

# Clean Power Plan – New Policy or New Normal?

---

How gas, solar, and wind are combining to change the way we produce power today

June 9, 2016

Patrick Luckow

Pat Knight

Liz Stanton (Moderator)

# Webinar Logistics

---

- The webinar is being recorded and will be circulated to all attendees, along with the slides
- All attendees have been muted on entry and will remain muted throughout the webinar
- Please send any questions on the content of the webinar to [webinar@synapse-energy.com](mailto:webinar@synapse-energy.com)
- During the Q&A session, the panelists will answer written questions that have been sent to [webinar@synapse-energy.com](mailto:webinar@synapse-energy.com)
- Please use the chat feature only to notify the host if you are having a technical issue with the WebEx software or audio
- Having trouble with audio? WebEx requires participants to choose an audio option when they join the webinar: computer audio or call in

# Who we are

---

## Synapse Energy Economics

- Research and consulting firm specializing in energy, economic, and environmental topics
- Services include economic and technical analyses, regulatory support, research and report writing, policy analysis and development, representation in stakeholder committees, facilitation, trainings, and expert witness services for public interest and government clients
- Experts in energy price forecasting, modeling multi-sector emissions, renewable integration analysis
- Developers of in-house and open-source tools to support robust, transparent energy planning

# Agenda

---

## The New Normal

- Recent changes in assumptions underlying power system outlook

## EIA's Annual Energy Outlook 2016

- With or without the Clean Power Plan, long-term results are shifting

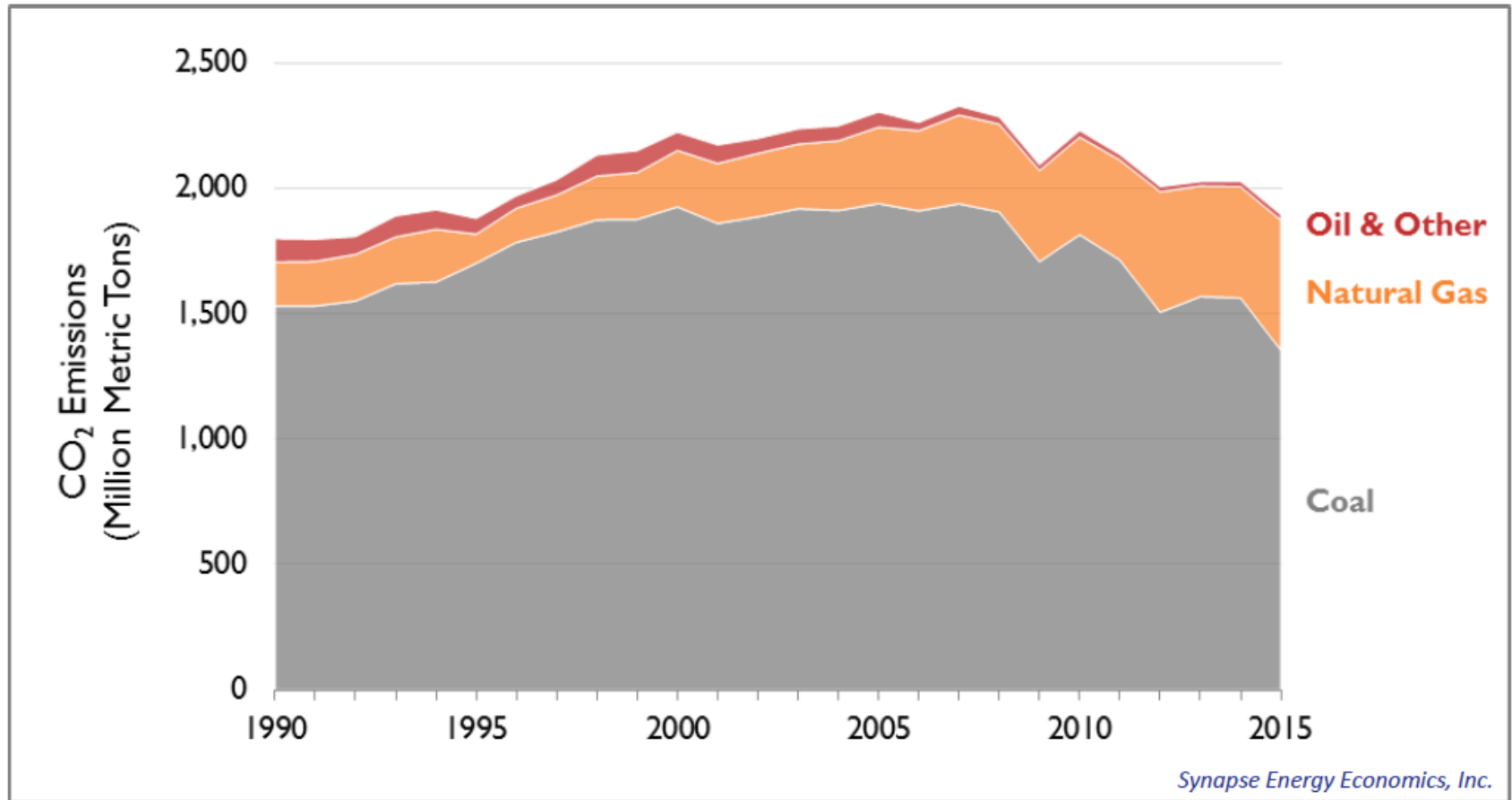
## Other Studies

- Synapse and others see as much or more of a shift than EIA

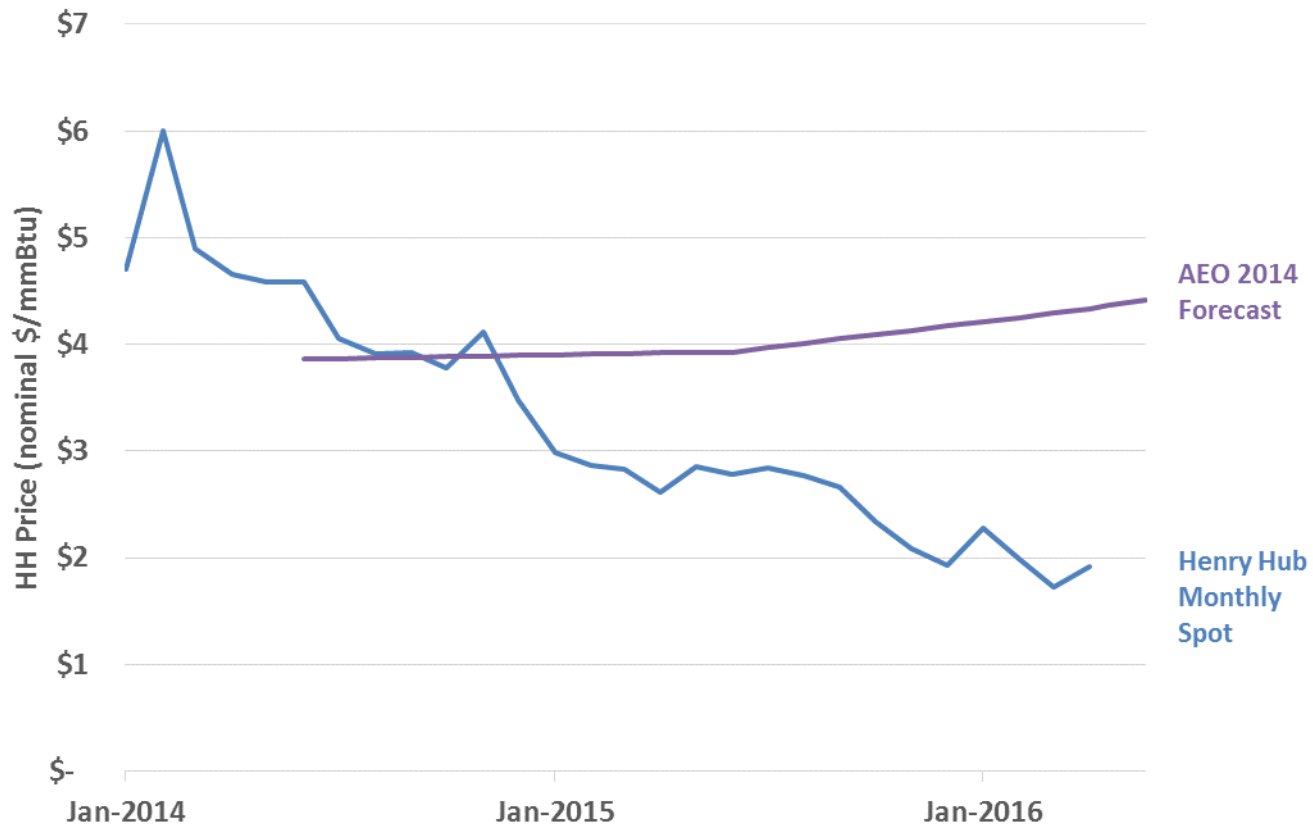
# The New Normal

# Major drivers are reducing emissions today

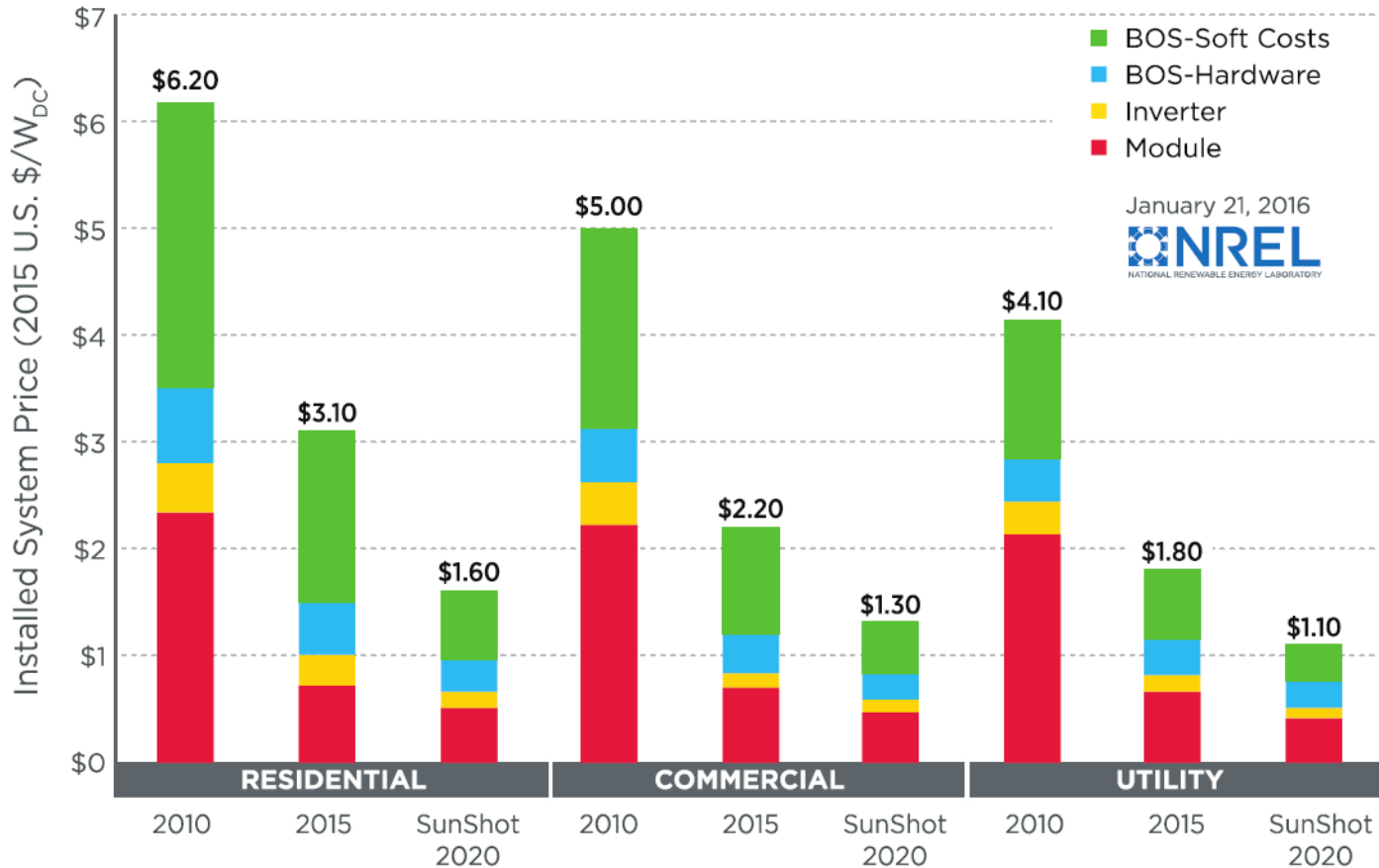
Electric-sector emissions at lowest levels since 1995



