Carpe Diem:

Eight Signs That Now is the Time to Invest in the Global Energy Market Transformation

Institute for Energy Economics and Financial Analysis
IEEFA.org

November 2015

Evidence continues to mount that the world is beyond peak coal consumption and that its appetite for thermal coal is waning. This trend has gathered remarkable momentum in 2015, as seen in sharp consumption declines in key coal markets. Much of this phenomenon is being driven by technological innovation and rapidly falling costs across the renewable and energy-efficiency sectors. Much also is being driven by emerging policies and investment strategies rooted in the recognition that a transformation is under way and now is the time to seize the day.

Executive Summary

This paper highlights eight trends driving a rapid transformation of the global energy economy, creating a "carpe diem" moment in which policymakers and investors can seize the day by engaging now with this historic shift.

Eight trends covered in this report:

- ***Coal's Share of Electricity Generation in Key Countries is Declining.*** While the International Energy Agency forecasts an ongoing erosion of coal's market share of electricity generation, IEEFA sees it happening much faster.
- ***Demand for Seaborne Thermal Coal Is Declining, and Prices Have Collapsed.*** IEEFA sees internationally traded coal markets as having likely peaked in 2014 at an estimated 1,113 metric tons. We forecast a further 30 percent decline by 2021, to 762 metric tons. Our outlook is based on the likelihood that China, Western Europe and Japan have already passed peak import demand—all in in 2013-2014—and that India's demand for thermal coal imports peaked in mid-2015.
- ***The Price of Renewable Energy is Declining.*** Technology innovation and economies of scale are working together to drive the down the capital cost of renewable energy deployments. The cost of solar continues to decline at a double-digit rate annually, and solar is rapidly moving toward grid parity in an increasing number of markets. Rapid cost reductions in battery technology will compound the rate of deployment of distributed-energy solutions, further undermining the commercial returns of existing fossil-fuel assets.
- ***Investment Capital Is Moving Rapidly From Coal Into Renewables.*** Investors over the past decade have put US$1.5 trillion into clean energy—mostly solar and wind, and 2014 was a record year. Renewable energy capacity, in the meantime, has grown even faster. These trends have triggered a considerable shift and growing acceptance in financial market of the structural decline of coal and the demand for raising capacity in low-emissions investments.
- ***The Coal-Fired Sector Has Been Overbuilt***. China has built more coal-fired plants than it can support, India is on a renewable-energy tear, and the U.S. is retiring coal-fired power plants.
- ***Coal Companies Are in Deep Financial Distress.*** Coal producers are in dire straits from a combination of energy-efficiency gains, eroding electricity demand, conversions to gas-fired power capacity, an expanding buildout of renewable energy projects, and the impact of pollution-control regulation.
- ***Structural Decline in Coal Demand Is an Increasingly Consensus Call.*** What was once an outlier point of view—that global coal markets are in decline—has become more mainstream.
- ***Global Banks Are Shifting Their Focus to Renewables.*** An increasingly sizeable group of financial institutions see the inevitability of rising regulatory pressures, and hence the rising stranded-asset risks of fossil-fuel assets.

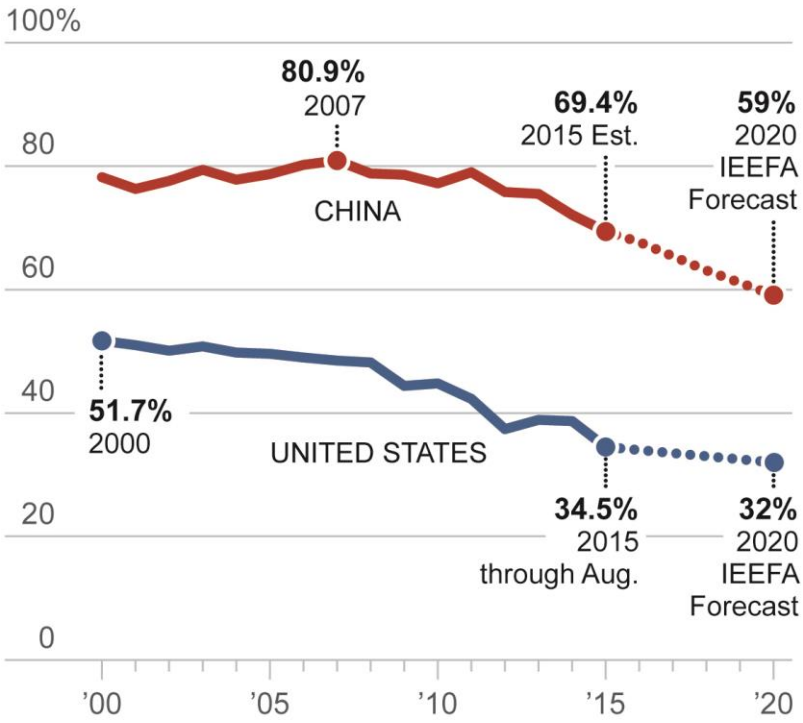
Coal's Share of Electricity Generation Is Falling in Key Countries

While the International Energy Agency forecasts an ongoing erosion of coal's market share in global electricity markets, IEEFA sees it happening much faster than under some of the IEA scenarios.

The central "New Policies Scenario" portion of the World Energy Outlook 2015 shows that coal's market share peaked at 41 percent in 2013 and will decline to 37 percent by 2020 and then drop more rapidly, to 30 percent, by 2040.[1] The IEA attributes this trend to the rising competition from renewable energy, and it sees wind and solar rising from a relatively immaterial 6 percent share of electricity generation in 2013 to 10 percent by 2020 and 18 percent by 2040. However, the agency's executive director, Fatih Birol, qualifies this scenario by describing it as "unsustainable" -- which is to say unreliable.[2] The IEA's alternative and, in IEEFA's view, more credible, "450ppm Scenario," on the other hand, has coal's market share peaking at 41 percent in 2013, declining to 35 percent in 2020 and then falling rapidly to 12 percent by 2040. The agency forecasts the market share of electricity generation from wind and solar rising to 11 percent by 2020 and 32 percent share by 2040. Bigger nuclear and hydro-electricity market shares also play a more material role in the "450 Scenario" than in the "New Policies Scenario."

