

3.2 Reduction Measure Pool

This section describes the complete pool of measures from which the County made selections in order to build their three distinct GHG reduction scenarios (see Sections 3.3, 3.4, 3.5). The pool of measures is divided into the following categories based on responsible party and funding source.

1. State Measures (3.2.1)
2. NMC Measures (3.2.2)
3. Public Works Audit Measures (3.2.3)
4. AMBAG Energy Watch Measures (3.2.4)
5. Other Measures (3.2.5)

3.2.1 State Measures

Through legislation, the state of California has established requirements on automobiles (AB 1493—Pavley I and II) and on electricity generation (SB 1078/SB 107—Renewable Portfolio Standard) in California that will reduce the County's GHG emissions by 2020 even without any County action. The state is also depending on the Low Carbon Fuel Standard (Executive Order S-01-07) to provide further GHG reductions from mobile sources. State-level reduction measures will reduce Monterey County's municipal GHG emissions by the amounts shown in Table 3-1.

State Action to Reduce Local GHG Emissions

Actions undertaken by the state government will help Monterey County achieve its emissions reduction target. Legislation enacted at the state level establishes requirements on automobiles, waste generation, electricity sales, and much more. For example, the state requires electric utility companies to increase their procurement of renewable resources by 2020 (the California Renewable Portfolio Standard or RPS). Renewable resources, such as wind and solar power, do not emit any GHGs. By generating a greater amount of the state's energy through renewable resources, electricity provided to the County will be cleaner and less greenhouse gas intensive than if the state hadn't required the renewable standard. California power providers are required to provide 33% of retail sales from qualified renewable sources by 2020. Even though this and other state measures do not require local government action, they will reduce GHGs in Monterey by 2,263 metric tons relative to the 2005 baseline. More information about the state's plan to reduce GHGs can be found at: <http://www.arb.ca.gov/cc/cc.htm>

Table 3-1. State Reduction Measures

Measure Number	Measure Name	Measure Description	GHG Reductions (MTCO ₂ e)
S-1	Renewable Portfolio Standard (RPS)	Obligates investor-owned utilities (IOUs), energy service providers (ESPs), and Community Choice Aggregations (CCAs) to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, no later than 2010. The RPS set forth a longer range target of procuring 33% of retail sales by 2020. SB X 1-2 expands and preempts the RPS to obligate all California electricity retailers in the state (including publicly owned utilities, investor owned utilities, electricity service providers, and community choice aggregators) to obtain at least 33% of their energy from renewable resources by the year 2020.	1,126
S-2	Pavley (AB 1493) and Advanced Clean Cars	Requires CARB to adopt vehicle standards that will lower GHG emissions from new light duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (Advanced Clean Cars) has been proposed for vehicle model years 2017–2025. Together, the two standards are expected to increase average fuel economy to roughly 43 miles per gallon by 2020 (and more for years beyond 2020) and reduce GHG emissions from the transportation sector in California by approximately 14%.	344
S-3	Low Carbon Fuel Standard	Mandates the following: (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020, and (2) that a low carbon fuel standard for transportation fuels be established in California.	632
S-4	AB32—Other Vehicle Efficiency Measures	The following AB32 measures are being implemented. <ul style="list-style-type: none"> • Tire Pressure Program (assures vehicle tire pressure is maintained to manufacturer specifications). • Low Friction Engine Oils (mandates the use of engine oils that meet certain low friction specifications). • Heavy-Duty Vehicle GHG Emission Reduction (requires installation of best available technology and/or CARB approved technology to reduce aerodynamic drag and rolling resistance). 	161
Total Reductions in Monterey County from State Measures			2,263
Note: Because of rounding in Microsoft Excel, the totals may not sum exactly.			

3.2.2 Natividad Medical Center Measures

In 2011, an energy efficiency audit of NMC in Salinas was completed (Willdan Energy Solutions 2011). The audit and subsequent report, funded by Pacific Gas and Electric (PG&E), identified a number of energy efficiency retrofits to reduce energy consumption at the facility. Financial incentives are provided by PG&E for reducing peak demand electricity and natural gas as a result of

implementing the retrofits. Of the twelve measures highlighted in the audit report, two have been completed (NMC-4 and NMC-6) at the time of writing of this document. The recommended energy efficiency measures range from upgrading boilers to installing lighting upgrades. The full list of NMC energy efficiency measures and their associated GHG reductions are included in Table 3-2 below.