# Gas prices dramatically less than forecast when CPP unveiled



# Costs of renewables are falling rapidly

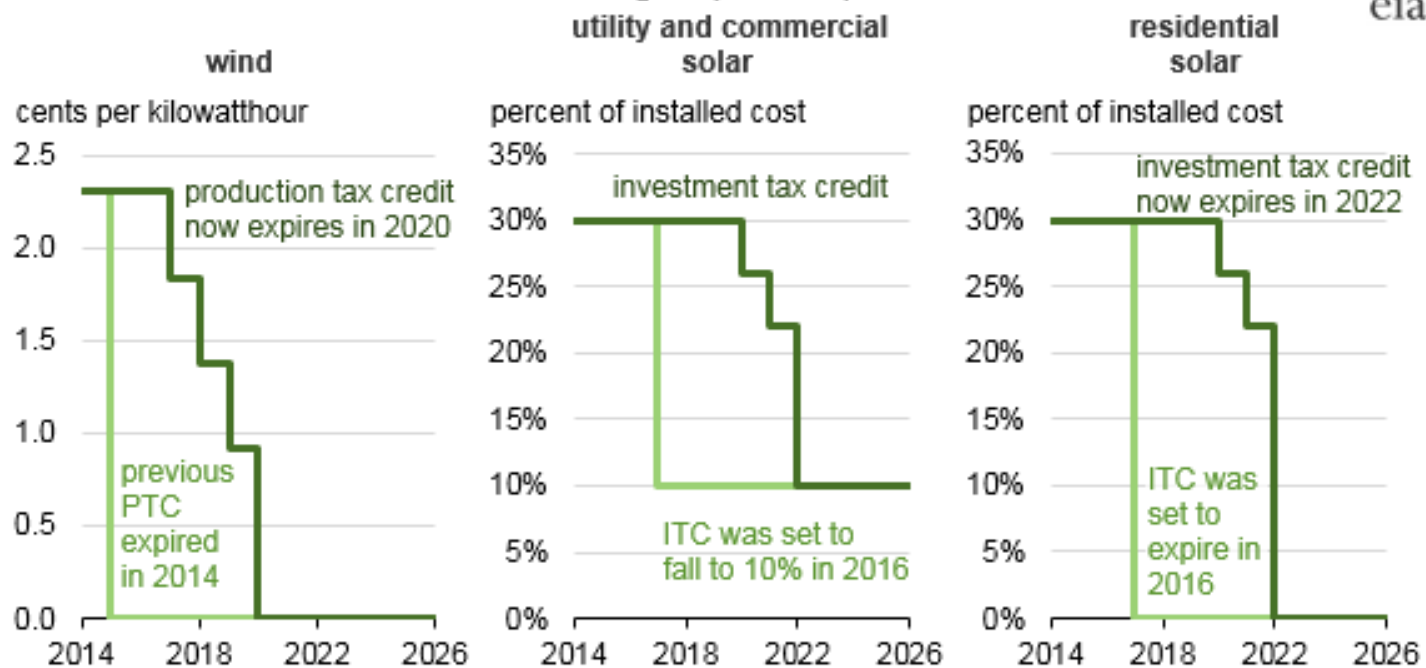




# Complementary policies help

- ITC/PTC Extension

Tax credits for wind and solar technologies (2014-26)



# Rhodium Group analysis shows ITC/PTC extension leads to major growth

**Figure 2: Utility scale wind and solar annual and cumulative capacity additions, 2015-2025**



Source: Rhodium Group analysis.

# Other Existing or Proposed Policies

---

## Major State RPS Policies Announced in the Past Year

- California – 50% by 2030
- Vermont – 75% by 2032
- Hawaii – 100% by 2045
- Oregon – 50% by 2040
- New York - 50% by 2030 (Proposed)

