Appendix F: Energy Generation & Storage Measures and Methodology

South Bay Cities Climate Action Plans
December 2017

SOUTH BAY CITIES
COUNCIL OF GOVERNMENTS

Appendix F: Energy Generation & Storage (EGS) Measures and Methodology

REFERENCE GUIDE - November 2017

This document is a reference guide for EGS measures that municipal governments may include and implement in their climate action plans. The South Bay Cities Council of Governments (SBCCOG) worked with member cities to identify specific measures and associated calculations to reduce Green House Gas (GHG) emissions using the baseline year of 2005. Reductions were estimated for both community and municipal operations. The 2005 inventory is established as a starting point against which other inventories are compared and targets are set.

Energy Generation and Storage (EGS)

Energy generation and storage (EGS) strategies involve supporting clean renewable energy and decreasing dependence on traditional GHG-emitting power sources. Renewable energy technologies such as wind, solar, geothermal, hydroelectric, and biomass — provide substantial benefits for the climate, human health, and economy. Some renewable energy technologies such as wind and solar have variable outputs which can cause them to generate power inconsistently. Storage technologies have the potential for smoothing out the electricity supply from these sources and ensuring that the supply of generation matches the demand. Different energy storage technologies such as thermal storage, compressed air, hydrogen, pumped hydroelectric storage, flywheels, and batteries contribute to electricity stability by working at various stages of the grid -- from generation to consumer end-use.

Because these strategies are exploratory, the GHG reductions were not quantified for this document. As the City identifies and implements strategies in the future the associated GHG reductions will be quantified.

EGS Measures

Goal 1: Establish City as a leader in the use of alternative energy

Implementation Strategy	Measures
Solar-Photovoltaics (PV) and Thermal	[Development-Existing] Incentivize solar installations on existing parking lots and rooftops
	[Development-New & Existing] Establish ordinance to streamline the solar PV and solar thermal permitting process by reducing approval time and/or fees
	[Development-New] Implement requirement to assure that all new pools be heated with ___% renewable energy, such as solar water heating
	[Development-New] Pre-wired solar homes: Adopt a requirement for pre-wired solar through the Green Building Code update, which is a CALGreen voluntary elective measure (A5.211.4) for both Tier 1 and Tier 2
	[Development-New] Pre-wired solar homes: Require all new roofs to be pre-wired for solar PV and all new buildings to be plumbed for solar water heaters
	[Development-New] Require new construction to employ design that guarantees solar access on neighboring properties. Solar access can be protected legally under existing law and practically by employing simple design principles in planning new development. Current California law does not guarantee solar access without local action.
	[Development-New] Require new parking lots to be covered with structures that support solar production facilities

	[Development-New] Review ordinances and design guidelines for opportunities to ensure roof orientation and other measures such as strategic tree planting to reflect active and passive solar energy principles. Green Building strategy complementing renewable energy - holistic whole building view.
	[Education & Outreach] Distribute information to commercial and industrial facilities on available state and federal rebates and incentive programs, solar leases, and power purchase agreements
	[Education & Outreach] Establish contractor training for installing (insert technology)
	[Education & Outreach] Promote Solar Education and Outreach. Increase public energy conservation and awareness; provide information and education to the general public, business, and organizations on the importance of energy conservation and available programs, products, and incentives regarding energy efficiency and alternatives
	[Education & Outreach] Support and promote demonstrations of solar PV and thermal technologies in public and private projects and leverage these demonstrations to promote the achievement of the goals
	[Funding Mechanisms] Pursue incentives and grant funding through utility, state and/or federal programs for municipal installations. Utility programs include the Self-Generation Incentive Program (SGIP) and California Solar Initiative
Combined Heat and Power (CHP)	[Development-New & Existing] Install CHP systems on city facilities that can benefit from the installation of these systems
	[Development-New & Existing] Require CHP systems for large commercial and industrial facilities that have on-site electricity production, both for new construction and retrofits
	[Education & Outreach] Publicize grant opportunities and financial incentives for CHP. This includes the Self-Generation Incentive Program and feed in tariffs for CHP systems
	[Education & Outreach] Support and promote demonstrations of CHP in public and private projects and leverage these demonstrations to promote the achievement of the goals
	[Funding Mechanisms] Pursue incentives and grant funding through utility, state and/or federal programs for municipal installations. These mechanisms includes the Self-Generation Incentive Program and feed in tariffs for CHP systems
Wind	[Development-New & Existing] Incentivize wind power installations
	[Development-New & Existing] Conduct feasibility studies for the deployment of wind power
	[Development-New & Existing] Establish ordinance to streamline the wind power permitting process by reducing approval time and/or fees
	[Development-New] Identify sites for wind power generation
	[Education & Outreach] Distribute information to commercial and industrial facilities on available state and federal rebates and incentive programs for wind power
	[Education & Outreach] Establish contractor training for installing (insert technology)
	[Education & Outreach] Promote wind power Education and Outreach
	[Education & Outreach] Support and promote demonstrations of wind technologies in public and private projects and leverage these demonstrations to promote the achievement of the goals
	[Funding Mechanisms] Pursue incentives and grant funding through utility, state and/or federal programs for municipal installations. These mechanisms include the Self-Generation Incentive Program and feed in tariffs for wind power systems
Geothermal	[Development-New & Existing] Develop feasibility studies for the deployment of geothermal in both direct and indirect use applications
	[Development-New & Existing] Establish ordinance to streamline the geothermal permitting process by reducing approval time and/or fees
	[Development-New & Existing] Identify sites for geothermal potential for both direct and indirect use applications
	[Education & Outreach] Distribute information to commercial and industrial facilities on available state and federal rebates and incentive programs for geothermal
	[Education & Outreach] Establish contractor training for installing (insert technology)
	[Education & Outreach] Promote geothermal Education and Outreach

