



DESALINATION TASK FORCE MEMORANDUM

TO: DESALINATION TASK FORCE
FROM: PROGRAM MANAGERS
SUBJECT: ENERGY STUDY STATUS REPORT AND PROPOSED EVALUATION CRITERIA WEIGHTING
DATE: JUNE 15, 2011

RECOMMENDATION: That the **scwd**² Desalination Task Force receive the Energy Study status report and provide additional input with regard to the preliminary carbon mitigation and renewable energy project evaluation criteria weighting and the potential mitigation options.

BACKGROUND: The Task Force received the first Energy Study status report at its April 20, 2011 meeting. This Memorandum serves as the third status report. This status report will update the Task Force on Energy Study work progress including the upcoming June 23rd Mitigation Project Workshop with the Energy Technical Working Group (ETWG). In addition, the Task Force is being asked to review and provide feedback to the proposed mitigation and renewable energy project evaluation criteria weighting and potential mitigation project options. The evaluation criteria were presented and tentatively approved at the May 18, 2011 Task Force meeting. The proposed weightings were developed by staff and are intended to reflect the relative importance of each criterion to meet the Program objectives. Task Force feedback will be used to inform the ETWG and additional Mitigation Project Workshop attendees.

Energy Study Project Update

Work Completed: In the last month, staff has created a draft agenda for the Mitigation Project Workshop, confirmed additional Workshop participants, and developed a draft List of Potential Mitigation Options.

1. Draft Mitigation Project Workshop Agenda

The purpose of the Mitigation Project Workshop is to engage participants with a broad range of specific project expertise (ETWG, City and District operations and engineering staff, local and regional project experts) in a discussion to determine what portfolio of potential mitigation projects could be used to meet the Program's objectives for each agency. The intent of the Workshop is to create a list of 10-15 potential projects to be studied in more detail. The basis for the Workshop discussion is presented in the attached memorandum and spreadsheet.

Below is the draft Workshop agenda:

- a. Introduction of group (10 min)
- b. Workshop introduction (15 min) – Kennedy/Jenks Consultants (K/J) will explain purpose and process of workshop

- c. Presentation of project ideas – Part 1 (2 min per project, 45 min) – each project champion presents on his/her project
- d. Break (15 min)
- e. Presentation of project ideas – Part 2 (2 min per project, 45 min)
- f. Dot Process (15 min) – each workshop attendee has 10 dots to place on project ideas posted around room
- g. Break (20 min) – during break, K/J will compile results of dot process
- h. Presentation of results (15 min) – K/J
- i. Discussion of results (1 hour) – group will weigh in on whether top 10-15 projects are the right group, move around as necessary, potential revote to clarify bottom few project ideas, come to an agreement on final list, and clarify each project’s scope for the assessment

2. Additional Mitigation Workshop Participants

In addition to the ETWG members previously identified, the Workshop will also include several individuals with unique technical perspective.

- **Kirsten Liske, Ecology Action Vice President, Pollution Prevention/Zero Waste Group**

Kirsten currently leads the Pollution Prevention and Zero Waste Division at Ecology Action, work which is fueled by a strong commitment to bring different segments of the community together to improve our quality of life. In this role, she develops strategic initiatives and programs with division staff and teams.

Since graduating from the University of California at Santa Cruz Environmental Studies (Honors) in 1991 she has succeeded in developing strategic programs with broad stakeholder engagement in the public, private and non-profit sectors to reach resource conservation and pollution prevention goals. As a result of her efforts and service, she was awarded a legislative resolution from the California State Assembly commending her significant and vital contribution to the state's household hazardous waste programs.

- **Joe Jordan, Sky Power Institute**

Joe teaches solar and renewable energy courses at San Jose State University and Cabrillo College, and provides green-jobs training (particularly in photovoltaics, or solar electricity) for a variety of corporate and non-profit organizations around the country. Joe has been a space and atmospheric scientist at NASA Ames Research Center and the SETI Institute in Mountain View. He holds a B.A. in Physics from Oberlin College and an M.S. in Computer/Information Sciences from the University of California at Santa Cruz. Joe served as a Public Works Commissioner for the City of Santa Cruz and is currently a board member for Ecology Action.

3. Draft List of Potential Mitigation Options

Attached is a preliminary list of potential mitigation options. This list includes a very broad range of projects for consideration during the Mitigation Project Workshop and was developed with input from staff, K/J and other consultants, ETWG members, the City Climate Action Plan Coordinator, and the public during EIR scoping.

Current Work: Staff is currently working with K/J to draft and finalize the Proposed **scwd**² Desalination Program GHG Mitigation Project Evaluation Criteria and Weighting Memorandum. This attached memorandum describes proposed project evaluation criteria that could be used to evaluate potential greenhouse gas (GHG) mitigation projects for the City and District. The memorandum also makes a recommendation for proposed weightings of each evaluation criteria. Additional project eligibility criteria for GHG offset projects are described following the proposed overall project evaluation criteria. This work is further described below.

