Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans

Appendix A: Glossary

EPA-456/D-12-001b
July 2012

Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans

Appendix A: Glossary

By:
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Outreach and Information Division
Research Triangle Park, North Carolina

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Outreach and Information Division
Research Triangle Park, North Carolina

ACKNOWLEDGMENTS

We would like to acknowledge substantial contributions from members of an inter-office EPA team that included the Office of Atmospheric Programs, the Office of Policy Analysis and Review, the Office of General Counsel and Regions 1 and 6. This document also reflects comments received from a number of stakeholders, including state and local air quality agencies.

Allowance: An allowance is an authorization to emit a specific amount of a pollutant under a cap and trade program. For example, under the U.S. Sulfur Dioxide (SO_2) Allowance Trading Program, one allowance is the authorization to emit 1 ton of SO_2. Allowances are used for compliance and can be traded among sources participating in the cap and trade program.

Annual Energy Outlook: Prepared by the U.S. Department of Energy's Energy Information Administration (EIA), the Annual Energy Outlook presents long-term projections of energy supply, demand, and prices through 2035, based on results from EIA's National Energy Modeling System.

Baseline Projections: Baseline projections, including energy supply and demand and related emissions, are intended to describe future year conditions and typically assume continuation of current trends and no changes in laws and regulations. Baseline projections are sometimes referred to as "business-as-usual" projections. A baseline projection can be used for comparison with one or more alternative policy scenarios to assess the impacts of various policies.

Combined Heat and Power: Also known as cogeneration, combined heat and power (CHP) is an efficient, clean, and reliable approach to generating power and thermal energy from a single fuel source. Since less fuel is burned to produce each unit of energy output, CHP reduces air pollution and greenhouse gas emissions. As a result, the emission benefits from CHP systems can be recognized for State Implementation Plan/Tribal Implementation Plan credit. Typical CHP configurations include gas turbines or engines with heat recovery units or steam boilers with a steam turbine.

Clean Air Act: The Clean Air Act (CAA) is the law that defines the U.S. Environmental Protection Agency's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. The last major change in the law occurred when Congress enacted the CAA Amendments of 1990. Legislation passed since then has made several minor changes.

Criteria Air Pollutant: The Clean Air Act requires the U.S. Environmental Protection Agency to set National Ambient Air Quality Standards for six common air pollutants. These common air pollutants (also known as "criteria pollutants") are found all over the country. They are particle pollution (often referred to as particulate matter), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead.

Demand: The time rate of energy flow. Demand usually refers to electric power measured in kilowatt but can also refer to natural gas, usually as British thermal unit/hour (Btu/hr), kiloBtu/hr, or therms/day.

Discount Rate: A measure of the time value of money.

Electric Generating Unit: This is an entity that supplies electricity to the electricity system relying on a variety of fuels.

Electricity Dispatch Models: Electricity dispatch models (also commonly referred to as "production cost" models) simulate the dynamic operation of the electric system, generally on a least-cost system dispatch. In general, these models optimize the dispatch of the system based on the variable costs of each resource and any operational constraints that have been entered into the model. These models are

helpful in assessing which existing plants are displaced. These models are also used in short-term planning and regulatory support.

Emissions & Generation Resource Integrated Database: The Emissions & Generation Resource Integrated Database is a comprehensive inventory of environmental attributes of electric power plants, providing air emissions data for the electric power sector. The U.S. Environmental Protection Agency maintains the database.[1]

Energy Efficiency: Energy efficiency is achieving the same or better level of service or performance with lower energy consumption. Examples include high-efficiency appliances; efficient lighting; high-efficiency heating, ventilating and air conditioning systems or control modifications; efficient building design; advanced electric motor drives; combined heat and power; and heat recovery systems.

Energy Efficiency Policy: Energy efficiency (EE) policy means an enacted law and/or regulation by a state, locality, or public utility commission order which requires applicable entities to adopt energy efficient technologies and/or practices, or to undertake activities to further such adoption in the marketplace. It can include: (1) policies that establish minimum efficiency requirements for new homes and buildings (building energy codes) or appliances (appliance standards); (2) policies that establish requirements on utilities (or other program administrators) to deliver a specified amount of energy savings by developing EE programs to increase market adoption of EE technologies and practices (EE resource standards); and (3) policies that commit to specified funding levels dedicated to implementing EE programs (e.g., EE rebates or combined heat and power capital cost incentives from public benefits funds). State and local governments both have authority over EE policies. EE policies are generally enforced over a multi-year period or until changed or updated by revised legislation or regulation (e.g., adopting a revised building energy code). These programs can be funded through ratepayer surcharges, federal funds, proceeds from pollution auctions such as the Regional Greenhouse Gas Initiative, or any combination of the above.

Electric-sector EE and renewable energy policies, programs and projects that will result in quantifiable reductions in emissions at existing fossil fuel-fired electric generating units and that improve air quality in a nonattainment area can be accounted for in State and Tribal Implementation Plans.

