



WWF

REVIEW

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A large-scale coal mining operation. In the foreground, a yellow Komatsu PC 290 LC excavator is positioned on a dark, rocky surface. The background shows a vast, terraced coal mine with a winding road and patches of green grass. The sky is clear and blue.

GLOBAL COAL: THE ACCELERATION OF MARKET DECLINE



Wind turbine , renewable energy source

This literature review captures the state-of-play of the global coal and renewable energy markets on the basis of over 130 studies and articles that were published between September 2014 and August 2015. It consists of key highlights, an executive summary, tables of main coal countries globally, and summaries of all the considered studies and articles (global and per key country).

An earlier literature review 2013-2014 showed that the global coal market became bearish around 2012. This new study of literature indicates that the decline is structural. Meanwhile, investments in renewable energy re-increased – leading to record power capacity additions in 2014 that surpassed power capacity additions from all fossil fuels combined. Fossil fuels are losing the race against renewables, with coal as the principal victim.



Coal mining harvester while working at a depth of about 700 meters underground

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Wind electricity generator on a house roof in Seredzius town on June 27, 2015, Seredzius, Lithuania.

HIGHLIGHTS

CHINESE COAL CONSUMPTION DROPS BY 2.9 PER CENT IN 2014

This reduction, which represents more than the annual UK coal consumption, came on the back of structural economic reform and a deliberate choice by the Chinese government to move towards a more sustainable energy mix.

THE EU AND USA MOVE TOWARDS THE END OF COAL

The share of coal in their energy mix is falling quickly, and this trend will continue in light of tighter legislations.

COAL MINES ARE ON THE VERGE OF THE ABYSS

Decreasing demand and low coal prices squeeze the profits of coal mines across the globe. There are no signs of relief ahead, as major emerging economies – most prominently China – start to take steps to limit coal consumption within their boundaries.

COAL UTILITIES ARE CAUGHT IN A DEATH SPIRAL

The global coal plant construction boom is turning to bust. European utilities notably (E.ON, Enel, RWE) are forced to change their business model in light of the fast development of renewable energy.

RENEWABLES ARE ON THE RISE

Investments in solar and wind energy surged in 2014, and renewables represented more than half (59 per cent) of 2014 net additions to global power capacity for the first time ever.

COAL DIVESTMENT IS SPREADING TO MAINSTREAM FINANCIAL INSTITUTIONS

The Norwegian Sovereign Wealth Fund and Axa (amongst others) decided to move their investment out of coal while Credit Agricole and Bank of America ended or reduced their coal lending - giving a clear signal that the trust of the financial institutions in the sector is waning quickly.



Highly polluted smog hanging over the pit head of a coal mine near Tongshuan in Shanxi province, northern China.

EXECUTIVE SUMMARY

INTRODUCTION

‘Coal is not cheap. Governments need to be seriously sceptical about whether coal provides a good deal for their citizens’

Angel Gurría (Secretary General, OECD)

The quote above shows how coal is now being challenged from several different angles. Coal is the largest single contributor to **climate change**, and the scientific evidence that it cannot continue to be burned at the current pace without creating serious havoc is now abundant. The UN climate summit (UNFCCC COP21) at the end of 2015 is likely to deliver a global climate agreement that will introduce measures to reduce carbon emissions.

The contribution of coal to climate change, further exacerbated by its effects on public health (air pollution) and the environment, raises **ethical** objections. Such concerns now go beyond religious authorities like Pope Francis: the \$900 billion Norwegian Sovereign Wealth Fund, the largest in the world, divested from coal for ethical reasons (see more below).

Climate, public health and ethical considerations have contributed to more stringent government policies with regards to coal, which in turn impact investments in the energy source. The **increasing competitiveness of renewable energy** has further undermined the attractiveness of coal investments, increasingly to a point of no return. Over the last three years, the Bloomberg Global Coal Equity Index has lost half of its value while broad market indices are up over 30 per cent. The number of coal companies going bankrupt is increasing all over the world (see more below).

From an economic and environmental perspective, coal lost its social license to operate and is stagnating globally for the first time in 2014. This literature review does not intend to cover all issues but identifies six main trends: the drop in Chinese coal consumption, the demise of coal in the EU and USA, the crisis in the coal mining sector, the coal utility death spiral, the rise of renewable energy, and the spread of the divestment movement to mainstream institutional investors.

THE GAME CHANGER: CHINESE COAL CONSUMPTION DROPPED IN 2014

‘In 2014, Chinese coal imports decreased year on year for the first time in many years, and the prognosis is for more of the same ’

Société Générale (Reuters)

Official data from the Chinese government indicate that **coal consumption dropped by 2.9 per cent in 2014** compared to the previous year (this represents more than the total annual UK consumption). While the Chinese economy grew by 7.4 per cent and energy use grew by 2.2 per cent, coal was the only major energy source whose consumption fell. **Chinese coal imports fell by 10.9 per cent in 2014 compared to 2013. This trend continued in the first six months of 2015, with total imports even 38.2 per cent lower compared to the first semester of 2014.**

An analysis by Citibank (November 2014) indicates four main drivers for the slowing coal consumption: structural reform of the economy; energy efficiency targets; renewable energy targets and improved efficiency of coal plants.

Citibank concludes that ‘policy priorities push coal to generation of last resort’.

COP21
IS BOUND TO DELIVER
A GLOBAL CLIMATE
AGREEMENT THAT
WILL DRIVE FORWARD
CLIMATE POLICIES.

Government intervention has, indeed, been a driving force. Between November 2014 and June 2015, the Chinese government announced plans to cap coal consumption by 2020 (4.2 billion tons), ordered several regions to draw up plans to reduce coal consumption, closed more than 1000 mines to reduce oversupply, and formally submitted its pledge to peak CO₂ emissions around 2030 in the context of the forthcoming climate agreement at the UNFCCC COP21 in Paris.

While several organisations (Citibank, Energy Foundation) studied the possibility of a Chinese coal peak by 2020, the 2014 developments have taken many by surprise. **It is now likely that a coal peak will happen well before 2020 (and possibly happened in 2013).** Given that China is responsible for almost half of global coal consumption, these developments have already – and will continue to have – major downward impacts for the coal market worldwide. In July 2015, Bloomberg reported that shipments from some of China’s main coal suppliers (Indonesia, Russia, Mongolia and Australia) had reduced by up to 49 per cent in the first six months of 2015, leaving these coal exporting countries to look for alternative markets (see more below).

THE EU AND USA TOWARDS THE END OF COAL

‘The coal renaissance in Europe was only a dream’

International Energy Agency

Coal is on a downward trajectory in the European Union (EU). Coal consumption fell by almost 20 per cent between 2007 and 2014, and net coal capacity was down with over 24.7 gigawatts (GW) between 2000 and 2014. According to research from UBS, this trend will accelerate in the coming years. Another 24 GW of coal and gas capacity would be pushed out of the market between 2015 and 2017. UBS mentions renewable energy and decreasing energy demand as the main drivers for the described developments. Notably, wind and solar alone accounted for over 200 GW of net capacity addition between 2000 and 2014, and Eurostat data indicate that EU energy demand in 2013 reached the lowest level in two decades.

European **legislation** adds to the grim outlook for coal: the Industrial Emissions Directive (IED) and the Large Combustion Plants Directive (LCPD) will impose further restrictions on coal fired power plants. Several Member States have, moreover, taken steps to significantly reduce coal in their national energy mix:

- **Germany** adopted measures that will lead to the closure of 4.2 GW of lignite fired power plants, giving a clear signal that the country is moving away from coal;
- In the run-up to the **UK** elections leaders from the three main parties – including David Cameron – signed a joint climate change pledge, in which they committed to ‘end the use of unabated coal for power generation’. UK coal consumption in 2014 dropped by 20 per cent compared to 2013, the lowest level since the industrial revolution (1950);
- In **Finland**, the new government committed to rule out coal ‘during the 2020s’ and **Portugal** plans a coal phase out by 2026.

In the USA, a structural shift occurred since 2007 as economic growth decoupled from coal use. The coal share fell from 50 per cent in 2008 to 39 per cent in 2013. This market share was picked up by gas (8.7 per cent), renewable energy (4.1 per cent) and energy efficiency. Bloomberg forecasts that this trend will continue, with the ‘the largest wave of coal retirements in US history ahead’: 23 GW would go offline in 2015 alone, and 50 GW by 2020.

The shift from coal will be accelerated as a result of the Environment Protection Agency’s **Clean Power Plan** that was finalised in August 2015. This plan will reduce CO₂ emissions from the US power sector by 32 per cent on 2005 levels, and requires utilities to source at least 28 per cent of their electricity from renewable sources (wind and solar) by 2030. The Clean Power Plan adds to legislation that was implemented over the last few years:

- Since 2013, all new energy generating capacity is subject to an Emissions Performance

**20 PER
CENT
DROP
IN EU COAL
CONSUMPTION
BETWEEN
2007-2014**

Standard (EPS) of 500 grammes of CO₂/kWh: this excludes the building of unabated coal power plants.

- The detrimental environmental and human health consequences of coal burning have been mitigated by regulations on mercury, lead, ozone, sulphur dioxide, particulate matter and nitrogen.

The risk profile of coal in the USA has been undoubtedly increased by the package of regulations. In combination with global and national energy market economics, this has led to a perfect storm for the American coal industry. With the same factors prevailing in the coming years, a structural decline of the sector is seen as unavoidable.

COAL MINES ON THE VERGE OF THE ABYSS

'The only practical way forward for the [coal] market to rebalance is to cut production. This will need to happen sooner rather than later, as the losses these mines are generating cannot be sustained'

Wood Mackenzie

UBS estimates that 'the 300 million-tonne seaborne market is currently oversupplied by 5 to 10 per cent'. Prices for thermal and metallurgical coal have been decreasing from a high-point of respectively \$150 and \$300 per tonne in 2010 to \$60 and \$150 per tonne in the first quarter of 2015. Coal companies around the world have been hit hard by what appears as a structural decline:

INDUSTRIAL AVERAGE
UP 69
PER CENT
MARKET COAL
SECTOR
DOWN 76
PER CENT

USA

- **The Dow Jones total Market Coal Sector Index is down 76 per cent over the last 5 years, compared to the Dow Jones Industrial Average that is up 69 per cent for the same period.** Peabody – the world largest pure play private coal mining company – saw its estimated value decrease from \$18 billion to \$344 million, while its debt increased to over \$5 billion.
- Wood Mackenzie estimates that 17 per cent of US coal production is at risk, and Standard&Poor's notes that it has 'no positive outlook for any covered coal company. About a quarter of the agency's ratings are negative – twice as high as 2014'.
- Over 25 coal companies have gone into bankruptcy in the last few years, with recent filings of major companies like Walter Energy and Alpha Natural Resources.

AUSTRALIA

- Government data indicate that revenues from coal – mainly for export – have decreased significantly. The response of the coal companies to decreasing profits has been slow however; often because they are bound to 'take or pay' rail contracts.
- 2015 saw restructurings from Glencore (production cut of 15 million tonnes), Rio Tinto (production cut of 3.3 million tonnes), Vale (value of Australian coal assets decreased by 71 per cent) and Yancoal (\$354 million loss). In July, the news broke that Adani had dissolved its 50-strong project team from the much discussed Carmichael mega-mine project: financing for the project is uncertain after both Commonwealth Bank of Australia and Standard Chartered withdrew from the project, and after 11 major international banks have refused to finance the project.

INDONESIA

- Indonesian coal production will fall in 2015 for the first time in thirty years, according to government's projections.

- The Indonesian Coal Mining Association stated that ‘of 14 publicly listed companies whose production makes up around 80 per cent of the national output, only 5 reported net profits last year’. 40 per cent of coal mining companies have stopped their activities according to the association.
- Indonesia is particularly hard hit by the cut in the Chinese coal consumption, with its exports to the country halved during the first half of 2015.

CHINA

- In May 2015, the Chinese government ordered the closure of more than 1000 coal mines – with a coal production capacity of 13.9 million tonnes.
- In 2014, the government had already closed mines with a cumulative capacity of 40 million tonnes – nearly 1 per cent of the country’s production capacity in that year.

POLAND

- Europe’s largest coal mine (KW) and methalurgical coal producer (JSW) are planned to be bailed out by Polish state-owned companies through a fund that was established by the government.

According to Bloomberg, ‘oversupply... would likely persist through 2020 if the entire pipeline of global projects comes to fruition. A total of 290 million tonnes would be competing with an already saturated market’. Goldman Sachs add that ‘the combination of fuel mix diversification, slower power demand growth and rising efficiency will moderate the growth rate of thermal coal demand until it eventually matches the rate of demand destruction in the OECD’.

The expectation from the coal industry that decreased imports from China will partly be compensated by increased imports from **India** should be met with caution. The Indian government has presented plans to diversify its energy mix – in particular by developing renewable energy (see below), increasing the efficiency of the electricity grid, and increasing domestic coal production. While the intention of energy minister Goyal to ‘stop imports of coal possibly in the next two or three years’ is seen as optimistic, analysis from IEEFA sees ‘Indian thermal coal imports peaking in 2015-16 and ceasing entirely by 2020-2022’. Price forecasts therefore remain feeble, which has a direct impact on the viability of **future coal developments**:

- Goldman Sachs foresees a long term coal price of \$65 per tonne. It argues that **‘past investment is sufficient until coal demand peaks: future demand growth will be met by exploiting existing assets more efficiently and by low cost expansions... The value of greenfield resources requiring major investment in infrastructure is limited’**;
- In an extensive research that looks at coal market developments until 2035, Carbon Tracker Initiative foresees that ‘expensive new mines would be surplus to requirements. 61 per cent of greenfield mines are over the thresholds of our low demand/price scenario compared to 30 per cent of brownfield.’ The report indicates that \$230 billion in investments could end up stranded, with China (\$44,5 billion) and Australia (\$35 billion) most exposed.

**IEEFA SEES INDIAN
THERMAL COAL
IMPORTS CEASING
ENTIRELY BY
2020-2022**

UTILITY DEATH SPIRAL: THERMAL COAL REACHES RETIREMENT AGE

'Just as a worker celebrating their 65th anniversary can settle into a more sedate lifestyle while they look back on past achievements, we argue that thermal coal has reached its retirement age'

Goldman Sachs

Research by CoalSwarm indicates that the worldwide construction boom (2005-2012) of coal fired power plants is turning to bust. Since 2010, two plant projects have been shelved or cancelled worldwide for every plant completed. The report brings to light interesting regional differences:

- In China, net coal capacity additions dropped from 78 GW in 2006 to 36 GW in 2013. In the latter year new solar, wind and hydro capacity surpassed net coal capacity for the first time.
- In India, 6 coal plants are shelved or cancelled for every coal plant built. The amount of coal capacity under construction dropped by 33 per cent between 2012 and 2014.
- In the USA, over 180 proposed coal plant projects were stopped, and from the 523 existing coal fired power stations in the country mid-2014, 200 were already planned to retire.
- Europe has one of the highest ratios of coal plants halted to coal plants completed (7 to 1), and the overall coal fleet is shrinking.

IN THE USA
180
PROPOSED COAL
PLANT PROJECTS
STOPPED

European utilities have been particularly affected by changes in the energy market. Research by Carbon Tracker Initiative indicates that the EU's largest 5 power generators (RWE, Enel, GDF Suez, EDF and E.ON) have collectively lost over 100 billion euros in market value from 2008 to 2013 – equivalent to 37 per cent of their total value. The companies continued to bank on coal, while investing significantly less than average in renewable energy. Renewables, however, had an important impact on the energy market: they added capacity to an already saturated market, have priority access to the electricity grid, eroded peak demand, and turned utility customers into competitors ('prosumers'). These factors contributed to a 'utility death spiral', eventually forcing companies to significantly shift their business strategy.

- In November 2014, **E.ON announced that it would spin-off its conventional generation activities (including coal) in a separate company, and focus its activities on clean energy.** This came on the back of the company reporting a 25 per cent drop in profits for the first nine months of that year.
- In March 2015, **Enel announced in a joint press release with Greenpeace a strategic change and a commitment to phase out investment in coal.**
- In August 2015, RWE announced a reorganization of its management structure. The company saw its 2014 earnings decrease by a quarter to 4 billion euros, and anticipates a further drop to 3.6 billion euros for 2015. The news that 23 municipal authorities seek to sell their shares in an RWE coal fired power plant in Hamm for 1 euro each, reducing the initial 2.5 billion stake to 23 euros, further illustrated RWE's precarious position.

The European phenomenon described above is also taking place in other developed countries. Different analyses (CoalSwarm, Energydesk, IEEFA) indicate that similar dynamics are also starting to shape up in major emerging countries:

- **China:** official government data shows that while coal capacity continues to be added, the utilization rate of coal fired power plants decreased from 60 per cent in 2011 to below 50 per cent in the first months of 2015. CoalSwarm states that this leaves the Chinese government with two options: 'curtail further capacity additions or face the prospect of underutilized or stranded assets'.
- **India** has significant coal capacity in the pipeline, partly supported by the Indian government's Ultra Mega Power Project plan. According to IEEFA, should India be able to deliver on its 175GW renewable-energy target, reduce transmission and distribution losses, enhance energy

efficiency and double domestic coal production, it is more than conceivable that India's thermal coal imports would decline or cease through the end of this decade (see below).

RENEWABLES ARE ON THE RISE

'Fossil fuels just lost the race against renewables... The world is now adding more capacity for renewable power each year than coal, natural gas, and oil combined. And there's no going back.'

Bloomberg

Bloomberg, UNEP and the Frankfurt School reported that total investments for renewables energy technologies – excluding hydro of over 50MW – reached \$270.2 billion in 2014, a 17 per cent increase compared to the previous year. Solar (\$149.6 billion) and wind (\$99.5 billion) were runaway leaders, and the split between developed (\$138.9 billion) and developing countries (\$131.3 billion) was more equal than ever before.

REN21 reported that **renewables represented 59 per cent of net additions to global power capacity in 2014.** Renewables were estimated to provide over 22 per cent of global electricity in 2014.

2014 also marked a further decrease in the cost of renewable energy. IRENA reported that the levelised cost of electricity (LCOE) 'from biomass for power, geothermal, hydropower and onshore wind are all now in the range, or even span a lower range, than estimated fossil fuel-fired electricity generation costs... Solar PV costs also increasingly fall within that range'. If externalities of fossil fuels are fully accounted for and technical barriers for renewables can be overcome, the organisation estimates that 'renewables remain fundamentally competitive'. Studies forecast that the cost of renewables will continue to decrease in the future, further increasing their competitiveness.

The NYSE Bloomberg Global Solar Index gained 65 per cent in 2015, outpacing the 3.4 per cent gains for the S&P 500 Index. Bloomberg foresees that two-thirds (\$8 trillion) of the world's spending on new power capacity over the next 25 years will go to renewables, with solar (\$3.7 trillion) accounting for more than one third of new power capacity worldwide. A Fraunhofer study concludes that solar power will soon be the cheapest form of electricity in many regions around the world.

With renewable energy costs plunging, several analyses (IRENA, Fraunhofer) highlight that other factors - 'such as maintenance, operations and finance costs' – will become more important in the roll-out of these often capital-intensive technologies. Financial and regulatory frameworks are identified as key to driving further renewable energy development. In early 2015 the number of countries with renewable energy targets had increased to 164, and an estimated 145 countries had renewable energy policies in place. Most remarkable developments in individual countries were:

- **In China**, the continued rapid development of renewable energy. Total investments in the country were up 33 per cent in 2014, reaching \$83.3 billion. The country has the highest total renewable capacity in the world (153 GW), and a leading position for total wind power capacity. It ranked second after Germany for total installed solar capacity in 2014, with the Chinese government raising its 2015 target from 12 to 17.8 GW.
- **In Japan**, the solar boom: the country may install as much as 12.7 GW of solar power in 2015, and solar technology is becoming commercially viable without government support.
- **India's** ambition to increase renewable energy capacity from the current 30 GW to 175 GW by 2022 – including targets for a tenfold increase in solar power to 100 GW, trebling of wind power to 60 GW, biomass (10 GW) and small-scale hydro (5 GW). While analysts highlight the challenges that need to be overcome to reach these targets, they see them as catalysts for major renewable energy developments. Deutsche Bank increased its projections for solar development to 34 GW by 2020, adding that in India, 'by 2020, solar power capacity additions and investments could surpass those for coal-based power projects'. IEEFA models a 75 GW solar capacity by 2022.
- **South Africa** adding 4.3 GW of renewable energy in less than four years, notably through a government programme inviting companies to competitive bids around clear criteria.

17

PER CENT INCREASE
IN INVESTMENTS IN
RENEWABLE ENERGY
TECHNOLOGIES

IN SOUTH AFRICA
RENEWABLE ENERGY
CAPACITY PROVIDES
POWER AT
LOWER RATES
THAN THE COAL-FIRED
POWER STATION OF
MEDUPI

Renewable energy capacity can already provide power at significantly lower rates than the major new coal-fired power station of Medupi.

- **In the USA**, renewable energy investments rebounded to \$38.3 billion in 2014 with, in particular, the addition of 4.7 GW of new wind power. The Energy Information Administration expects that wind (9.8 GW) and solar power (2.2 GW) will account for more than 50 per cent of total new power capacity in 2015. This forecast certainly seems to become reality, with wind and solar accounting for 74 per cent of new power capacity in the first five months of 2015.
- **In the EU** there were record investments of \$18.6 billion in offshore wind. Renewable energy accounted for 79.1 per cent of all new power capacity in 2014.
- **In Australia**, the continuing quick uptake of rooftop solar.

COAL DIVESTMENT SPREADING TO MAINSTREAM FINANCIAL INSTITUTIONS

'We support divestment as it sends a signal to companies, especially coal companies, that the age of 'burn what you like, when you like' cannot continue'

Nick Nuttal, spokesperson UNFCCC

The **divestment movement** has gained traction over the last few years, gravitating from North-America to Europe and Australia. Almost 350 organisations (mostly foundations, faith-based groups, governmental organisations and colleges/universities/schools) have committed to divest from fossil fuels.

Until recently, the basis for most divestment decisions stemmed from climate and ethical considerations. Several analyses, however, indicate that there is now also an economic and financial incentive to shift investments away from coal:

- **Goldman Sachs** indicates – with a view on an imminent global coal peak – that 'the value of undeveloped thermal coal resources requiring new infrastructure is limited'.
- **The Economist** reports that 'the biggest danger for the coal mines is that capital ceases to flow their way. Investors can cope with a cyclical business, but the fear now is of a structural shift, in which China follows the rich world in beginning to phase out coal, India increasingly produces its own, and a plentiful supply of cheap gas keeps prices low everywhere. If so, new coal-mining investments would risk becoming stranded assets, and older deep mines would be even more uneconomic than now.'
- **Oxford University** researched the risk of stranded assets for least-efficient (subcritical) coal fired power plants due to carbon intensity, water stress and air pollution – concluding that 'there is a strong case for financial institutions to ... evaluate the risk of companies that hold subcritical assets and, where appropriate to then screen, engage, or divest.'

The growing understanding on the risk of **stranded assets** may explain the acceleration of divestment/engagement commitments from mainstream institutional investors:

- **The landmark coal divestment came from the \$900 billion Government Pension Fund Global (GPF), also known as the Norwegian Sovereign Wealth Fund, the world's largest.** It defined the threshold for divestment as: 'coal power companies and mining companies who themselves or through other operations they control base 30 per cent or more of their activities on coal, and/or derive 30 per cent of their revenues from coal'. Research brought to light that this criterion would cover 122 companies in the GPF portfolio, representing a divestment of up to \$10 billion.
- On 22 May, **AXA's** CEO Henri de Castries made the following statement: 'It is our responsibility, as a long term institutional investor, to consider carbon as a risk and to accompany the global energy transition. For this reason, AXA has decided to divest from the companies most exposed to coal-related activities for the assets managed internally. This initiative represents a divestment of 0.5 billion euros.' The threshold for exclusion was set at 50 per cent of activities/revenues from coal. AXA also announced it will triple its investment

in green infrastructure to 3 billion euros by 2020.

- On 24 July, **Aviva** committed to ‘divest highly carbon-intensive fossil fuel companies where we consider they are not making sufficient progress towards the engagement goals set’. The insurance company has identified 40 relevant companies in portfolio. It added: ‘We will target a £500 million annual investment in low-carbon infrastructure for the next five years’.

Major commercial and investment banks also set new precedents:

- **Bank of America** presented a new coal policy that ‘will continue to reduce our credit exposure to coal extraction companies.’
- **Crédit Agricole** announced its decision to ‘no longer finance coal mining projects or companies specialized in this field’.