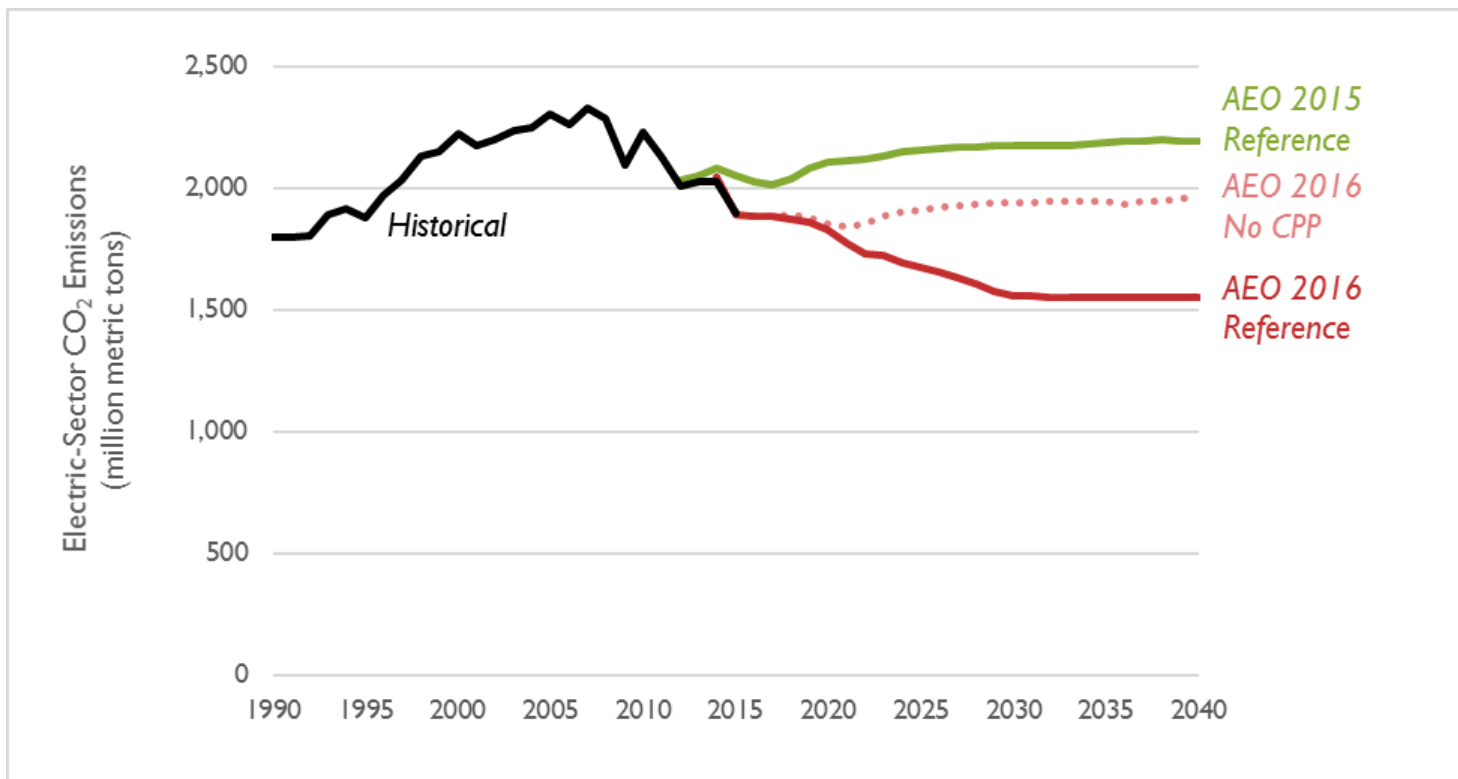
## Pollutant Rules

- NAAQS, CSAPR, MATS, Coal Combustion Residuals, Cooling Water
- See Synapse 2016 CO<sub>2</sub> Price Forecast

