

Energy and Climate Action Plan Technical Appendix Methods and Assumptions for GHG Quantification

LUD I: Promote infill development.

Actions

- 1) Support strategies for sustainable new development by adopting principles and policies that encourage and expedite the permitting of mixed-use, infill, and transit-oriented development, with jobs and housing co-located together where feasible or in close proximity (walking/biking distance) to transit facilities.
- 2) Review the Comprehensive Plan to determine the extent to which it promotes GHG emissions reductions. Recommend amendments to improve policies and implementation measures to promote GHG emissions reductions.
- 3) Integrate complete streets policies and projects into updates of the Land Use Element and Circulation Element and into new and existing Community Plans.
- 4) Promote the use of ground-floor or street-oriented space in commercial and mixed-use centers for retail, food service, financial institutions, and other high-volume commercial uses.
- 5) Encourage new residential development to be within walking distance (1/2 mile or less) of public activity centers such as schools, libraries, parks, and community centers.
- 6) Retrofit existing, older neighborhoods to improve connectivity, redesign circulation, and create walkable streets.
- 7) Establish a program where energy-efficient mixed-use, infill, and transit-oriented development projects can trade GHG credits.

Assumptions	2010	2020	2035
Percentage of new units built in infill locations	10%	25%	25%
Average VMT reduction (%) compared to BAU	10%	10%	10%

Activity and GHG Reduction	2010	2020	2035
VMT reduction	96,580	1,210,360	2,992,050
Emissions reduction (MTCO ₂ e)	50	460	1,050

Performance Indicators	2010	2020	2035
Total infill units to be built	40	420	910

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Santa Barbara County. 2012. Baseline GHG Emissions Inventory and Forecast.

Santa Barbara County Association of Governments. 2007. 2007 Regional Growth Forecast. <http://www.sbcag.org/PDFs/publications/ReginalGrowthforecastComplete%20Final.pdf>.

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LUD 2: Coordinate office, commercial, industrial, and high-density residential developments with mass transit service and existing or proposed bikeways.

Actions

- 1) Encourage employers to provide funding for reliable mass transit.
- 2) Coordinate new, proposed, and existing commuter rail, mass transit service, and bikeways so that alternative transportation modes complement one another.
- 3) Expand the existing bike network around existing development as proposed in the Bicycle Master Plan.

Assumptions	2010	2020	2035
Percentage of new units in mixed-use developments	10%	10%	10%
Average VMT reduction per unit in mixed-use developments	0%	15%	15%
Percentage of nonresidential square feet in mixed-use developments	10%	10%	10%
Average VMT reduction per square foot in mixed-use developments	0%	15%	15%

Activity and GHG Reduction	2010	2020	2035
VMT reduction	0	3,241,600	7,271,200
Emissions reduction (MTCO _{2e})	0	1,240	2,550

Performance Indicators	2010	2020	2035
Number of units built in mixed-use developments	0	130	320
Nonresidential square feet built in mixed-use developments	0	508,510	1,271,280

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Santa Barbara County. 2012. Baseline GHG Emissions Inventory and Forecast.

Santa Barbara County Association of Governments. 2007. 2007 Regional Growth Forecast.
<http://www.sbcag.org/PDFs/publications/ReginalGrowthforecastComplete%20Final.pdf>.

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LUD 3: Work to increase workforce and affordable housing in Santa Barbara County.

Actions

- 1) Continue to provide programs, incentives, and regulations for affordable housing through the County’s affordable housing requirements and inclusionary housing program.

Assumptions	2010	2020	2035
Average VMT reduction per affordable unit	12%	12%	12%
Percentage of new housing units developed to be affordable	0%	50%	50%

Activity and GHG Reduction	2010	2020	2035
VMT reduction	0	2,033,400	5,026,640
Emissions reduction (MTCO ₂ e)	0	780	1,760

Performance Indicators	2010	2020	2035
Number of affordable housing units by target year	0	850	1,820

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Santa Barbara County. 2010. 2009–14 Housing Element.

<http://longrange.sbcountyplanning.org/programs/housing/housing2009.php>.

———. 2012. Baseline GHG Emissions Inventory and Forecast.

Santa Barbara County Association of Governments. 2007. 2007 Regional Growth Forecast.

<http://www.sbcag.org/PDFs/publications/ReginalGrowthforecastComplete%20Final.pdf>.

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T 1: Create new, additional, or improve existing, car-sharing and ride-sharing programs.

Actions

- 1) Work with Traffic Solutions to expand North County Santa Barbara carpool/vanpool programs and increase bus line options.
- 2) Explore expanding car-share options in Santa Barbara County with Traffic Solutions and the Community Environmental Council.
- 3) Work to effectively implement the CalVans program in Santa Barbara County.
- 4) Support SBCAG's Park and Ride Program.

Assumptions	2010	2020	2035
Commute-to-work mode share of car share/vanpool	19%	25%	30%
Average percentage VMT reduction per car-share/vanpool participant	40%	40%	40%

Activity and GHG Reduction	2010	2020	2035
VMT reduction	0	15,071,800	26,496,220
Emissions reduction (MTCO ₂ e)	0	5,770	9,280

Performance Indicators	2010	2020	2035
Number of car-share/vanpool participants	6,000	8,380	10,900

GHG Sources

- Santa Barbara County. 2012. Baseline GHG Emissions Inventory and Forecast.
- Santa Barbara County Association of Governments. 2007. 2007 Regional Growth Forecast.
<http://www.sbcag.org/PDFs/publications/ReginalGrowthforecastComplete%20Final.pdf>.
- US Census Bureau. 2009. American Communities Survey 5-Year Average. Santa Barbara County Economic Statistics.
- US Department of Transportation, Federal Highway Administration. 2009. National Household Transportation Survey. <http://nhts.ornl.gov/>.

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T 2: Work cooperatively with major local employers to offer incentives and services that decrease single-occupant automobile commuting.

Actions

- 1) Encourage and support employers, especially small and medium-sized employers to voluntarily prepare and implement a Transportation Demand Management program for their employees.
- 2) Provide TDM program education and community briefings annually and/or semiannually.

Assumptions	2010	2020	2035
Commute-to-work mode share of car share/vanpool	19%	25%	30%
Average percentage VMT reduction per car-share/vanpool participant	40%	40%	40%

Activity and GHG Reduction	2010	2020	2035
VMT reduction	0	9,043,080	19,430,560
Emissions reduction (MTCO _{2e})	0	3,460	6,810

Performance Indicators	2010	2020	2035
Number of car-share/vanpool participants	6,000	8,380	10,900

GHG Sources

Santa Barbara County. 2012. Baseline GHG Emissions Inventory and Forecast.
 Santa Barbara County Association of Governments. 2007. 2007 Regional Growth Forecast.
<http://www.sbcag.org/PDFs/publications/ReginalGrowthforecastComplete%20Final.pdf>.
 US Census Bureau. 2009. American Communities Survey 5-Year Average. Santa Barbara County
 Economic Statistics.
 US Department of Transportation, Federal Highway Administration. 2009. National Household
 Transportation Survey. <http://nhts.ornl.gov/>.

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T 3: Increase the use of alternative-fuel vehicles, and plan for the development of alternative-fuel infrastructure.

Actions

- 1) Require pre-wiring for electric vehicle charging stations in new developments.
- 2) Support the efforts of Plug In Santa Barbara to plan for and deploy electric vehicle infrastructure in Santa Barbara County.
- 3) Revise parking requirements for public and new commercial developments to include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and to pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity.
- 4) Ensure that alternative-fuel stations and support facilities are allowed uses in land use designations which currently allow gas and service stations.
- 5) Identify alternative-fuel projects to seek funding through Measure A.

