



NORTHEAST AND MID-ATLANTIC STATES COLLABORATIVE ON RPS IMPLEMENTATION – MODEL RESOURCE ELIGIBILITY DEFINITIONS

States have multiple policy objectives for enacting renewable portfolio standards (RPS) and these objectives often vary from state to state. States are interested in taking advantage of some or all of the various benefits associated with renewable energy, such as obtaining environmental benefits, improving resource diversity, advancing technologies, promoting in-state economic development, and responding to public support for renewable energy.

Each of these objectives, however, can inform different definitions of renewable resources that are eligible for the RPS. In designing an RPS, policy makers seek to match their goals with the characteristics of the different renewable resources. As a result, there is substantial variation between state RPS programs in the definitions of eligible resources.

While there is no single, ideal way to define eligible RPS resources, there is merit in establishing some clear, common definitions of renewable resources for states to consider as RPS programs evolve and mature. To that end, the members of the *Northeast and Mid-Atlantic States Collaborative on RPS Implementation* have developed a set of model resource eligibility definitions. In developing these definitions, members took into consideration each state's current definitions as a starting point; selected definitions where there was substantial commonality between states already; crafted new definitions when warranted that are clear, specific, and consistent with the major RPS policy objectives of the states; and considered special issues associated with specific technologies and fuels (i.e. unique characteristics of hydropower and biomass).

The following recommended model definitions are based on the experience of RPS administrators participating in the Northeast and Mid-Atlantic States Collaborative. They are based on identification of best practice design elements and broad policy design principles. These standard definitions can be productively used to guide successful RPS policy design both at the states and federal level. However, designing an effective RPS often requires balancing sometimes-conflicting goals. Therefore, while these recommended definitions can guide state RPS definitions, considering policy tradeoffs will remain important.

There are several reasons why common RPS eligibility definitions have merit for consideration by policymakers at the state and federal levels.

First, these definitions can assist state policymakers as they develop new, or amended, RPS policies so that they include clear, well-crafted definitions of resource eligibility.

Second, use of common definitions by states serves the overriding goal of an RPS—to advance renewable energy resources *in the most efficient and low cost manner possible*. Today, variations in state specific definitions of renewable energy or REC eligibility tend to segment renewable energy markets across the region and the nation. This results in smaller, less liquid markets that

can increase the cost of RPS compliance by limiting the types and sources of renewable energy that can be used to meet compliance. A common definition of renewable resources would allow states to more readily integrate their markets and increase the liquidity of RECs.

Third, the recommended common definitions are designed to allow states to avoid vague and unclear terms when crafting eligible resource definitions. In order to support investment in renewable facilities, developers need to know with certainty whether or not a facility will qualify before making significant financial commitments and must have confidence that definitions are sufficiently clear so that the universe of possible competitors is known. Developers and investors also are more likely to pursue new renewable projects if there are multiple state market outlets for the project output.

Fourth, the use of common and clear definitions will reduce administrative complexities and costs by avoiding debates over sometimes vague resource eligibility definitions. It will help to free regulators from the burden of holding time-consuming regulatory proceedings to determine whether a particular facility qualifies towards an RPS mandate.

Finally, use of common definitions by states will allow for the development of RPS reciprocity between states, i.e. a renewable energy generator that registers in one state RPS would automatically be eligible in other states with RPS policies. Reciprocity will help ease RPS administration; make it easier for renewable energy generators to register for multiple states' RPS policies; and thereby help contribute to a larger, more regional market for renewable energy generation.

For these reasons, the following definitions are crafted to provide a common RPS eligibility foundation while providing flexibility to allow for technology advancement and development. The definitions are technology and fuel inclusive and attempt to avoid discrimination against any one renewable resource. The definitions also are crafted to minimize the need for policymakers to determine the forms of technology that should receive market preference or to continuously revise the mandate to include new technologies that may be developed.