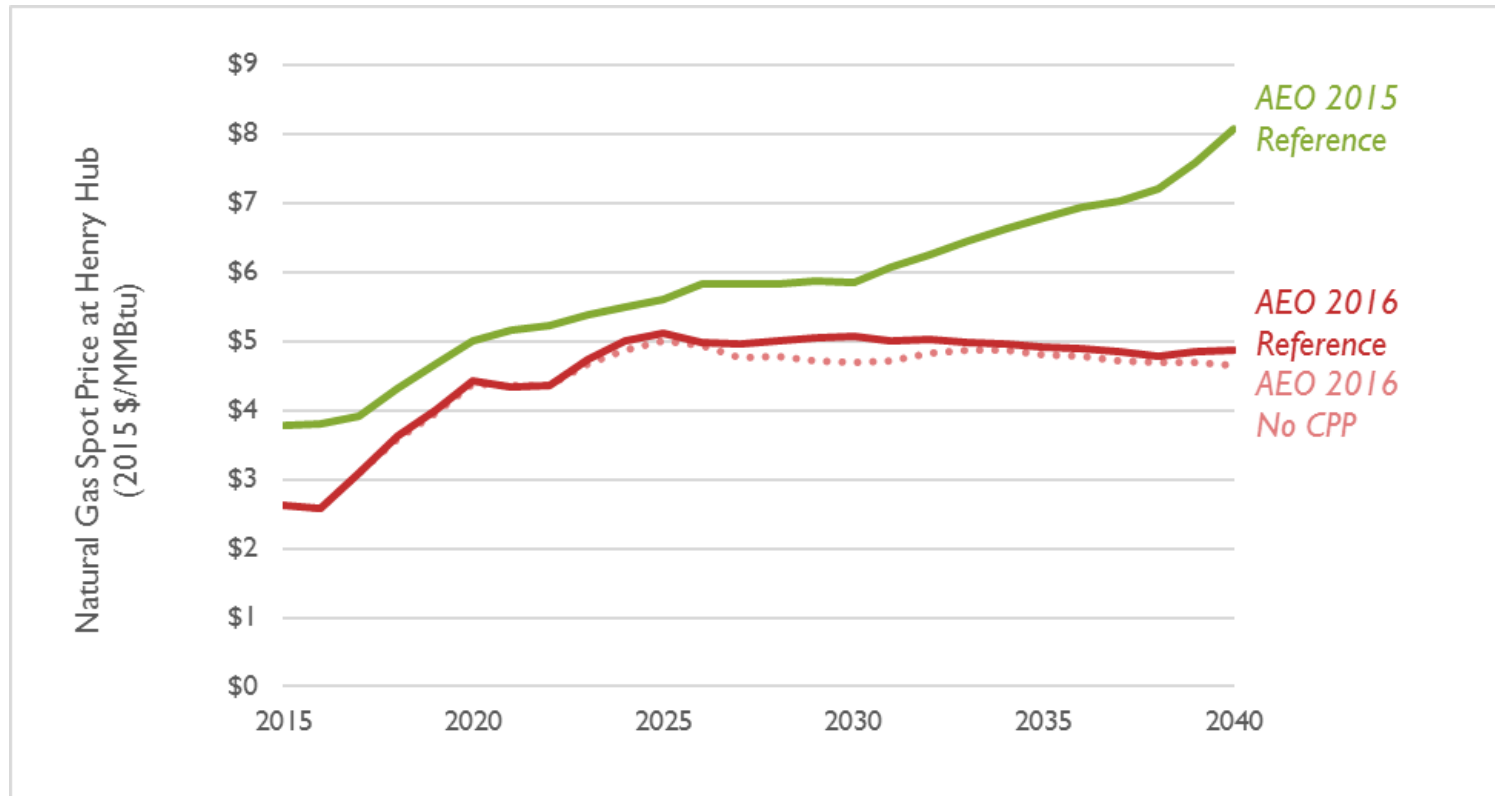
# **EIA's 2016 Annual Energy Outlook**

# EIA released 2016 Annual Energy Outlook on May 17

- Final release due in July
- Initial Reference case results show largest decline in CO<sub>2</sub> yet



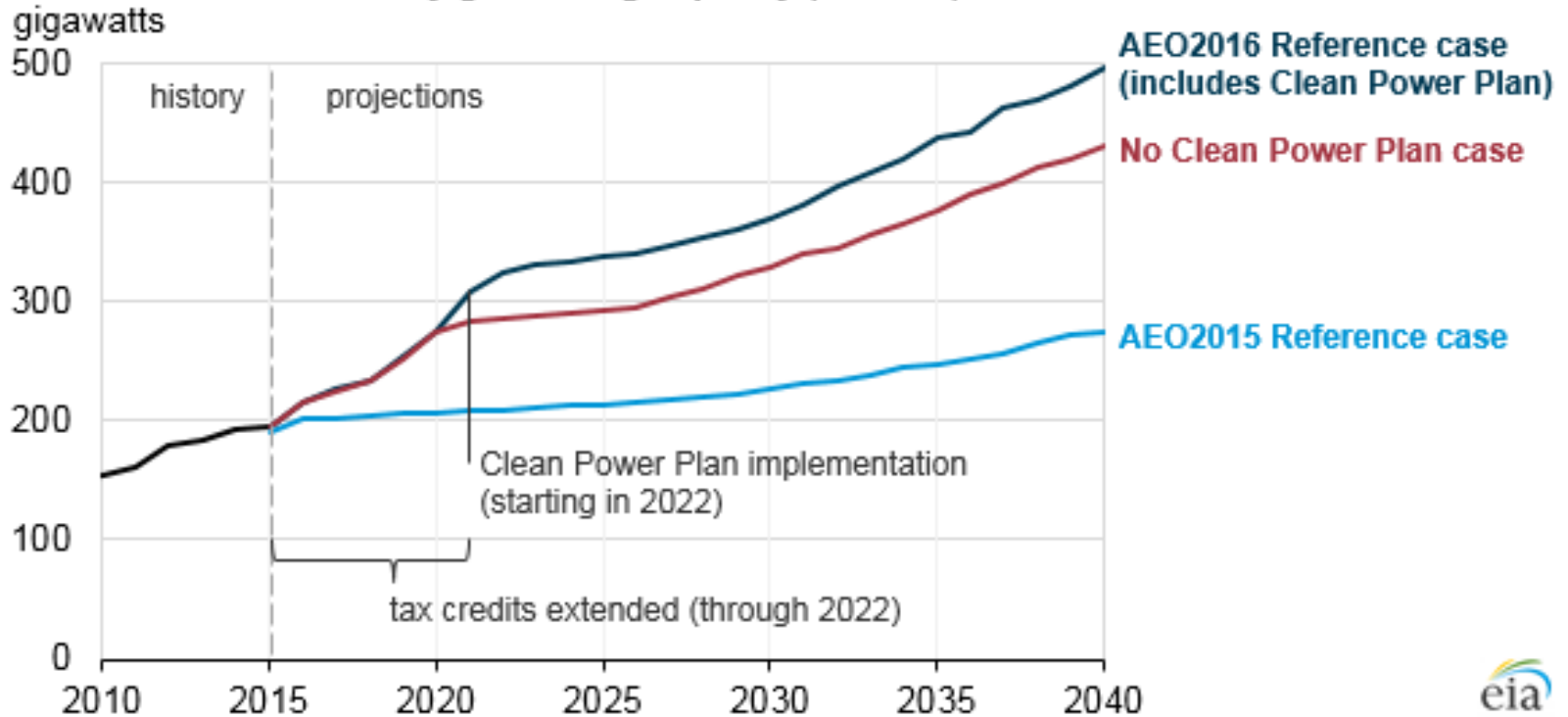
# Long-term gas price forecast well below AEO 2015



# Renewables up dramatically

Even in the absence of the Clean Power Plan

U.S. renewable electricity generating capacity (2010-40)



