Policies to support Grid Integration of Renewable Energy:

Cases and Renewable-Grid Synergies

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EESI
Environmental and Energy Study Institute

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- Founded in 1984 by a bipartisan Congressional caucus as an independent non-profit organization (but receives no Congressional funding)
- Source of non-partisan information on energy and environment policy development for Congress and other policymakers
- Our work focuses on win-win solutions to climate change in the energy, buildings, bioenergy, biofuels and transportation sectors

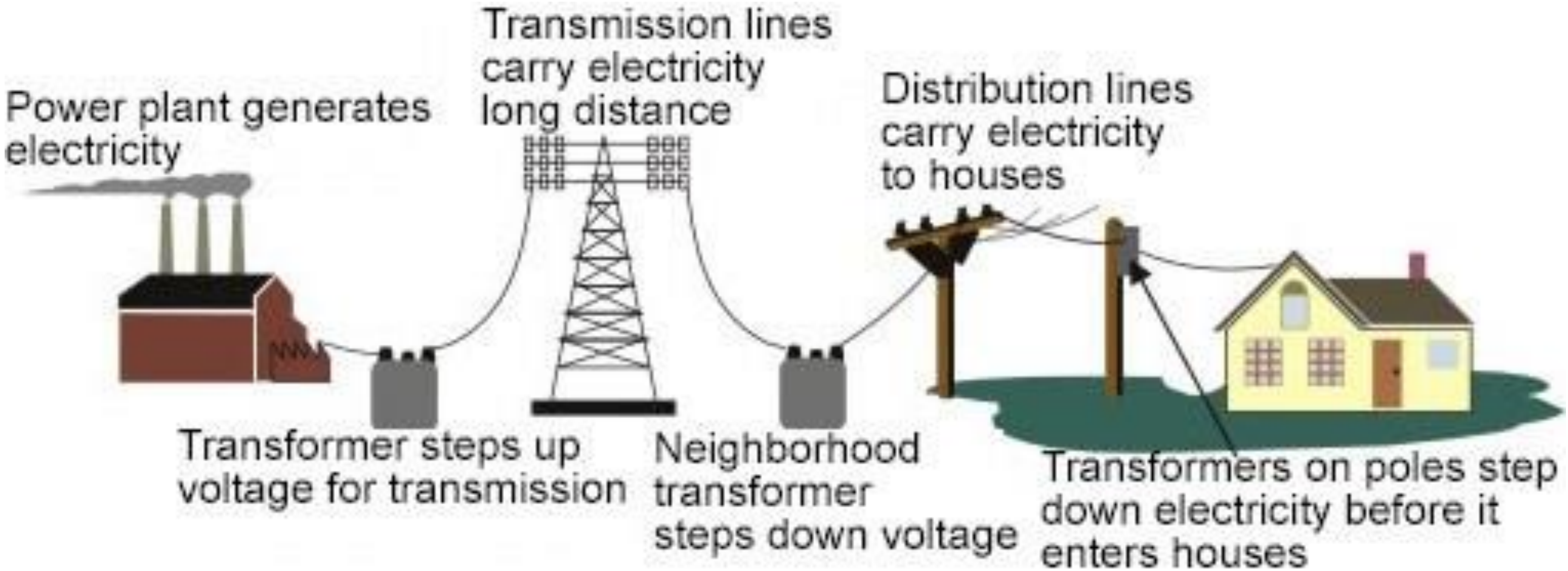
Outline:

I. Brief Overview

II. Policies to Increase Renewable Energy
   I. Federal
   II. Regulatory
   III. State

III. Conclusion

Traditional Electric Grid



Source: EIA

Key Federal Policies

- The **Production Tax Credit (PTC) –** originally enacted in 1992
- The **Investment Tax Credit (ITC) –** both residential and commercial were originally enacted in 2005

Key Regulations

- Federal Energy Regulatory Commission (FERC)
  - **Order 1000** (2010)

- Environmental Protection Agency (EPA)
  - **Clean Power Plan** (proposed 2014)

State Policies

- **Net-energy metering (NEM)**
- **Renewable Portfolio Standards (RPS)**
- Third-party power purchase agreements
- Loan programs for renewable energy
- *Carbon Trading Schemes (RGGI and California Cap-and-Trade)*
- Tax Credits
- PACE Financing
- Grant programs for renewables
- Etc.

