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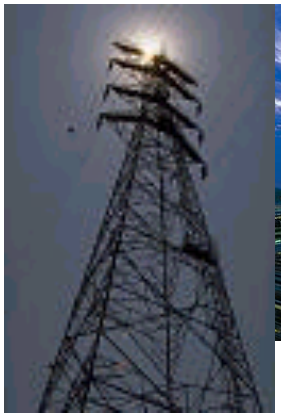

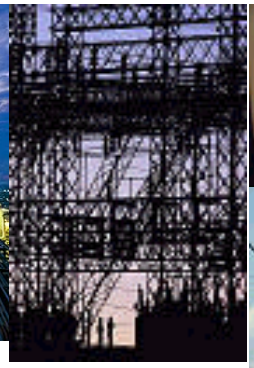


Ratepayer benefits of reforming PURPA.

Harvard Electricity Policy Group Webinar. PURPA: A time to reform or reduce its role?

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Key takeaways

- PURPA dates back to the **energy crisis of the 1970s** and designed to **enhance/diversify electric generation capacity** during a time of uncertainty.
- Led to creation of **competitive wholesale generation markets**.
- Comprised of two parts emphasizing **cogeneration** and **renewables**.
- Today, many of PURPA's provisions are being **abused by renewable energy development** by forcing utilities to purchase renewable energy at **inflation rates, over long contract durations, regardless of need**.
- Estimated **20,000 MW** of renewable QF capacity has been developed over the past decade with another **24,000 MW** under development (all wholesale, not behind the meter/retail).
- As much as **$45 billion** in now wholesale power purchases on top of the **$108 billion** that has already been incurred over the past decade.
- These provisions **harm ratepayers, not utilities**, since all of these costs are typically a pass-through.

Ratepayer implications

Ratepayer implications of PURPA: avoided cost rates

- **Ratepayers are often burdened** with paying for renewable QF generation at **"administratively-determined"** (i.e., "set by regulators") avoided cost rates that are higher than market prices.
- These avoided "cost" rates can be **out of sync with markets for a number of reasons.**
  - Many states include **premiums or "adders"** to **"encourage"** the development of a particular resource type.
  - **Premiums can be added to administratively-determined avoided cost rates** in order to ensure a QF's ability to secure financing.
  - Most often, the calculation of **avoided cost reflects the "all-in" capital cost** of developing a new natural gas-fired resource, which includes the capacity, operation and fuel costs, on a levelized basis regardless of **excess market capacity.**

➢ Even though this calculation is "cost-based" and unitized, it **often results in a rate that is higher than market prices**, particularly when markets are **long on capacity,** which is the case in many of today's regional wholesale markets.

Ratepayer implications of PURPA: unneeded capacity

- QF provisions require **ratepayers to fund QF capacity regardless of whether the capacity or generation is needed**.
- Most states have passed legislation or promulgated rules and/or regulations requiring utilities to promote **energy efficiency and demand-reduction programs**.
- Government-mandated electricity **demand reduction requirements**, coupled with ongoing **technology innovation facilitating end-use efficiency**, and the overall **slowing of electricity demand** have led to considerable **reductions in electricity use per customer (UPC") and overall electricity growth**.

➢ Requiring utilities to purchase QF electricity in the face of this flat electricity growth outlook simply **requires ratepayers to pay for electricity that they do not need.**