More than the value of cash divested, these commitments have an important signaling effect: coal is losing confidence of mainstream financial institutions.

CONCLUSION

The literature review indicates that coal is caught in a perfect storm. Concerns about climate change, the environment and health impacts have increasingly incited governments to impose regulations on its use. Coal is further undermined by the advancement in energy savings and renewable energy technologies. Coal mining companies and utilities see their profits decline – while investors are becoming increasingly aware of the risk of stranded assets, and start to shift their investment strategy accordingly. The market for coal is shrinking fast. Indeed so fast that the coal industry is in terminal decline.

THE MARKET
**DECLINE
OF COAL**
IS ACCELERATING

MAIN COAL COUNTRIES GLOBALLY

PRODUCERS (2010-2014, MT)

MILLION TONNES	2010	2011	2012	2013	2014
China	3428,0	3764,0	3945,0	3974,0	3874,0
US	983,7	993,9	922,1	893,4	906,9
India	573,8	570,1	606,5	605,1	644,0
Australia	433,4	420,8	444,9	470,8	491,5
Indonesia	275,2	353,3	385,9	449,1	458,0
Russian Federation	322,8	337,4	358,3	355,2	357,6
South Africa	254,5	252,8	258,6	256,4	260,5
Germany	182,6	188,8	196,5	190,3	185,8
Poland	133,2	139,3	144,1	142,9	137,1
Kazakhstan	106,6	111,4	115,7	114,4	108,7
TOTAL top 10 countries	6693,8	7131,8	7377,6	7451,6	7424,1
Total World	7472,9	7968,6	8186,9	8230,7	8164,9

Source: BP statistical review

CONSUMERS (2010-2014, MTOE)

MILLION TONNES OF OIL EQUIVALENT (MTOE)	2010	2011	2012	2013	2014
<p>It should be noted that BP – at the moment of publication the only source to provide comprehensive data beyond 2012 – has a tendency to overestimate coal consumption (only expressed in Mtoe). This is particularly important for Chinese coal consumption, where official data (2014 National Statistic Report) indicate a drop from 4054 Mt in 2013 to 3936 Mt in 2014 – which is equivalent to a 2.9 per cent reduction.</p>					
China	1740,8	1896,0	1922,5	1961,2	1962,4
US	525,0	495,4	437,9	454,6	453,4
India	260,2	270,1	302,3	324,3	360,2
Japan	123,7	117,7	124,4	128,6	126,5
South Africa	92,8	90,4	88,3	88,7	89,4
Russian Federation	90,5	94,0	98,4	90,5	85,2
South Korea	75,9	83,6	81,0	81,9	84,8
Germany	77,1	78,3	80,5	81,7	77,4
Indonesia	39,5	46,9	53,0	57,6	60,8
Poland	56,4	56,1	54,3	55,8	52,9
TOTAL top 10 countries	3081,9	3228,4	3242,6	3324,8	3352,9
TOTAL world	3611,2	3777,4	3798,8	3867,0	3881,8

Source: BP statistical review

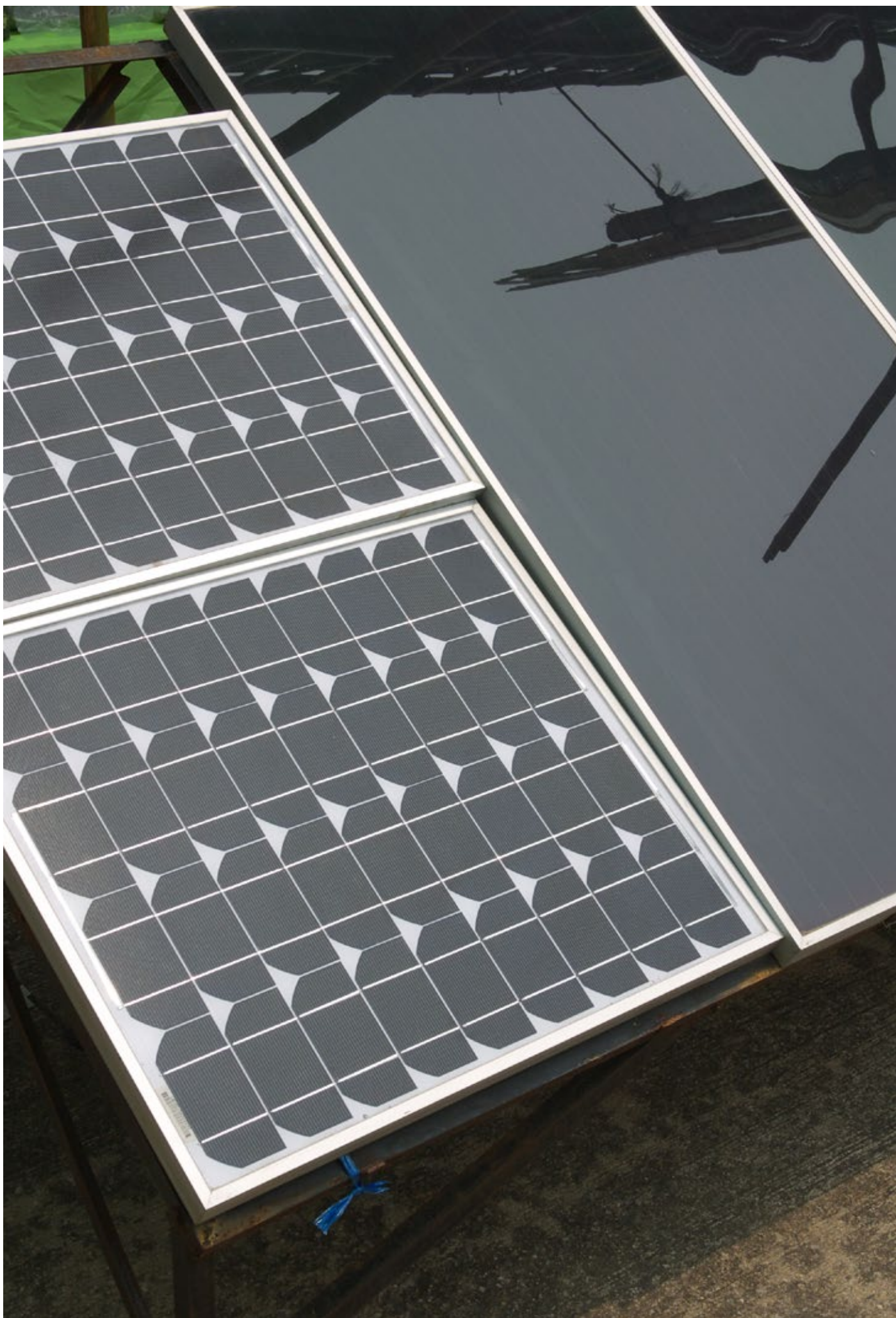
EXPORTERS AND IMPORTERS (2013, MT)

TOP EXPORTERS	2013
Indonesia	426Mt
Australia	336Mt
Russia	141Mt
USA	107Mt
Colombia	74Mt
South Africa	72Mt
Canada	37Mt

Source: World Coal Association

TOP IMPORTERS	2013
China	327Mt
Japan	196Mt
India	180Mt
South Korea	126Mt
Chinese Taipei	68Mt
Germany	51Mt
UK	50Mt

Source: World Coal Association



Solar cells for renewable energy



Wind turbines stand on a hill top above Douglas in Lanarkshire, Scotland, with coal spoil in the foreground from Glentaggart open cast coal mine.

WHAT IS NEW IN THE GLOBAL ENERGY MARKET?

POLICY

POPE FRANCIS ENCYCLICAL LETTER LAUDATO SI ASKS TO REPLACE COAL (JUNE 2015)

In its encyclical letter on climate change Pope Francis states the following about coal: ‘We know that technology based on the use of highly polluting fossil fuels – especially coal, but also oil and, to a lesser degree, gas – needs to be progressively replaced without delay’.

Source: [Encyclical letter](#)

OECD SECRETARY GENERAL ANGEL GURIA WORLD MUST WEIGH THE TRUE COST OF COAL TO BE SERIOUS ABOUT CLIMATE (JULY 2015)

The OECD published a report 3 July 2015 about ‘aligning policies for a low-carbon transition’. The report notes that ‘without new mitigation measures, coal generation is projected to emit more than 500 billion tonnes of CO₂ between now and 2050 which would eat up around half the remaining carbon budget consistent with keeping a global temperature rise below 2 degrees Celsius’.

In this context, Angel Guria, Secretary-General of the OECD, said: ‘Coal is not cheap. Governments need to be seriously sceptical about whether coal provides a good deal for their citizens’.

On developing countries, Guria notes: ‘They need to weigh the full social benefits and the full costs, even if they don’t want to formally put a price on carbon. Pre-eminent among these should be health costs and claims on water and other scarce resources, as well as the benefits and costs of clean energy generation technologies. If the combined costs and benefits of any clean alternatives win out, there should be no debate, nor delay. If, however, coal still has an edge, then governments need a reliable way of judging how long that advantage is likely to last because the cost of clean technologies will continue to fall. While access to energy and alleviating poverty rightly come first in developing countries, they need a trustworthy appraisal tool to help them ensure that the benefits of coal are not being over-estimated or short-lived’.

On developed countries, Guria notes: ‘They face the retirement of old generating capacity. We cannot continue building coal-fired plants simply because we have been doing so for the last 150 years.’

Sources: [OECD press release](#), [Speech by Angel Guria](#)

‘COAL IS NOT CHEAP. GOVERNMENTS NEED TO BE SERIOUSLY SCEPTICAL ABOUT WHETHER COAL PROVIDES A GOOD DEAL FOR THEIR CITIZENS’.

COAL MARKET

WORLD BANK CLIMATE CHANGE ENVOY WE NEED TO WEAN OURSELVES OFF COAL (JULY 2015)

Rachel Kyte, the World Bank climate change envoy, said continued use of coal was exacting a heavy cost on some of the world's poorest countries, in local health impacts as well as climate change, which is imposing even graver consequences on the developing world: 'In general globally we need to wean ourselves off coal. There is a huge social cost to coal and a huge social cost to fossil fuels ... if you want to be able to breathe clean air.'

Source : [The Guardian](#)

CARBON TRACKER INITIATIVE BLEAK OUTLOOK FOR COAL INVESTORS (SEPTEMBER 2014)

This report provides, in Carbon Tracker Initiative (CTI)'s own words:

'a powerful risk analysis methodology to help the majority of investors who cannot simply divest from an entire sector but need to understand and adjust their risk exposure to coal in today's world,' and 'the first time anyone has sought to look at the global coal industry in such a holistic way'.

Based on research from IEEFA, CTI identifies energy efficiency, grid efficiency, energy diversity and increasing potential for substitution of coal as key factors for low coal demand in the future. It sees these drivers play out in China, India, the EU and USA. Low demand has an impact on coal prices, which is 'eroding profits and risking losses for producers across a wide range of supply cost levels'. The report finds that 'over the last three years, the Bloomberg Global Coal Equity Index has lost half of its value while broad market indices are up over 30 per cent'.

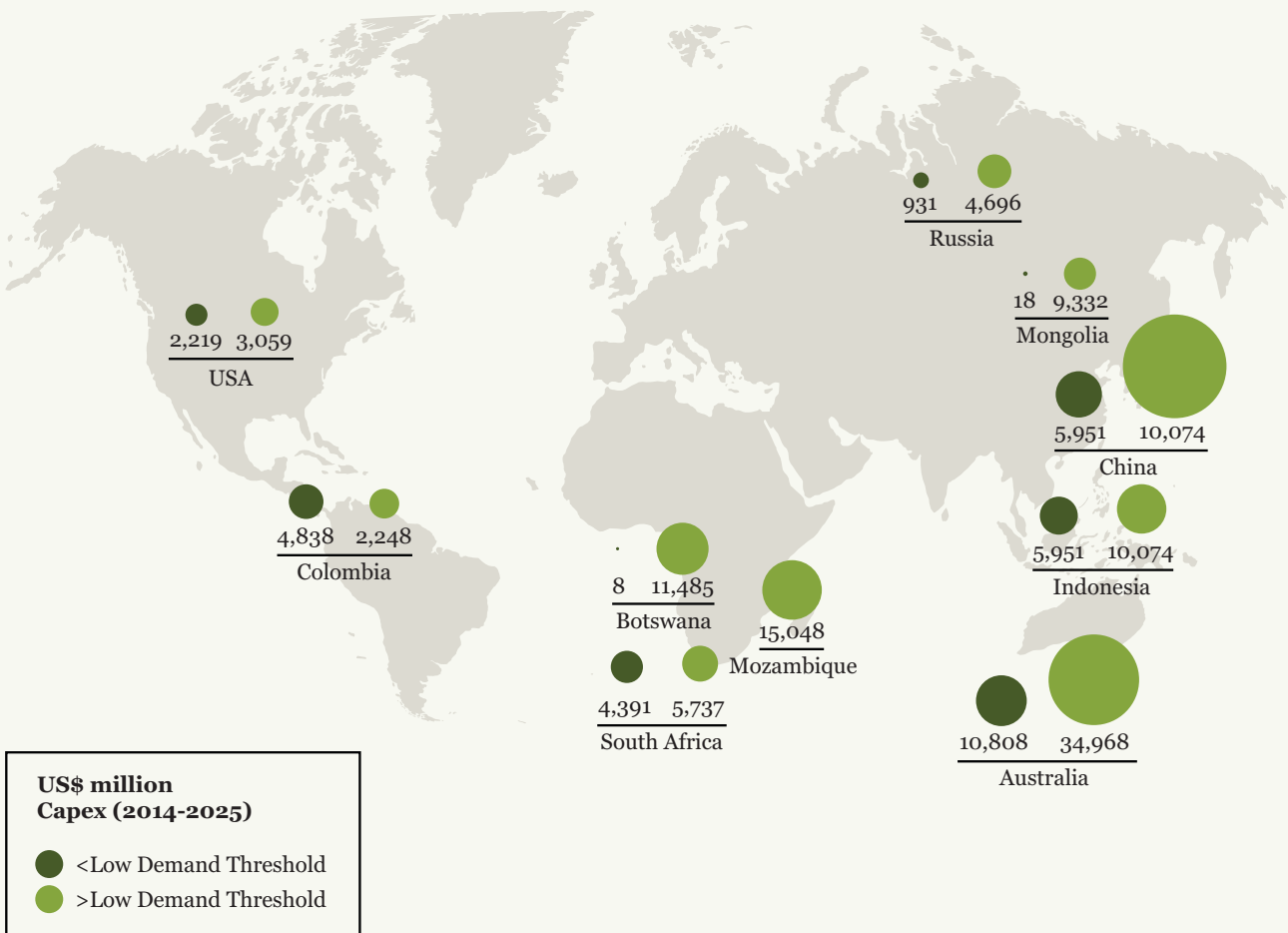
Figure 3: Breakdown between existing and new mines

	EXISTING MINES	NEW MINES
Capex 2014 -25	\$220bn	\$268bn
Production 2014 -25	5,689mtpa	2,313mtpa
Co₂ Emissions	225GtCO ₂	92GtCO ₂

Despite the bleak outlook for coal demand, projected capex for the period 2014-2035 stands at \$220 billion for brownfield and \$268 billion for greenfield mines: this would generate large production and related CO₂ emissions.

The tension between low demand and high projection for capex is then studied. For the period 2014-2035, CTI concludes that: 'applying the breakeven to build in an investor return indicates that only production up to \$75/tonne will be supported'. In particular high cost new mines are the most likely to be affected from such a scenario. The figure overleaf indicates how this would play out in different regions.

The map below shows the level of potential capex for export from the largest ten countries. This is split above and below the \$75/tonne breakeven price where the low demand scenario intersects with the export cost curve, with the high cost capex indicated by the light green circles on the map below.



The CTI analysis further looks at Chinese domestic production (2014-2035), US domestic production (2014-2035), diversified mining companies and pure coal producers.

Source: [Carbon Tracker Initiative report](#)

BLOOMBERG LOW COAL PRICE PUTS PRESSURE ON COAL MINING PROJECTS IN THE PIPELINE (OCTOBER 2014)

This set of slides gives an overview of potential coal development up to 2020, based on projects in the pipeline. Its major conclusions are that:

- ‘Oversupply, which has pushed thermal coal prices lower over the past four years, would likely persist through 2020 if the entire pipeline of global projects come to fruition. A total of 290 million metric tons would be competing with an already saturated market.
- The coal market will need to absorb 203 million metric tons by 2020, even after excluding thermal coal projects that have not received some sort of government or environmental approval. This list does include 160 million tons of Galilee Basin projects. If the massive projects in the Galilee Basin that require more than \$35 billion in capital outlays do not come to fruition, supply and demand fundamentals could begin to tighten by the end of 2016.
- Capital intensity is up almost 55 per cent since 2005, though does not have the same positive demand or supply fundamentals to support all of the investments in the pipeline. As a result, a good portion of the project pipeline may never see the light of day.’

Source: set of slides by Bloomberg

INTERNATIONAL ENERGY AGENCY COAL TO BE SURPASSED BY RENEWABLES AS MAIN ENERGY SOURCE BY 2035 (SEPTEMBER 2014)

The 2014 World Energy Outlook (WEO) of the International Energy Agency (IEA) signals that under its New Policies Scenario energy-related carbon dioxide (CO₂) emissions grow by one-fifth by 2040, putting the world on a path consistent with a long-term global average temperature increase of 3.6°C.

The WEO also states that global coal demand will grow at a much lower rate than over the last 30 years, at 0.5 per cent per year, to 6350 Mtce in 2040 – but also be driven by the stringency of carbon policies.

According to the WEO renewable electricity generation, including hydropower, nearly triples over 2012-2040, overtaking gas as the second-largest source of power generation in the next couple of years and surpassing coal as the top source after 2035.

Source: [IEA World Energy Outlook](#)

CARBON TRACKER INITIATIVE COAL IS NOT THE WAY OUT OF ENERGY POVERTY (NOVEMBER 2014)

This Carbon Tracker Initiative report states that ‘globally, coal’s contribution to extending energy access is constrained by the reality that: (1) 84 per cent of individuals without electricity live in rural areas; (2) such areas often lack connections to a centralized electricity grid; and (3) the costs of grid extension plus grid-based electricity often exceed the costs of off-grid solutions such as diesel generators or small-scale wind, hydro, and solar PV.’

The report refers to the IEA energy for all scenario to underline that coal has a limited role in providing access to energy: ‘the IEA projects that achieving universal electricity will increase 2030 electricity demand by roughly 1400 terawatt-hours (TWh), or by 4.1 per cent above the base case level. Owing partly to the grid extension costs noted above, only 35 per cent of this additional 1400 TWh (i.e. 488 TWh) will come from fossil fuels, with the remainder coming from renewable generation sources such as hydro, wind, and solar. Pro-rating this incremental fossil fuel demand to coal, 215 TWh is equal to only 1.8 per cent of global electricity generation from coal in 2011.’

The report also gives examples on how ‘the cost of electricity from major new coal-fired projects in developing countries is often turning out to be much higher than expected. For example, electricity from South African utility Eskom’s massive new 4.8 GW Medupi plant is estimated to cost ~\$90/MWh. By way of comparison, in May 2013 Eskom contracted for 787 MW of wind power at an average cost of \$75/MWh and 435 MW of solar PV at an average cost of \$100/MWh.’

Other elements that are addressed in the report are environmental impacts of coal, increasing investments by developing countries in renewables, high potential for renewables in developing countries, innovative business models, potential for fuel savings, current high cost of on-site generation due to unreliable and costly power supplies, and declining battery costs.

Source: [Carbon tracker Initiative report](#)

MOODY'S ASIAN COAL INDUSTRY WILL STRUGGLE TO GENERATE POSITIVE CASH FLOW IN 2015 (NOVEMBER 2014)

The rating agency Moody’s states that ‘the negative outlook for the Asian coal industry reflects our expectation that excess supply will keep coal prices low throughout 2015, which in turn will make it difficult for companies to generate operating cash flows.’

Moody’s points out that while downside pricing pressure will likely ease after recent regulatory controls implemented in China and Indonesia, the measures are insufficient to support a material recovery in prices. China has implemented tariffs on imports and guided mines to cut production levels, while Indonesia has implemented an export licensing regime and has committed to keeping production levels flat.

Source: [Moody’s research paper](#)

INTERNATIONAL ENERGY AGENCY COAL RENAISSANCE IN EUROPE WAS ONLY A DREAM (DECEMBER 2014)

Every year in December the IEA ‘Medium-Term Coal Market Report’ (MCTMR) brings the latest trends and forecast for the next five years for coal supply, demand and trade. The 2014 publication included the following main findings:

- In 2014, coal oversupply persists and very low coal prices continued to dominate. The strategy of producers is to reduce costs or cut production of unprofitable mines. However, this is not always possible. Take-or-pay contracts for infrastructure use and financial commitments to pay investments make many producers operate with negative margins.
- The coal renaissance in Europe was only a dream: after 2012, coal demand began to decline due to moderate economic growth, energy efficiency gains, increasing renewable energy sources and coal plant retirements.
- Chinese developments will define coal markets: we have entered a new time in which the outstanding growth from the past in all of the coal indicators, such as production, consumption and imports, will not be repeated.
- India will become the second-largest coal consumer, surpassing the United States, and the second-largest coal importer, close to China, as well as the world’s largest thermal coal importer.
- **Indonesia is the main unknown among the suppliers:** projections show increasing exports from Indonesia, but at a much slower pace than in previous years.

The report shows decreasing capital expenditure of major US coal producers between 2012 and 2014:

Table 1.7 Capital expenditure, historical and anticipated, for major US coal producers, 2012-14, in USD million

	2012	2013	2014*
Peabody energy	990	330	250-300
Arch Coal	395	297	180-190
Alpha Natural Resources	498	258	225-275
Cloud Peak Energy	104	57	40-60
Consol Energy**	663	459	390
Alliance Resource Partners	425	329	320-350
Walter Energy	392	154	130

Source: [IEA medium term coal market report 2014](#)

GOLDMAN SACHS THERMAL COAL REACHES RETIREMENT AGE (JANUARY 2015)

Goldman Sachs states in this research paper that: ‘just as a worker celebrating their 65th birthday can settle into a more sedate lifestyle while they look back on past achievements, we argue that thermal coal has reached its retirement age.’ It cites greater competition in the fuel mix, regulatory risk for new coal plants and sharp slowdown of demand growth in China as main drivers for a peak post 2020.

Goldman Sachs states that past investment is sufficient until demand peaks: ‘assets with low production costs and growth options with low capital intensity will remain attractive, but the value of greenfield resources requiring major investment in infrastructure is limited.’

The paper continues in more detail on:

- **Demand and price:** ‘thermal coal experienced such a bull market over the period 2004-12 and has been grappling with excess capacity and cost deflation in the years since...current spot prices have already undershot relative to marginal cost, and many producers in China and other supply regions are operating at a loss; the decline in prices has run ahead of cost deflation.’

- **Regulatory risk:** ‘the prospect of tighter regulations increases the risk profile of coal’.
- **Peak demand:** ‘demand will peak when the decline in developed markets offsets ongoing growth in emerging markets (i.e. fuel diversification, slower power demand growth, rising efficiency)’.
- **Implications for producers and investors:** ‘assets at the bottom of the cost curve will remain attractive as cash cows, but diversified mining companies are unlikely to allocate fresh capex over and above the annual rate of depreciation... For pure-play producers, management teams may manage their risks by diversifying away from thermal coal mining’.

Exhibit 3 We downgrade our long term forecasts

Coal Price Forecast Summary US\$/tonne		Q4 2014	Q1 2015E	Q2 2015E	Q3 2015E	2014	2015E	2016E	2017E	Long Term 2015 real \$
Thermal Coal Spot 6,000 kcal/kg NAR	FOB News	\$ 66	\$ 61	\$ 60	\$ 59	\$ 71	\$ 60	\$ 65	\$ 60	\$ 65
change vs previous			-10%	-12%	-13%		-12%	-10%	-10%	-18%

Source: [Goldman Sachs research paper](#)

BLOOMBERG GLOBAL COAL MARKET IN ‘BAD SHAPE’ (JANUARY 2015)

Based on research by Clarkson Capital Markets and BB&T Capital Markets, Bloomberg concludes that ‘the world is oversupplied for both thermal and metallurgical coal as Chinese demand slows while a stronger U.S. dollar and cheaper diesel slow production cuts in Australia and Indonesia’.

It continues: ‘Prices for power-plant coal in the U.S., Europe and Asia have fallen four consecutive years, while the metallurgical variety, used to forge steel, has dropped three years, as supply outstrips demand. Challenges persist for the market even after suppliers from Appalachia to Australia shut mines.’