## Other opportunities not embedded in AEO

---

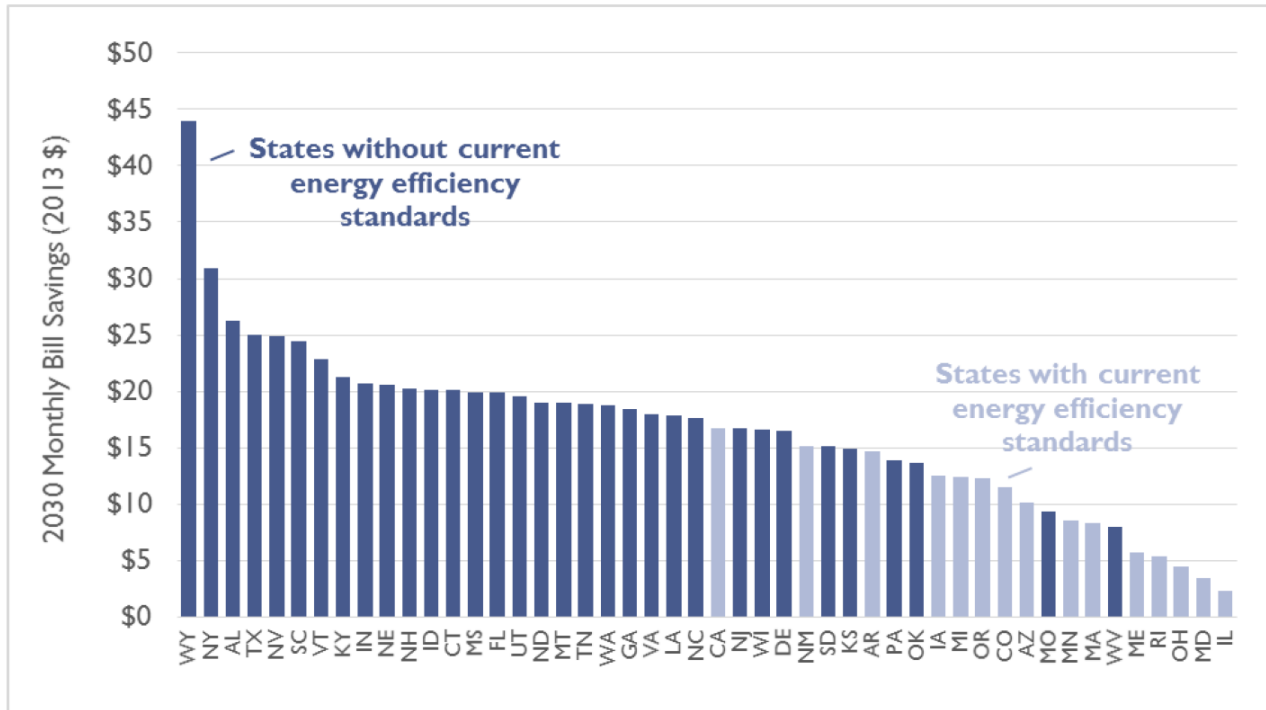
- Persistently low natural gas prices
- Substantial adoption of distributed generation
- Aggressive energy efficiency standards
- Reference case coal retirements based on economics



# **Independent Analysis Shows Similar Results**

# Synapse and others see major shifts

- Synapse analysis using ReEDS shows bill *savings* with the Clean Power Plan



<http://www.synapse-energy.com/project/bill-impacts-clean-power-plan> (Jan 2016)

- Bill savings largely result from energy efficiency impacts on overall bills, even with higher natural gas and solar costs

# Preliminary Synapse ReEDS Analysis shows even lower cost compliance

---

- **Preliminary model runs incorporate PTC/ITC, AEO 2016 fuel prices, and more aggressive PV trajectories future**
- **These tend to reduce costs from late 2015 model runs by 25 to 75 percent**
- **New developments could drive marginal CO<sub>2</sub> prices well below our Spring 2016 CO<sub>2</sub> Price Forecast** (Depending on trading, fuel prices, complementary policies)

# Recent studies all show renewables growth

➤ **Renewable energy capacity expected to nearly double from 2015 levels by 2021**

NRDC “New NRDC Analysis: Electric Sector on Track to Meet Clean Power Plan.” June 2016.

[www.nrdc.org/experts/david-doniger/new-nrdc-analysis-electric-sector-track-meet-clean-power-plan](http://www.nrdc.org/experts/david-doniger/new-nrdc-analysis-electric-sector-track-meet-clean-power-plan).

➤ **“Bulk Power System already undergoing a broad transformation”**

NERC “Reliability Considerations for Clean Power Plan Development.” Jan 2016.

[www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/Reliability%20Considerations%20for%20State%20CPP%20Plan%20Development%20Baseline%20Final.pdf](http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/Reliability%20Considerations%20for%20State%20CPP%20Plan%20Development%20Baseline%20Final.pdf).

➤ **129GW of new RE by 2022 driven by tax credits, 71GW more from CPP by 2030**

UCS “Accelerating Toward a Clean Energy Economy.” May 2016.

