



## Participation in the Illinois solar renewable energy market

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### ABSTRACT

Opportunities for Illinois residential electricity consumers to participate in the renewable energy market will expand considerably as a result of the recently enacted Future Energy Jobs Act. These opportunities range from proactive options, such as installation of one's own solar array, to passive ones by which most Illinois residential electricity consumers will participate minimally by law simply by being an electric customer of a public utility.

### 1. Introduction

Many Illinois residential electricity consumers have contemplated using solar energy. Opportunities for them to participate in the renewable energy market will expand considerably as a result of the recently enacted Public Act 99-0906, also known as the Future Energy Jobs Act. The purpose of this paper is to discuss those opportunities, which range from proactive options, such as the installation of one's own solar array, to the passive, meaning that, whether they know it or not, most Illinois residential electricity consumers will be participating minimally by law simply by being an electric customer of a public utility.

### 2. Useful terms to know

Two terms that are often used interchangeably, but are in fact different, are “power” and “energy.” These terms are critical to any discussion of electricity. Power refers to the rate at which energy is produced or consumed at a particular moment in time. In other words, power can be thought of as a measure of electrical flow at any one moment in time. Energy, on the other hand, measures the amount of work performed or generated over a period of time (typically one hour). One watt of electrical power, maintained for one hour, equals one watt-hour of energy. One thousand watt-hours equals a kilowatt-hour (kWh). One thousand kilowatt-hours equals one megawatt-hour (MWh).

Household appliances and other electrical devices perform “work” and that requires energy in the form of electricity. For example, a 60-W light bulb left on for one hour consumes 60 W-h of energy. For those interested in

breaking down their individual energy consumption by device, there are many publications that provide such information.<sup>1</sup> Additionally, power meters (many available to buy starting at around \$25) can be used to monitor the power and energy consumption of a connected appliance.

The size of electrical generation facilities are typically measured by their capacity or power output. Large utility-scale generation facilities are measured in MW, while small commercial or residential generation facilities are measured in kW or watts. Residential electric bills are based on energy consumed in the range of kWhs.

Knowing how much power and energy one uses is important to those residential customers wanting to offset their usage with renewable energy. An existing customer's past electric bills should reflect their kWh usage during a billing period.

What constitutes renewable energy has been defined in many ways by many authorities and jurisdictions. For our purposes, it is perhaps best to rely on the recently amended definition of “renewable energy resources” in the Illinois Power Agency Act.<sup>2</sup> The Illinois Power Agency (IPA) plays a significant role in implementing Illinois' renewable portfolio standard (RPS), which is described further later. Briefly, the statutory definition includes energy *and* the associated renewable energy credits (RECs) from certain hydroelectric facilities, wind, solar thermal sources, photovoltaic (PV) systems (solar panels or modules), and certain types of biomass (energy from biomass involves the burning or combustion of crops or tree waste).

Identifying what constitutes a REC is also appropriate. A REC is an intangible tradeable credit created to encourage the development of renewable energy. One REC is said to have the environmental attributes of one MWh of energy produced from a renewable energy resource.<sup>3</sup>

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<sup>1</sup> Appliance Energy Calculator- <https://energy.gov/energysaver/estimating-appliance-and-home-electronic-energy-use>; and Appliance Energy Usage Chart - <http://www.siliconvalleypower.com/for-residents/save-energy/appliance-energy-use-chart>.

<sup>2</sup> 20 ILCS 3855/1-1 et seq.

<sup>3</sup> The IPA Act defines REC to mean a tradeable credit that represents the environmental attributes of one megawatt hour of energy produced from a renewable energy resource. 20 ILCS 3855/1-10.

