Examination of Federal Financial Assistance in the Renewable Energy Sector to Promote Solar and Wind Development and Investment

Lessons Learned to Implement New Programs Moving Forward

Seth Kirshenberg

KUTAKROCK

Overview

- Background and Objectives
- Approach
- Types of Incentives
- Findings
- Summary and Recommendations

Renewable Incentives Background

- Government is the largest Purchaser of Power in the US
- DOD is the largest Government purchaser of power.
- Government incentives since the passage of the Energy Policy Act of 2005 (EPACT 2005) have stimulated widespread commercial use of renewable energy from wind and solar.
- During the Obama Administration – focus by federal agencies to promote – through purchasing – renewable energy development
  - How much did renewable incentives cost the government?
  - What benefits did the incentives bring?
  - How can similar incentives be applied to any energy source?

Analysis and Report Approach

- 2006 marked the start of a renewed federal focus on renewables with passage of EPACT 2005 and the federal government's policy shift to support renewable through federal agency energy purchasing.

- 2009 kicked off large federal purchases of renewable energy

- The Team analyzed the costs and benefits of incentive programs for wind and solar power.
  - Government spending / revenue loss
  - Benefits: MW installed, kWh delivered, jobs, etc.

- The analysis focused on the period from 2005-2015, examining the incentives provided, the associated impacts on industry growth, and the cost to the tax payer.

Types of Renewable Energy Incentives

- Credit Incentives:
  - Credit incentives involve the provision of loans and loan guarantees to eligible projects. Typically, credit incentives target underserved markets or address financing gaps in the market. The budgeted cost of credit incentives is typically a fraction of the total amounts loaned.

- Tax Incentives:
  - Production Tax Credits (PTCs): Tax liability is reduced by a specified dollar amount per unit of power produced.
  - Investment Tax Credits (ITCs): Tax liability is reduced by a specified percentage of qualifying capital expenditure.
  - Accelerated Depreciation (MACRS): Depreciation of qualifying capital assets is accelerated to frontload depreciation in the early years of operating life.

Types of Renewable Energy Incentives (cont)

- R&D Incentives:
  - R&D incentives provide financial support to cover costs related to developing commercial technology. These can support a range of activities from building demonstration projects to preparing environmental or technical studies.

- Demand Mandates
  - The federal government set targets for renewables as a share of power consumption by federal facilities.
  - The U.S. Department of Defense (DoD) is the nation's largest energy user. Each service had large renewable energy goals (covered below)
  - Many states set targets for renewables as a share of power delivered by load-serving entities to their general customer base.

Goals in the Last Administration for Purchasing Renewable Energy by DOD (Examples)

- **Navy** - In his State of the Union Address to Congress on 24 January 2012 President Obama announced Navy will purchase “enough [renewable energy] capacity to power a quarter-million homes.” To address this mandate Navy chartered the 1 Gigawatt Task Force (1GW TF).
- **Army** set a goal of drawing 25% of renewables by 2025 in its Energy And Water Goal Attainment Responsibility Policy for Installations (January 2017). Navy had a goal of 1 GW.
- **Air Force** set goals to reduce energy demand by installations, flight operations, and ground operations • Increase energy supply by developing and utilizing renewable and alternative energy wherever possible.

Background -Federal Agency Contracting - Options

- **Appropriated Funding** – Pay for it upfront
- **Power Purchase Agreements** – (40 U.S.C. 501 / FAR Part 41) -- Up to 10 years
- **2922a - DOD Authority** – (10 U.S.C. 2922a) – Up to 30 years
- **"2667 Leases"** – (10 U.S.C. 2667)
- **Energy Savings Performance Contract (ESPC)** – (42 U.S.C. 8287)
  - Contracts for the sole purpose of achieving energy savings and benefits ancillary to that purpose. Period not to exceed 25 years.
- **Energy Service Agreements (ESA)**
  - ESPCs can incorporate the purchase of on-site renewable energy, if the result is lower energy consumption and costs. ESPCs with an ESA, requires Office of Management and Budget (OMB) review as per a Aug 16, 2011 memo.
- **Utility Energy Service Contract (UESC)** – (10 U.S.C. 2913)
  - DoD may enter into UESCs for up to 25 years.
- **Utility Privatization** – (10 U.S.C. 2688)
  - Enables a Secretary of a military department to convey a utility system, or part of a utility system, under the jurisdiction of the Secretary to a municipal, private, regional, district, or cooperative utility company or other entity. (up to 50 years).

