ACORE
American Council On Renewable Energy

The State of Play for Renewable Energy

REFF-Wall Street

Gregory Wetstone
President & CEO

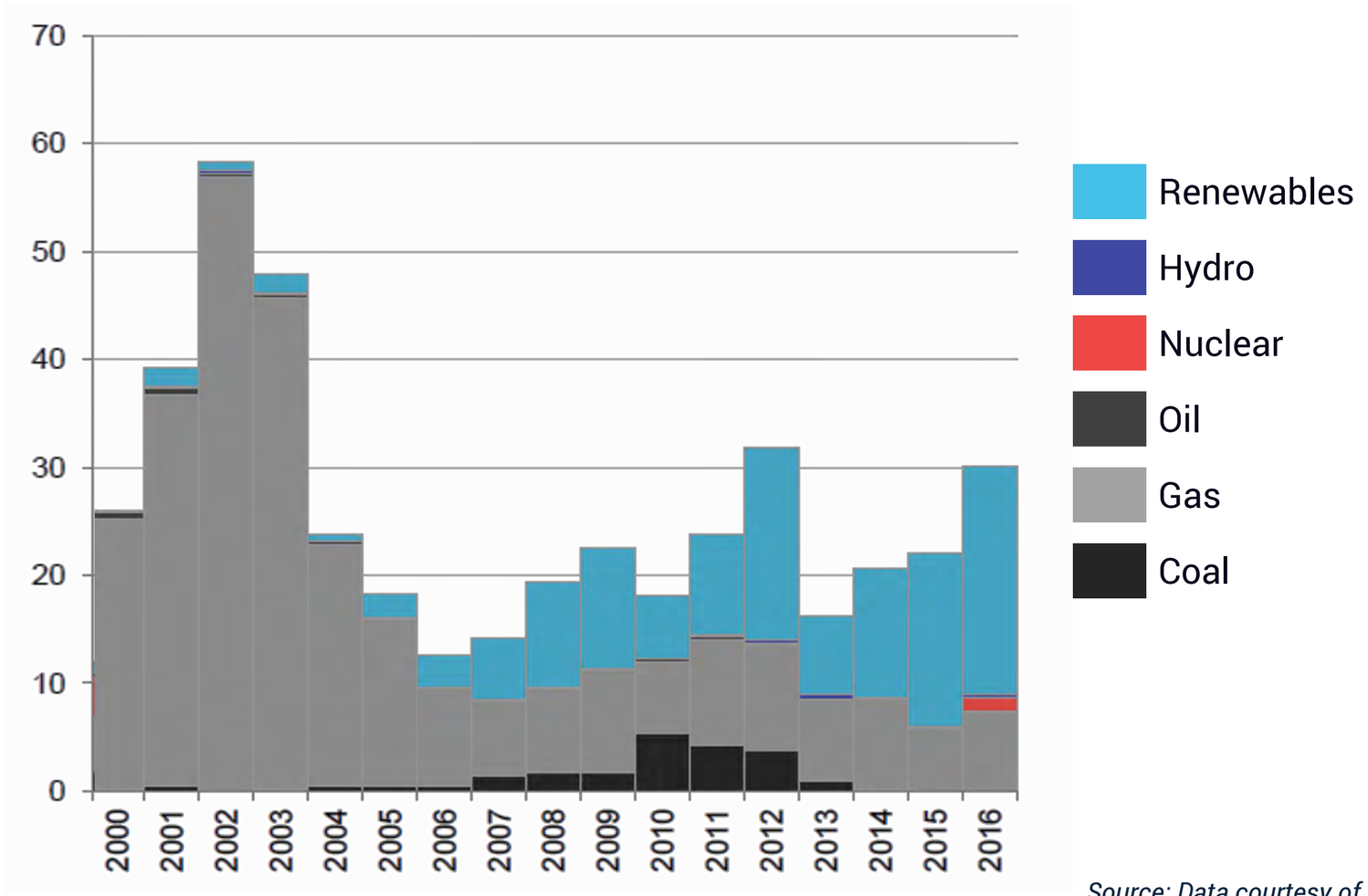
June 20, 2017

ACORE: Driving Investment and Deployment

Our Mission: Accelerate the Transition to a Renewable Energy Economy

The Transition to Renewables Is Well Underway

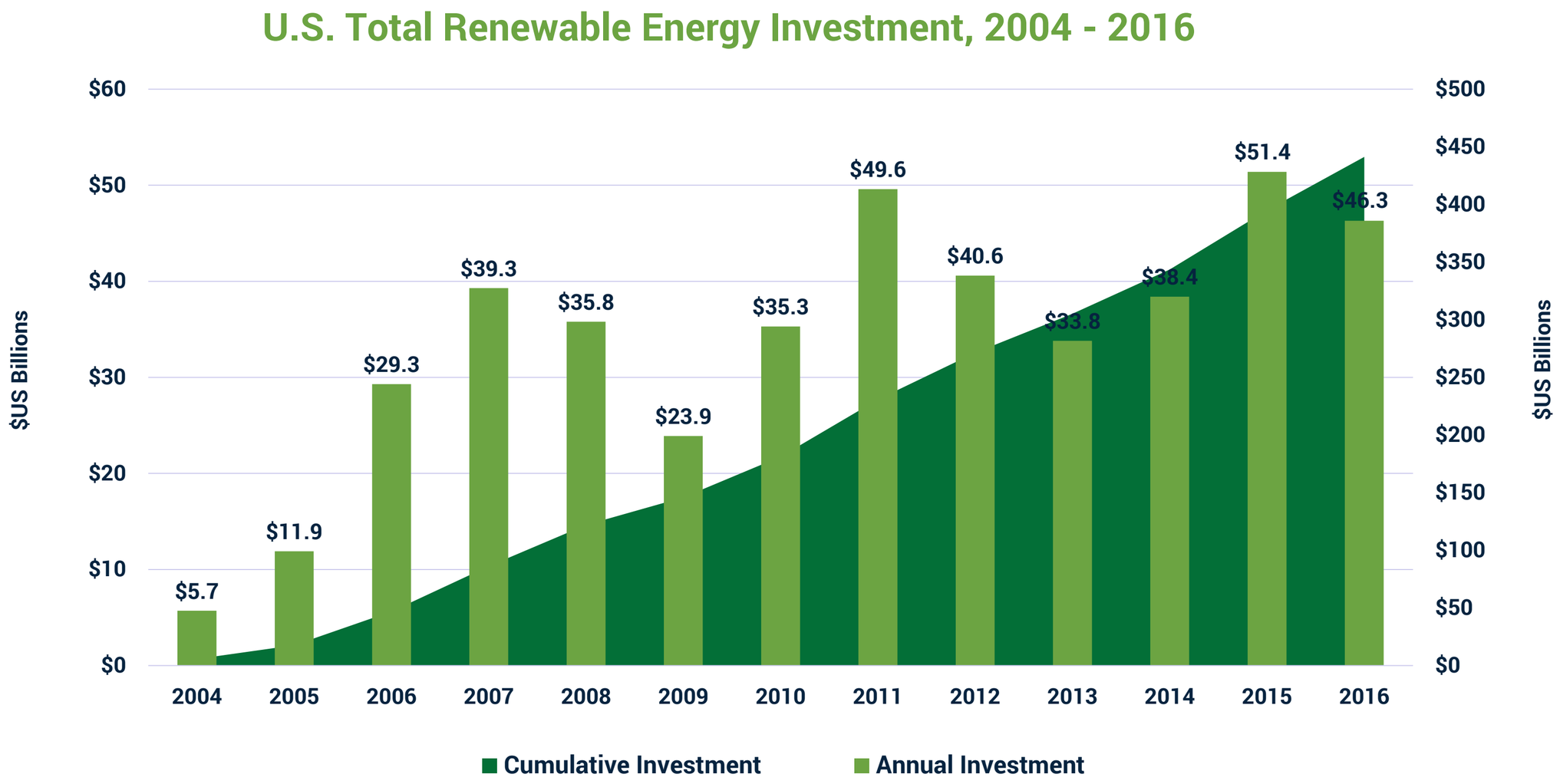
Electric Generation Capacity Build by Fuel Type, 2000 - 2016



