



# The World Petrocoal Conference, Delhi

## Greening Coal: A Global Technology & Finance Driven Transition

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# Utilities Need to Transition: Laggards

## Peabody Energy (Red) vs S&P500 US (Blue)

Peabody Energy Corporation (BTU) ☆

NYSE - NYSE Delayed Price. Currency in USD

7.47 -0.15 (-1.97%)

At close: January 24 4:02PM EST

Indicators Comparison Events Date Range 1D 5D 1M 3M 6M YTD 1Y 2Y 5Y Max Interval 1D Line



# Global Miners Exiting Thermal Coal



## Anglo American CEO Says He's Getting Ready to Exit Thermal Coal

By [Thomas Biesheuvel](#) and [Felix Njini](#)  
3 February 2020, 9:34 pm GMT+5:30



Mark Cutifani, chief executive officer of Anglo American *Photographer: Carla Gottgens/Bloomberg*

Global Miners are exiting thermal coal:

- Rio Tinto - out
- South32 - out
- BHP – exiting
- Anglo – Exiting
- Mitsui & Co/Mitsubishi/Sojitz/ ITOCHU - out



# Utilities Need to Transition: Leaders

## NextEra Energy (Red) vs S&P500 US (Blue)

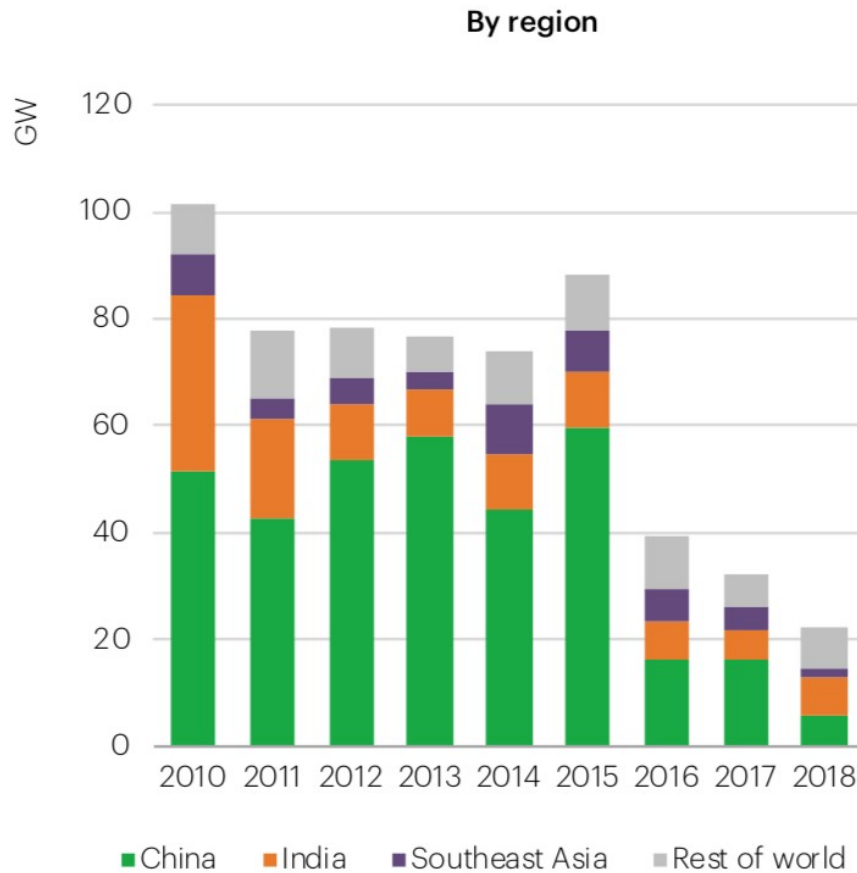


### Potential Cost per MWh Post-2023<sup>(1)</sup> (\$/MWh)



# Global energy systems are transitioning

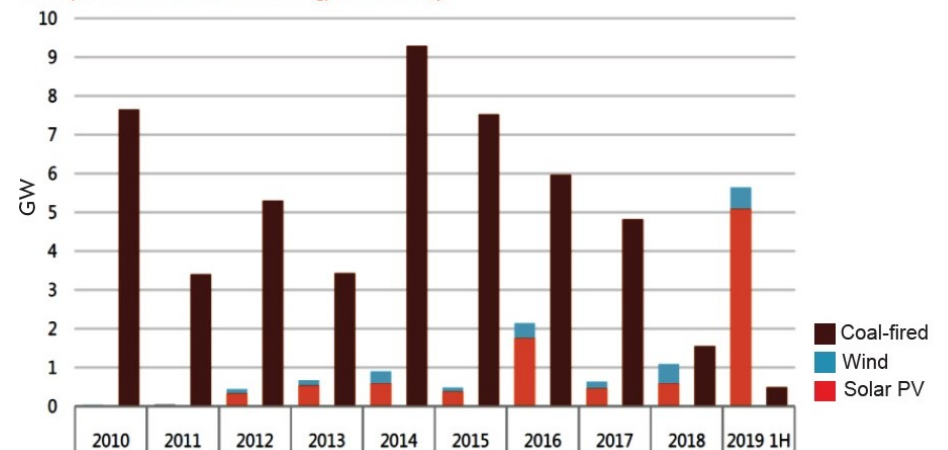
Coal-fired power generation capacity subject to an FID



Keep accelerating thermal power plant closure rates in mind!