	[Education & Outreach] Support and promote demonstrations of geothermal technologies in public and private projects and leverage these demonstrations to promote the achievement of the goals
	[Funding Mechanisms] Pursue incentives and grant funding through utility, state and/or federal programs for municipal installations. These mechanisms include the Self-Generation Incentive Program and feed in tariffs for geothermal
Wave/Tidal	[Development-New & Existing] Develop feasibility studies for the employment of wave/tidal power
	[Development-New & Existing] Identify sites for wave/tidal power generation
	[Education & Outreach] Support and promote demonstrations of wave/tidal technologies in public and private projects and leverage these demonstrations to promote the achievement of the goals
Biomass (Biogas)	[Development-Existing] Develop feasibility study to implement methane recovery at the landfills and wastewater treatment plant to generate energy
	[Development-Existing] Require existing hotels and restaurants to install biodigester during retrofit
	[Development-New] Require installation of biodigestors in new construction (i.e. hotels and restaurants)
	[Education & Outreach] Support and promote demonstrations of biomass technologies in public and private projects and leverage these demonstrations to promote the achievement of the goals
	[Funding Mechanisms] Pursue incentives and grant funding through utility, state and/or federal programs for municipal installations
Energy Storage	[Development-New & Existing] Establish ordinance to streamline the energy storage permitting process by reducing approval time and/or fees
	[Development-New & Existing] Incorporate energy storage in combination with solar installations in municipal facilities
	[Development-New] Promote and incentive energy storage in combination with renewable energy installations in new construction
	[Education & Outreach] Distribute information to commercial and industrial facilities on available state and federal rebates and incentive programs for energy storage
	[Education & Outreach] Establish contractor training for installing (insert technology)
	[Education & Outreach] Promote energy storage Education and Outreach
	[Education & Outreach] Support and promote demonstrations of energy storage technologies in public and private projects and leverage these demonstrations to promote the achievement of the goals
	[Funding Mechanisms] Pursue incentives and grant funding through utility, state and/or federal programs for municipal installations
Generic-Funding Mechanisms	Pursue economic incentives and creative financing for [insert technology] projects as well as support for tenants or developers seeking funding for such projects
	Promote the adoption of a feed-in tariff that further encourages the development of mid-sized renewable energy installations
	Promote the adoption of the NEM (Net Energy Metering) program to encourage clean and/or renewable energy generation facilities
	Promote the adoption of the VNM (Virtual Net Metering) program to encourage clean and/or renewable energy generation facilities for low incomes residents
	Offers incentives to encourage a switch in electricity generation from fossil fuels to renewable sources through small-scale renewable electricity generation
	Promote investor-owned utilities self-generation incentive programs
	Pursue funding to identify renewable energy resources in the sub region (or city) and advise on how the amount of renewable energy generated within the sub region (or city) may be increased over the short-, medium-, and long-term
	Research and promote innovative financing opportunities for commercial and residential alternative/renewable energy installations
Renewable Energy Credits (RECs)	Purchase renewable energy credits as one of the strategies in an alternative energy portfolio mix

Generic- Siting and Permitting	Identify and develop methods to address barriers to renewable energy development, including permitting issues and potential opposition from the local community
	Develop maps of alternative/renewable energy potential in the [City]
	Provide complimentary plan check review to identify alternative/renewable energy opportunities in new construction
	Create a permitting process to accelerate alternative and renewable clean energy projects
Generic Policies and Ordinances	Implement onsite renewable energy generation policy for [select year - 2020, 2030, 2050]
	Establish policies and programs that facilitate the siting of new alternative energy generation and/or storage
	Conduct ongoing city staff training to building officials, plan checkers, and other building department staff on alternative/renewable energy technologies
	Identify and remove or reduce barriers to alternative/renewable energy generation, including: * Review and revise building and development codes, design guidelines, and zoning ordinances to remove barriers * Work with related agencies, such as fire, water, health and others that may have policies or requirements that adversely impact the development or use of alternative/renewable energy technologies
Generic- Education and Outreach	Promote alternative/renewable energy Education and Outreach in combination with energy efficiency
	Encourage low income residents to participate in installing alternative/renewable energy in their homes
	Promote high-impact energy efficiency options, target key institutions, and develop partnerships to implement new projects
	Promote opportunities for businesses "greening" through local chambers of commerce and other partners
	Provide incentives to promote voluntary Green Building practices incorporating alternative/renewable energy and energy efficiency

Goal 2: Achieve local control of energy supply

Implementation Strategy	Actions (Measure)
Community Choice Aggregation (CCA)	Conduct feasibility study for Community Choice Aggregation to allow residents and businesses to aggregate their buying power to purchase renewable energy
	Pursue Community Choice Aggregation
Microgrid	Establish a microgrid in municipal facilities
	Conduct feasibility study for a community microgrid
	Establish a community microgrid

Goal 3: Pursue Carbon Offsets

Implementation Strategy	Actions (Measure)
Carbon Offsets	Purchase Carbon offsets for employee air travel