



County of Sonoma

Climate Resilience Comprehensive Action Plan Multi-Criteria Analysis

August 2024



Overview

The County prepared a Multi-Criteria Analysis of the County Operations measures in the Climate Resilience Comprehensive Action Plan (Climate Plan). The analysis is based on the County's Climate Action, Resilience and Equity (CARE) Framework for evaluating climate resilience projects. Both analyses provide a relative ranking of value based on the benefits provided; this allows comparing value between diverse types of projects or measures.

Foundation: CARE Framework

The Multi-Criteria Analysis of Climate Plan measures is based on the CARE Framework that was developed to help guide prioritization of climate-related projects for the County of Sonoma. A fully scoped project has more known and quantifiable details than a planning-level measure will. There are, therefore, elements of the CARE Framework that can't be applied directly to the measures in the Climate Plan. Following is an overview of the CARE Framework itself. The discussion of the Multi-Criteria Analysis will explain how the CARE Framework was adapted to support analysis of measures in the Climate Plan.

The CARE Framework is built around the County's policy priorities. Performance points are assigned based on how well a project achieves those priorities, with a total of 100 points possible for a project. Projects are ranked based on the County's cost to achieve that performance – County dollars spent per point achieved. In this way, the CARE Framework compares different types of climate action and resilience projects on a common scale.

There are three policy categories in the CARE Framework: the CARE category, the Strategic Alignment category, and the Strategic Leveraging category. Each category includes specific performance measures, as follows:

- **The CARE category** includes measures of project performance around climate mitigation, climate resilience, and climate equity. Because the Framework was developed to prioritize climate action and resiliency projects, it awards the majority of points (up to 75 out of 100) in the CARE category. Specific measures of project performance in this category include:
 - The magnitude, timeliness, certainty, and permanence of greenhouse gas reductions, as well as project co-benefits (such as energy security, public health and/or safety, and ecosystem health).
 - The degree to which the project reduces vulnerability climate hazards, including severity of potential exposures and sensitivities, and the adaptive capacity, before and after the project.

- How fully the project implements goals and objectives of the Climate Action and Resilience (CAR) Pillar of the County’s Strategic Plan (how direct and complete the implementation is).
 - Whether the CARE properties of the project were evaluated using a specific plan, tool or model (including how detailed and rigorous the evaluation, and how highly it prioritized the project).
 - How effectively the project integrates equitable community engagement, enhances equitable access to the project’s benefits, and promotes just transition to future economic benefits.
- **The Strategic Alignment category** recognizes the value of projects that also support goals and objectives of the other four Pillars of the County’s Strategic Plan. The CARE Framework awards up to 5 points depending on how directly and fully the project implements another Pillar’s goals or objectives.
 - **The Strategic Leveraging category** emphasizes the leveraging of current or future external resources. The Framework awards up to 20 points for:
 - Committed co-funding with non-county funds (bonus point for committed non-public funds).
 - The degree to which the project directly and essentially enables future implementation of the CAR Pillar, demonstrates significant and timely expected return on investment, and creates or promotes important partnerships.
 - Project design to maximize award of federal, state, or regional funding, including the extent and specificity of the alignment, and the likelihood of award (such as prior applicant success).

Points are awarded using defined scales and matrices. Where projects could have an adverse effect on CARE priorities, negative points are possible. Points for each category are summed to a total of 100 possible points and divided into the County’s cost for the project.

The Multi-Criteria Analysis Framework

The MCA included the following steps:

1. Each of the **6** overall criteria (and their sub-criteria) were clearly defined and assigned a maximum score.
2. A qualitative score matrix was used to allow for a consistent action scoring process.
3. Scores for were assigned to each action based on the criteria definitions, knowledge of County context and the scorer’s expertise. Each criterion was evaluated on a specific scale; the scoring is explained in more detail below.

Criteria Definitions

The table below sets out the criteria and available point allocation used to evaluate the actions. Each criterion was evaluated on a scale defined by the number of points available. For example, actions may be scored in increments of 5 points, from zero through 25, for the climate mitigation and resilience criteria, or in increments of 2 points, for the “State and Federal Funding Potential” criterion. The scores of each sub-criterion are averaged to arrive at a final priority score for each criterion.