Future Work and Tentative Schedule: Energy Study work progress remains on schedule. Staff will focus the next several months on narrowing down potential mitigation projects for each agency with input from K/J, the ETWG and the TF.

Proposed Evaluation Criteria Weighting

During development of the Energy Study, potential renewable energy and carbon mitigation projects will be evaluated and ranked based on a matrix of weighted criteria. Staff proposed evaluation criteria to the Task Force on May 18, 2011. The Task Force approved the preliminary evaluation criteria to be the following, cognizant that additional feedback will be received during the development of the Energy Study that may modify the preliminary composition:

- Local Benefit
- Amount of Energy Produced or GHG's Mitigated
- Technical Maturity and Reliability
- Environmental and Community Impacts
 - Land, Air, Water, Waste, Noise, Aesthetics
- Operational Complexity
- Cost/Cost Effectiveness: Capital, O&M, \$/MT CO₂ and \$/kWh saved or produced

Weighting of the criteria will reflect the values and objectives of each agency and therefore could be different for each agency. The attached Draft Proposed **scwd**² Desalination Program GHG Mitigation Project Evaluation Criteria and Weighting Memorandum provides a weighting range recommendation for each criteria. These ranges are based around the concept of shared equity of weighting and are intended to demonstrate the initial thinking on relative importance. In addition to these overall project evaluation criteria and weighting, the memorandum provides a larger discussion on the criteria put forth through AB32 for GHG Offset projects.

FISCAL IMPACT: There is no fiscal impact associated with this item.

Attachments: Draft Proposed **scwd**² Desalination Program GHG Mitigation Project Evaluation Criteria and Weighting Memorandum
Preliminary Energy Minimization and GHG Reduction Study – List of Potential GHG Mitigation Options

8 June 2011

Draft Memorandum

To: Susan O' Hara, City of Santa Cruz Water Department
From: Julia Sorensen, Todd Reynolds, Alan Zelenka
Subject: Proposed **scwd**² Desalination Program GHG Mitigation Project Evaluation Criteria and Weighting
K/J 0868005*03

This memorandum provides a discussion of general types of potential greenhouse gas (GHG) mitigation projects for the City of Santa Cruz Water Department (SCWD) and the Soquel Creek Water District (SqCWD), including project eligibility criteria, and describes proposed overall project evaluation criteria and weighting that could be used to evaluate, score and rank the potential GHG mitigation projects.

Types of Potential GHG Mitigation Projects and Project Eligibility

The potential GHG mitigation projects are broadly categorized as:

- Water and Energy Efficiency Projects
- Renewable Energy Projects
- GHG Reduction Projects

Examples of different types of GHG mitigation projects and a discussion of project eligibility criteria are provided below. Project eligibility means that a project meets regulatory compliance (or eligibility) standards such that the mitigation project could potentially qualify for a future GHG cap and trade system. In general, the same eligibility criteria also are required in the voluntary GHG market. For the **scwd**² Desalination Program, although it is not expected that potential GHG mitigation projects developed by the SCWD or SqCWD would be traded beyond the program, we recommend that each mitigation project be treated as if it were going to qualify as a compliance mitigation, and meet the established eligibility requirements. Also, any third-party mitigation offsets or renewable energy credits purchased from the voluntary GHG market would need to meet regulatory compliance eligibility standards.

Water and Energy Efficiency Projects

Water and energy efficiency programs and projects have existed and been put into practice for over thirty years. The projects reduce energy and indirectly reduce GHG emissions by improving the efficiency of systems and equipment in our homes and businesses. These types of projects include: pump and motor replacement, refrigerator and hot water heater

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replacement, and water conservation programs. These types of projects are well understood, have defined criteria and requirements and have demonstrated energy savings.

The project eligibility criteria for water and energy efficiency programs and projects have been developed by the US Department of Energy and state agencies and are often administered through the local utility. For example, PG&E has defined rebate programs with eligibility criteria for water and energy efficiency projects such as refrigerator replacement projects. A similar GHG mitigation project developed by the SCWD or SqCWD would need to accelerate the replacement to add additional energy savings, but otherwise would follow the eligibility requirements of the defined PG&E rebate program.

Renewable Energy Projects

Some types of renewable energy projects have existed and been put into practice for many years, and some types of projects are emerging technologies. Renewable energy projects typically generate energy without use of fossil fuels. These types of projects include: solar and wind energy, new hydroelectric, and micro-turbines. Some renewable projects use bio-fuels or fossil fuels more efficiently to reduce GHG emissions. These types of projects include: methane capture energy, waste to energy, or fuel cells that run off natural gas. These types of projects are well understood, have defined criteria and requirements and have demonstrated renewable energy production and indirect GHG reductions.

