Renewable Electricity Standard	Senate Majority Draft RES	Waxman-Markey RES
Generation Technologies that Qualify for RECs (see specific qualifications below)	• Wind energy • Solar energy • Geothermal energy • Biomass or landfill gas • Qualified hydropower • Marine and hydrokinetic energy • Coal-mine methane • Secretary will have the ability to add renewables to this list as new technologies develop	• Wind energy • Solar energy • Geothermal energy • Renewable biomass • Biogas derived exclusively from renewable biomass • Biofuels derived exclusively from renewable biomass • Qualified hydropower • Marine and hydrokinetic energy • Landfill gas • Wastewater treatment gas • Coal mine methane used to generate electricity at or near mine mouth • Qualified waste-to-energy
Stipulations on Existing Renewable Generation	In order to count as a new renewable and receive full RECs for generation, a facility Must be placed in service after January 1, 2006. For facilities placed in service before January 1, 2006 (classified as existing renewables) that generate electricity from: • Solar energy • Wind energy • Ocean energy • Biomass • Qualified hydropower • Incremental geothermal production Any additional energy above the average amount produced between January 1, 2004 and January 1, 2006 will be included. Except for geothermal (see	None outside of limitations on hydropower and waste-to-energy. See limitations below.

	explanation below). In states where renewable electricity standards are already in place and RECs are supplied for generation, utilities shall receive federal credits amounting to: • the quantity of renewable energy resulting from the generation or purchase by the electric utility of existing renewable energy or new renewable energy if RECs are supplied In the case were alternative compliance payments or fees exist: • the pro rata share of the electric utility, based on the contributions to the mechanism made by the electric utility or customers of the electric utility, in the State, of the quantity of renewable energy resulting from those mechanisms.	
Limitations on Geothermal	Existing geothermal facilities count towards the RES target, with an equation limiting incremental geothermal they can claim, and therefore the amount of RECs they can receive. See table note at the end of this document for the calculation of incremental geothermal for facilities in place prior to January 1, 2006.	None

Biomass Definition	Biomass definition taken from the Energy Policy Act of 2005. Defined as: Any lignin waste material that is segregated from other waste materials and is determined nonhazardous by the Administrator of the EPA and any solid, nonhazardous cellulosic material that is derived from; • any of the following forest-related resources: mill residues, pre-commercial thinnings, slash, and brush, or non-merchantable material • solid wood waste materials, including waste pallets, crates, dunnage (scrap wood), manufacturing and construction wood wastes (other than pressure-treated, chemically-treated, or painted wood wastes), and landscape or right-of-way tree trimmings, but not including municipal solid waste, gas derived from the biodegradation of solid waste, or paper that is commonly recycled • agriculture wastes, including orchard tree crops, vineyard, grain, legumes, sugar, and other crop byproducts or residues, and livestock waste nutrients • a plant that is exclusively grown as a fuel for electricity production	Renewable Biomass defined as: • Plant material, including waste material, harvested or collected from actively managed agricultural land that was in cultivation, cleared, or fallow and non-forested on January 1, 2009 • Plant material, including waste material, harvested or collected from pastureland that was non-forested on January 1, 2009 • Nonhazardous vegetative matter derived from waste, including separated yard waste, landscape right-of-way trimmings, construction and demolition debris or food waste (no municipal solid waste, recyclable waste paper, painted, treated or pressurized wood, or wood contaminated with plastic or metals) • Animal waste or animal byproducts • Vegetative matter removed from any structure within 600 feet of any building, campground, or route designated for evacuation by a public official with responsibility for emergency preparedness or from within 300 feet of a paved road, electric transmission line, utility tower or water supply line • Residues from byproducts of milled logs that were not from Federal forested land or high conservation priority land • Trees, brush, slash, residues, energy crops, or vegetative matter removed from managed tree plantation established prior to January 1, 2009 or on land that was cultivated, fallow or deforested prior to January 1, 2009 • Logging residue, thinnings, cull trees

		pulpwood, brush and species that are non-native and noxious, from stands that were planted and managed after January 1, 2009 to restore or maintain native forest types • Dead or severely damaged trees removed within 5 years of fire, blowdown, or other natural disaster, and badly infested trees • Materials, pre-commercial thinnings or removed invasive species from the National Forest System land and public lands including those that are byproducts of preventive treatments that are removed as part of a federally recognized timber sale, or that are removed to reduce hazardous fuels, to reduce or contain disease or insect infestation, or to restore ecosystem health. Cannot be from designated wilderness or conservation areas and must be harvested in sustainable quantities and in accordance with state and federal law.
Limitations on Hydropower	Only "incremental hydropower," meaning additional energy generated by efficiency improvements or capacity additions occurring on or after January 1, 2001, is to be included in the RES as "qualified hydropower." Additional energy produced from operational changes that are not related to efficiency improvements or capacity additions is excluded.	Only "qualified hydropower" is to be included in the RES. "Qualified hydropower" consists of capacity additions and efficiency improvements made to hydroelectric facilities on or after January 1, 1992as well as hydroelectric additions made to dams that were not functioning as hydroelectric facilities on or after January 1,1992. Additional energy produced from operational changes that are not related to efficiency improvements or capacity additions is excluded.