Criterion	Points Available	Sub-Criterion	Scoring
Climate Mitigation	25	Likelihood of Impact	<p>0 = This action will have no reduction to the relevant GHG emission source or may cause an increase in emissions, or does not create any opportunity for carbon sequestration.</p> <p>5 = The action will make a slight or limited reduction to the relevant GHG emission source.</p> <p>10 = The action will make some reduction to the relevant GHG emission source or creates a minor opportunity for carbon sequestration through County-owned assets.</p> <p>15 = The action will make a moderate reduction to the relevant GHG emission source.</p> <p>20 = The action will make a significant reduction to the relevant GHG emission source or creates a significant opportunity for carbon sequestration through County-owned assets.</p> <p>25 = The action will fully eliminate the relevant GHG emission source or creates a significant opportunity for carbon sequestration in the community.</p>
		Extent of Impact*	<p>0 = Does not address greenhouse gas emissions.</p> <p>5 = Addresses a low County emissions source.</p> <p>10 = Addresses a moderate County emissions source.</p> <p>15 = Addresses a larger-than-average County emissions source.</p> <p>20 = Addresses one of the County's largest emissions sources.</p> <p>25 = Addresses a community emissions source.</p> <p>*Does not apply to measures intended to increase carbon sequestration.</p>
Climate Resilience	25	Adaptation Measures	<p>0 = This action lacks adaptation measures.</p> <p>5 = The action includes minimal adaptation measures.</p> <p>10 = The action includes basic adaptation measures.</p> <p>15 = The action includes adequate adaptation measures.</p> <p>20 = The action includes comprehensive adaptation measures.</p> <p>25 = The action includes robust and innovative adaptation measures.</p>
		Climate Exposure**	<p>0 = This action does not address any climate impacts that Sonoma County is exposed to.</p> <p>5 = The action addresses decrease in snowpack.</p> <p>10 = The action addresses air quality degradation or climate migration.</p> <p>15 = The action addresses loss of biodiversity or natural cycles disruption.</p> <p>20 = The action addresses temperature & extreme heat, drought, sea</p>



Criterion	Points Available	Sub-Criterion	Scoring
			<p>level rise, or energy interruption. 25 = The action addresses wildfire, flooding, or extreme precipitation.</p> <p>**These scores are sourced from the CARE framework's "SoCo Baseline" for exposure.</p>
Co-benefits	5	N/A	<p>For each of the following co-benefits: air quality, energy/fuel savings, VMT reduction, water conservation, ecosystem health, energy security, and public health/safety.</p> <p>0 = This action will not provide this co-benefit to the County or community. 1 = This action will provide this co-benefit to the County or community.</p> <p>An action can receive a maximum of 5 points.</p>
Environmental Equity & Justice	15	Community Participation	<p>0 = Does not create community access to decision making processes 5 = Provides relevant information to and gathers input from the community 10 = Ensures community needs and assets are integrated into process and inform planning 15 = Fosters democratic participation and equity through community-driven decision-making</p>
		Serving Vulnerable Communities	<p>0 = Does not increase access by vulnerable communities to a service or benefit. 5 = Generally increases access by vulnerable communities to a service or benefit. 10 = Specifically increases access by vulnerable communities to a service or benefit that may or may not be important to the community. 15 = Specifically and meaningfully increases access by vulnerable communities to a service or benefit that is important to the community.</p>
		Economic Benefits	<p>0 = Does not create economic benefits for any communities. 5 = Identifies future pathways/mechanisms to expand economic benefits or opportunities for vulnerable communities. 10 = Incorporates defined mechanisms to expand economic opportunities for vulnerable communities. 15 = Specifically and meaningfully provides economic benefit to vulnerable communities.</p>
Other Strategic Plan Alignment	4	N/A	<p>0 = This action does not align with any other pillars of the County's Strategic Plan. 2 = This action is generally aligned with at least one other pillar of the County's Strategic Plan. 4 = This action directly aligns with at least one other pillar of the County's Strategic Plan.</p> <p>Note: Because these actions are part of the Climate & Resilience Master Action Plan, we are assuming that they are aligned with the CAR pillar.</p>



Criterion	Points Available	Sub-Criterion	Scoring
State and Federal Funding Potential	6	N/A	<p>0 = Implementation of this action is not currently eligible for potential/future State or Federal funding opportunities.</p> <p>2 = Action could be modified to increase eligibility for potential/future State or Federal funding opportunities.</p> <p>4 = Action is eligible for existing State or Federal funding opportunities, stands a moderate chance of award.</p> <p>6 = Action is eligible for existing State or Federal funding opportunities, stands a high chance of award (history of County award or guidance received).</p>

Criteria Weighting

As described in “Criteria Definitions,” the County can adjust the weighting of each sub-criterion to weight certain sub-criteria as more impactful than others to represent County or community priorities. When the first draft of this analysis was completed in October 2023, all sub-criteria were weighted equally, as shown below.