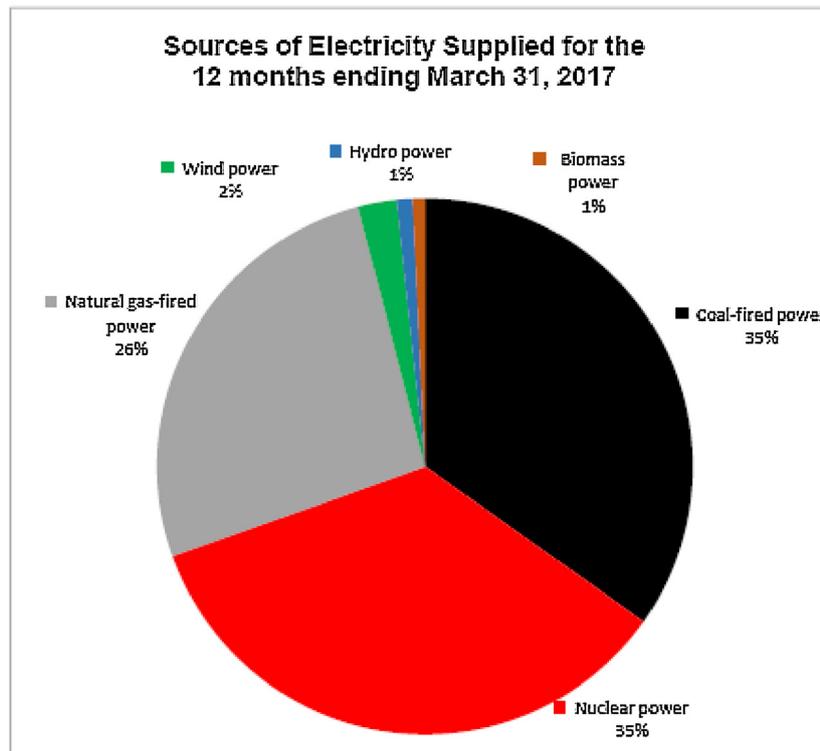
The actual MWh of generated electricity, or energy that is produced and sold into the market is separate and distinct from the REC market. The MWh price (representing the actual generation output) will vary according to day, time, and location, which is often described as locational marginal pricing (LMP). For example, PJM, a major regional transmission organization (RTO), describes that LMP pricing “reflects the value of the energy at the specific location and time it is delivered.” It is important to note that all electricity is priced the same, regardless of its generation source (renewable, non-renewable, etc.).

The REC market, distinct from the sale of the generated electricity, has a market value that fluctuates depending upon demand, and values may vary according to location and renewable source. For example, a solar REC (SREC) may have a higher value than a wind REC because there is demand for SRECs but not as much supply compared to wind RECs. Also a REC located within a state that has an RPS favoring in-state RECs will likely have a higher value in that state than it would in another, particularly one lacking a robust RPS.

and 83 Illinois Administrative Code 421, “Environmental Disclosure,” require regulated public utilities<sup>4</sup> and alternative retail electric suppliers (ARES) to report to customers and the Illinois Commerce Commission (ICC) the generation sources of electrical energy sold.<sup>5</sup> Municipal systems and electric cooperatives are not subject to the reporting requirement. The dominant suppliers in Illinois are Commonwealth Edison Company (ComEd) and Ameren Illinois Company.

Some 35% of ComEd’s power comes from nuclear plants with another 35% from coal-fired plants. Natural gas constitutes the next largest portion of ComEd’s electricity source, at 26%. Renewable energy (primarily from large-scale wind farms) makes up roughly 2% of the power supplied by ComEd. For Ameren, which falls within the MISO RTO, the primary source of generation is coal, which accounts for nearly half its generation. Natural gas and nuclear rank second and third, respectively. Large-scale wind farms make up about 8% of Ameren’s generation.

ComEd



**Sources of Electricity Supplied for the 12 months ending March 31, 2017**  
**PJM System Mix**

The following distribution of energy resources was used to produce electricity in the PJM Region from the System Mix.

**3. Sources of generation in Illinois and nationwide: fuel mix**

In discussing opportunities to participate in the renewable energy market, it is useful to identify the current sources of electrical energy, or generated electricity, both within Illinois and at the national level.

**3.1. Illinois**

Section 16–127 of the Public Utilities Act, 220 ILCS 5/1-101 et seq.,

<sup>4</sup> The regulated public utilities in Illinois are Ameren Illinois Company, Commonwealth Edison Company, MidAmerican Energy Company, and Mt. Carmel Public Utility Company.

<sup>5</sup> Environmental Disclosure Statements December 2017 <https://www.icc.illinois.gov/electricity/utilityreporting/environmentaldisclosure.aspx>.

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