Table 3-2. NMC Audit Report Reduction Measures

Measure Number	Measure Description	GHG Reductions (MTCO ₂ e)	Measure Completed?
NMC-1	Install Direction Expansion Units for Common Room, Lab and building 300. Chiller off at night	57	No
NMC-2	Air Handling Unit Schedule, and boilers off at night	756	No
NMC-3	Install Boiler Isolation Valves	96	No
NMC-4	Isolate the Dietary/Dishwasher Boiler Hot Water Loop from the Domestic Loop	59	Yes
NMC-5	Replace the Heating Hot Water Condensing Boilers	369	No
NMC-6	Convert 3-Way to 2-Way Valves and Implement Chilled Water Temperature Reset	7	Yes
NMC-7	Implement Condenser Water Temperature Reset	0.4	No
NMC-8	Air Balance	7	No
NMC-9	Schedule the Building 151 Packaged Unit to Operate Only During Occupied Hour	36	No
NMC-10	Install Controls for the Kitchen Hood Exhaust	11	No
NMC-11	Exhaust fan Timers (2% Horse Power Fans)	7	No
NMC-12	Lighting Upgrade	106	No
Total from All NMC Measures		1,511	
Total Reductions from Completed Measures		66	
Total Reductions from Remaining Measures		1,445	
Note: Because of rounding in Microsoft Excel, the totals may not sum exactly.			

3.2.3 2011 Public Works Audit Report Measures

In 2011, DOE funded an energy audit report that was completed for the County at fourteen of its facilities. The audit report identifies a number of energy conservation measures such as equipment repairs, equipment upgrades, and alterations in building controls. The audits and the implementation of a portion of the measures were funded by the EECBG Program. The measures that have already been implemented were funded by the EECBG Program, while the funding of the remaining measures has not yet been identified. All energy efficiency actions identified in the Public Works Audit Report are listed below in Table 3-3 along with a brief description, project location, associated GHG reductions and status.

Table 3-3. Public Works Audit Report Measures

Measure Number	Measure Description and Location	GHG Reductions (MTCO ₂ e)	Measure Completed?
HVAC Measures			
BE-1	Air balance of rooftop units at Adult Rehab Facility	28	Yes
BE-2	Install Building Energy Management System at Correctional Facility	89	No
BE-3	Replaced Heating units—100% OSA at Correctional Facility	88	Yes
BE-4	Replaced Heating units—recirculating at Correctional Facility	9	No
BE-5	Replace Heating units—receiving wing at Correctional Facility	28	Yes
BE-6	Replace Heating unit-women's dayroom at Correctional Facility	11	No
BE-7	Install Building Energy Management System at New Jail	16	No
BE-8	Retro-commission heating/ventilating units at New Jail	16	Yes
BE-9	ACU-7 retro-commissioning at New Jail	2	Yes
BE-10	Replaced 3-ton AC units at New Jail	6	Yes
BE-11	ACU-1 replacement at New Jail	3	No
BE-12	Expand Building Energy Management System at Public Safety Building	60	No
BE-13	Retro-commission HU-1 through 5 at Public Safety Building	39	Yes
BE-14	Replace AC-1 through AC-5 at Public Safety Building	57	No
BE-15	Replace 5-ton, single-zone units at Public Safety Building	2	No
BE-16	Install Building Energy Management System at Probation Headquarters	9	No
BE-17	Calibrate wireless pneumatic thermostats at Probation Headquarters	4	Yes
BE-18	Install Building Energy Management System at Probation Juvenile Intake	4	No
BE-19	Retro-commission heating/ventilating units at Probation Juvenile Intake	4	Yes
BE-20	Replace baseboard heating valve-Secretary's office at Probation Juvenile Intake	1	No
BE-21	Replace exhaust fans as needed at Probation Juvenile Intake	—	Yes
BE-22	Retro-commissioning heating units at Probation Youth Center	8	Yes
BE-23	Replace 15-year-old packaged AC units at Probation Youth Center	2	No
BE-24	Heating, ventilation, and air conditioning (HVAC) Duct Work at Department of Social & Employment Services Seaside Office	—	No
BE-25	Replace units AC-1, 3, 5 & 6 at Department of Social & Employment Services Seaside Office	2	No
BE-26	Replace older HVAC units at Agricultural Commission Facility	3	No