Criteria	Total Points	Sub-Criteria	Weighting by Sub-Criteria
Climate Mitigation	25	Likelihood of Impact	50%
		Extent of Impact	50%
Climate Resilience	25	Adaptation Measures	50%
		Climate Exposure	50%
Co-benefits	5	Co-benefits	100%
Environmental Equity & Justice	15	Community Participation	33%
		Serving Vulnerable Communities	33%
		Economic Benefits	33%
Other Strategic Plan Alignment	4	Plan Alignment	100%
State and Federal Funding Potential	6	Funding	100%

For example, in the weightings shown above, the “Climate Resilience” criterion accounts for up to 25 points out of the total score, which can be up to 80 points. Because the “Adaptation Measures” and “Climate Exposure” sub-criteria are weighted equally, each of these account for up to 12.5 points in the total score. If the County were to shift these weightings so that “Adaptation Measures” was weighted at 75% and “Climate Exposure” was weighted at 25%, the “Adaptation Measures” sub-criterion would account for 18.75 points, and “Climate Exposure” would account for 6.25 points.

Applying the Multi-Criteria Analysis

The Multi-Criteria Analysis was performed on 54 County Operations measures. Measures were ranked based on their score, which is a relative ranking of overall benefit. Higher scores have greater relative benefit. Measures with the same or very close scores are grouped together.

Measure ID	Action Short Name	Current MCA Score
NWL-CO-1, 4, 5; W-CO-3, 5	Protect existing rural and urban forest cover and green spaces	65.67
NWL-CO-2	Increase Tribal Land Management	58.00
WF-CO-1	Implement the Wildfire Resilience Project	54.00
T-CO-9	Reduce County staff commuting	47.50
W-CO-4	Prioritize Conservation Practice Projects on County Lands	46.67
W-CO-2	Implement green stormwater infrastructure (GSI) projects	41.33
NWL-CO-3	Establish Compost and Mulch Application on County Lands	41.00
E-CO-2, 10	Electrify County buildings	40.67
E-CO-1, 3, 8	Perform energy efficiency upgrades and retrofits	40.67
W-CO-1, 6, 7; WF-CO-3, 4, 5, 6, 7; NWL-CO-6	Conserve water	38.17
E-CO-9	Support Decarbonization Transition Planning	36.83
WF-CO-2	Develop a Wildfire Risk Reduction and Structure Hardening Plan	35.50
NWL-CO-7	Establish a Climate Resilient Working Group	35.00
T-CO-5	Install EV chargers at County facilities	33.83
E-CO-5, 6	Develop a County construction policy	33.00
T-CO-8, 12	Support Vehicle Fleet Staff Transitions for New Transport Technology	32.00
T-CO-11	Create Class 1 Bikeways	31.00
T-CO-1, 2, 3, 4, 6	Electrify County fleet	30.50
WF-CO-4	Pursue the CAL VTP for Wildfire Resilience	30.50
W-CO-8	Sea-level Rise Planning on County Lands	29.50
WF-CO-3	Identify Buffer Zone Services and Gaps	28.00
WF-CO-5	Implement Fire-Safe Landscape Practices	28.00
WF-CO-7	Plan for Managed Retreat from Wildfire Risk	27.00
E-CO-7	Reduce refrigerant emissions	26.00
ZW-CO-1, 2, 3, 4, 5, 7, 9	Increase diversion of waste from landfills	22.33
ZW-CO-10	Reduce landfill impact	21.33
E-CO-4	Transition to Sonoma Clean Power's Evergreen program	17.50
T-CO-7	Reduce Idling Emissions from vehicles	15.50
ZW-CO-6, 8	Update Green Purchasing Policy	13.00



Multi-Criteria Analysis Findings

Measures that would implement nature-based solutions generally ranked higher than built-environment measures although not uniformly so. Notably, measures to reduce County employee commute-related emissions ranked higher than other built-environment measures, followed by decarbonization of County facilities, and near-term energy upgrades to County facilities, which produce more savings from reduced energy use over the life of the upgrades than the upgrades cost to install. Measures with a low relative ranking include all of the measures that would reduce waste from County operations, transitioning the remaining County electricity accounts to Sonoma Clean Power (most are already transitioned), and upgrading all accounts to Evergreen (85% of County energy use assigned to Sonoma Clean Power is already Evergreen). In addition, reducing idling emissions from vehicles ranked low, and the lowest ranking measure was updating the County's Green Purchasing Policy, as benefits were difficult to estimate without knowing precisely what the update would include.

There are other ways to gauge relative value of measures, and different methods can have different results. In considering the relative value of measures, direct costs and benefits can also be considered, as can the relative value based on the social cost of carbon. Each weights different aspects of value differently and can provide useful information about the value of measures compared to each other.