Assumptions	2010	2020	2035
Percentage of parking spaces to have EV charging stations	0%	3.5%	4%

Activity and GHG Reduction	2010	2020	2035
Reduction in VMT from fossil fuel-based vehicle use	0	6,585,600	16,464,000
Increased kWh from EV use	0	3,655,010	9,137,520
Net emissions reduction (MTCO _{2e})	0	1,850	4,790

Performance Indicators	2010	2020	2035
Number of EV charging stations	0	1,400	3,500

GHG Sources

California Building Standards Commission. 2010. Title 24, Part 11. California Green Building Code.
<http://www.bsc.ca.gov/home/calgreen.aspx>.

Institute of Transportation Engineers. 2010. Parking Generation, 4th Edition: An ITE Informational Report. <http://www.ite.org/emodules/scriptcontent/orders/ProductDetail.cfm?pc=IR-034C>.

Santa Barbara County Association for Governments. 2011. Regional Growth Forecast, Theoretical Buildout Capacity.
<http://sbcag.org/Meetings/Joint%20TTAC%20TPAC%20August%2011/Item%2011%20RGF%20Buildout%20Assumptions.pdf>

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T 4: Enhance alternative transportation.

Actions

- 1) Promote the efforts of the Santa Barbara Car Free program.
- 2) Require reduced-fare or free transit passes to residents or employees as mitigation of significant traffic impacts for projects.
- 3) Require projects to include mass transit improvements, such as bus stops, pullouts, and shelters, or funding to assist in the installation of mass transit improvements as mitigation for significant impacts
- 4) Continue to identify alternative transportation projects for funding under Measure A.
- 5) Expand transit opportunities in northern Santa Barbara County and in agricultural communities.
- 6) Encourage bus service providers in the county to expand express services and to purchase alternatively fueled and accordion buses.
- 7) Work with the chambers of commerce to encourage alternative transportation opportunities in the tourism industry.
- 8) Work with Traffic Solutions to establish a bike-sharing program.

Assumptions	2010	2020	2035
Percentage of residents within 1/4 mile from transit	61%	65%	75%
Percentage of jobs within 1/4 mile from transit	82%	85%	90%

Activity and GHG Reduction	2010	2020	2035
VMT reduction	584,490	3,476,270	6,941,220
Emissions reduction (MTCO _{2e})	280	1,330	2,430

Performance Indicators	2010	2020	2035
Percentage of residents within 1/4 mile from transit	61%	65%	75%
Percentage of jobs within 1/4 mile from transit	82%	85%	90%

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Santa Barbara County Association of Governments. 2011. Transit Needs Assessment.
http://www.sbcag.org/PDFs/publications/TNA2011_FINAL.pdf.

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T 5: Complete an integrated bikeway system, linking residences with commercial centers, work locations, schools, parks, and mass transit facilities, to be a high priority for promoting the use of the bicycle as a primary mode of transportation.

Actions

- 1) Fully implement the Santa Barbara County Bicycle Master Plan.
- 2) Support educational programs for safe and lawful biking.
- 3) Install signage to promote safe biking and discourage actions such as biking on sidewalks.
- 4) Expand the existing bicycle network, especially in North County.
- 5) Add more Class I and II bike lanes.

Assumptions	2010	2020	2035
Miles of bike lane installed	0	60	90

Activity and GHG Reduction	2010	2020	2035
VMT reduction	0	4,492,800	7,079,680
Emissions reduction (MTCO ₂ e)	0	1,720	2,480

Performance Indicators	2010	2020	2035
Number of new bike commuters	0	1,060	1,700

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Santa Barbara County. 2012. Goleta Valley Community Plan Update.

———. 2012. Santa Barbara County Draft Bicycle Master Plan.

US Department of Transportation, Federal Highway Administration. 2009. National Household Transportation Survey. <http://nhts.ornl.gov/>.

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T 6: Improve pedestrian convenience, comfort, and safety.

Actions

- 1) Update the countywide design guidelines to create maximum connectivity between neighborhoods, streets, and projects for pedestrian and bicycle travel.
- 2) Work with COAST to support the expansion of Safe Routes to School programs to all elementary and middle schools in the county, and assess potential roadway improvements for increased safety in school zones.
- 3) Amend applicable ordinances to direct new development to construct paths that connect land uses and other non-motorized routes and safe road crossings at major intersections.
- 4) Facilitate pedestrian needs, and provide and ensure well-lit, safe, well-connected, accessible walkways and sidewalks to commercial nodes, schools, and recreation to increase the walkability of communities in the county.
- 5) Continue to complete gaps in the existing sidewalk system and improve pedestrian crossings.
- 6) Support enforcement of vehicles yielding for pedestrians in crosswalks.

Assumptions	2010	2020	2035
Student alternative mode share	19%	30%	30%

Activity and GHG Reduction	2010	2020	2035
VMT reduction	0	5,286,080	9,357,800
Emissions reduction (MTCO _{2e})	0	2,020	3,280

Performance Indicators	2010	2020	2035
Number of students using alternative modes	2,000	3,260	3,390

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Santa Barbara County. 2012. Goleta Valley Community Plan Update.

———. 2012. Santa Barbara County Draft Bicycle Master Plan.

US Department of Transportation, Federal Highway Administration. 2009. National Household Transportation Survey. <http://nhts.ornl.gov/>.

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T 7: Reduce vehicle idling through enforcement and education targeted toward commercial vehicle operators, school parents, and government employees.

Actions

- 1) Support enforcement and education to reduce vehicle idling.

Assumptions	2010	2020	2035
Percentage reduction in commercial vehicle idling	0%	5%	10%

Activity and GHG Reduction	2010	2020	2035
Emissions reduction (MTCO _{2e})	0	6,590	13,330

Performance Indicators	2010	2020	2035
Percentage reduction in commercial vehicle idling	0%	5%	10%

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

T 8: Implement traffic signal synchronization technologies or traffic calming measures to reduce idling emissions.

Actions

- 1) Work to install video signal detection for cyclists and off-peak traffic light prompts for cyclists, pedestrians, and cars on minor connectors.

Assumptions, Reductions, and Performance Indicators

This measure is supportive of other measures that promote the use of non-motorized transit, including T 5 and T 6, and measures that reduce vehicle idling time, including T 7. There are no assumptions, activity or GHG reductions, or performance indicators for supportive measures.

GHG Sources

Supportive measures do not produce direct, measurable GHG reductions. There are no sources for GHG reduction calculations for supportive measures.

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T 9: Develop commuter rail connections between employment centers.

Actions

- 1) Continue to work with Union Pacific to reach agreement on track sharing.
- 2) Work with Traffic Solutions to provide jitney services from station to final destination.
- 3) Provide amenities at rail connection stations.

Assumptions	2010	2020	2035
Percentage of commuters riding commuter rail	0%	2%	5%

Activity and GHG Reduction	2010	2020	2035
VMT reduction	0	5,299,920	15,873,840
Emissions reduction (MTCO ₂ e)	0	2,030	5,560

Performance Indicators	2010	2020	2035
Number of daily commuter rail passengers	0	290	870

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Institute of Transportation Engineers. 2007. Trip Generation Manual.

US Census Bureau. 2012. Longitudinal Employer-Household Dynamics. <http://lehd.ces.census.gov/>.

BE 1: Increase public energy conservation and awareness. Provide information and education to the general public, businesses, and organizations on the importance of energy conservation and available programs, products, and incentives regarding energy efficiency and alternatives. Promote existing low-income energy conservation and weatherization programs, and coordinate with local utility providers and nonprofit corporations to develop additional energy efficiency programs.