Source: [Bloomberg](#)

NATURE 85 PER CENT TO 99 PER CENT OF COAL RESERVES ARE UNBURNABLE UNDER A +2°C SCENARIO (JANUARY 2015)

This research by University College London was published in the Nature edition of 7 January 2015, accompanied by a summary from Michael Jakob and Jérôme Hilaire.

The research finds that ‘the cumulative carbon dioxide emissions must be less than 870 to 1,240 giga-tonnes between 2011 and 2050 if we are to have a reasonable chance of limiting global warming to 2 °C above the average global temperature of pre-industrial times. But the carbon contained in global resources of fossil fuels is estimated to be equivalent to about 11,000 Gt of CO₂, which means that the implementation of ambitious climate policies would lead to large proportions of reserves remaining unexploited’. Its novelty is that the study ‘stems from the detailed regional representation of fossil fuel reserves used in the authors’ model, which are based on well-established data sources’.

For coal it concludes that ‘countries with large coal endowments would face great challenges. China and India would have to discard 66 per cent of their reserves, whereas Africa would have to leave 85 per cent of them. In addition, the United States, Australia and countries of the former Soviet Union would need to leave more than 90 per cent of their coal reserves underground.’

Regional distribution of reserves unburnable before 2050 for the 2°C scenarios with and without CCS'

COUNTRY OR REGION	2°C WITH CCS						2°C WITHOUT CCS					
	Oil		Gas		Coal		Oil		Gas		Coal	
	Billions of barrels	%	Trillions of cubic metres	%	Gt	%	Billions of barrels	%	Trillions of cubic metres	%	Gt	%
Africa	23	21%	4.4	33%	28	85%	28	26%	4.4	34%	30	90%
Canada	39	74%	0.3	24%	5.0	75%	40	75%	0.3	24%	5.4	82%
China and India	9	25%	2.9	63%	180	66%	9	25%	2.5	53%	207	77%
FSU	27	18%	31	50%	203	94%	28	19%	36	59%	209	97%
CSA	58	39%	4.8	53%	8	51%	63	42%	5.0	56%	11	73%
Europe	5.0	20%	0.6	11%	65	78%	5.3	21%	0.3	6%	74	89%
Middle East	263	38%	46	61%	3.4	99%	264	38%	47	61%	3.4	99%
OECD Pacific	2.1	37%	2.2	56%	83	93%	2.7	46%	2.0	51%	85	95%
ODA	2.0	9%	2.2	24%	10	34%	2.8	12%	2.1	22%	17	60%
United States of America	2.8	6%	0.3	4%	235	92%	4.6	9%	0.5	6%	245	95%
Global	431	33%	95	49%	819	82%	449	35%	100	52%	887	88%

FSU, the Former Soviet Union countries; CSA, Central and South America; ODA, Other Developing Asian countries; OECD, the Organisation for Economic Co-operation and Development. A barrel of oil is 0.159 m³ ; % Reserves unburnable before 2050 as a percentage of current reserves.

Source: [Nature](#)

INTERNATIONAL ENERGY AGENCY ENERGY-RELATED EMISSION STALLED IN 2014 (MARCH 2015)

Preliminary data from the International Energy Agency (IEA) indicate that global emissions of CO₂ from the energy sector stalled in 2014, marking the first time in 40 years in which there was a halt or reduction in CO₂ emissions that was not tied to an economic downturn.

The IEA attributes the halt in emissions growth to changing patterns of energy consumption in China and OECD countries: ‘in China, 2014 saw greater generation of electricity from renewable sources, such as hydropower, solar and wind, and less burning of coal. In OECD economies, recent efforts to promote more sustainable growth – including greater energy efficiency and more renewable energy – are producing the desired effect of decoupling economic growth from greenhouse gas emissions’.

Source: [IEA press release](#)

MOODY'S IMPACT OF CARBON REDUCTION POLICIES IS RISING GLOBALLY (MARCH 2015)

Moody's in-depth analysis 'Environmental Risks and Developments: Impact of Carbon Reduction Policies is Rising Globally' finds that:

- ‘Credit pressures are building generally for companies that have carbon-intensive products and limited ability to adapt.’
- ‘In addition, policy and regulatory risks are creating uncertainty that is in turn hindering investment decisions and investor flows, and while the impact of this uncertainty on most industries is harder to quantify, it is likely to become more significant as global carbon reduction policies tighten further.’
- ‘Specifically, such uncertainty can raise questions about the future profitability of a business model, impacting both corporate decisions on future capital expenditure and investor decisions regarding investment allocations to certain corporates or industries.’

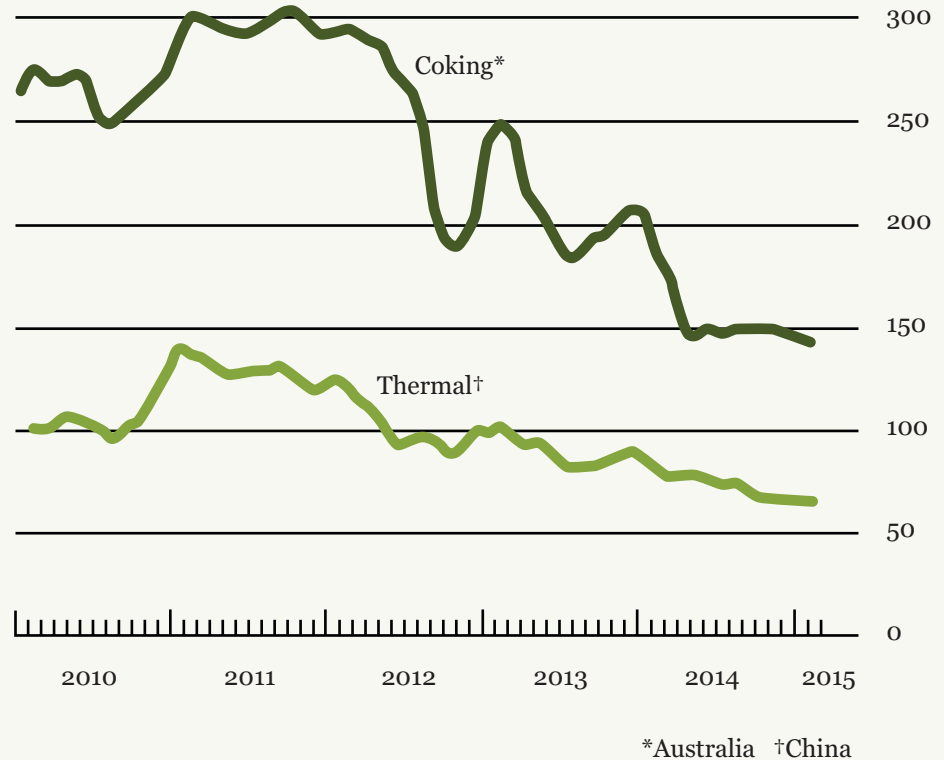
Source: [Moody's research paper](#)

THE ECONOMIST AS MORE COUNTRIES TURN AGAINST COAL, PRODUCERS FACE PROLONGED WEAKNESS IN PRICES (MARCH 2015)

In this article, The Economist states that: ‘growing energy efficiency, rising pollution worries and stiffer competition from other fuels mean that in most countries the tide is turning against coal. Prices have been sliding (see chart), political opposition growing and demand drooping. The Dow Jones Total Coal Market index has fallen by 76 per cent in the past five years’.

The article refers to China’s decrease in coal consumption (1.6 per cent) in 2014 and bankruptcies of 24 American coal companies. It also touches on regional changes (EU, India, exporting countries), the divestment movement, pollution (CO₂, mercury, etc.) and consequent health impact.

The article concludes by setting out risks for investments in coal mining: ‘The



biggest danger for the coal mines is that capital ceases to flow their way. Investors can cope with a cyclical business, but the fear now is of a structural shift, in which China follows the rich world in beginning to phase out coal, India increasingly produces its own, and a plentiful supply of cheap gas keeps prices low everywhere. If so, new coal-mining investments would risk becoming stranded assets, and older deep mines would be even more uneconomic than now.’

Source: [The Economist](#)

OXFORD UNIVERSITY COMPANIES AND INVESTORS AT RISK OF STRANDED ASSETS FOR SUBCRITICAL COAL (MARCH 2015)

The Stranded Assets Programme of the Smith School of Enterprise and the Environment analysed the risk of stranded assets and subcritical coal power stations (SCPS) in light of three factors: carbon intensity, air pollution and water stress.

The study also analysed the world’s 100 largest SCPS portfolios by total generation capacity, and from there: identified the 20 most vulnerable large company portfolios according to carbon intensity, PM 2.5 pollution, and water stress. We find that Indian companies (5) dominate the tables for poor carbon efficiency, with former Soviet (6) and Chinese portfolios (5) also notable for their poor carbon performance. Chinese and Indian company portfolios monopolise the ranking for being located in areas with the worst PM 2.5 air pollution, with respectively 15 and 5 firms in this largest 20. And China (6) and India (5) also have the greatest number of company portfolios that are under the most acute water stress.

TOP 5 MOST VULNERABLE COMPANIES TO STRANDED ASSETS		
Carbon	Air pollution	Water stress
Neyveli Lignite Corp Ltd	State Power Central Co	Beijing Energy Invest Holding
Mp Power Generating Co Ltd	North China Grid Co Ltd	Origin Energy
GDF Suez	China Resources Power Holdings	Xishan Coal And Electricity
Kazakhmys Plc	State Grid Power Corp	Intermountain Power Agency
West Bengal Power Dev Corp	Shenergy Company Ltd	Rajasthan Rv Utpadan Nigam

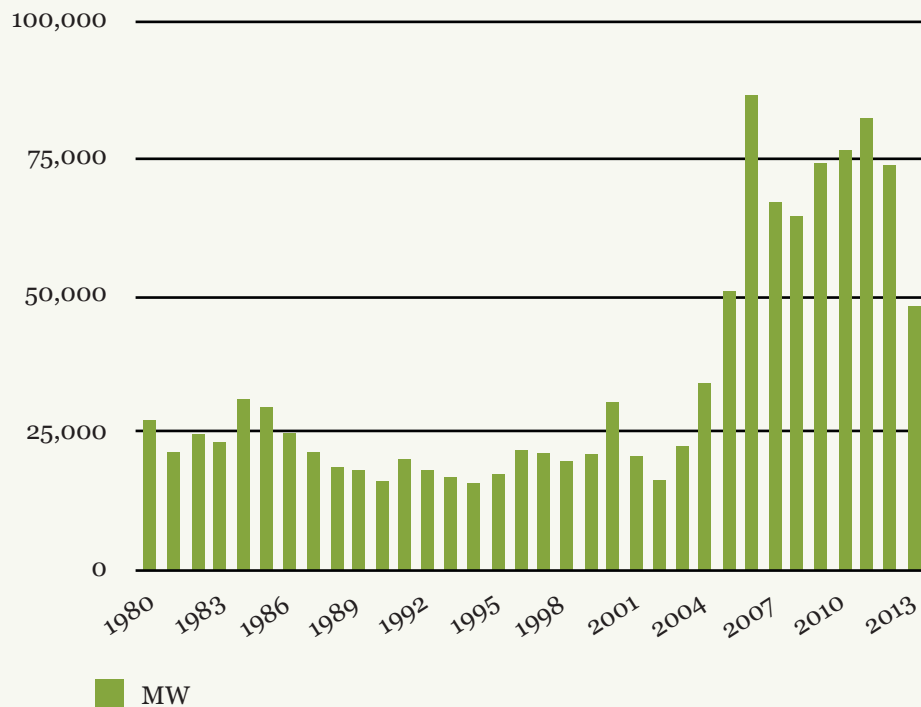
Source: [Oxford University report](#)

COALSWARM MORE COAL PLANTS ARE BEING CANCELLED THAN BUILT GLOBALLY (MARCH 2015)

The 'Boom and Bust' report developed by the research group CoalSwarm is based on the Global Coal Plant Tracker database that identifies, maps, describes, and categorizes every known coal-fired power units in the world proposed since January 1, 2010.

A key finding of the analysis is that the global coal boom has started to slow, as more plans for new power plant projects are now being shelved than completed. The findings update a 2012 report by the World Resources Institute, which estimated that a total capacity of 1,401 GW of new coal plants were in the pipeline for construction. New figures suggest that by 2014 this had shrunk by 23 per cent to a proposed 1,083 GW of new coal-fired capacity.

Figure 1 Worldwide Coal-Fired Generation Net Capacity Additions, 1980-1993



Source: Platts WEPP January 2015 and CoalSwarm analysis

The report gives an overview of new coal plant additions from 2005 to 2013: ‘the pace of net coal capacity additions (new capacity minus retired capacity) worldwide remained around 20 GW to 25 GW per year for over two decades, then abruptly tripled during the period 2005 to 2012 before receding in 2013.’

However, this coal boom is now turning to bust: ‘after a period of extraordinary growth, worldwide coal plant construction has slowed rapidly due to increasingly effective citizen opposition, competition from renewables and economic restructuring. Since 2010, two plants have been shelved or cancelled worldwide for every plant completed.’ As the table below indicates, large regional differences occur:

Table 4 Outcome of Coal-Fired Capacity in the Development Pipeline Since January 1, 2010 (MW)

REGION	HALTED (shelved or cancelled)	COMPLETED	RATIO OF HALTED TO COMPLETED
East Asia	194,625	227,650	1:1
South Asia	313,420	80,340	4:1
Europe / Turkey	96,600	14,599	7:1
United States of America	23,653	14,677	2:1
Southeast Asia	22,260	13,701	2:1
Latin America	17,890	4,016	4:1
Other	41,504	1,883	22:1
World total	709,952	356,866	2:1

Source: Global Coal Plant Tracker, January 2015

(Note: Since 2012 the India ratio has increased to 6:1 See discussion under " South Asia" in Part1)

The Boom and Bust report states on climate impacts that: ‘unless the worldwide cancelation rate for proposed projects observed since 2010 (two projects halted for each project built) can be substantially increased by advocates, capacity currently under construction or proposed will add 113 Gt of additional CO₂ to the atmosphere, singlehandedly pushing emissions dangerously close to the lower end of the 2°C carbon budget (870 Gt).’

Sources: [CoalSwarm report](#), [Carbon Brief](#)

AL GORE AND DAVID BLOOD CHEAP COAL IS A LIE (APRIL 2015)

In an opinion piece in The Guardian, Al Gore (former US vice-president) and David Blood (co-founder of Generation Investment Management) rebut the claim of the coal industry that coal is crucial for providing access to energy, stating: ‘This exploitation of an urgent humanitarian need to promote more coal-burning in poor countries is extremely misleading. If ever implemented, it would actually significantly worsen the condition of the 1.3 billion people mired in energy poverty’.

The authors further state: ‘The relative merits of different energy options must be considered over the long term with an emphasis on three factors: financial cost, reliability, and impact on society and the environment. And when viewed through this lens, renewable energy – particularly solar photovoltaic energy – far outranks coal as the best future energy choice for developing nations.’

Coal loses out on all of these three factors, with its consequences: ‘Although the nominal cost of using coal to power existing grids remains misleadingly low today, it will not remain so for long as the tide turns against it. Investors have been taking careful note of the growing headwinds facing the industry. Regulations to limit carbon emissions continue to mount, even as technological advances make low-carbon energy alternatives ever more cost-competitive. Global investments in new electricity capacity from renewable sources have exceeded those in fossil fuel sources for the past seven years, and the gap is growing’.

Source: [The Guardian](#)

INTERNATIONAL ENERGY AGENCY BANNING THE CONSTRUCTION OF LEAST-EFFICIENT COAL-FIRED POWER IS KEY FOR REACHING A PEAK OF ENERGY-RELATED EMISSIONS BY 2020 (JUNE 2015)

This report analyses the targets that countries have put forward by June 2015 in context of international negotiations to reach a global climate agreement at COP21 in Paris, concluding that: ‘the growth in global energy-related emissions slows but does not peak by 2030. The link between economic growth and emissions weakens significantly, but is not broken: the economy grows by 88 per cent from 2013 to 2030 and energy-related carbon dioxide emissions by 8 per cent. Renewables are the leading source of electricity by 2030, but inefficient coal-fired power generation capacity declines only slightly’.

In its Bridge Scenario, the IEA defines measures that can lead to a peak in energy-related emissions by 2020. This includes ‘reducing the use of the least-efficient coal-fired power plants and banning their construction’. Global coal use peaks by 2020 under this scenario.

Source: [IEA special report on energy and climate change](#)

IMF TOTAL COAL SUBSIDIES AMOUNT TO 3 PER CENT OF GLOBAL GDP (JUNE 2015)

A working paper by the IMF estimates global pre-tax and post-tax consumer energy subsidies: ‘pre-tax consumer subsidies arise when the price paid by consumers (that is, firms and households) is below the cost of supplying energy. Post-tax consumer subsidies arise when the price paid by consumers is below the supply cost of energy plus an appropriate “Pigouvian” (or “corrective”) tax that reflects the environmental damage associated with energy consumption and an additional consumption tax that should be applied to all consumption goods for raising revenues. Post-tax consumer subsidies are typically much higher than pre-tax consumer subsidies.’

Total coal subsidies amount to up to 3 per cent of global GDP, mostly due to very high post-tax consumer subsidies: ‘coal is the most carbon-intensive and airpollution intensive energy product (per unit of energy), yet no country really imposes meaningful taxes on coal use from an environmental perspective.’

Source: [IMF](#)

COAL FINANCE UN BACKS FOSSIL FUEL DIVESTMENT CAMPAIGN (MARCH 2015)

Nick Nuttal, spokesperson for UNFCCC, stated that ‘we support divestment as it sends a signal to companies, especially coal companies, that the age of ‘burn what you like, when you like’ cannot continue’.

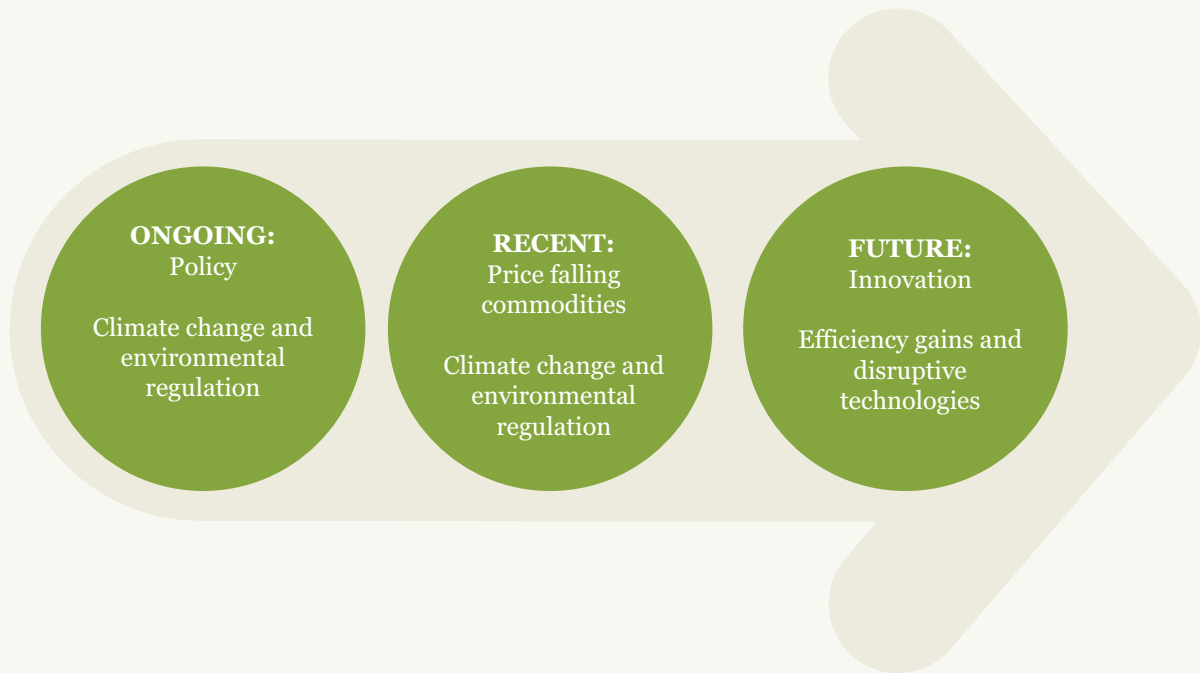
Nuttal continues: ‘everything we do is based on science and the science is pretty clear that we need a world with a lot less fossil fuels. We have lent our own moral authority as the UN to those groups or organisations who are divesting. We are saying ‘we support your aims and ambitions because they are fairly and squarely our ambition’, which is to get a good deal in Paris.’

The article also refers to an earlier statement to investors from UN Secretary-General Ban Ki-Moon: ‘Please reduce your investments in the coal- and fossil-fuel-based economy and [move] to renewable energy.’

Source: [The Guardian](#)

HSBC CLIMATE CHANGE REGULATION, ECONOMICS AND ENERGY INNOVATION INCREASE RISK OF STRANDED ASSETS (APRIL 2015)

Figure 1 A brief history of stranding

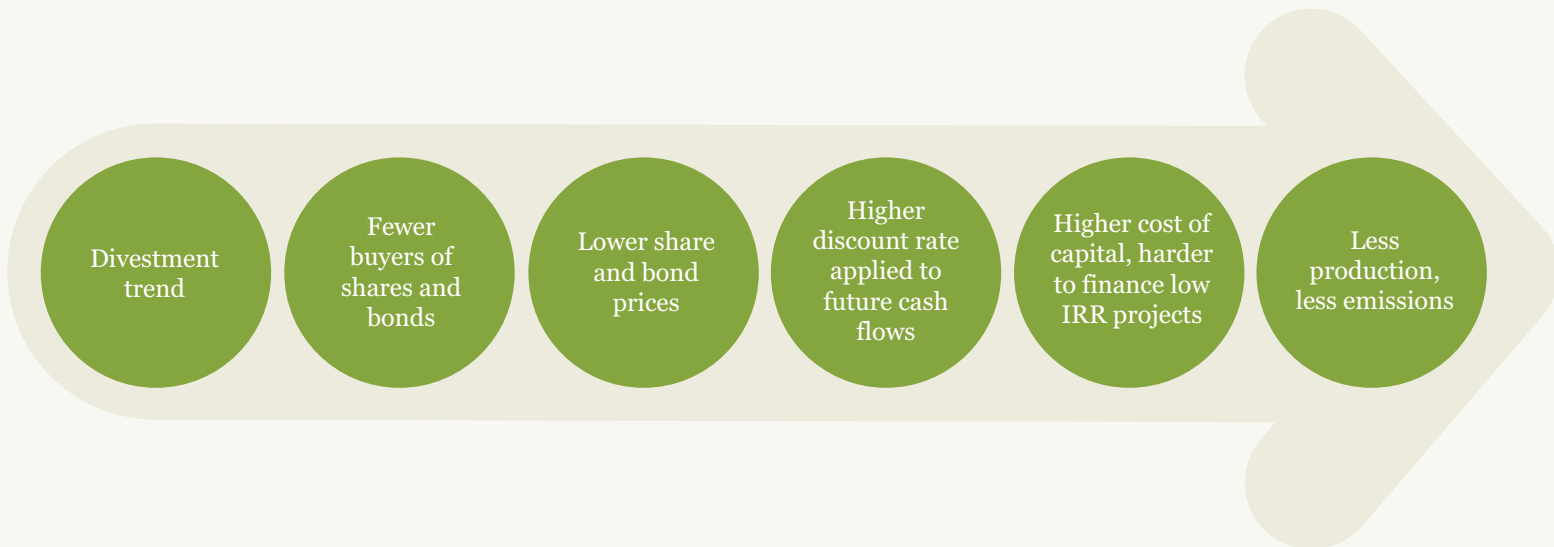


HSBC's report analyses the risk of stranded assets in fossil fuels, based on three factors:

- **Climate change regulation:** e.g. closing down of coal plants in Chinese cities, USA clean power plan and Mercury and Air Toxic Standards (MATS), the prospect of a universal climate agreement at COP21.
- **Economics:** 'With lower oil prices, producers have a choice: continue to operate and take losses in the hope that prices will recover, or cut losses and shut down facilities. The ability and timeframe to withstand losses will depend on the type of producer (e.g. state owned or private) and diversification of reserves across the cost curve. Where the decision is taken not to produce from a proven reserve or to cease production which was underway, then the asset can be said to be economically stranded – non-viable given the current energy economy.'
- Energy technology innovation.

The second part of the report looks into how investors can divest or hold and engage in fossil fuels. It states that 'to effectively manage stranding risks the starting point is to understand which assets have the potential to be devalued. The IEA stated in 2012 that no more than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the 2°C target is to be met. Coal, oil and natural gas have very different emissions profiles and so coal would be likely to see a much higher proportion left unburned than natural gas.'