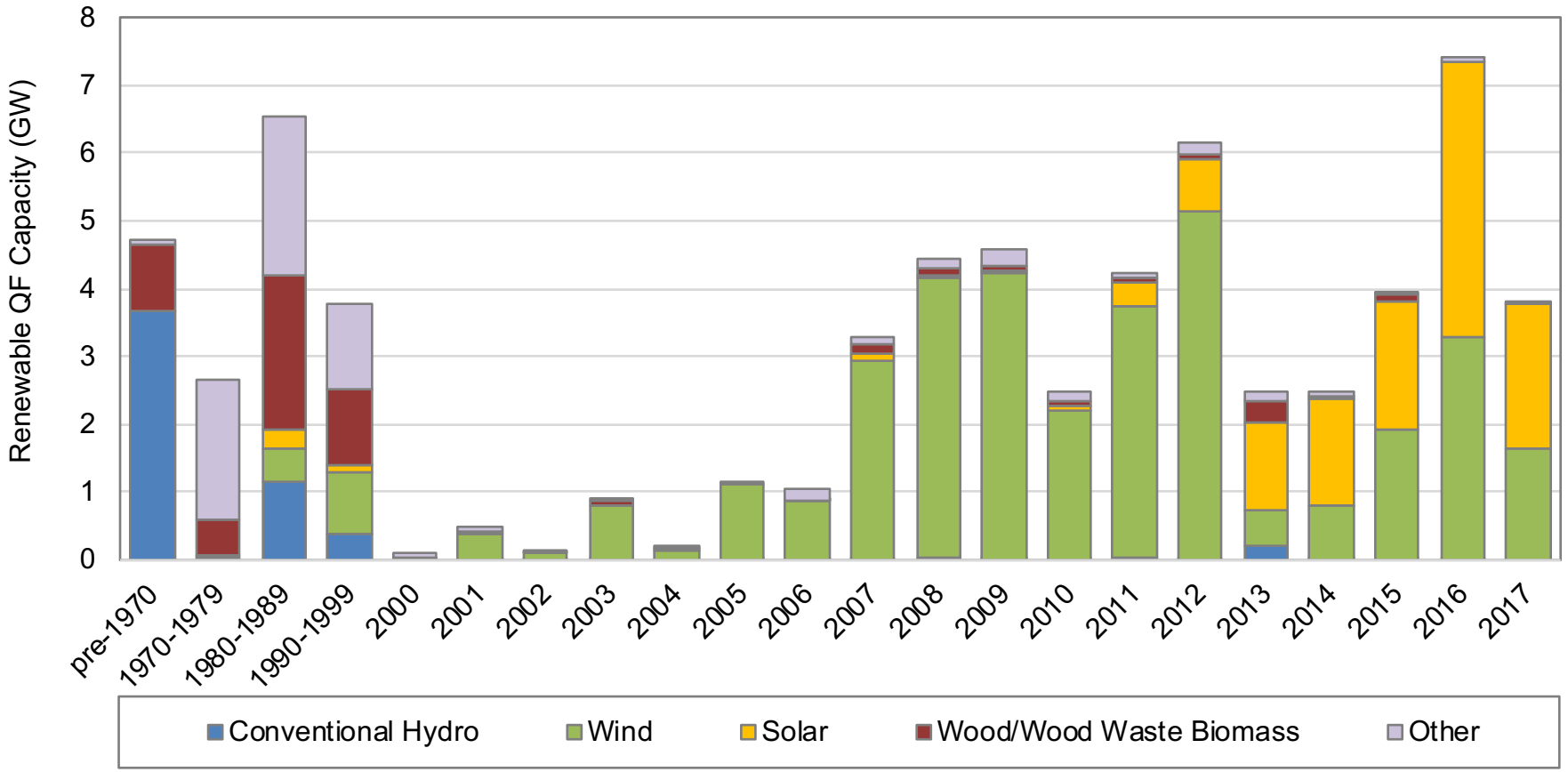
Ratepayer implications of PURPA: financial liabilities

- Many states are **subsidizing renewable QF projects through contract terms** that afford project developers a high degree of ratepayer **"underwriting" or "securitization."**
  - Revenue streams are **"backed" by a set of captive utility customers** (ratepayers) that will make up any short falls in cost recovery for this QF-contracted capacity.
  - Represents a set of **financial and contracting benefits not usually not afforded to other traditional fossil-fuel generation resources.**
  - QF developers **do not have to compete** for these contracts through any form of competitive bidding: **contracts are often offered strictly on a standard-offer basis**.
- QF contracts are **financial liabilities to utilities**, in the form of long-term payment requirements that are recorded on a utility's financial statements and evaluated by ratings agencies.
  - **An increasing level of these obligations are comparable to adding more debt**, thereby increasing utility risks and, more importantly, their overall cost of capital.
  - **Increased utility cost of capital** is another cost that flows directly to ratepayers.
- Renewable QF contracts, and their often overstated avoided cost payments, represent a **regressive wealth transfer from ratepayers to unregulated renewable energy developers and their shareholders**.