Actions

- 1) Work with public utilities, private businesses, organizations, and governmental agencies to develop guidelines on energy-efficient design. These guidelines should be disseminated as early in the planning process as possible (e.g., include the guidelines with all initial permit applications, disseminate at the permit zoning counter and at pre-application meetings).
- 2) Work with public utilities, educational facilities, County departments, City departments, and others that have existing outreach programs to disseminate materials about energy conservation and programs available to the general public.
- 3) Work with public utilities, private businesses, organizations, and governmental agencies to develop outreach programs designed to inform the general public about the cost and benefits of energy efficiency, including technical options, funding, and incentive programs.

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- 4) Establish public outreach (elementary school component, public workshops, etc.) and employee education mechanisms to teach about energy efficiency and other climate-related initiatives.
- 5) Continue to encourage and promote utility provider energy conservation programs for residential, commercial, industrial, agricultural, and governmental buildings.
- 6) Encourage the development of green building and weatherization training programs.
- 7) Encourage builders to make all new construction solar-ready and to inform their clients about the option to install both solar water heating and photovoltaics.
- 8) Support programs like the Community Action Commission of Santa Barbara County, which provide free energy services to low-income households, including weatherization, furnace repair, and water heater replacement.

Assumptions	2010	2020	2035
Percentage of people engaged in education programs	10%	20%	25%
Average energy savings from participants	5%	5%	5%

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	2,255,890	4,709,730	6,223,530
Energy reduction (therms)	184,710	387,190	513,710
Emissions reduction (MTCO _{2e})	1,630	2,860	3,230

Performance Indicators	2010	2020	2035
Number of people participating in education programs	13,460	27,840	36,170

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Gardner, Gerald T., and Paul C. Stern. 2008. The Short List: The Most Effective Actions U.S. Households Can Take to Curb Climate Change
<http://www.environmentmagazine.org/Archives/Back%20Issues/September-October%202008/gardner-stern-full.html>.

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BE 2: Incentivize homeowners and commercial and industrial building owners to improve the energy efficiency of existing buildings upon renovation or alteration. Support and provide resources for tax credits, grants, loans, and other incentives to assist the public, businesses, and local agencies with the purchase of energy-efficient equipment.

Actions

- 1) Require that applicable nonresidential alterations or additions comply with current minimum CALGreen standards as they apply to new construction.
- 2) Require energy audits for all building permits valued greater than \$10,000, offer expedited building permit plan check for implementing audit recommendations, and consider providing a rebate for completing the audit or a waiver of building permit fees if upgrades were completed.
- 3) Provide energy audit information on different residential building types in each community. These pilot audits would provide general information about efficient retrofits in different building types without requiring each building to complete an audit.
- 4) Investigate incentivizing energy-efficient retrofits through direct financial incentives such as property tax rebates or subsidies.
- 5) Encourage participation in the County's emPowerSBC Program and Energy Upgrade California.
- 6) Maintain a website with resources for tax credits, grants, loans, and other incentives for the purchase of energy-efficient equipment.
- 7) Pursue the participation in an established program or development of a County program, such as commercial PACE, to incentivize energy efficiency upgrades in commercial and multi-family buildings.

Assumptions	2010	2020	2035
Percentage of households retrofitted	0%	30%	50%
Percentage of energy saved per retrofitted household	0%	30%	30%
Percentage of nonresidential buildings retrofitted	0%	30%	50%
Percentage of energy saved per retrofitted nonresidential building	0%	30%	30%

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	0	40,606,020	67,676,710
Natural gas reduction (therms)	0	3,324,810	5,541,350
Emissions reduction (MTCO ₂ e)	0	24,300	34,920

Performance Indicators	2010	2020	2035
Number of retrofitted homes	0	13,820	23,030
Percentage of nonresidential buildings retrofitted	0%	30%	50%

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GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

EmPower Santa Barbara County. 2012. EmPower Santa Barbara County Program Results. <http://www.empowersbc.org/>.

Santa Barbara County. 2009. Santa Barbara County Municipal Energy Financing District Feasibility Study. http://www.countyofsb.org/uploadedFiles/housing/CCEIP/SBCO_FeasibilityStudyFinal.pdf.

BE 3: Increase participation in the Santa Barbara County Green Business Program.

Actions

- 1) Highlight the efforts of businesses participating in the Santa Barbara County Green Business Program.
- 2) Provide information about the Santa Barbara County Green Business Program when new business license applications are received by the County Treasurer/Tax Collector.
- 3) Support the Green Business Program through additional funding and dedicated staff time.

Assumptions	2010	2020	2035
Percentage of businesses participating in Green Business Program	0%	10%	15%
Average energy savings per Green Business participant	0%	15%	15%

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	0	2,495,770	4,068,310
Natural gas reduction (therms)	0	259,490	422,980
Emissions reduction (MTCO ₂ e)	0	1,800	2,550

Performance Indicators	2010	2020	2035
Number of certified Green Businesses	0	100	150

GHG Sources

Green Business Santa Barbara County. 2012. Green Business Guide Book. <http://www.greenbizsbc.org/>.

US Census Bureau. 2009. American Communities Survey 5-Year Average. Santa Barbara County Economic Statistics.

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BE 4: Improve the energy efficiency of buildings at the time of sale for all residential buildings, and disclose energy use history when nonresidential buildings are leased or sold.

Actions

- 1) Require residential property owners to complete or comply with a specified set of energy efficiency upgrades to their home at the time of building sale or within one year from the close of escrow including:
 - 2) Toilets – 1.28 gallons per flush, or flow reduction devices
 - 3) Showerheads – 2.0 gallons per minute at 80 psi flow rate
 - 4) Faucet aerators – 1.8 gallons per minute flow at 60 psi rate for kitchens and 1.5 gallons per minute flow at 60 psi rate for bathrooms
 - 5) Water heater blankets – Insulation wrap of R-12 value
 - 6) Hot & Cold Water Piping – Insulate the first two feet from the heater to R-3 value
 - 7) Hot Water Piping in Pumped, Re-circulating Heating Systems – Insulate all pipes to R-3 value
 - 8) Exterior Door Weatherstripping – Permanently affix weather stripping, and door sweeps or door shoes;
 - 9) Furnace duct work – Seal duct joints add insulation wrap to R-6 value
 - 10) Fireplace chimneys – Must have dampers, doors or closures
 - 11) Ceiling insulation – Insulate to R-30 value or greater
 - 12) Common Area Lighting (multi-unit buildings) – Replace incandescent bulbs with compact fluorescent lamps (CFL) of at least 25 lumens
- 13) Encourage all nonresidential properties, even those not covered by AB 1103, to provide buyers or tenants with the previous year’s energy use by documenting use through the EPA’s Energy Star Portfolio Manager with a 50% participation rate goal by 2016. If a 50% participation rate is not achieved by 2016, the County will consider requiring participation of building owners by 2020.
- 14) Provide resources for individuals self-auditing their home’s or business’s energy efficiency.

Assumptions	2010	2020	2035
Retrofit participation rate	0%	90%	90%
Housing units sold per year	1,000	1,000	1,000
Percentage of businesses complying with AB 1103	0%	75%	75%

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	0	24,797,150	38,578,310
Natural gas reduction (therms)	0	2,373,640	3,397,410
Emissions reduction (MTCO ₂ e)	0	16,790	21,100

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Performance Indicators	2010	2020	2035
Cumulative number of residential retrofits	0	6,300	18,900
Percentage of businesses complying with AB 1103	0%	75%	75%

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

EmPower Santa Barbara County. 2012. EmPower Santa Barbara County Program Results.
<http://www.empowersbc.org/>.