Energy vs. Electricity: Each definition begins with the phrase “Electricity derived from...” because, unless specified by a state as electricity generation, renewable resources can mean energy from eligible resources that have not been converted to electricity. Such energy, for example, could come from geothermal heat pumps, solar water heating systems, biomass used as a heating fuel, and landfill gas that is upgraded and supplied in a gas pipeline.

Because most existing state RPS policies seek to achieve increases in the quantity of renewable resources in the portfolio of a retail electricity seller, the recommended definitions restrict eligibility to resources and technologies that generate electricity. While some states include energy efficiency resources in their RPS, the model common definitions are focused on renewable energy electricity generation. This approach provides consistency and ensures that each resource definition is geared towards electricity production, rather than avoided consumption.

Below is a suggested model definition of each renewable energy resource and the rationale for the definition.¹

MODEL RESOURCE ELIGIBILITY DEFINITIONS

Resource: Wind

Definition: *Electricity derived from wind energy.*

Rationale: Existing state definitions vary from the very generic—“wind”—to the more specific—“wind turbines”, and include other variations without policy significance, such as “wind power”, “wind energy”, and “electricity derived from wind energy”. The concept of wind power is universal and simple as defined by the states. The recommended fuel-based wind standard, “electricity derived from wind energy” is specific, inclusive of all wind-based electricity-production technologies, consistent with or implied in the various existing state “wind” definitions, and does not conflict with respective state policies or affect differing political realities. States could adopt the proposed definition with no significant alteration in the meaning of how any specific state defines wind-based electricity as an eligible resource in their RPS.

Resource: Solar

Definition: *Electricity derived from solar energy.*

Rationale: All states include solar power in their RPS policies. However, the definitions vary greatly, with some states not specifying any particular form of solar technology and other states listing specific eligible solar technologies. Existing definitions range from the very generic “solar” to the very specific “radiant energy, direct, diffuse, or reflected, received from the sun at wavelengths suitable for conversion into thermal, chemical, or electrical energy.” Some states list solar technologies and photovoltaic technologies as two separate fuel sources.

The recommended definition of “electricity derived from solar energy” is specific, universal, and inclusive of all solar-based technologies that create electricity using a technology that employs solar radiation. It includes photovoltaics and solar thermal *electric* technologies. The inclusive definition is not significantly different from what is included, or implied, in the majority of state solar-based definitions (except for those few states that limit eligibility to PV or states that include solar thermal energy).

The recommended model definition also provides a broad fuel-based definition that affords states the flexibility to incorporate new solar electric technologies as they are developed without requiring legislative or regulatory changes.

¹ These recommendations do not address other eligibility issues such as whether existing renewable facilities should be included, should generators be required to meet location requirements, should states establish resource tiers, etc.

Resource: Fuel Cells

Definition: *Electricity derived from any electrochemical device that converts chemical energy in a hydrogen-rich fuel directly into electricity without combustion.*

Rationale: Currently, there is little consensus among state RPS policies regarding whether certain kinds of fuel cells powered by natural gas and other “non-renewable” fuels should be included in the definition of technologies eligible for RPS compliance purposes. Only a few states qualify fuel cells as eligible technologies without imposing renewable fuel requirements. In contrast, the majority of states include only fuel cells that operate on renewable fuel in their RPS as eligible resources.

The disparity of approaches by states regarding fuel cell eligibility is limiting the ability of RPS policies to promote fuel cell technology advancements. Because fuel cells represent an advanced energy technology that is vital to the transition to a clean energy future, the recommended definition includes fuel cells as eligible RPS resources, regardless of fuel source. This “technology-based” definition would allow fuel cells to participate in RPS markets, irrespective of fuel source. The definition encourages the use of the technology, rather than a specific fuel, with the intent of helping fuel cells to “compete” with other technologies in RPS compliance.

From a policy perspective, the definition is based on the recognition that, with their low emissions profile and advanced energy character, fuel cells are important for environmental and climate reasons and their potential to act as a zero-emissions technology.

The recommended definition also is consistent with the major policy goals that states are trying to achieve through an RPS, including technology advancement, environmental benefits, in-state generation, distributed generation, and resource diversity.