Quantifying uneconomic development and ratepayer costs

Renewable QF capacity by type and installation year

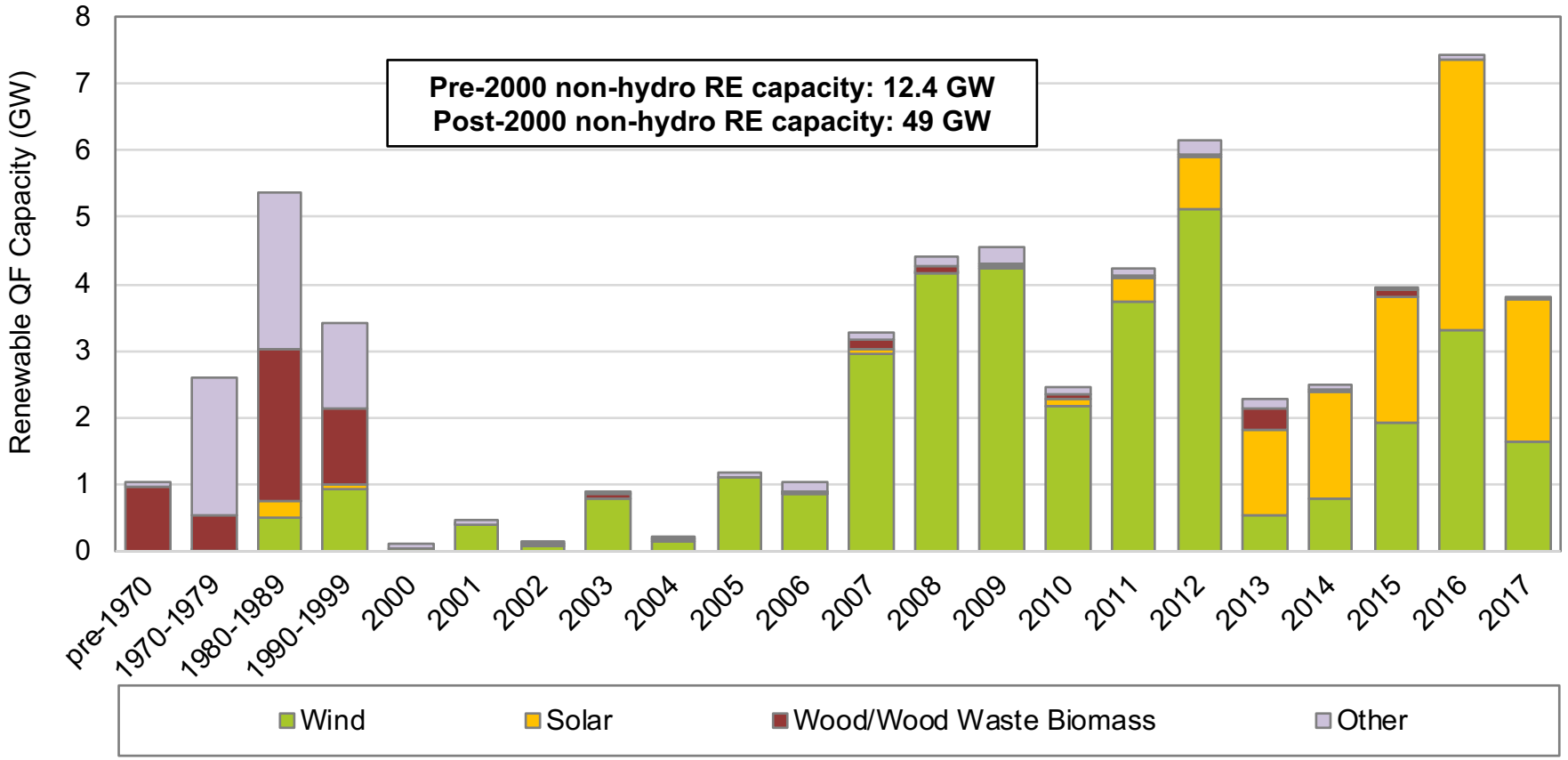
Renewable QF capacity development has expanded considerably. Empirical trends over the past decade **underscores the degree to which PURPA has facilitated renewable development**.



Note: "Other" category includes Geothermal, Hydroelectric Pumped Storage, Landfill Gas, Municipal Solid Waste and Other Waste Biomass.
Source: U.S. Energy Information Administration.

Renewable QF capacity by type and installation year (without hydro)