The project eligibility criteria for renewable energy projects have been developed by the US Department of Energy and state agencies. For example, the California Energy Commission (CEC) Emerging Renewables Program has defined eligibility criteria for renewable energy projects such as solar, wind projects. A similar GHG mitigation project developed by the SCWD or SqCWD would need to provide new, additional renewable energy, but otherwise would follow the eligibility requirements for renewable projects established by the CEC.

GHG Reduction (Offset) Projects

GHG reduction (or offset) projects are relatively new and are being developed to respond to efforts to address climate change. GHG offset projects directly reduce or offset GHG emissions by reducing the amount of fuel consumed, eliminating refrigerant GHGs, or adsorbing GHGs. Examples of GHG offset projects include: reductions in the use of fleet vehicle fuel, truck stop electrification that permits trucks to stop idling, and cooling system monitoring and maintenance programs to reduce chlorofluorocarbon (CFC) and perfluorocompound (PFC) releases, and carbon sequestration in forests or wetlands.

Because these projects are relatively new and no formal regulatory eligibility frame work has been developed over a period of years, as is the case with efficiency and renewable energy

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projects, six eligibility criteria have been developed that each potential direct GHG offset project must meet, in order for it to be considered a regulatory compliance offset. The GHG offset project eligibility criteria include:

1. Additionality
2. Quantifiable
3. Enforceable
4. Real
5. Permanent
6. Verifiable

These six eligibility criteria come directly from AB 32 (the Global Warming Solutions Act of 2006). However, AB 32 merely lists the criteria without defining them. A section at the end of this memorandum summarizes various internationally recognized standards and tests in order to more clearly illustrate these eligibility criteria, and what would be required of an offset project to meet each standard.

Overall GHG Mitigation Project Evaluation Criteria

An initial list of over thirty potential GHG mitigation projects has been developed with input from SCWD and SqCWD staff, and the Energy Technical Working Group (ETWG). A workshop will be held with SCWD and SqCWD staff and the ETWG to evaluate the large list of projects at a relatively high level, confirming project eligibility, and using the overall project criteria described below, as a guide, to narrow the list of projects. The objective of the workshop is to prepare a short-list of approximately 10 to 15 potential GHG mitigation projects for further, more detailed evaluation. The proposed project evaluation criteria and weighting would then be applied to evaluate, score and rank the short-listed projects.

Each overall project evaluation criterion description includes three rankings – Low, Medium, and High – which are meant to compare a potential project against other proposed potential projects. The High ranking is more favorable and represents greater success at meeting Program objectives compared to other potential projects. The Low ranking is less favorable and represents less success at meeting Program objectives compared to other potential projects.

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The proposed evaluation criteria are as follows:

1. Local Benefit
2. Amount Produced or Mitigated
3. Technical Maturity and Reliability
4. Environmental and Community Impacts
5. Operational Complexity
6. Cost / Cost Effectiveness

Criterion 1: Local Benefit

This criterion considers the local benefit of the proposed project to the community. Local benefits could include:

- Local job creation
- Reduction of local energy consumption and/or mitigation of local GHG emissions
- Reduction/reuse of local waste generation

The processes are ranked according to the following performance criteria:

- ◆ **Low** – The project would have less local benefit compared to other projects.
- ◆ **Medium** – The project would have similar benefit to other projects.
- ◆ **High** – The project would have greater local benefit compared to other projects.

Criterion 2: Amount Produced or Mitigated

This criterion considers the amount of energy saved, renewable energy produced, or GHG mitigated by a proposed project. Fewer projects, each with more relative impact, could be more desirable and easier to implement than a greater number of smaller projects. The applicability of the proposed project to local conditions, such as weather patterns, natural resources, and terrain, would also be considered.

The processes are ranked according to the following performance criteria:

- ◆ **Low** – The project would produce less energy or mitigate a lesser amount of GHG emissions compared to other projects.

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- ◆ **Medium** – The project would produce an average amount of energy or mitigate an average amount of GHGs compared to other projects.
- ◆ **High** – The project would produce a greater amount of energy or mitigate a greater amount of GHGs compared to other projects.

Criterion 3: Technical Maturity and Reliability

This criterion considers the proven performance, stage of research and/or development, reliability, and risk of the proposed project. The projects are ranked according to the following performance criteria:

- ◆ **Low** – The project technology is under development, implemented in fewer locations, and presents a higher risk compared to other projects.
- ◆ **Medium** – The project technology has been implemented in several locations and is considered fairly reliable and of medium risk compared to other projects.
- ◆ **High** – The project technology is well understood, reliable, established, and presents a lower risk compared to other projects.

