The Renewables Portfolio Standard: How It Works and Why It's Needed

What is the Renewables Portfolio Standard?

The Renewables Portfolio Standard (RPS) is a flexible, market-driven policy that can ensure that the public benefits of wind, solar, biomass, and geothermal energy continue to be recognized as electricity markets become more competitive. The policy ensures that a minimum amount of renewable energy is included in the portfolio of electricity resources serving a state or country, and -- by increasing the required amount over time -- the RPS can put the electricity industry on a path toward increasing sustainability. Because it is a market standard, the RPS relies almost entirely on the private market for its implementation. Market implementation will result in competition, efficiency and innovation that will deliver renewable energy at the lowest possible cost.

How Would the RPS Work?

Renewable Energy Credits are central to the RPS. A Credit is a tradable certificate of proof that one kWh of electricity has been generated by a renewable generator. Credits are denominated in kilowatt-hours (kWh) and are a separate commodity from the power itself. The RPS requires all electricity generators (or electricity retailers, depending on policy design) to demonstrate, through ownership of Credits, that they have supported an amount of renewable energy generation equivalent to some percentage of their total annual kWh sales. For example, if the RPS is set at 5%, and a generator sells 100,000 kWhs in a given year, the generator would need to possess 5,000 Credits at the end of that year.

Investors and generators make all decisions about how to comply, choosing the type of renewable energy to acquire, which technologies to use, what renewable developers to do business with, what price to pay, and which contract terms to agree to. Companies decide for themselves whether to invest in renewable energy projects and generate their own Credits, enter into long-term contracts to purchase Credits or renewable power along with Credits, or simply to purchase Credits on the spot market. Only the bottom line is enforced: possession of a sufficient number of Credits at the end of each year. The Credit system provides compliance flexibility and avoids the need to "track electrons." Because the RPS applies equally to all generators, it is competitively-neutral.

What Is The Government's Role Under the RPS?

Government involvement would be limited to certifying Credits, monitoring compliance, and imposing penalties if necessary. The Credit certification process would apply to renewable producers who wish to certify their renewables output. Monitoring compliance would require each generator to demonstrate ownership of a sufficient number of Credits relative to electricity

sales. For generators that are not in full compliance with the RPS at the end of the year, the administrative agency would assess an automatic penalty for each Credit that the generator fails to produce as required.

The amount of the penalty should be several times what it would have cost to purchase the Credits. A high penalty level makes the policy self-enforcing by avoiding the need to resort to costly administrative and enforcement measures. It is modeled after the federal sulfur dioxide (SO2) allowance trading program, under which an automatic $2,000/ton penalty is imposed for each excess ton of SO2 produced. Because of the high penalty associated with noncompliance, the EPA has not had to take any enforcement actions -- it is far more economic for power plants to comply than not.

What Are the Efficiency Advantages of the RPS Approach?

An advantage of the RPS over direct subsidy approaches is that it avoids the process of government agencies distributing funds, which can be bureaucratic and inefficient. In addition, government-administered programs almost always impose artificial constraints of various types, which increase costs.

Second, under the RPS, no renewable energy project is guaranteed a place in the market. Unlike a one-time competition for funds, each project must continually compete to keep its place in the market created by the standard. For example, existing projects and technologies must compete with new ones, and project enhancements must compete with greenfield projects.

Third, the certainty and stability of the renewables market created by a properly-designed RPS will enable long-term contracts and financing for the renewable power industry, which will, in turn, lower renewable power costs.

Fourth, the flexibility of the RPS encourages least-cost compliance for generators. Generators can compare the cost of owning a renewables facility to the cost of a Credit/renewable power purchase package and to secondary-market Credits. Those who are most efficient at generating renewable power will end up producing it, and those who cannot efficiently produce it will purchase Credits on the competitive market.

Finally, and perhaps most importantly, since large generation companies will be looking to improve their competitive position in the market, they will have an interest in driving down the cost of renewables to reduce their RPS compliance costs. They may do this by lending their own financial resources to a renewables project, by seeking out least-cost renewables applications, or by entering into long-term purchasing commitments. This fosters a "competitive dynamic" that is not achieved with policies that involve direct subsidies to renewable generators without involving the rest of the electric industry.