Declining Use of Coal for Electricity In the U.S. and China

The share of electricity produced by coal is falling in both the United States and China, a trend that is likely to continue.



Sources: U.S. Energy Information Administration; International Energy Agency; IEEFA

In terms of electricity generation from coal, the "450 Scenario" has global coal-fired power production dropping almost 60 percent from 9,612TWh in 2013 to 4,107TWh by 2040.

IEEFA's view is the world is on the verge of exponential—rather than linear—growth rates for new technologies like solar and batteries. Although innovation in the fossil fuel sector has typically been slow and only marginally efficient, innovation in wind and solar is fundamentally different because solar and wind are not traditional fuels. Development of solar and wind, technology, therefore, is more akin to the type of innovation that has occurred with mobile phones, the Internet and portable computers. Once a critical mass has been reached in development, market shifts will occur in just a few years, rather than over several decades.

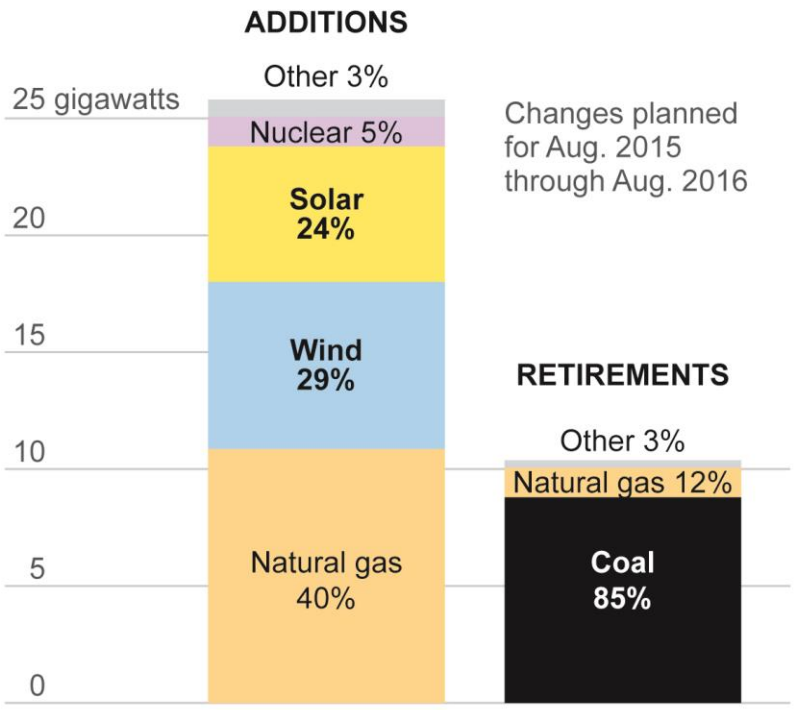
[1] IEA World Energy Outlook 2015, page 310
[2] IEA World Energy Outlook 2015, Forward, page 3

A key consideration in IEEFA's analysis of electricity markets is that once built, renewable-energy generators are the relatively low-cost sources, with hydro and nuclear in the middle of the cost order, and generation built around imported gas and coal representing the highest-cost sources of supply.

Data from the Chinese electricity market over the last two years illustrates how this reality is taking root already. Although significant new coal-fired power generation has been commissioned (100GW in the past two years) in China, coal-fired power utilization rates fell from 57.2 percent in 2013 to 53.7 percent in 2014 and to a record low 49.3 percent in the first 10 months of 2015.

A Major Shift in U.S. Electric Generation

The changes planned in U.S. electricity generation through next August show a stark contrast: the vast majority of plant retirements are fueled by coal, while more than half of the additions are solar or wind powered.



Source: Energy Information Administration

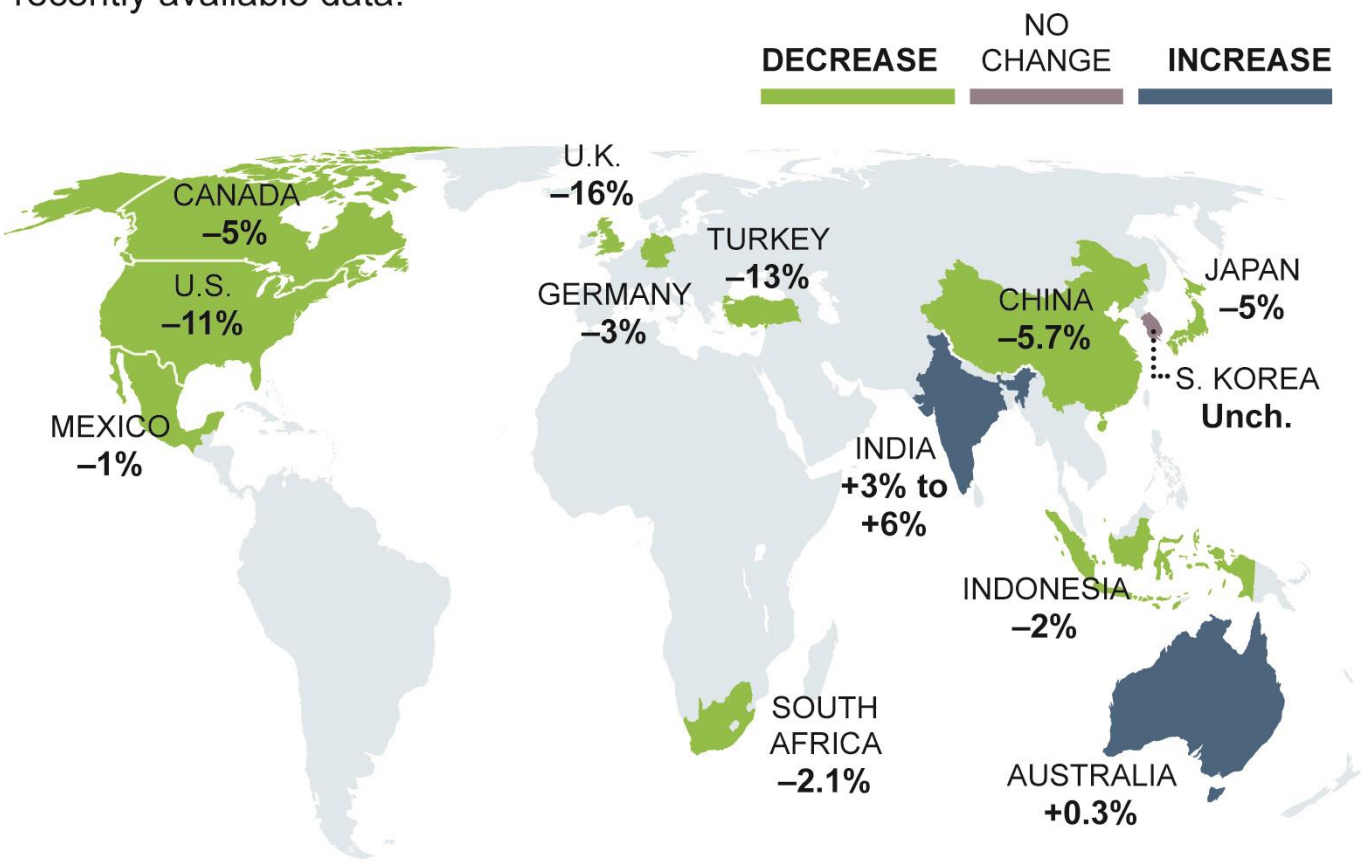
Coal-fired power generation in China hit a recent high of 79 percent, in 2011, and has since declined, to 69 percent in 2015. IEEFA sees coal-fired power's contribution to China's electricity-generation mix declining to less than 60 percent by 2020. This outlook acknowledges the ongoing decoupling of electricity demand growth from overall economic growth in China along with the country's sustained investment in wind, hydro, solar and nuclear-powered generation. Such investments are a key part of the Chinese government's long-term program to promote low-carbon energy sources, reduce water, air and particulate pollution, and build energy security through a more diversified domestic generation base.