Definition of Hydrokinetic	As defined in EISA of 2007: (1) waves, tides, and currents in oceans, estuaries, and tidal areas; (2) free flowing water in rivers, lakes, and streams; (3) free flowing water in man-made channels; and (4) differentials in ocean temperature (ocean thermal Energy conversion). The term ‘‘marine and hydrokinetic renewable energy’’ does not include energy from any source that uses a dam, diversionary structure, or impoundment for electric power purposes.	As defined in EISA of 2007: (1) waves, tides, and currents in oceans, estuaries, and tidal areas; (2) free flowing water in rivers, lakes, and streams; (3) free flowing water in man-made channels; and (4) differentials in ocean temperature (ocean thermal Energy conversion). The term ‘‘marine and hydrokinetic renewable energy’’ does not include energy from any source that uses a dam, diversionary structure, or impoundment for electric power purposes.
Limitations on Waste-to-Energy Systems	Not included as a renewable technology. Rather, not counted in base quantity (see Base Quantity).	“Qualified waste-to energy” defined as: • Energy from the combustion of municipal solid waste or construction, demolition, or disaster debris, or from the gasification or pyrolization of such waste or debris and the combustion of the resulting gas at the same facility provided that • Such term shall include only the energy derived from non-fossil biogenic portions • Total life cycle emissions attributable to the generation of electricity from such waste are lower than the likely alternative method of disposal • The facility generating is in compliance with State and Federal environmental permits • The facility meets emissions standards promulgated under sections 112 or 129 of the Clean Air Act • Waste originates from an area where recycling services are provided

Minimum Annual Compliance Schedule for Percentage of Base Quantity That Must Come From Renewable Energy/Efficiency Savings	2011-2013……..3.0% 2014-2016……..6.0% 2017-2018……..9.0% 2019-2020……..12.0% 2021-2039……..15.0%	2012-2013……..6.0% 2014-2015……..9.5% 2016-2017……..13.0% 2018-2019……..16.5% 2020-2039……..20.0%
Base Quantity	Total electricity sold by a utility to customers during a year excluding electricity generated by: hydroelectric facilities that are not "qualified hydropower," municipal solid waste incineration, and new nuclear power or uprates from existing nuclear facilities.	Total electricity sold by a utility to customers during a year excluding electricity generated by hydroelectric facilities that are not "qualified hydropower" and new nuclear power. Fossil fuel electricity generation for which the associated CO_2 emissions are captured and sequestered does not count toward the base quantity.
Facilities Covered	Electric utilities are covered. No specific definition of an electric utility; only exemptions (see exemptions below).	"Retail Electricity Suppliers," defined as, "an electric utility that sold not less than 4,000,000 MWh of electric energy to electric consumers for purposes other than resale during the preceding year."
Exemptions	Utilities that sold less than 4,000,000 MWh of electricity to consumers during the preceding calendar year are exempt from participation, as is the state of Hawaii.	Utilities that sold less than 4,000,000 MWh of electricity to consumers during the preceding calendar year are not defined as "retail electric suppliers" and are, therefore, not required to participate in the RES.
Functional Unit	1 federal renewable energy credit (REC) per kilowatt-hour (kWh) of qualified renewable electricity generation.	1 federal REC per megawatt-hour (MWh) of qualified renewable electricity generation.