Criterion 4: Environmental and Community Impacts

This criterion considers the environmental and community factors related to the proposed projects. Environmental and community factors could include:

- Air impacts, such as pollution
- Land impacts, such as land requirements or impact on natural habitats
- Water impacts, such as amount of water consumed or water quality impact
- Noise impacts, such as loudness of project technology or impacts on surrounding neighbors
- Visual aesthetic impacts, such as scale, mass, intrusion into the skyline, or visual emissions plume
- Waste impacts, such as amount of waste by-product created by project or reuse of existing structures and materials
- Constructability
- Acceptance in local community

The projects are ranked according to the following performance criteria:

- ◆ **Low** – The project would have fewer beneficial or more undesirable environmental and community impacts compared to other projects.

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- ◆ **Medium** – The project would have moderate environmental and community impacts compared to other projects.
- ◆ **High** – The project would have more beneficial or fewer undesirable environmental and community impacts compared to other projects.

Criterion 5: Operational Complexity

This criterion considers the operational complexity of the proposed projects. Operational complexity could include:

- Number of different processes and equipment,
- Level of automation and ease of operation
- Ownership by SCWD or SqCWD
- Staffing and maintenance requirements by SCWD or SqCWD
- Level of interagency collaboration
- Regulatory and permitting requirements

The projects are ranked according to the following performance criteria:

- ◆ **Low** – The project would have a higher degree of complexity compared to other projects.
- ◆ **Medium** – The project would have a moderate degree of operational complexity compared to other projects.
- ◆ **High** – The project would have a relatively low degree of operational complexity compared to other projects.

Criterion 6: Cost / Cost Effectiveness

This criterion would consider the relative level of capital, operations and maintenance (O&M), and present worth life-cycle costs for the proposed projects. This criterion would also include a cost-effectiveness evaluation by dividing the annualized life-cycle cost by the estimated amount of GHG reduced or kWh produced, to determine a \$/MT CO₂ or \$/kWh value for the proposed project.

The projects are ranked according to the following performance criteria:

- ◆ **Low** – Project cost is estimated to be comparably higher than other proposed projects or the cost-effectiveness is low.

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- ◆ **Medium** – Project cost and the cost-effectiveness is estimated to be comparable to other proposed projects.
- ◆ **High** – Project cost is estimated to be comparably less than other proposed projects or the cost-effectiveness is high.

Proposed Weighting of Criteria

The proposed project evaluation criteria would be applied to evaluate, score and rank the short-listed projects. The project evaluation criteria could have different weightings based on the relative importance of the criteria for the overall Program objectives. With six evaluation criteria, the average weighting, based on 100-percent total weight, is approximately 15-percent. Therefore, the weighting of criteria could be categorized, for example, with those criteria of higher relative importance having a higher than average weighting.

The proposed weighting range of the evaluation criteria is shown in Table 1 and discussed below.

Table 1: Proposed Weighting Range for Evaluation Criteria

Evaluation Criteria	Proposed Weighting Range
Local Benefit	15 to 20%
Amount Produced or Mitigated	10 to 15%
Technical Maturity and Reliability	15 to 25%
Environmental and Community Impacts	10 to 15%
Operational Complexity	5 to 10%
Cost/Cost Effectiveness	15 to 25%
Total	100%

Recommended Higher Importance Weighting

The Local Benefit, Technical Maturity and Reliability, and Cost/Cost Effectiveness evaluation criteria are recommended to have a relatively higher level of weighting. Projects in the SCWD or SqCWD service areas, or in the County of Santa Cruz that provide local benefits, are recommended to have a greater weighting than non-local projects. Technical Maturity and

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Reliability are important for implementation of the project and to ensure that the project will provide the expected GHG reductions or renewable energy over the project life. Cost/Cost Effectiveness is also recommended to have a relatively higher level of weighting to make sure that the projects provide a higher level of GHG reductions or renewable energy for each dollar spent.

Recommended Moderate Importance Weighting

The Amount Produced or Mitigated, and Environmental and Community Impacts evaluation criteria are recommended to have a relatively moderate level of weighting. While the amount of GHG reduction is important, other criteria could be of higher importance. Environmental and Community Impacts are also important, but are often able to be mitigated during subsequent EIR research and development, and therefore this criteria is recommended to have a moderate weighting.

Recommended Lower Importance Weighting

The Operation Complexity evaluation criterion is recommended to have a relatively lower level of weighting. While the complexity of the systems and their operations are important, these challenges can often be adequately addressed, and therefore this criteria is recommended to have a lower weighting.

Sensitivity Analysis

With feedback from the Task Force, Kennedy/Jenks will work with SCWD and SqCWD staff and the ETWG to identify recommended weighting factors for each evaluation criteria. Following the initial evaluation, a sensitivity analysis would be performed on the evaluation, scoring and ranking of the short-listed potential GHG mitigation projects. The weighting factors could be adjusted within the proposed range to determine if there was a significant impact to the ranking of the short-listed projects.

Timeline of Project Evaluation Process

A timeline for the proposed GHG mitigation projects evaluation is presented below.

