

# The Development of Renewable & Alternative Energy Resources: The Role of the Commissioner

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# Renewable & Alternative Energy Resources:

## What's the difference?

# Alternative Energy Defined:

- “Alternative energy” refers to any source of usable energy intended to replace fuel sources without the undesired consequences of the fuel being replaced.
- Usually, the fuel sought to be replaced is a fossil fuel that produces carbon dioxide when burned.
- The definition of alternative energy has changed over time.

# Renewable Energy Defined:

- There is no one universally accepted definition of “renewable energy”, but there are some common themes:
  - wind;
  - solar;
  - biomass;
  - geothermal;
  - low-impact hydropower; and
  - hydrogen-powered fuel cells.

# Renewable Energy Defined:

- Missouri defines renewable energy as energy produced from wind, solar thermal sources, photovoltaic cells and panels, dedicated crops grown for energy production, cellulosic agricultural residues, plant residues, methane from landfills or wastewater plants, clean and untreated wood such as pallets, hydropower < 10 MW (not pump storage) ..., fuel cells using hydrogen produced by renewable sources, and anything else (not nuclear) certified renewable by the state.

# Renewable Energy Defined:

- Australia takes an even broader approach. Section 17 of their federal *Renewable Energy Act of 2000* defines renewable energy sources as follows: (a) hydro; (b) wave; (c) tide; (d) ocean; e) wind; f) solar; g) geothermal aquifer; h) hot dry rock; (i) energy crops; j) wood waste; k) agricultural waste; l) waste from processing of agricultural products; m) food waste; n) food processing waste; o) bagasse; (p) black liquor; q) biomass based components of municipal solid waste; r) landfill gas; s) sewage gas and biomass based components of sewage; t) any other energy source prescribed by regulation.

# Renewable Energy Defined:

- The EU has a much simpler definition. Article 2 of EU Directive 2001/77/EC defines renewable energy sources as:
  - (2)(a) 'renewable energy sources' shall mean renewable non-fossil energy sources (wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases);

# Renewable Energy Defined:

- The directive further defines biomass:
  - (2)(b) 'biomass' shall mean the biodegradable fraction of products, waste and residues from agriculture (including vegetable and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste;
- The EU definition is consistent with the International Energy Agency (IEA) definition.



# Renewable Energy Defined:

## Conclusions

- Government definitions are often affected by environmental concerns and local politics.
- Disputed “renewables” often include large hydroelectric power plants and nuclear plants.
- One man’s “alternative energy” is another man’s “renewable energy”.

# What can regulators do to encourage the development of new technologies?

- Regulators have a number of options when seeking to assist development of new technologies:

(1) quotas, mandates or “renewable portfolio standards” (RPS);

(2) “Feed-in” Tariffs or “Standard Offer Contracts” for distribution utilities; and

(3) Create a market for trading of “renewable energy credits” (RECs).

# Renewable Portfolio Standards:

- A renewable portfolio standard (RPS) is a regulation requiring distribution utilities to either purchase or generate a certain amount or percentage of electricity sold to consumers from renewable or alternative sources.

# Renewable Portfolio Standards:

- There is no federal RPS policy in the U.S. 34 states and the District of Columbia have RPS requirements. These mandates are similar, but not identical.
- A number of countries including Great Britain, Italy and Chile have adopted similar nationwide standards often called Renewable Energy Standards (RES).
- An RPS or RES alone is usually not enough to incent renewable energy development. In the U.S., we use a number of additional tools to assist their development.

# Other Renewable Requirements: Renewable Contracts

- An increasing number of governments are requiring companies seeking government contracts to obtain a certain amount or percentage of energy used in the manufacturing process from renewable resources.
- In order to obtain the “contract”, bidders must demonstrate how they will obtain renewable electricity.

# “Feed-In Tariffs”

- “Feed-in” tariffs refer to a style of incentives adopted, most notably in Germany and now the U.S., that increase the adoption of renewables. They have three characteristics:
  - (1) guaranteed grid interconnection;
  - (2) generators are paid a premium rate for all the electricity they produce over a period of time (usually 10 or 20 years);
  - (3) different rates based on avoided costs (cost of electricity from distribution utility) or technology (solar, wind, biomass, etc.)

