U.S. EPA: Consumers, Solar and the Environment

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Environmental Overview of the U.S. Electricity Sector

- The U.S. electricity sector is a significant source of greenhouse gas emissions and air pollution.
- Air pollution generated from the electricity sector impacts human health.
- Greenhouse gas emissions emitted from fossil-fuel resources contribute to climate change.
- For consumers, electricity consumption can represent a significant part of one’s environmental and carbon footprint, which is a motivating factor for consumers.
Solar Generation and the Environment

- Solar photovoltaics is a zero emitting resource that can help reduce air pollution, including greenhouse gas emissions.
- Solar photovoltaics can also offer other environmental benefits including water savings and land use benefits in some circumstances.
- Other desirable benefits of solar photovoltaics range from health to economic benefits.
U.S. Renewable Energy Markets

• Compliance markets
  – Require obligated entities to *generate* a certain amount of renewable electricity

• Voluntary markets
  – Allow non-regulated electricity consumers (e.g., organizations and residences) to *use* renewable energy and make environmental claims

• Regulatory surplus
  – The interest of voluntary buyers to know that their purchase is incremental to (e.g., above and beyond) what otherwise would occur due to regulation
Role of Renewable Energy Certificates (RECs)

- Renewable energy certificates (RECs) are tradeable instruments that represent the environmental and energy attributes of 1 MWh of renewable energy delivered to the grid.

- Because the flow of electricity cannot be traced on the grid, RECs serve as an essential ownership and accounting tool to track the attributes of renewable energy.

- RECs are the instrument used for claims of renewable energy use. If you don’t own a REC to substantiate your renewable electricity use claim, you aren’t using renewable electricity.
Role of Renewable Energy Certificates (RECs)

- RECs have a strong legal standing for renewable energy generation and use claims*
  - Utilities use RECs to substantiate claims of compliance with generation requirements driven by state mandates (e.g., Renewable Portfolio Standards)
  - Voluntary buyers use RECs to substantiate claims of renewable energy use and environmental claims relative to self-imposed goals, e.g., corporate GHG accounting.

- REC prices are affected by many factors including geographic variations in supply and demand, obligations placed on certain buyers, and penalties (e.g., alternative compliance payments).

The Green Power Partnership works with 1,400 organizations using more than 34 billion kWhs of green power annually, all of which is substantiated through renewable energy certificates

- Nearly 1 billion of which is from solar

The voluntary market is not insignificant

- In 2014, voluntary retail sales of renewable energy totaled 74 million megawatt-hours (MWh), representing about 26% of total U.S. non-hydropower renewable generation, and approximately 2% of total U.S. electricity sales. [NREL 2015]
Consumer motivations for using solar energy

• To make an environmental difference
• To realize cost stability and energy savings
• To meet renewable energy and sustainability goals
• To manage climate risks and GHG emissions
• To enhance environmental marketing and brand management
Consumer Issues

• REC Tensions
  – Making claims and taking incentives
  – Compliance and voluntary markets

• Lack of consumer understanding and available information
  – What is a REC and why should I care?
  – Clarity in contract language

• REC ownership (e.g., third-party development structures)

• Substantiation of carbon footprint reduction claims in corporate greenhouse gas reporting requirements

• Marketing claims
  – Developer vs Consumer (i.e., Community Solar)