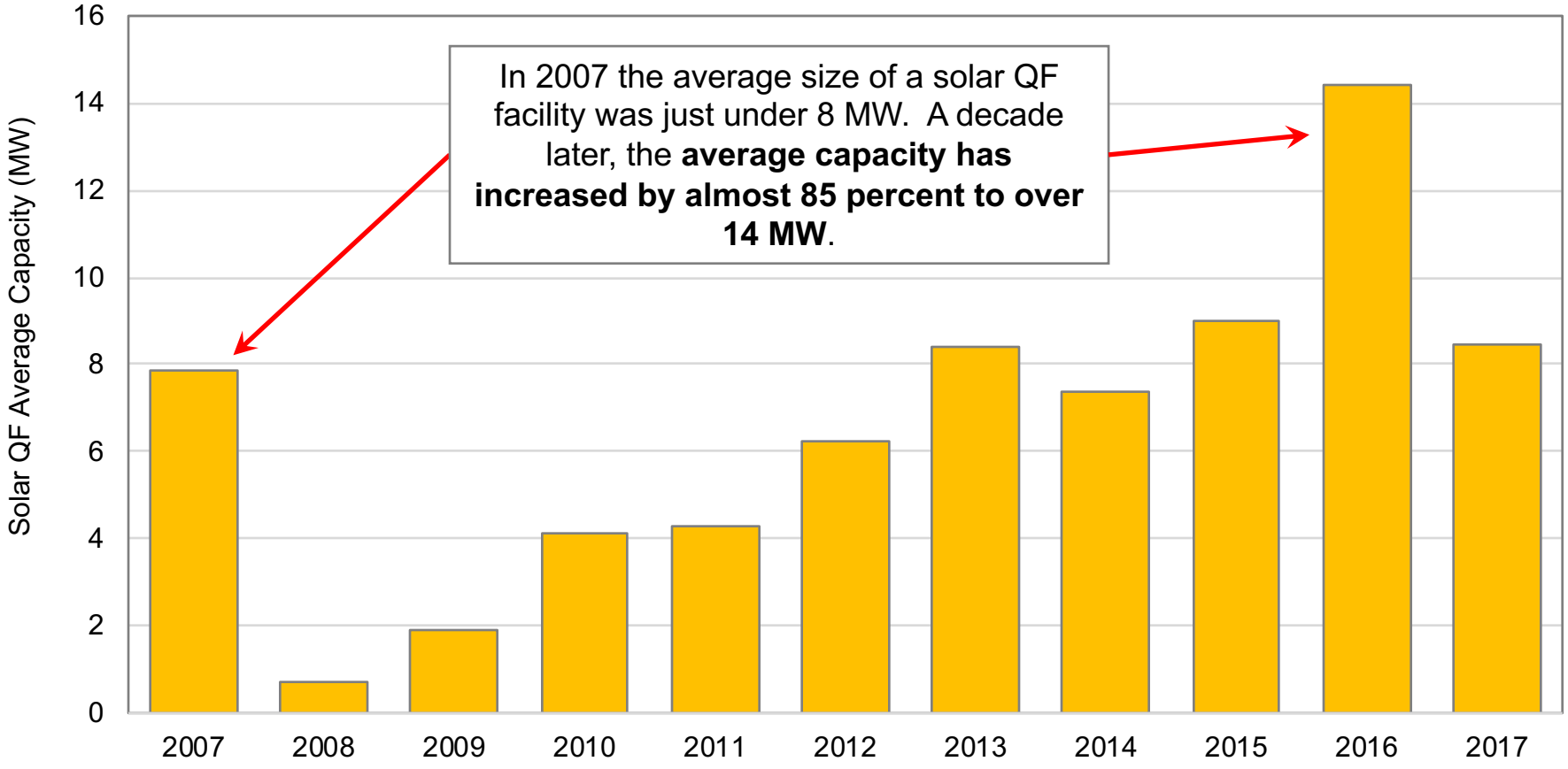
The composition of renewable QF development has also changed. Wind resources were the primary renewable QFs being developed from 2007 through 2012. **But since 2013, almost 11 GW of solar has been developed, compared to 8 GW of wind capacity**.



Note: "Other" category includes Geothermal, Hydroelectric Pumped Storage, Landfill Gas, Municipal Solid Waste and Other Waste Biomass.
Source: U.S. Energy Information Administration.

Average solar QF capacity by installation

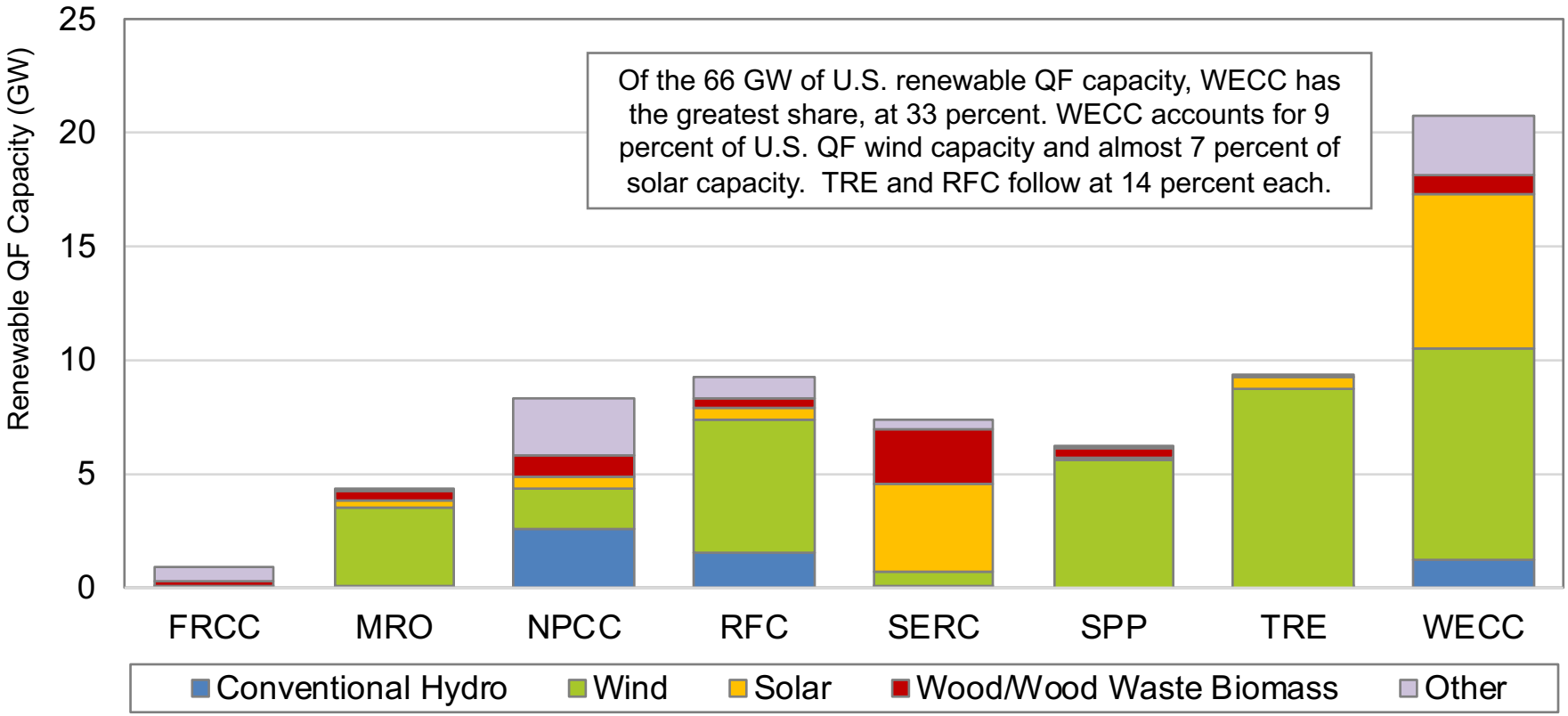
Not only has total renewable QF capacity been increasing, but **the average size of typical renewable generators** taking advantage of PURPA provisions is increasing as well.