## Emerging Signs of a Change in the Generation Mix

During the first half of 2019, approvals of new solar PV exceeded coal-fired capacity for first time in South East Asia (Source: IEA Southeast Asia Energy Outlook 2019)



Note: GW = gigawatt.

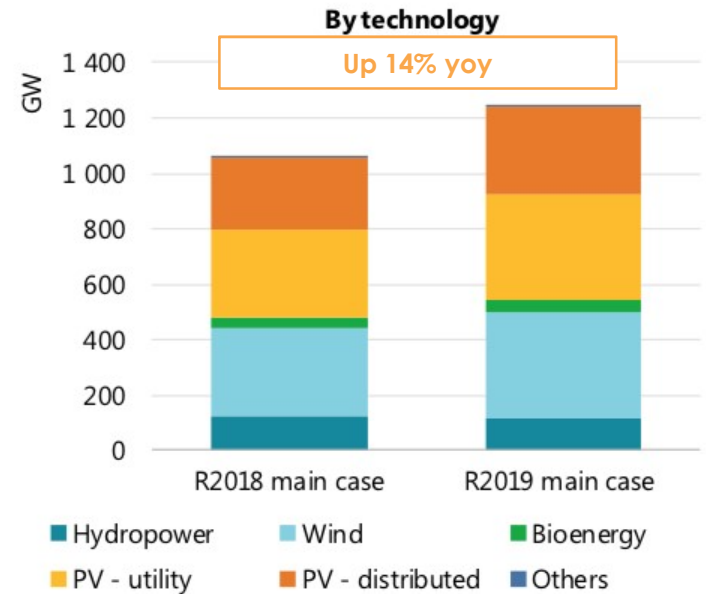
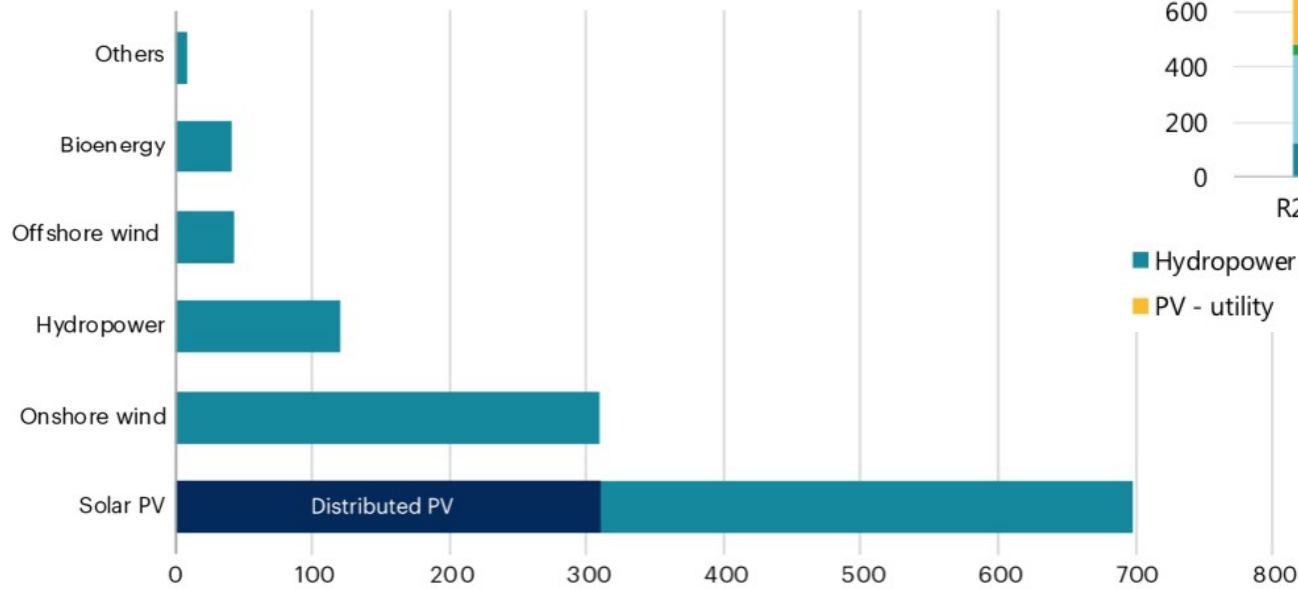
Source: IEA analysis with calculations based on McCoy Power Reports (2019)