Source: Data courtesy of EIA, BCSE and BNEF

ACORE
American Council On Renewable Energy

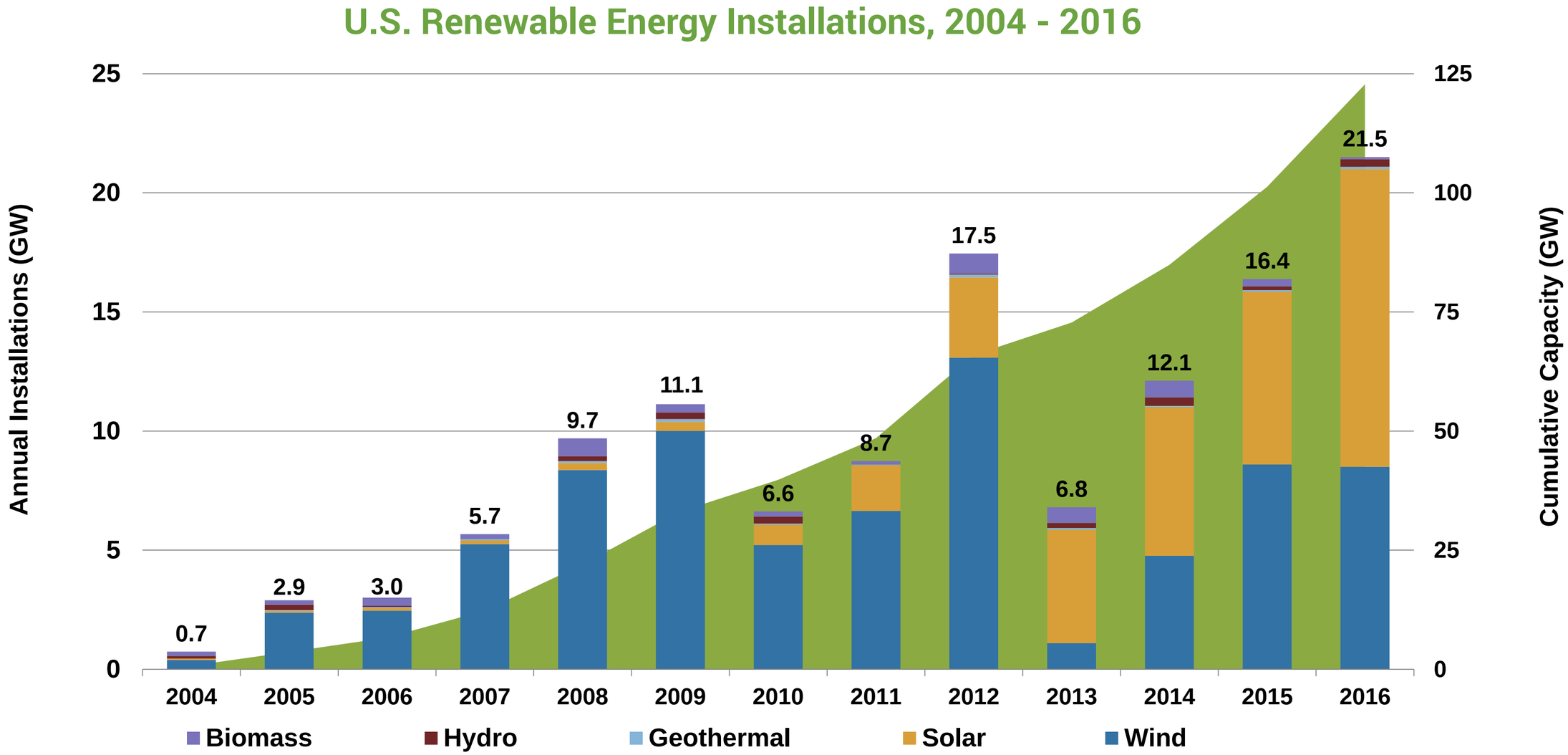
Domestic Investment Remains High



Technologies include all biomass waste-to-energy, geothermal, and wind projects greater than 1 MW; all hydropower between 1 MW and 50 MW; all wave and tidal projects; all biofuel projects with a capacity of one million liters or greater per year; and all solar projects.

Source: Data courtesy of Frankfurt School, UNEP/BNEF

New U.S. Renewable Energy Generating Capacity

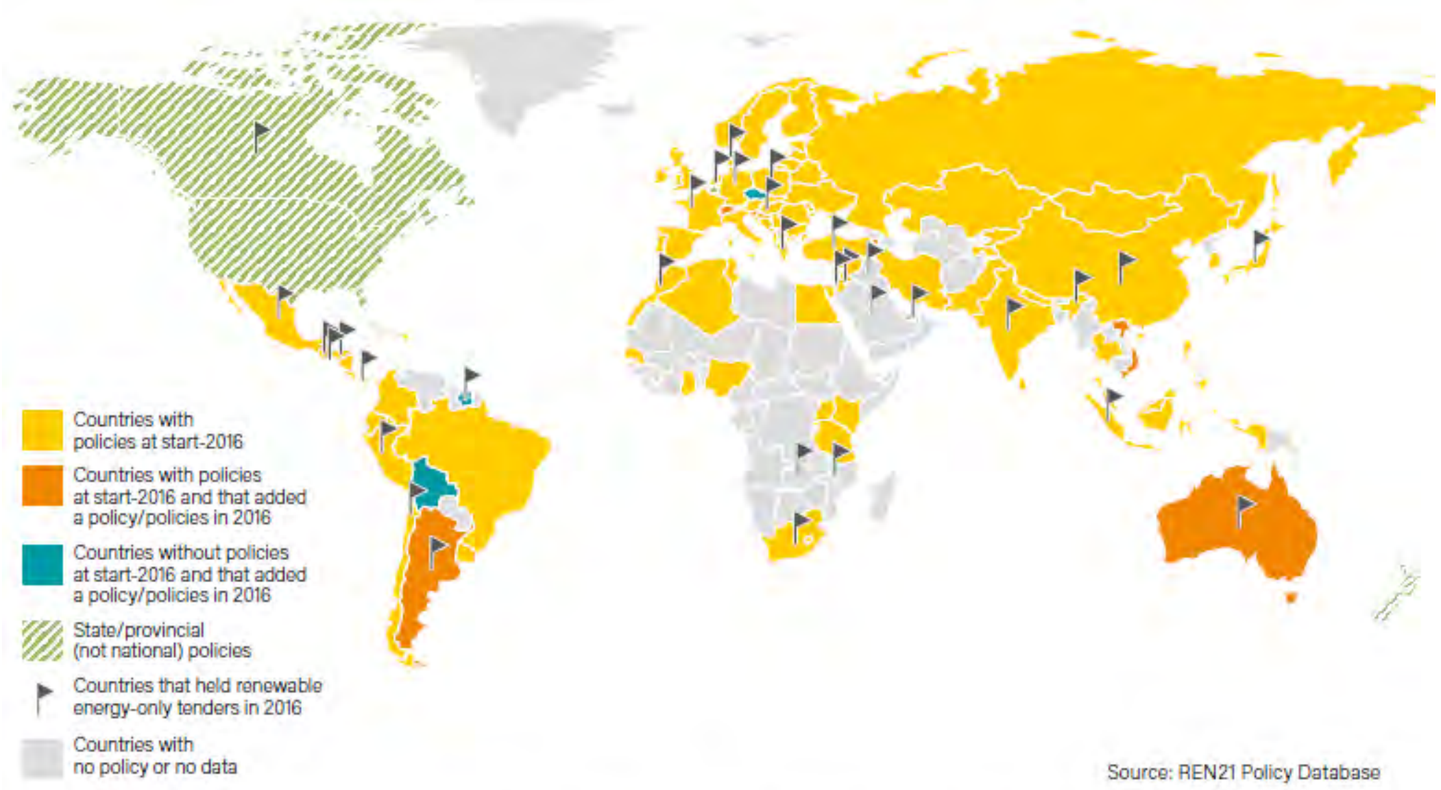


Source: BNEF/BCSE

ACORE
American Council On Renewable Energy

Overview of Global Renewable Energy Policies

Countries with Renewable Energy Power Policies (2016)



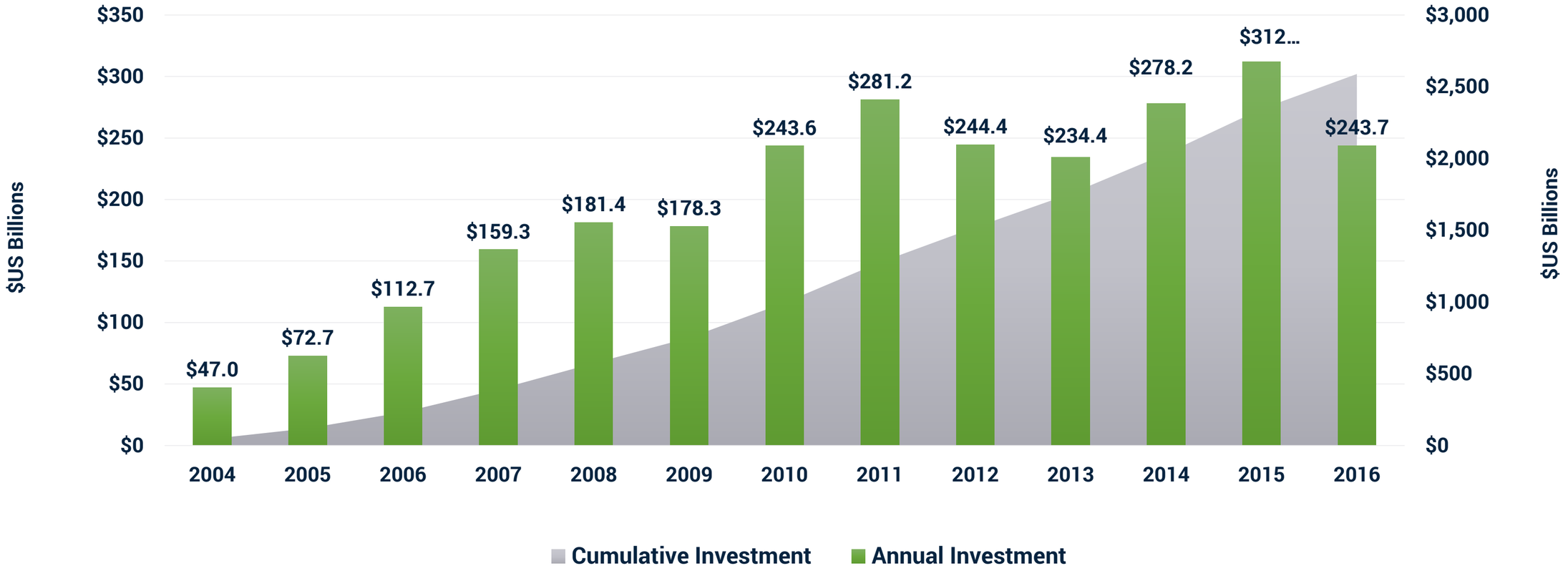
Note: Figure shows countries with Renewable Portfolio Standards, feed-in tariffs/premium payments and net metering policies. Countries are considered to have policies when at least one national-level policy is in place; these countries may have state/provincial-level policies in place as well. Diagonal lines indicate that countries have no policies in place at the national level but have at least one policy at the state/provincial level.

- **176 countries with renewable energy targets**
- **191 of 197 countries have NDCs for the Paris Agreement (98% or emissions)**
- **33 countries issued new tenders in 2016**

Source: Chart courtesy of REN21

High Levels of Global Investment

Global Renewable Energy Investment, 2004 - 2016



Technologies include all biomass waste-to-energy, geothermal, and wind projects greater than 1 MW; all hydropower between 1 MW and 50 MW; all wave and tidal projects; all biofuel projects with a capacity of one million liters or greater per year; and all solar projects.

