using the 10 digit number found for each tract on the map(s) at <http://www.calepa.ca.gov/EnvJustice/GHGInvest/>.

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5. GHG Methodology: Fill in the GHG calculated amounts below. Describe the assumptions used to quantify GHG reductions using the ARB Quantification Methodology as required in the grant guidelines and found at: <https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/quantification.htm>. You are required to attach UTCC runs for species specified and the ARB calculator output.

5A. Estimated carbon stored (MT CO2e)	<input type="text" value="1,407"/>
5B. Estimated avoided emissions (MT CO2e)	<input type="text" value="377"/>
5C. Estimated project emissions (MT CO2e)	<input type="text" value="89"/>
5D Net GHG benefit (MT CO2e). (5A + 5B) - 5C =	<input type="text" value="1,695"/>

The list of trees the City is proposing to plant were evaluated based on their local compatibility, low water requirements and high canopy (which can become medium to large size at maturity) and maximize greenhouse gas reduction benefits. The species and number of each was then determined based on the following assumptions:

- The climate region is Mediterranean and located in the Central Valley
- Planting of 104 trees in parks (44 Cedrus deodara and 60 Platanus racemosa)
 - These trees will provide a GHG storage benefit
- Planting the remaining 530 trees along residential streets
 - Assumed that 60% would be planted on streets that run E-W and 40% on streets that run N-S
- Within each species, divided the planting locations as follows:
 - 30% planted to the north of buildings (no shade benefit)
 - 30% planted to the south (energy benefits included)
 - 20% planted to the east (energy benefits included)
 - 20% planted to the west (energy benefits included)
- Since the distances from the trees to the buildings are not yet known, staff chose the moderate distance for the estimates: 20'-40'
- Since the ages of the nearby buildings are also not known, staff chose the middle building vintage option: 1950-1980
- Assumed all trees were 1.5" DBH at planting and predicted benefits of 40 years after planting

Staff entered these assumptions into the CTCC to determine the total project lifetime storage and the energy benefits at 40 years. These values were then entered into the ARB GHG Calculator, along with 5 years (the minimum numbers of years of care and replacement we will be providing).

Project will use staff, tree service contractor, consultants and/or volunteers to create an inventory of the trees as they are planted and to perform the calculations as needed.

6. Narrative. In the sections below, please follow the prompts and provide all relevant information for the project.

6A. Background. Describe the situation in the project area(s) and problems in the project area(s) that need attention.

The City of Tracy Public Works Department has contracted with West Coast Arborists for the last eight years and has a comprehensive public tree inventory and tree maintenance program. The City manages over 37,000 thriving trees and 8,000 vacant sites. The goal of this project is to establish a UFMP to aid in the long-term management of the City's trees (including those planned for new areas of development), engage the community's understanding and support and secure a formal commitment to best management practices and invest in the City's urban forest.

This project will sequester carbon emissions and improve the urban tree canopy by planting 634 trees in Disadvantage Communities (and adjacent areas within a half mile of these communities) in four City of Tracy Census Tracts that CalEnvironScreen 2.0 scores from 75%- 90%. There are troubling air quality effects from having three major highways forming a triangle surrounding the city with dense traffic and hovering particulate matter. This is especially true for areas near Interstate 205 where one of the high CalEnvironScreen Census Tracts is located. According to the CalEnvironScreen 2.0 data, this area is characterized by high unemployment, asthma ratios and pollution burden.

Through the efforts of the Public Works Department, the City has gained Tree City USA status in 2015 and embarked in a new partnership with the newly established Tracy Tree Foundation (TTF) (a 501c non-profit organization). A Memorandum of Understanding was approved by the City Council in September, 2016 with the TTF. Together, this partnership has initiated efforts to engage and educate the community about the importance and value of trees. The City has collaboratively held two Arbor Day events, including one earlier this year, where 150 trees were planted through the Cal Fire CIRCLE partnership grant.

The City has many aspects of an UFMP in place at this time and is ahead of many municipalities in its commitment to the care and maintenance of its trees, including a part-time person dedicated to the inspection of all City trees. The City needs additional resources, including staff and trees. A City-approved UFMP will engage the community further, establish environmental justice and heritage tree standards, and formalize the City's commitment to increasing and enhancing the City's urban forest.

6B. Project Objectives - What are the objectives of the proposed project? How do they address the situations and problems identified in the background section?

The City of Tracy "Tracy Trees for Tomorrow" primary purpose is to:

- 1) Formalize the City's commitment to its urban forest through the development of a long-term plan establishing best management practices and sustainable development of the City's urban forest,
- 2) Increase the number of trees and size of tree canopy in the City of Tracy's urban forest for improvement in air quality, soil permeability and a reduction of greenhouse gas emissions,
- 3) Develop and implement a formal, City-approved UFMP, promoting the greatest health and longest life of urban trees,
- 4) Engage the Tracy community residents, businesses and elected officials in improving their understanding of the benefits and importance of trees,
- 5) Improve management and care of trees including residential and business owner participation in protection of the City's trees through education of community members on the care of privately owned trees,
- 6) Provide benefit to residents of DACs that include improved health and well-being, community engagement and educational opportunities, home energy savings and reduced effects from pollution, and
- 7) Through cooperation of the City's tree service provider, employ and train at least one entry level urban forestry employee from a disadvantaged community.

The "Tracy Trees for Tomorrow" project aligns with requirements and attributes for the Urban Forest Management Activities grant by:

- 1) Planting trees in DACs,
- 2) Engaging and educating community residents and businesses,
- 3) Developing and implementing urban forest management activities to reduce greenhouse gases, and
- 4) Increasing the City's urban tree canopy. The UFMP will result in a long range, comprehensive plan utilizing best urban forest management practices and an ecological approach to ensure long-term health and benefits of trees and engage residents and property owners in a greater understanding of the positive effects of trees.

This project's objectives align with Cal Fire's strategic goals to:

- 1) Optimize benefits people receive from urban & community forestry,
- 2) Improve management and health of urban forests, and
- 3) Promote industry growth and job creation.

The project also aligns with USFS Strategic Focus Areas: 1) Mitigate and adapt to climate change, 2) protect and improve water and air quality, 3) conserve energy, 4) reduce the impacts of land use change, 5) improve community health and well-being, and 6) build urban forest resilience and mitigate the impacts of invasive pests and catastrophic events.

16-GHG-UF-01-MGMT-010

6C. Scope of Work - Describe the approach to be used, the design (methods), and implementation of the project. Include who will be involved with specific tasks and justify why the approach, methods and implementation is the most effective way to accomplish the objectives. Include a description of project sign contents and their locations. *(continued on next page)*

This proposal contains a tree-planting project in conjunction with the production, adoption and implementation of a formal UFMP. The UFMP will follow the recommendations and guidance of the California Department of Forestry and Fire Protection, focusing on detailed strategies, goals, policies and procedures to increase, protect, and maintain the City of Tracy's urban forest, develop heightened community interest in urban trees, and further public safety. The UFMP will satisfy other goals that are current priorities for City of Tracy and the Tracy Tree Foundation, including the development of a Heritage Tree Ordinance, community awareness and education on the importance of urban trees and tree canopy, increase development of the tree canopy in disadvantaged communities, and decrease urban heat islands.

The City of Tracy proposes to develop an UFMP beginning in 2017, with an approved plan by the end of 2018, and to plant 634 trees over a 2 1/2-year period, ending February, 2020. These trees will be chosen with consideration to drought tolerance, suitability and adaptability to local conditions, canopy size, long lifespan, with a focus on measurably reducing greenhouse gas emissions over a 40-year tree growth period and providing additional environmental and health benefits in and around communities and neighborhoods.