Source: IEA's World Energy Investment 2019

# The IEA keeps Upgrading their Renewable forecasts

Figure 1.2 Renewable electricity capacity forecast

**Renewable capacity growth between 2019 and 2024 by technology**  
Renewables 2019

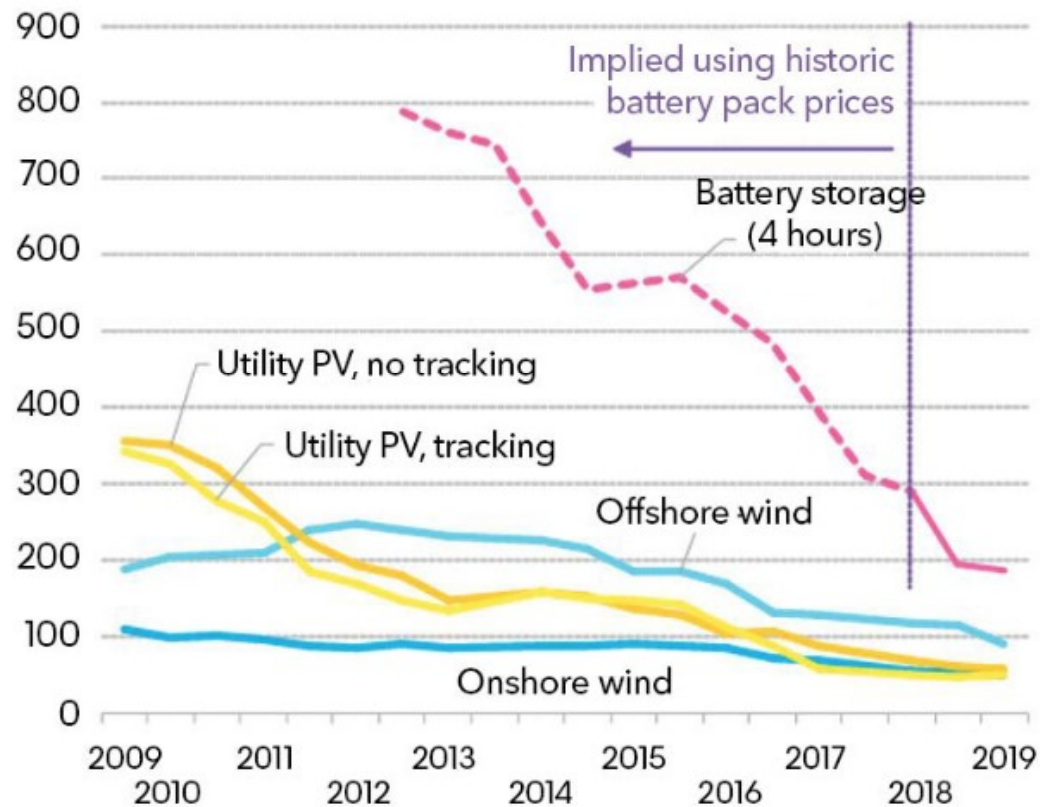


International Energy Agency

# Renewables are very deflationary

Global benchmarks - PV, wind and batteries

LCOE (\$/MWh, 2018 real)



Lithium prices down 50% in the last 2 years

Source: BloombergNEF. Note: The global benchmark is a country weighed-average using the latest annual capacity additions. The storage LCOE is reflective of a utility-scale Li-ion battery storage system running at a daily cycle and includes charging costs assumed to be 60% of whole sale base power price in each country.

# Renewable Record Lows Continue to be Set

## Los Angeles seeks record setting solar power price under 2¢/kWh

The city's municipal utility is readying a 25-year power purchase agreement for 400 MWac of solar power at 1.997¢/kWh along with 200 MW / 800 MWh of energy storage at 1.3¢/kWh.

JUNE 28, 2019 JOHN WEAVER



## Portugal Bags Lowest-Cost Solar Bid In The World

August 1st, 2019 by Charles W. Thurston CleanTechnica

The Portuguese energy secretariat has secured 1.15 GW of solar development at an average cost of €20.33 (\$22.53 per MWh), representing an investment of about €800m.

One of the bids was made at €14.76/MWh (\$16.44/MWh), which was declared a new world record for low solar bidding, according to Portugal's Journal Económico. The secretariat had placed a €45/kWh ceiling on bidding.

"We made a unique model in the world because it was the first auction in the world to directly compete with fixed rates and market rates with contribution to the system. There has never been such an auction in the world, this was the first," Secretary of State for Energy João Galamba told the news agency.

The auction included 24 projects, of which 23 attracted bids and were awarded to 13 bidders. Spain's Iberdrola won 7 of the 24 licenses available, as the largest number of projects gained by one bidder. France's Akuo won 370 MW, the largest project in the auction, according to Jornal de Negocios.

## Brazil A-4 auction signs 211 MW of solar for record-low price of \$0.0175 kWh

Cracking the two-cent-mark as a global standard for PV appears within sight as projects in the U.S. and Brazil have been signed below that threshold. Just two years ago the industry celebrated sub-three-cent bids in the MENA region. Prices have come down so quickly, however, the new records are another third cheaper.

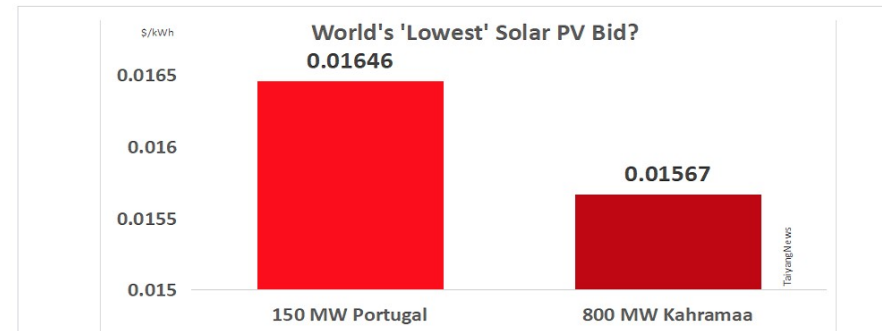
JULY 1, 2019 MARIAN WILLUHN PV-Magazine



Record Low Winning Bid In 800 MW Qatar PV Tender

Total & Marubeni Consortium To Build 800 MW Al-Kharsaah PV Plant In Qatar For QAR 0.0571 (\$0.01567)/kWh Tariff, Says Kahramaa & Calls It 'Lowest' Competitive Unit Price For Solar Power Globally

09:04 AM (Beijing Time) - 25. January 2020



Kahramaa says the levelized cost of electricity of \$0.01745 per kWh initially offered by Total and Marubeni consortium was lowered to \$0.01567 per kWh making it the lowest for a solar project in the world. As of August 2019, the lowest bid was held by Akuo in the Portugal tender with €14.76 (\$16.46) per MWh.