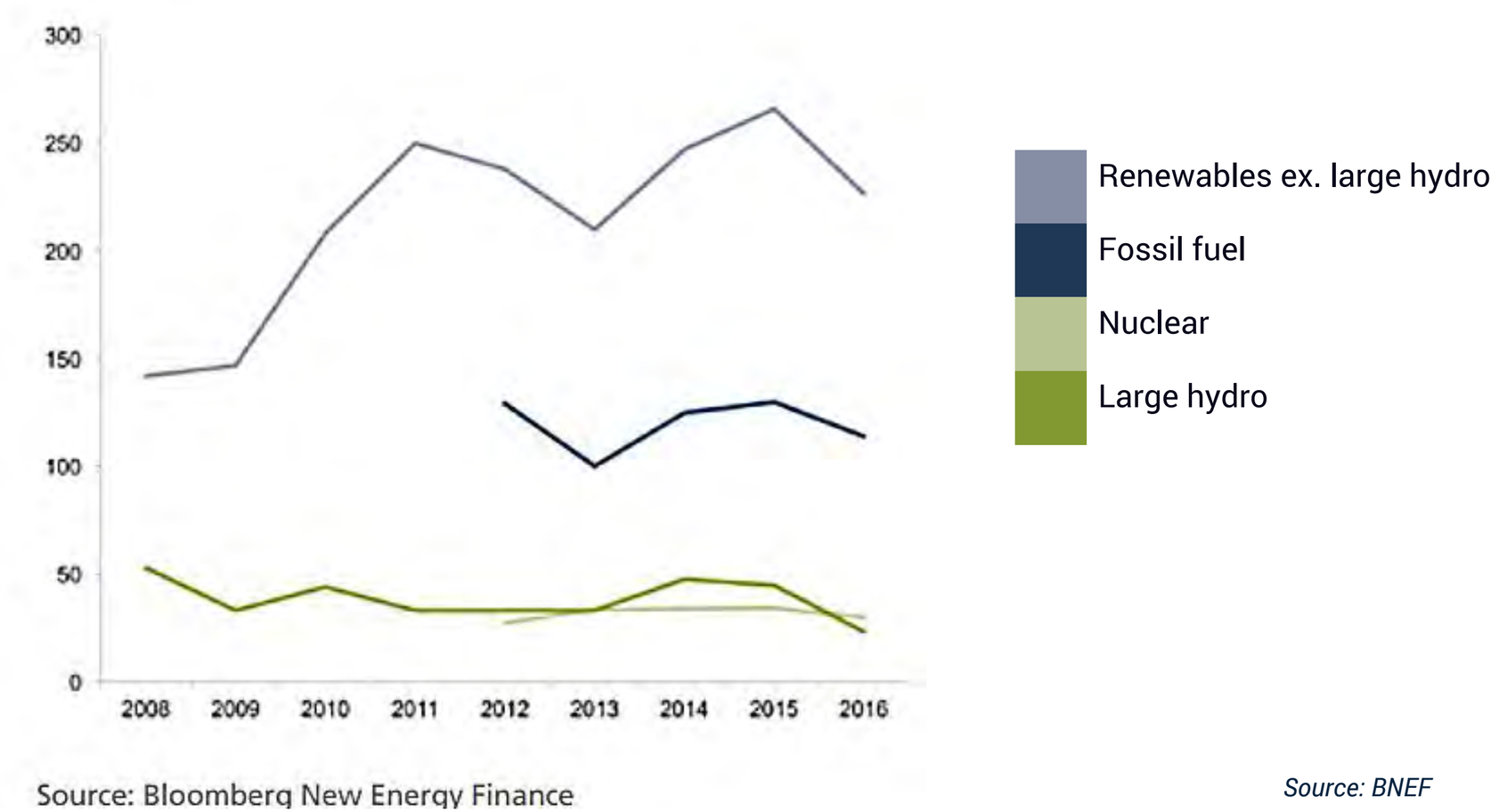
Source: Frankfurt School – UNEP/BNEF

ACORE
American Council On Renewable Energy

Global Investment In Renewables Is Outpacing Other Energy Sources

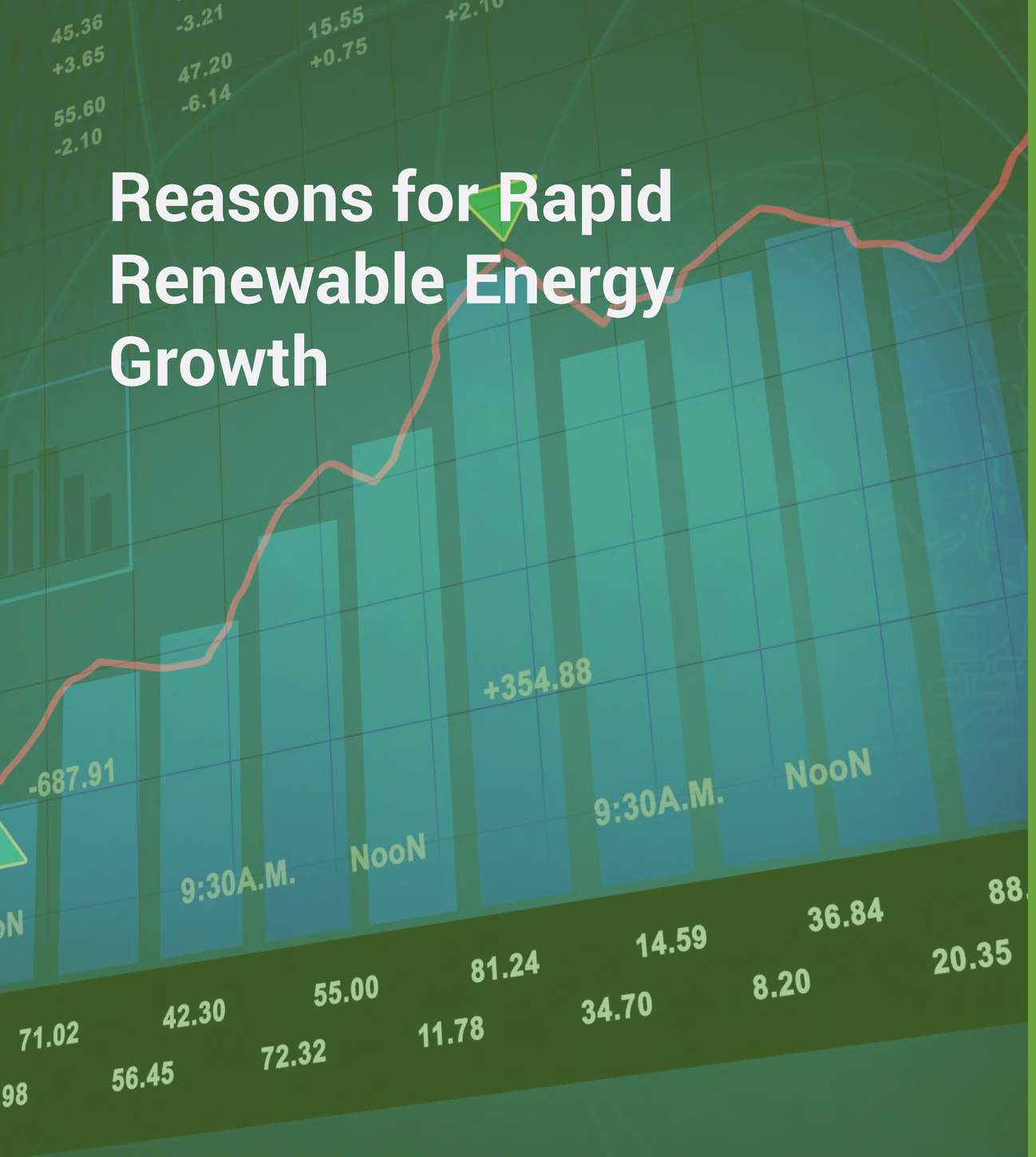
Annual Renewable Energy Investment from 2008 - 2016

Nearly Double That of Fossil Fuels (Power Sector, $Bn)



Source: Bloomberg New Energy Finance

Source: BNEF

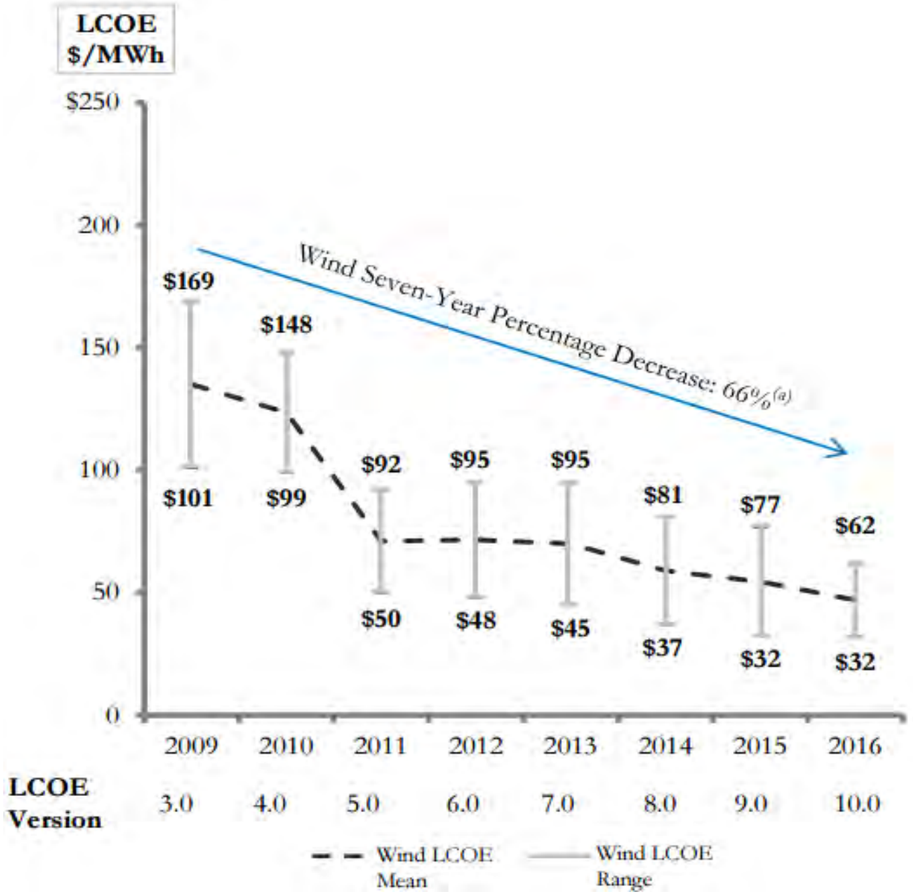


Reasons for Rapid Renewable Energy Growth

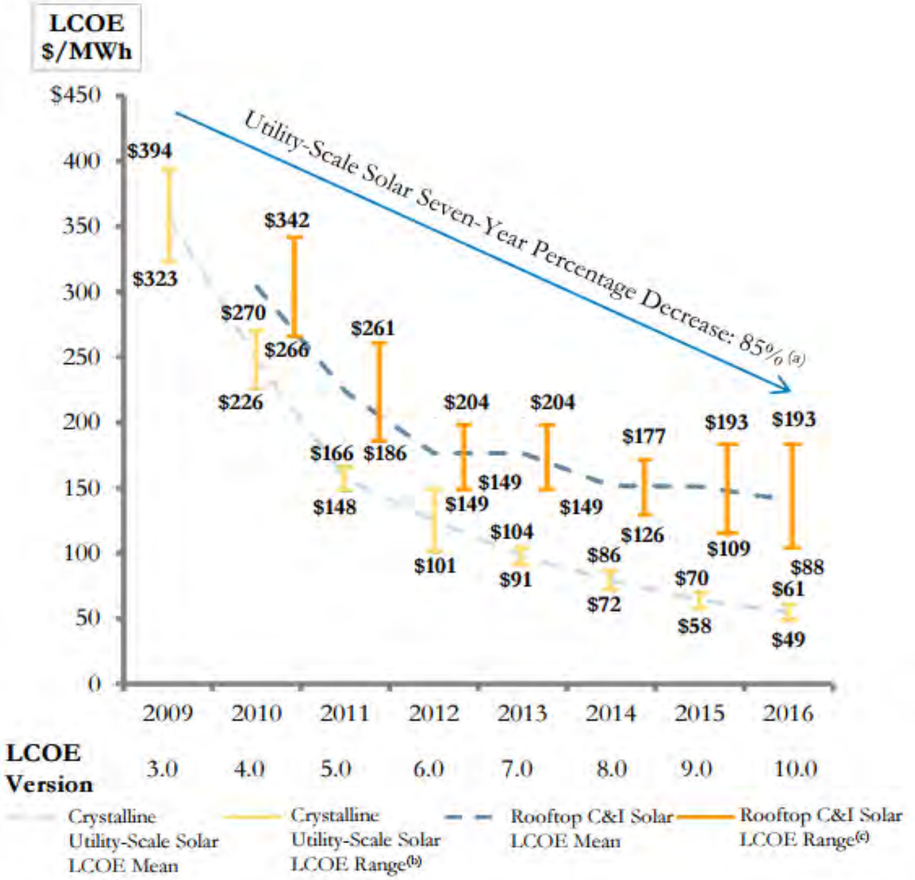
- Dramatic improvements in cost effectiveness