Source: U.S. Energy Information Administration.

Active renewable QF capacity by NERC region (2017)

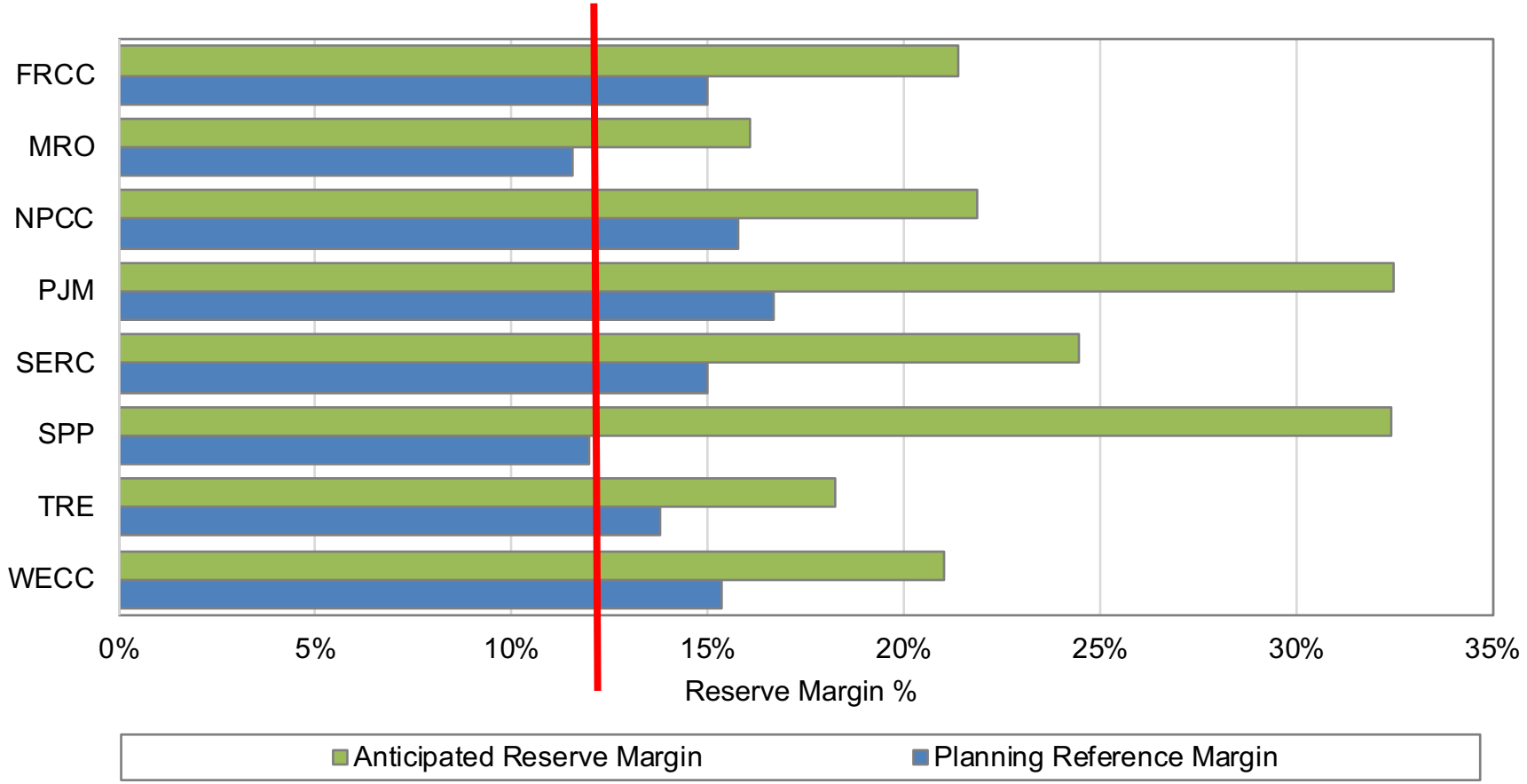
The **location of renewable energy QF capacity development is concentrated in states that have more generous QF pricing and contracting policies**. A large amount of both wind and solar installations are located in the western part of the country.