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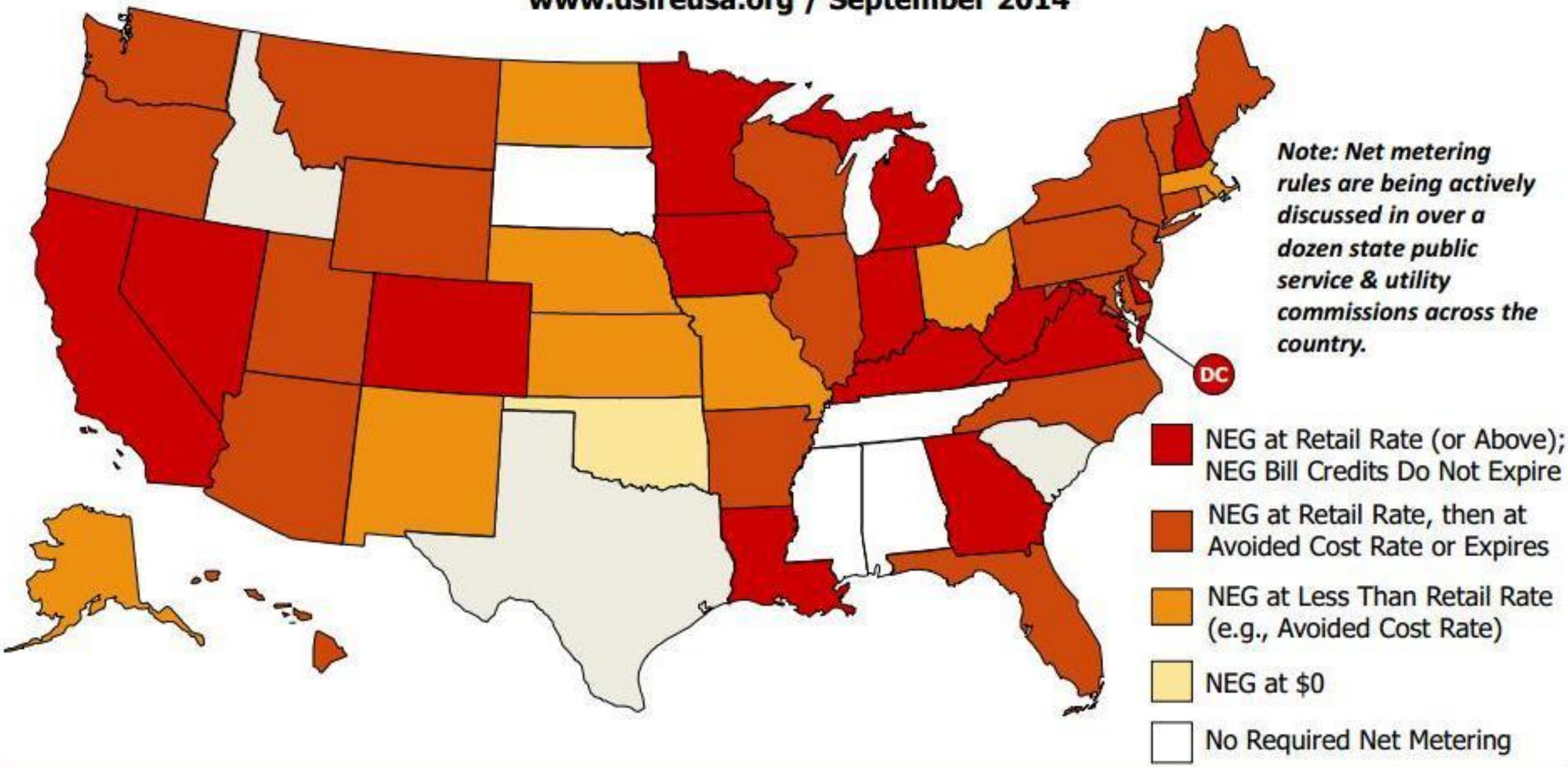
Payment/Credit to Customer-Generator for Monthly Net Excess Generation (NEG) Under Net Metering

www.dsireusa.org / September 2014



Note: Net metering rules are being actively discussed in over a dozen state public service & utility commissions across the country.