The IEA devotes a significant part of its World Energy Outlook to the rapidly transforming Indian electricity sector, but gets several fundamental points wrong. The agency concludes that India will be the key driver of demand growth in internationally traded seaborne thermal coal through 2040. This projection is predicated on a number of flawed assumptions, including that India will not reach its goal of 100GW of solar installations until 2030, nine years behind the 2021 date the Government of India is pursuing.

IEEFA's analysis, "Indian Electricity Sector Transformation: Building Global Capacity," suggests a much faster uptake of solar in India, noting the commitments of more than 30 globally significant electricity-sector participants in just the past eight months, commitments that collectively involve over US$100bn of investment in solar in India. Such support is more than sufficient for India to achieve its 100GW target by 2021 on time and below budget. IEEFA sees coal-fired power generation declining from a 75 percent market share in 2014-15 to less than 60 percent by 2025-26, consistent with the trend also evident in the Chinese electricity market.

Change in Coal Consumption So Far This Year

IEEFA forecasts an overall 2% to 4% decline in global consumption in 2015. Here are the changes in key countries, based on the most recently available data.



Sources: Government figures from individual countries; International Energy Agency

In the U.S., where roughly 200 coal-fired power plants with a combined 83GW of capacity have been scheduled for retirement since 2012,[3] coal-fired power's share of electricity generation is set to decline to 35 percent in 2015, down from 50 percent a decade earlier. Goldman Sachs forecasts a further decline, to 30 percent by 2025, and UBS sees a potential decline to 18 percent by 2030. The U.S. Energy Information Administration in October of this year forecast that U.S. coal consumption would decline 100 metric tons in 2015 (an 11 percent drop over the same time last year[4]), and then has it falling further in 2016. Record low U.S. gas prices, record high renewable energy buildouts (9GW of wind plus 8GW of solar in 2015 alone) and a decoupling of electricity demand from economic growth are all permanently eroding coal demand in the U.S.

In the U.K., public policy is moving toward complete banishment of coal-fired electricity. The U.K. market for coal will disappear should the recently proposed coal-fired power plant phase-out by 2025 be completed. Recent official pursuit of this goal marks the end game of a decade-long

[3] http://content.sierraclub.org/coal/victories
[4] http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_2_01_a

transition that in the first six months of this year saw U.K. coal consumption for power generation drop 16 percent year on year as coal-fired power plants closed down or converted to biomass.

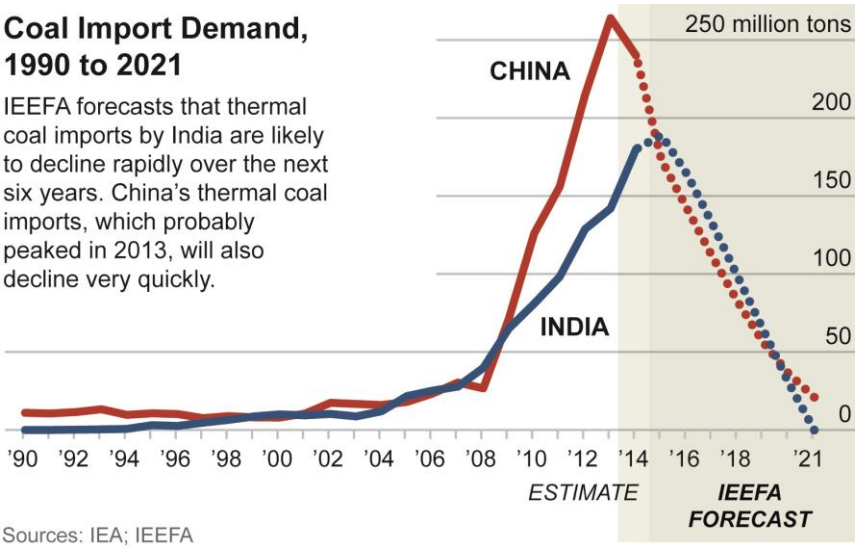
In Germany, total coal-fired electricity production in the first half of 2015 was down 9.9 percent over the same period two years ago, with renewable energy generation up 16.1 percent. The two-year trend is reflective of a gradual decline in overall demand through energy-efficiency gains, and the ongoing loss of coal's share is to gains made by renewables. Electricity generated by hydro, wind, solar and biomass supplied 38 percent of net electricity consumption in Germany in the first half of 2015, a record high share, and one that reflects new contributions from offshore wind generation.[5]

Demand for Seaborne Thermal Coal Is Down; Prices Are Collapsing

IEEFA sees internationally traded coal markets as having likely peaked in 2014 at an estimated 1,113 metric tons. We forecast a 30 percent decline by 2021, to 762 metric tons. Our outlook is based on the likelihood that China, Western Europe and Japan have already passed peak import demand—all in in 2013-2014—and that India's demand for thermal coal imports peaked in mid-2015.