Santa Barbara County Office of the Assessor. 2012. Grantor-Grantee Index.
<http://www.sbcvote.com/assessor/AssessorParcelMap.aspx>

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BE 5: Maintain and expand the native tree population to enhance the cooling benefits.

Actions

- 1) Consider developing a shade tree program that provides free native trees to residents and businesses for planting adjacent to buildings to reduce building heat gain.
- 2) Require landscape plans to include shade trees in parking lots and street trees, where appropriate.
- 3) Assess existing trees on a proposed project site to determine compatibility with landscaping, shading, and solar access goals, and protect existing trees to the maximum extent feasible.
- 4) Develop a comprehensive community tree program for planting and maintaining native trees on County-maintained roads, medians, and public parking lots.
- 5) Continue tree replacement and mitigation requirements when removing trees with new development.
- 6) Continue to require the protection of native trees on land with proposed development.
- 7) Form partnerships with local advocacy and community groups to fund the planting and maintenance of native street trees.

Assumptions	2010	2020	2035
Trees planted per year	200	300	300

Activity and GHG Reduction	2010	2020	2035
Emissions reduction (MTCO _{2e})	110	520	1,300

Performance Indicators	2010	2020	2035
Number of existing street trees	21,000	23,000	26,000
Total urban area covered by trees (square feet)	32,129,040	35,188,950	39,778,810

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

McHale, Melissa R., E. Gregory McPherson, and Ingrid C. Burke. 2007. The potential of urban tree plantings to be cost effective in carbon credit markets. Fort Collins, CO: Elsevier.

Santa Barbara County Public Works Department. 2012. Public Works Tree Inventory. <http://www.countyofsb.org/pwd/roads/tree.htm>.

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BE 6: Support the local utility providers' implementation of smart grid technology in new and existing residential and nonresidential properties.

Actions

- 1) Encourage the installation of real-time energy monitoring (such as smart meters) for natural gas, electricity, and water meters on all residential and nonresidential buildings.
- 2) Work with the utility companies to develop a web-based application to provide customers with real-time feedback on their energy consumption and related costs.
- 3) Encourage building users to install smart grid integrated appliances that can be automated to run when electricity costs are lowest and controlled remotely through a web or phone application.
- 4) Encourage the installation of energy monitors and smart grid appliances in new residential and nonresidential buildings as such appliances become commercially available and economically feasible.

Assumptions	2010	2020	2035
Percentage of customers with smart meter technology	0%	85%	90%
Percentage of smart meter-enabled customers participating in monitoring program	0%	50%	75%
Average electricity savings from use of smart meter apps	7.2%	7.2%	7.2%

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	0	14,411,780	24,197,080
Emissions reduction (MTCO ₂ e)	0	2,640	2,590

Performance Indicators	2010	2020	2035
Percentage of customers with smart meter technology	0%	85%	90%
Percentage of smart meter-enabled customers participating in monitoring program	0%	50%	75%

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Ehrhardt-Martinez, K., K. Donnelly, and J. Laitner. 2010. Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Savings Opportunities. Washington, DC: American Council for an Energy-Efficient Economy.

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BE 7: Increase the use of electric or alternative-fuel lawn and garden equipment through the development of an exchange or rebate program.

Actions

- 1) Work with the local APCD to include lawn and garden equipment in the Cash for Cleaner Engines program.
- 2) Discourage the use of lawn and garden equipment with two-stroke engines.

Assumptions	2010	2020	2035
Percentage of lawn mowers to be exchanged	0%	15%	25%

Activity and GHG Reduction	2010	2020	2035
Increase in electricity use (kWh)	0	96,660	167,700
Net emissions reduction (MTCO _{2e})	0	50	110

Performance Indicators	2010	2020	2035
Number of lawn mowers replaced	0	2,690	4,660

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

California Air Resources Board. 2007. Off-Road Software.

BE 8: Implement energy efficiency and green building practices in new and existing developments to exceed the California Green and Building Code (Title 24) standards.

Actions

- 1) Continue to use the Smart Build Santa Barbara Committee, designated by the County Building Official, to incentivize green building practices. The committee will function on a voluntary basis and comprise professionals with specific expertise in energy-efficient building, including the gas and electric utilities, architects, and energy specialists. Its membership shall be approved by the County Building Official.
- 2) Develop and apply permit streamlining for solar energy systems.
- 3) Require applicants to exceed the California Green Building Standards Code (Title 24, Part 6) by 15% and earn 25 points for residential buildings or 15 points for nonresidential buildings from the County's Smart Build Santa Barbara checklist.
- 4) Encourage the installation of energy-efficient materials and equipment that substantially exceed the requirements of Title 24 for all new and existing development.
- 5) Provide incentives like expedited building permit plan check and energy plan check fee reductions to development projects that achieve CALGreen's Tier 2 standard or beyond. Investigate providing additional incentives for implementing environmental efficiency and green building practices.

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- 6) Provide homeowners and commercial building owners with information on cost/benefit analysis for energy-efficient measures and available audit and rebate programs. The information would be disseminated early in the planning process.
- 7) Encourage energy-efficient upgrades on all development projects.
- 8) Encourage the use of post-consumer recycled content and/or certified sustainable production in building materials.
- 9) Encourage building design, materials production, and construction practices that minimize waste.
- 10) Provide resources and incentives to residents and businesses on carbon reduction actions in existing buildings, including energy efficiency, renewable energy, choice of materials, and building reuse.

Assumptions	2010	2020	2035
Percentage of new buildings exceeding Title 24 requirements	0%	100%	100%
Average percentage above Title 24 standards (as amended) of new buildings	5%	15%	25%

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	0	1,071,140	1,948,800
Natural gas reduction (therms)	0	350,330	581,560
Emissions reduction (MTCO ₂ e)	0	2,000	3,110

Performance Indicators	2010	2020	2035
Number of new homes exceeding Title 24 requirements	0	1,300	1,940
Percentage of new nonresidential buildings exceeding Title 24 requirements	0%	100%	100%

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

California Energy Commission. 2010. Nonresidential Building Energy Performance Rating Disclosure Regulations.

Energy and Climate Action Plan Technical Appendix Methods and Assumptions for GHG Quantification

BE 9: Assist architects, builders, and others in using state-of-the art energy technology, design, and spatial orientation for more efficient buildings. Increase the use of passive solar design and daylighting in existing and new structures.

Actions

- 1) Encourage the use of energy-efficient equipment, including but not limited to Energy Star appliances, high-energy-efficiency equipment, heat recovery equipment, and building energy management systems in all new and existing development.
- 2) Encourage new development projects to utilize cool pavement materials, provide shade from structures covered by solar panels, or use an open-grid pavement system to reduce the heat island effect.
- 3) Encourage the use of alternative, energy-efficient construction types (straw bale, insulated block, rammed earth, pumice-crete, etc.), especially using locally available materials.
- 4) Encourage projects to install solar energy systems for heating swimming pools.
- 5) Encourage the installation of green roofs or cool roofs or minimizing the use of dark materials on roofs to achieve a minimum solar reflectivity.
- 6) Encourage the replacement of inefficient appliances, such as natural gas and propane space and water heating, with more efficient and/or alternative-fuel appliances.
- 7) Promote the following design techniques to maximize solar resources:
 - a. Passive solar design, thermal mass, and insulation to reduce space heating and cooling needs.
 - b. Shading on east, west, and south windows with overhangs, awnings, or deciduous trees.
 - c. Sustainable site design and landscaping to create comfortable microclimates.
 - d. Use of lighting shelves, exterior fins, skylights, atriums, courtyards, or other features to enhance natural light penetration.
- 8) Develop an informational sheet that describes passive solar designs (orientation of buildings, vegetative shading, light-colored roofs, daylighting, etc.) and other energy efficiency features. This sheet would be disseminated early in the planning process and should refer applicants to the Smart Build Santa Barbara Program for further information and guidance.