Figure 3 How substantial divestment could affect fossil fuels production and extend the carbon budget



The report distinguishes four divestment strategies:

- 100 per cent divestment from all companies producing fossil fuels;
- Partial divestment (tilting) according to index classification, revenue criteria or breakeven prices;
- Value chain analysis of the companies that are involved in fossil fuels;
- Worst-in-class approach based on carbon intensity of individual companies.

The report continues to analyse the impact of decisions to invest, challenges (share of fossil fuel reserves owned by state-owned enterprises and disengaged investors) and opportunities to engage rather than divest.

Source: [HSBC research paper](#)

BANK LENDING TO COAL MINING AND COAL POWER PLANTS DECREASING IN 2014 (MAY 2015)

This report gives an overview of global financing for coal mining and coal fired power by commercial banks, and concludes: ‘global financing for coal mining and top coal-fired power companies was holding steady at \$141 billion, compared to \$145 billion in 2013’.

GLOBAL BANK FINANCING FOR COAL MINING, 2014

\$66.37 billion
(Up from \$55.28 billion in 2013)

GLOBAL BANK FINANCING FOR 30 LARGEST COAL-FIRED POWER PRODUCERS, 2014

\$74.39 billion
(Down from \$89.62 billion in 2013)

Source: [report](#)

NORWEGIAN PARLIAMENT NORWEGIAN SOVEREIGN WEALTH FUND DIVESTS FROM COAL (MAY/JUNE 2015)

On 27 May, the Norwegian Parliament decided unanimously – in a finance committee session – to pull the Government Pension Fund Global (GPF) out of coal. It followed a recommendation formulated in a report by a previously established expert group to ‘introduce a new conduct-based criterion for the observation and exclusion of companies whose activities on an aggregate company level entail unacceptable degrees of climate gas emissions’.

The Parliament’s statement continues: ‘The committee is of the view that there are ethical aspects connected with the operations of a number of coal companies within mining and power production. The committee believes in light of this that a separate product-based criterion in the guidelines for the observation and exclusion relating to such companies is advisable’.

The criteria are specified as follows: ‘The criterion should cover mining companies and power producers for whom a significant part of their business relates to coal used for energy purposes. Coal power companies and mining companies who themselves or through other operations they control base 30 per cent or more of their activities on coal, and/or derive 30 per cent of their revenues from coal, should as a rule fall under the essentiality principle. Importance should be attached to forward-looking assessments relating to new product-based criteria, including companies’ plans that would change the share of coal-related activities and the share of activities relating to renewable energy sources.’

On 5 June, the decision of the committee was enforced by the Parliament. The Norwegian finance ministry mentioned that \$9 to \$10 billion could be divested.

Sources: [Norwegian Parliament](#), [The Guardian](#)

COAL IMPACTS

THE LANCET COAL-FIRED POWER PLANTS POSE SERIOUS RISK TO PUBLIC HEALTH (JUNE 2015)

The Lancet, the world’s leading medical journal, published a study by its health and climate commission. The report recommends to ‘protect cardiovascular and respiratory health by ensuring a rapid phase out of coal from the global energy mix. Many of the 2200 coal-fired plants currently proposed for construction globally will damage health unless replaced with cleaner energy alternatives’.

The report further specifies: ‘A coal-fired power plant will emit particulates that result in immediate exposure for the local population with consequent increased risk of developing respiratory disease and lung cancer. The exposure to emissions can result in immediate health effects for the local population, such as respiratory tract infections, or take many years or decades to have an effect. Another dimension is locality of the emissions-exposure, exposure-health effect pathways. Locally generated emissions will affect both the population surrounding the point of discharge and in some cases more widely, as in burning coal in north Asia’.

Source: [The Lancet](#)

RENEWABLE MARKET

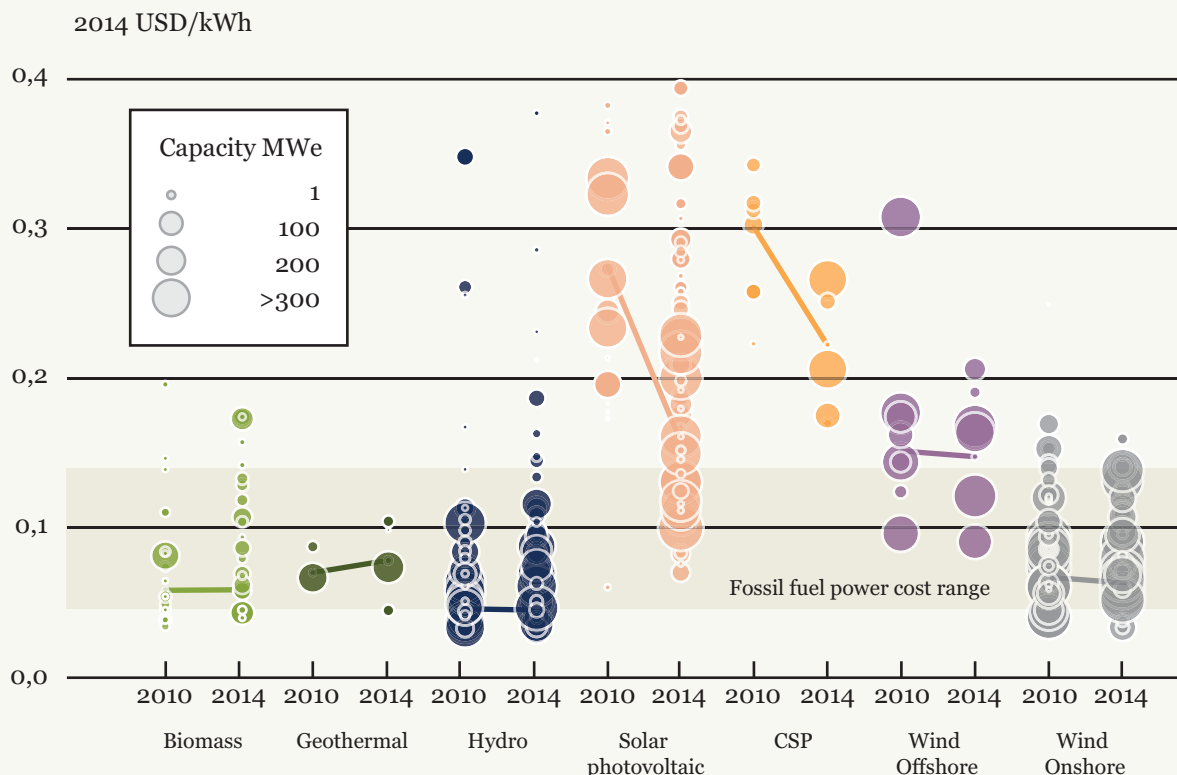
IRENA COMPETITIVENESS OF RENEWABLE POWER GENERATION TECHNOLOGIES IMPROVED IN 2014 (JANUARY 2015)

The goal of IRENA’s report is ‘to reduce uncertainty about the true costs of renewable power generation technologies, so that governments can be more ambitious and efficient in their policy support for renewables. As this comprehensive report clearly demonstrates, any remaining perceptions that renewable power generation technologies are expensive or uncompetitive are at best outdated, and at worst a dangerous fallacy.’

The report shows that ‘the competitiveness of renewable power generation technologies – on the basis of Levelised Cost of Electricity (LCOE) – continued improving in 2013 and 2014.’

Regional, weighted average costs of electricity from biomass for power, geothermal, hydropower and onshore wind are all now in the range, or even span a lower range, than estimated fossil fuel-fired electricity generation costs. Because of striking LCOE reductions, solar PV costs also increasingly fall within that range.'

Figure ES 1: The levelised cost of electricity from utility-scale renewable technologies, 2010 and 2014



The report looks beyond LCOE, addressing issues like:

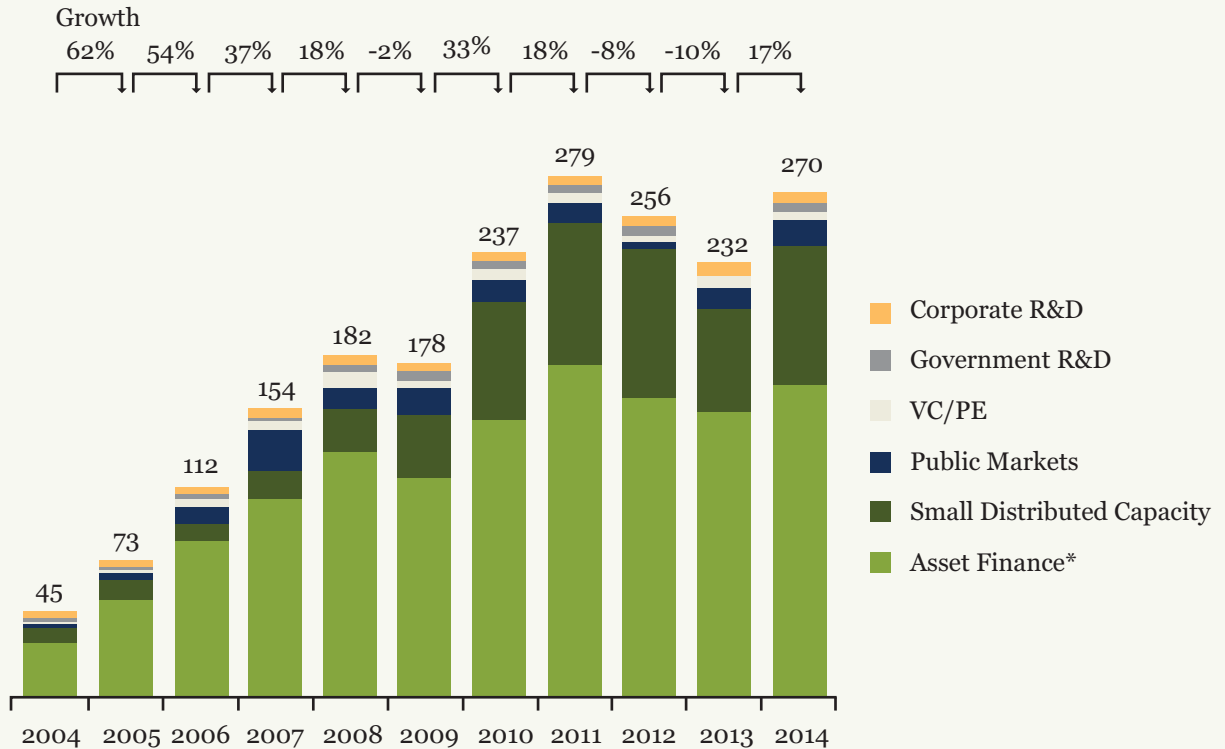
- **Technical barriers for renewables energy and externalities of fossil fuels:** ‘with a level playing field and all externalities considered, renewables remain fundamentally competitive.’
- **The reasons for and prospect of continued price reduction of renewable energy sources:** ‘renewable power generation equipment costs are falling, even as the technologies themselves continue becoming more efficient. The combination of these two factors has led to the continual, often rapid, decline in the cost of electricity from renewable-based technologies’. ‘With today’s low equipment costs, cost reduction opportunities in absolute terms will increasingly hinge on non-equipment factors, such as balance-of-project, operations and maintenance and finance costs.’
- Other cost indicators such as equipment cost and total installed cost.
- The potential of renewable energy to provide a solution to energy poverty.

Sources: [IRENA report and press release](#)

BLOOMBERG NEW ENERGY FINANCE AND UNEP GLOBAL RENEWABLE ENERGY INVESTMENT JUMPED IN 2014 (MARCH 2015)

This report tracks investments in renewable energy across from R&D funding and venture capital for technology and early-stage companies, through to public market financing for projects and mature companies.

Figure 1: Global New Investment In Renewable Energy By Asset Class, 2004 - 2014, Sbn



*Asset finance volume adjusts for re-invested equity. Total values include estimates for undisclosed deals

Global investment in renewable power and fuels (excluding large hydro-electric projects > 50 MW) was \$270.2 billion in 2014, nearly 17 per cent higher than the previous year. The split in investment between developed and developing countries was more equal than ever before in 2014, with the first group attracting 138.9 billion and the second group 131.3 billion.

Despite the investment being slightly lower than in record year 2011, a record number of renewable capacity of 103 GW was installed. This is due to falling technology costs, in particular in solar. Renewable energy technologies excluding large hydro made up 48 per cent of the net power capacity added worldwide in 2014.

Solar and wind were runaway leaders in terms of renewable energy investment, the former accounting for \$149.6 billion, the second highest figure ever and up 25 per cent on 2013; and the latter bringing in \$99.5 billion, up 11 per cent to a new record. **It distinguishes two major trends in that regard:**

- An unprecedented solar boom in China and Japan: 74.9 billion dollar of investments, half of the global total;
- European offshore wind development: 16.2 of total 18.6 billion dollar investment took place in Europe.

The report lists a number of challenges:

- Less predictable support policies;
- A bigger role for gas due to lower prices caused by halving of oil price;
- Structural challenges (e.g. grids);

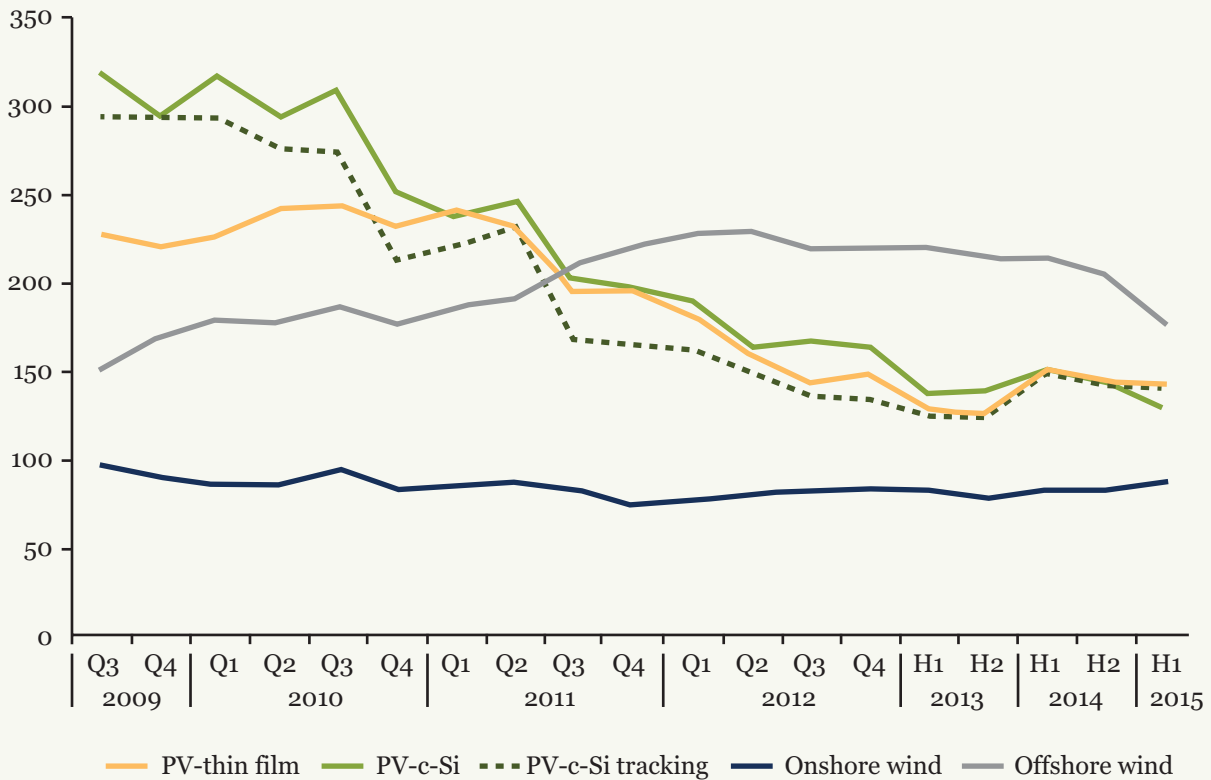
- Barriers in developing countries.

Costs of renewable energy continue to decline on the other hand. They moreover continue to play a large role, together with energy efficiency, in limiting the increase in global emissions – in particular in light of the Paris climate change conference.

Finally, renewables are increasingly being seen as a stable – even relatively low-risk – investment by institutional funds.

Sources: [BNEF-UNEP report](#), [Euractiv](#)

Figure 10: Global Average levelised cost of electricity for wind and PV, Q3 2009 to H1 2015, \$ per mwh



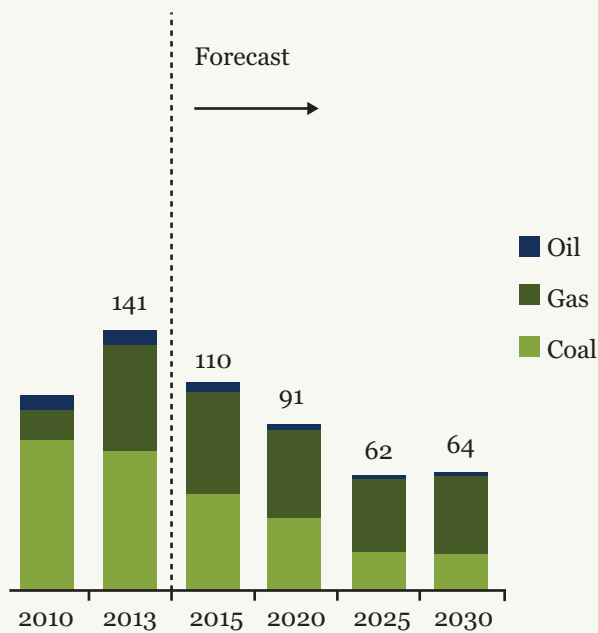
PV-c-Si stands for crystalline silicon photovoltaics

BLOOMBERG FOSSIL FUELS JUST LOST THE RACE AGAINST RENEWABLES (APRIL 2015)

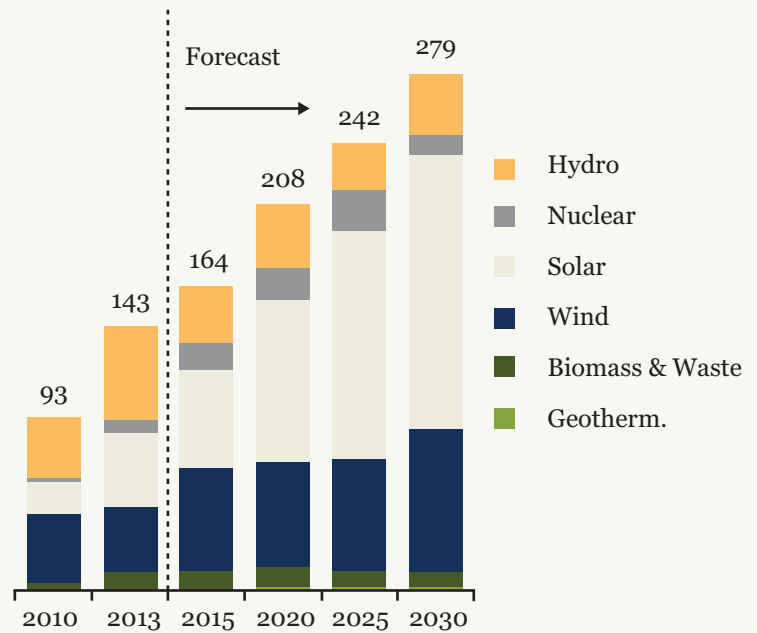
Bloomberg posted analysis on its website, stating that ‘the race for renewable energy has passed a turning point. The world is now adding more capacity for renewable power each year than coal, natural gas, and oil combined. And there’s no going back. The shift occurred in 2013, when the world added 143 GW of renewable electricity capacity, compared with 141 GW in new plants that burn fossil fuel... and by 2030 more than four times as much renewable capacity will be added.’

The Bloomberg analysis also forecasts the billions of dollars that need to be invested each year in order to avoid the most severe consequences of climate change, represented by a benchmark increase of more than 2 degrees Celsius – and compares it with what’s actually being spent.

FOSSIL FUEL



CLEAN ENERGY (GW)



Source: [Bloomberg](#)

REUTERS AND BLOOMBERG SOLAR SURGE DRIVEN FROM ASIA (APRIL/MAY 2015)

Two articles from Reuters and Bloomberg underline the positive trend in solar energy.

The Reuters article starts from a Japanese viewpoint:

- According to the Japan Renewable Energy Foundation (JREF), solar power is set to become profitable in Japan as early as this quarter, freeing it from the need for government subsidies and making it the last of the G7 economies where the technology has become economically viable. Once Japan reaches cost-revenue parity in solar energy, it will mean the technology is commercially viable in all G7 countries and 14 of the G20 economies, according to data from governments, industry and consumer groups.
- Investors are also re-discovering solar, with the global solar index up 40 per cent this year, lifting it out of a slump following the 2008/2009 financial crisis, far outperforming struggling commodities such as natural gas or coal.
- By starting mass-production of solar panels, China is the driving force in bringing down solar manufacturing costs by 80 per cent in the last decade, according to Germany's Fraunhofer Institute.

The Bloomberg article points to the rise of demand in China and Japan as main driver for the blooming solar business:

- Bloomberg data forecasts panel production to grow by almost a third in 2015.
- The Chinese government earlier this year increased its target for 2015 solar installations to 17.8 GW from about 12 GW. Japan may install as much as 12.7 GW of solar power this year. Cheaper solar has also made the technology more economically viable for emerging economies such as India and South Africa.
- Manufacturers are expected to produce as much as 55 GW of panels this year. Shares have responded, with the NYSE Bloomberg Global Solar Energy Index of 132 companies gaining 65 per cent this year, outpacing the 3.4 per cent gain for the S&P 500.

Sources: [Reuters](#), [Bloomberg](#)

TESLA INNOVATION IN BATTERIES FOR HOMES, BUSINESSES AND UTILITIES (MAY 2015)

Tesla launched batteries for homes, business and utilities on 1 May, increasing the profile and potentially feasibility of energy storage: According to Tesla, ‘the battery is designed to enable so-called “load-shifting” by charging during times when electricity prices are lower due to less demand, and discharging when demand and prices are high. It can also store solar power generated during daytime and release it at night, and serve as backup during outages’.

Sources: [Tesla](#), [Bloomberg](#)

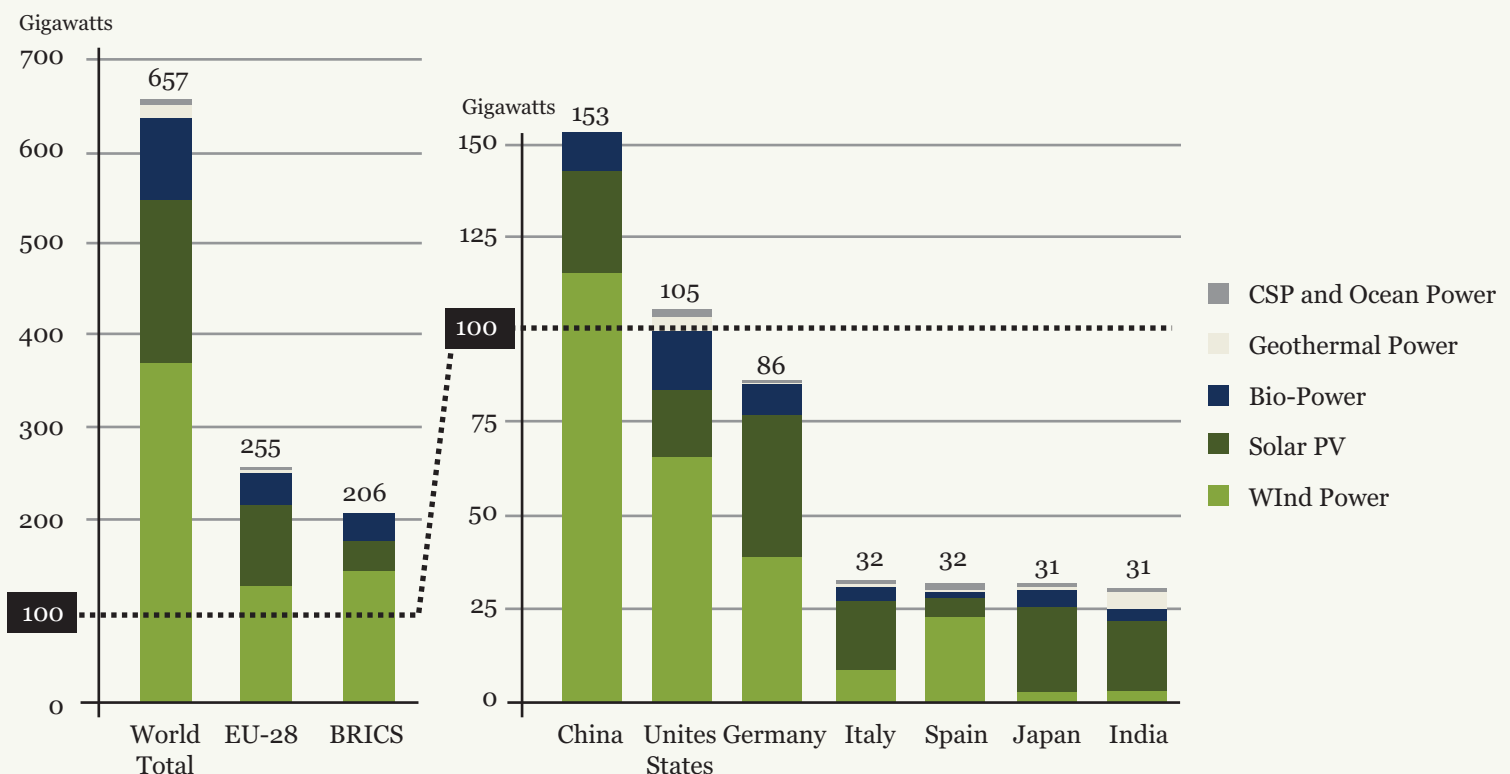
REN21 RENEWABLES REPRESENTED 59 PER CENT OF NET ADDITION TO GLOBAL POWER CAPACITY IN 2014 (JUNE 2015)

The REN21 Renewables Global Status Report (GSR) provides an annual look at the advances in renewable energy markets, policy frameworks and industries globally. Each report uses formal and informal data to provide the most up-to-date information available.