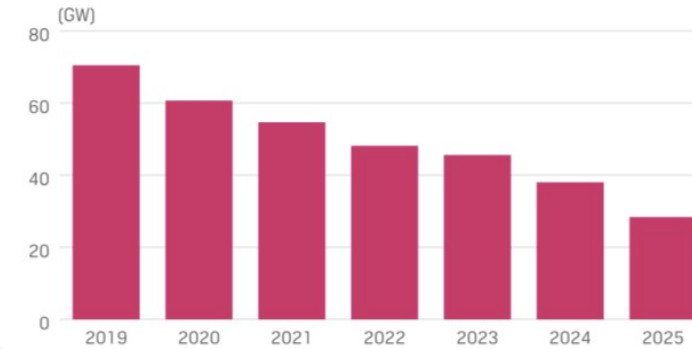


# 8 European Emission Allowances: Pricing is Driving Technology Adoption



It has taken a decade, but the EU emissions trading scheme is finally working. At Euro23/t the EUAs were the best performing commodity globally in the last three years.

WEST EUROPE'S DECLINING COAL/LIGNITE CAPACITY



Source: S&P Global Platts Analytics



Source: <https://markets.businessinsider.com/commodities/co2-european-emission-allowances>

# Germany: Renewable Energy at a Record High: A Global Force for Change



## Net public electricity generation in Germany in 2019

**date selection**

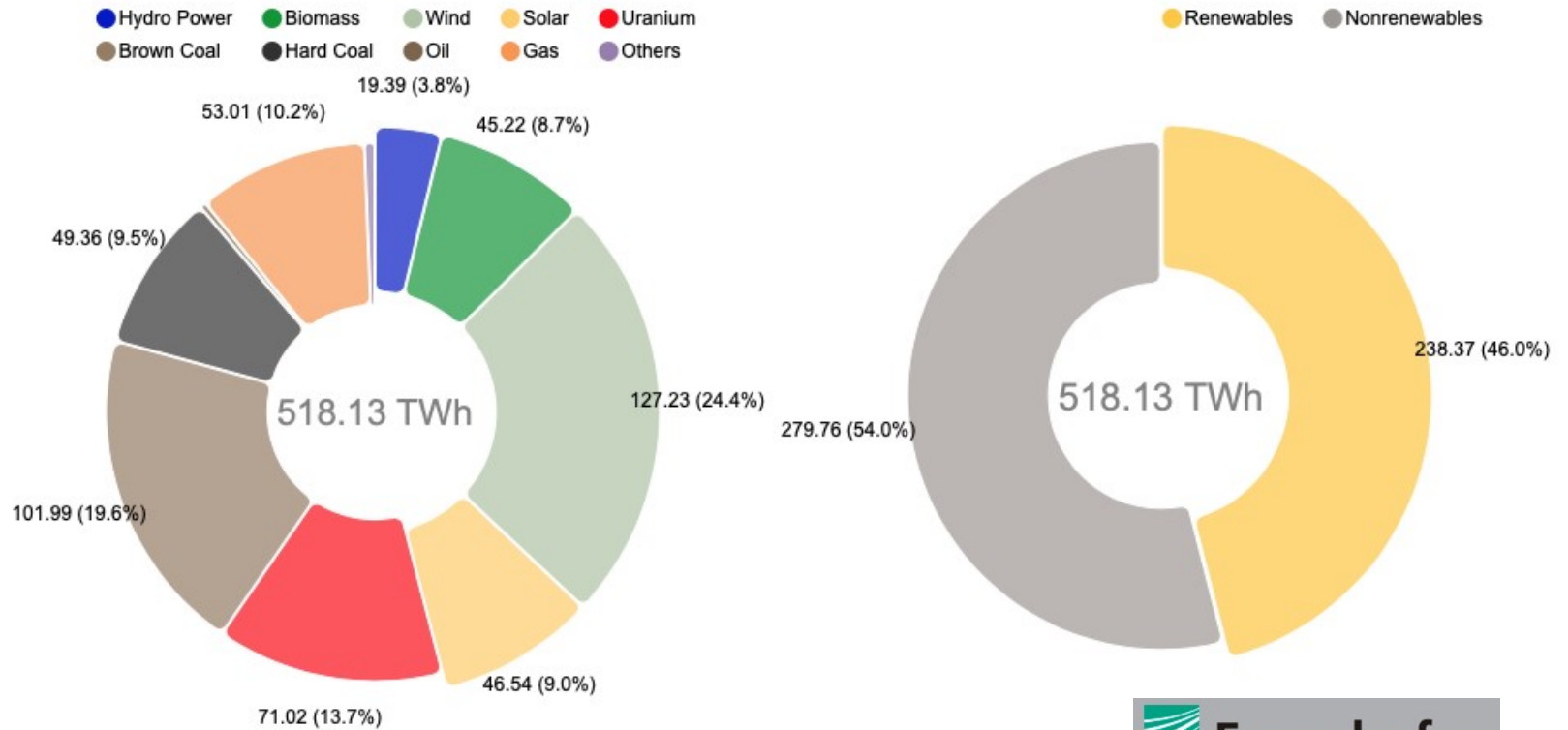
year: 2019

month:

week:

day:

**German Coal Power -26% yoy in CY2019**

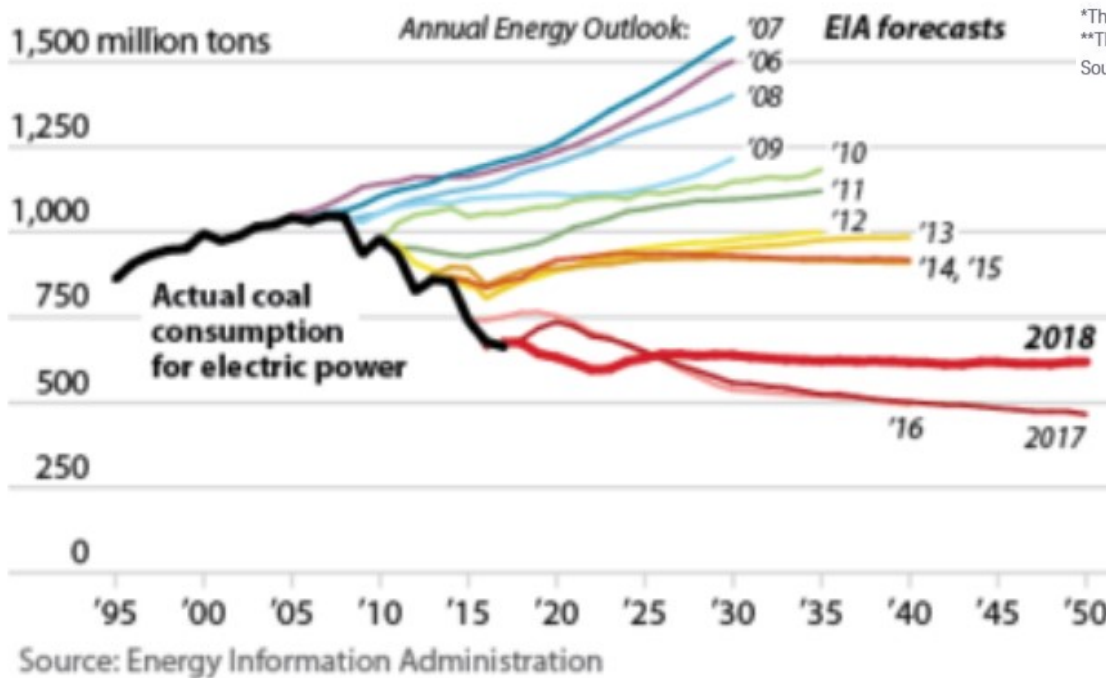


# America is exiting coal

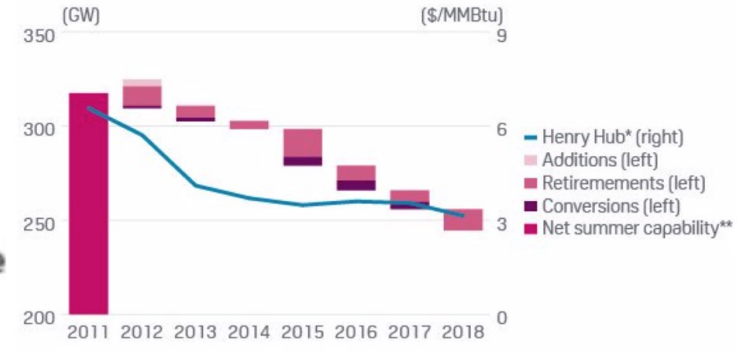


## EIA Coal Consumption Forecasts, 2006-2018

Each year, the Energy Information Administration releases its Annual Energy Outlook, which includes a long-term forecast for U.S. coal consumption for electric power generation. However, the forecasts have been wildly inaccurate, even in the near term.



## US COAL FLEET SHRINKS AS GAS PRICES FALL



\*Three-year average with a two-year lag  
 \*\*The capacity available under typical summer peak conditions

**Note: Like the IEA, the EIA continues to get their forecasts entirely wrong. Trump vowed to bring back coal. US coal production in 2019 was -15% yoy. There will be no recovery. 15GW coal closures, zero adds.**

# Electricity demand down this decade



## Change in generation in the National Energy Market

Between 2009 and 2019 the amount of coal power lost from the system was offset by gains in solar and wind energy – without a corresponding increase in gas generation. (Units: TWh generated annually)