IEEFA considers thermal coal imports into China as having peaked in 2013, far earlier than most commodity forecasters anticipated. Thermal coal imports to China declined 9 percent in 2014, and this year—through October—have declined an additional 30 percent year over year. This trend is driven by significant changes in energy intensity of growth (as the Chinese economy becomes less reliant on high-energy-consumption sectors), a gradual slowing of overall Chinese economic growth and ongoing policies to diversify the electricity sector away from excessive reliance on coal.

Western Europe is forecast to decline materially over this decade due to European Union policy initiatives to accelerate investment in renewables and energy efficiency, combined with the impact of the Large Combustion Plant Directive 2001/80/EC in terms of mandating coal-fired power plant closures or modernization.



Japan's coal consumption will decline due to the combination of five factors: slower economic growth; ongoing energy-efficiency gains of 2 to 3 percent annually; the addition of 8-10GW per year of new solar installations; any sustained nuclear facility restart (Japan has 42GW of idle nuclear capacity); and the 60 percent decline in liquid natural gas import prices since early 2014.[6]

Bullish forecasts for coal import demand growth are increasingly reliant on India.

[5] https://www.ise.fraunhofer.de/en/downloads-englisch/pdf-files-englisch/data-nivc-/power-generation-from-renewable-energy-in-germany-assessment-of-first-half-of-2015.pdf

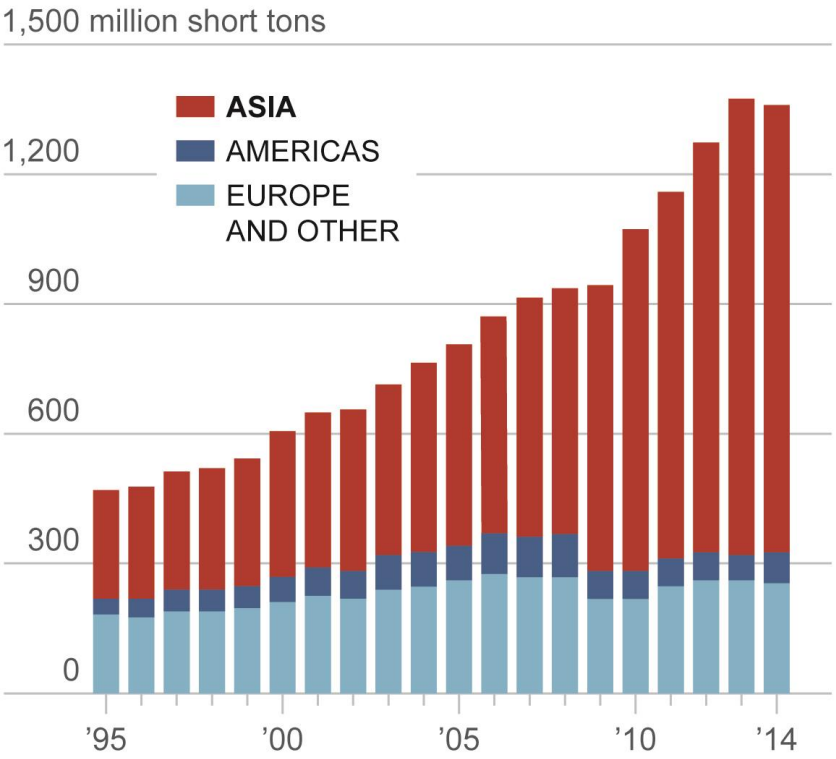
[6] http://ieefa.org/wp-content/uploads/2015/11/IEEFA_Peak-Coal_November-2015.pdf

However, IEEFA questions the true scope for Indian thermal coal imports in light of the fact that in Energy Minister Piyush Goyal in November 2014 said that India's recently elected government was aiming to stop the import of coal "possibly in the next two or three."[7] IEEFA's analysis suggests this policy is directionally correct.[8] The 27 percent year-over-year decline in Indian coal imports in September 2015 combined with a 5 percent decline in October 2015 sends a strong signal that coal-market analysts would do well to revisit their India coal forecasts.

Should Energy Minister Goyal continue succeed in implementing energy-market reforms, Indian thermal coal imports would be the first casualty. The economics of the matter show why: Electricity generated from a new power plant fired by imported coal is now materially more expensive than the cost of utility-scale solar, hydro, wind or gas-fired power, and double the average cost of existing domestic coal-fired power generation.

Coal Imports by Major Importing Region

Nearly all the growth in global coal imports since 2008 came from China and India, where coal consumption has probably peaked.



Source: U.S. Energy Information Administration

Renewable markets in India are evolving quickly. In November 2015, for instance, a 500MW solar tender in Andhra Pradesh saw a record-low winning bid of Rs4.63 (US$0.071)/kWh.[9] The same auction saw an additional 5GW of bids by 29 other developers that put utility-scale solar below India's delivered wholesale cost of electricity of Rs5.15/kWh in 2013/14. Further, India's astute energy minister has engineered a deflationary benefit into most renewable energy power purchase agreements with fixed zero indexation, meaning that roughly 5 percent annual real price declines are locked into renewable project for the next 25 years.

IEEFA sees India achieving its 175GW renewable-energy goal within five to seven years given the rapid financial capacity being assembled. This combines with a double-digit annual expansion of domestic coal mining production, the joint effect being to curtail thermal coal imports.

On the price front, the seaborne thermal coal market has entered structural decline. Having peaked in 2009, the seaborne price has fallen more than 60 percent. The Australian export benchmark (the Newcastle 6,000kcal net as received (NAR) free on board (FOB) index) was US$52/ton in November

[7] http://in.reuters.com/article/2015/10/19/india-coal-imports-idINKCN0SD0C920151019
[8] http://ieefa.org/india-electricity-sector-transformation/
[9] http://economictimes.indiatimes.com/industry/energy/power/sunedision-to-supply-cheapest-solar-power-in-india/articleshow/49654469.cms

of this year. The Newcastle coal forwards markets have prices remaining below US$48/t through October 2021 (and down 10 percent in just the last three months).[10]

The Price of Renewable Energy Is Dropping

The price of renewable energy is dropping and is declining rapidly relative to the cost of coal.