NEM's impacts on renewable energy

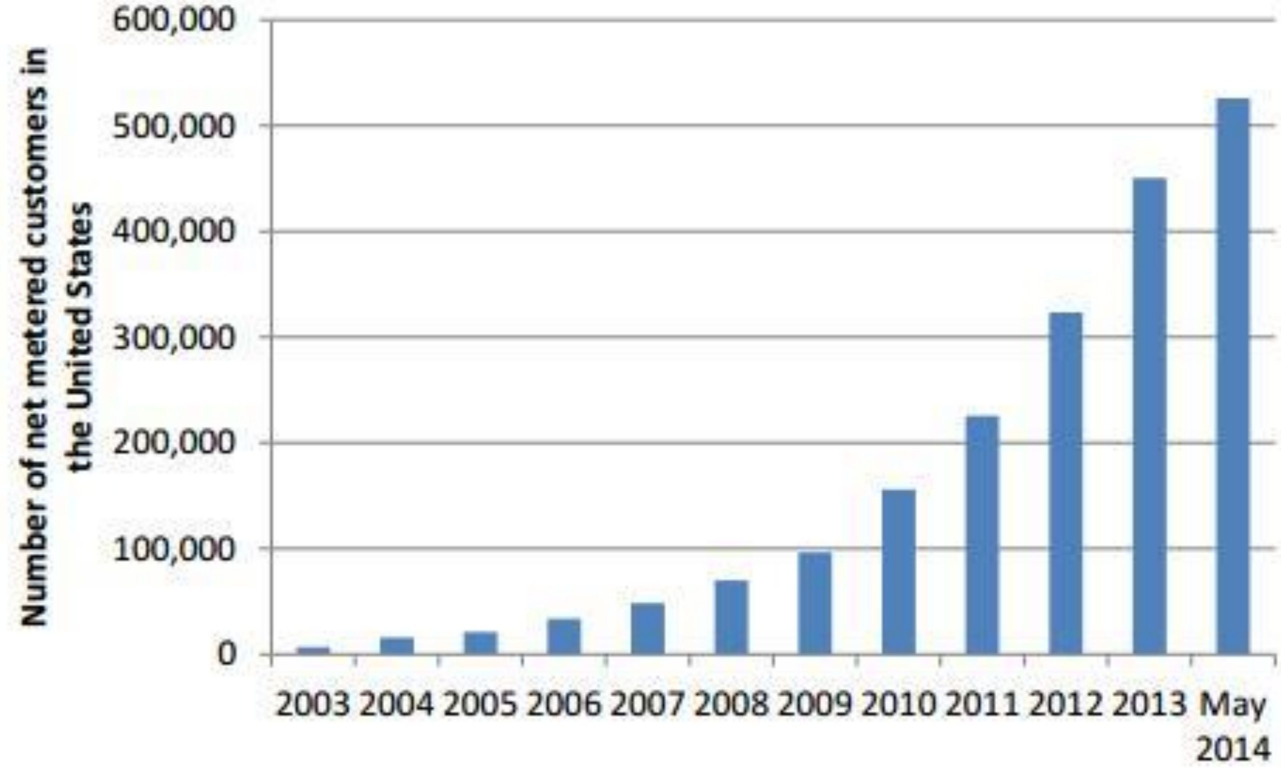