The development and implementation of the UFMP will be carried out in the following steps:

1. Create a City of Tracy UFMP team comprised of staff from the Public Works, Parks and Recreation, Engineering and Planning Departments. The team will then begin and complete the process of hiring a consultant specializing in urban forest planning who will work closely with the City's team to coordinate the development of the City's UFMP.
2. Create and perform an Urban Forest Assessment that will determine the status of the City's trees, infrastructure, canopy, staffing, and other City-specific concerns and needs. West Coast Arborists has already inventoried and evaluated the majority of the City's trees in the past two years. The list will be updated accordingly.
3. Identify major goals, objectives and priorities. This step will utilize the data collected during the assessment step to help integrate goals, objectives and priorities into other planning documents such as the City's General Plan, Parks Master Plan and Parkway and Streetscape Standards for new development. Staff will also look at developing preservation and management procedures for the aging tree population.
4. Public input. Establish a process, plan and schedule to inform and receive input from the community in collaboration with Tracy Tree Foundation. This will involve local school districts, the City's Parks Commission, community groups and other interested entities. Various forms of communication will be utilized, including public meetings, social media, television, print media, mailers, etc. All communications material will recognize the use of Cal Fire's Urban and Community Forestry Program and the California Climate Investments Program.
5. Develop plan.
6. Re-address community and City Council.
7. Finalize plan.
8. Implement.
9. Re-visit and evaluate plan.

The final UFMP will provide the community a clear and complete plan for managing and developing the urban tree canopy, addressing best management practices for public safety and tree care. The plan will incorporate the following important components:

1. Updating the City's Tree Care Ordinance and evaluate duties between Public Works, Parks & Recreation, Engineering and other Departments
2. Coordinating the UFMP with other City master plans
3. Addressing the tree infrastructure in new residential and commercial developments with other City departments to ensure proper installation
4. Analyzing current Public Works Department's resources in support of urban forestry management and identifying unmet staffing and policy needs, safety issues, observed problems, etc.
5. Developing of a City of Tracy Heritage Tree Ordinance
6. Identifying a process for addressing, caring for, and replacing the City's aging tree population
7. Addressing the need to implement practices that increase community appreciation and understanding of personal, public, economic, environmental, social and health benefits of trees
8. Detailing tree canopy goals to align with Cal Fire goal to increase canopy size by 10% in 2030, and 35% by 2050

6C. Scope of Work - Continued from previous page

All of the 634 trees will be planted within a DAC area or a 1/2 mile walking distance of a DAC. The Tracy Tree Foundation (TTF) has committed to plant 100 of the trees using volunteers through various educational projects associated with schools and the community. Over the three-year period, the City and TTF will host a minimum of two events per year, which include Arbor Day and Earth Day. The City will collaborate with West High School's FFA and other school programs to educate youth on the advantages of trees. All partners will work together on community outreach, education and events to plant trees. They will also engage the community in all activities that celebrate the importance and benefits of healthy urban trees.

The remaining 534 trees will be planted over the three year period by the City's contractor, West Coast Arborists. For trees planted in residential easements, additional educational material will be provided to residents and property owners by the City at the time of planting to ensure proper establishment of the tree. Educational material will include proper watering amounts, techniques and frequencies, as well as a list of other guidelines for proper tree care. Staff contact information will also be provided for resident's questions and concerns.

Planting methodology will adhere to ISA and City standards for site selection, site preparation, planting, staking and watering. Inspection of the trees will be conducted a minimum of twice per year and as needed. Structural pruning/training of the trees will be conducted each of the first two years and at the conclusion of the third year following planting, if needed. Subsequent pruning will then take place per the City's current programmed pruning cycle (typically every 5 - 7 years). Again, all grant work performed will acknowledge the use of Cal Fire's Urban and Community Forestry Program and the California Climate Investments program through the use of the approved banner.

6D. Project Timeline - Provide a project timeline. Do not list specific dates or months due to uncertainty in when projects may begin. Plan on projects ending no later than March 30, 2020.

TIMELINE - UFMP

Fall 2017– Winter 2018: Initiate, complete and implement UFMP

TIMELINE - TREES

Fall 2017: Begin planting 234 trees; Conduct Arbor Day event -- 84 trees at event /150 additionally throughout the year

Fall 2018: Tree Planting and Fall Arbor Day Event(s) – 200 trees -- 50 trees at event /150 additionally throughout the year

Fall 2019: Tree Planting and Fall Arbor Day Event(s) – 200 trees -- 50 trees at event / 150 additionally throughout the year

Feb 2020: Project wrap-up and close

6E. Tree Information (if applicable) - Provide the following information about any trees or plants to be planted as part of the grant project. Include information even if the trees or plants are not to be funded by CAL FIRE.

Species List - Provide a list of the tree and plant species for this grant project . Include common name, Genus, and species. Include the approximate number of each species to be used. List minimum planting stock size for each species.

1. Chinese Pistache/Pistacia chinensis (150 used)
2. Red Oak/Quercus rubra (85 used)
3. Sycamore/Platanus spp. (75 used)
4. Japanese Zelkova/Zelkova serratta (60 used)
5. Ginkgo/Ginkgo spp. (50 used)
6. Valley Oak/Quercus lobata (60 used)
7. Cork Oak/Quercus suber (60 used)
8. Elm/Ulmus spp. (50 used)
9. Deodar Cedar/Cedrus deodara (44 used)

Total Project Trees:

Total CAL FIRE Funded:

6F. Other deliverables. List all other project deliverables and quantities to be funded by CAL FIRE, as well as overall project totals.

The City of Tracy has a comprehensive electronic tree inventory (Arbor Access), a tree maintenance schedule and is a Tree City USA. This electronic database allows the City to track the species, age, health, work performed, vacant sites as well as other information for all City trees.

The City was a recipient of CAUFC's CIRCLE partnership grant, administered by West Coast Arborists, and received 150 trees which were planted during a combined Arbor Day celebration and Make A Difference volunteer day on October 22, 2016. The event was coordinated with Tracy Tree Foundation, Tracy United To Make A Difference, California Conservation Corp., DARE (Drug Abuse Resistance Education) youth leaders, the West High School FFA, and other volunteer organizations. Over 100 community volunteers assisted to plant trees.

The City of Tracy has an existing tree ordinance.

7. Budget Information

7A. Budget Detail - Provide a specific budget for work to be done. The budget should be based on bid quotes and/or estimates from vendors or on actual costs that will be incurred. The line items listed should be specific enough to adequately describe project expenses. Use the Excel format CAL FIRE has provided for your budget, and follow the guidance in the Procedural Guide. You should note that applicants, if successful in being awarded a grant, will have to follow this budget and will only have the opportunity for minor budget adjustments. The total amount of the project can not be changed later.

7B. Vendor List - List the vendors that have provided you quotes or estimates for this project.

West Coast Arborists
Norman's Wholesale Nursery
Normac Irrigation & Landscape Supply
Tracy Signs

7C. Explanation of Budget and Costs - Describe the basis for the budget amounts listed above. Applicants will be expected to adhere to this budget (*Continued on next page*).