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Task	Participants	Approximate Date
Prepare for Mitigation Project Workshop	Staff and K/J	June 2011
Approve Mitigation Project Evaluation Criteria Weighting	Task Force	6/15/11
Mitigation Project Workshop: Develop Short List(s), Criteria, Weighting	Staff, K/J, TWG, additional participants	6/23/11
Rank Short List Projects According to Approved Evaluation Criteria and Weighting	Staff and K/J	~ July 2011
Perform Sensitivity Analysis to Shortlisted Projects	Staff and K/J	~ July/Aug 2011
Review of Detailed Evaluation of Short List Mitigation Options	Staff, K/J and TWG	~July/Aug 2011
Review Short List and Recommend Mitigation Goal	Task Force	~Aug/Sept 2011
Submit Draft Energy Study for Staff and TWG review and comment	Staff, K/J and TWG	~September 2011
Present the Draft Energy Study to the scwd ² Task Force	Staff, K/J and Task Force	~October 2011

GHG Offset Project Eligibility Criteria

Background

This section describes the six eligibility criteria, and their associated standards, that each potential direct GHG offset project must meet, in order for it to be considered a regulatory compliance offset.

The GHG offset project eligibility criteria include:

1. Additionality
2. Quantifiable
3. Enforceable
4. Real

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5. Permanent
6. Verifiable

These six eligibility criteria come directly from AB 32 (the Global Warming Solutions Act of 2006). However, AB 32 merely lists the criteria without defining them. This report summarizes various internationally recognized standards and tests in order to more clearly illustrate what would be required of an offset project to meet each standard. Each offset project considered by **scwd**² would need to be individually assessed and deemed to have met each of the eligibility criteria standards described below. Failure to meet any single standard could deem the project ineligible as an offset project.

Additionality

Description

The concept of additionality was introduced in the Kyoto Protocol in Article 12.5, which states that “emission reductions resulting from each project activity shall be certified by DOEs (Designated Operational Entities) on the basis of ... reductions in emissions that are additional to any that would occur in the absence of the certified project activity.”

The major credible certification standards all require that project activities are not already mandated and assess additionality either through a performance standard, like Climate Action Reserve (CAR), or a project level review, like Voluntary Carbon Standard (VCS).

Standard

Evaluation of additionality on a project-by-project basis typically utilizes three tests to determine a project’s additionality: 1) Regulatory Surplus Test, 2) Barriers Tests, and 3) Common Practice Test. These tests are based on the Kyoto Protocol’s Clean Development Mechanism methodology, as well as the World Resource Institute’s GHG Protocol for Project Accounting.

Test 1 – Regulatory Surplus

The Regulatory Surplus Test ensures that the project is not mandated by any existing law, policy, statute, regulation, or other legal obligation. If it is, then it is assumed that the project is being developed to comply with the law or regulation and thus, cannot be considered additional to the business as usual scenario.

➤ Key question:

- Is this project mandated by any existing law, policy or statute?

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Test 2 – Implementation Barriers

There are three main implementation barrier tests: 1) Financial, 2) Technological, and 3) Institutional. A project must meet at least one, though preferably more than one, of the following barrier tests in order to be considered additional.

Financial Barriers

The financial barrier test addresses how offset funding impacts the project in question. There are two main types of financial barriers a project can face: capital constraint and internal rate of return. The Capital Constraint Test addresses whether a project would have been undertaken without offset funding. Internal rate of return indicates whether or not a project would have met established targets for internal rates of return without offset funding. These are not the only acceptable tests of financial barriers, but are the most commonly used.

Economic returns do not necessarily make a project non-additional. There are instances where projects with high rates of return remain unimplemented. To demonstrate additionality for projects that generate rates of return, it can be useful to describe the barriers faced by the project. Include a clear explanation of the project's return rate with a pro forma financial analysis showing both with and without project case. For example, Company Y typically does not pursue project activities unless they provide a 25% rate of return. An energy efficiency upgrade at the facility will generate a 15% rate of return. The additionality case is that offset funding can be used to increase the return of the efficiency measures to a level that is acceptable to management.

➤ Key questions:

- Does this project face capital constraints that offset funding can address?
- Will offset funding bring the internal rate of return to a level that enables the implementation of the project?

Technological Barriers

There are several categories of assessment that could fall under this test. If the primary reason for implementing a technology is its GHG reduction benefits, that project is generally considered to be additional. For example, if a more energy efficient, though more new or uncommon, model of a hot water heater is available and the lack of project developer familiarity is barring its entry into the market, offset funding can help bridge that gap and bring a technology to market that otherwise would not have been available. In this case, the GHG reductions resulting from the deployment of the new technology are clearly above and beyond business as usual.

➤ Key question:

- Is the primary benefit or purpose of the technology in question its GHG reduction capabilities?