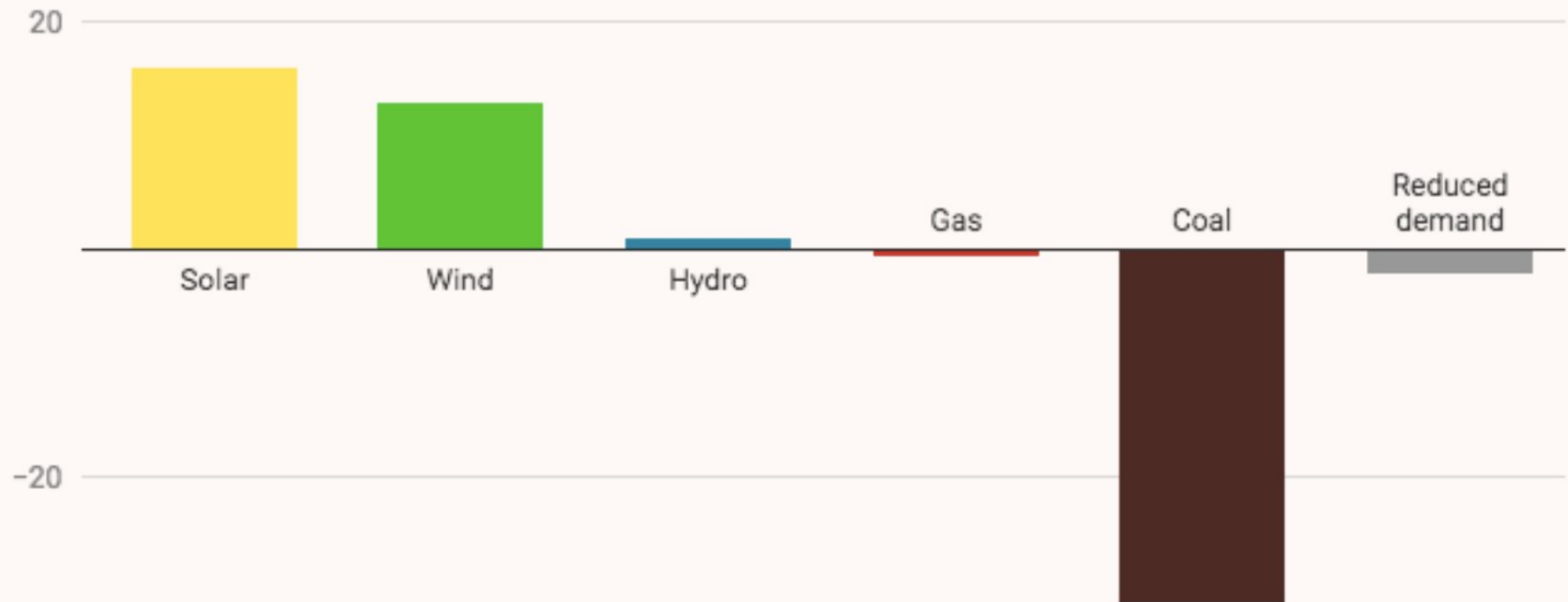
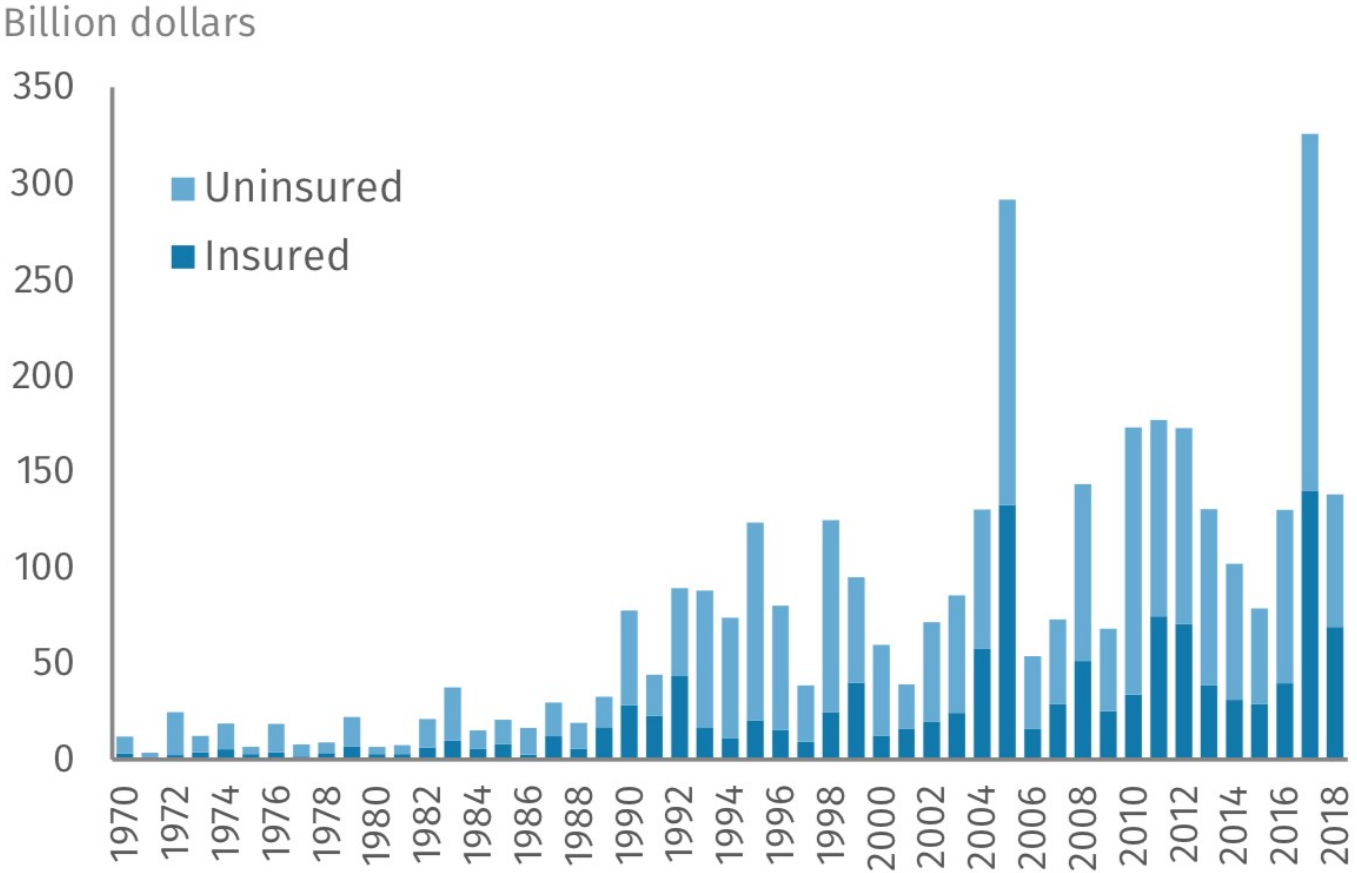