Resource: Geothermal

Definition: *Electricity derived from geothermal sources.*

Rationale: Most states include geothermal fuel resources in their RPS. While the definition of geothermal power varies among states, the different definitions are fairly broad, have no major policy significance and are not mutually exclusive. For example, some states do not define geothermal power while others use particular phrases in reference to this type of power, such as “steam turbine”, “hot water or steam”, “earth’s crust”, or “heat of the earth”. Since the definitions are all very similar and often identical in meaning, states could adopt the proposed definition with no significant alteration in the scope of eligibility under current state-specific definitions.

The recommended geothermal power definition is inclusive and is consistent with the major state RPS policy objectives – obtaining environmental benefits, advancing renewable energy technologies, and promoting energy diversity.

Resource: Oceans, Lakes and Rivers

Definition: *Electricity derived from the tidal currents, thermal gradients and waves of oceans, lakes or rivers.*

Rationale: Ocean-based technologies are eligible under several state RPS policies. However, most of the states with ocean-based resource eligibility do not clearly specify the three types of ocean-based technologies that might be eligible: tidal current, wave, and ocean thermal. For the most part, the various definitions used by states are general in nature and are not intended to restrict specific forms of ocean energy.

No state lists tidal currents, thermal gradients, and waves *in lakes and rivers* as eligible resources. Many of the aforementioned technologies will operate in all bodies of water. The recommended ocean/lake/river definition is intended to be inclusive of all the types of ocean, lake, and river-based energy technologies, with the exception of hydropower. Broadening the definition to include all three technology applications in oceans, lakes and rivers provides states with the flexibility to take advantage of these new, evolving technologies in all viable water-based locations. The definition also makes this resource category relevant to all states, allowing even non-coastal states to receive the in-state benefits of multi-state RPS support for wave, current and thermal energy.

Resource: Biomass

Definition: *Electricity produced by the direct combustion or co-firing of solid, liquid and gaseous fuels derived from organic, non-fossil materials, not to include:*

- a) Construction and demolition waste;*
- b) Black liquor from pulp and paper mills;*
- c) Mixed municipal solid waste;*
- d) Old-growth timber.*

Also included is methane from the anaerobic decomposition of organic materials from sources such as:

- a) Landfills;*
- b) Wastewater treatment;*
- c) Agricultural operations;*
- d) Sewage treatment facilities;*
- e) Food and beverage processing, sales or distribution facilities.*

Eligible biomass fuels may be co-fired, or blended, with fossil fuels, provided that only the renewable energy fraction of production from multi-fuel facilities shall be considered eligible.

The facilities must meet or exceed current federal or state air emission standards, whichever is more stringent. Biomass facilities must meet the emission limits of the state whose market it is selling into, rather than just the state that it is operating in, unless the emissions regulations in the operating state are more stringent.

Rationale: The term “biomass” is very general and can be interpreted to include a wide variety of resources, such as primary biomass resources (whole trees and crops grown for energy purposes), forest and agricultural wastes, urban wood wastes, municipal solid waste, landfill gas, and black liquor (a by-product of pulp and paper production). Methods of converting biomass to electricity also vary and include direct combustion, co-firing with coal, gasification, anaerobic digestion, and pyrolysis. Each of these technologies has varying emission rates and energy conversion efficiencies. As a result, the various state RPS definitions for biomass eligibility exhibit a high degree of complexity, variation, and ambiguity.

There are a number of policy-based restrictions placed on the eligibility of biomass involving such factors as air quality, a desire to support new biomass projects, and concern over the potential over-harvesting of forests and overuse of farm lands for energy crops. Furthermore, the use by some states of terms such as “non-hazardous”, “sustainable” and “low-emission” introduces substantial uncertainty over which biomass fuels and facilities do and do not qualify. For example, there is no generally agreed upon standard to ensure sustainable biomass harvest and cultivation. Regardless of the policy rationale, these eligibility restrictions can make it difficult for biomass energy projects to benefit from RPS policies.