Other - (10 USC 2916, 10 USC 2917, 10 USC 2662, 40 USC 591, DoD Instruction 4170.11, DoDI 4165.70, etc.)

Example of Executive Orders

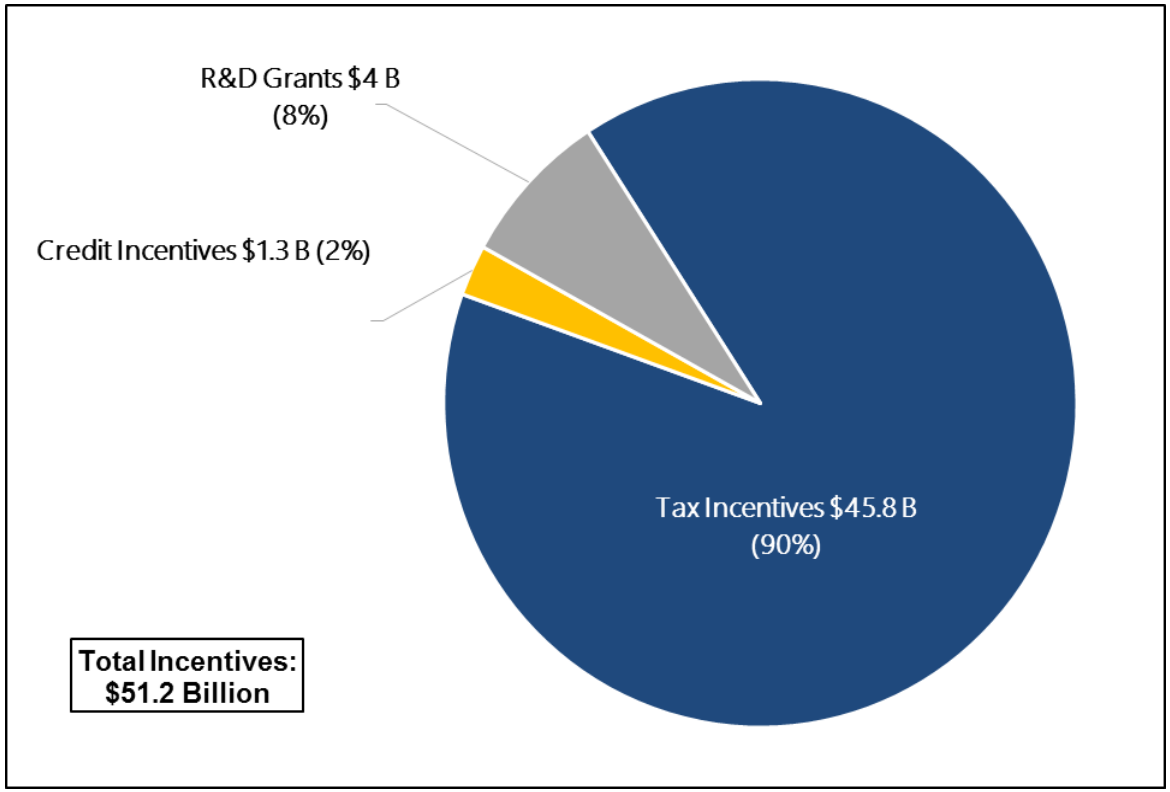
During the Obama Administration implemented the following energy Executive Orders to promote renewable energy usage by federal agencies:

- **Executive Order 13423 (2007):** Requires federal agencies to reduce energy intensity by three percent annually or 30 percent by end of fiscal year 2015 (compared to FY 2003 baseline), with the goal of improving energy efficiency and reducing greenhouse gas emissions.
- **Executive Order 13514 (2009)**: Required federal agencies to set percentage reduction targets for greenhouse gas emissions.
- **Executive Order_13693 (2015)** required federal agencies to draw 30% of federal energy use from renewables purchase.