# “Feed-In Tariffs”

- Germany was one of the first countries to adopt pricing based on the cost of generation and not the avoided costs of the utility. Since passage of the Renewable Energy Standards Act of 2000, Germany has more than doubled its capacity of renewable energy.
- According to Wikipedia, more than 63 jurisdictions around the world have since adopted “feed-in” tariffs.

# “Feed-In Tariffs”

- Grid interconnection and access to the transmission system are essential to the success of any new generator.
- In the United States, expensive interconnection fees have prevented new generators from entering the market in some cases.
- Equal access to transmission and fair administration are also necessary to insure deliverability.



# “Feed In Tariffs”

- “Feed in tariffs” require the utility to pay compensation at a rate designed to help the generator recover the costs of its investment and earn a reasonable profit on that investment over time.
- Rates take a variety of forms. Some are fixed over time. Other rates decline over time or adjust based on the rate of inflation or some other index.

# “Net Metering”

- Many jurisdictions have similar tariffs for “net metering”.
- Net metering tariffs promote the use of smaller intermittent renewable generation (usually wind or solar) by consumers who “net” or deduct any generation from their metered bill and are paid for any excess generation.
- Net metering can be accomplished with one meter, which effectively allows full ‘banking’ of produced vs. consumed electricity during the billing period.

# Standard Offer Contracts:

- Used to develop residential or small scale renewable electricity.
- Usually the standard offer contract works exactly like a net metering tariff, with one exception: the generator receives an up-front payment for five or ten years' worth of generation.

# Renewable Energy Credits (RECs):

- RECs are certificates representing that 1 Megawatt-hour (MWh) of electricity was generated from a renewable resource.
- These certificates can be sold or traded, allowing the owner to claim he has purchased renewable energy.
- No energy changes hands.

# Renewable Energy Credits (RECs):

- Every REC certificate has a unique identification number so that it can be tracked and eventually redeemed.
- In contrast to cap-and-trade models for reducing carbon dioxide emissions, RECs provide a subsidy to the generator without raising the cost of the generation.

# Government Subsidies:

- In the United States, the financial subsidies offered by the federal government are at least as important, if not more important, in developing alternative technologies.
- These federal subsidies drive competition between the states and political subdivisions for these investments, which leads to more subsidies.

# U.S. Government Incentives:

- Income Tax Credits
  - Production
  - Investment
- Depreciation
- Loan Programs
  - Bonds
  - Loan Guarantees

# The Production Tax Credit (PTC):

- The United State's single most important tool in developing wind, solar and biomass projects.
- The PTC is a federal tax credit for renewable generators equivalent to \$21/MWh for every MWh generated during the plant's first 10 years of operation.
- Credits can be used to offset 100% of a generator's federal tax liability.



# Investment Tax Credits (ITCs):

- In 2008 and 2009, generators could obtain ITCs equivalent to 30% of the generator's entire investment in the project in lieu of the PTC.
- The credit was convertible to a cash payment from the United States Treasury.

# Depreciation:

- For more than 20 years, the United States government has allowed generators to depreciate out the cost of most renewable technologies over five years.
- The *Economic Stimulus Act of 2008* included a 50% first-year bonus depreciation provision for renewable technologies placed in service in 2008 and was extended through 2009. To qualify for bonus depreciation, the original use of the property had to commence with the taxpayer claiming the deduction and the property must have been placed in service in 2008 or 2009.

# Loan Programs:

- Clean Renewable Energy Bonds (CREBs) are used by government entities and cooperatives to finance renewable energy projects.
- The borrower pays a 0% interest rate and only repays the principal.
- The federal government pays the interest in the form of tax credits.
- The government has limited the amount of money available.

# Loan Programs:

- Originally authorized by the Energy Policy Act of 2005, the U.S. Department of Energy Loan Guarantee Program authorized \$10 billion in loan guarantees to finance energy efficiency and renewable projects as well as necessary transmission.
- In 2009, Congress authorized another \$8.5 billion worth of loan guarantees.

# State & Local Incentives

- Tax Exemptions
  - Property
  - Sales, use and consumption taxes
- Permits & Licenses
  - Waiver of permit & license fees
  - Expedited application process
  - Scoring preferences for permits.

# Conclusions:

- Government mandates and incentives have helped the renewables industry improve efficiencies and develop new, more cost-effective technologies that lower the cost of these emerging energy resources.
- Assuming electric rates continue to rise, renewables will become even more competitive.