The report’s main conclusions are as follows:

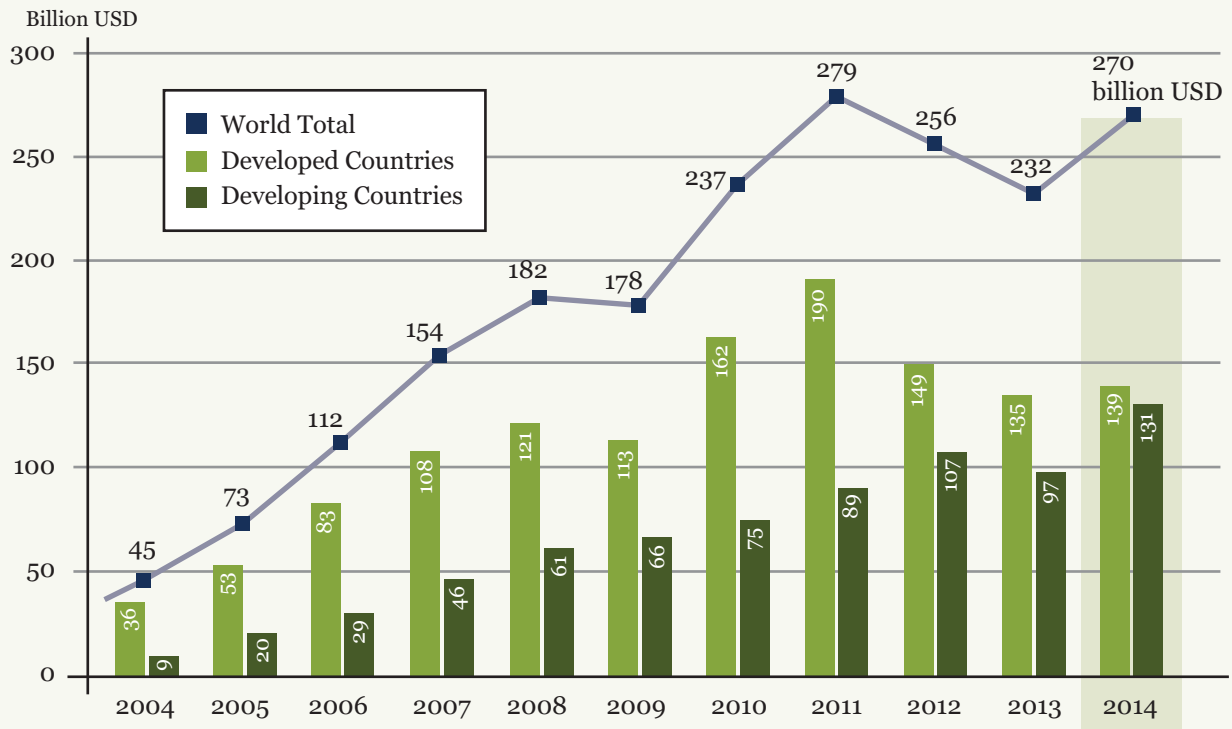
- Global carbon emissions associated with energy consumption remained stable in 2014 while the global economy grew; this stabilisation has been attributed to increased penetration of renewable energy and to improvements in energy efficiency.
- Renewables represented approximately 59 per cent of net additions to global power capacity in 2014, with renewable power investments outpacing net investments in fossil fuel power plants.
- Development of renewable heating, cooling, and transport still lags behind that of renewable power.
- Renewable energy development in 2014 continued to be shaped largely by government policy. Renewables faced challenges in some countries resulting from policy changes or uncertainties. However, the number of countries with renewable energy targets (164) and policies increased again in 2014.

Renewable Power Capacities* in World, EU-28, BRICS, and Top Seven Countries - 2014



* not including hydropower

Global New Investment in Renewable Power and Fuels, Developed and Developing Countries, 2004 - 2014



Does not include investment in hydropower >50MW

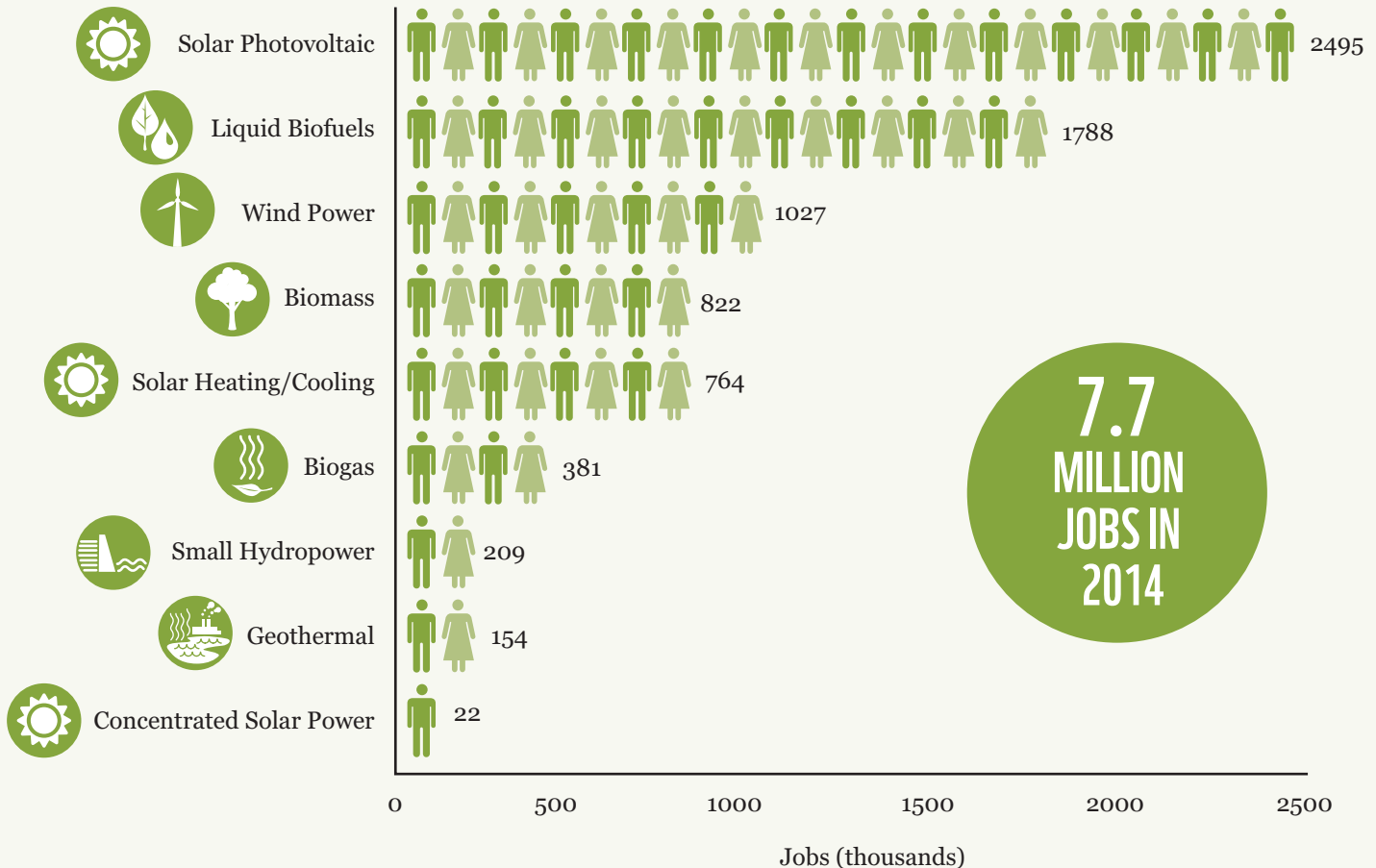
The REN21 GSR also gives an overview of investment trends in renewables for the first quarter of 2015 : ‘global investment in renewable energy was USD 50.2 billion in the first quarter (Q1) of 2015, as dealmaking slowed in big markets such as Brazil, China, and in Europe. The first quarter tends to be the weakest of the year, but this total was down 10 per cent from Q1 in 2014 (USD 55.9 billion). However, the US dollar had strengthened 15 per cent against several currencies over the interim, and 29 per cent against the euro, accounting for at least part of this decline.’ It goes on providing numbers per region and technology, concluding that: ‘Despite the declines, the numbers indicate that the slump in oil and natural gas prices has not had much of an impact on investment in renewable energy.’

Source: [REN21 report](#)

IRENA RENEWABLE ENERGY EMPLOYED 9.2 MILLION PEOPLE AROUND THE WORLD IN 2014 (JUNE 2015)

IRENA's report estimates that renewable energy employed 7.7 million people, directly or indirectly, around the world in 2014 (excluding large hydropower). This is an 18 per cent increase from the number reported last year. In addition, IRENA conducted the first-ever global estimate of large hydropower employment, showing approximately 1.5 million direct jobs in the sector.

Figure 1: Renewable Energy Employment By Technology



Source : [IRENA report](#)

BLOOMBERG NEW ENERGY FINANCE TWO THIRDS OF POWER INVESTMENTS OVER NEXT 25 YEARS WILL GO TO RENEWABLES (JUNE 2015)

The New Energy Outlook (NEO) of Bloomberg New Energy Finance (BNEF) gives a forecast for how global power markets will evolve up to 2040. BNEF calls its report unique: 'what sets NEO apart is that our assessment is focussed on the parts of the system that are driving rapid change in markets, grid systems and business models. This includes the cost of wind and solar technology, battery storage, electricity demand and consumer dynamics among others.'

The report identifies six massive shifts:

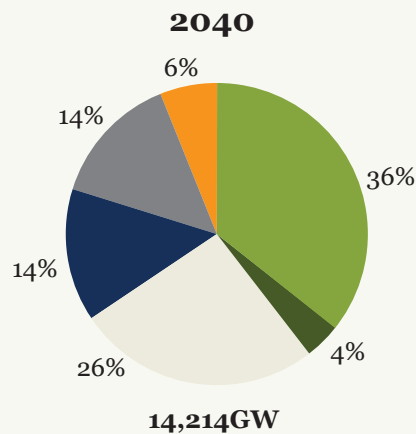
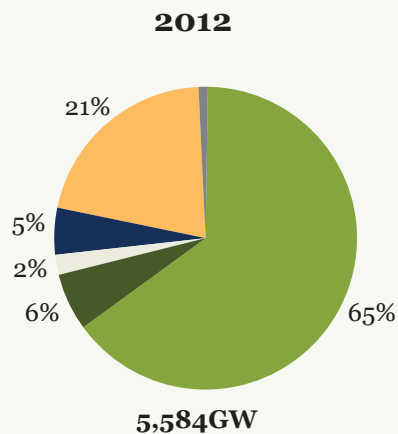
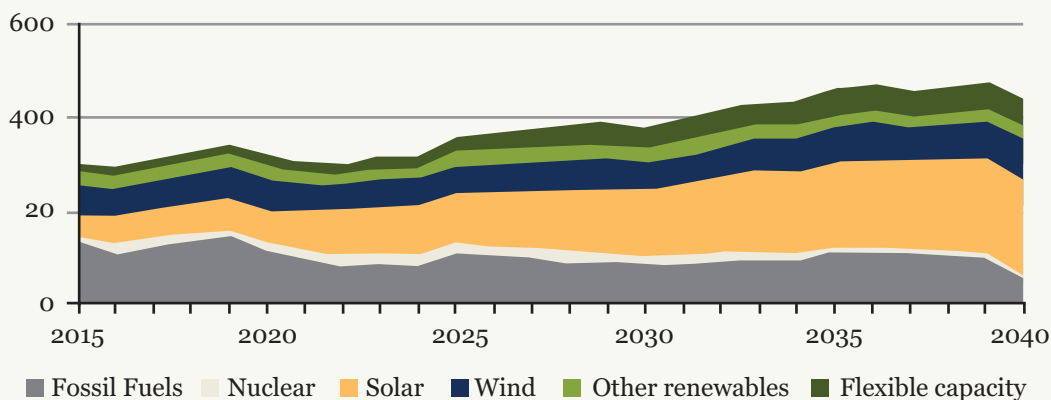
- The price of solar power will continue to fall, until it becomes the cheapest form of power in a rapidly expanding number of national markets.
- With solar power so cheap, investments will surge. Expect \$3.7 trillion in solar investments between now and 2040. Solar alone will account for more than a third of new power capacity worldwide.
- The biggest solar revolution will take place on rooftops. By 2040, almost 13 per cent of electricity worldwide will be generated from small-scale solar systems.
- Global demand slows due to energy efficiency. So even as people rise from poverty to middle

class faster than ever, BNEF predicts that global electricity consumption will remain relatively flat.

- Fossil fuels aren't going to suddenly disappear. They will retain a 44 per cent share of total electricity generation in 2040, down from two thirds today. Natural gas won't become the oft-idealized "bridge fuel" that transitions the world from coal to renewable energy. Coal is clearly on its way out, but in developing countries that need to add capacity quickly, coal-power additions will be roughly equivalent to utility-scale solar.
- About \$8 trillion, or two thirds of the world's spending on new power capacity over the next 25 years, will go toward renewables. Still, without additional policy action by governments, global CO2 emissions from the power sector will continue to rise until 2029 and will remain 13 per cent higher than today's pollution levels in 2040.

Figure 1: Global Installed Capacity in 2014 and 2040 and projected capacity additions, by technology (GW)

Annual capacity additions, 2015-40 (GW)



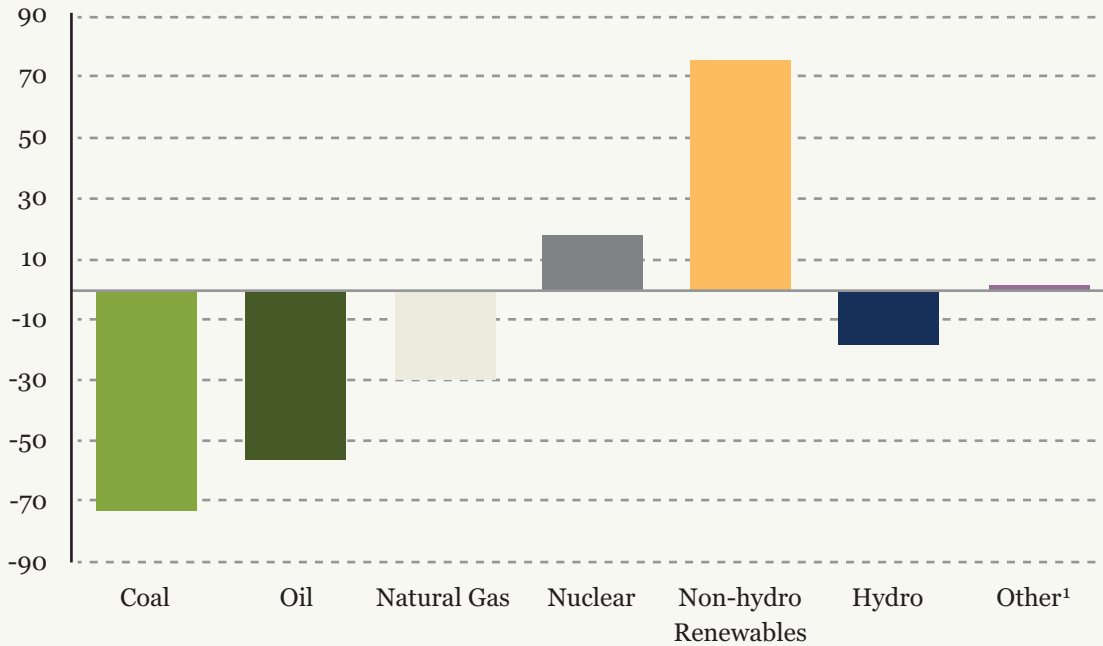
Sources: [BNEF report](#), [Bloomberg](#)

IEA RENEWABLES OVERTAKE GAS AS WORLD'S SECOND LARGEST SOURCE OF POWER GENERATION (AUGUST 2015)

The IEA reports that 'data for 2013 show that renewable electricity generation overtook natural gas to become the second largest source of electricity worldwide producing 22 per cent of total electricity or 5 130 TWh. In addition, in 2013, global non-hydro renewable electricity, which rose to 1 256 TWh or 5.4 per cent of global electricity production, surpassed oil-fired generation for the first time ever.'

In the OECD, electricity consumption 'fell slightly to 10 712 TWh a decrease of 0.8 per cent or 86 TWh compared to 2013. This decline was driven by lower fossil fuel and hydro production that were only partially offset by growth in non-hydro renewables (+8.5 per cent) and nuclear (+0.9 per cent).'

OECD Electricity production: 2013 - 2014 change by source



Source: [IEA](#)



Gladstone harbour has been the focus of the debate around port expansion in Queensland. The port of Gladstone has permission to dredge 32 million tonnes of sea bed in order to expedite the shipment of coal and LNG from Curtis Island. Reports from fishermen of diseased fish, as well as an environmental disaster which coincided with a leaking bund wall in 2011 resulted in dead turtles and dugongs washing up on the beach and millions of tonnes of dredge spoil spilling out into the harbour and inner reefs. The local fishing industry has collapsed as a result. Queensland, Australia.

WHAT IS NEW IN AUSTRALIA?

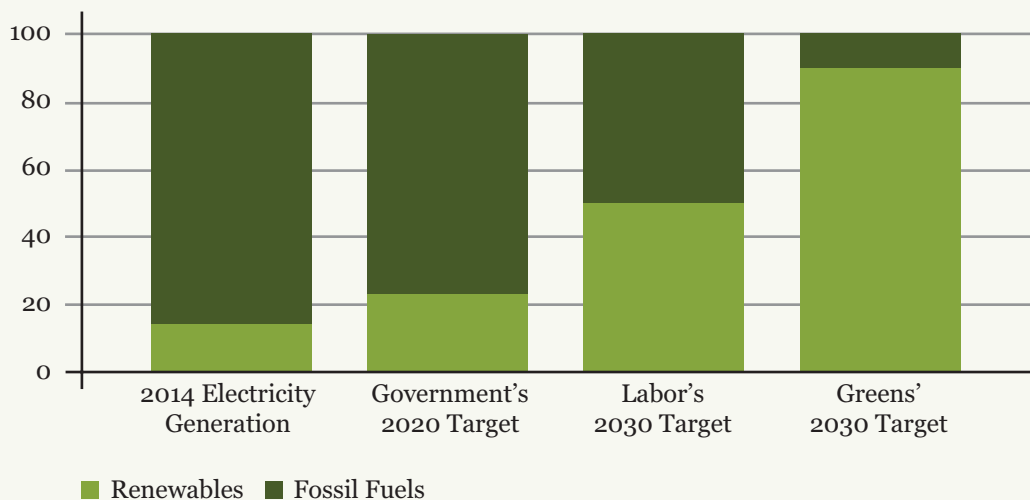
POLICY

AUSTRALIAN GOVERNMENT ADJUSTS RENEWABLE ENERGY POLICY (JUNE/JULY 2015)

On 23 June the Australian senate passed legislation reducing the large scale renewable energy target from 41,000 GWh to 33,000 GWh by 2020 (corresponding reduction in capacity over the next five year from 8500MW to 5500MW). But the legal certainty created by the deal incited a decision to move forward with the construction of the 240 MW Ararat Wind Farm in south-western Victoria. The project, which will supply enough electricity to power 123,000 households, is almost twice the size of the entire investment (\$US450 million) in large-scale clean energy in Australia in 2014. Clean Energy Council chief executive Kane Thornton said in this context: ‘We expect that approximately \$10 billion of investment and thousands of jobs will be created in wind and solar farms by the renewable energy target over the next five years, as well as hundreds of medium-sized projects’.

Following the closure of the debate on the 2020 renewables target and with discussions on the government’s Clean Energy Finance Corporation – the 10 billion dollar body responsible for financing renewable energy development – ongoing, the Labour party announced its ambition to set a 50 per cent renewable power target for 2030: ‘Labor’s ambition is to see 50 per cent of our electricity energy mix generated by renewable energy by 2030.’

Renewable energy production: realities and targets



Sources: [reneweconomy](#), Sydney Morning Herald ([one](#), [two](#)), ABC ([one](#), [two](#))

COAL MARKET

AUSTRALIAN COAL INDUSTRY EDGES TOWARDS THE ABYSS (FEBRUARY TO JUNE 2015)

In February, the Sydney Morning Herald gave an overview of restructuring decisions of mines in Australia – and some background as to the reasons for, and timing of, these decisions:

- ‘Glencore made the most aggressive move, announcing plans to cut Australian coal output by 15 million tonnes in 2015, or more than 15 per cent when compared with its 2014 production volumes.
- Rio Tinto reduced production of Australian coking and thermal coal in 2014, as the energy unit posted a \$US210 million loss. The mine will reduce thermal coal exports from Australia by a further 3.3 million tonnes, or about 15 per cent in 2015.
- Brazilian mine Vale was also downbeat about the future of Australian coal on Friday, revealing it had slashed the book value of its Australian coal assets by 71 per cent during 2014. Vale shut two Australian coal mines, Integra and Isaac Plains, during 2014 and still runs the Carborough coal mine in Queensland's Bowen Basin.’

The article gives some insight on the reasons for and timing of these decisions:

- Thermal coal exported from Newcastle in New South Wales was fetching more than \$US130 per tonne in early 2011, but was selling for \$US61.65 per tonne this week. Coking coal exported from Queensland was fetching more than \$US300 per tonne in early 2011, but was worth closer to \$US102.75 per tonne this week.
- The widespread issue of "take-or-pay" rail contracts, where mines committed to pay for rail haulage for several years at a time, and were duly incentivised to keep loss-making mines open to limit their losses on the haulage contracts.

In March, the Sydney Morning Herald added information about mine Yancoal: ‘Aside from weak coal prices, Yancoal said take-or-pay rail and port contracts were a major factor in its \$353.4 million full-year loss, continuing a trend that has been witnessed across the industry. The contracts have become notorious in the Australian coal sector, where some mines have been forced to keep loss-making mines open because the take-or-pay contracts would make it more expensive to shut.’

Also in March, Tim Buckley from IEEFA analysed for ABC the repercussions of development in China and India for the Australian coal market: ‘Indian coal demand is likely to start matching, or exceeding, China's declines. The energy minister has made it pretty clear that India's thermal coal imports could potentially go to zero within two to three years. I think that should be ringing massive alarm bells for the Australian export coal industry. They should be re-evaluating every assumption that they have made in the past, because the world is changing very, very rapidly and it's not in Australia's favour. It does not bode well for assets like Whitehaven Coal's Maules Creek project, Shenhua's own possible Watermark project on New South Wales' Liverpool Plains and yet to be developed projects in central Queensland's Galilee Basin. They are stranded assets in the making, and the definition of stranded assets are assets that will not deliver the economic returns that were forecast and required to justify the initial investment made in those projects.’