Energy Efficiency Program: Energy efficiency (EE) program means a program designed to increase adoption of energy efficient technologies and practices in particular end-use sectors (or specific market segments within a sector) through education and outreach, financial incentives, and/or technical assistance. An individual EE program can be run by a utility, state or local government, and/or third parties. In most cases, EE program administrators (i.e., utilities, state agencies, or 3rd parties) develop and implement EE programs to meet adopted EE policy objectives. State Public Utilities

[1] For more information, go to: www.epa.gov/egrid.

Commissions oversee and approve the EE programs funded with rate-payer resources. EE programs typically operate over a one to three year period.

Electric-sector EE and renewable energy policies, programs and projects that will result in quantifiable reductions in emissions at existing fossil fuel-fired electric generating units and that improve air quality in a nonattainment area can be accounted for in State and Tribal Implementation Plans.

Energy Efficiency Project or Measure: Installation of equipment, installation of subsystems or systems, or modification of equipment, subsystems, systems, or operations on the customer side of the meter, in order to improve energy efficiency (EE). These projects or measures can be taken in conjunction with or independent of an EE policy or program.

Energy Efficiency Resource Standard: An Energy Efficiency Resource Standard (also known as Energy Efficiency Portfolio Standards) consists of electric and gas savings targets for utilities, often with flexibility to achieve them through a market-based trading system or a buyout-option to purchase credits at a default price.

Energy Model: This refers to simulation models that utilize computer modeling software to analyze the electric power system Energy models are capable of simulating electric system dispatch, forecasting future capacity and technology changes, and/or representing behavior of system-wide energy markets. Examples of energy models include: Energy 2020, Integrated Planning Model, MARKAL, National Energy Modeling System, Strategist by Ventyx.

Evaluation, Measurement and Verification: The performance of studies and activities aimed at determining the effects of a program; any of a wide range of assessment activities associated with understanding or documenting program performance, assessing program or program-related markets and market operations; any of a wide range of evaluative efforts including assessing policy or program-induced changes in energy efficiency markets, levels of demand or energy savings, and program cost-effectiveness.

Federal Enforceability: This refers to what occurs in the State Implementation Plan (SIP) planning process when the U.S. Environmental Protection Agency (EPA) approves a SIP control strategy submitted to it for review and the SIP becomes federally enforceable. A federally enforceable SIP provides EPA with authority to ensure the SIP is implemented. Once energy efficiency/renewable energy policies and programs become federally enforceable, EPA has the authority under the Clean Air Act (CAA) to apply CAA-mandated penalties against the noncompliant party.

Future Attainment Year Baseline: A specific year in the future for which a state, tribal or local agency must show attainment of the National Ambient Air Quality Standard. The baseline forecast of emissions in a future attainment year refers to the emissions that will result if no future policies or programs are adopted and implemented. A baseline forecast of future emissions is made when an area prepares a State or Tribal Implementation Plan (SIP/TIP). Future year emission projections

provide a basis for considering control strategies for (SIPs/TIPs), conducting attainment analyses, and tracking progress towards meeting air quality standards.

Heating, Ventilating, and Air Conditioning: Heating, ventilating, and air conditioning refers to technology to provide for indoor environmental comfort.

Independent System Operator: Independent system operators (ISOs) **s**erve as grid operators, coordinating the power grid to ensure reliable delivery. ISOs also match generation to load instantaneously to keep electricity supply and demand balanced and administer forward capacity markets where utilities can use energy efficiency as a resource to meet demand.

Integrated Planning Model: The EPA uses the Integrated Planning Model (IPM) to analyze the impact of environmental policies on the electric power sector in the 48 contiguous states and the District of Columbia. This model simultaneously models electric power, fuel, and environmental markets associated with electric production. It is a capacity expansion and system dispatch model. Dispatch is based on seasonal, segmented load duration curves, as defined by the user. IPM can be used to model the impacts of clean energy resources on the electric sector in the short and long term.

Kilowatt-Hour: A kilowatt-hour (KWh) is a unit of work or energy, equivalent to 1 kilowatt (1,000 watts) of power expended for 1 hour. One kWh is equivalent to 3,412 British thermal units.

Load Shapes: Representations such as graphs, tables, and databases that describe energy consumption rates as a function of another variable such as time or outdoor air temperature.

Marginal Emission Rates: The emissions associated with the marginal generating unit in each hour of the day.

Measurement and verification: Data collection, monitoring, and analysis associated with the calculation of gross energy and demand savings from individual sites or projects. Measurement and verification can be a subset of program impact evaluation.

Megawatt: A megawatt is one million watts of electricity.

Megawatt-hour: A megawatt-hour is one thousand kilowatt-hours or 1 million watt-hours.

National Ambient Air Quality Standards: The Clean Air Act (CAA), which was last amended in 1990, requires the U.S. Environmental Protection Agency to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The CAA established two types of NAAQS. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Nitrogen Oxides: Nitrogen oxides can refer to a binary compound of oxygen and nitrogen, or a mixture of such compounds.