Bloomberg New Energy Finance (BNEF) recently detailed how new technology innovation drives rapid cost reductions as the scale of deployment accelerates. In particular, BNEF suggests that with every doubling of installed capacity, solar costs decline by 26.3 percent. And while lithium-Ion battery costs drop, the learning rate associated with that technology—cost reductions accrued as technology manufacturers accumulate experience—is also helping drive renewable-energy costs down.

Cost deflation in renewable energy in general and energy storage in particular remain key drivers. Tesla Motor Inc. alone is set to double global production of batteries by 2017.

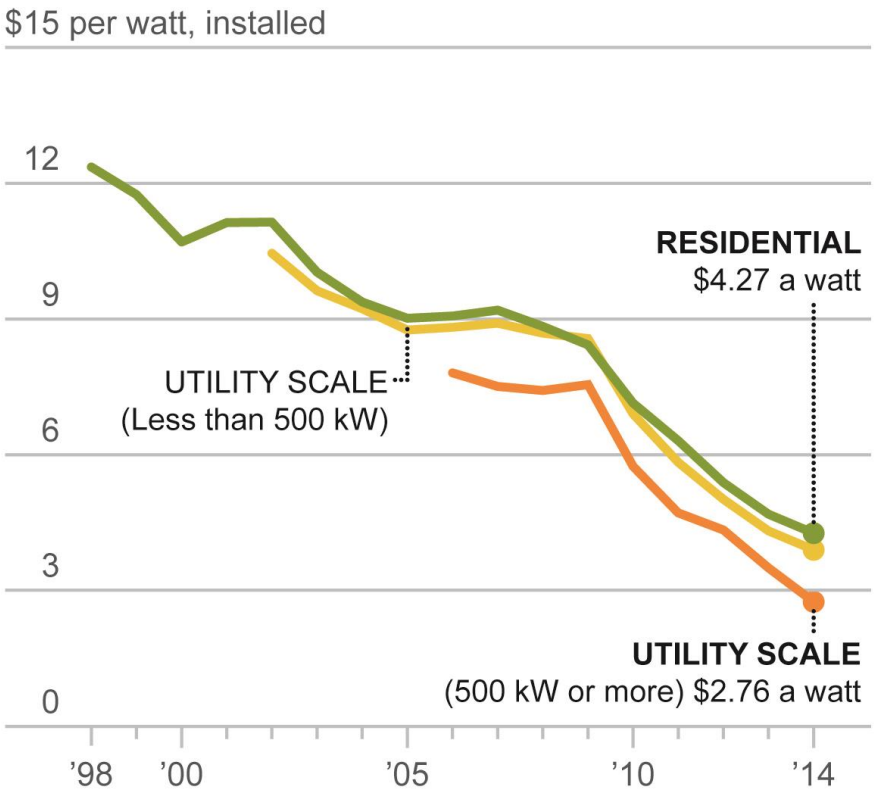
BNEF has also detailed recently how the continued technology advances evident in solar module efficiency. Firms like Sunpower forecast their best modules by 2017 delivering a 22-23 percent conversion efficiency relative to the current global average of 15-16 percent; additional significant improvement is assured.

In the U.S., the prices for long-term power purchase agreements (PPA) from utility-scale solar PV projects has fallen so dramatically since 2009 that the median PPA price in the U.S. is now just below $50 per MWh, lower than the cost of power from many coal plants.

IEEFA recently published a case study on how South Australia serves as a model today for the new energy economy. The installed capacity of renewable generation in the state consistently exceeds electricity demand already, according

Cost of Solar Power

The median cost of installing residential and utility-scale solar photovoltaic systems in the United States is less than half of what it was a decade ago.



Source: U.S. National Renewable Energy Laboratory; U.S. Department of Energy Sunshot program

[10] http://quotes.esignal.com/esignalprod/quote.action?symbol=NCFQ-ICE

to data from the Australian Energy Market Operator (AEMO). Residential rooftop solar in South Australia is expected to reach 28 percent penetration—which is to say more than a quarter of all rooftops—and the state has the most installed wind generation in all of Australia, with 1,473 megawatts of onshore wind capacity, representing 25 percent of total generation capacity (and an additional 2,963 megawatts of wind projects are planned).

The shift spells the end of coal-fired generation in South Australia. In June, Alinta Energy—which has 800,000 customers nationally—made news with the announcement that its sub-critical Flinders Operations Northern (554 megawatts) and Playford B (240 megawatts) power stations and its Leigh Creek coal mine would close by March 2018, maybe sooner. The company said all three outfits had become "increasingly uneconomic."

Investment Capital is Moving Rapidly From Coal to Renewables

Bloomberg New Energy Finance estimates that investment in clean energy—mostly renewables—over the past decade exceeds US$1.5 trillion. In 2014 alone, investors put US$340 billion into renewables, and the lion's share of those investments were in solar and wind.