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Institutional Barriers

Institutional barriers can be organizational, social, or cultural. If a GHG reduction project falls outside of the normal purview of a company or organization and there is reluctance to implement a project that is not within that purview or to capitalize a project with uncertain returns, offset funding can often assist in overcoming that barrier.

➤ Key question:

- Does this project face significant organizational, cultural or social barriers that carbon funding will help overcome?

Test 3 – Common Practice

This test is intended to determine whether or not a project is truly above and beyond “business as usual”. If a practice is widely employed in a field, it is not considered to be additional.

➤ Key question:

- Is the project, technology or practice commonly employed in the field or industry?

It is important to note that there is a certain degree of subjectivity in the assessment of additionality. These tests are based on emerging norms and best practices in the burgeoning offset market in the United States and internationally. These principles and practices are intended to assure that offset projects deliver on their basic promise to mitigate GHG emissions as effectively as on-site or direct GHG reductions.

Quantifiable

Description

All GHG emission reductions and removals must be quantifiable using recognized measurement tools (including adjustments for uncertainty and leakage) against a credible emissions baseline.

Standard

There is a mix of generic and mitigation measure specific questions that an offset project must answer affirmatively to assess the likelihood that the project would qualify under any certification standard’s quantification criteria.

➤ Key questions:

- Can the baseline emissions (without the project) be quantified?
- Can business as usual improvements be quantified and integrated into the emissions baseline?
- Are there reliable methods that use direct measurement or credible objective studies to quantify the parameters that result in lower emissions in the project case?

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- Are there reliable third-party derived data parameters that can be used to account for any uncertainties associated with quantifying emissions in the project case?
- Are the effects of a project on GHG emissions comprehensively accounted for, including unintended effects that could result in an increase in emissions outside of the project's boundary (often referred to as "leakage")?

Enforceable

Description

No parties other than the registered project owner must be able to reasonably claim ownership of the GHG reductions.

Standard

➤ Key Questions:

- Is ownership of GHG reductions clear and unambiguous?
- Can other parties, other than the registered project owner, reasonably claim ownership of the GHG reductions?
- Do any of the emission reductions or increases take place in a country outside of the U.S.?
- Can we be reasonably sure that double counting of reductions or removals does not take place?

Real

Description

GHG reductions must have actually occurred (not merely projected to occur), and should not be an artifact of incomplete or inaccurate emissions accounting. Methods for quantifying emission reductions should be conservative to avoid overstating a project's effects. The effects of a project on GHG emissions must be comprehensively accounted for, including unintended effects (often referred to as "leakage").

Standard

If the project protocol and verification are rigorous and conservative, the project activity will result in real emission reductions.

➤ Key Questions:

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- Can we be reasonably assured that project GHG reductions have actually occurred (not merely be projected to occur), genuinely taken place, and are quantified using complete, accurate, transparent, and conservative methodologies?
- Have GHG reductions actually occurred, and are not an artifact of incomplete or inaccurate emissions accounting?

Permanent

Description

In order to function as offsets to GHG emissions, GHG reductions must effectively be “permanent.” This means that if verified GHG reductions are reversed after their registration, an equivalent number of offsets must be retired to compensate for the reversal.

Standard

➤ Key Questions:

- If properly verified, will the emission reductions will be permanent?
- Will the GHG reductions be reversed once they are registered?
- Where GHG emission reductions or removals are generated by projects that carry a risk of reversibility; are adequate safeguards in place to ensure that the risk of reversal is minimized? Should any reversal occur are mechanisms in place that guarantees the reductions or removals will be replaced or compensated?
- Will GHG reductions be monitored and verified in the future?
- Are there any other major risks to project performance?

Verifiable

Description

GHG reductions must be verified on an ex-post basis. Verification requires a third party review to ensure the methodology and data are complete, accurate, and free of material misstatements.

Standard

➤ Key Question:

Can GHG reductions be verified after the fact, or upon completion of the offset project?

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Application of Eligibility Criteria Standards

Potential GHG mitigation projects currently are being developed as part of the **scwd**² Energy Minimization and Greenhouse Gas Reduction Plan process. Once a short-list of potential projects is compiled, the standards and tests described above will be applied only to the GHG offset projects but not to the energy efficiency or the renewable energy projects. Each offset project would be assessed as to whether it were highly likely, likely, or unlikely to meet the specific standard, a short discussion or rationale would be prepared justifying each finding, and an overall conclusion would be made for each offset project. Failure to meet any one of standards would disqualify the potential project from further consideration as a viable offset project.

Table 2 shows an example table that would summarize the outcome of the evaluation criteria analysis.