Assumptions, Reductions, and Performance Indicators

This measure is supportive of other measures that promote the use of passive solar techniques, including BE 8 and RE 2. There are no assumptions, activity or GHG reductions, or performance indicators for supportive measures.

GHG Sources

Supportive measures do not produce direct, measurable GHG reductions. There are no sources for GHG reduction calculations for supportive measures.

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BE 10: Implement best management practices for construction equipment operation. Examples of BMPs include reduced equipment idling, use of alternative fuels or electrification of equipment, and proper maintenance and labeling of equipment.

Actions

- 1) Develop resources for best practices for construction equipment operation.

Assumptions	2010	2020	2035
Percentage of projects implementing BMPs	0%	90%	90%
Average percentage of GHG reduction per BMP	0%	21%	21%
Average percentage of BMPs implemented	0%	50%	50%

Activity and GHG Reduction	2010	2020	2035
Emissions reduction (MTCO ₂ e)	0	990	980

Performance Indicators	2010	2020	2035
Percentage of projects implementing BMPs	0%	90%	90%

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.
 California Air Resources Board. 2007. Off-Road Software.

BE 11: Maintain and strengthen the existing training of Planning and Development, Building & Safety Division personnel to remain proficient and consistent in reviewing plans for compliance with the energy code.

Actions

- 1) Continue to educate staff and the public about green building through partnerships with local nonprofit organizations and professional planning and building organizations.

Assumptions, Reductions, and Performance Indicators

This measure is supportive of other measures that promote compliance with green building codes, including BE 8. There are no assumptions, activity or GHG reductions, or performance indicators for supportive measures.

GHG Sources

Supportive measures do not produce direct, measurable GHG reductions. There are no sources for GHG reduction calculations for supportive measures.

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RE 1: Increase the use of alternative energy technology in appropriate new and existing development.

Actions

- 1) Support the establishment of federal and state funds to provide low-interest loans for alternative energy technology.
- 2) Expand emPowerSBC to allow for funding of multi-family housing and alternative energy packages.
- 3) Where appropriate and feasible, remove impediments (e.g., prolonged review due to a proposal including a new or different technology) to the utilization of alternative energy technologies that are cost-effective and contribute to improved environmental conditions.
- 4) Reconsider commercial PACE programs to finance energy efficiency and renewable energy improvements.
- 5) Encourage the use of anaerobic digesters in agriculture.
- 6) Identify policies and practices to attract businesses that develop or market alternative energy technologies.
- 7) Require new buildings to install renewable energy systems or be built "renewable energy ready" as follows:
 - Single family residential projects, multi-family projects under 4 units, and commercial projects less than 10,000 square feet must be built in a manner that future photovoltaic installation could be installed.
 - Multifamily residential projects greater than 4 units, and commercial projects larger than 10,000 square feet must provide at least 1 kW of renewable energy per 1,000 square feet.

Assumptions	2010	2020	2035
Average size of residential renewable energy system (kW)	5	5	5
Average size of nonresidential renewable energy system (kW)	12	12	12
Number of residential renewable energy systems installed per year	50	70	50
Number of nonresidential renewable energy systems installed per year	0	60	20
Program years	0	7	22

Activity and GHG Reduction	2010	2020	2035
Electricity generated (kWh)	0	13,186,860	21,078,750
Emissions reduction (MTCO ₂ e)	0	2,420	2,260

Performance Indicators	2010	2020	2035
Total residential renewable energy systems installed	0	500	1,250
Total nonresidential renewable energy systems installed	0	420	720

Energy and Climate Action Plan Technical Appendix Methods and Assumptions for GHG Quantification

GHG Sources

California Solar Statistics. 2012. Download Current CSI Data.
http://www.californiasolarstatistics.ca.gov/current_data_files/.

Energy and Climate Action Plan Technical Appendix Methods and Assumptions for GHG Quantification

RE 2: Increase the replacement of existing water heaters with solar water heaters.

Actions

- 1) Require new residential development and encourage existing development to participate in the State's CSI-Thermal program, which provides rebates to utility customers who install solar thermal systems to replace water-heating systems powered by electricity or natural gas.

Assumptions	2010	2020	2035
Average natural gas saved per solar water heater (therms)	130	130	130

Activity and GHG Reduction	2010	2020	2035
Natural gas reduction (therms)	12,500	273,540	625,000
Emissions reduction (MTCO ₂ e)	70	1,410	3,120

Performance Indicators	2010	2020	2035
Number of solar water heaters installed	100	2,910	5,000

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

California Energy Commission. 2010. 2009 California Residential Appliance Saturation Study. Volume 2: Results. <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.PDF>.

Energy and Climate Action Plan Technical Appendix Methods and Assumptions for GHG Quantification

RE 3: Adopt a policy or program that offers incentives (such as streamlined permitting, permit waivers, or fee waivers) to encourage a switch in electricity generation from fossil fuels to renewable sources through small-scale renewable electricity generation.

Actions

- 1) Expedite review of solar projects by Building & Safety, County Fire, and Montecito Fire.
- 2) Develop an ordinance for the development of small commercial solar projects.
- 3) Update the small wind ordinance.
- 4) Encourage the use of group purchasing programs of solar equipment to encourage renewable energy installations.
- 5) Implement a group purchasing program in partnership with local solar installers, green builders, or a nonprofit to implement solar electricity on single-family residential, multi-family residential, and commercial properties.

Assumptions	2010	2020	2035
Annual number of Solarize Santa Barbara participants (beginning in 2011)	50	50	50
Percentage of total Solarize Santa Barbara participants in unincorporated county	50%	50%	50%
Average renewable energy system size (kW)	0	5	5

Activity and GHG Reduction	2010	2020	2035
Electricity generated (kWh)	0	6,387,500	5,246,880
Emissions reduction (MTCO ₂ e)	0	1,170	560

Performance Indicators	2010	2020	2035
Number of total Solarize Santa Barbara participants in unincorporated county	0	700	580

GHG Sources

California Solar Statistics. 2012. Download Current CSI Data.
http://www.californiasolarstatistics.ca.gov/current_data_files/.

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RE 4: Promote the use of clean alternative energy production by encouraging development of utility-scale renewable electrical generation facilities.

Actions

- 1) Support the use of renewable energy sources such as sun, wind, and wave, and waste-to-energy production.
- 2) Develop an ordinance to allow installation of photovoltaic solar systems on agricultural land.

Assumptions	2010	2020	2035
Annual production of County Jail PV project (kWh)	0	1,825,000	1,825,000
Number of mid-sized projects installed	0	10	25
Average size of mid-sized projects (MW)	0	3	3

Activity and GHG Reduction	2010	2020	2035
Electricity generated (kWh)	0	45,625,000	111,325,000
Emissions reduction (MTCO ₂ e)	0	8,360	11,940

Performance Indicators	2010	2020	2035
Number of mid-sized projects installed	0	10	25
MW of County Jail PV project	0	1	1

GHG Sources

County of Santa Barbara. 2012. <http://www.independent.com/news/2012/mar/27/solar-project-will-power-county-campus/>.

Santa Barbara County Department of Public Works. 2012. The Resource Recovery Project at the Tajiguas Landfill Subsequent EIR Scoping Document. http://www.conversiontechnologystudy.com/media/documents/TJ%20RRP%20NOP%20SCOPING%2004_11_12%20FINAL%20with%20figures.pdf.

Energy and Climate Action Plan Technical Appendix
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IEE I: Support legislation for tax credits, grants, loans, and other incentives to assist the public, businesses, and local agencies with the purchase of energy-efficient equipment.