North American Electric Reliability Corporation: The North American Electric Reliability Corporation (NERC) is the electric

reliability organization certified by the Federal Energy Regulatory Commission to establish and enforce reliability standards for the bulk-power system. NERC ensures the reliability of the North American bulk power system.

"On the books" Energy Efficiency/ Renewable Energy Policies: Energy efficiency/renewable energy policies that have been adopted by a legislative or regulatory body.

"On the way" Energy Efficiency/ Renewable Energy Policies: Energy efficiency/renewable energy policies that are planned for adoption by a legislative or regulatory body prior to the submittal of the State or Tribal Implementation Plans in question to the U.S. Environmental Protection Agency.

Peak Demand: The maximum level of metered demand during a specified period, such as a billing month or a peak demand period.

Portfolio: A portfolio is either (1) a collection of similar programs addressing the same market, technology, or mechanisms or (2) the set of all programs conducted by one organization.

Power Pool: A power pool is an association of two or more interconnected electric systems that agree to coordinate operations and planning for improved reliability and efficiencies.

Program: A group of projects, with similar characteristics and installed in similar applications.

Public Utilities Commission or Public Service Commission: A public utilities commission or public service commission is a governing body that regulates the rates and services of a public utility. In some cases, government bodies with the title "Public Service Commission" may be civil service oversight bodies, rather than utility regulators.

Renewable Energy: Renewable **e**nergy resources are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy resources include biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action.

Renewable Energy Policy: Regulations, statutes, or state public utility commission orders that require parties to acquire renewable energy or to commit to funding levels for programs aimed at acquiring renewable energy.

Electric-sector energy efficiency and renewable energy policies, programs and projects that will result in quantifiable reductions in emissions at existing fossil fuel-fired electric generating units and that improve air quality in a nonattainment area can be accounted for in State or Tribal Implementation Plans.

Renewable Energy Program: Renewable energy program means a program designed to increase the production and use of renewable energy sources through resource development and procurement, education and outreach, financial incentives, and/or technical assistance.

Electric-sector energy efficiency and renewable energy policies, programs and projects that will result in quantifiable reductions in emissions at existing fossil

fuel-fired electric generating units and that improve air quality in a nonattainment area can be accounted for in State or Tribal Implementation Plans.

Renewable Portfolio Standard: A renewable portfolio standards are a requirement on retail electric suppliers to supply a minimum percentage or amount of their retail load with eligible sources of renewable energy (e.g., solar, wind, biomass and geothermal).

Retail Electricity Supplier: A person or entity that sells electrical energy to end-use customers, including but not limited to electric utility distribution companies supplying basic service or any successor service to end-use customers.

State Implementation Plans: A State Implementation Plan (SIP) is a plan developed by a state detailing how that state will comply with the requirements of the federal Clean Air Act, administered by the U.S. Environmental Protection Agency. The SIP consists of narrative, rules, technical documentation, and agreements that an individual state will use to meet the National Ambient Air Quality Standards.

State Implementation Plan/Tribal Implementation Plan Credit: Credit for State and Tribal Implementation Plans means emission reductions, achieved by using technologies or strategies, used by a state or tribe for the purpose of meeting emission reduction requirements in its reasonable further progress, attainment or maintenance (control) strategy.

Tribal Implementation Plans: Although not required to do so, a tribe with "treatment as state" eligibility may develop its own air quality control plan, called a Tribal Implementation Plan, for approval by the U.S. Environmental Protection Agency (EPA). A TIP enacted by a tribal government and approved by the EPA is legally binding under both tribal and federal law and may be enforced by the tribe, EPA and the public.

Voluntary Energy Efficiency/Renewable Energy Programs: These are energy efficiency/renewable energy programs are not directly enforceable against a source or party administering the program. Examples could include municipal government energy conservation plans or public awareness campaigns.

Emerging/Voluntary Measures Policy: In September 2004, the U.S. Environmental Protection Agency issued guidance entitled: "Incorporating Emerging and Voluntary Measures in a State Implementation Plan (SIP)." The guidance provides a policy for areas to try new types of pollutant reduction strategies such as energy efficiency/renewable energy programs to attain or maintain the National Ambient Air Quality Standards and meet Clean Air Act requirements.

Watt: The watt is a standard unit of electrical power equivalent to one ampere flowing across a potential difference of one volt. A watt is equal to 1/746 horse power.

Weight-of-Evidence: The augmentation of a State Implementation Plan/Tribal Implementation Plan modeled attainment test with supplemental analyses, which may yield a conclusion different from that indicated by the modeled attainment test results alone.

United States
Environmental Protection
Agency

Office of Air Quality Planning and Standards
Outreach and Information Division
Research Triangle Park, NC

Publication No. EPA-456/D-12-001b
July 2012