A/B. Salaries, Wages and Employee Benefits: City of Tracy Public Works Department (COT) will administer the grant, provide project oversight, engage in UFMP development activities and contract for tree work - currently with West Coast Arborists (WCA). A COT Urban Forestry Supervisor is being requested in the FY 2017/18 budget and will devote 15% of their time for grant administration, project management and outreach. This supervisor or trained City staff may perform tree care tasks on an as-needed basis. COT will spend \$34,200 on staff time for project administration. This includes \$10,200 for City of Tracy Management Analyst and Parks Superintendent oversight. These projections are for a three-year time period. The City will then commit to funding the Urban Forestry Supervisor in future years to oversee the program.

C. Contractual: WCA will plant 534 trees at \$165 per tree. They will employ and train at least one employee from a DAC (equivalent of one FTE) for tree work and maintenance. Watering costs for areas that do not have irrigation is anticipated at 25 days for WCA to water trees for the first three years at \$600 per day. COT will develop the UFMP with assistance from WCA or another consulting firm at an estimated cost of \$125,000.

D. Travel: N/A

E. Supplies: TTF will plant 100 fifteen-gallon trees at a cost \$55 per tree. Costs will include all the materials for planting such as stakes, ties, etc.

F. Equipment: N/A

G. Outreach/Education: COT will coordinate with TTF, Tracy United to Make a Difference, Tracy Unified School District, FFA and other volunteer partners on multiple tree events. Volunteer costs are estimated at \$20,700 annually. Volunteer costs are projected for two events minimum per year for three hours each, with 150 volunteers per event at a rate of \$23 per hour. TTF will oversee volunteer activities. This category also includes a banner (\$406) and printing costs for COT outreach on tree benefits at \$5,000.

H. Other: City staff will modify tree well locations prior to planting in areas where the tree well is not large enough to accommodate the selected species. The \$5,000 budget is at a rate of a City Maintenance Worker II at \$35.69 per hour for 140 hours.

Indirect Costs: TTF's indirect costs are \$1,500 annually for a three-year total of \$4,500 for business services. COTs indirect costs are \$5,000 annually, for a three-year total of \$15,000.

Total Project Costs: \$300,253.50 for 634 trees (includes budgeted amount of \$125,000 for the UFMP contractual fee) equals \$473.59 per tree for the grant request amount.

The cost to Cal Fire per tree (without the \$125,000 for the UFMP) is \$276.43.

7D. Matching Funds - List other non-GGRF funding sources, that will meet grant matching requirements.

Source 1 Amount

Description

Source 2 Amount

Description

Source 3 Amount

Description

Source 4 Amount

Description

Matching funds comments

8. Project Co-Benefits - What co-benefits will the project have? Check the boxes below for the applicable co-benefits, then describe and/or quantify them. Describe how the project will achieve the co-benefits.

- Stormwater reduction
- Improved public health
- Jobs created
- Improved water quality
- Enhanced active transportation
- Job training conducted
- Improved air quality
- Reduced vehicle miles travelled
- Community outreach conducted
- Energy savings
- Vacant lot(s) acquired
- Education tools/media produced
- Biomass diverted from landfill
- Improved urban forest management
- Other co-benefits

Planting trees and proper management to protect the growth and lifespan of trees, has many co-benefits, including stormwater reduction, improved public health, water and air quality, energy savings, and other human and environmental benefits. According to The Center for Urban Horticulture, trees help stabilize the soil which reduces stormwater runoff, and creates a cost savings related to stormwater management. Reduced stormwater decreases soil erosion and pollutant runoff into streams and other waterways.

Beyond benefiting City water management systems, trees have economic, aesthetic, and health benefits including, but not limited to: reduced noise pollution, higher commercial and residential property values, lower home energy costs, increased patronage and consumer spending for businesses, decreased effects due to air pollution, and other benefits.

This project will support the City Council's adopted FY17-19 Strategic Priorities. These priorities are aimed at "Promoting Economic Development" and improving "Quality of Life." One of the Council's Quality of Life objectives is to seek grant opportunities that enhance our urban forest. Enhancing the City's urban forest in key locations will promote economic development by improving the City's image, which will support the efforts to attract and retain business. Staff is proposing to plant trees in commercial and industrial parts of the City (within the DAC). These areas saw a high number of tree casualties due to drought, disease and species selection.

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8. Project Co-Benefits - continued from previous page.

The development, approval and implementation of a City of Tracy Urban Forest Management Plan will bring the City's urban forest into focus of the Council and community. The plan will enlist a commitment from the City to achieve important milestones that will lead to a healthy, sustainable urban forest and happier, healthier Tracy residents. The City has done well to maintain their trees but there is currently a deficit due to the lengthy drought, which resulted in the loss of trees, and limited funds to replace them. UFMP will create a City-adopted stewardship of trees with a committed effort to replace trees when lost, increase overall urban tree canopy, and improve the diversity and suitability of tree species for their carbon sequestration. Other beneficial characteristics go beyond the City limits as it relates to the regional environment, as many of the trees planted will be adjacent to San Joaquin County pocket areas. For example, the Larch-Clover community sits adjacent to Census Tract 6077005305.

In addition, the UFMP will formally provide for objectives that were set forth in a Memorandum of Understanding with the Tracy Tree Foundation and adopted by the City in September of 2016, to establish a community outreach component including the production of educational materials, a Heritage Tree Ordinance, and relationship building with community organizations and schools for urban forest education.

9. Certifications & Forms- The following certifications must be filled out and signed by the appropriate person.**9A. Certification of Party Responsible For Maintenance**

I, Appropriate representative

certify that the Appropriate agency

will provide or be responsible for 100% of the maintenance for a minimum of 3 years after the end of the grant period in accordance with ANSI A-300 tree care standards, the accompanying ISA Best Management Practices and the standards outlined in the grant agreement and/or grant attachments with the California Department of Forestry and Fire Protection.

Signature



Date

Title Phone Number **9B. Statement of Compliance With All Applicable Laws (all projects must fill out and sign)**

I, Appropriate representative

certify that the Appropriate agency

will abide by all applicable federal, state, and local laws, ordinances, regulations and policies in carrying out this State bond-funded project. Failure to do so will lead to cancellation of the grant award.

Signature



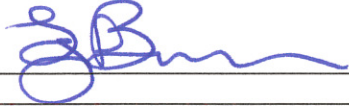
Date

Title Phone Number

9C. Recycling Certification (all projects must fill out and sign) - This certification applies to all state contracts and, to the extent feasible, all federally funded contracts.

Contractor certifies under penalty of perjury that percent of the minimum, if not exact, percentage of recycled content, both post consumer waste and secondary waste as defined in the Public Contract Code, Sections 12616 and 12200, in materials, goods, or supplies offered or products used in performance of this Agreement, regardless of whether the product meets the required recycled product percentages defined in the Public Contract Code, Sections 12161 and 12200. Contractor may certify that the product contains zero recycled content. (PCC 10233, 10308.5, 10354)

Signature



Date

Title Phone Number

9D. Checklist of Necessary Forms To Be Completed. Some may not be applicable to your project.