The Growing Cost-Effectiveness of Wind and Solar Power (Part 1)

66% Reduction in Wind LCOE since 2009



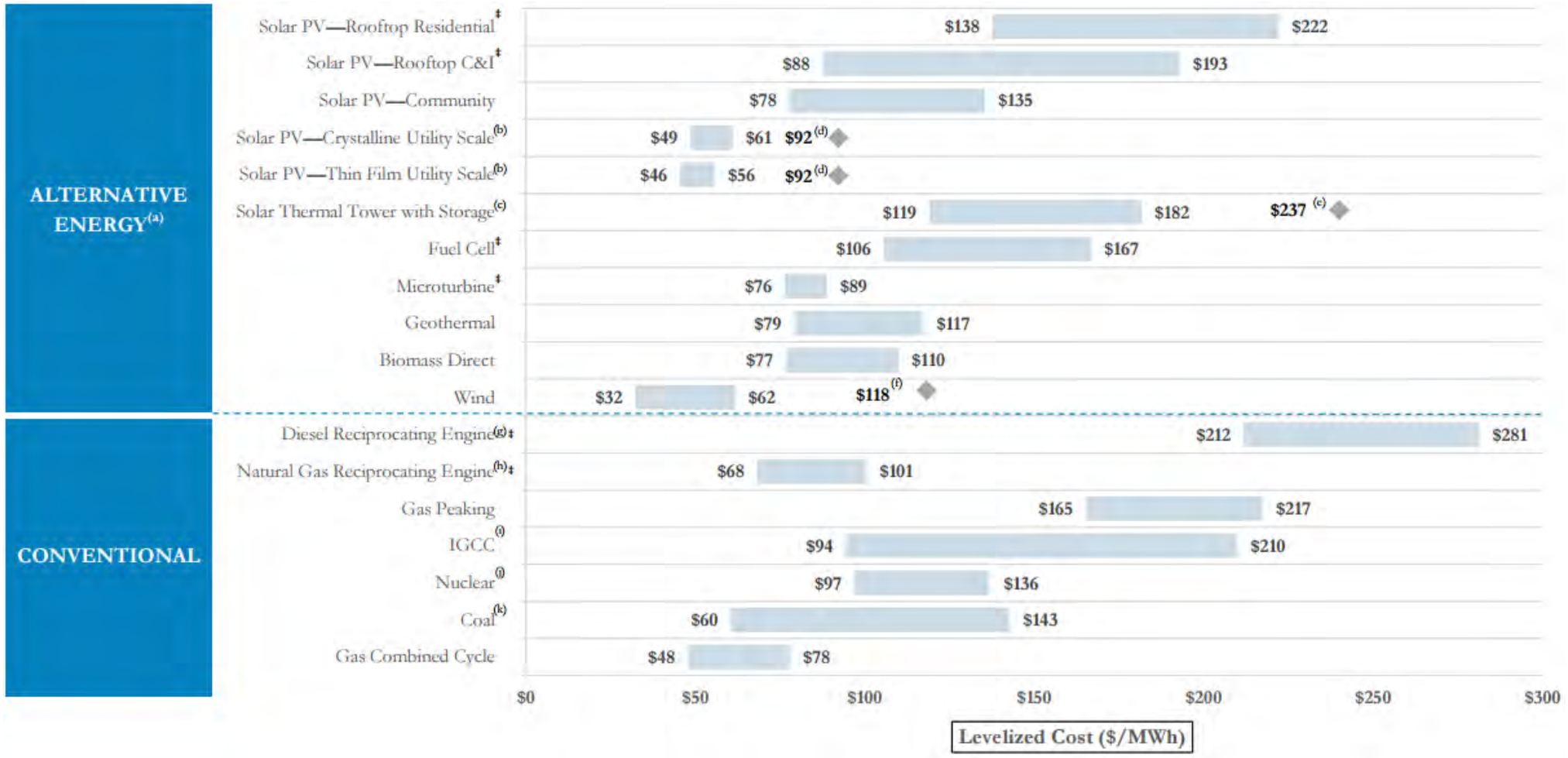
85% Reduction in Solar LCOE since 2009



Source: Lazard

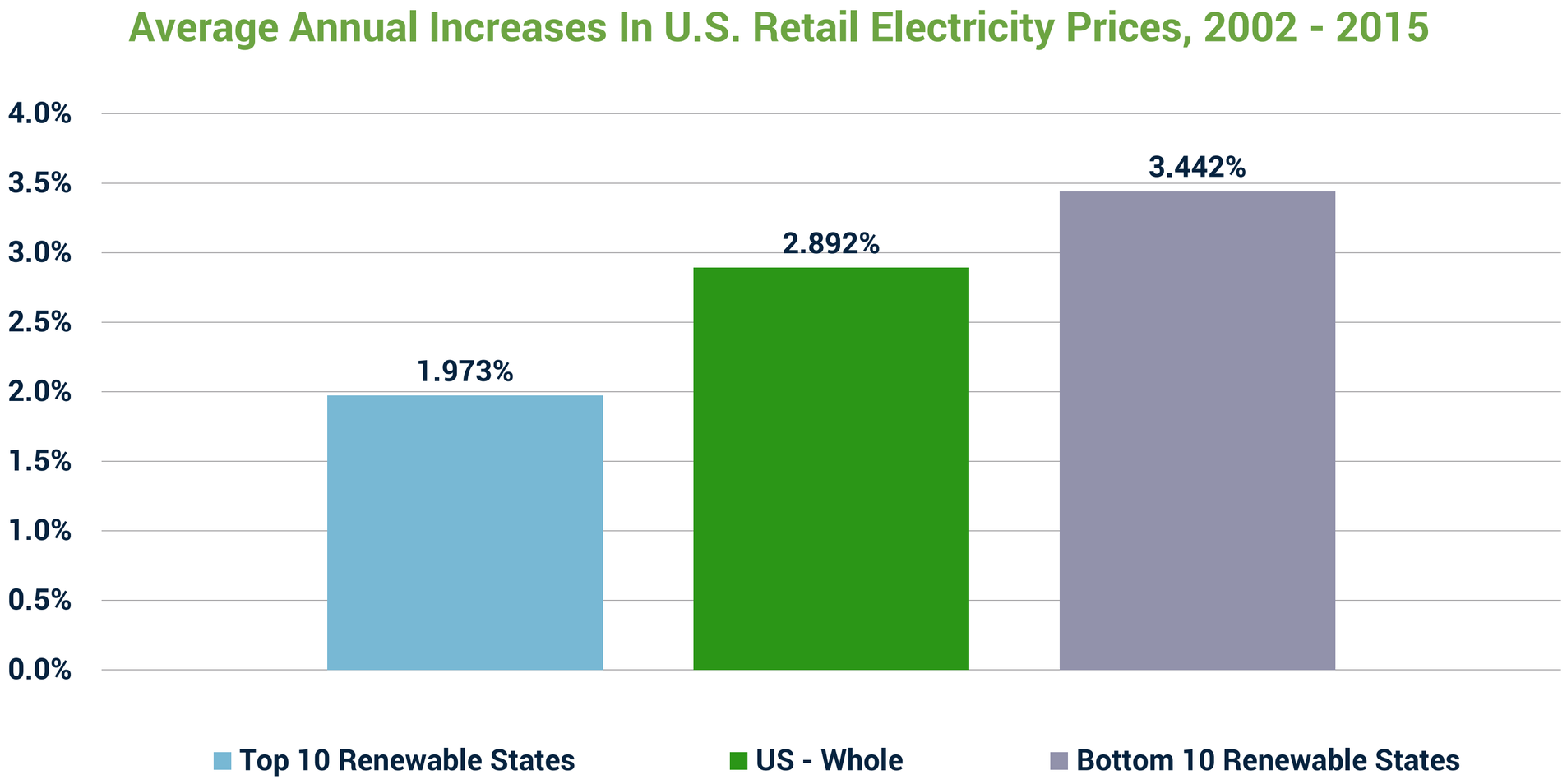
The Growing Cost-Effectiveness of Wind and Solar Power (Part 2)

Unsubsidized Levelized Cost of Electricity Comparison (U.S.)