In May, the Financial Review foresaw ‘more pain to come’ for the coal business, based on statements by the Queensland Resources Council President Micheal Roche, who said that ‘10 per cent of mines in the state are in a ‘very precarious position’:

- A quarter of the state's coal output is produced at a loss, including half of all production of thermal coal, used in power stations. One in 10 tonnes produced at Queensland coal mines is done so at a loss of more than \$14 a tonne.
- Fixed costs for rail and port access under “take-or-pay” contracts, which require mines to pay a fixed amount for a certain tonnage of coal, regardless of whether they ship it or not, range from about \$14 to \$20 a tonne. Mines losing more than \$14 a tonne may be left with little imperative to stay open.

Reporting by Business Reporter (June) added to the mounting evidence of the struggling Australian mines. Focussing on methallurgical coal, the article states:

- China’s appetite for coal used in steelmaking is faltering, deepening a market downturn mines say is the worst in recent memory.
- Analysts caution that prices will recover only if more cuts are made. The consultancy Wood Mackenzie doesn’t expect the oversupply of steelmaking coal, or coking coal, to clear up until about 2022.
- About 12,000 jobs have been cut from the local coalmining sector following a string of mine closures and delays to projects, including by Glencore , Vale, BHP, Rio Tinto and Peabody.

The article quotes market analysis from Citigroup:

- ‘Driving much of this slowdown (in coal) is China’s transition,’ said Citigroup analyst Ivan Szpakowski. ‘It is a transition we think there is no going back from.’
- At current spot prices, more than half of the coal produced is being dug up at a loss, Citigroup estimates. Many mines do lock in sales each quarter at fixed prices - exporters are selling at around \$109.50 a tonne for the current quarter - but buyers are likely to drive a harder bargain for the rest of the year.

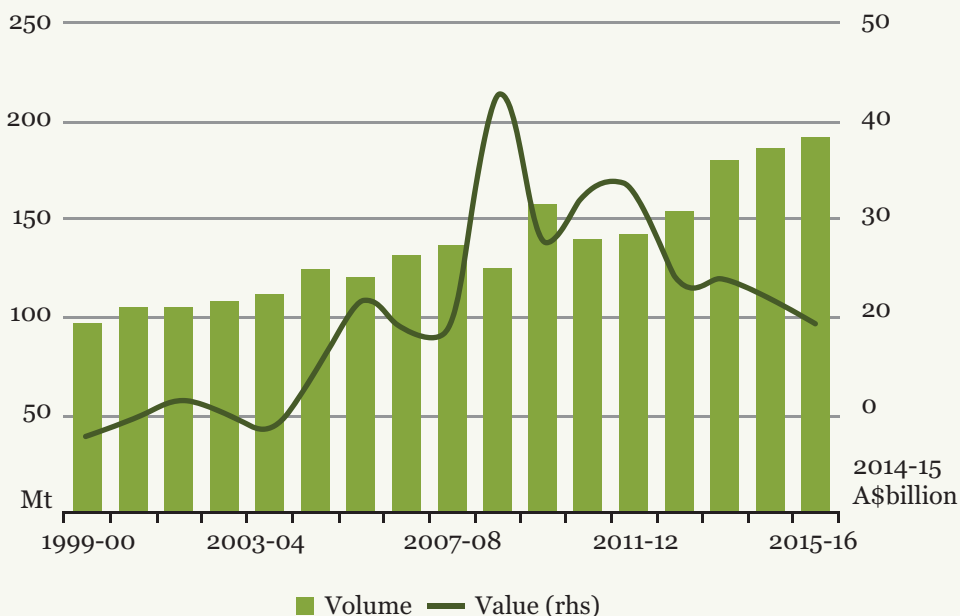
In July, the story broke in several media outlets that Adani had dissolved its 50-strong project team from troubled \$16.5 billion Carmichael mine. Adani said it remained committed to the project, but Posco – a Korean steelmaker – retired talks with Adani for a 1 billion USD investment in the mine. Tim Buckley from IEEFA stated in that regard: ‘Who is the bank that’s actually funding it? There isn’t any. Korea was the major funder supposedly on the book. This is a major body blow. It’s probably the death knell.’

Sources: Sydney Morning Herald ([February](#), [March](#), [July](#)), [Business Spectator](#), [ABC](#), [Financial Review](#), [The Guardian](#)

AUSTRALIAN GOVERNMENT AUSTRALIAN COAL INDUSTRY UNDER PRESSURE BECAUSE OF GLOBAL ENERGY MARKET DYNAMICS (JUNE 2015)

In its quarterly energy and resources outlook, the department of industry and science of the Australian government gives an overview of Australia’s production of methallurgical and thermal coal within a global context.

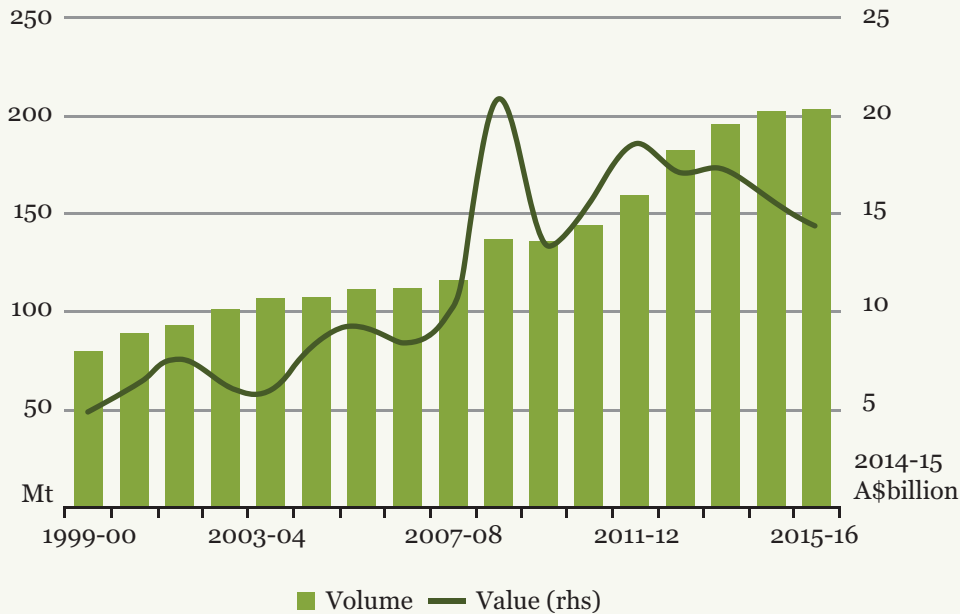
Figure 4.4: Australia's metallurgical coal exports



Source: ABS

On metallurgical coal, the overview states that: ‘Australian benchmark contract prices for high-quality metallurgical coal delivered in the June quarter 2015 settled at US\$109.50 a tonne, down from US\$117 a tonne in the March quarter. Australia’s production of metallurgical coal is estimated to have increased by 4.3 per cent to 188 million tonnes in 2014-15. Australian producers have been affected by lower prices, with several companies announcing their intention to reduce output during 2015. Glencore announced that it will reduce output at its Collinsville mine (thermal and metallurgical coal) by 2 million tonnes in 2015 as they attempt to improve its efficiency and reduce losses. Similarly, Peabody Energy announced that it will reduce output at its North Goonyella operation by 1.5 million tonnes to reduce costs, improve cash flow and preserve its resources for when the market improves. However, the loss of production from these operations is expected to be more than offset by increased output from recently completed projects such as Maules Creek. As a result, Australia’s production is forecast to increase by 2.8 per cent in 2015-16 to 193 million tonnes.

Figure 5.11: Australia's thermal coal exports



Source: ABS

It continues for thermal coal: ‘prices continued on a downward trajectory in the first half of 2015 in response to surplus supply and lower import demand from China. Newcastle free on board prices began 2015 at around US\$62 a tonne and declined progressively to around US\$54 a tonne in mid-April. Prices have since recovered to around US\$60 a tonne. Australia’s thermal coal production is estimated to have declined by 0.7 per cent to 246 million tonnes in 2014-15 as announced reductions in capacity more than offset higher production from recently completed projects. In February, Glencore announced its intention to reduce output at its Australian operations by 15 million tonnes in 2015. Australia’s exports of thermal coal increased by 3.2 per cent to 201 million tonnes in 2014-15. Despite higher volumes, the value of these exports declined by an estimated 7 per cent to \$15.6 billion because of lower prices.

Source: [Australian department of industry and science](#)

RENEWABLES

CLEAN ENERGY COUNCIL DEVELOPMENT OF RENEWABLES CONTINUES DESPITE UNFAVOURABLE POLICY CONTEXT (2015)

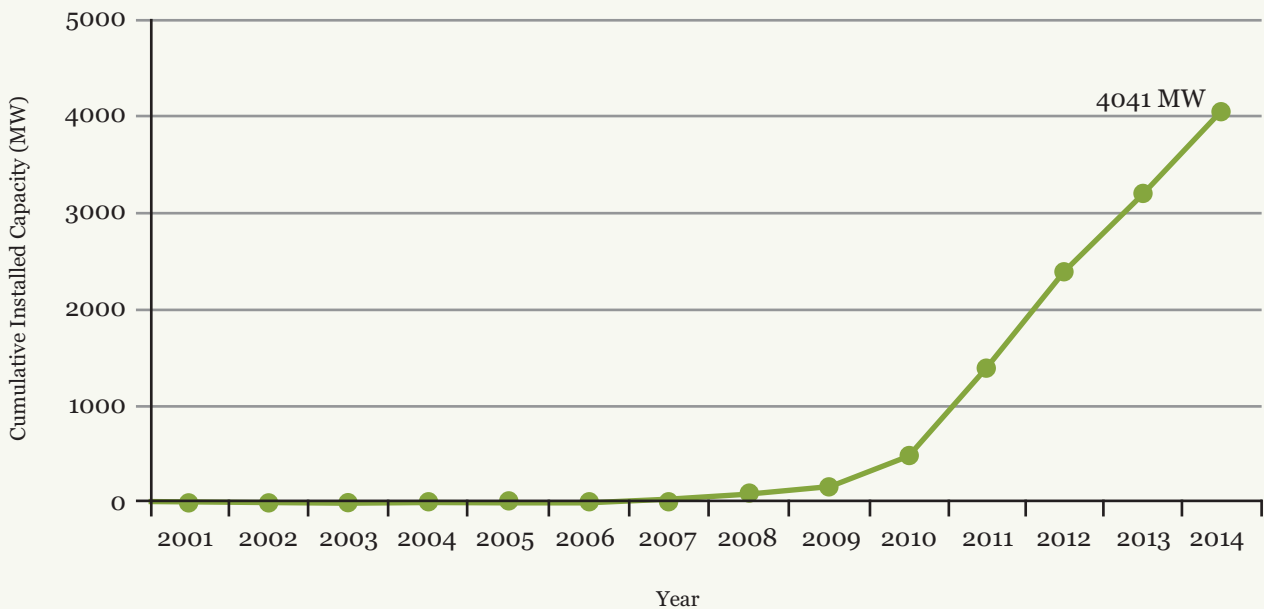
This report from the clean energy council shows that the reform of the Renewable Energy Target (see below) has had a tempering impact on investments in renewables.

Investments for large scale developments were down. Despite the uncertainty, however, three large wind farms totalling 566.7 MW were completed during the year.

The uptake of both rooftop solar power and solar hot water continued steadily (see graph below). And the commercial solar power sector was the biggest source of growth during the year, as more businesses switched on to the potential of solar power to help them reduce their power bills.

Alltogether, renewables accounted for 13.47 per cent of total generation in 2014.

Cumulative installed capacity of small-scale solar power systems (MW)



Source: [Clean Energy Council](#)



A view of Hangdang Steel Works in Hangdang, northern China. Hangdang Steel Works is one of the largest steel plants in China, fuelling China's huge construction boom and requiring massive quantities of coal to power its furnaces. In 2008, China officially became the world's largest emitter of CO₂ (greenhouse gases), largely driven by its ever increasing demand for energy most of which is met by producing electricity from coal fired power stations. Worryingly, China is building a new coal fired power station every week and has huge reserves of coal, much of which is very low grade and highly polluting.

WHAT IS NEW IN CHINA?

POLICY

NATIONAL DEVELOPMENT AND REFORM COMMISSION CHINA PLANS TO CAP COAL CONSUMPTION BY 2020 (NOVEMBER 2014 / JANUARY 2015)

In November 2014, the Chinese National Development and Reform Commission (NDRC) announced plans to cap coal consumption by 2020 to 4.2 billions tonnes, and decrease the fuel's share in the energy mix to 62 per cent. The share already fell to 64.2 per cent in 2014 from 66 per cent at the end of 2013. It is expected that China will include these targets in its next five-year plan (2016-2020).

In January 2015, China's state planning agency ordered the city of Shanghai and the provinces of Zhejiang, Jiangsu and Guangdong to draw up plans to reduce coal consumption.

Sources: [Reuters](#), [ECNS](#)

NATIONAL ENERGY ADMINISTRATION AND ADMINISTRATION OF COAL MINE SAFETY CHINA PLANS TO FORCE MORE THAN A THOUSAND COAL MINES TO SHUT DOWN (MAY 2015)

E&E reports on a statement by the China's National Energy Administration and the State Administration of Coal Mine Safety. To address China's oversupply problem, the statement says, 1,052 coal mines with combined annual production capacity of 63.9 million tons are required to close in 2015. Besides that, 202 coal mines with a total annual production capacity of 13.9 million tons will have to upgrade their technology and improve efficiency.

The article adds, based on analysis by Bloomberg New Energy Finance that 'in 2014, the Chinese government closed down coal mines with a cumulative capacity of about 40 million tons, nearly 1 per cent of the country's total production capacity in the same year.'

Source: [E&E](#)

WALL STREET JOURNAL CHINA FIRES AWAY AT COAL POWER (MAY 2015)

The Wall Street Journal (WSJ) reports that: 'In the past two months, China's top planning body has published multiple documents stressing that market forces should decide how electricity is generated, transmitted and distributed.'

The article notes that specifics are missing and internal contradiction still rife. But if enacted, it could mean according to WSJ: 'that generators using dirty coal will be thrown to the market lions. That almost surely will force down coal-power tariffs... it could shutter unneeded coal-generation capacity. In that scenario, companies that operate small plants and suffer higher costs will get hit.'

Source: [Wall Street Journal](#)

UNFCCC CHINA FORMALIZES ITS PLEDGE TO PEAK CO2 EMISSIONS AROUND 2030 (JUNE 2015)

Following the joint announcement with the USA in November 2014, China formally submitted to UN its pledge for 2030 climate and energy targets:

'Based on its national circumstances, development stage, sustainable development strategy and international responsibility, China has nationally determined its actions by 2030 as follows:

- To achieve the peaking of carbon dioxide emissions around 2030 and making best efforts to peak early;

- To lower carbon dioxide emissions per unit of GDP by 60 per cent to 65 per cent from the 2005 level;
- To increase the share of non-fossil fuels in primary energy consumption to around 20 per cent;
- To increase the forest stock volume by around 4.5 billion cubic meters on the 2005 level.’

The pledge also includes a list of policy and measures. In the part on building low-carbon energy systems, China commits to ‘control total coal consumption, to lower coal consumption of electricity generation of newly built coal-fired power plants to around 300 grams coal equivalent per kilowatt-hour, and to achieve the utilization of thermal energy reaching 50 million tons coal equivalent by 2020.’

COAL MARKET

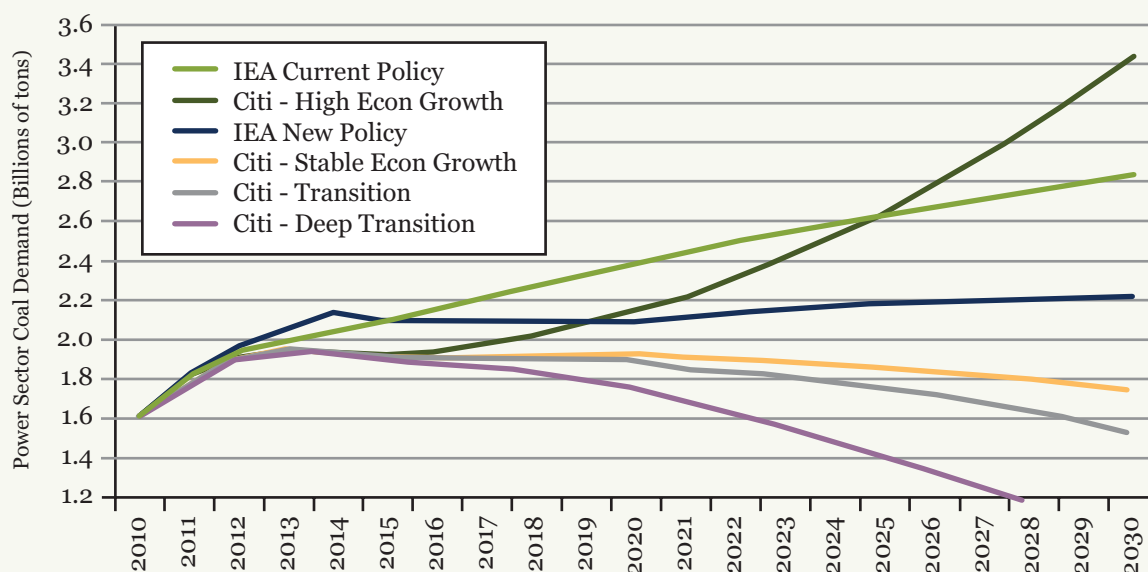
Source: [UNFCCC](#)

CITIBANK PEAK COAL IN CHINA FORESEEN BY/BEFORE 2020 (NOVEMBER 2014)

Citibank forecasts coal consumption in China based on projections for GDP growth. Under three of its four scenarios, the bank foresees peak coal consumption before/by 2020.

The main drivers of peak coal are seen to be: structural reforms of the economy, energy efficiency targets, renewable energy targets, and improved efficiency of coal plants. Put more generally, Citibank believes that ‘policy priorities push coal to generation of “last resort”.’

Power sector coal demand peaks in multiple Citi scenarios



Scenario GDP Assumptions: Moderating growth slows power demand growth

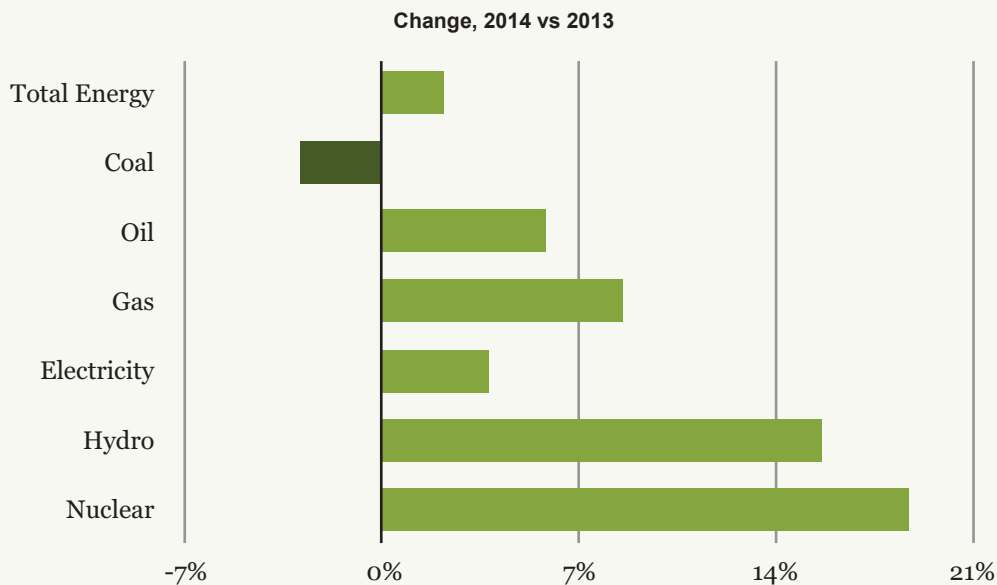
ECONOMIC GROWTH SCENARIOS	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual	9.6%	9.2%	10.4%	9.3%	7.7%								
High Econ Growth	9.6%	9.2%	10.4%	9.3%	7.7%	7.7%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Stable Econ Growth	9.6%	9.2%	10.4%	9.3%	7.7%	7.7%	7.5%	7.1%	6.7%	7.1%	6.8%	6.5%	6.2%
Transition	9.6%	9.2%	10.4%	9.3%	7.7%	7.7%	7.3%	7.3%	7.0%	6.5%	6.1%	5.8%	5.5%
Deep transition	9.6%	9.2%	10.4%	9.3%	7.7%	7.7%	7.2%	6.6%	6.1%	5.6%	5.1%	4.7%	4.0%

■ GDP in Peak Coal Scenarios

Source: [Citigroup research paper](#)

GOVERNMENT DATA CHINA'S COAL CONSUMPTION DROPPED IN 2014, TREND CONTINUES IN 2015 (FEBRUARY/MARCH 2015)

Official Chinese government data indicate that coal use fell by 2.9 per cent in 2014 compared to the previous year. Against an overall increase in Chinese energy use of 2.2 per cent, coal was the only major energy source to see falling. At the same time, the Chinese economy grew by 7.4 per cent, showing it is decreasing its energy intensity.



China is continuing to expand its thermal generation capacity, mainly coal, with a 6 per cent year-on-year increase. Chinese coal plants have been running fewer hours, however, suggesting capacity is being added but not used. The utilisation rate of coal plants decreased from 57.3 per cent in 2013 to 53.7 per cent in 2014, and even 52.2 per cent in the first two months of 2015.

Preliminary analysis suggests the reduction in coal consumption will mean Chinese emissions fell in 2014, maybe up to 0.7 per cent compared to 2013.

Sources: [Reuters](#), [Carbon Brief](#), [RTCC](#)

GOVERNMENT DATA CHINA'S COAL IMPORTS DROPPED IN 2014, TREND CONTINUES IN 2015 (JANUARY - JUNE 2015)

In January, media outlets reported that total Chinese coal imports for 2014 slumped 10.9 per cent compared with 2013, the first annual decline in at least a decade. At that occasion, the China Coal Industry Association (CCIA) said in a report that it remained pessimistic about 2015 demand, with the economy under pressure from weak export markets and falling real estate investment.

In June, Reuters reported that 'total imports in the first five months of the year reached 83.26 million tonnes, down 38.2 per cent compared with the previous year, according to preliminary data from China's General Administration of Customs'. The article highlights a few potential drivers for the continued decline in exports: increasing use of cleaner energy, expectation of a 5 per cent consumption decrease in 2015 as a result of a slowing economy, cheaper domestic coal due to decreased bottlenecks and government intervention.

In May, both thermal coal (40.8 per cent) and coking coal (68 per cent) imports decreased on a year-on-year basis.

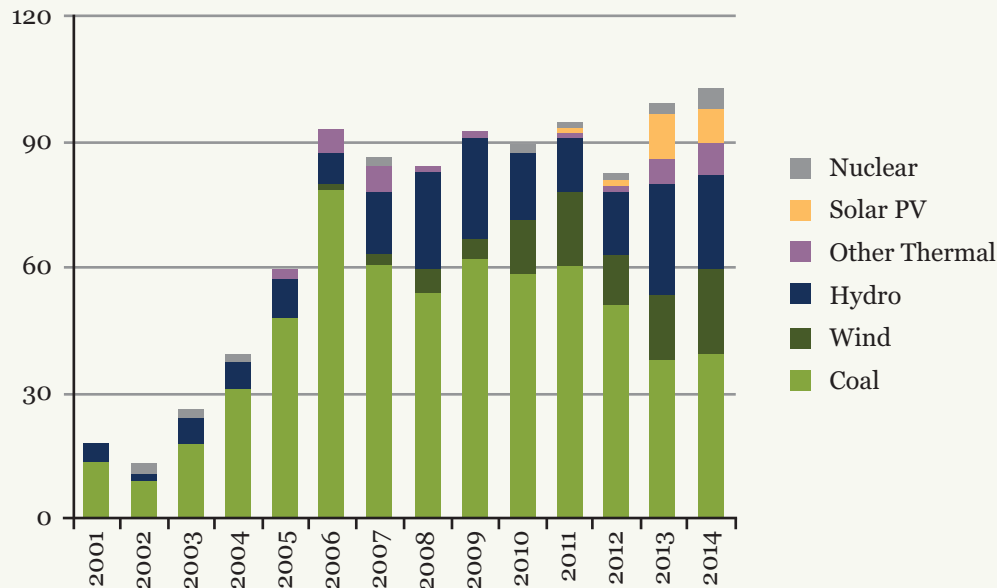
Sources: [Reuters](#), [SX Coal \(one, two\)](#), [brecorder](#)

COALSWARM RENEWABLES SURPASSED NET COAL CAPACITY INCREASES IN 2013 (MARCH 2015)

CoalSwarm's Boom and Bust report finds that net coal capacity additions dropped from 78 GW in 2006 to 36 GW in 2013. In 2014 additions were 39 GW. New solar, wind, and hydro capacity allowed China to maintain its overall generating capacity growth from 2006 to 2013 while steadily shrinking the share of that growth produced by coal. **In 2013, new solar, wind and hydro capacity surpassed net coal capacity increases for the first time.**

The following policy trends are playing a significant role in determining future coal capacity: (1) Small Plant Replacement Policy, (2) air pollution mitigation, (3) economic restructuring, (4) expanding renewable, gas, nuclear, and hydro power sources, (5) climate policies, (6) energy efficiency initiatives, and (7) shifts in the regional distribution of generating capacity.