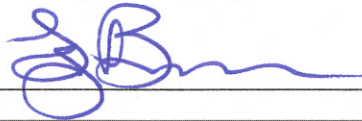
- | | |
|--|---|
| <input checked="" type="checkbox"/> CAL FIRE Urban Forestry Program Environmental Checklist | <input checked="" type="checkbox"/> State of California Non-Discrimination Compliance (Std. 19) |
| <input checked="" type="checkbox"/> Proof of CalEnviroScreen 2.0 community designation. | <input checked="" type="checkbox"/> State of California Drug-Free Workplace Certification (Std. 21) |
| <input checked="" type="checkbox"/> Governing Body Resolution (must follow sample format) | <input checked="" type="checkbox"/> State of California Payee Data Record (Std. 204) |
| <input checked="" type="checkbox"/> Representative project area maps with DAC information. | <input checked="" type="checkbox"/> Signed letters of participation from listed partners. |
| <input checked="" type="checkbox"/> Project sign schematic (including CAL FIRE and CCI logos) | <input checked="" type="checkbox"/> Urban and Community Forestry Project Budget |
| <input checked="" type="checkbox"/> 5-10 representative site photos | <input checked="" type="checkbox"/> UTCC runs for assumptions used, ARB Calculator filled in. |

 Other:

List other attachments:

SIGNATURE: The authorized primary project contact for the applying organization must sign below. This must be the person, or person holding the position, that is mentioned in the required governing body resolution, and the same person or position signing all of the other required forms. The signature indicates that, to the best of the signer's knowledge, all of the information provided in this application and all attached required forms and documents is accurate and correct. The signer additionally acknowledges that they have read and understand the grant program RFP and the Procedural Guide common to all of the CAL FIRE Urban & Community Forestry grant programs.

Signature


Printed Name Title

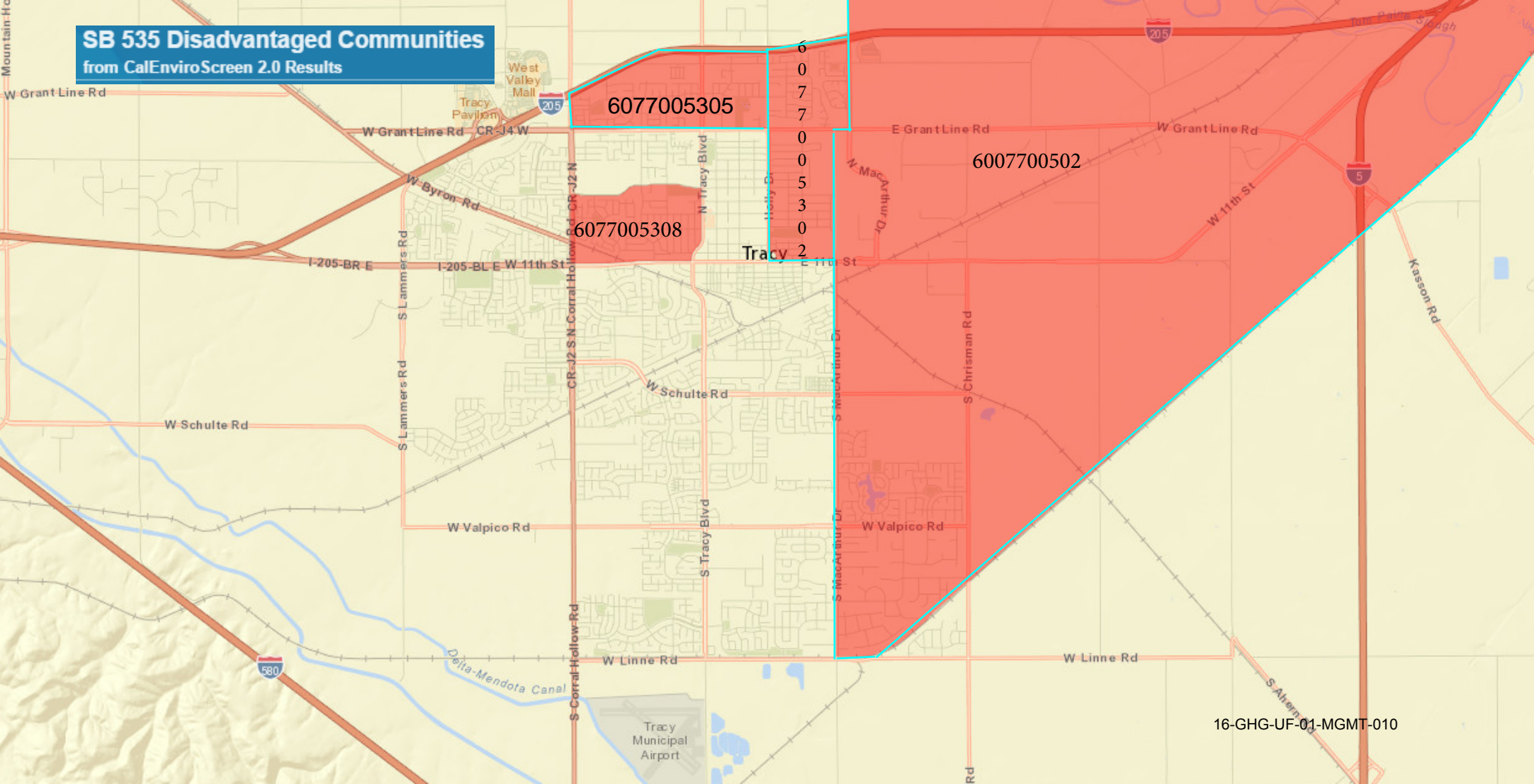
Date

Please fill out this form completely. Be sure to save a copy of this form for your records. Submit one (1) electronic copy in the fillable PDF format with all supporting materials to CALFIRE.Grants@fire.ca.gov. Please use "U&CF GGRF Project Application" in the E-mail subject line and include yourself as a cc. Your CC will be proof of your submittal. In addition, submit one (1) hard copy with signatures and all supporting materials to : California Department of Forestry and Fire Protection, Attention: Grants Management Unit/Urban and Community Forestry Greenhouse Gas Reduction Fund Grant, P.O. Box 944246, Sacramento, CA 94244-2460. Both hard copy and electronic copy must be postmarked no later than the due date in the invitation letter you received. If you would like to mail the hard copy via expedited/overnight mail, please E-mail CALFIRE.Grants@fire.ca.gov for the physical mailing address.

CAL FIRE Urban & Community Forestry Program GHG Reduction Grants

Budget Item	Description	Cost Basis	CAL FIRE Grant		Total
			Share	Grantee Match	
A. Salaries and Wages			42,241.86	31,561.19	73,803.05
	Project Lead (Forestry Supervisor)	924.936 hours x \$45.67/hour	42,241.86	24,000.00	66,241.86
	City of Tracy Analyst	82.76 hours x \$43.27/hour	-	3,581.03	3,581.03
	City of Tracy Superintendent	72 hours x \$55.28/hour	-	3,980.16	3,980.16
B. Employee Benefits			14,695.64	2,638.81	17,334.45
	Project Lead (Forestry Supervisor)	924.936 hours x \$15.89/hour	14,695.64	-	14,695.64
	City of Tracy Analyst	82.76 hours x \$15.14/hour	-	1,246.33	1,246.33
	City of Tracy Superintendent	72 hours x \$19.34	-	1,392.48	1,392.48
C. Contractual			228,110.00	-	228,110.00
	West Coast Arborists (WCA) Tree Planting	534 trees @ \$165/tree	88,110.00	-	88,110.00
	WCA watering	\$600/day for 25 days, as needed for three years	15,000.00	-	15,000.00
	UFMP Contract	Hire a consultant to develop the UFMP	125,000.00	-	125,000.00
D. Travel			-	-	-
	n/a		-	-	-
E. Supplies			5,300.00	-	5,300.00
	Trees	100 trees @ \$50/tree	5,000.00	-	5,000.00
	Tree stakes and ties	100 trees @ \$3.00/tree	300.00	-	300.00
F. Equipment			-	-	-
	n/a		-	-	-
G. Outreach/Education			406.00	67,100.00	67,506.00
	Volunteer Hours	2 annual events at 3 hours each, with 150 volunteers per event @ \$23/hr (3hrs) over 3-year period	-	62,100.00	62,100.00
	Printing - literature Banners	City's advertising budget 1 banner @ \$406 each	406.00	5,000.00	406.00
H. Other			5,000.00	-	5,000.00
	Concrete cutting	City Maintenance Worker II @ \$35.69/hr x 140 hours	5,000.00	-	5,000.00
TOTAL DIRECT COSTS			295,753.50	101,300.00	397,053.50
INDIRECT COSTS		\$1500 annually for TTF operating costs	4,500.00	15,000.00	4,500.00
TOTAL PROJECT COSTS			300,253.50	116,300.00	416,553.50
LESS Program Income			-	-	-
TOTAL GRANT PROPOSED COSTS			300,253.50	116,300.00	416,553.50
			72%	28%	100%