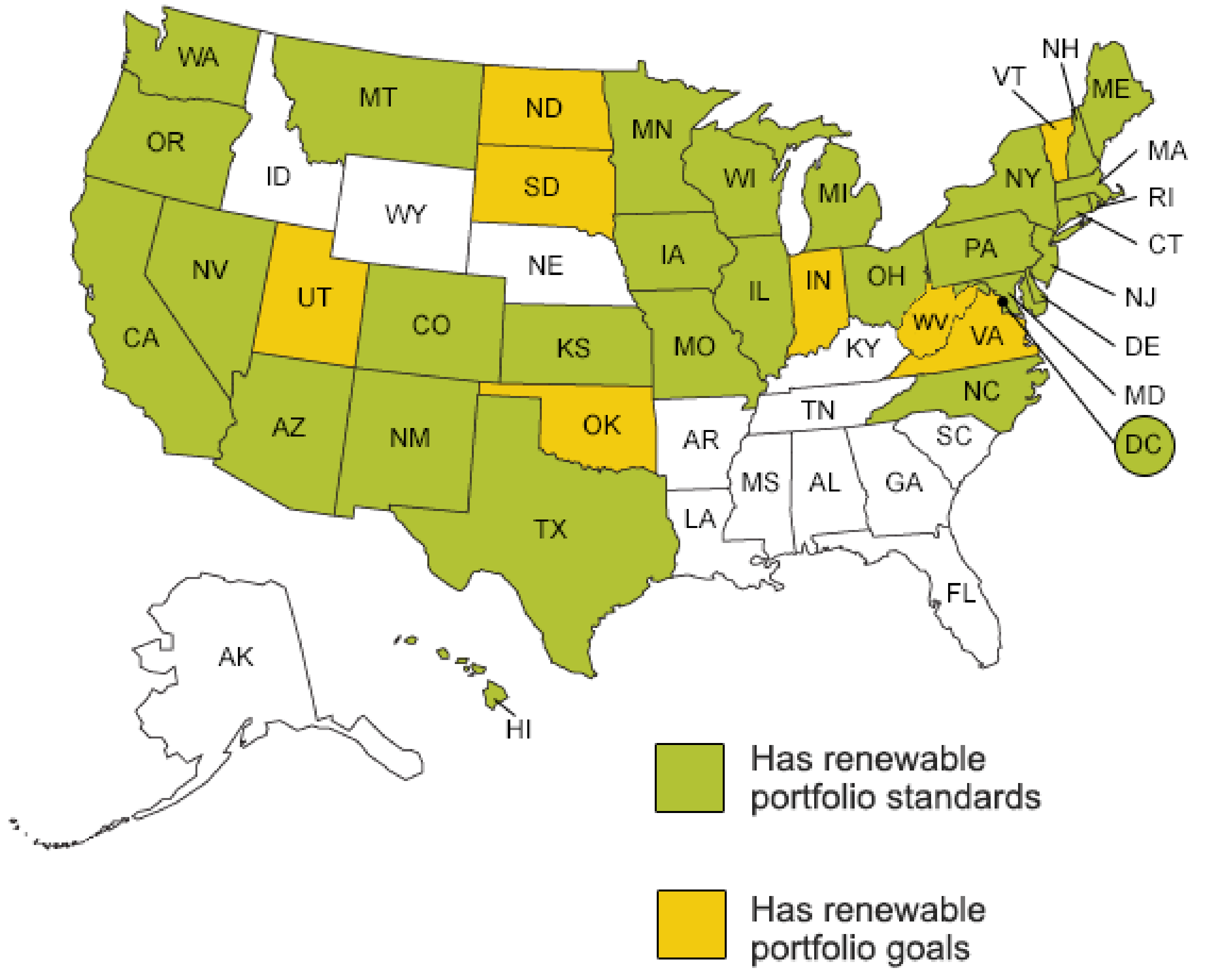