Figure 7. China annual power grid capacity additions 2001 -2013, Net Retirements (GW)



CoalSwarm states: 'already, data for 2014 showed economic growth of 7.3 per cent coinciding with a reduction in coal consumption, including coal use outside the power sector, of 2.9 per cent (National Bureau of Statistics 2015). Within the power sector, the amount of electricity generated from coal fell by 1.6 per cent in 2014 (Myllyvirta 2015). Utilization rates for coal-fired generation have shown a steep decline, from an estimated 60 per cent in 2011 to 54 per cent in 2014'.

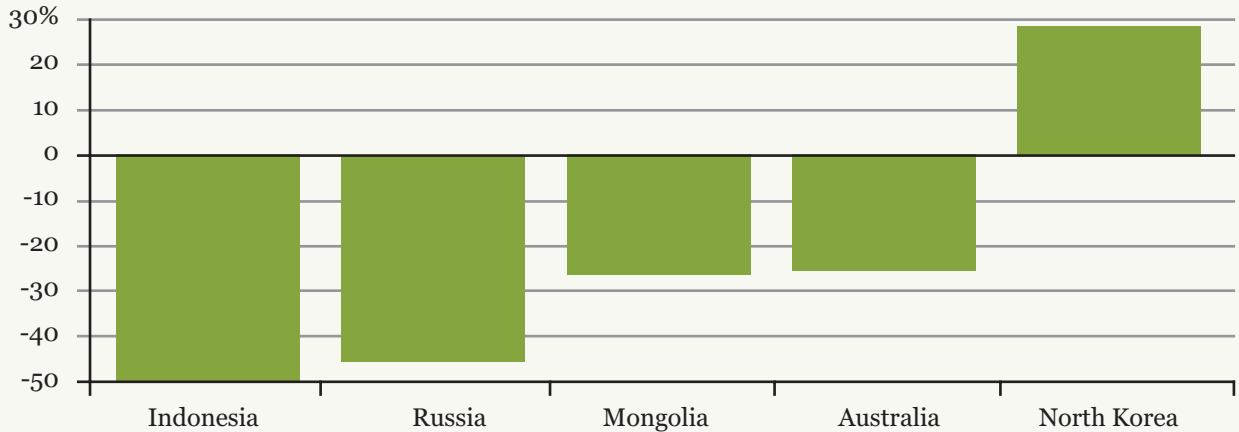
Source: [CoalSwarm report](#)

BLOOMBERG FALLING CHINESE DEMAND IMPACT COAL EXPORTING COUNTRIES (JULY 2015)

On 23 July, Bloomberg reports on the impact of falling Chinese coal demand: 'China's tighter quality limits on seaborne coal and increased support for domestic mines cut imports 38 per cent from a year earlier in the six months through June, the most for the period in at least five years, according to China customs data... Shipments from Indonesian mines fell 49 per cent, the most of China's five largest suppliers. Reduced imports by China amid a shift to a more consumer-driven economy left exporters searching for alternative markets as supplies expanded following an investment boom from 2008 through 2011.... North Korea which produces a high-quality grade known as anthracite, was the only of China's five biggest suppliers to increase deliveries in the six-month period, offsetting Vietnamese imports.'

China's coal cutback

Year-on-year change in cumulative exports to China



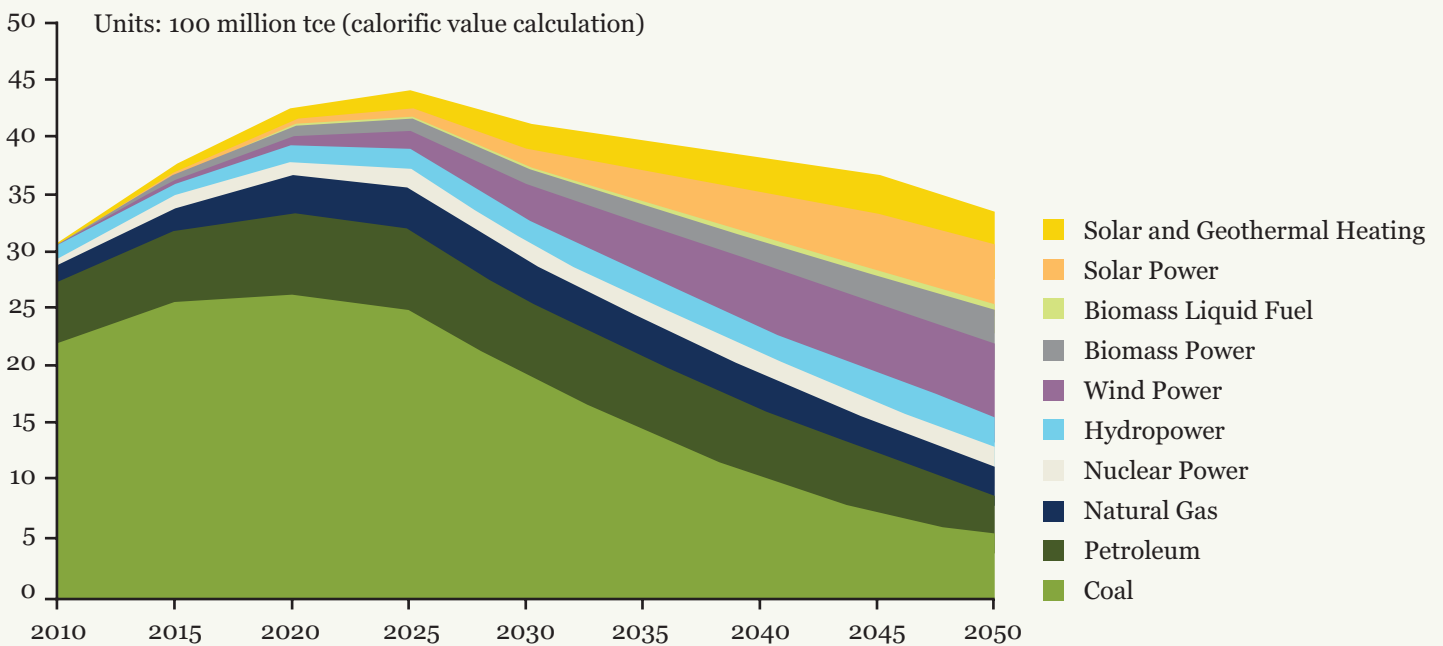
Source: Chins Customs data

Source: [Bloomberg](#)

RENEWABLES

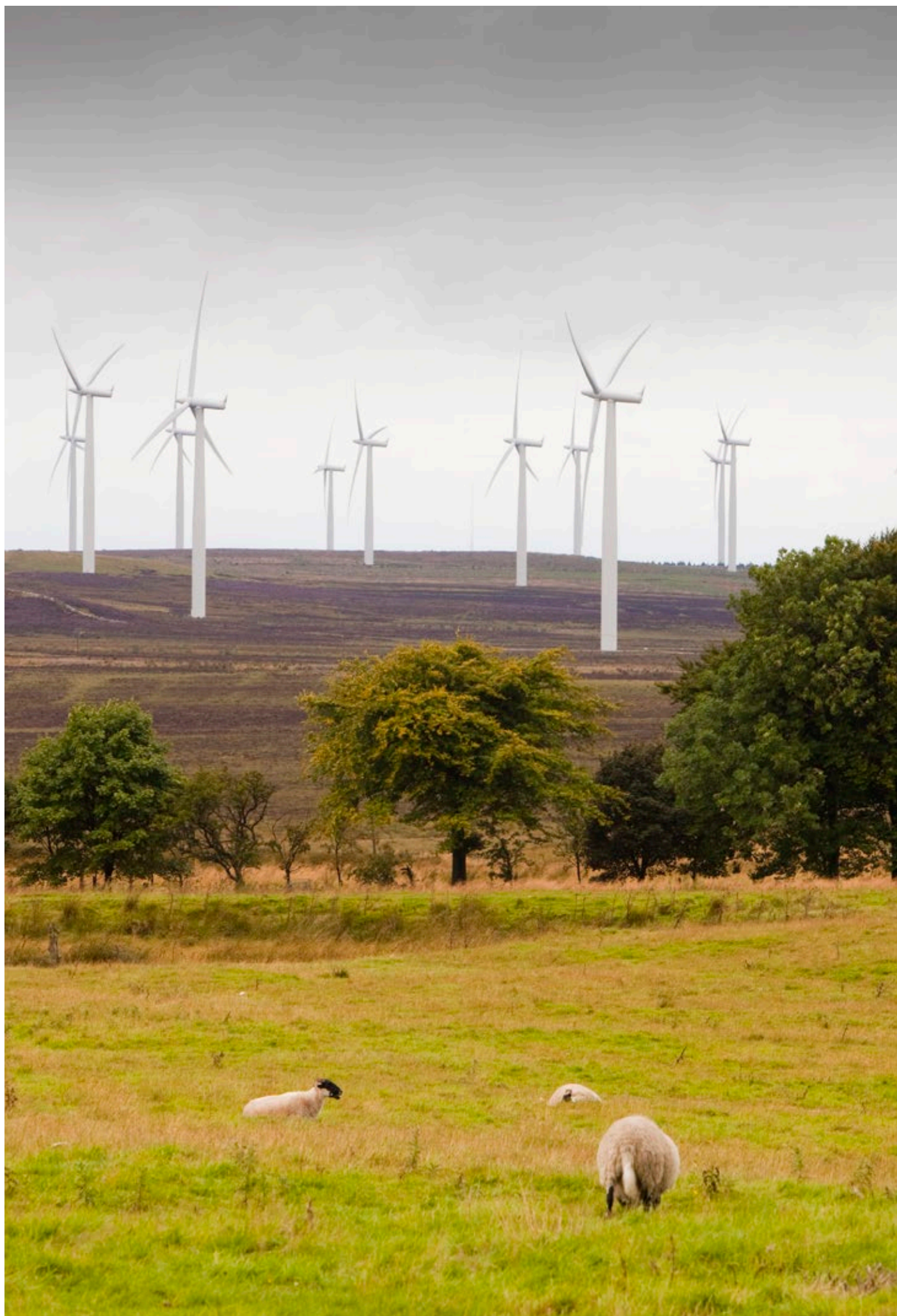
ENERGY FOUNDATION CHINA CAN MEET 60 PER CENT OF ENERGY DEMAND BY RENEWABLE ENERGY SOURCES IN 2050 (APRIL 2015)

In April 2015, The Energy Foundation, China National Renewable Energy Center and other Chinese organizations jointly published a high renewable energy scenario for China. It concludes that 'China's end-use energy consumption in 2050 will be 3.2 billion tce and electricity will account for 62 per cent. China's electrification rate will be up by 36 percentage points from 2010. Among end-use energy consumption, 900 million tce will be directly consumed fossil energy; non-fossil energy will account for 66 per cent and renewable energy 60 per cent. With regard to power supply, 91 per cent of power generation will be from non-fossil energy and 86 per cent from renewable energy.'



The study also notes that ‘under the high renewable energy penetration scenario, coal consumption peak will be reached before 2020. Thereafter, fossil energy consumption peak will be realized by 2025. The replacement of coal-fired power generation by renewable energy power will highly reduce coal consumption... Power from coal will peak at 1.45 billion tce in 2020 and then decline year by year after that. By 2050, coal consumption in power sector will be only 280 million tce’.

Source: [Energy Foundation report](#)



Black Law windfarm near Carlisle in Scotland, UK. When it was constructed it was the largest wind farm in the UK with 54 turbines with a capacity of 97 megawatts, enough to power 70,000 homes. The wind farm was built on the site of an old open cast coal mine..

WHAT IS NEW IN EUROPE?

POLICY

FINLAND AND PORTUGAL MOVE FORWARD WITH PHASING-OUT COAL FOR POWER PRODUCTION (SEPTEMBER 2014 TO MAY 2015)

In May, the Portuguese government presented plans to phase out its coal capacity by 2026.

Also in May, the declaration of the New Finish government stated: ‘Coal will no longer be used in energy production and the use of imported oil for the domestic needs will be cut by half during the 2020s’.

Sources: [Portugese climate plan](#), [Finish government declaration](#)

UK POLITICAL LEADERS PLEDGE TO END THE USE OF UNABATED COAL FOR POWER GENERATION (FEBRUARY 2015)

In the run-up to the UK elections, David Cameron, Nick Clegg and Ed Miliband signed a joint pledge to tackle climate change. As part of this pledge they engaged to ‘accelerate the transition to a competitive, energy-efficient low-carbon economy and end the use of unabated coal for power generation’.

Source: [The Guardian](#)

GERMANY PUTS LIGNITE-FIRED POWER PLANTS IN CAPACITY RESERVE TO MEET 2020 CLIMATE GOALS (DECEMBER 2014 TO JUNE 2015)

In December 2014, the German government introduced a plan on how to reach its target to reduce greenhouse gas emissions by 40 per cent by 2020 compared to 1990. **The plan includes:** ‘making coal plant operators reduce emissions by at least 22 million tonnes, equivalent to shutting about eight plants.’

On 2 June, Germany’s main political parties (CDU and S&D) reached a compromise:

- Germany will put 2.7 GW of lignite-fired plants into a power-capacity reserve from 2017, and close them after four years. The reserve will enable the plants to operate when supplies are short, although the facilities won’t be allowed to sell power on the market. This would lead to a reduction in carbon-dioxide emissions of 11 million metric tons a year, the Economy Ministry estimated. The cost of the reserve would be around 230 million euros per year.
- The lignite industry agreed to cut an additional 1.5 million tons a year from 2018 in a way that still needs to be negotiated.
- Germany will also shut a number of coal-fired CHPs as part of the new policy and replace them with gas-fired units. This will curb emissions by 4 million tonnes of CO₂e. Berlin aims to subsidise the construction of the gas-fired CHPs with 500 million euros per year, and stop the funding of existing coal-fired facilities.
- Measures to boost energy efficiency will save a further 11 million tons of carbon at a cost of 1.16 billion euros per year, taken from German budget.

The German cabinet is likely to pass the legislation in autumn. Gabriel, the Minister of Economy, said: ‘utilities can’t afford to cling to coal energy because Germany will have to cut 200 million tons of carbon by 2030. The real challenge is still ahead of us. We will have to start talking about it this year’.

Sources: Reuters ([one](#), [two](#)), [Bloomberg](#), [Politico](#)

COAL MARKET

E.ON E.ON TO SPIN OFF ITS FOSSIL FUEL ASSETS AS BIG LOSSES LOOM (NOVEMBER 2014)

On 30 November 2014, E.ON announced a new strategic course: ‘E.ON will focus on renewables, distribution networks, and customer solutions and combine its conventional generation, global energy trading, and exploration and production businesses in a new, independent company’.

E.ON details its future focus activities: ‘E.ON will place a particular emphasis on expanding its wind business in Europe and in other selected target markets. It will also strengthen its solar business. It will upgrade its energy distribution networks in its European markets and also in Turkey and make them smarter so that customers can take advantage of new products and services in areas like energy efficiency and distributed generation.’

The Financial Times reported: ‘E.ON, Germany’s biggest utility by market capitalisation, posted a 25 per cent drop in profit for the first nine months of this year, compared with the same period in 2013. E.ON said it expected additional impairment charges of about 4.5 billion euros in 2014, primarily on its operations in southern Europe and on generation assets, beyond 700m euros already disclosed in the first three quarters. The impairment charges will result in E.ON reporting a substantial loss.’

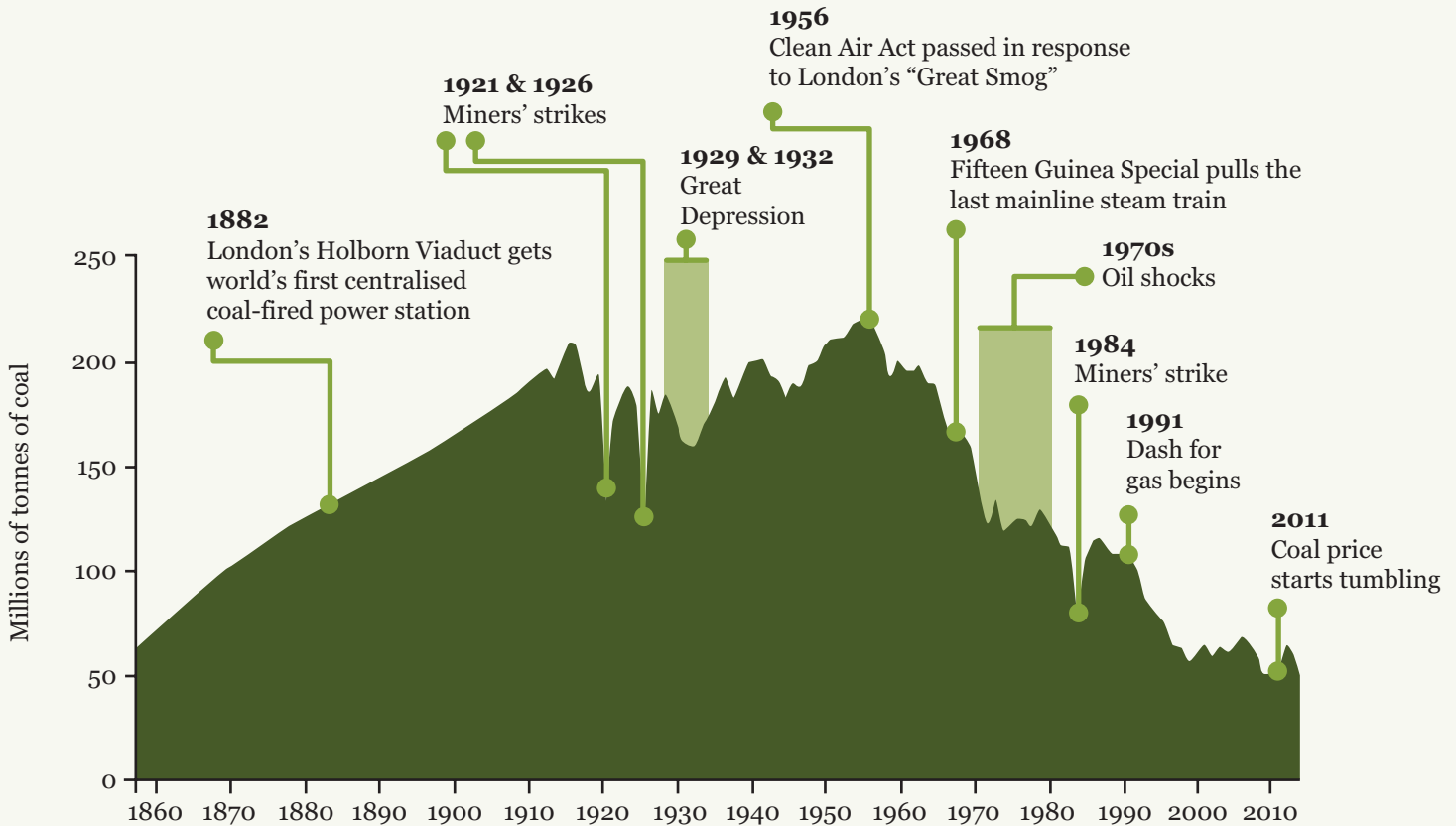
Sources: [E.ON](#), [Financial Times](#)

CARBON BRIEF UK COAL USE TO FALL TO LOWEST LEVEL SINCE INDUSTRIAL REVOLUTION (JANUARY 2015)

The UK used 49 million tonnes of coal in 2014 according to Carbon Brief estimates. That’s more than a 20 per cent reduction compared to the previous year, and the joint lowest coal use in records going back to the 1850s. Only 2009, when the country was in the depths of the financial crisis, had equally low coal consumption.

Four factors have contributed to this development: the UK’s drive to decarbonise, failure to secure government capacity payments, EU regulation, and the switch from coal to gas.

Historical coal use in the UK



Source: [Carbon Brief](#)

BLOOMBERG NEW ENERGY FINANCE EU SHUTTERS MOST COAL AND GAS POWER IN SIX YEARS (FEBRUARY 2015)

EU power companies shut 13 GW of fossil capacity last year, the most since 2009, when Bloomberg New Energy Finance started tracking data. They added 8 GW of new coal- and gas-fired generation. The EU ETS and Large Combustion Plant Directive contributed to these closures, and will continue to do so in the future.

Source: [Bloomberg New Energy Finance](#)

REUTERS GERMAN CO2 EMISSIONS FALL FOR FIRST TIME IN THREE YEARS (MARCH 2015)

Reuters reports on an announcement by the German environment ministry that 'Germany's greenhouse gas emissions fell for the first time in three years in 2014, helped by a mild winter and the expansion of renewable sources of energy'.

Emissions from gas and black coal fell by 12.9 per cent and 8.2 per cent respectively last year. Emissions from brown coal were down 2.2 per cent.

Source: [Reuters](#)

COALSWARM EUROPE HAS ONE OF THE HIGHEST RATIOS OF COAL PLANTS HALTED TO COAL PLANTS COMPLETED (MARCH 2015)

Over 33 GW of new coal capacity is proposed in the European Union, but despite the seemingly large amount of proposed coal capacity, recent history shows that Europe has one of the highest ratios of coal plants halted to coal plants completed. Moreover, as in the United States, the overall coal fleet is shrinking as plants are being retired in the European Union at a faster rate than they are being added.

Table 19: Coal capacity additions and retirements in the European Union, 2003 - 2014 (MW)

YEAR	CAPACITY ADDED	CAPACITY RETIRED	NET GAIN/LOSS
2003	1,594	2,887	-1,293
2004	163	755	-593
2005	362	959	-597
2006	135	250	-115
2007	33	524	-491
2008	1,182	594	588
2009	610	136	474
2010	1,411	100	1,311
2011	913	1,262	-349
2012	2,953	2,460	493
2013	1,646	6,918	-5,272
2014	3,467	735	2,732
TOTAL	14,469	17,580	-3,112

Source: [CoalSwarm report](#)

ENEL WITHDRAWS FROM COAL (MARCH 2015)

On 17 March 2015, Enel issues a press release in which it states – following a meeting with Greenpeace: ‘Enel’s industrial strategy is focused on further boosting investment in renewable sources, energy efficiency, smart grids and storage systems. The Group is also committed to gradually phasing out further investment in coal. Although there are still differences when it comes to assessing the Group’s definitive withdrawal from coal generation in Italy and certain methodologies to pursue more ambitious targets in Europe, the medium to long-term vision of an energy system largely based on renewable sources and energy efficiency is now a shared view’.

Source: [Greenpeace](#)

CARBON TRACKER INITIATIVE COAL CAUGHT IN THE EU UTILITY DEATH SPIRAL (JUNE 2015)

This report analyses the EU’s largest 5 power utilities (EDF, GDF Suez, Enel, E.ON and RWE), which collectively represent nearly 60 per cent of Europe’s electricity generation, during the period between 2008 and 2013 to analyse why they lost so much value; and the viability of new coal in Europe based on the assessment of future market conditions.

Its main conclusions are:

- The EU’s largest 5 power generators have collectively lost over 100 billion euros (or 37 per cent of their value) from 2008 to 2013. In contrast, Germany’s stock market increased 18 per cent over the same period.
- Improved efficiency of economies demonstrates that continued economic growth is not necessarily dependent on parallel growth in energy. Not only is the overall level of demand falling, but the proportion being met by fossil fuels is declining. Yet utilities have been banking on business as usual which has led to oversupply and excess fossil fuel capacity. In the face of increased competition, EU coal-fired generation fell 4.2 per cent over the 2008-2013 period.
- The EU ETS, continued gains in energy efficiency and increased renewable energy generation beyond 2020 will impact fossil fuel generation in the future. A case study of Vattenfall’s newly built Moorburg coal plant shows that it could potentially generate a negative Net Present Value (NPV) range of 2.6 billion to 3.7 billion euros over its lifecycle.