Note: "Other" category includes Geothermal, Hydroelectric Pumped Storage, Landfill Gas, Municipal Solid Waste and Other Waste Biomass.
Source: U.S. Energy Information Administration.

NERC reliability reserve margins

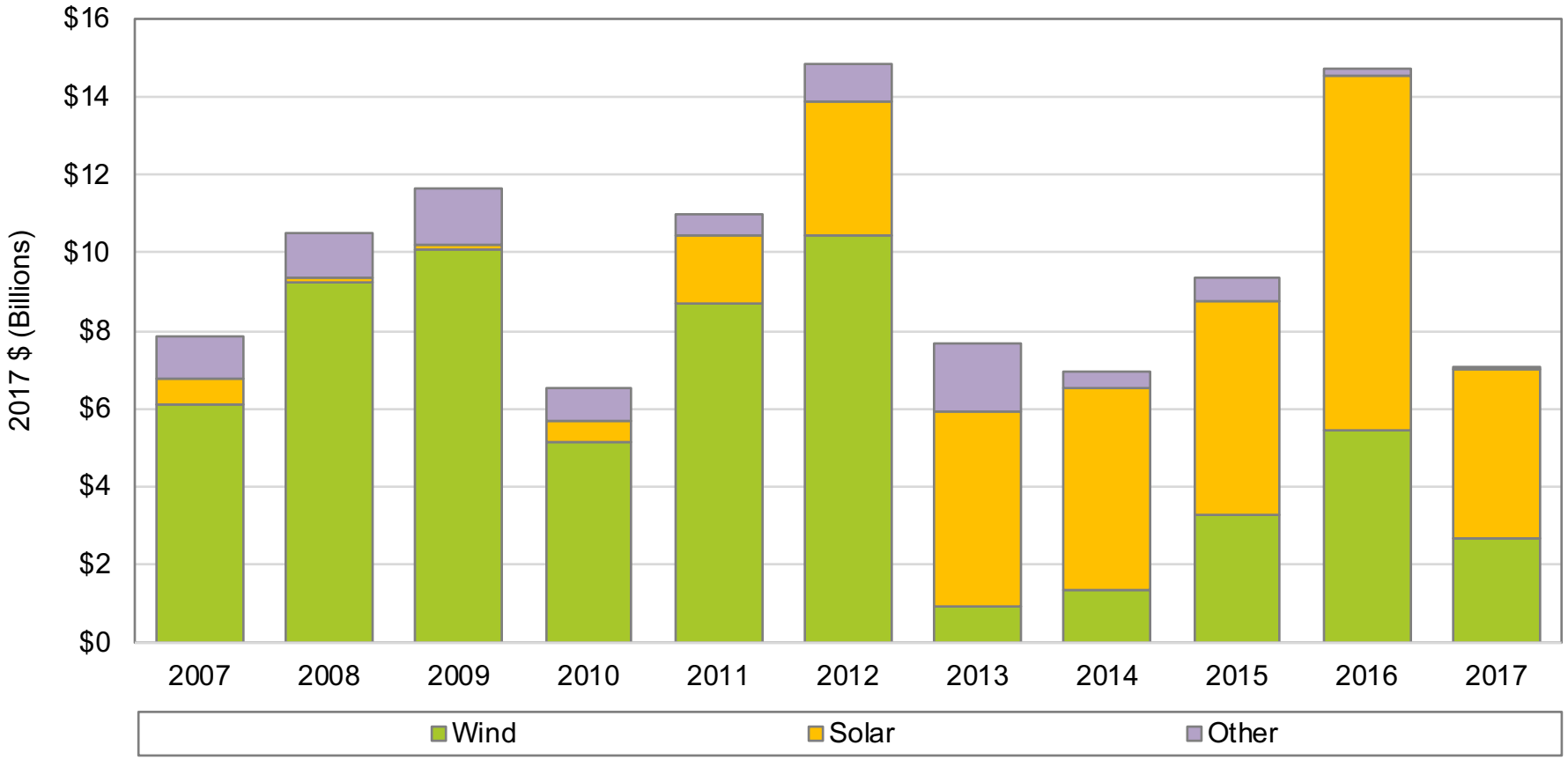
Most NERC regions use planning margins of 13 to 15 percent. Every NERC region is well above its standard reserve margin meaning that, at least from a capacity requirement perspective, all of the additional PURPA-stimulated renewable **QF capacity is unneeded and unnecessary to meet regional reliability needs**



Source: NERC.