Figure 1. Number of net metered customers in the United States

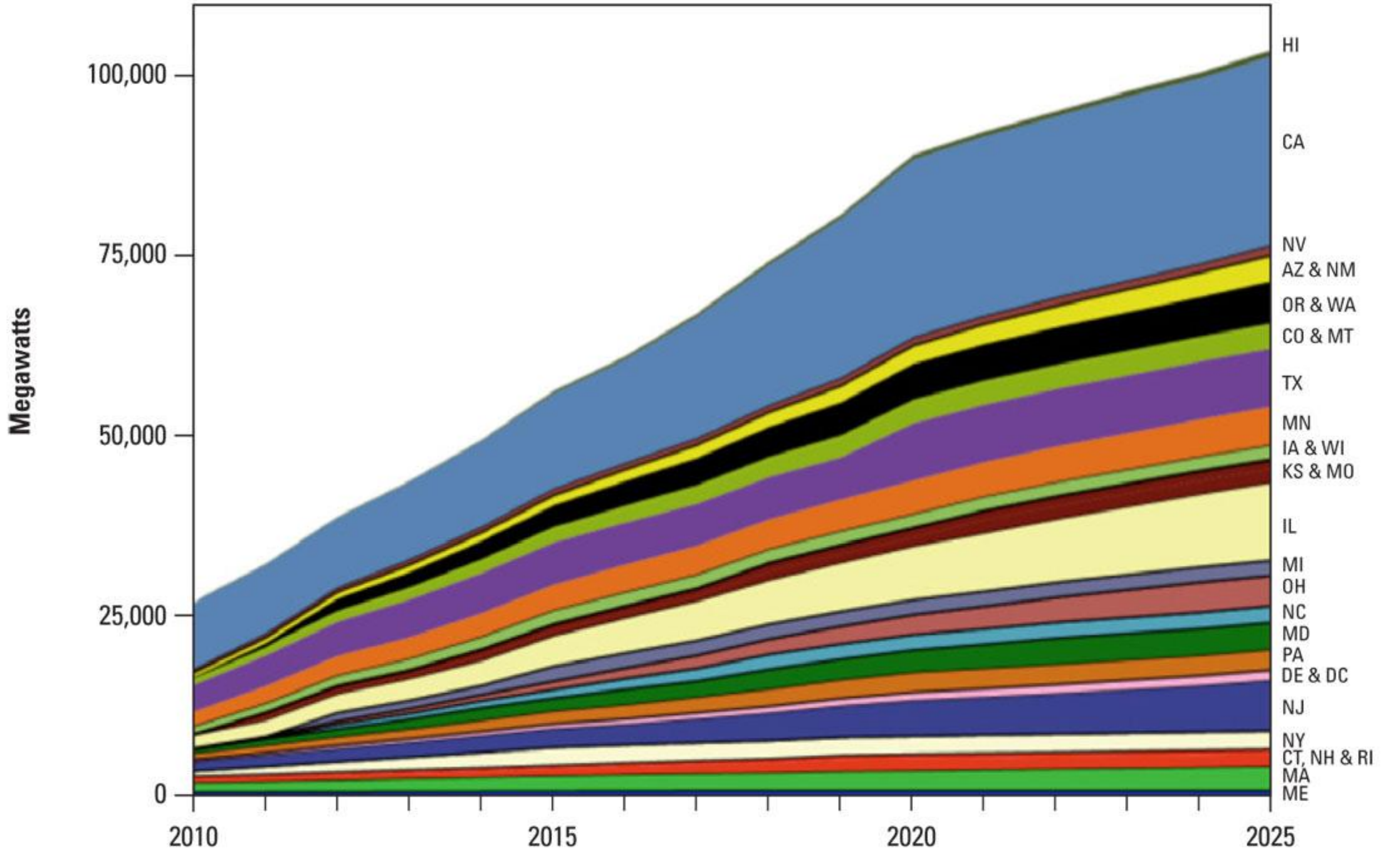
Source: EIA (2014)

Most states have renewable portfolio standards or goals



Source: Interstate Renewable Energy Council, Database of State Incentives for Renewable & Efficiency (as of March 2014).

Projected Renewable Energy Development from State Renewable Electricity Standards*



State RES policies are projected to support more than 103,000 MW of renewable energy capacity by 2025, with 87,000 MW of that total coming from new development. The RES policies in California, Illinois, Texas, New Jersey, and Minnesota represent the five largest new renewable energy markets in the United States.

*Includes new and existing renewable energy capacity. Projected development assumes states achieve annual renewable energy targets.

Final Thoughts

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Thank You

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For more information, see:

- Check out Department of Energy (DOE) loan guarantee programs
- The White House Climate Action Plan
- The Database of State Incentives for Renewables & Efficiency (DSIRE)
- Rocky Mountain Institute, Edison Electric Institute, C2ES

Federal Loan Programs*

- DOE loan-guarantee program
- Clean Renewable Energy Bonds (CREBs)
- Energy-Efficient Mortgages
- FHA PowerSaver Loan Program
- Qualified Energy Conservation Bonds (QCEBs)
- USDA Rural Energy For America Program (REAP) Loan Guarantees

*Many of these programs were created out of federal policies

Grid technologies to increase renewable energy on the grid

- “Smart grid” – smart meters, demand-response and peak load shaving
- Two-way electricity and information transmission
- Energy storage

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Environmental Protection Agency (EPA) Regulations

- Clean Power Plan – final rule January 1, 2015
- (MATS) Regulation
- Cross-State Air Pollution Regulation (CASPR)
- Ozone Standards
- Coal Ash Standards

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EPA’s Clean Power Plan

- Standing under the Clean Air Act
- Renewable energy is part of four building blocks EPA suggests to states for compliance
- States will need to rapidly ramp up renewable energy to meet goals
- Many baseload energy supply coal-fired power plants will be required to close
- Etc.

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Utility Business Model

- Decoupling
- De-integration
- Additional policies: Straight Fixed Variable Rate Design (flat fee that covers a utility's fixed costs); Lost Revenue Adjustment Mechanism (LRAM); Net Lost Revenue Recovery, or Conservation; and Load Management Adjustment

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