Table 2: Example GHG Offset Project Eligibility Summary

Eligibility Criterion	Offset Quality	Discussion / Rationale
Additionality	<i>Highly Likely, Likely, or Unlikely</i>	
Quantifiable		
Enforceable		
Real		
Permanent		
Verifiable		
Conclusion		

scwd² Energy Minimization and GHG Reduction Study
Initial List of Potential GHG Mitigation Options

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1	Water	Both	Additional Water Conservation Activities	Implement expanded and accelerated programs to increase water conservation.	Included in IWP/IRP	Yes	Low	No	N/A	Yes	Low to Medium	Low
2	Water	Both	Recycled Water projects	Develop recycled water projects where appropriate.	Included in IWP/IRP	Yes	Low	No	N/A	Yes	Low to Medium	Medium
3	Water	Both	Residential RainstoreWater Program	Program to promote rain storage for irrigation use.	Included in IWP/IRP	Yes	Low	No	N/A	Yes	Low	Low
4	Water	Both	Residential Onsite Grey Water Program	Program to promote grey water use.	Included in IWP/IRP	Yes	Low	No	N/A	Yes	Low	Low
5	Energy Efficiency	Both	Water Supply Pump Optimization	Optimize water supply pumps to save energy, minimize cost and maximize reliability. Implement a Pump Energy Optimization Program (EOP) using software such as the Derceto AQUADAPT (used by EBMUD & Eastern) or Amulet to reduce overall and peak-period pumping by using reservoir levels, water demands, system pressures, and supply constraints to determine optimal schedules for operating pumps (maximizing reservoir storage during peak periods), where appropriate. Interface with SCADA were appropriate.		Yes	Medium	No	N/A	Yes	Medium	Medium to High
6	Energy Efficiency	Both	Pump & Motor Efficiency Improvement Program	This project would estimate the energy savings and GHG impacts of an accelerated program (potentially over a 2-3 year period) to evaluate all pumps & motors, and install all cost-effective pump & motor retrofits. The project would describe a retrofit program using the existing PG&E programs (which may be need to be supplemented) and incentives. This project would also develop a pump & motor specification requiring premium efficiency pumps & motors.		Yes	Medium	No	N/A	Yes	Medium	Medium to High
7	Energy Efficiency	Both	Well Efficiency Testing & Rehabilitation	This project would evaluate the energy savings and GHG reduction potential from a program to test and evaluate well pump/motor efficiency and capacity, potentially "right-size" pump/motors, clean well screens, and rehabilitate wells with excessive drawdown requirements (from scaling, clogged perforations or drop in water table).		Yes	Low for City Medium for District	No	N/A	Yes	Low	Medium
8	Energy Efficiency	Both	Building Energy Efficiency Measures	This project would identify City & District facilities with high energy saving potential, get a PG&E energy audit, and then summarize the cost-effective energy efficiency measures (EEMs).		Yes	Medium to High	No	N/A	Yes	Low	Low
9	Energy Efficiency	City	Investigate the implementation of an energy management system software at GHWTPs	Describe an energy management system for GHWTP. Estimate the cost of the system and the potential energy savings and GHG reductions at GHWTP		Yes	Medium	No	N/A	Yes	Medium	Low to Medium
10	Energy Efficiency	City	Santa Cruz WWTP Energy Audit Results (#4)	Implement the results from the USDOE Energy Audit for the Santa Cruz WWTP (#4 - Improved Mixing System) or different mixing system	Initial Study Complete	Yes	High	No	N/A	Yes	High	Medium to High
11	Energy Efficiency	City	Santa Cruz WWTP Energy Audit Results (#1 thru #8 but not #4)	Implement the results from the USDOE Energy Audit for the Santa Cruz WWTP (#1 thru #8 but not #4: VFD, Screwpress, Lighting, and Turblex Blower)	Initial Study Complete	Yes	High	No	N/A	Yes	High	Low to Medium
12	Energy Efficiency	City	GHWTP Process Audit	This project would perform a process audit at the GHWTP and summarize the energy savings and GHG reductions from suggested changes in operations.		Yes	Medium to High	No	N/A	Yes	Low	Medium
13	Energy Efficiency	Both	Appliance Replacement Rebates	This project would provide rebates for homeowners in their service area to replace appliance such as refrigerators with more energy efficient models .		Yes	Low	No	N/A	Yes	Low	Low
14	GHG Project	Both	Fleet Fuel Consumption/GHG Policy	This project investigates GHG reduction opportunities to reduce fuel consumption in fleet vehicles. This includes driver behavioral changes, maintenance activities, and alternative fuel opportunities that reduce fuel consumption and GHG emissions. Would address adoption of vehicle policies that reduce fuel consumption and thus GHG such as no idle policy, alt fuel vehicles (CNG, hybrids, EVs), minimum MPG standard for new purchases, biodiesel use (B-20), low emissions vehicle purchasing standard, replacement schedule.		Yes (fuel)	Medium to High	No	N/A	Yes	Medium	Medium
15	GHG Project	Both	Forestry Offset Program	Develop an Urban Forestry tree planting program within City/District for carbon sequestration, and forestry set-aside of existing City/District forestry land.		No	N/A	No	N/A	Yes	Medium	Medium
16	GHG Project	Both	Video Conferencing	Install video conferencing capability to reduce travel for meetings.		Yes (fuel)	Low to Medium	No	N/A	Yes	Low to Medium	High
17	GHG Project	Both	Leak Detection System	Leak detection system installed on building refrigeration systems.		No	N/A	No	N/A	Yes	Low	Low
18	GHG Project	Both	GHG Offset Purchases	Describe the potential and cost of Carbon Offset market purchases.		No	N/A	No	N/A	Yes	Medium	Medium
19	GHG Project	Both	Wetlands Carbon Sequestration Project	Describe how a wetlands restoration project that sequesters carbon would work, potential sites, its GHG reduction potential, and the cost.		No	N/A	No	N/A	Yes	Medium	Medium
20	Renewables	Both	Microhydro	This project would perform screening of sites between water supply pressure zones for feasibility to install microhydro systems (<100 kW) in place of PRVs.		No	N/A	Yes	Low	Yes	Low	Medium To High
21	Renewables	City	Microhydro at Graham Hill WTP	Graham Hill WTP has an existing microhydro turbine that has not been used in several decades. This project would revitalize the old turbine, or investigate a replacement turbine.		Yes	Low to Medium	Yes	Low	Yes	Low	Medium To High
22	Renewables	Both	Hydro Project at Lake Nacimiento	This project would investigate the cost of a Purchase Power Agreement (PPA) with Monterey County Water Resources Agency for existing 4 MW hydropower project on Lake Nacimiento in San Luis Obispo County, CA.	RFP released 5/16/11	No	N/A	Yes	High (Avg 14,500 MWh/yr)	No [because 20 year old project]	High (Approx 4,200 MT/yr)	Medium
23	Renewables	City	Reservoir Pumped Storage	This project would evaluate the potential for energy generation, and cost savings by avoiding TOU rates, by implement a pumped storage project between reservoirs/storage.		No	N/A	Yes	Medium to High	Yes	Medium to High	High
24	Renewables	City WWTP	Food Waste to Energy	This project investigates the energy generation potential and GHG impacts of using food waste (FW) and food processing facilities waste to codigest with biosolids to increase digester gas production at the City WWTP. This additional gas could be used to provide fuel for their existing and possible additional internal combustion engines (ICE) to generate additional electricity .		No	N/A	Yes	Medium to High	Yes	Medium to High	Medium to High