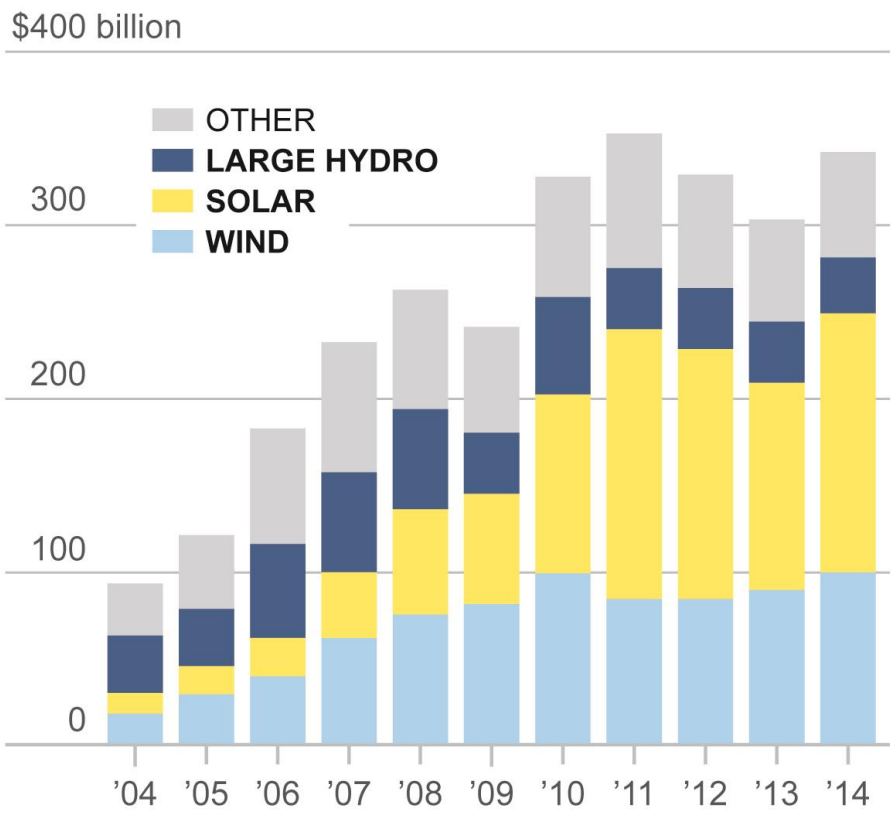
These numbers, telling as they are, mask the rapid decline in the cost of renewables, such that the underlying capacity of renewable energy has continued to expand spectacularly in terms of gigawatts of capacity added. A record 133GW of renewable capacity was installed in 2014, and—with a 20 percent expansion in solar installations, to 56GW—2015 will see in excess of 140GW of new renewable-energy capacity.

A deeply illustrative case of how renewable energy is catching on among investors can be found in India, where US$100 billion has been committed to renewables by global energy investors just this year. Here's a snapshot of that activity:

Four of the world's largest solar manufacturers are advancing plans to build Indian solar manufacturing capacity (Trina Solar, JA Solar, Hanwha Q CELLS, LONGi).

New Investment in Clean Energy

Globally, hundreds of billions of dollars is being invested in clean energy projects every year, primarily solar and wind.



Source: Bloomberg New Energy Finance

- Three of the world's top renewable energy utilities are acquiring major Indian renewable project-development firms (EDF Energies Nouvelles, ENEL Green Power, ENGIE);
- Four of North America's top solar-development companies are accelerating project development in India (Sky Power of Canada, First Solar, SunEdison and SunPower);
- Numerous leading Asian innovators and utilities are targeting Indian renewables (Foxconn of Taiwan, SoftBank of Japan, Sembcorp of Singapore, CLP Group of HK);
- Major Indian energy sector conglomerates are initiating multiple new investment programs in renewables (Adani Power, Tata Power and Reliance Power);
- Several of India's wealthiest companies are entering the power markets to invest in renewables (Aditya Birla Group, the Dilip family, Bharti Enterprises, Jindal Steel and Power);
- Global development banks and leading equity investors are providing innovative green finance (International Finance Corp, the World Bank, KfW of Germany, Asia Development Bank, Abu Dhabi Investment Authority, GE, Goldman Sachs, Actis Capital, Lightsource UK).

The Coal-Fired Electricity Sector Has Been Overbuilt

China has commissioned 60GW of new thermal power generation capacity in the 12 months to September 2015[11]—after commissioning 45GW in the previous 12 months. This averages out to 1GW of new coal-fired commissions per week for two years. Yet total thermal power generation in China is down 2 percent this year compared to 2014, and is lower today than it was 2012. With minimal growth in national electricity demand, and with 20GW annually of new solar, wind and hydro installs across China, the highest marginal-cost source of supply—coal—has lost out. Coal-fired power plant utilization rates in China have fallen from 57 percent in 2013 to 53 percent in 2014 to a year-to-date 2015 level of just 49.3 percent. This means that China in effect has been adding 1GW of new idle thermal capacity—a total of US$70 billion in stranded assets—since 2014.

The government of India, in the meantime, has done a better job of recognizing the potential for creating stranded power-generation assets and is shying away from doing so. Here's Energy Minister Goyal in October 2015:[12] "Already, we are not encouraging any fossil-fuel projects. We are completing stalled ones. …. In the next two to three years, I don't see the possibility of fossil-fuel plants."

The U.S. coal-fired power sector since 2012 has closed or has announced it will close 206 plants that generate or generated a combined 85.5GW of capacity.[13] Some 17GW of coal-fired power plants have shut in 2015, with a further 12GW slated for closure in 2016.[14] This trend is driven in part by the federal government's heightened regulation of air pollution but also substantially by the combined impact of low natural gas prices, gains in energy efficiency and the uptake of renewables and complimented by the federal government's heightened regulation of air pollution.

A growing global awareness that change is afoot was stated perhaps most notably this fall by Francesco Starace, the CEO of the multinational utility company ENEL, when he said this: "Why would you put €1bn into something (coal-fired power) that takes 10 years to be built and by the time

[11] http://uk.reuters.com/article/2015/10/19/china-economy-output-power-idUKL3N12J1PO20151019
[12] http://economictimes.indiatimes.com/opinion/interviews/indias-investment-thrust-will-be-towards-renewable-energy-piyush-goyal/articleshow/49532254.cms
[13] http://content.sierraclub.org/coal/victories
[14] https://www.snl.com/InteractiveX/article.aspx?ID=34602202&KPLT=4