Actions

- 1) Support the development of state and federal resources such as tax credits, loans, and other incentives for the purchase of energy-efficient equipment.
- 2) Provide outreach and education to large industrial energy users to increase awareness of utility-sponsored incentive and rebate programs specific to large equipment and operations.

Assumptions	2010	2020	2035
Percentage of industrial facilities installing new equipment	0%	25%	50%

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	0	4,915,540	10,879,730
Natural gas reduction (therms)	0	106,850	236,480
Emissions reduction (MTCO ₂ e)	0	1,450	2,350

Performance Indicators	2010	2020	2035
Percentage of industrial facilities installing new equipment	0%	25%	50%

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

South Coast Air Quality Management District. 2011. California Emissions Estimator Model. <http://www.caleemod.com/>

Energy and Climate Action Plan Technical Appendix
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IEE 2: Increase industrial energy user participation in energy management programs such as the Energy Star Benchmarking Program to ensure the efficient use of energy resources and proper operation of equipment and facilities.

Actions

- 1) Provide resources, educational programs, and incentives for energy management programs to ensure efficient use of energy resources and proper operation of equipment and facilities.

Assumptions	2010	2020	2035
Average percentage of electricity savings from retrocommissioning (kWh)	14%	14%	14%
Average percentage of natural gas savings from retrocommissioning (therms)	6%	6%	6%
Participation rate	0%	25%	50%

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	0	1,101,080	1,137,290
Natural gas reduction (therms)	0	10,260	9,890
Emissions reduction (MTCO ₂ e)	0	250	170

Performance Indicators	2010	2020	2035
Participation rate	0%	25%	50%

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

South Coast Air Quality Management District. 2011. California Emissions Estimator Model. <http://www.caleemod.com/>.

Southern California Edison. n.d. SCE Energy Efficiency Filings – Retrocommissioning.

<http://asset.sce.com/Regulatory/Energy%20Efficiency%20Filings/SCE2508RETROCOMMISSIONING.pdf>.

Energy and Climate Action Plan Technical Appendix Methods and Assumptions for GHG Quantification

IEE 3: Implement energy efficiency upgrades at industrial facilities through streamlining permit review, providing rebates for audits, and highlighting best practices among similar energy users.

Actions

- 1) Establish a streamlined permit review process for completion of energy efficiency upgrades at industrial facilities through 2016. After 2016, evaluate program participation in audits and consider a mandatory program if participation falls below 10% of total industrial facilities.
- 2) Develop resources for best practices among industrial facilities.

Assumptions	2010	2020	2035
Percentage of facilities audited	0%	50%	80%
Percentage of facilities completing renovations from audits	0%	90%	90%
Average energy savings per facility	0%	30%	30%

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	0	21,832,370	31,333,620
Natural gas reduction (therms)	0	418,620	615,430
Emissions reduction (MTCO ₂ e)	0	6,180	6,430

Performance Indicators	2010	2020	2035
Percentage of facilities audited	0%	50%	80%
Percentage of facilities completing renovations from audits	0%	90%	90%

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Chittum, Anna, Neal Elliot, and Nate Kaufman. 2009. "Trends in Industrial Energy Efficiency Programs: Today's Leaders and Directions for the Future." American Council for an Energy-Efficient Economy. <http://www.aceee.org/sites/default/files/publications/researchreports/ie091.pdf>.

Energy and Climate Action Plan Technical Appendix
 Methods and Assumptions for GHG Quantification

IEE 4: Increase the use of energy-efficient or Energy Star-rated equipment at new or renovated industrial facilities.

Actions

- 1) Provide education, resources, and assistance for the installation of energy-efficient equipment at new or renovated industrial facilities.
- 2) Support or partner with state agencies or nonprofit groups to implement an energy efficiency retrofit program to increase energy efficiency in existing industrial facilities.

Assumptions	2010	2020	2035
Percentage of additional facilities to upgrade equipment	0%	10%	25%

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	0	1,331,080	3,616,280
Natural gas reduction (therms)	0	138,390	375,990
Emissions reduction (MTCO _{2e})	0	960	2,260

Performance Indicators	2010	2020	2035
Percentage of additional facilities to upgrade equipment	0%	10%	25%

GHG Sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Energy and Climate Action Plan Technical Appendix Methods and Assumptions for GHG Quantification

WR 1: Continue to support the programs associated with efficient waste collection and recycling, public school education, and composting.

Actions

- 1) Enhance community understanding of resource recovery and waste management programs.
- 2) Continue the home composting education campaign and the discounted sale of composting bins.
- 3) Establish a program that removes food waste from landfills.
- 4) Continue to implement recycling programs for schools and businesses.
- 5) Support environmentally preferable purchasing programs.
- 6) Support waste reduction regulations such as a plastic bag ban.
- 7) Develop an evaluation mechanism to measure waste prevented by preservation, reuse, and thoughtful consumption.

Assumptions	2010	2020	2035
Goal diversion rates	73%	85%	95%

Activity and GHG Reduction	2010	2020	2035
Tons of waste reduced	8,980	24,170	40,230
Emissions reduction (MTCO ₂ e)	7,160	19,020	31,560

Performance Indicators	2010	2020	2035
Goal diversion rates	73%	85%	95%

GHG Sources

CalRecycle. 2009. Waste Disposal Characterization.

<http://www.calrecycle.ca.gov/Publications/General/Extracts/2009023/Tables.pdf>.

———. 2011. Single-Year Countywide Origin Detail, County of Santa Barbara: 2011.

<http://www.calrecycle.ca.gov/LGCentral/Reports/Viewer.aspx?P=ReportName%3deDRSCountyWideOrigin%26CountyID%3d42%26ReportYear%3d2011>.

Santa Barbara County Department of Public Works. 2012. The Resource Recovery Project at the Tajiguas Landfill Subsequent EIR Scoping Document.

http://www.conversiontechnologystudy.com/media/documents/TJ%20RRP%20NOP%20SCOPING%204_11_12%20FINAL%20with%20figures.pdf.

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WR 2: Seek additional opportunities for county residents to recycle cardboard, glass, paper, and plastic products.

Actions

- 1) All public and private events requiring a discretionary permit must implement a waste management plan that meets County approval for providing recycling and composting opportunities at such events.
- 2) Implement a centralized processing facility for all waste.
- 3) Consider addition of new materials to comingled recyclable materials as markets develop.

Assumptions	2010	2020	2035
Goal diversion rates	73%	85%	95%

Activity and GHG Reduction	2010	2020	2035
Tons of waste reduced	7,730	20,790	34,610
Emissions reduction (MTCO ₂ e)	6,150	16,360	27,150

Performance Indicators	2010	2020	2035
Goal diversion rates	73%	85%	95%

GHG Sources

CalRecycle. 2009. Waste Disposal Characterization.
<http://www.calrecycle.ca.gov/Publications/General/Extracts/2009023/Tables.pdf>.
 ———. 2011. Single-Year Countywide Origin Detail, County of Santa Barbara: 2011.
<http://www.calrecycle.ca.gov/LGCentral/Reports/Viewer.aspx?P=ReportName%3deDRSCountyWideOrigin%26CountyID%3d42%26ReportYear%3d2011>.
 Santa Barbara County Department of Public Works. 2012. The Resource Recovery Project at the Tajiguas Landfill Subsequent EIR Scoping Document.
http://www.conversiontechnologystudy.com/media/documents/TJ%20RRP%20NOP%20SCOPING%2004_11_12%20FINAL%20with%20figures.pdf.

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WR 3: Increase the recycling and reuse of construction waste to reduce energy consumption associated with extracting and manufacturing virgin materials.