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25	Renewables	Both	Renewables Purchase	The project would investigate the energy and GHG impacts of buying into a larger renewable energy project (solar PV or Wind) that is developed by a third-party which can provide economies-of-scale from larger projects. Various options would be investigated including: equity ownership, power purchase agreement, and Renewable Energy Certificates.		No	N/A	Yes	Medium to High	Yes	Medium to High	Medium to High
26	Renewables	City	Floto-Voltaic	Floating solar PV projects on ponds/reservoir such as Loch Lomond.		No	N/A	Yes	Low	Yes	Low	High
27	Renewables	City	Waste Heat Use	This project investigates the beneficial use of waste heat from the City wastewater process. Examples of this are using waste heat to supplement building heat, drive an Organic Rankine Cycle (ORC) to produce electricity, or replace traditional chiller systems with absorption chillers to provide cooling at reduced energy consumption. This could be implemented with waste to energy project.		Yes (Nat Gas)	Low	Yes	Low	Yes	Low	Medium
28	Renewables	Both	Local Small Wind Projects	Small to medium sized wind turbines on City/District property to generate electricity.		No	N/A	Yes	Medium to High	Yes	Medium to High	High
29	Renewables	Both	Local Solar PV Projects	This project would assess the energy generation potential and GHG reductions of various potential solar PV projects for both the City and District, including building rooftops, parking lot shade structures, open space, and Bay Street Reservoir. The assessment would look at various ownership models including: City/District ownership, purchase power agreements (PPA), and land leases to a third-party owner.		No	N/A	Yes	Medium to High	Yes	Medium to High	Medium to High
30	Renewables	Both	Solar PV Rebate Program	This project would provide rebates for homeowners in their service area to install solar PV panels on their homes. [Double check the City does not already do this?]		No	N/A	Yes	Low to Medium	Yes	Low to Medium	Low to Medium
31	Renewables	Both	Solar Water Heater Rebate Program	This project would provide rebates for homeowners and businesses in their service area to install solar water heaters on homes and business.	Identified in City CAP	No	N/A	Yes	Low	Yes	Low	Low
32	Renewables	Both	Wave/Tidal Energy Generation	This project would install wave/tidal energy generation facilities.	Scoping Comment	No	N/A	Yes	Low to High	Yes	Low to High	High
33	Renewables	Both	Bloomenergy Fuel Cell	Install Bloomenergy solid oxide fuel cells using natural gas in increments of 100 KW		No	N/A	Yes	100 KW per unit	Yes	Medium to High	Medium to High