Measure Number	Measure Description and Location	GHG Reductions (MTCO ₂ e)	Measure Completed?
BE-27	Replace hot water heaters at Animal Shelter	13	No
BE-28	Install Building Energy Management System at Animal Shelter	32	No
BE-29	Install Building Energy Management System at Marina Coastal Offices	4	No
BE-30	Add wireless pneumatic thermostats at Marina Coastal Offices	4	Yes
Indoor Lighting Measures			
BE-31	Interior Lighting retrofits at Adult Rehab Facility	8	No
BE-32	Interior lighting controls at Adult Rehab Facility	1	No
BE-33	Interior lighting retrofits at Correctional Facility	34	No
BE-34	Interior lighting controls at New Jail	2	No
BE-35	Interior lighting retrofits at New Jail	41	No
Outdoor Lighting Measures			
BE-36	Outdoor lighting improvements at Adult Rehab Facility	17	No
BE-37	Outdoor lighting improvements at Correctional Facility	13	No
BE-38	Outdoor lighting improvements at New Jail	8	No
BE-39	Outdoor lighting improvements at Public Safety Building	3	No
BE-40	Outdoor lighting improvements at Probation Facility	3	No
BE-41	Outdoor lighting improvements at Probation Juvenile Intake Facility	2	No
BE-42	Outdoor lighting improvements at Probation Juvenile Detention Facility	0.4	No
BE-43	Outdoor lighting improvements at Probation Youth Center	5	No
BE-44	Outdoor lighting improvements at Department of Social & Employment Services Seaside Office	5	No
BE-45	Outdoor lighting improvements at Agricultural Commission Facility	8	No
BE-46	Outdoor lighting improvements at Animal Shelter	6	No
BE-47	Outdoor lighting improvements at Marina Coastal Offices	3	No
BE-48	Outdoor lighting improvements at Laurel Yard Facility	16	No
Total Reductions from All Public Works Measures		719	
Total Reductions from Completed Public Works Measures		228	
Total Reductions from Remaining Public Works Measures		491	
Note: Because of rounding in Microsoft Excel, the totals may not sum exactly.			

3.2.4 AMBAG Energy Watch Program Measures

Between 2006 and 2010, the County identified and implemented a number of lighting and other energy efficiency retrofit projects at County facilities. These projects were sponsored by AMBAG's Energy Watch Program. AMBAG's Energy Watch Program provides energy assessments, retrofit project incentives, and direct installation of energy efficiency fixtures/equipment for municipal

facilities in the Monterey Bay Area (Association of Monterey Bay Area Governments n.d.). Because all of the reduction measures through AMBAG's Energy Watch Program have been completed, the GHG reductions associated with these measures are included in all three reduction scenarios. Table 3-4 lists the facilities where the measures were implemented and the GHG reductions achieved by the measures.



Photo 3-1. HVAC System Retrofits Being Installed at the County Jail

Table 3-4. AMBAG Energy Watch Program Reduction Measures

Measure Number	Location of Measure	GHG Reductions (MTCO ₂ e)
AM-1	Agriculture Center & Corporate Yard Shops	0.03
AM-2	Lake San Antonio (north toll gate)	0.2
AM-3	Monterey County Courthouse	0.05
AM-4	Public Works Yard	0.4
AM-5	Court Building (Marina)	0.3
AM-6	Monterey County King City Court	0.4
AM-7	Social & Employment Services (Seaside District Office)	0.3
AM-8	Lake San Antonio (south toll gate)	0.4
AM-9	Lake San Antonio (north restroom)	0.6
AM-10	Lake San Antonio (south visitor center)	0.6
AM-11	San Lorenzo Park Office & Shop	3
AM-12	Royal Oaks Park	2
AM-13	San Ardo Yard	0.4
AM-14	Probation Youth Center	2
AM-15	Agriculture Center	0.6

Measure Number	Location of Measure	GHG Reductions (MTCO ₂ e)
AM-16	Agriculture Center & Corporate Yard Office	2
AM-17	Lake San Antonio (south camps)	2
AM-18	Lake San Antonio (South Harris creek)	2
AM-19	Public Works (Greenfield)	2
AM-20	Monterey County King City Court	0.6
AM-21	Monterey County King City Court	0.5
AM-22	San Lorenzo Park Museum	4
AM-23	Sheriff and Public Safety Building	1
AM-24	Toro Park	5
AM-25	Lake San Antonio (south shop)	—
AM-26	Lake San Antonio (north shop)	5
AM-27	Social Services	17
AM-28	Social Services	5
AM-29	Monterey County Courthouse	0.9
AM-30	Lake San Antonio (south resort area)	4
AM-31	Monterey County Courthouse	0.9
AM-32	Monterey County Courthouse	1
AM-33	Monterey County Jail Rehab	2
AM-34	Monterey County Jail Rehab	0.8
AM-35	Monterey County Jail Rehabilitation	1
AM-36	Monterey County King City Court	5
AM-37	Probation Headquarters	28
AM-38	Salinas IT Building	32
AM-39	Monterey County Courthouse	8
AM-40	Corporate Yard	40
AM-41	Sherriff/Public Safety	91
AM-42	Monterey County Courts (City of Monterey)	113
AM-43	Heating & Ventilation Upgrade at the County Correctional Facility	228
Total from AMBAG Energy Watch Program Measures		613
Note: Because of rounding in Microsoft Excel, the totals may not sum exactly.		