SB 535 Disadvantaged Communities from CalEnviroScreen 2.0 Results



6077005305

6077005308

607700502

Tracy



**California Air Resources Board and
California Department of Forestry & Fire Protection**

**Greenhouse Gas Calculator Tool
Urban and Community Forestry Program
Greenhouse Gas Reduction Fund
Fiscal Year 2016-2017**

Version 2 - December 8, 2016

Read Me Worksheet

The California Air Resources Board (ARB) is responsible for providing the quantification methodology to estimate greenhouse gas (GHG) emission reductions from California Climate Investment projects receiving monies from the Greenhouse Gas Reduction Fund (GGRF).

This Urban and Community Forestry (UCF) GHG Calculator Tool accompanies the draft quantification methodology for the fiscal year (FY) 2016-17 GGRF UCF Program available at: <https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/quantification.htm>

ARB released the draft FY 2016-17 quantification methodology and GHG emission reduction calculator for public comment in October 2016. The final draft was updated to reflect public input received and was released in November 2016. As of December 8, 2016, a technical error has been corrected in the UCF GHG Calculator Tool for FY 2016-17; Version 2, dated December 8, 2016, must be used for concept proposals and full applications submitted to CAL FIRE. CAL FIRE has extended the deadline for concept proposal submissions until December 30th to accommodate applicants (see http://calfire.ca.gov/resource_mgmt/resource_mgmt_urbanforestry_grants). The quantification methodology document has not been updated because the methods and equations remain unchanged.

Applicants must use this UCF GHG Calculator Tool to estimate the net GHG benefit associated with the Urban and Community Forestry projects. **Refer to the quantification methodology document for background and step-by-step detailed instructions.** To use this UCF GHG Calculator Tool, follow these steps:

Step 1 Enter general project information: Enter the project name and the contact information for a person who can answer project specific questions from staff reviewers on the quantification calculations. Enter the date that the project completed the GHG calculations.

Project Name:	City of Tracy "Tracy Trees for Tomorrow"
Grant ID, if applicable:	16-GHG-UF-01-MGMT-010
Contact Name:	Brian MacDonald
Contact Phone Number:	209-831-6233
Contact Email:	brian.macdonald@cityoftracy.org
Date Completed:	4/19/2017

Step 2 Identify the project component(s): The applicant must select the appropriate project component(s) from the list of four eligible urban forestry project components listed in the quantification methodology.

Step 3 Determine the inputs needed: The applicant will use the quantification methodology and the carbon calculator tools identified therein to determine the project information that must be input into this UCF GHG Calculator Tool for the applicable project component(s) selected in Step 2. Many of the inputs will come from the output of urban forest carbon calculators identified in the quantification methodology.

Step 4 Estimate the net GHG benefit: The applicant will enter the project details identified in Step 3 into this calculator tool to calculate the net GHG benefit of the project.

Step 5 Submit documentation: Save file for submittal. This file will be submitted with other documentation requirements. See Section C of the quantification methodology for additional documentation requirements.

This UCF GHG Calculator Tool allows users to estimate the net GHG benefit from a variety of specific urban forestry activities. Each eligible project component identified in Table 2 of the quantification methodology has a worksheet within the calculator (note: carbon stored in trees planted by the project and GHG emission reductions from energy savings as a result of strategically planting trees to shade buildings share a worksheet). Applicants must input data into the worksheets that apply to the proposed project. The UCF GHG Calculator Tool provides fields for users to input project specific information. User input fields are shaded yellow and calculator outputs of GHG emission reduction estimates are shaded grey. After the user inputs are entered for each proposed project component, the GHG Summary worksheet displays the GHG benefit from each component, the GHG emissions from project implementation, the net GHG benefit over the project life, as well as the estimated total project GHG benefit per UCF GGRF funds requested and the estimated total project GHG benefit per total GGRF funds requested.

For more information on ARB's efforts to support implementation of Greenhouse Gas Reduction Fund investments, see:

<https://www.arb.ca.gov/auctionproceeds>

Questions on this document should be sent to: GGRFProgram@arb.ca.gov

Questions on the Urban and Community Forestry Program should be sent to the CAL FIRE Urban Forestry Advisor nearest to the proposed project location. Contact information for Urban Forestry Advisors can be found http://calfire.ca.gov/resource_mgmt/resource_mgmt_urbanforestry_advisors



California Air Resources Board and
California Department of Forestry & Fire Protection

Greenhouse Gas Calculator Tool
Urban and Community Forestry Program
Greenhouse Gas Reduction Fund
Fiscal Year 2016-2017