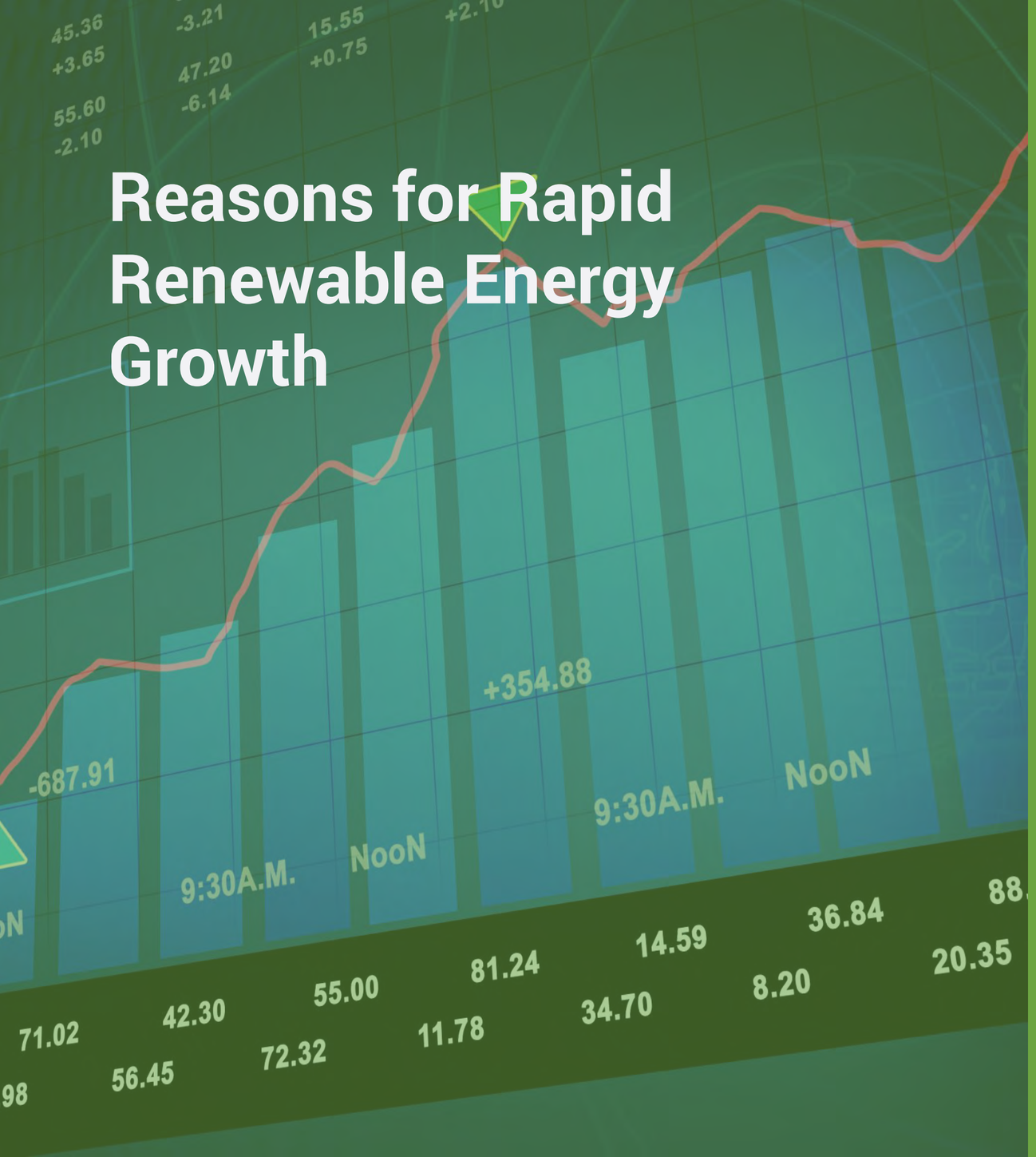


Source: Lazard

Wind and Solar Power and Electricity Rate Increases



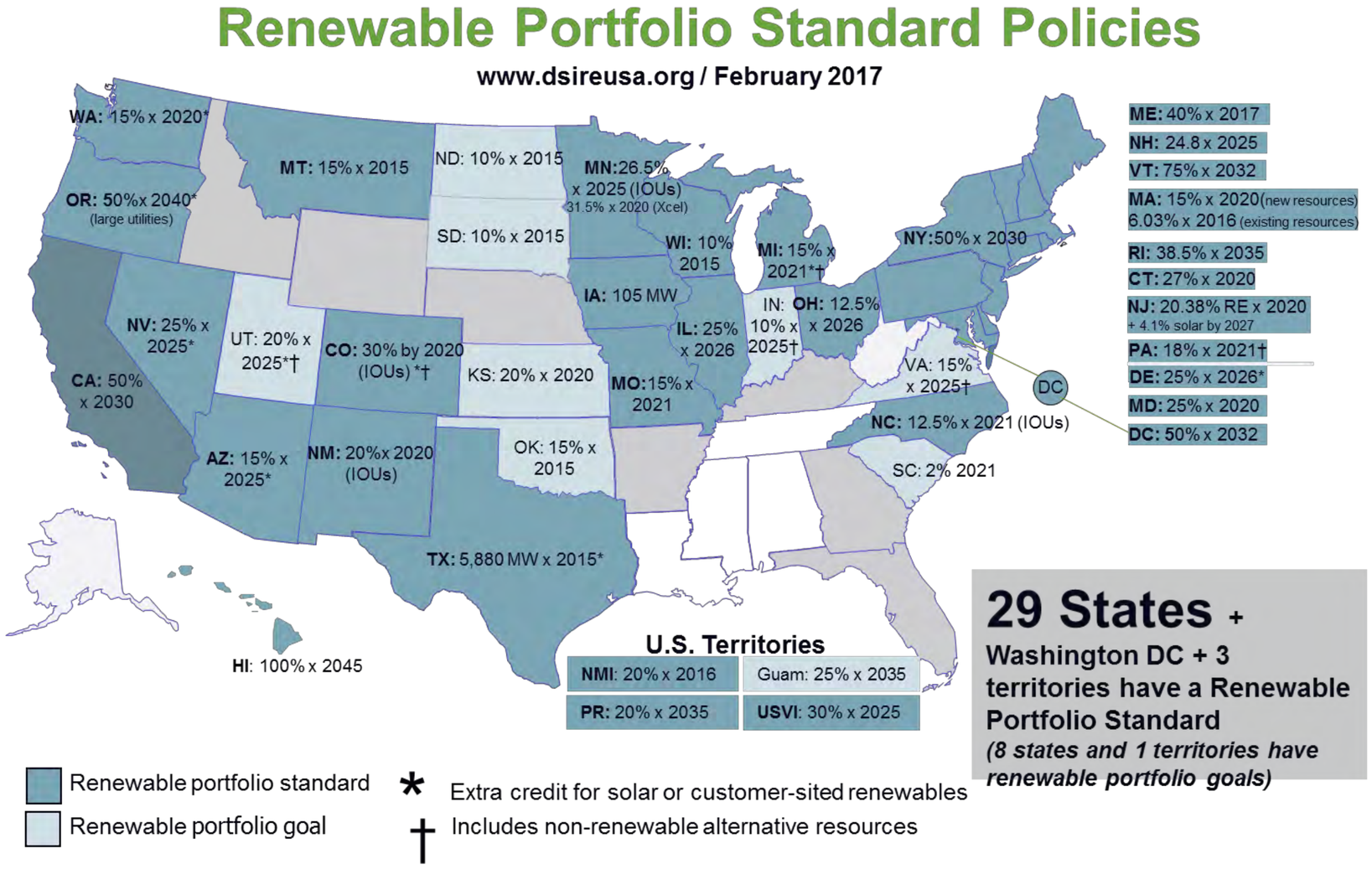
Source: EIA



Reasons for Rapid Renewable Energy Growth

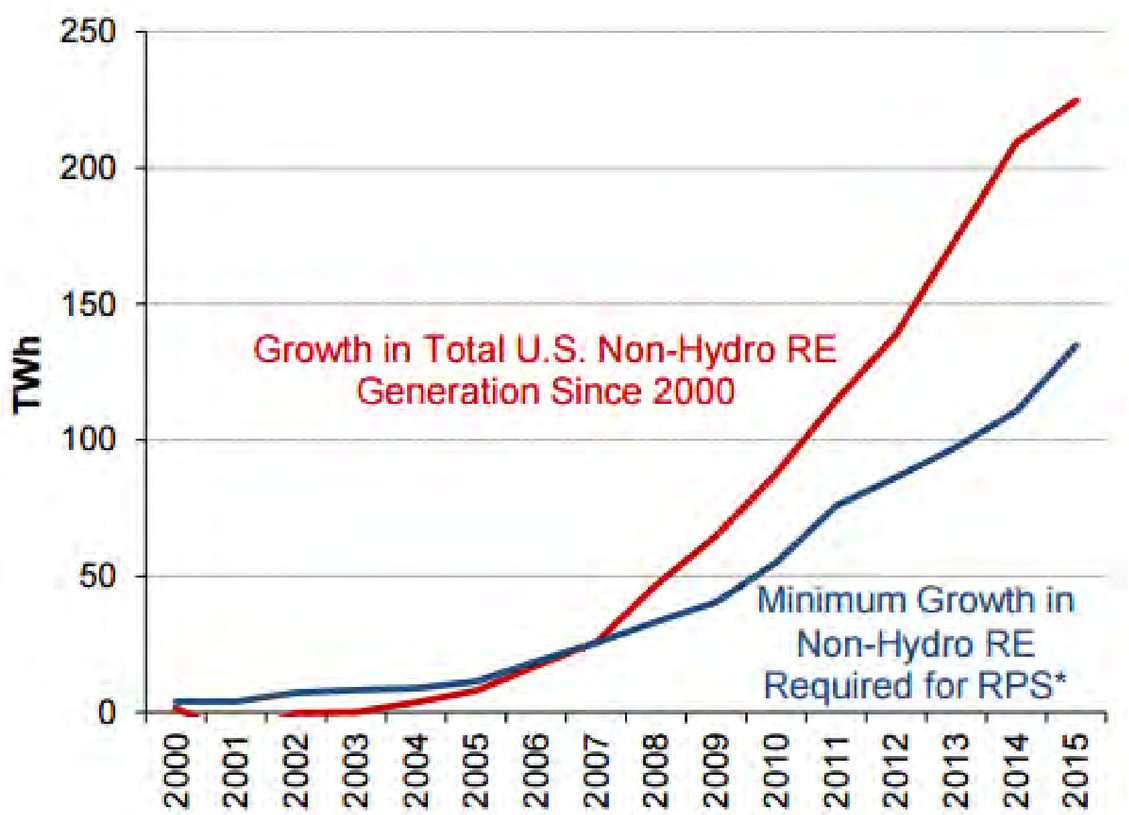
- Dramatic improvements in cost effectiveness
- Aggressive state renewable standards in populous (big load) states