3.2.5 Other Reduction Measures

In addition to the audit reports and AMBAG lighting measures, the County is also considering or has already implemented several other measures to reduce energy consumption and provide renewable energy. These measures are discussed and presented in Table 3-5 below.

Measure LY-1, which entails the installation of a photovoltaic (PV) system at the Laurel Yard facility, has already been completed by the County. Funding for this measure was provided through the

Department of Energy's EECBG Program. The PV system at Laurel Yard reduces the amount of electricity that the County needs to purchase from PG&E and produces renewable energy without emitting GHGs.

The County is considering implementing measure BM-1, the installation of Building Energy Management Systems (BEMS) in all major facilities in the County¹. BEMS in County facilities would reduce energy consumption through increased automation of lighting and climate controls. According to the Intergovernmental Panel on Climate Change (IPCC), BEMS can improve energy efficiency by 5-20% (Intergovernmental Panel on Climate Change 2007). For this analysis, 12.5%, the mean of the IPCC's range, was assumed. In the Public Works audit report there are a number of measures that call for installing building energy management systems. Energy and GHG savings resulting from these Public Works measures were excluded from the determination of energy savings from the BEMS measure to avoid a double count.

The County is also considering purchasing two electric vehicles for the County fleet, though the funding for this measure is uncertain. By implementing measure EV-1, the County would replace two gasoline fleet vehicles with two electric vehicles.

To further reduce electricity consumption, the County is considering the implementation of measure PL-1, which would replace outdoor lighting fixtures with light fixtures that have a higher level of efficiency. Funding for PL-1 is uncertain at this time.

The County has installed a solar-powered aerator at the Chualar wastewater treatment plant, which eliminates nearly all energy consumption at the facility.



Photo credit: Santa Cruz Westside Electric, Inc. Dba Sandbar.

Photo 3-2. Photovoltaic System at the Laurel Yard Facility, Funded by the Department of Energy's EECBG Program

¹ This analysis assumed BEMS would be installed in the major facilities of the County's original municipal GHG inventory. These facilities include: Environmental Health Center, Seaside Library, Salinas Road Department, Laguna Seca Facilities, Public Defender, Printing and Mail OPS OFC, Parks Department Office, OFC, NMC Office Building, Monterey Courthouse, Marina Court Building, King City Library, King City Courthouse, DSSS (Building One, Office Buildings, and OFC Building), DA Office, County Communication Network Facility, 911 Call Center. Natividad Medical Center was also included in the BEMS analysis. Facilities that will install building energy management systems as part of the Public Works audit report were excluded.

Table 3-5. Other Reduction Measures

Measure Number	Measure Name	Measure Description	GHG Reductions (MT CO ₂ e)	Measure Completed?
LY-1	Photovoltaic System at Laurel Yard	A 141 Kilowatt power solar photovoltaic system was installed at Laurel Yard. This measure was funded through the Department of Energy's Energy and Conservation Block Grant Program.	43	Yes
BM-1	Building Energy Management Systems at Major Facilities	The County would install building energy management systems at all major ² County-owned facilities.	1,013	No
EV-1	Electric Vehicles	The County would purchase two electric vehicles for the vehicle fleet to replace the same amount of internal combustion engine cars.	4	No
PL-1	Public Lighting	The County would replace outdoor lighting fixtures with energy efficient fixtures.	20	No
WW-1	Solar Aerator at Chualar Wastewater Treatment Plant	The County has installed a solar-powered aerator at the Chualar wastewater treatment plant. The County receives credit for electricity savings and GHG reductions that result from using the solar aerator.	7	Yes
Total Reductions from Individual Reduction Measures:			1,087	
Note: Because of rounding in Microsoft Excel, the totals may not sum exactly.				

² Major facilities, for this analysis, were assumed to be all of the facilities listed individually in the County's Municipal GHG Inventory.