Actions

- 1) All demolition projects requiring a discretionary permit must implement a viable recycling plan that meets County approval and includes provisions to maximize recycling of asphalt, concrete, and equipment and to minimize disposal of wastes into hazardous waste and solid waste management facilities to the maximum extent feasible.
- 2) Promote the reuse of construction waste by educating the public about material reuse facilities and programs.
- 3) Develop guidelines for managing construction-generated wastes.
- 4) Require asphalt removed from roads and paved structures to be recycled to the maximum extent feasible.
- 5) Require the use of recycled materials in roadway and paved surface construction.

Assumptions	2010	2020	2035
Goal diversion rates	73%	85%	95%

Activity and GHG Reduction	2010	2020	2035
Tons of waste reduced	4,880	13,130	21,850
Emissions reduction (MTCO ₂ e)	3,890	10,330	17,140

Performance Indicators	2010	2020	2035
Goal diversion rates	73%	85%	95%

GHG Sources

CalRecycle. 2009. Waste Disposal Characterization.

<http://www.calrecycle.ca.gov/Publications/General/Extracts/2009023/Tables.pdf>.

———. 2011. Single-Year Countywide Origin Detail, County of Santa Barbara: 2011.

<http://www.calrecycle.ca.gov/LGCentral/Reports/Viewer.aspx?P=ReportName%3deDRSCountyWideOrigin%26CountyID%3d42%26ReportYear%3d2011>.

Santa Barbara County Department of Public Works. 2012. The Resource Recovery Project at the Tajiguas Landfill Subsequent EIR Scoping Document.

http://www.conversiontechnologystudy.com/media/documents/TJ%20RRP%20NOP%20SCOPING%204_11_12%20FINAL%20with%20figures.pdf

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WR 4: Reduce or minimize GHG emissions from waste materials deposited into landfills.

Actions

- 1) Develop best management practices and utilize new technologies for reducing GHG emissions from active landfills.
- 2) Conduct a waste characterization study.

Assumptions	2010	2020	2035
Goal diversion rates	73%	85%	95%
On-site energy needs (kWh/hr of operation)	0	500	750
Annual hours of operation	0	7,460	7,460

Activity and GHG Reduction	2010	2020	2035
Electricity reduction (kWh)	0	3,732,000	5,598,000
Emissions reduction (MTCO ₂ e)	0	680	600

Performance Indicators	2010	2020	2035
Renewable energy generated (kWh)	0	7,600,000	10,400,000

GHG Sources

CalRecycle. 2009. Waste Disposal Characterization.
<http://www.calrecycle.ca.gov/Publications/General/Extracts/2009023/Tables.pdf>.

———. 2011. Single-Year Countywide Origin Detail, County of Santa Barbara: 2011.
<http://www.calrecycle.ca.gov/LGCentral/Reports/Viewer.aspx?P=ReportName%3deDRSCountyWideOrigin%26CountyID%3d42%26ReportYear%3d2011>.

Santa Barbara County Department of Public Works. 2012. The Resource Recovery Project at the Tajiguas Landfill Subsequent EIR Scoping Document.
http://www.conversiontechnologystudy.com/media/documents/TJ%20RRP%20NOP%20SCOPING%2004_11_12%20FINAL%20with%20figures.pdf

Energy and Climate Action Plan Technical Appendix Methods and Assumptions for GHG Quantification

WR 5: Reduce GHG emissions from waste collection vehicles through the use of alternative fuels.

Actions

- 1) Require the installation of particulate filters on pre-2007 waste collection vehicles to reduce particulate emissions. Older trucks that are not good candidates for retrofit should be phased out of operation.
- 2) Require alternative-fuel vehicles in all new contracts with waste haulers.

Assumptions	2010	2020	2035
Percentage of solid waste collection vehicles converted	0%	90%	100%
Number of waste collection vehicles	130	130	130
MTCO _{2e} per diesel waste vehicle	25	25	25
Percentage reduction from CNG-fueled waste vehicles	0	0	0

Activity and GHG Reduction	2010	2020	2035
Emissions reduction (MTCO _{2e})	0	730	810

Performance Indicators	2010	2020	2035
Number of vehicles converted to CNG fuel	0	120	130

GHG Sources

California Air Resources Board. 2011. EMFAC 2011.

http://www.arb.ca.gov/jpub/webapp//EMFAC2011WebApp/rateSelectionPage_1.jsp.

CalRecycle. 2009. Waste Disposal Characterization.

<http://www.calrecycle.ca.gov/Publications/General/Extracts/2009023/Tables.pdf>

———. 2011. Single-Year Countywide Origin Detail, County of Santa Barbara: 2011.

<http://www.calrecycle.ca.gov/LGCentral/Reports/Viewer.aspx?P=ReportName%3deDRSCountyWideOrigin%26CountyID%3d42%26ReportYear%3d2011>.

Santa Barbara County Department of Public Works. 2012. The Resource Recovery Project at the Tajiguas Landfill Subsequent EIR Scoping Document.

http://www.conversiontechnologystudy.com/media/documents/TJ%20RRP%20NOP%20SCOPING%204_11_12%20FINAL%20with%20figures.pdf

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AG 1: Increase local food production and distribution.

Actions

- 1) Support the development of edible landscapes, neighborhood gardens, and backyard gardening through educational programs.
- 2) Provide education and outreach for implementing local food programs.
- 3) Reduce emissions from the transport of county agriculture-related products by encouraging grocers to purchase local food.
- 4) Encourage reduced consumption of resource-intensive products.

Assumptions, Reductions, and Performance Indicators

This measure is supportive of general efforts to improve sustainable agriculture in Santa Barbara County. There are no assumptions, activity or GHG reductions, or performance indicators for supportive measures.

GHG Sources

Supportive measures do not produce direct, measurable GHG reductions. There are no sources for GHG reduction calculations for supportive measures.

AG 2: Promote the use of responsible agricultural practices, such as those established by various Good Agricultural Practice programs, and seek to expand those programs to include science-based soil, fertilizer, water, crop rotation, and fuel management practices.

Actions

- 1) Work with the University of California Cooperative Extension to develop and disseminate appropriate voluntary management practices for the application of pesticides and fertilizers, tillage practices, cover crops, crop rotation, and other techniques to reduce nitrous oxide emissions, maximize carbon sequestration, and reduce fuel use.

Assumptions, Reductions, and Performance Indicators

This measure is supportive of general efforts to improve sustainable agriculture in Santa Barbara County. There are no assumptions, activity or GHG reductions, or performance indicators for supportive measures.

GHG Sources

Supportive measures do not produce direct, measurable GHG reductions. There are no sources for GHG reduction calculations for supportive measures.

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AG 3: Work with the APCD to increase the use of alternatively fueled equipment in agricultural operations through education, incentives, or revisions to existing regulations.

Actions

- 1) Continue to support the APCD's participation in the Carl Moyer Program to provide rebates for retrofitting or replacing off-road equipment.
- 2) Encourage the use of non-fuel alternatives such as goats for vegetation management.

Assumptions	2010	2020	2035
Percentage of tractor equipment to be replaced	0%	35%	50%
Average percentage of fuel savings from tractor replacement	0%	20%	20%

Activity and GHG Reduction	2010	2020	2035
Emissions reduction (MTCO ₂ e)	0	4,140	6,370

Performance Indicators	2010	2020	2035
Percentage of tractor equipment to be replaced	0%	35%	50%

GHG Sources

California Air Resources Board. 2006. Off Road Emissions Inventory. OFFROAD2007, Version 1. ———. 2011. AB 118 Air Quality Improvement Program. <http://www.arb.ca.gov/msprog/aqip/aqip.htm>.