Estimated annual QF renewable installation capital investments

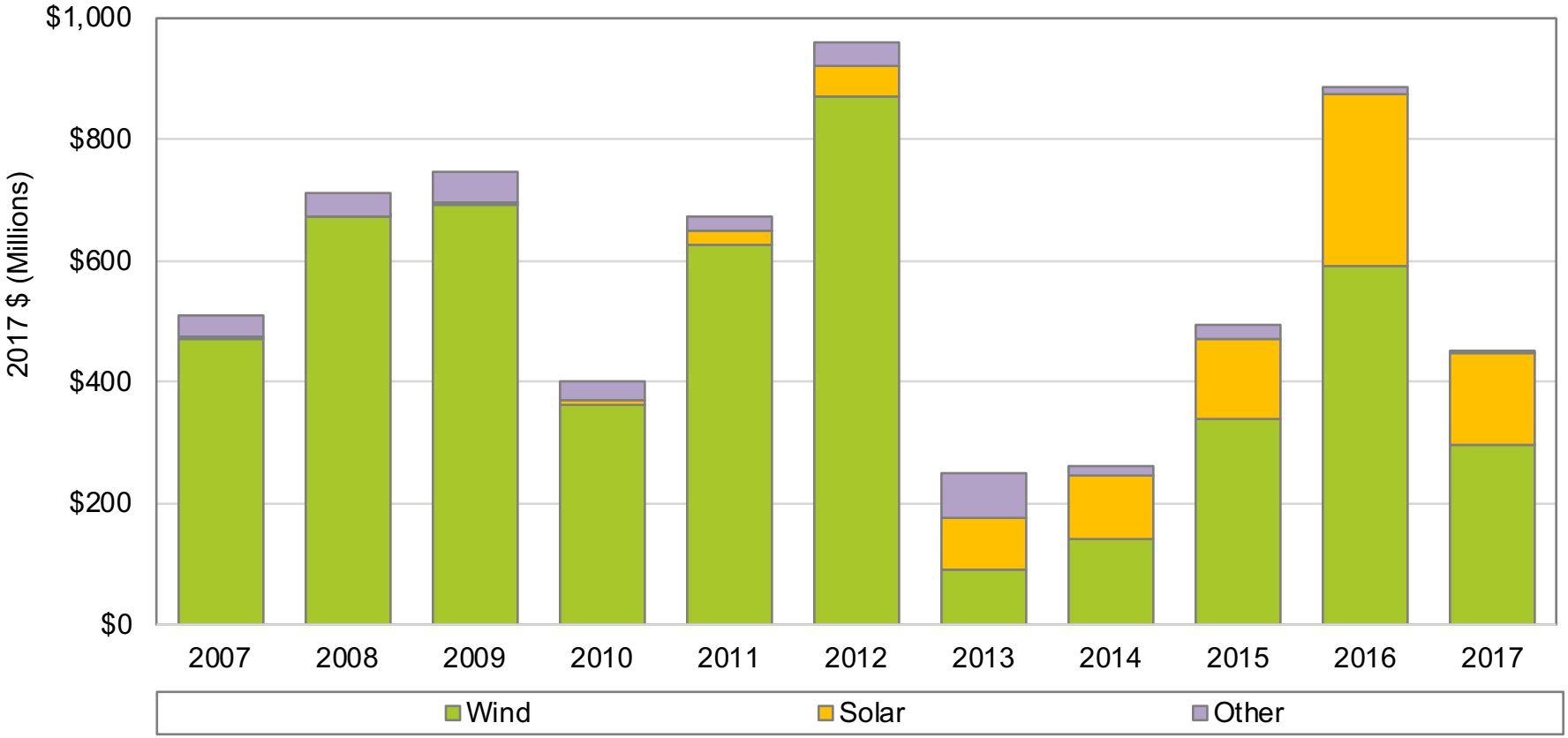
Excess renewable QF capacity development is not costless since utilities are forced to purchase this electricity, regardless of whether the generation is needed. **Capital investments are estimated to total $108 billion from 2007 to 2017.** Installed costs over the **past five years total $45 billion.**



Source: Authors construct with information from: U.S. Energy Information Administration; Lawrence Berkley National Laboratory; National Renewable Energy Laboratory and Lazard.

Estimated annual "avoided cost" payments to QF renewable installations

Estimated payments needed to support renewable QF generation are considerable: **an annual average of $468 million, totaling $2.3 billion over the last five years.** These are likely underestimated since the valuation is done using a **natural gas-based estimate of avoided cost that does not include any mark ups, premiums, or "adders" that can often be tacked on top of an avoided cost reimbursement rate**.