California Environmental Protection Agency
Air Resources Board

Version 2 - December 8, 2016

Definitions Worksheet

Tree Carbon & Energy Savings Using Estimates from the CTCC	Tree & Tree Planting Site Characteristics	Enter a brief description of the tree and tree planting site characteristics (species, age, tree azimuth and distance from building, etc.) to differentiate it from other tree and tree planting sites modeled in the CTCC. Use a separate row for each combination of tree and planting site. If cells are not applicable, leave blank.
	Quantity of Trees to be Planted with Tree & Tree Planting Site Characteristics	Enter the quantity of trees to be planted with the tree and tree planting site characteristics entered in the cell to the left. If cells are not applicable, leave blank.
	Carbon Stored in Individual Tree 40 Years After Project Start (kg CO ₂ e)	Enter the carbon stored in an individual tree with the characteristics entered in the cell to the left 40 years after project start (from the CTCC). If cells are not applicable, leave blank.
	Annual GHG Emission Reductions from Energy Savings From Individual Tree 40 Years After Project Start (kg CO ₂ e)	Enter the annual emission reductions from energy savings from the individual tree with the characteristics entered in the cell to the left 40 years after project start (from the CTCC). If cells are not applicable, leave blank.
	Years of Establishment and Replacement Care Provided by Project (years)	Enter the number of years of establishment and replacement care to be provided by the project. If cells are not applicable, leave blank.
Tree Carbon & Energy Savings Using Estimates from i-Tree Streets	Carbon Stored in Population of Trees 40 Years After Project Start (lb CO ₂ e)	Enter the carbon stored in the population of project trees 40 years after project start (from i-Tree Streets). If cells are not applicable, leave blank.
	Annual Electricity Savings From Population of Trees 40 Years After Project Start (MWh)	Enter the annual electricity savings from the population of project trees 40 years after project start (from i-Tree Streets). If cells are not applicable, leave blank.
	Annual Natural Gas Savings From Population of Trees 40 Years After Project Start (therms)	Enter the annual natural gas savings from the population of project trees 40 years after project start (from i-Tree Streets). If cells are not applicable, leave blank.
	Trees Within Population to be Planted to Shade Buildings (%)	Enter the percent of the population of trees to be planted that will be strategically placed to shade buildings (i.e., those planted within 60 feet of a building).
	Years of Establishment and Replacement Care Provided by Project (years)	Enter the number of years of establishment and replacement care to be provided by the project. If cells are not applicable, leave blank.
Wood Products	Tree Characteristics	Enter a brief description of the tree characteristics (species, age or diameter at breast height, etc.) to differentiate it from other trees modeled in the CTCC. Use a separate row for each tree type. If cells are not applicable, leave blank.
	Quantity of Trees to be Removed with Tree Characteristics	Enter the quantity of trees with the characteristics entered in the cell to the left to be removed and utilized for wood products. If cells are not applicable, leave blank.
	Aboveground Biomass at Time of Removal (kg)	Enter the aboveground biomass of an individual tree with the characteristics entered in the cell to the left at the time of removal to be utilized for wood products (from the CTCC). If cells are not applicable, leave blank.
	Mill Efficiency (%)	Applicants can enter either the actual mill efficiency from the mill where trees will be delivered, supported with documentation, or the appropriate default mill efficiency based on the type of wood provided in Table 10 of the quantification methodology. If trees will be delivered to more than one mill with different efficiencies, applicants may provide a weighted mill efficiency. If cell is not applicable, leave blank.
	Wood Product Classes (%)	Enter the percent of removed biomass that will go into each wood product class category. If not available from the mill that wood will be delivered to, assume that 100% of the biomass goes into "miscellaneous products." If cells are not applicable, leave blank.
Electricity	Tree Characteristics	Enter a brief description of the tree characteristics (species, age or diameter at breast height, etc.) to differentiate it from other trees modeled in the CTCC. Use a separate row for each tree type. If cells are not applicable, leave blank.
	Quantity of Trees with Tree Characteristics to be Removed and Utilized to Generate Electricity via Combustion	Enter the quantity of trees with the characteristics entered in the cell in column A to be removed and utilized for electricity generation via combustion. If cells are not applicable, leave blank.
	Quantity of Trees with Tree Characteristics to be Removed and Utilized to Generate Electricity via Gasification	Enter the quantity of trees with the characteristics entered in the cell in column A to be removed and utilized for electricity generation via gasification. If cells are not applicable, leave blank.
	Aboveground Biomass at Time of Removal (lbs)	Enter the aboveground biomass of an individual tree with the characteristics entered in the cell to the left at the time of removal to be utilized for energy generation (from the CTCC). If cells are not applicable, leave blank.
	Biomass Combustion or Gasification Facility	Select from the drop down menu if the biomass facility generates electricity via combustion or gasification.
GHG Summary	UCF GGRF Funds Requested (\$)	Enter the UCF GGRF funds requested for all project features. This amount is equal to the amount of GGRF dollars the applicant is requesting from CAL FIRE's UCF program.
GHG Summary	Total GGRF Funds Requested (\$)	Enter the total GGRF funds requested for all project features. This amount is equal to the amount of GGRF dollars the applicant is requesting from CAL FIRE's UCF program, plus all GGRF dollars from CAL FIRE or other agencies that have previously been awarded to the same project and any GGRF dollars from agencies other than CAL FIRE that project has or plans to apply for. For a list of GGRF funded programs, go to: https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/ggrfprogrampage.htm . If no other GGRF funds are requested, this will be the same amount as the UCF GGRF Funds Requested.



California Environmental Protection Agency
Air Resources Board

**California Air Resources Board and
 California Department of Forestry & Fire Protection**

**Greenhouse Gas Calculator Tool
 Urban and Community Forestry Program
 Greenhouse Gas Reduction Fund
 Fiscal Year 2016-2017**

Version 2 - December 8, 2016

Project Name:	City of Tracy "Tracy Trees for Tomorrow"
Grant ID, if applicable:	16-GHG-UF-01-MGMT-010

GHG Benefit of Tree Planting

Enter data below after using the i-Tree Streets to estimate tree carbon storage and electricity and natural gas savings of the population of project trees.

Carbon Stored in Population of Trees 40 Years After Project Start (lb CO ₂ e)	Annual Electricity Savings From Population of Trees 40 Years After Project Start (MWh)	Annual Natural Gas Savings From Population of Trees 40 Years After Project Start (therms)	Trees Within Population to be Planted to Shade Buildings (i.e. within 60 ft) (%)	Years of Establishment and Replacement Care Provided by Project (years)

GHG Benefit of Carbon Stored in Live Project Trees (MT CO ₂ e)	0
GHG Benefit from Energy Savings (MT CO ₂ e)	0
GHG Emissions from Project Implementation (MT CO ₂ e)	0



California Air Resources Board and
California Department of Forestry & Fire Protection

Greenhouse Gas Calculator Tool
Urban and Community Forestry Program
Greenhouse Gas Reduction Fund
Fiscal Year 2016-2017

Version 2 - December 8, 2016



Project Name:	City of Tracy "Tracy Trees for Tomorrow"
Grant ID, if applicable:	16-GHG-UF-01-MGMT-010

GHG Summary Worksheet

GHG Benefit of Carbon Stored in Live Project Trees Estimated Using the CTCC (MT CO ₂ e)	1,407
GHG Benefit of Carbon Stored in Live Project Trees Estimated Using i-Tree Streets (MT CO ₂ e)	0
GHG Benefit from Energy Savings Estimated Using the CTCC (MT CO ₂ e)	377
GHG Benefit from Energy Savings Estimated Using i-Tree Streets (MT CO ₂ e)	0
GHG Benefit of Carbon Stored in Wood Products (MT CO ₂ e)	0
GHG Benefit from Utilizing Biomass for Energy Generation (MT CO ₂ e)	0
GHG Benefit from Preventing the Landfilling of Biomass (MT CO ₂ e)	0
GHG Emissions from Project Implementation (MT CO ₂ e)	89

Net GHG Benefit (MT CO ₂ e)	1,695
UCF GGRF Funds Requested (\$)	
Total GGRF Funds Requested (\$)	
Net GHG Benefit/UCF GGRF Funds Requested (MT CO ₂ e/\$)	0
Net GHG Benefit/Total GGRF Funds Requested (MT CO ₂ e/\$)	0