State Renewable Energy Directives a Key Driver for Renewable Demand

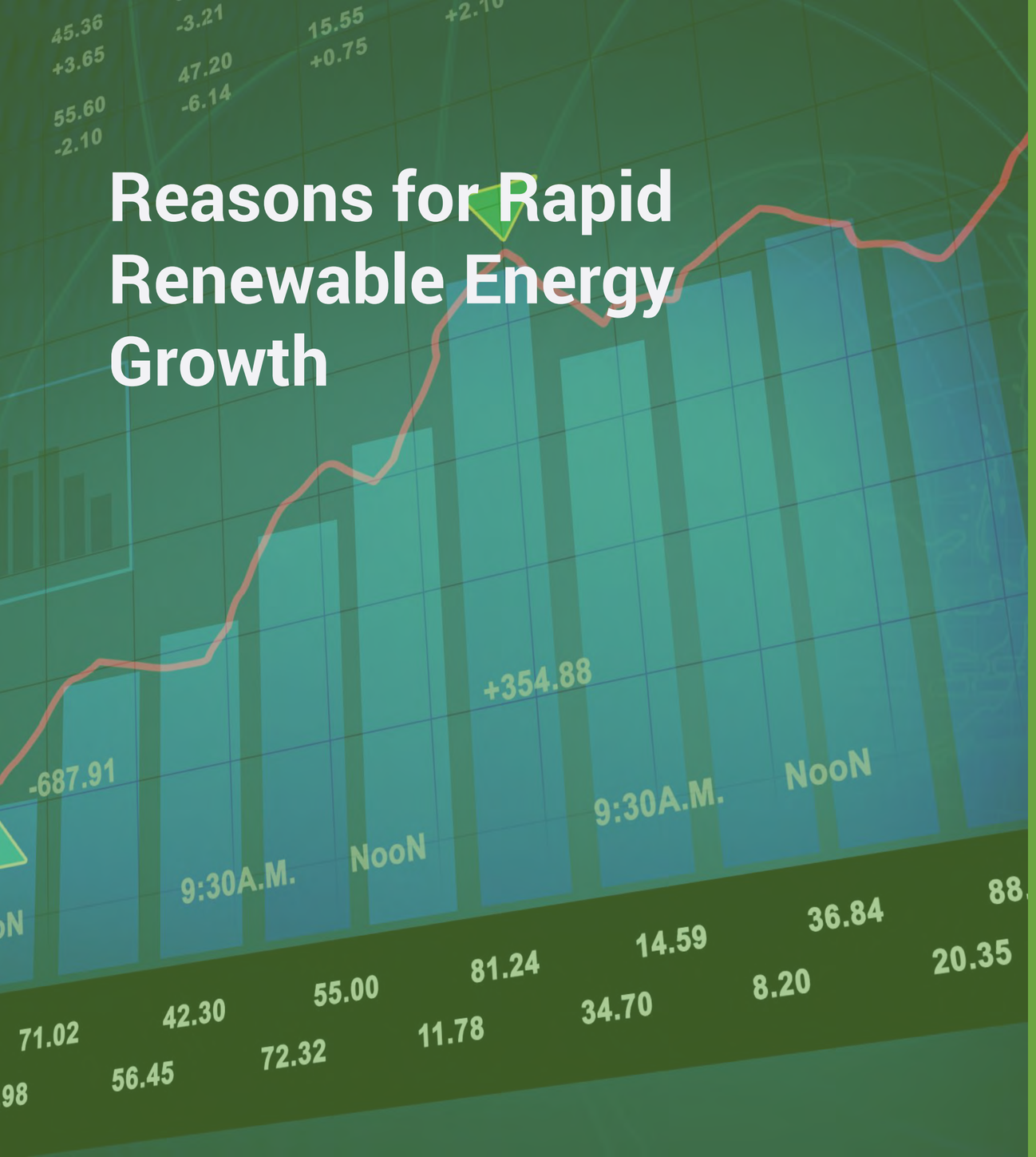


Market Evolution: Renewable Energy Growth Exceeds RPS Mandates

Growth in US Non-Hydro Renewable Generation (TWh)



Source: NREL

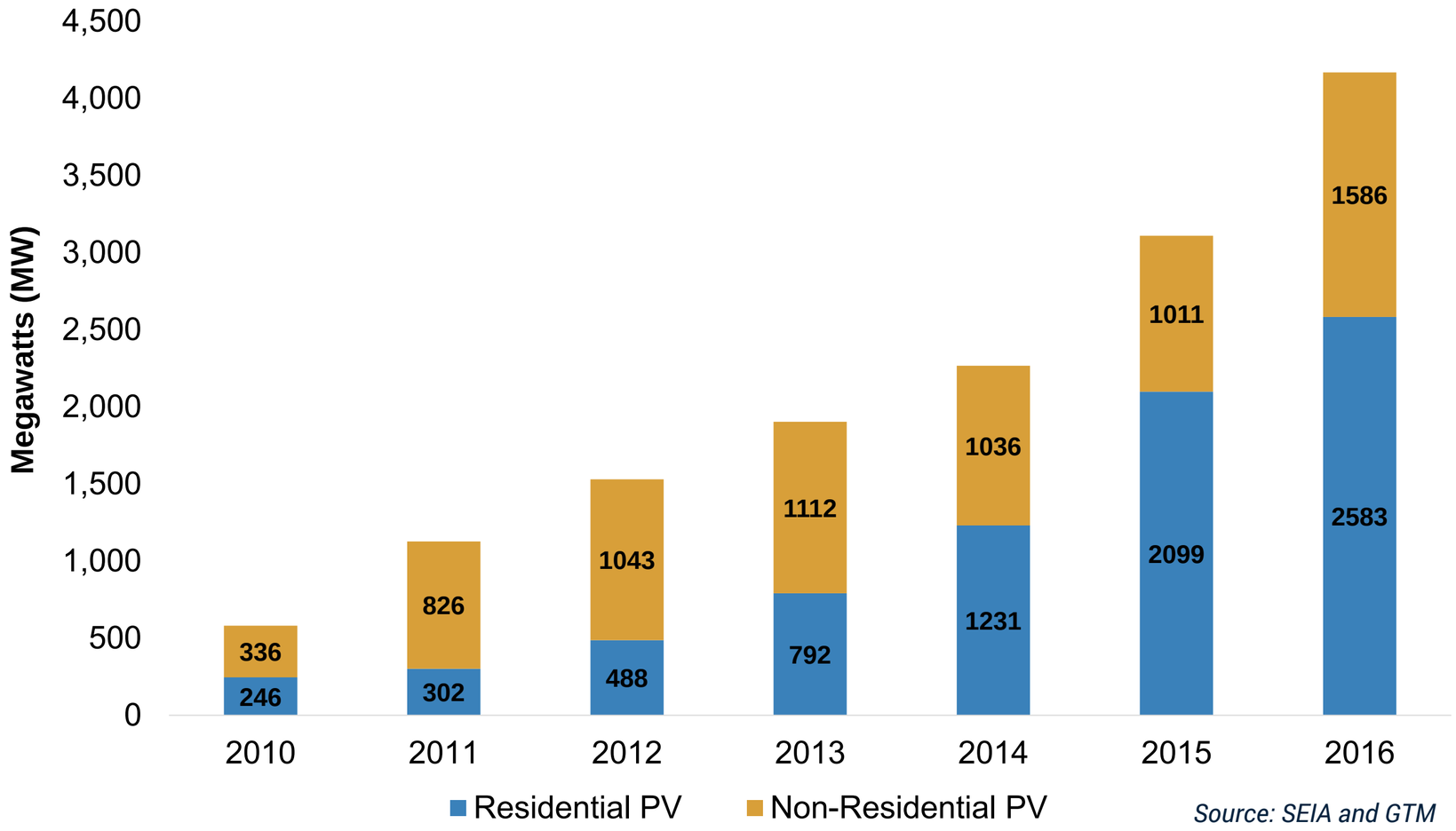


Reasons for Rapid Renewable Energy Growth

- Dramatic improvements in cost effectiveness
- Aggressive state renewable standards in populous (big load) states
- Increasing demand from residential consumers and American companies