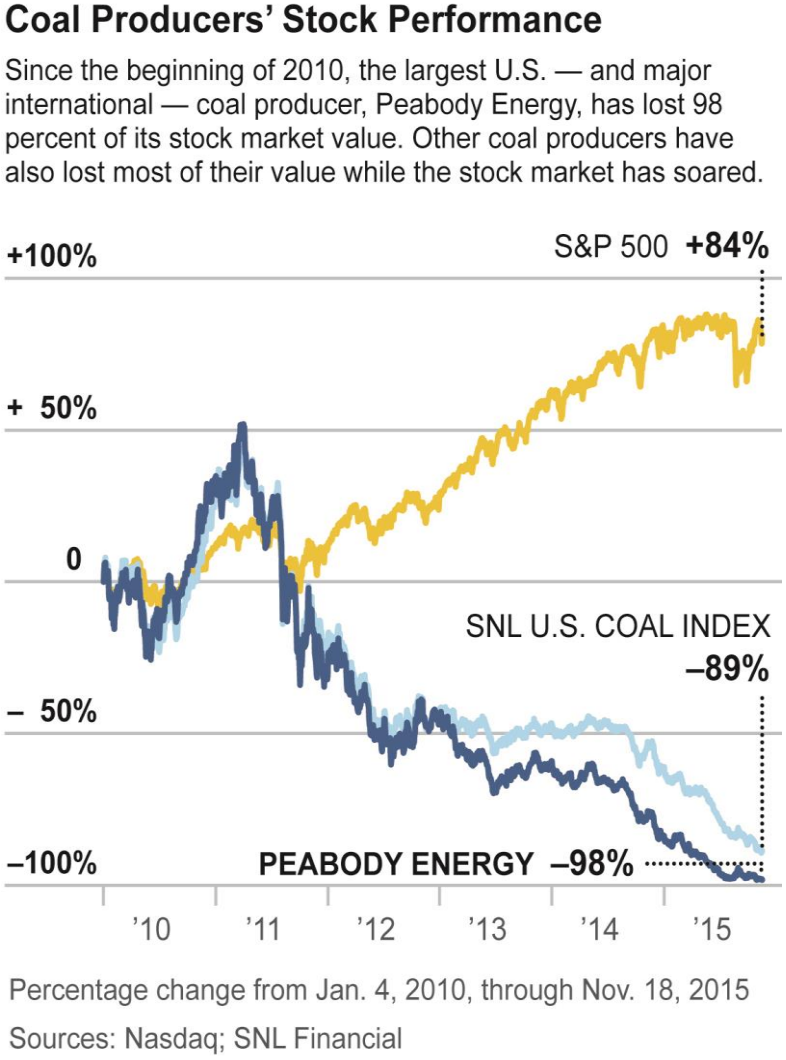
you finish, you find out there is no point in having it anymore. It is too slow to be fitting this world anymore."

Coal Companies Are in Deep Financial Distress

Recent published reports cite estimates that put unfunded liabilities among U.S. coal producers—including debt service, employee pension plan and healthcare obligations, and reclamation costs—at US$45 billion. Such liabilities at Peabody Energy, the single largest non-governmental coal producer in the world, total US$16bn alone, suggesting that the US$45 billion estimated is conservative.

The dire state of the U.S. coal industry in particular reflects the combined impact of energy efficiency gains, eroding electricity demand, increased conversion from coal to gas-fired power capacity, an expanding buildout of renewable energy projects that are increasingly more cost competitive than incumbent generation capacity, and the impact of greater pollution regulation under the EPA's Clean Power Plan. Executives are beginning to acknowledge industry distress, perhaps no so bluntly as Robert Murray, the CEO of Murray Energy, who recently said this: "The industry is bankrupt. Our coal markets are being destroyed."[15]

The chart here tracks the wealth destruction created by U.S. coal producers alone over the past five years. Arch Coal, the second biggest U.S. producer, is considering Chapter 11 bankruptcy protection,[16] while Patriot Coal, Walter Energy and Alpha Natural Resources have filed already for bankruptcy this year. The trend is the result of a combination of ill-timed top-of-the-cycle, debt-funded acquisitions and structural decline in the underlying coal markets, where demand is down by 30 percent over the past eight years.



[15] https://www.snl.com/InteractiveX/article.aspx?ID=34581321&KPLT=4
[16] http://www.bloomberg.com/news/articles/2015-11-09/arch-posts-12th-consecutive-loss-as-liquidity-weighs-on-lenders

The Australian coal industry has likewise seen significant and sustained wealth destruction, with most Australian listed coal companies share prices down 60 to 100 percent over the past five years. A notable feature of Australia's coal industry has been the flow-on effect on mining-service providers (such as WorleyParsons, Monadelphous Group, Wesfarmers), as well as capital-intensive coal rail and port infrastructure operators. The A$3 billion, 27Mtpa Wiggins Island Coal Export Terminal (WICET), commissioned in 2015, is a stranded asset already given a funding structure of almost 100 percent debt and that it was built at a peak-cycle construction cost. The project's excessive long-term take-or-pay liabilities have already forced two of the previously largest listed coal-mining development companies to file for administration: Bandanna Energy in October 2014 and Cockatoo Coal in November 2015.[17]

Aurizon (Queensland's premier rail freight company) reported in October 2015 that it's new A$831m rail link to WICET was also a likely stranded asset that IEEFA estimates potentially requires up to a 50 percent write-down due to onerous take-or-pay rail contracts on coal mines that have yet to be built in many cases.[18]

Multinational coal companies are also underperforming, among them BHP Billiton, Anglo American and Glencore. Their varying degrees of underperformance reflect the individual extent of exposure to the coal sector, with Glencore having wiped out the most shareholder value. The other common ingredient among coal companies globally is the presence of excessive financial leverage brought about largely by poorly timed debt-fueled acquisitions or greenfield coal expansions. Glencore's shareholder wealth destruction reflects a combination of operational leverage compounded by financial leverage.

Structural Decline in Coal Demand Is an Increasingly Consensus Call

Bernstein Research in June 2013 called for a peak in China's coal consumption by 2016 in their seminal Blackbook: "China: The beginning of the end of Coal."

In September 2014, the noted economist Ross Garnaut published a non-consensus call on the dramatic transformation of the Chinese economy, declining emissions intensity and the prospect of peak coal in China.[19] Nicholas Stern and Fergus Green of the London School of Economics reached similar conclusions at about the same time.

Financial markets today are catching up, acknowledging the increasingly structural nature of the prolonged decline of coal, particularly in the internationally traded thermal coal sector. One result is broader consideration of the risk of stranded assets.