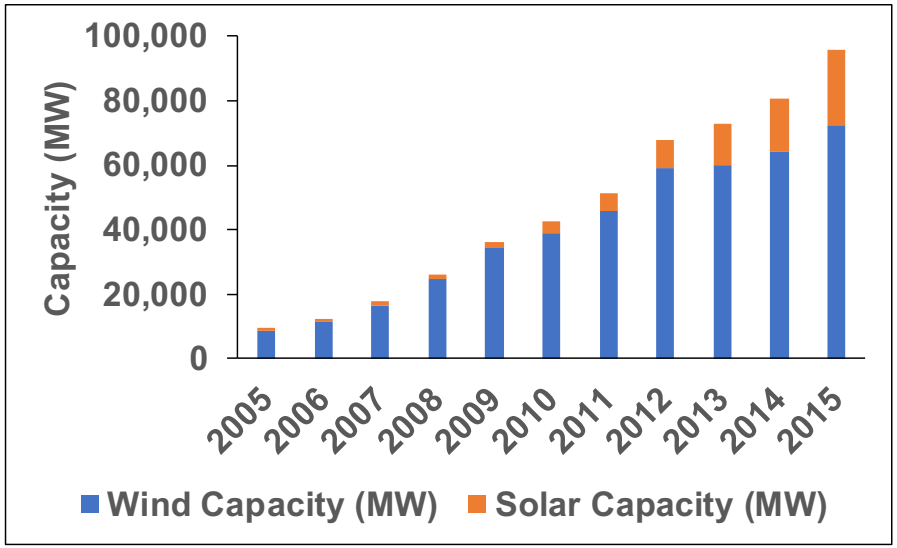
Findings: Federal Financial Support for Wind and Solar

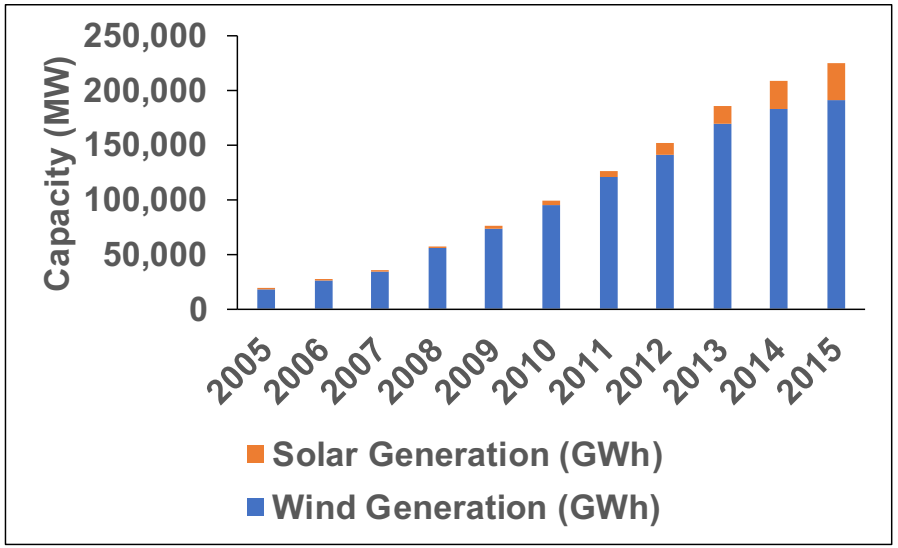
- Government support for wind and solar **totaled $51.2 billion over the period 2005 to 2015**; tax incentives comprised 90% of this amount.

- Investment in renewables was supported further by **government purchasing mandates** enacted at the federal and state levels.