Chart: Simon Holmes à Court • Source: [OpenNEM](#) • [Get the data](#) • Created with [Datawrapper](#)

# Global Insurance Losses Are Rising



The Financial Sector including Insurance, Asset Managers and Banks are all exposed. BlackRock's Jan'2020 announcement pivotal.

The TCFD is materially influencing global corporates (80% of top 1,100 global firms)

Meanwhile, Norway's SWF is exiting fossil fuels, EIB following.

Source: Swiss Re

# 126 global financial institutions are exiting (thermal) coal

BlackRock's thermal Coal Divestment; January 2020

“A Fundamental Reshaping of Finance”

**Exiting Thermal Coal Producers** - Thermal coal production is one such sector. Thermal coal is significantly carbon intensive, becoming less and less economically viable, and highly exposed to regulation because of its environmental impacts. With the acceleration of the global energy transition, we do not believe that the long-term economic or investment rationale justifies continued investment in this sector. As a result, we are in the process of removing from our discretionary active investment portfolios the public securities (both debt and equity) of companies that generate more than 25% of their revenues from thermal coal production, which we aim to accomplish by the middle of 2020. As part of our process of evaluating sectors with high ESG risk, we will also closely scrutinize other businesses that are heavily reliant on thermal coal as an input, in order to understand whether they are effectively transitioning away from this reliance. In addition, BlackRock's alternatives business will make no future direct investments in companies that generate more than 25% of their revenues from thermal coal production.

# 126 global financial institutions are exiting (thermal) coal

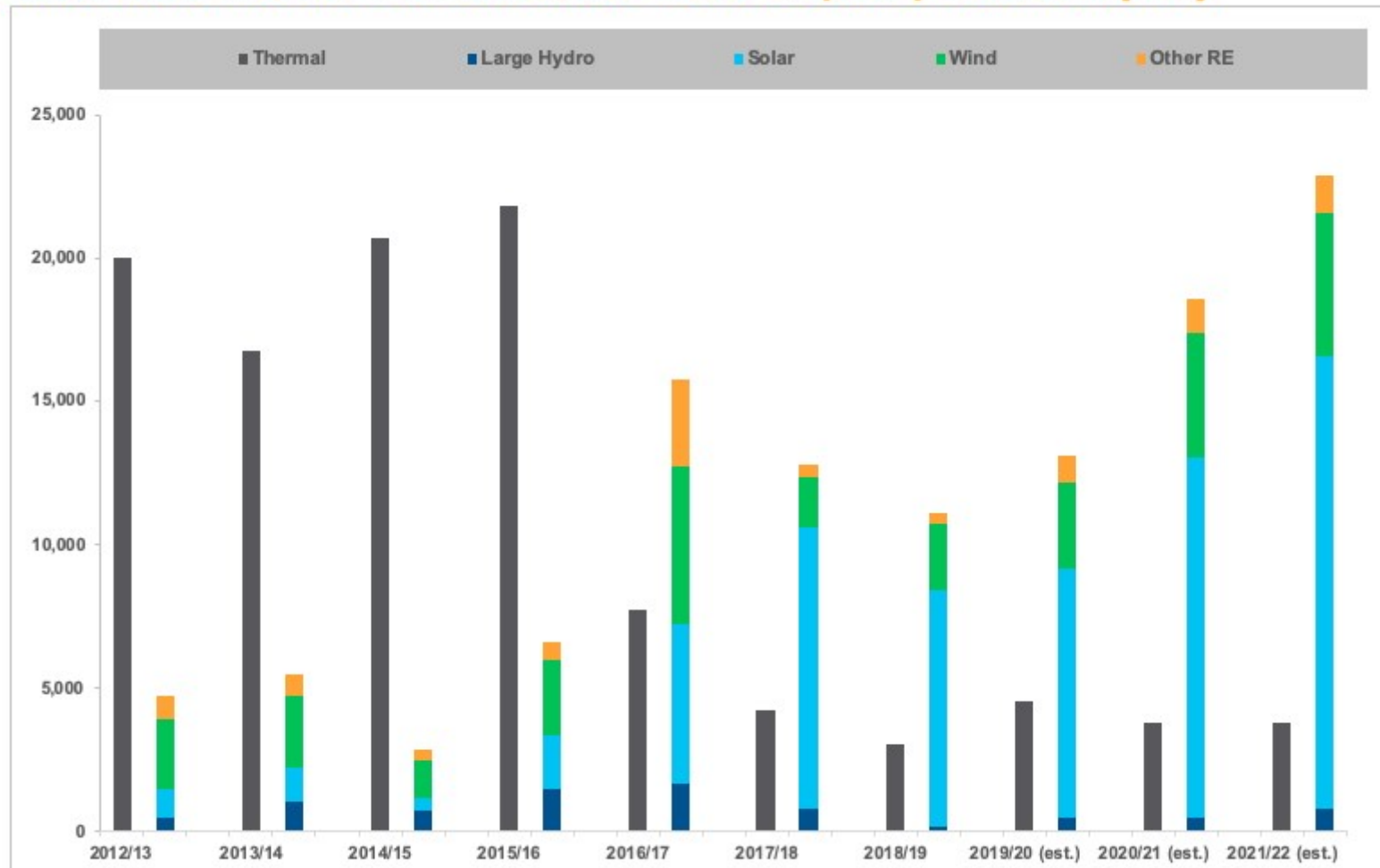
A new announcement every week in 2019, 10 to-date in 2020

