

Renewable Energy and Energy Efficiency for State Implementation Plans

Energy services fuel economic growth and prosperity. But energy also pollutes, dispersing substantial air emissions from sources such as power plants, vehicles, industrial production, and buildings. For air quality planners seeking to limit pollution from energy sources, renewable energy and energy efficiency technologies can reduce these emissions.

Potential Renewable Energy and Energy Efficiency Projects for Future SIPs

States can use renewable energy, energy efficiency, advanced-vehicle, and alternative fuels projects for State Implementation Plans (SIPs). The National Renewable Energy Laboratory can help states use these energy technologies to meet air quality goals:

- New renewable electricity generation that uses wind, biomass, geothermal, solar, or hydro resources;
- Energy-efficient electrical equipment purchases for residential, commercial, or industrial applications, such as efficient electric motors, office equipment, and consumer appliances;
- Energy-efficient building projects, such as community planning requirements and building codes, air sealing and insulation, space conditioning, and lighting;
- Advanced vehicles and alternative fuels for on-road vehicles and off-road engines, such as natural gas, biodiesel, ethanol, hybrid-electric, and fuel cell vehicles.

Regulatory Authority: How Can We Do This?

Nonmobile Sources:

The Environmental Protection Agency (EPA) is developing a guidance that facilitates the use of renewable energy and energy efficiency technologies to address nonmobile source emissions in State Implementation Plans. This may allow renewable energy and energy efficiency to be used to demonstrate attainment, reasonable further progress, rate of progress, or maintenance.

Energy Efficiency and Renewable Energy Set-Aside Under Stationary Source Market Programs:

States in the NO_x SIP Call region of the Eastern United States must cap their NO_x emissions from large, stationary sources. These states may make allowances available to energy efficiency and renewable energy projects through set-asides, which provides extra incentives to these projects.

Mobile Sources

The Clean Air Act Amendments of 1990 create opportunities for advanced vehicle technologies and alternative fuels that reduce emissions. These opportunities include use of alternative-fuel vehicles in low-emission vehicle programs and use of ethanol from renewable sources in oxygenated fuel programs.

Examples of Renewable Energy and Energy Efficiency in State Implementation Planning

- Western Regional Air Partnership policy supports renewable energy and energy efficiency as cost-effective mitigation measures for regional haze SIPs;
- Emissions reductions from end-use electrical energy efficiency are included in SIPs in Maryland and Texas, as described in EPA's new guidance.
- Energy efficiency and renewable energy set-asides for NO_x trading programs are in effect or under development in Indiana, Maryland, Massachusetts, New Hampshire, New Jersey, New York, and Ohio;
- Alternative-fueled vehicles are being used in SIPs to help meet air quality goals in many states, including California, Texas, Arizona, and Nevada.

Importance of Energy Efficiency and Renewable Energy in State Implementation Planning

Energy systems are large contributors to air quality problems, and energy technology investments are long-term commitments. State Implementation Planning is one opportunity to influence long-term energy technology investment toward cleaner energy systems, which will contribute to air quality preservation during the system's operational life. Energy efficiency and renewable energy technologies can help meet growing energy-service needs while maintaining or improving air quality.



State Implementation Plans (SIPs) encourage energy-efficient building projects, such as applying photovoltaic technologies, to meet air-quality goals.

Questions and Answers

1. What are the benefits of using renewable energy and energy efficiency in State Implementation Plans?

- **Cost-Effective:** Renewable energy and energy efficiency can be the least-cost solution for both energy and environment.
- **Benefits Local Economy:** Renewable energy and energy efficiency can help retain energy expenditures within a state or local area, contributing to economic growth.
- **Reduces Multiple Pollutants:** Renewable energy and energy efficiency prevent pollution across a wide range of criteria and hazardous air pollutants, as well as greenhouse gas emissions.

2. How do renewable energy and energy efficiency technologies reduce air emissions?

Efficient use of electricity reduces the need for electricity generation and associated emissions. Some forms of renewable electricity generation have zero emissions during generation, such as wind and photovoltaics. Others, such as biomass and geothermal electricity generation, have lower emissions. Advanced vehicles and alternative fuels can reduce emissions. Electric and fuel cell vehicles have zero emissions during operation; and alternative fuels such as natural gas, ethanol, and biodiesel can reduce emissions during vehicle use and during the fuel cycle. Efficient vehicles use less oil and reduce fuel-cycle emissions.

3. What are issues for renewable energy and energy efficiency in State Implementation Plans?

- **Technology Cost and Performance:** Clean energy works! Many renewable energy and energy efficiency technologies are proven and commercially available. States also may choose to pursue demonstrations of newer technologies. Technical experts can assist states in understanding the amount of risk associated with different technologies.
- **Quantity and Location of Emissions Reductions from Electricity Generation:** Estimating effects on air emissions of renewable electricity generation and energy-efficient electrical equipment depends on the performance of the technology itself – and on what would happen in its absence. EPA's guidance discusses quantification issues and resources in detail. A DOE pilot project is starting to further develop quantification processes, with advice from EPA and others.
- **Relation to Baseline Assumptions:** Renewable energy and energy efficiency as SIP measures must be clearly distinguished from assumptions about the use of these technologies in the baseline. Inventories may need refinement to establish this distinction.

4. If a state wants to use these technologies, what are the next steps?

Using emissions inventories and emissions reduction targets, SIP officials can work with technology experts to develop alternatives. Your state energy office may offer assistance, and national contacts are listed below.

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