Alternative Compliance Payments	Alternative compliance payment set at a rate of $.021/kWh adjusted for inflation from a base year of 2008. Effective price ceiling of $21/MWh.	$25/MWh adjusted for inflation every January 1 from base year of 2009
Penalties for Non-Compliance	Utilities that are found to be out of compliance with annual requirements will be forced to pay 200% of the value of the alternative compliance payment from the preceding year— which is $.021/kWh adjusted for inflation—for each kWh for which they are out of compliance. Effective penalty ceiling of $42/MWh.	Utilities that are found to be out of compliance with annual requirements will be forced to pay 200% of the value of the alternative compliance payment from the preceding year for each REC for which they are out of compliance. Effective penalty ceiling of $50/MWh.
Usage of Revenues Generated from RES	Alternative compliance payments and civil penalties assessed are to be returned to states. Funds will be used for increasing the quantity of renewable energy generation within the state, to promote the development of electric vehicles, or to offset the costs of the program borne by electricity consumers through efficiency investments or direct grants. The allocation of funds for each state will be based on the proportion they have deposited into the account.	Alternative compliance payments and civil penalties assessed are to be given to states based on the portion they paid-in. States must then use these funds to pay for the deployment of renewable energy technologies or cost-effective energy efficiency programs. States must provide full accounting of their use of the funds. Failure to comply revokes the state's right to the funds, and they will instead be deposited in the U.S. Treasury.
Banking	RECs can be submitted for compliance up to 3 years after the date they were issued.	RECs can be submitted for compliance up to 3 years after the date they were issued.
Energy Efficiency Compliance Options	Governors of all states can petition the Secretary to permit compliance through energy efficiency improvements. If granted, up to 26.67% of a state's annual compliance requirement can be met by submitting energy efficiency credits. These credits have the same attributes as renewable energy credits in that they can be traded and transferred amongst entities.	Utilities can use demonstrated "total annual electricity savings" to satisfy up to 25% of the standard. At least 75% of the standard must be met with renewable energy credits. "Electricity savings" are calculated as the net difference between "customer facility savings"— the decrease in electricity at a consumer site— and the increases in fuel consumption at said site (this

	Energy efficiency credits represent "qualified electricity savings," which are verifiable and quantifiable "customer facility savings," or reductions in electricity use amongst the utility's consumers, and at its facilities, from a base year "Electricity savings" are calculated as the net difference between "customer facility savings"— the decrease in electricity at a consumer site— and the increases in fuel consumption at said site (this prevents on-site generation from counting as a reduction), plus the reductions in distributions losses stemming from new equipment installation relative to losses that would have occurred through the use of equipment of average efficiency. Electricity savings from combined heat and power are also included. Savings must stem from energy efficiency investments; those caused by other factors, such as climate or economic conditions, are excluded. Energy efficiency credits will be provided on the following schedule: 1 credit…….50% improvement 1.1 credits…..50-70% improvement 1.25 credits…70-90% improvement 1.5 credits….>90% improvement	prevents on-site generation from counting as a reduction), plus the reductions in distributions losses stemming from new equipment installation relative to losses that would have occurred through the use of equipment of average efficiency. "Electricity savings" Includes combined heat and power savings, fuel cell savings, and recycled energy savings. Recycled energy savings are defined as, "a reduction in electricity consumption that results from a modification of an industrial or commercial system that commenced operation before the date of enactment of this section, in order to recapture electrical, mechanical, or thermal energy that would otherwise be wasted" Governors of all states can petition the Secretary to increase the percentage of compliance that can be met through total annual electricity savings. If granted, the electric supplier's federal annual compliance requirement for energy sold within that state can be met through energy efficiency will be increased to 40%.
REC Multipliers	Renewable energy generated by facilities located on Indian land will receive double the RECs per kWh generated. Small renewable distributed generators (capacity less than 1 MW) will receive triple the RECS per kWh generated.	Renewable energy generated by "distributed generation facilities"— defined as those that primarily serve 1 or more consumers at or near the site and are either no larger than 2 MW in capacity, or are no larger than 4 megawatts in capacity if they are placed in service after enactment and do not use combustion to generate

	Facilities that use algae to produce energy will receive 3 RECs per kWh generated.	electricity—shall be issued 3 RECs for each MWh generated. The REC multiplier for "distributed generation facilities" is subject to adjustment by January 1, 2014 and every 4 years thereafter. New facilities are guaranteed the REC multiplier in place during their first year in service for a period of 10 years.
Ratepayer Protection	Effective beginning June 1, 2010, and on or before June 1 every year thereafter, each utility may petition the Secretary to waive or reduce compliance for the following year so as to limit incremental costs of compliance to no more than a 4% increase per retail customer annually.	No additional ratepayer protection clause.
Utility Protection	Stipulations of RES can be waived if a utility is suffering financial hardship brought on by natural disasters or conditions outside of a utility's reasonable control. The Secretary can also be petitioned for a 1 year variance from utilities that are having difficulty complying because inadequate transmission is impeding their ability to establish new renewable facilities.	Utilities may seek judicial review of any decision made regarding penalties for non-compliance.

Note: Incremental geothermal will be calculated as: $E - E_{avg}$

Where E is equal to a given years electricity production and E_{avg} is equal to the previous 7 years electricity production average taken without the highest and lowest production years.

Utilities will be allowed to decrease E_{avg} on an annual basis by the average percentage decrease in annual production for the 7 year period before enactment. Cumulative decrease will not exceed 30%. This will either increase the incremental geothermal they produce, providing them with more RECs, or it will allow for a consistent amount of RECs as production declines because of resource exhaustion and facility scales down operation.