Findings: Impact on Capacity and Generation



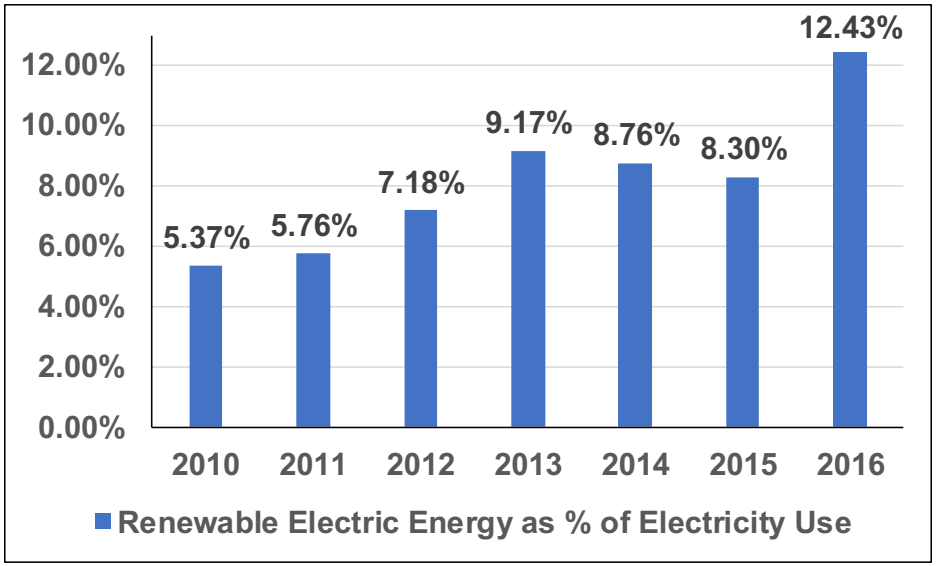


- Total installed capacity for solar and wind grew by 86,428 MW (9x) from 2005-2015.
- Total annual generation for solar and wind grew by 206,600 GWh (10x) from 2005-2015.
- The available incentives drive significant market penetration by wind and solar.

Findings: Federal Renewable Energy Purchasing Mandates

Federal energy mandates are found in executive orders and agency directives which set targets renewable usage targets for federal agencies.

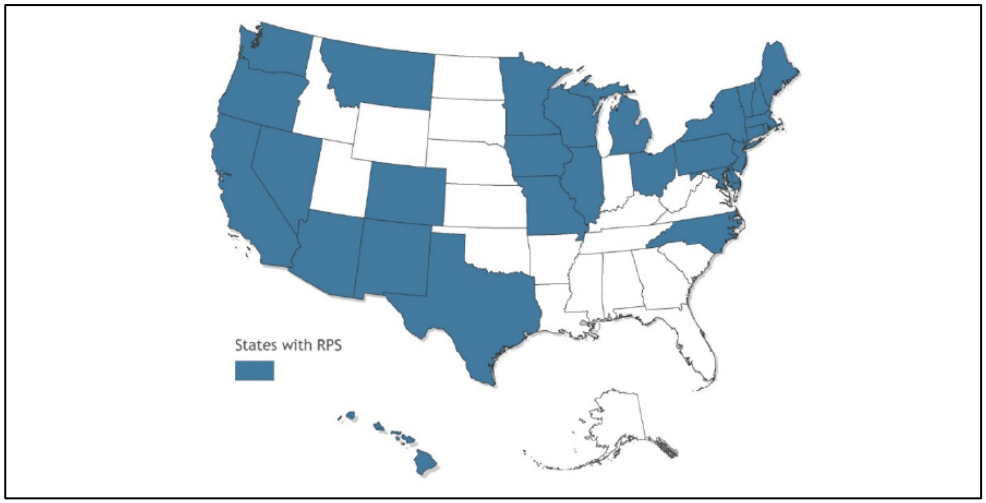
- EPACT 2005 set a federal renewables target which was later increased by **Executive Order 13693 to draw 30% of federal energy use from renewables.**



- The share of federal electricity use comprised by renewables has more than doubled from 2008 to 2016, reaching 12.4%.