AG 4: Increase agriculture-related energy conservation through appropriate and practical efficient energy, water, and resource management practices.

Actions

- 1) Support the voluntary installation of energy-efficient irrigation systems and other energy conservation system devices.
- 2) Encourage landowners to participate in voluntary energy conservation programs through the provision of incentives.
- 3) Evaluate potential efficiency improvements in agriculture-related groundwater delivery.
- 4) Encourage the State to enact legislation that promotes environmentally sustainable farming practices.
- 5) Encourage participation in self-assessments and certification programs.

Assumptions, Reductions, and Performance Indicators

This measure is supportive of general efforts to improve sustainable agriculture in Santa Barbara County. There are no assumptions, activity or GHG reductions, or performance indicators for supportive measures.

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GHG Sources

Supportive measures do not produce direct, measurable GHG reductions. There are no sources for GHG reduction calculations for supportive measures.

AG 5: Continue to support the programs of the Soil Conservation Service, Resource Conservation Districts, UC Cooperative Extension/Farm Advisor, utility companies, and others that address efficient irrigation because of their associated energy benefits.

Actions

- 1) Continue the smart irrigation technology education campaign for smart irrigation controllers and rotating sprinkler nozzles.
- 2) Encourage the use of irrigation only between 3 a.m. and two hours after sunrise.
- 3) Encourage the use of irrigation controllers with rain sensors, gravity-fed systems, and drip irrigation.
- 4) Investigate setting up a mitigation fee program to offset the costs of installing efficient irrigation.

Assumptions	2010	2020	2035
Number of farms	780	780	780
Target participation rates	0%	35%	50%
Average percentage of water savings from irrigation improvements	0%	15%	15%

Activity and GHG Reduction	2010	2020	2035
Water reduction (gallons)	0	4,399,212,150	6,585,829,930
Emissions reduction (MTCO ₂ e)	0	1,430	1,340

Performance Indicators	2010	2020	2035
Number of participating farms	0	270	390

GHG Sources

Cooley, H., Christian-Smith, J., and Gleick, P. 2009. Sustaining California Agriculture in an Uncertain Future. <http://pacinst.org/wp-content/uploads/sites/21/2014/04/sustaining-california-agriculture-pacinst-full-report.pdf>.

County of Santa Barbara. 2013. 2012 Agricultural Production Report. <https://www.countyofsb.org/uploadedFiles/agcomm/crops/2012%20Crop%20Report.pdf>.

Municipal Water District of Southern California and East Bay Municipal Utility District. 2009. Evaluation of California weather-based "smart" irrigation controller programs. <http://ucanr.edu/sites/UrbanHort/files/99641.pdf>.

Pacific Institute. 2005. California Water 2030: Appendix A - Agricultural Efficiency. http://www.pacinst.org/wp-content/uploads/2013/02/ca_water_20303.pdf.

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AG 6: Facilitate the increased use of agriculture and open space easements through zoning, dedication of public funds, and mitigation fees to protect carbon-sequestering environments and to support local resource-based industries.

Actions

- 1) Review the County Land Use Development Code and Comprehensive Plan for opportunities to strengthen zoning.
- 2) Identify opportunities to support research of carbon sequestration in open spaces and agricultural operations.
- 3) Encourage property owners to participate in carbon sequestration programs developed by the State or other entities.
- 4) Establish a mitigation fund for open space easements.

Assumptions, Reductions, and Performance Indicators

This measure is supportive of general efforts to explore the use of agricultural and open space land in Santa Barbara County for carbon sequestration. There are no assumptions, activity or GHG reductions, or performance indicators for supportive measures.

GHG Sources

Supportive measures do not produce direct, measurable GHG reductions. There are no sources for GHG reduction calculations for supportive measures.

WE 1: Decrease energy use associated with the pumping, distribution, heating, and treating of water and wastewater.

Actions

- 1) Provide resources for water-efficient plumbing fixture retrofit programs.
- 2) Encourage and assist in the use of water-efficient technologies in the residential, commercial, and industrial sectors.
- 3) Increase coordination and streamline standards or regulations with local water districts that serve unincorporated areas of the county to improve water efficiency.
- 4) Identify per capita water use baselines from water purveyors to determine the need for more indoor and outdoor conservation and rebate programs.
- 5) Encourage water conservation before development of new water resources.

Assumptions	2010	2020	2035
Target percentage of per capita water use reduction	0%	20%	30%

Activity and GHG Reduction	2010	2020	2035
Water reduction (gallons)	0	707,662,310	1,061,493,470
Emissions reduction (MTCO ₂ e)	0	230	220

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Performance Indicators	2010	2020	2035
Average community gallons per capita per day (GPCD)	140	125	118

GHG Sources

California Energy Commission. 2005. California's Water-Energy Relationship.
<http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF>.
 ———. 2006. Refining Estimates of Water-Related Energy Use in California.
<http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>.

WE 2: Maximize end-user water efficiency by encouraging the implementation of prescriptive or performance measures included in the California Green Building Code in all new and existing development.

Actions

- 1) Require the installation of water-efficient fixtures and equipment in all new residential, commercial, and industrial development.
- 2) Encourage replacement of inefficient plumbing fixtures with more efficient models and require as a condition for issuance of a certificate of final completion and occupancy or final permit approval for building additions and/or alterations.
- 3) Encourage the installation of dual plumbing for graywater systems in new and existing buildings.
- 4) Encourage the installation of graywater and rainwater harvesting systems to reduce outdoor potable water use.

Assumptions	2010	2020	2035
Percentage water reduction target	20%	20%	20%

Activity and GHG Reduction	2010	2020	2035
Water reduction (gallons)	0	53,806,590	121,617,640
Emissions reduction (MTCO ₂ e)	0	20	20

Performance Indicators	2010	2020	2035
Percentage water reduction target	20%	20%	20%

GHG Sources

California Energy Commission. 2005. California's Water-Energy Relationship.
<http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF>.
 ———. 2006. Refining Estimates of Water-Related Energy Use in California.
<http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>.

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WE 3: Increase the use (per Government Code, Section 65590, Article 10.8) of native, drought-tolerant landscaping and smart irrigation technologies in new and renovated developments and at public parks and facilities.

Actions

- 1) Encourage native, drought-tolerant landscaping and smart irrigation technologies while discouraging hardscape in all new and existing developments.
- 2) Provide resources for the water purveyors' incentives for installing native, drought-tolerant landscaping and smart irrigation technologies.
- 3) Require a reduction in outdoor water use in new landscapes through compliance with the California Water Conservation in Landscaping Act for properties having landscaped areas between 2,500 and 5,000 square feet.
- 4) Increase the availability and use of recycled water for use in outdoor landscaping areas.
- 5) Encourage the installation of turf on no more than 20% of the total site area on parcels 1 acre or less and 20% of landscaped areas on parcels greater than 1 acre.
- 6) Promote the treatment of stormwater runoff on site through the installation of rain gardens, green roofs, and rain barrels.

Assumptions	2010	2020	2035
Target percentage water use reduction for landscaping	0%	20%	35%

Activity and GHG Reduction	2010	2020	2035
Water reduction (gallons)	0	653,226,750	1,143,146,810
Emissions reduction (MTCO ₂ e)	0	210	230

Performance Indicators	2010	2020	2035
Water use reduction for landscaping	0%	20%	35%

GHG Sources

California Energy Commission. 2005. California's Water-Energy Relationship.
<http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF> .
 ———. 2006. Refining Estimates of Water-Related Energy Use in California.
<http://www.energy.ca.gov/2006publications/CEC-500-2006-118/CEC-500-2006-118.PDF>.