- **Feb 2020:** **ABP** Netherlands, **ATP** Denmark, **Ilmarinen** Finland, **RBS UK & Pictet** Switzerland
- **Jan 2020:** **BlackRock** thermal coal divestment, **Aegon** Netherlands, **UK ECA** coal exclusion, **Lloyds Bank UK** to halve carbon emissions financing in 10 years, **Swedbank** (Sweden) 2040 carbon neutral.
- **Dec 2019** saw **DB Insurance** Korea, **ANZ Bank** Australia, **Credit Suisse**, **Liberty Mutual** US, **Goldman Sachs**, **Standard Chartered & Hartford Financial** US all move.
- **Nov 2019** saw **UniCredit** Italy, **NAB** Australia, **European Investment Bank**, **Sveriges Riksbank** of Sweden, **Axa** of France all announce new coal exit policies.
- **FirstRand SA**, **African Development Bank** + **Axis Capital** moved in Sept/Oct 2019
- **CommBank** of Australia & **Sumitomo** of Japan announced new policies in Aug 2019
- **Suncorp** of Australia and **Chubb** of the U.S., & **KfW** Germany, July 2019
- **DBS**, **UOB** & **OCBC** of Singapore & **MUFG** of Japan, **Hannover Re** of Germany & **UBS** of Switzerland ceased offering coal power plant financing in April/May 2019
- **MAPFRE** of Spain, **UNIQA** of Austria and **QBE** of Australia exited thermal coal insurance March 2019, as did **SDIC**, the first asset manager in China
- **Varma**, Finland & **VIG** of Austria exit coal insurance/divest coal holdings Jan/Feb 2019
- **Generali** of Italy coal exit Nov 2018, follows **SCOR** France, **Munich RE** Germany & **Swiss Re** Zurich
- **Standard Chartered UK** exiting coal power plant financing globally Sept 2018
- **Marubeni Corp Japan** exiting coal fired power plant development Sept 2018
- **Dia-ichi Life & Nippon Life** of Japan ceased overseas coal insurance May & July 2018
- **Sumitomo Mitsui Trust Bank** Japan introduces global coal exclusion July 2018

# Thermal Power Capacity Net Adds down 80%; VRE two-thirds of adds



IEEFA: India Thermal and Renewable Power Capacity Additions (MW)



Source: Central Electricity Authority India, IEEFA calculations



# Adani Green +624% in 2 years, Validated by Green bond issues & the US\$500m deal with Total



## Adani Green Energy Limited (ADANIGREEN.NS) ☆

NSE - NSE Real Time Price. Currency in INR

**213.35** +0.35 (+0.16%)

At close: 3:30PM IST



# When Financial Markets Move, Take Note!

- RE has already gone below **grid parity** in India, America, Chile, Brazil, Australia, Spain, Portugal et al. China gets there this year. Technology change is disrupting global energy & transport markets.
- RE deflation continues => **stranded thermal asset risks** are rising, globally.
- The financial distress of GE and Westinghouse US, Toshiba and TEPCO in Japan, Areva of France & Cameco in Canada all strongly suggest **nuclear** is unviable absent ongoing government subsidies.
- Banks, insurers and asset managers like making money, when they collectively pivot, it can turn into an avalanche, unstoppable & permanent. 126 globally significant financial institutions have already moved on **thermal coal**.
- **India** needs to focus on reducing fossil fuel imports (particularly oil), so domestic coal + RE are both going to play a key role. But coal is financially challenged by cheap VRE; while cheap VRE is operationally challenged by the need for a strong grid and the cost of firming (flexible thermal power, PHS, batteries, DRM **all** needed).

## Thank You