Growing Consumer Demand: Part 1 Increasing Deployment of Distributed Solar

Annual U.S. Distributed Solar Installations, 2010 - 2016

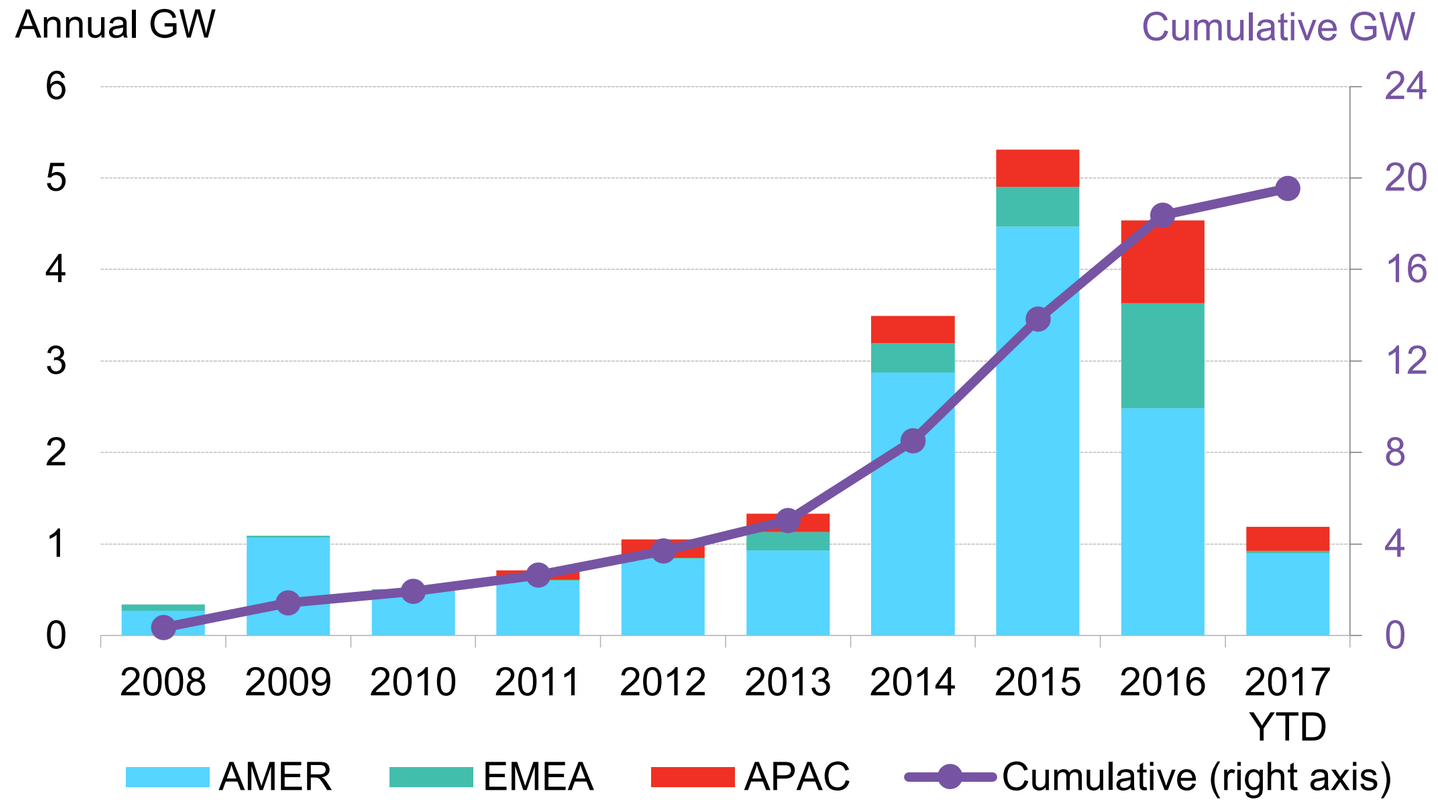


Source: SEIA and GTM

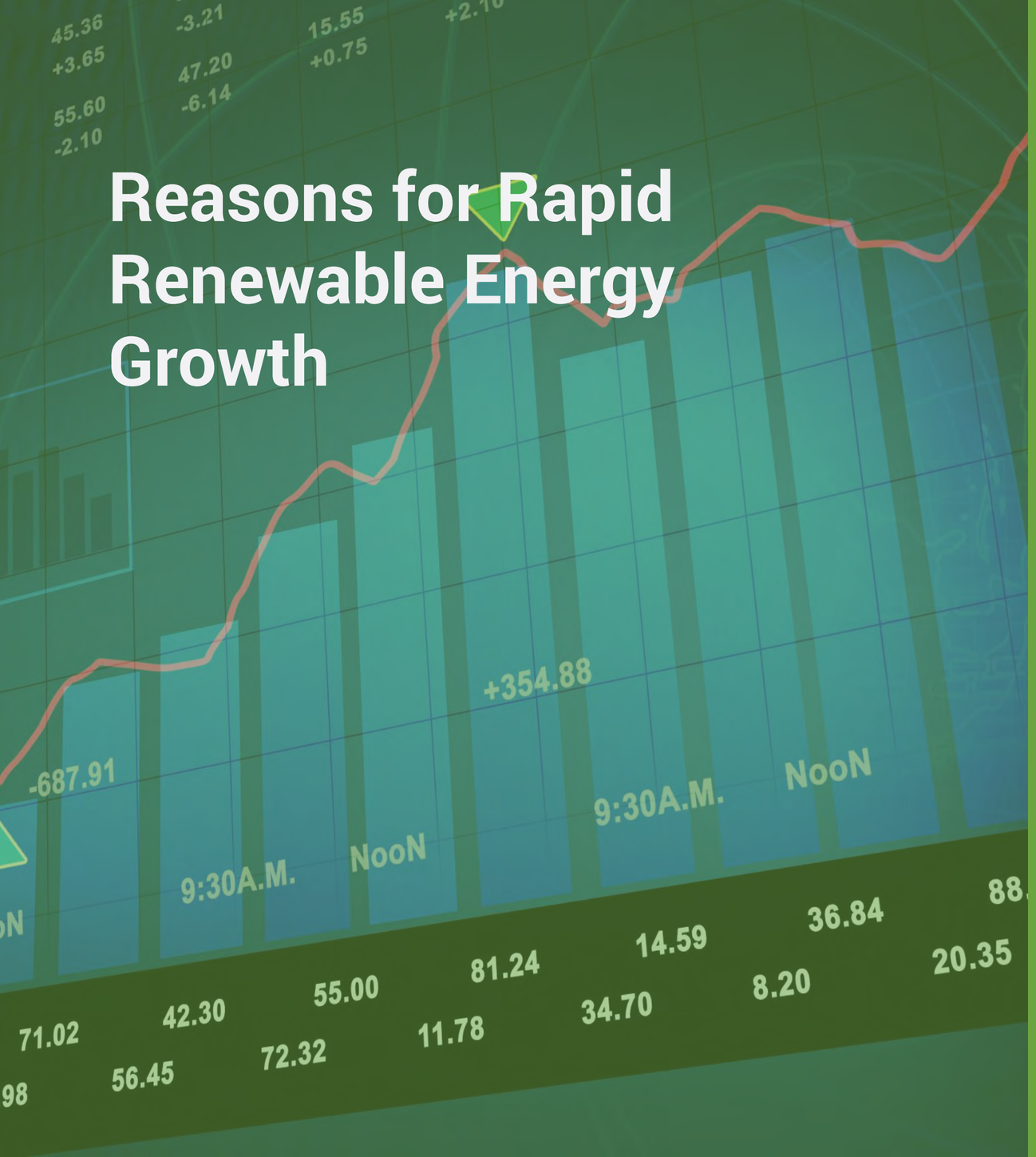
ACORE
American Council On Renewable Energy

Growing Consumer Demand: Commercial & Industrial PPAs

Corporate Demand for Renewable Energy: New Market Entrants & Global Expansion



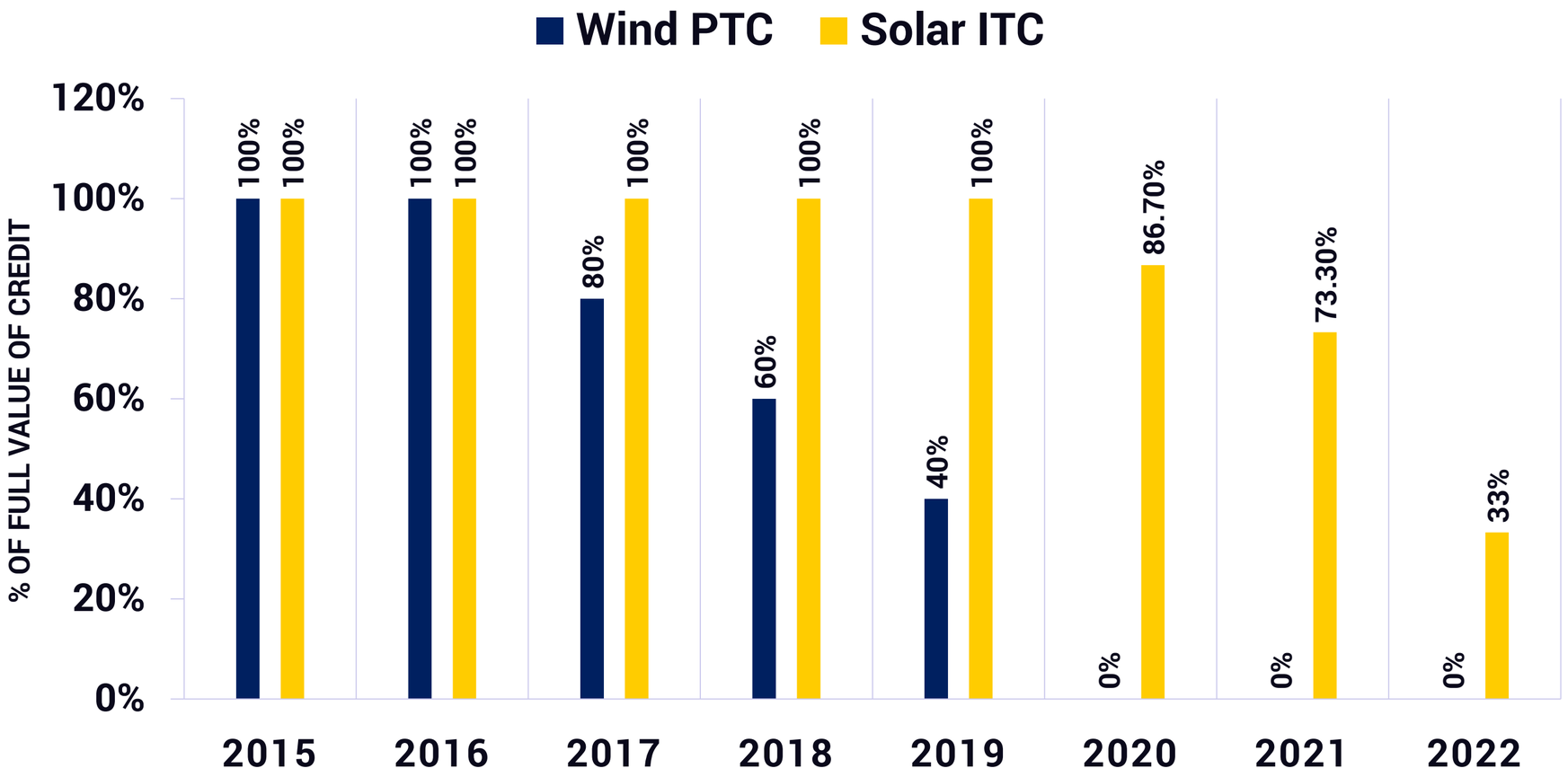
Source: BNEF



Reasons for Rapid Renewable Energy Growth

- Dramatic improvements in cost effectiveness
- Aggressive state renewable standards in populous (big load) states
- Increasing demand from residential consumers and American companies
- A supportive tax platform

Wind PTC and Solar ITC Phase-Down Schedules



- PTC guidance with four year safe harbor will delay the impact of the wind phase out
- Section 48 ITC continues permanently at 10%, while section 25 (residential) phases out
- ITC guidance still pending at Treasury

ACORE
American Council On Renewable Energy

Assessing Key Market Drivers Today

1. **Dramatic improvements in cost effectiveness**
   IMPACT: Costs have continued to decline, but Suniva ITC case could change the cost picture for solar

2. **Aggressive state renewable standards in populous states**
   IMPACT: Unchanged and apparently growing, but headwinds in some states