Emission Reduction Factors Worksheet

Standard Emission Reduction Factors		
Annual Mortality Rate (percent)	3%	<ul style="list-style-type: none"> i-Tree ECO Guide to Using the Forecast Model http://www.itreetools.org/resources/manuals/Ecov6_ManualsGuides/Ecov6Guide_UsingForecast.pdf Roman, Lara "How many trees are enough? Tree death and the urban canopy" in Scenario Journal (Spring 2014) http://www.fs.fed.us/nrs/pubs/jrnl/2014/nrs_2014_roman_001.pdf U.S. Department of Energy Information Administration "Method for Calculating Carbon Sequestration by Trees in Urban and Suburban Settings" (April 1998) http://www3.epa.gov/climatechange/Downloads/method-calculating-carbon-sequestration-trees-urban-and-suburban-settings.pdf
Years After Planting With Greatest Risk of Mortality (years)	10	John Melvin, State Urban Forester (April 19, 2016) personal communication
Years Adjusted for Annual Energy Savings Output at Year 40 (years)	20	Greg McPherson, Research Forester, US Forest Service (April 25, 2016) personal communication
Emission Factor for Electricity (MT CO ₂ e/MWh)	0.303	ARB California grid electricity emission factor for GGRF programs. Consistent with other GGRF quantification methodologies, the electricity emission factor is based on 2013 data for total in-state and imported electricity emissions (89,840,000 MT CO ₂ e) divided by total consumption (296,203,000 MWh). Emissions data for 2013 were obtained from the ARB GHG inventory, dated March 30, 2016, available online at: https://www.arb.ca.gov/cc/inventory/data/data.htm . Consumption data for 2013 were obtained from the CEC Energy Almanac, as of September 10, 2015, available online at: http://energyalmanac.ca.gov/electricity/electricity_generation.html .
Emission Factor for Natural Gas (MT CO ₂ e/therm)	0.005311	EPA Emission Factors for Greenhouse Gas Inventories (2014) https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf
Carbon Storage Factor for Softwood Lumber	0.463	California Air Resources Board, Compliance Offset Protocol U.S. Forest Projects (June 25, 2015) https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/forestprotocol2015.pdf
Carbon Storage Factor for Hardwood Lumber	0.250	California Air Resources Board, Compliance Offset Protocol U.S. Forest Projects (June 25, 2015) https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/forestprotocol2015.pdf
Carbon Storage Factor for Softwood Plywood	0.484	California Air Resources Board, Compliance Offset Protocol U.S. Forest Projects (June 25, 2015) https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/forestprotocol2015.pdf
Carbon Storage Factor for Oriented Standboard	0.582	California Air Resources Board, Compliance Offset Protocol U.S. Forest Projects (June 25, 2015) https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/forestprotocol2015.pdf
Carbon Storage Factor for Nonstructural Panels	0.380	California Air Resources Board, Compliance Offset Protocol U.S. Forest Projects (June 25, 2015) https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/forestprotocol2015.pdf
Carbon Storage Factor for Paper	0.058	California Air Resources Board, Compliance Offset Protocol U.S. Forest Projects (June 25, 2015) https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/forestprotocol2015.pdf
Carbon Storage Factor for Miscellaneous Products	0.176	California Air Resources Board, Compliance Offset Protocol U.S. Forest Projects (June 25, 2015) https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/forestprotocol2015.pdf
Fossil Fuel Displacement Emission Reduction Factor for Electricity Generated via Combustion (MTCO ₂ e/BDT)	0.25	California Air Resources Board & California Department of Resources, Recycling, and Recovery, Biomass Conversion (September 17, 2013) https://www.arb.ca.gov/cc/waste/biomassconversion.pdf <i>Note: This methodology assumes that the wood waste is delivered to a biomass energy facility that produces electricity via combustion where the biomass is incinerated in boiler to produce steam which powers a turbine-driven generator that produces electricity. Applicants that propose eligible projects that cannot be calculated using the GHG Calculator Tool, such as projects that utilize biomass energy technology not included in the calculator, may propose the use of alternative GHG quantification methods. See the accompanying quantification methodology for more details.</i>
Fossil Fuel Displacement Emission Reduction Factor for Electricity Generated via Gasification (MTCO ₂ e/BDT)	0.32	California Air Resources Board, Detailed California-Modified GREET Pathway for Cellulosic Ethanol from Forest Waste (February 27, 2009) https://www.arb.ca.gov/fuels/lcfs/022709lcfs_forestw.pdf Sonoma County Water Agency, Feasibility of Using Residual Woody Biomass to Generate Electricity for Sonoma County (2013) http://www.scwa.ca.gov/files/docs/carbon-free-water/SCWA Bioenergy Feasibility Assessment_WDFeatherman_FINAL REPORT_2014-05-17.pdf <i>Note: This methodology assumes that the wood waste is delivered to a biomass energy facility that produces electricity via gasification where the biomass is heated in an oxygen-limited environment to produce hydrogen and carbon monoxide rich gas (syn gas) which powers a turbine-driven generator or internal combustion engine that produces electricity. Applicants that propose eligible projects that cannot be calculated using the GHG Calculator Tool, such as projects that utilize biomass energy technology not included in the calculator, may propose the use of alternative GHG quantification methods. See the accompanying quantification methodology for more details.</i>
Avoided Landfill Emission Reduction Factor (MTCO ₂ e/short ton)	0.21	California Air Resources Board, Draft Method for Estimating Greenhouse Gas Emission Reductions from Diversion of Organic Waste from Landfills to Compost Facilities (March 2016) https://www.arb.ca.gov/cc/waste/waste.htm
Emissions from Tree Planting Projects (percent of reduction)	5%	U.S. Department of Agriculture Forest Service, Tree Guides (multiple publications). http://www.fs.fed.us/psw/programs/uesd/uep/tree_guides.shtml

Conversion Factors	
0.5	unit carbon/unit biomass
3.67	CO ₂ e/C
2000	lb/bone dry ton (BDT)
2000	lb/short ton
2202.62	lb/MT
1000	kg/MT
907	kg/short ton



CUFR Tree Carbon Calculator

Developed by the Center for Urban Forest Research
Pacific Southwest Research Station
US Forest Service



In partnership with the California Department of
Forestry and Fire Protection

Figure 1		Project Data entry		
Data name	Data entry	Units	Description	
Flag1	0		Tree age selected	
Flag2	0		Shade only selected	
Climate Zone	4 (Central Valley)		Central Valley	
Electricity CO2 emissions factor§	303	(kg/MWh)		
Electricity CH4 emissions factor§	0.0000	(kg/MWh)		
Electricity N2O emissions factor§	0	(kg/MWh)		
§required for energy project				

Help Commands

Help for Selected Cell

Help Menu

Figures 6 & 9		Tree and Building Data entry		
Enter Tree data below one tree at a time, then record results				
Data name	Data entry	Units	Description	
Species code and scientific name	PICH (Pistacia chinensis)		chinese pistache	
Age (years)	41	Age (years)	15.3 in DBH & 40.8 ft high	
Tree azimuth	7		W	
Tree distance class	2		Near	
Building vintage	2		1950-80	
air conditioning equip.	1		Central air/heat pump	
Heating equip.	1		natural gas	
Heating emissions factor- CO ₂ §	53.1	(kg/MBtu)		
Heating emissions factor CH ₄ §	0	(kg/MBtu)		
Heating emissions factor N ₂ O§	0	(kg/MBtu)		

Output Help

Figures 7-10		Carbon Calculator Results (annual)						
Energy reductions		Emission reductions (CO ₂ equivalent)			CO ₂ Sequestration	Total CO ₂ Stored	Above ground biomass	
Cooling kWh/tree	Heating MBtu/tree	Cooling (kg/tree)	Heating (kg/tree)	Cooling + Heating (kg/tree)	(A value of 0.0 indicates no tree growth)	(kg/tree)	(dry weight) (kg/tree)	
391.59	-0.097	118.7	-5.1	113.5	37.1	1109.2	471.5	
kWh/tree	GJ/tree	lb/tree	lb/tree	lb/tree	(lb/tree/year)	(lb/tree)	(lb/tree)	
391.59	-0.102	261.6	-11.3	250.2	81.8	2,445.4	1,039.4	



CUFR Tree Carbon Calculator

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Project Data entry				
Data name	Data entry	Units	Description	
Flag1	0		Tree age selected	
Flag2	0		Shade only selected	
Climate Zone	4 (Central Valley)		Central Valley	
Electricity CO2 emissions factor§	303	(kg/MWh)		
Electricity CH4 emissions factor§	0.0000	(kg/MWh)		
Electricity N2O emissions factor§	0	(kg/MWh)		
§required for energy project				