In March 2015, Mark Pervan, ANZ Bank commodities analyst, said this: "Right now with thermal coal at $60/t and the Galilee coal 500km from port, funding these projects doesn't seem viable. What is unknown is whether the Indian companies are prepared to take a long-term view and put a lot more of their own equity into these projects."[20]

Citigroup published its "Energy Darwinism II" as a second follow-on from Tony Yuen's September 2013 report: "*The Unimaginable: Peak Coal in China*." And in January 2015 Goldman Sachs said that

[17] https://www.ppbadvisory.com/uploads/i411-17-November-2015-First-Report-to-Creditors.pdf
[18] http://www.smh.com.au/business/aurizon-warns-dispute-with-wicet-could-hit-earnings-by-27-million-a-year-20151004-gk16ic.html
[19] Ross Garnaut, China & World Economy, 2-18, Vol 22, No. 5, 2014, "China's Role in Global Climate Change Mitigation," http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2496674
[20] http://www.ft.com/cms/s/0/ec88baae-c7af-11e4-9226-00144feab7de.html#ixzz3U9A8k7MS

thermal coal had reached "retirement age." Merrill Lynch, Deutsche Bank, HSBC and Morgan Stanley have likewise downgraded their demand and price expectations for coal, and increasingly talked of structural headwinds.

In August 2015, Deutsche Bank forecast that excess thermal coal production would be so pressing that China likely return to exporting 100 million metric tons per year by 2020.

Finally, in November 2015, UBS Equity Research released a report titled: "Coal: Is seaborne trade in terminal decline?" Publication was accompanied by another 33 percent cut to the UBS long-term international thermal coal price forecast, to US$55/t, and a 20 percent cut to coking coal to US$105/t. An 82 percent cut to the UBS price target for Peabody Energy was a key result of the analysis.

Global Banks Are Shifting Their Focus to Renewables

The global banking system is moving money away from higher-risk fossil-fuel lending in hopes of avoiding stranded-asset risk and to capitalize on opportunities in low-emissions technology.

Key developments on this front include the decision this year by Norway's Government Pension Fund Global, the world's largest sovereign wealth fund, to divest from the coal sector,[21] using a 30% threshold for coal mining or burning, and the very recent decision by Allianz, the world's largest insurance company, to follow Norway's example. These decisions combined will affect over $10 billion of investments.

An increasingly sizeable group of financial institutions see the inevitability of rising regulatory pressures, and hence the rising stranded-asset risks of fossil-fuel assets.

This trend can be seen, in one instance, at Citi, which announced in 2007 a target to lend US$50bn over 10 years to address climate change.[22] In February 2015, Citi doubled that number to US$100bn, having met its first target in 2013, three years ahead of schedule.[23]

In 2012, Bank of America Corp set a goal of US$50bn to provide loans and other financing for environmentally friendly energy projects over 10 years. Also in 2012, Goldman Sachs set a 10-year target of US$40bn for investments in renewable-energy projects. In November 2015, Goldman expanded its ambition, announcing the highest lending target yet, with a commitment to invest US$150bn by 2025. This follows Goldman's write-off and divestiture of its 2010-2012 US$600m of direct investments in Columbian coal mining.[24]

Australian banks have followed this trend. In 2013, Westpac committed to invest A$6bn in clean tech and environmental services, a target exceeded in 2015 ahead of schedule. In October 2015, ANZ Bank committed to invest A$10bn toward loans for renewable energy, reforestation and energy-efficiency projects over five years.[25] Then Commonwealth Bank of Australia committed to a A$20bn lending target, confirmed it has ceased its advisory role to the Adani Carmichael coal project proposal and undertook one of Australia's largest renewable-infrastructure investments ever by investing €900m in a portfolio of wind farms in Portugal. The National Australia Bank announced its

[21] http://ieefa.org/wp-content/uploads/2015/05/Case-for-Divesting-Coal-from-the-Norwegian-Government-Pension-Fund-Global_compressed.pdf
[22] http://www.citigroup.com/citi/news/2007/070508a.htm
[23] http://www.cnbc.com/2015/02/18/citi-announces-100b-10-year-climate-change-program.html
[24] https://www.argusmedia.com/News/Article?id=1130309
[25] http://www.ibtimes.com.au/australian-bank-anz-tightens-lending-norms-coal-industry-loans-be-restricted-coal-plants-lowest

support for climate-change initiatives and said it would put a new emphasis on investing A$18bn over seven years to support the transition to a low-carbon economy.[26]

French banks, traditionally major global lenders to the fossil-fuel sector, have also announced low-emissions lending targets. BNP Paribas in November 2015 committed to €15bn of renewables lending by 2020. Societe Generale committed to double renewables lending by 2020 and cease extending project financing for coal mine development.[27]

In September 2015 the Asian Development Bank announced plans to double annual spending on climate-change initiatives to US$6bn by 2020. The OECD Export Credit Group also announced in November 2015 they would reduce their subsidies for financing coal-fired power plants.

Institute for Energy Economics and Financial Analysis (IEEFA.org)

The Institute for Energy Economics and Financial Analysis (IEEFA) conducts research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy and to reduce dependence on coal and other non-renewable energy resources. More at www.ieefa.org.

The full report is posted at the following link:
ieefa.org/wp-content/uploads/2015/11/Carpe-Diem-Report.pdf

Scan the QR code to access the report on your phone

Important Information

This report is for information and educational purposes only. It is for the sole use of its intended recipient. It is intended solely as a discussion piece focused on the topics of the export thermal coal markets. Under no circumstance should it to be considered as a financial promotion. It is not an offer to sell or a solicitation to buy any investment even indirectly referred to in this document; nor is it an offer to provide any form of general nor personal investment service.

This report is not meant as a general guide to investing, or as a source of any specific investment recommendation. While the information contained in this report is from sources believed reliable, we do not represent that it is complete and it should not be relied upon as such. Unless attributed to others, any opinions expressed are our current opinions only.

Certain information presented may have been provided by third parties. The Institute for Energy Economics and Financial Analysis believes that such third-party information is reliable, and has checked public records to verify it wherever possible, but does not guarantee its accuracy, timeliness or completeness; and it is subject to change without notice.

For additional Information on this report and for media queries:

Karl Cates kcates@ieefa.org +1 917-439-8225

[26] http://www.smh.com.au/business/banking-and-finance/green-is-the-new-black-for-australian-banks-20151105-gkrj4o.html#ixzz3sJ9KW8hg
[27] http://www.societegenerale.com/en/building-tomorrow/sustainable-commitments/societe-generale-commits-to-the-fight-against-climate-change