What Are the Key Design Details of an RPS?

As with any policy, getting the details right in the initial legislation is critical to the policy's success. Three issues that are particularly important in designing the RPS are:

- **Defining "renewables."** The definition must be limited to those resources and technologies that are environmentally sound, that represent a small fraction of the current resource base, and that need market support. Such a definition would include wind, solar, biomass

and geothermal resources. Although hydro is clearly a renewable technology, it has also been commercially mature for decades and currently represents about 10% of the power mix.

- **Setting the level of the standard and its rate of increase over time.** The level of the standard must begin at or near current levels of renewables and rise steadily from that point.

- **Sunset date.** The RPS should be "self-sunsetting" -- meaning that the RPS policy sunsets when the price of Credits falls to zero, signifying that renewables are fully competitive and integrated into the market. A self-sunset date indicates that the RPS is intended to be a long-term policy.

Why Is Renewable Energy Policy Necessary in Competitive Markets?

Even "perfectly competitive" markets have inherent imperfections that are well-established in economic theory. The combination of the following market barriers will serve as powerful hindrances to renewables:

- **Externalities:** Fossil fuel generators pollute the air but do not have to pay for the local, regional, and global damage caused by their emissions. Renewable energy does not pollute but, in unregulated markets, will receive no credit for the damages they prevent.

- **Public Goods:** The price stability, environmental, and economic benefits of renewable energy resources are ones that accrue to the public at large, not directly to the purchasing consumer. This "free rider" phenomenon can be expected to deter consumers from volunteering to pay a little more for renewables since their purchase will benefit other, non-contributing consumers as much as it will them. Thus, while a "green market" of some size may develop, it is likely to be far smaller than what is required to significantly diversify the nation's electricity supply and than what might be expected given the strong public support that renewables enjoy.

- **Transactions Costs:** Under retail competition, there will be high transactions costs associated with reaching consumers who are willing to pay for the public benefits of renewables.

In addition, the market reality will be that – absent the long-term contracts that have supported virtually all existing renewable energy projects, but which will be very rare in competitive markets -- investors will have very short investment horizons. In markets that will be characterized by short-term energy sales and price volatility, investors will prefer low-capital-cost technologies with short payback times. Financing for capital-intensive renewable energy projects will be expensive and difficult to obtain, even if they produce more cost-effective power over their lifetimes.

What Are the Primary Benefits of an RPS?

Renewable energy sources like wind provide environmental and economic benefits, including:

***Stable electricity prices*:** Because wind and other renewables are a fuel-free source of energy, the cost of the electricity generated by such sources is stable once the facility is built and provides insurance against spikes in the price of fuels used for electricity generation. An analysis from the Union of Concerned Scientists finds switching 10% of our electricity to clean energy sources by 2020 could save consumers as much as $13 million over 20 years.

* ***Income for communities*****:** Every 100 MW of wind development generates about $1 million in property tax revenue. The 160-MW wind farm in rural Prowers County, Colorado, increased the county's revenue by 29%.

**Jobs*: Every 100 MW of wind development creates about 500 job-years of employment. An increase in U.S. wind energy installations to 50,000 MW could create 150,000 jobs in the manufacturing sector alone, according to a study by the Renewable Energy Policy Project.

**Payments to landowners*: A single wind turbine can provide $2,000-$4,000 per year in income to landowners, mostly farmers and ranchers. The development of 1,000 MW in Texas following the adoption of that state's RPS led to royalty payments of $2.5 million in 2002 alone.

Zero emissions of pollution and greenhouse gases***:** To generate the same amount of electricity as a single 1.65-MW wind turbine using instead the U.S. average utility fuel mix (50% coal, with the remainder produced by nuclear, natural gas, and other power sources) would result in emissions of 2,700 tons of carbon dioxide (the leading greenhouse gas), 14 tons of sulfur dioxide (the leading component of acid rain), and 9 tons of nitrogen oxides (the leading component of smog) every year. A forest measuring 1.5 square miles would be needed to absorb the same amount of CO_2.

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