Findings: State Renewable Energy Purchasing Mandates

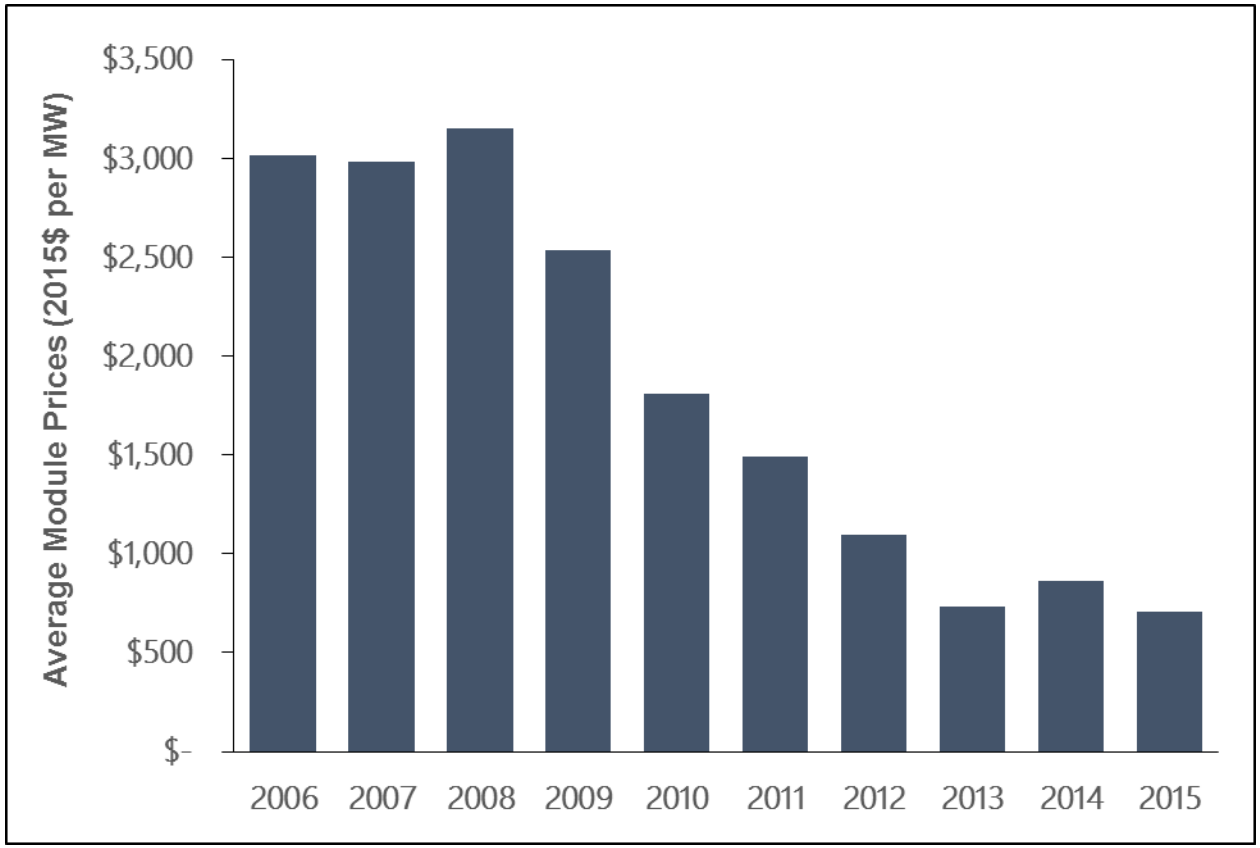
As of 2019, 29 states and DC have Renewable Portfolio Standard ("RPS") programs, which mandate that load-serving entities (the entities delivering power to customers) draw a specified portion of their power supply from renewable sources.



- For example, 10 states have recently increased their targets
  - **CA**: 60% by 2030 (and 100% zero-carbon by 2045)
  - **CT**: 40% Class I by 2030
  - **DC**: 100% by 2032, with 10% solar by 2041
  - **MA**: Annual increase of 2% of sales/year over 2020-2029
  - **MD**: 50% Tier 1 by 2030, incl. 14.5% solar + ~9.5% OSW
  - **ME**: 50% Class I by 2030
  - **NJ**: 50% Tier 1 by 2030
  - **NM**: 80% by 2040 (and 100% zero-carbon by 2045)
  - **NV**: 50% by 2030
  - **NY**: 70% by 2030 (and 100% zero-carbon by 2040)

Findings: Solar and Wind Costs

- The industry scale-up, driven in large part by incentives implemented in the U.S. and abroad contributed to significant cost reductions in the cost of solar power.



- From 2006 to 2015, average solar module prices declined by 77% in real terms.
- During the same period average turbine prices declined by 25%

Summary & Recommendations

- **Learn from the Successes of Renewable Energy**:
- A multi-pronged approach was pursued by the federal government to increase solar and wind development in the U.S. Energy market. Investment was significant at $51.2 billion.
- **Scale Impacts Price**: The industry impact was dramatic, particularly for solar as technological advances and competitions led to significant cost reductions.
- An opportunity exists for this to be revisited to contribute to the country's need for energy security and energy resilience.