Therefore, crafting a standard biomass RPS-eligibility definition which allows for adding more biomass capacity and addresses the range of state biomass restrictions poses a significant challenge. Faced with this challenge, the recommended definition does not use descriptive restrictions such as “non-hazardous”, “sustainable” and “low-emission” because these terms do not have commonly accepted definitions, only introduce ambiguity, and are difficult to enforce. Instead, the recommended biomass definition excludes those specific biomass resources that many states have excluded on policy grounds due to environmental concerns—black liquor, construction waste and mixed municipal solid waste. The exclusions also include old growth forests because of the significant sustainability problem facing this resource and recognized public interest value in maintaining the remaining old growth forest.

The proposed biomass definition also includes a broad, inclusive category for methane gas resources—including landfills, sewage and wastewater treatment facilities, food and beverage wastes, and wastes from agricultural operations, including animal and crop wastes. This reflects the strong merits of this renewable resource and its consistency with state environmental, local generation, climate change and fuel diversity goals. Of particular importance, methane-based facilities significantly reduce emissions that contribute to climate change. Methane is a potent greenhouse gas, with a heat-trapping capacity of about 21 times that of carbon dioxide. An inclusive definition of methane gas resources does not raise any air emission, public health, hazardous substance, or sustainability issues of consequence (as compared to other biomass resources discussed above).

The model definition further addresses the eligibility of mixed-fuel facilities (co-firing), such as coal facilities that also burn biomass fuels. The definition allows only the energy generated from the qualifying biomass fuels to benefit under an RPS. Rather than ban the eligibility of such facilities altogether, the definition allows for efficient combinations of fuel usage while providing benefits for the use of biomass-based eligible fuels.

Finally, to address air quality concerns, rather than using a qualitative term such as “low-emission”, the model definition refers more specifically to emission rates as specifically defined by the state which is receiving out-of-state-generation, or the federal EPA standard, whichever is more protective of human health and the environment. This acknowledges the regional nature of air pollution and respects the legitimate efforts of states to protect their air quality.

Resource: Hydropower

Definition: *Electricity generated by a hydroelectric facility that:*

- a) operates as a run-of-river* facility, or has been repowered without the use of new impoundments,*
- b) has a maximum design capacity of 30 megawatts or less,*
- c) uses flowing water as the primary energy resource, with or without a dam structure or other means of regulating water flow,*
- d) is not located at a facility that uses mechanical or electrical energy to pump water into a storage facility, and*
- a) meets all relevant environmental standards as determined by the state environment department.*

* “Run-of-river” refers to a hydropower facility that releases water at the same rate as the natural flow of the river – outflow equals inflow.

Rationale: The unique characteristics of hydropower, such as its technological maturity and extensive development, many states have restricted the RPS eligibility of hydropower. Taking these characteristics into account, the proposed definition incorporates the most common elements of state definitions on hydropower eligibility. The definition allows for RPS economic support for small-scale hydropower facilities that have operational characteristics designed to address the major environmental concerns associated with hydropower dam operation—damage to watersheds and fisheries.

The recommended definition avoids the use of vague terms and restrictions such as requiring certification as a “low-impact” hydropower facility, which would require a time-consuming case-by-case review for environmental acceptability. Instead, the definition relies on compliance with established state environmental standards to ensure that RPS-supported hydropower projects are environmentally acceptable.

The most significant feature of the recommended definition is that it is designed only to support small-scale hydropower, by establishing an eligibility ceiling of 30 MW or less of aggregate capacity. This capacity cap was selected because it is the most common limit used by states. The small hydro eligibility focus also is designed to provide financial support to those projects that are likely to be less economically stable. Furthermore, the small-scale hydro focus is designed to avoid the environmental drawbacks associated with larger hydropower facilities with impoundments, as compared to smaller dams that operate under run-of river conditions.

Finally, the definition establishes RPS eligibility for incremental hydropower repowering at existing small-scale hydro sites to provide support to additional generation achieved through increased efficiency or use of new equipment that will further a state's technology advancement goals.