Help Commands

Help for Selected Cell

Help Menu

Tree and Building Data entry				
Enter Tree data below one tree at a time, then record results				
Data name	Data entry	Units	Description	
Species code and scientific name	GIBI (Ginkgo biloba)		ginkgo	
Age (years)	47	Age (years)	24.7 in DBH & 45.4 ft high	
Tree azimuth	5		S	
Tree distance class	2		Near	
Building vintage	2		1950-80	
air conditioning equip.	1		Central air/heat pump	
Heating equip.	1		natural gas	
Heating emissions factor- CO2§	53.1	(kg/MBtu)		
Heating emissions factor CH4§	0	(kg/MBtu)		
Heating emissions factor N2O§	0	(kg/MBtu)		

Output Help

Carbon Calculator Results (annual)								
Energy reductions			Emission reductions (CO2 equivalent)			CO2 Sequestration	Total CO2 Stored	Above ground biomass
Cooling	Heating		Cooling	Heating	Cooling + Heating	(A value of 0.0 indicates no tree growth)		(dry weight)
kWh/tree	MBtu/tree		(kg/tree)	(kg/tree)	(kg/tree)	(kg/tree)	(kg/tree)	(kg/tree)
88.37	-0.130		26.8	-6.9	19.8	182.6	2844.2	1209.0
kWh/tree	GJ/tree		lb/tree	lb/tree	lb/tree	(lb/tree/year)	(lb/tree)	(lb/tree)
88.37	-0.138		59.0	-15.3	43.8	402.5	6,270.3	2,665.3

0

Age (years) 24.7 in DBH & 45.4 ft high

16-GHG-UF-01-MGMT-010

Data Template

CTCC

Output Template

+



CUFR Tree Carbon Calculator

Developed by the Center for Urban Forest Research
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Figure 1		Project Data entry			
	Data name	Data entry	Units	Description	
	Flag1	0		Tree age selected	
	Flag2	0		Shade only selected	
	Climate Zone	4 (Central Valley)		Central Valley	
	Electricity CO2 emissions factor\$	303	(kg/MWh)		
	Electricity CH4 emissions factor\$	0.0000	(kg/MWh)		
	Electricity N2O emissions factor\$	0	(kg/MWh)		
	\$required for energy project				

Help Commands

Help for Selected Cell

Help Menu

Figures 6 & 9		Tree and Building Data entry			
Enter Tree data below one tree at a time, then record results					
	Data name	Data entry	Units	Description	
	Species code and scientific name	ZESE (Zelkova serrata)		#N/A	
	Age (years)	41	Age (years)	20.8 in DBH & 41.7 ft high	
	Tree azimuth	3		E	
	Tree distance class	2		Near	
	Building vintage	2		1950-80	
	air conditioning equip.	1		Central air/heat pump	
	Heating equip.	1		natural gas	
	Heating emissions factor- CO2\$	53.1	(kg/MBtu)		
	Heating emissions factor CH4\$	0	(kg/MBtu)		
	Heating emissions factor N2O\$	0	(kg/MBtu)		

Output Help

Figures 7-10		Carbon Calculator Results (annual)						
Energy reductions		Emission reductions (CO2 equivalent)				CO2 Sequestration	Total CO2 Stored	Above ground biomass
Cooling	Heating	Cooling	Heating	Cooling + Heating	(A value of 0.0 indicates no tree growth)			
kWh/tree	MBtu/tree	(kg/tree)	(kg/tree)	(kg/tree)	(kg/tree)	(kg/tree)	(kg/tree)	(kg/tree)
274.94	-0.478	83.3	-25.4	57.9	91.1	2434.7	1034.9	
kWh/tree	GJ/tree	lb/tree	lb/tree	lb/tree	(lb/tree/year)	(lb/tree)	(lb/tree)	
274.94	-0.504	183.7	-56.0	127.7	200.8	5,367.7	2,281.6	

0

Age (years) 20.8 in DBH & 41.7 ft high

16-GHG-UF-01-MGMT-010

Data Template

CTCC

Output Template

+

Species	TCC matching species	Size at planting	Shade tree?	Tree direction	Tree distance	Number of trees	CO2 Storage (kg/tree)	CO2 Heating + Cooling (kg/tree)
Pistacia chinensis	PICH	1.5"	No			45	1,109.2	
Pistacia chinensis	PICH	1.5"	Yes	E	20-40	30	1,109.2	49.8
Pistacia chinensis	PICH	1.5"	Yes	W	20-40	30	1,109.2	113.5
Pistacia chinensis	PICH	1.5"	Yes	S	20-40	45	1,109.2	2.2
Quercus rubra	QUIL2	1.5"	No			26	3,694.2	
Quercus rubra	QUIL2	1.5"	Yes	E	20-40	16	3,694.2	57.4
Quercus rubra	QUIL2	1.5"	Yes	W	20-40	17	3,694.2	129.5
Quercus rubra	QUIL2	1.5"	Yes	S	20-40	26	3,694.2	9.5
Platanus racemosa	PLAC	1.5"	No			64	1,813.6	
Platanus racemosa	PLAC	1.5"	Yes	E	20-40	3	1,813.6	42.9
Platanus racemosa	PLAC	1.5"	Yes	W	20-40	3	1,813.6	97.5
Platanus racemosa	PLAC	1.5"	Yes	S	20-40	5	1,813.6	19.8
Zelkova serrata	ZESE	1.5"	No			18	2,434.7	
Zelkova serrata	ZESE	1.5"	Yes	E	20-40	12	2,434.7	57.9
Zelkova serrata	ZESE	1.5"	Yes	W	20-40	12	2,434.7	137.1
Zelkova serrata	ZESE	1.5"	Yes	S	20-40	18	2,434.7	3.9
Ginkgo biloba	GIBI	1.5"	No			15	2,844.2	
Ginkgo biloba	GIBI	1.5"	Yes	E	20-40	10	2,844.2	37.5
Ginkgo biloba	GIBI	1.5"	Yes	W	20-40	10	2,844.2	89.1
Ginkgo biloba	GIBI	1.5"	Yes	S	20-40	15	2,844.2	19.8
Quercus lobata	QUIL2	1.5"	No			18	3,694.2	
Quercus lobata	QUIL2	1.5"	Yes	E	20-40	12	3,694.2	57.4
Quercus lobata	QUIL2	1.5"	Yes	W	20-40	12	3,694.2	129.5
Quercus lobata	QUIL2	1.5"	Yes	S	20-40	18	3,694.2	9.5
Quercus suber	QUIL2	1.5"	No			18	3,694.2	
Quercus suber	QUIL2	1.5"	Yes	E	20-40	12	3,694.2	57.4
Quercus suber	QUIL2	1.5"	Yes	W	20-40	12	3,694.2	129.5
Quercus suber	QUIL2	1.5"	Yes	S	20-40	18	3,694.2	9.5
Ulmus spp.	ZESE	1.5"	No			15	2,434.7	
Ulmus spp.	ZESE	1.5"	Yes	E	20-40	10	2,434.7	57.9
Ulmus spp.	ZESE	1.5"	Yes	W	20-40	10	2,434.7	137.1
Ulmus spp.	ZESE	1.5"	Yes	S	20-40	15	2,434.7	3.9
Cedrus deodara	PIRA	1.5"	No			44	3,838.4	