[www.ucsusa.org/clean-energy/increase-renewable-energy/accelerating-toward-clean-energy-economy?\\_ga=1.37932323.1249951154.1461332670#.V1g1UfkrJhE](http://www.ucsusa.org/clean-energy/increase-renewable-energy/accelerating-toward-clean-energy-economy?_ga=1.37932323.1249951154.1461332670#.V1g1UfkrJhE)

➤ **Arizona on track to comply without other actions based on gas and EERE**

Pace Global analysis of Arizona Compliance Position. Feb 2016.

[www.legacy.azdeq.gov/enviro/air/download/pace\\_cpp\\_rate.pdf](http://www.legacy.azdeq.gov/enviro/air/download/pace_cpp_rate.pdf).

# Want to team up with us?

---

## Synapse provides:

- **Economic and technical analysis**
- **Research and report writing**
- **Policy analysis and development**
- **Representation in voting and stakeholder committees**
- **Economic and power system modeling**
- **Expert witness services**
- **Regulatory support**
- **Facilitation and trainings**
- **Development of analytical tools**

# Related Resources

---

**Synapse Spring 2016 National Carbon Dioxide Price Forecast** [http://www.synapse-energy.com/sites/default/files/2016-Synapse-CO2-Price-Forecast-66-008\\_0.pdf](http://www.synapse-energy.com/sites/default/files/2016-Synapse-CO2-Price-Forecast-66-008_0.pdf)

**Consumer Costs of Low-Emissions Futures Factsheets and Reports:** <http://synapse-energy.com/project/consumer-costs-low-emissions-futures>

**Synapse Clean Power Plan Toolkit:** <http://synapse-energy.com/CleanPowerPlan>

**Past Clean Power Plan Webinars:** <http://synapse-energy.com/synapse-projects-and-webinars-related-clean-power-plan>

**Clean Power Plan Modeling Tools for States and Stakeholders:** <http://www.synapse-energy.com/project/clean-power-plan-modeling-tools-states-and-stakeholders>

**Clean Power Plan Handbook for National Association of State Utility Consumer Advocates:** <http://synapse-energy.com/sites/default/files/Clean-Power-Plan-Handbook.pdf>

**Synapse Blog Posts on Clean Power Plan:** <http://synapse-energy.com/tags/clean-power-plan>

**Harvard Environmental Policy Initiative Resource Center:** <http://environment.law.harvard.edu/state-clean-power-plan-resources/>

# Upcoming Webinars

---

## **The Changing Role of Planning in the Electric Sector: The Future of Integrated Resource Planning**

Thursday, June 16, 2016 | 2:00-3:00pm

## **New Renewable Generation Capacity – Why Here and Not There?**

Wednesday, June 22, 2016 | 2:00-3:00pm

Register at <http://www.synapse-energy.com/webinars>

Did you miss last week's webinar, *New Perspectives on RGGI and the Massachusetts Global Warming Solutions Act*? Watch the recording at <http://www.synapse-energy.com/project/new-perspectives-rggi-and-massachusetts-global-warming-solutions-act>.

# Contact Information

Patrick Luckow, [pluckow@synapse-energy.com](mailto:pluckow@synapse-energy.com)

Pat Knight, [pknight@synapse-energy.com](mailto:pknight@synapse-energy.com)

Liz Stanton, [eastanton@synapse-energy.com](mailto:eastanton@synapse-energy.com)

**Please remember to send any questions on content to  
[webinar@synapse-energy.com](mailto:webinar@synapse-energy.com)**



# Sources and related reading

---

- Woodhouse et al. 2016. On the Path to SunShot: The Role of Advancements in Solar Photovoltaic Efficiency, Reliability, and Costs. Golden, CO: NREL.  
<http://www.nrel.gov/docs/fy16osti/65872.pdf>.
- Larsen, John and Herndon, Whitney. 2016. “**Renewable Tax Extenders: The Bridge to the Clean Power Plan**” <http://rhg.com/notes/renewable-tax-extendors-the-bridge-to-the-clean-power-plan>
- **Synapse Bill Impacts of the Clean Power Plan.** <http://www.synapse-energy.com/project/bill-impacts-clean-power-plan>
- NACAA “Implementing EPA’s Clean Power Plan: Model State Plans”. May 2016.  
[http://www.4cleanair.org/sites/default/files/Documents/5\\_30\\_2016\\_NACAA\\_State\\_Models\\_FINAL.pdf](http://www.4cleanair.org/sites/default/files/Documents/5_30_2016_NACAA_State_Models_FINAL.pdf)
- Emory Law “Mass-Based CPP Compliance: State Law Impacts on Allowance Trading Programs in Eight Southeastern States”. June 2016. [http://climate.emory.edu/policy/CPP\\_Report.pdf](http://climate.emory.edu/policy/CPP_Report.pdf)