Source: Authors construct with information from: U.S. Energy Information Administration.

Conclusions

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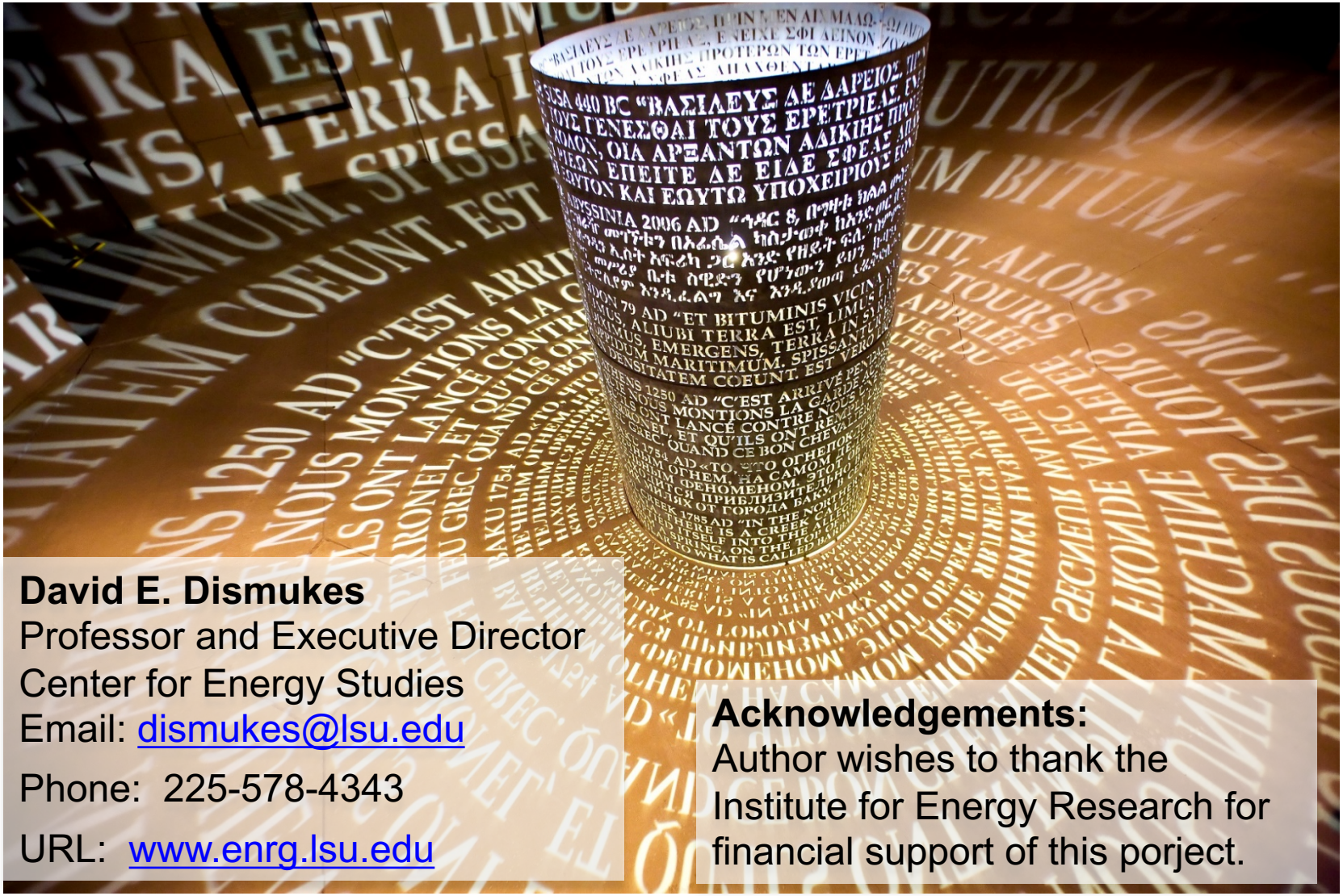
The **FERC has recognized the need for reforming PURPA** and has opened a **Notice of Proposed Rulemaking ("NOPR")** with proposed rule seeking stakeholder comment.

The main components of the reform include:

- Grant states flexibility for energy rates that vary reflect **market trends**.
- Grant states flexibility for fixed energy rates based on **projected market trends.**
- Grant states flexibility to set **"as available" energy rates.**
- Grant states flexibility to set prices based on **hub or fixed heat rate proxy**.
- Grant states flexibility to use **competitive bidding** results for energy rates.
- Modify the **one-mile rule** – anything less than one mile, presumptively non-affiliated. Provisions set for challenges of projects between one to ten miles.
- **Drop the rebuttal presumption from 20 MW to 1 MW** (on SPP puts).
- Allow states to determine **commercial viability standards**.
- Allow for **self-certification protests**.

Conclusions

Questions, Comments and Discussion.



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