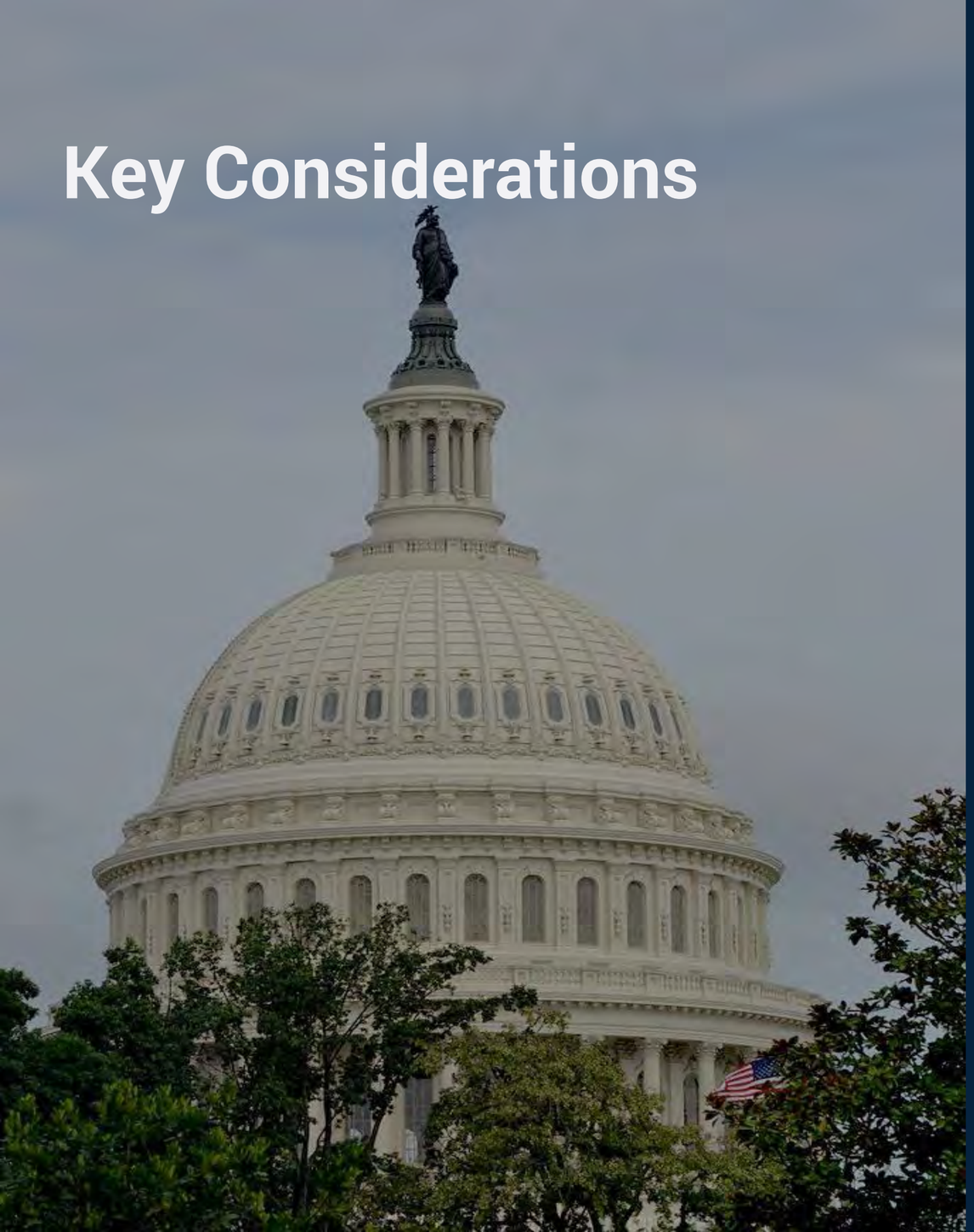
3. **Increasing demand from residential consumers and American companies**
   IMPACT: Unchanged and apparently growing

4. **A supportive tax platform**
   IMPACT: unchanged, but tax reform effort creates uncertainties

Potential Impacts of Tax Reform on the Renewable Energy Sector

- The mere possibility of tax reform creates uncertainty that is already complicating deals and giving some investors pause.
- Changes to Wind and Solar Tax Credits (PTC/ITC) are highly unlikely, but not impossible.
- Reductions in corporate tax rates reduce the value of depreciation benefits for renewables and others.
- Lower tax rates could also reduce tax equity supply and increase pressure on market.

Key Considerations



- Tax reform is slow and difficult. Success is not a given.
- Tax reform also presents important opportunities to level the long-term playing field.
- Renewable energy sector today has unprecedented private sector support.
- Renewable energy sector is used to uncertainty.

Other Factors Creating Uncertainty

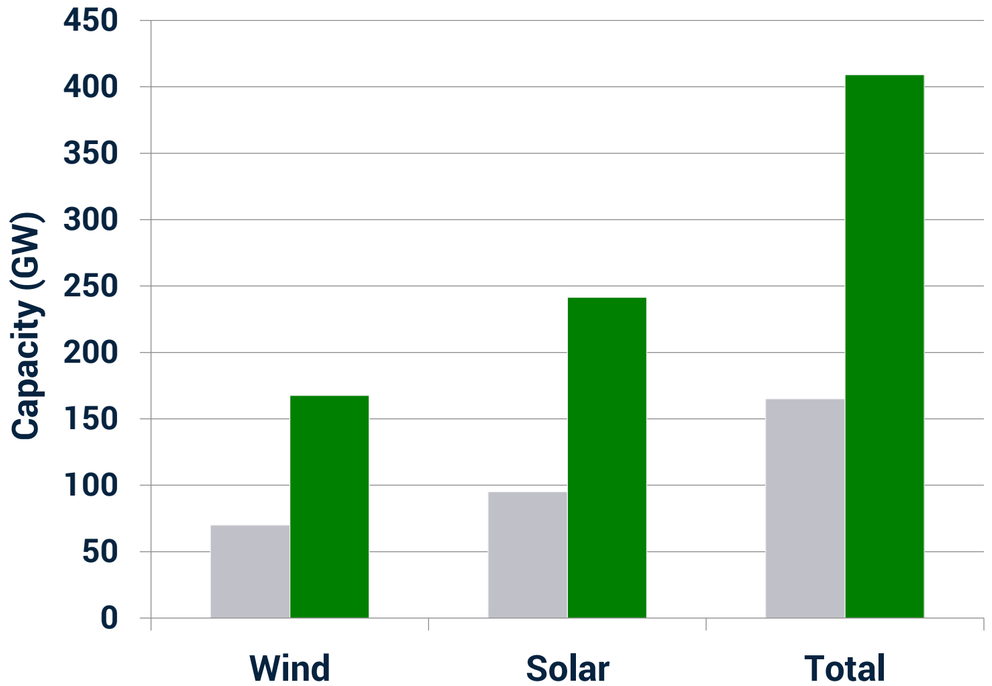
- Pending DOE Grid Study and troubling rhetoric about a “national security” need for more coal and nuclear power.
- Suniva suit at International Trade Commission could impact PV prices.
- U.S. withdrawal from Paris and related isolationism could create complications in international trade.
- Political uncertainty could create broader economic instability.

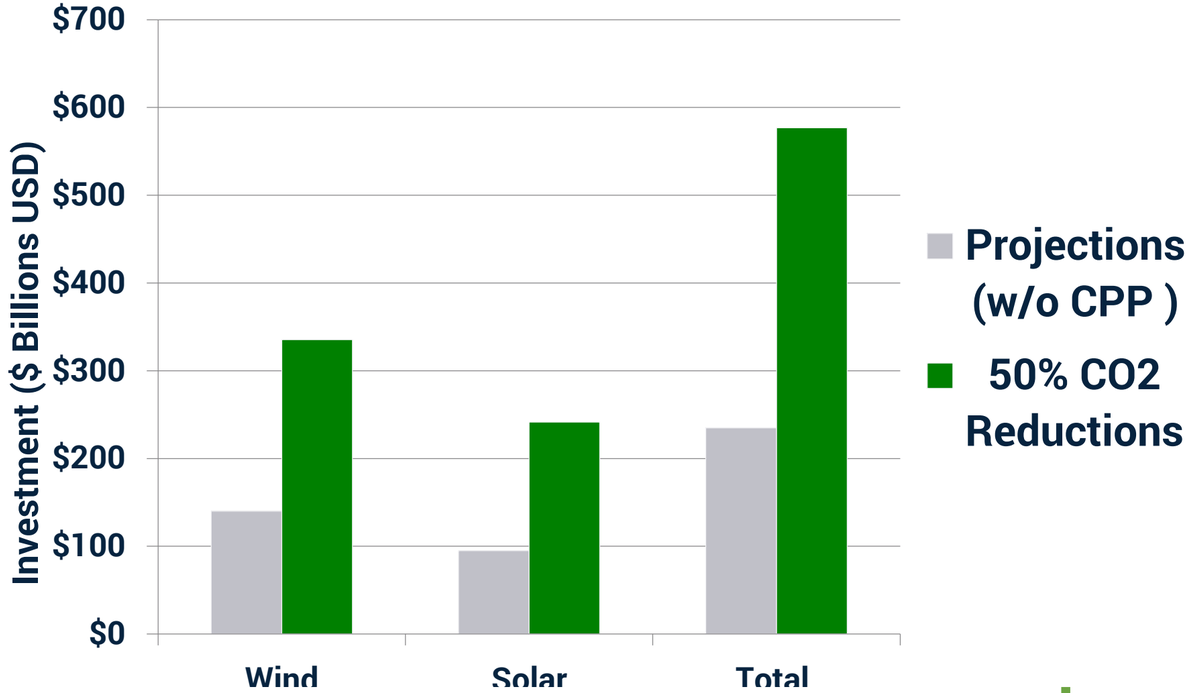
We'll Always Have Paris

- Decision to withdraw from Paris has galvanized dramatic new commitments to renewable energy from state and local governments and major corporations.
- US NDC required an economy-wide GHG reduction of 26-28% below 2005 levels by 2025.
- Reducing electric power sector GHG emissions by 50% provides a path to achieve economy-wide targets, despite retrenchments in GHG regulatory programs.
- Recent fossil plant retirements and renewable growth puts us in striking distance of that objective.
- Near-term investment in additional renewable capacity provide the only long-term path to the ultimate Paris milestone (2°C).

Achieving Paris: The Renewable Energy Gap

- ~400 GW of new U.S. renewable capacity will be required by 2025 to achieve a 50% GHG reduction in the power sector.
- This would require nearly $600 billion in U.S. renewable investment over the next nine years. If we keep attracting investment at the same rate as 2016, we would be within $200 billion of this target.





Source: ACORE Anaylsis of EIA & BNEF Data

Steps in Securing 400 New GW by 2025

- ✓ **Maintain Momentum:** Retain investor confidence in the face of today's uncertainty
- ✓ **Expand the Market:** Continue ambitious state and local programs; community aggregation; corporate and defense sector procurement; and electrification of the broader economy
- ✓ **Modernize the Grid:** Facilitate a combined state and federal effort to improve market design
- ✓ **Secure New Sources of Capital:** Broaden investor community, recruit additional participation of insurance and pension funds, expand tax equity market
- ✓ **Level the Federal Tax Playing Field for All Renewables:** Enact a technology neutral incentive post PTC/ITC for all renewable energy sources

ACORE
American Council On Renewable Energy

Thank You

Gregory Wetstone
President & CEO

wetstone@acore.org

www.acore.org | www.uspref.org

1600 K Street NW
Suite 650
Washington, DC 20006