Figure 3. Market capitalisation of surveyed utilities

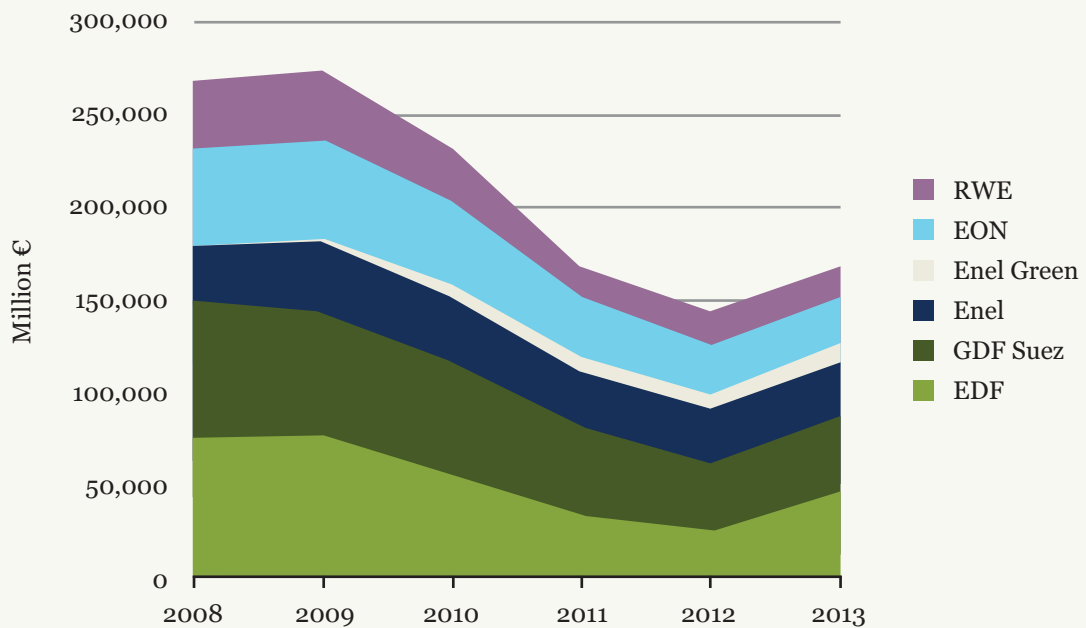
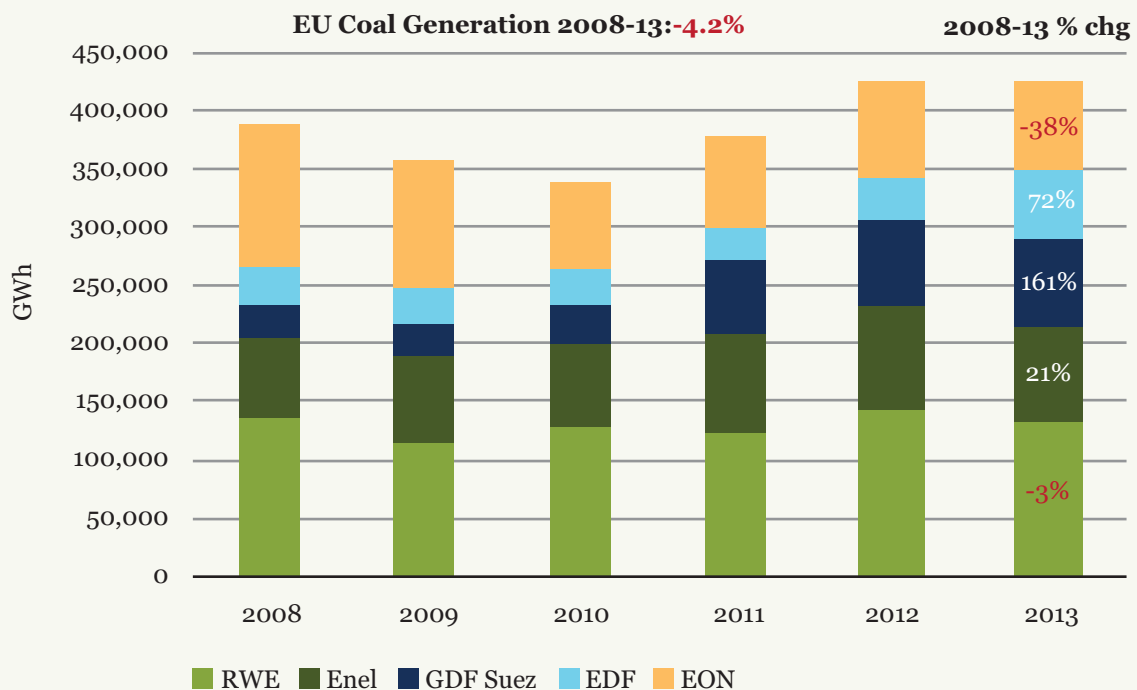


Figure 13. Coal generation from 2008 to 2013. Gwh



Source: [Carbon Tracker Initiative report](#)

RWE RESTRUCTURING (JULY/AUGUST 2015)

An article in Handelsblatt refers to a leaked email of Peter Terium, CEO of RWE, that hints at a restructuring of the company in light of decreasing profits: ‘When Mr. Terium took up the post of chief executive in 2012, RWE earned 49 euros per MWh for electricity; that price has fallen to 30 euros. The company’s profits have fallen correspondingly, with earnings in 2014 down to 4 billion euros, down by a quarter. Mr. Terium anticipates a further drop to 3.6 billion euros for 2015.’ The article quotes the development of renewable energies (energiewende) and announced regulations (see above) by German government to decrease brown coal as reasons for the decreased profits.

On 10 August, RWE announced the approved restructuring consisting of five pillar: ‘RWE AG will no longer exist as a holding and will be changed into an operating company, structures to become leaner, bureaucracy reduced, many executive board and supervisory board

committees within the Group to be dissolved, all locations to remain unaffected’.

Source: [Handelsblatt](#), [RWE](#)

NEW GERMAN COAL PLANT WORTH ONE EURO (JULY 2015)

23 municipal utilities were reported to want to sell their stakes in a coal fired power plant in Hamm which has a collective capacity of 1.6 GW. RWE made them a surprising offer: one euro per municipal for their entire holdings – initially worth 2.5 billion euros. In other words, the 2.5 billion euro stake is now worth 23 euros.

Source: [Renewables International](#)

STATE-OWNED COMPANIES BAIL OUT EUROPE’S BIGGEST COAL MINES (JULY 2015)

Reuters reported in July 2015 about the troubles of Polish mines: ‘KW, which is the EU’s largest coal mine, and JSW, the bloc’s biggest coking coal producer, are both facing insolvency, an outcome which would anger politically-influential mining unions in an election year. To avoid that, Poland’s treasury ministry has forged a special fund whose function is in part to help the troubled state-run mines. It will have 6 billion zlotys (\$1.59 billion) worth of assets... State bank BGK and its investment vehicle PIR are to invest 1.5 billion zlotys in the fund by the end of August. The rest is supposed to come from major Polish companies, either in the form of cash or non-cash assets.’ Copper mine KGHM, utility PGE and chemicals producer Grupa Azoty would – according to sources – have agreed to invest in the fund.

Source: [Reuters](#)

FRENCH BANKS PLEDGE NOT TO FINANCE MEGA COAL PROJECTS IN AUSTRALIA (APRIL 2015)

COAL FINANCE

Three French banks (BNP Paribas, Crédit Agricole and Société Générale) committed by letter to not support coal projects in the Australian Galilee Basin.

There are two major integrated coal projects planned for Central Queensland, each of which comprises a mega-mine, a railway, coal loading facility and some also comprise a power plant. The larger project is the Carmichael mine proposed by the Adani Group, which is estimated to need \$16.5 billion in external financing, and which would produce up to 60 million metric tons per annum (MTPA) of coal for export. The mine would move coal on a planned rail line to Abbot Point, where the company plans to build a coal loading facility, which would require dredging in the Great Barrier Reef World Heritage area. A second project, the Alpha mine proposed by GVK would require \$10 billion in external financing and would produce up to 30 MTPA of coal for export through Abbot Point. The project would also require the construction of a rail link and a coal loading facility at Abbot Point, also requiring dredging in the Great Barrier Reef.

Sources: [letters by BNP Paribas](#), [Crédit Agricole](#) and [Société Générale](#)

CRÉDIT AGRICOLE ANNOUNCES END TO GLOBAL COAL MINING LENDING AT AGM (MAY 2015)

Crédit Agricole announced at its annual general assembly (20 May) a commitment to end global coal mining lending. ‘Credit Agricole SA has taken the decision to no longer finance coal mining projects or companies specialised in this field’, outgoing Chief Executive Jean-Paul Chifflet told shareholders.

In its updated policy on metals and mining they have included coal mining projects in their exclusion criteria and state that they will not develop relationship with clients predominantly active in coal mining.

Source: [Reuters](#)

AXA DIVESTS FROM COAL (MAY 2015)

Henri de Castries, Chairman and CEO of AXA announced on 22 May 2015: ‘It is our responsibility, as a long term institutional investor, to consider carbon as a risk and to accompany the global energy transition. The burning of coal to produce energy is today clearly one of the biggest obstacles preventing us from reaching the 2°C target. For this reason, AXA has decided to divest from the companies most exposed to coal-related activities for the assets managed internally. This initiative represents a divestment of EUR 0.5 billion.’

He continued: ‘In addition to this exclusion policy, AXA also has a positive approach. That is why we also commit to tripling our green investment footprint aiming to reach to over EUR 3 billion by 2020 for our General Account, coming principally from investments in clean technology private equity, green infrastructure, impact investment and green bonds.’

The company said it would remove from its portfolio and refrain from future investment in mining companies that derive more than half of their turnover from coal mining, and in electrical utilities that take more than half of their energy from thermal coal power plants.

Sources: [Axa](#), [The Guardian](#)

AVIVA BOOSTS INVESTMENTS IN RENEWABLES AND ENERGY EFFICIENCY, AND ENVISAGES DIVESTMENT FROM COAL (JULY 2015)

On 24 July, insurance company Aviva published a major report on the risk of climate change to investors. Mark Wilson, CEO of the company stated: ‘If we don’t tackle climate change and temperatures rise by 6 degrees, the value at risk – roughly speaking the value of global assets - will decline by up to \$13.8 trillion for investors – that’s 13.8 followed by an eye-watering 11 zeroes. And for governments it climbs higher – to \$43 trillion - if temperatures rise by 6 degrees.’

Aviva also made its strategic response to climate change public at the same event, consisting of five pillars: integrating climate risk into investment considerations, investing in lower carbon infrastructure, supporting strong policy action on climate change, active stewardship on climate risk, divesting where necessary.

With regards to investments in low carbon infrastructure, the policy notes: ‘We will target a £500 million annual investment in low-carbon infrastructure for the next five years... and are setting an associated carbon savings target for this investment of 100,000 tonnes CO₂ annually’. The major focus of Aviva will lie in the European market.

With regards to coal divesting, the policy notes: ‘We will divest highly carbon-intensive fossil fuel companies where we consider they are not making sufficient progress towards the engagement goals set. We have identified an initial set of 40 companies where Aviva has beneficial holdings and which have more than 30 per cent of their business (by revenue) associated with thermal coal mining or coal power generation... These 40 companies will form the basis of well-resourced and focused initial engagement over the next 12 months. Engagement progress will be reviewed on an annual basis. Where we consider companies are not making sufficient progress towards the engagement goals, we will withdraw our capital. This is intended to add additional focus to the engagement.’

Source: [Aviva](#)

STANDARD AND POOR’S LOWERS RWE’S CREDIT RATING (AUGUST 2015)

On 28 August, Standard and Poor’s lowered RWE’s credit rating to BBB+: ‘in our view, the business risk profile of German utility RWE AG has weakened, owing to continuously weak profitability amid challenging market conditions that are unlikely to improve materially in the medium term. Furthermore, RWE’s divestment program has shown limited results, failing to compensate for the impact of lower cash generation on key credit metrics. RWE’s financial risk profile has therefore in our view deteriorated.’

Source: [Reuters](#)

RENEWABLES

WIND BLOWS AWAY FOSSIL POWER IN THE NORDICS (OCTOBER 2014)

Fossil power plants in Finland and Denmark act as swing-producers, helping to meet demand when hydropower production in Norway and Sweden falls due to dry weather. The arrival of wind power on a large scale has made this role less relevant and has pushed electricity prices down, eroding profitability of fossil power plants. Short-run marginal costs of coal generation were 28.70 euros per megawatt-hour (MWh). Nordic wholesale forward power prices ENOYc1 have almost halved since 2010 to little over 30 euros per MWh as capacity increases while demand stalls.

According to Marius Holm Rennesund from the Oslo-based consultancy THEMA: ‘The Nordic system price will likely more often clear well below the production cost for coal fired power production. This will, in our view, result in mothballing of 2,000 MW of coal condensing capacity in Denmark and Finland towards 2030’. The developments in the Nordic countries are also beginning to affect utilities in the Baltic states as their grids get more integrated.

Source: [Reuters](#)

EUROSTAT ENERGY CONSUMPTION IN EUROPE AT LOWEST LEVEL SINCE 1990 (FEBRUARY 2015)

Energy consumption in the European Union in 2013 has fallen to levels last seen more than two decades ago, according to data from Eurostat. For Euractiv this ‘reflects in part the continuing economic troubles in the eurozone, but also efforts taken by member states and businesses to cut energy use and improve efficiency’.

Solid fossil fuel primary energy consumption gradually declined – with an exception for 2011 – from 453.2 Mtoe in 1990 to 285.2 Mtoe in 2013, while renewable consumption increased from 71.3 Mtoe to 196.6 Mtoe.

Sources: [Eurostat](#), [Euractiv](#)

EWEA RENEWABLES ACCOUNTED FOR 79.1 PER CENT OF INSTALLED POWER GENERATING CAPACITY IN 2014 (FEBRUARY 2015)

This study gives an overview of annual (2014) and cumulative capacity additions in Europe since 2000 for all energy sources:

Figure 5. Installed power generating capacity per year (MW) and renewable share (per cent)

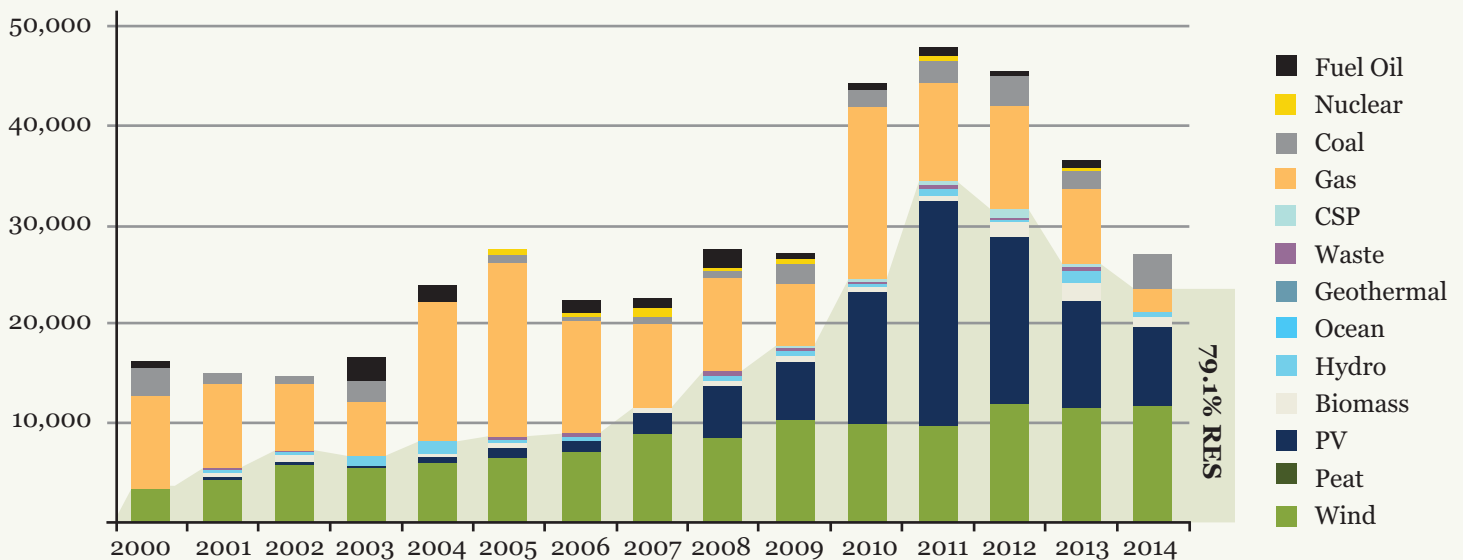
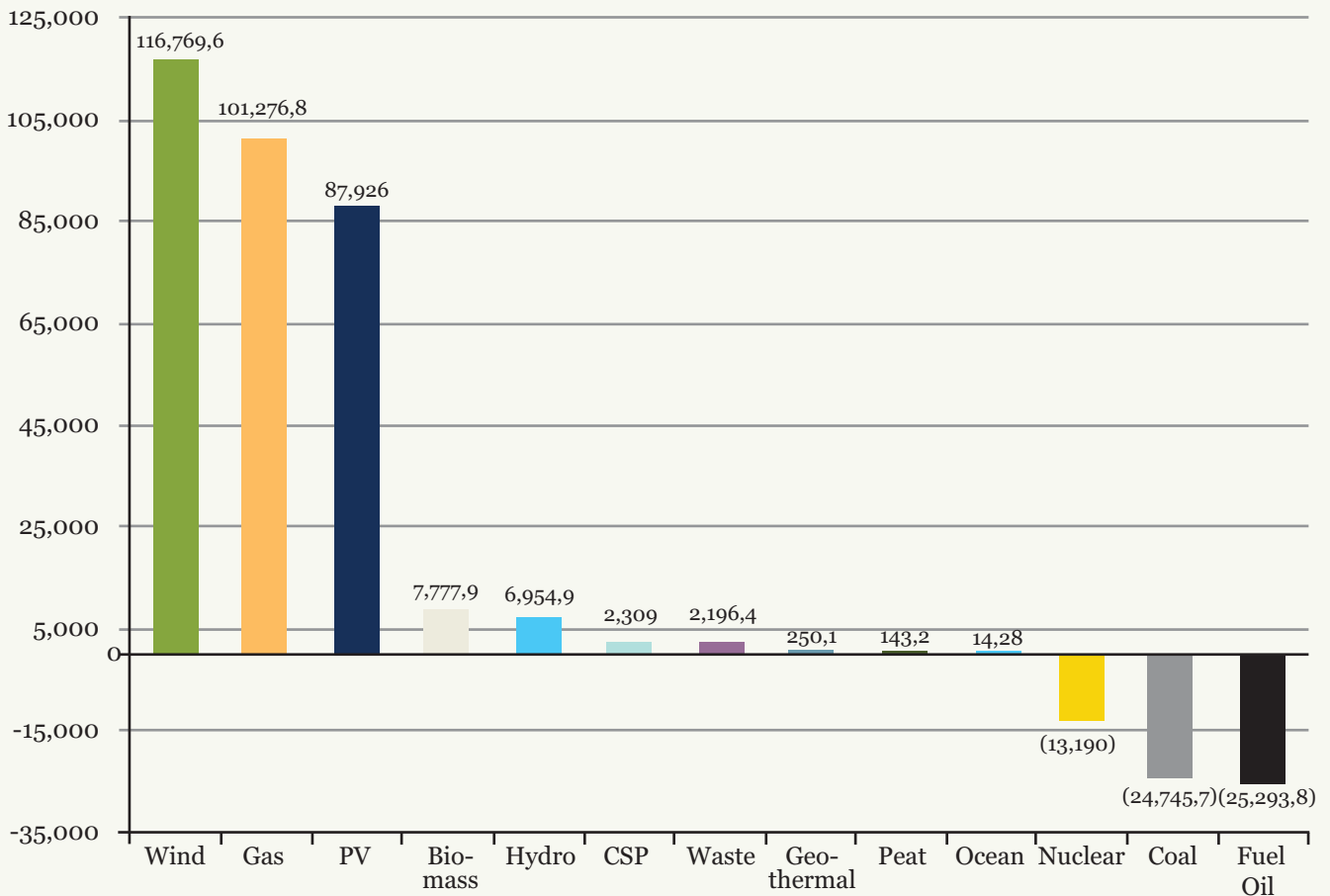


Figure 6. Net electricity generating installations in the EU 200-2014 (MW)



Source: [EWEA](#)

FRAUNHOFER INSTITUTE AND AGORA ENERGIEWENDE SOLAR WILL SOON BE THE CHEAPEST POWER SOURCE IN MANY WORLD'S REGIONS (FEBRUARY 2015)

This study looks at the future cost of solar power in Europe and beyond. Its key conclusions are that:

- Solar photovoltaic is already today a low-cost renewable energy technology: ‘The feed-in tariff paid for electricity from large-scale photovoltaic installations in Germany fell from over 40 ct/kWh for installations connected in 2005 to 9 ct/kWh for those connected in 2014. The cost of producing power through newly built gas- or coal-fired power plants ranges from 7 to 11 ct/kWh.’
- Solar power will soon be the cheapest form of electricity in many regions of the world: ‘Depending on annual sunshine, power costs of 4-6 ct/kWh are expected in Europe by 2025, reaching 2-4 ct/kWh by 2050. These results indicate that in future, power produced from large-scale solar photovoltaic plants will be cheaper than power produced from any conventional technology in large parts of Europe.’
- Financial and regulatory environment will be key for reducing costs in the future: ‘Producing power from solar photovoltaic requires a high up-front investment, but subsequently allows power production for 25 years and more at a marginal cost of close to zero. It is thus a very capital-intensive power-generation technology, and the interest paid on both debt and equity has a large effect on the total cost of a large-scale photovoltaic project.’
- Most scenarios fundamentally underestimate the role of solar power in future energy systems.

Figure E4. Cost of electricity from new solar power plants in Southern and Central Europe



* Real values in EUR 2014; bandwidth represents different scenarios of market, technology and cost development, as well as power plant location between south of Germany (1190 kWh/kWp/y) and south of Spain (1680 kWh/kWp/y); assuming 5% (real) weighted average cost of capital.

Source: [Fraunhofer Institute report](#)

BLOOMBERG LESS POWER OUTAGES IN GERMANY WITH MORE RENEWABLES (APRIL 2015)

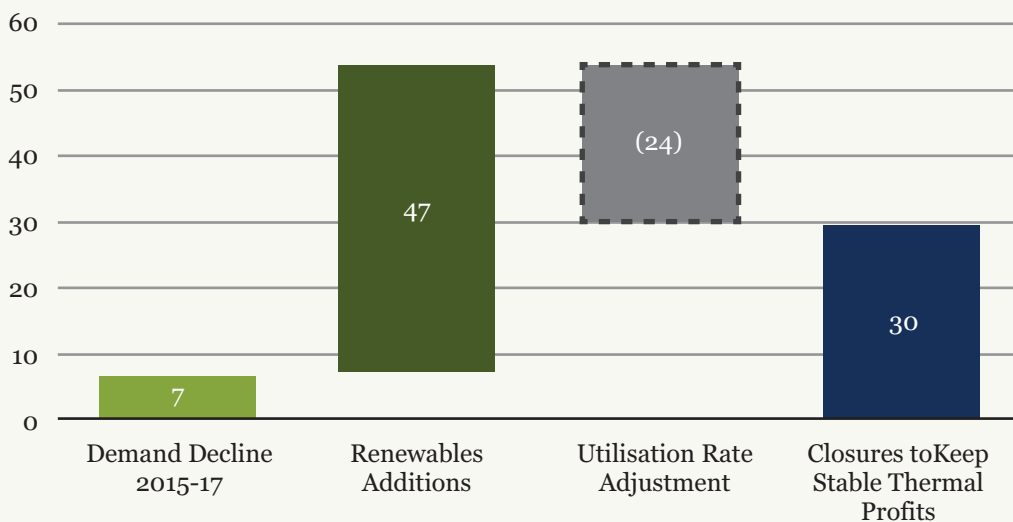
This article gives a sense of how Germany tackles the challenges of increased levels of renewable energy into the electricity grid: ‘the system has been so successful that Germany experiences just 15 minutes a year of outages, compared with 68 minutes in France and more than four hours in Poland. The model in Germany, the biggest economy in the world to rely so heavily on renewables, is being copied from California to China as wind and solar displace traditional fuels such as nuclear and coal.’

Michael Liebrich, founder of Bloomberg says: ‘there’s a myth among opponents of renewable energy that you need 100 per cent backup spinning all the time, and it’s utter nonsense. Any grid needs flexibility. You can have a nuclear plant shut down by jellyfish or a coal plant closed because of a freeze and you can’t shovel in supplies fast enough.’

Source: [Bloomberg](#)

UBS RENEWABLES ARE PUSHING COAL AND GAS OUT OF THE POWER MARKET (APRIL 2015)

Figure 7. Thermal closures needed to keep stable profits (GW)

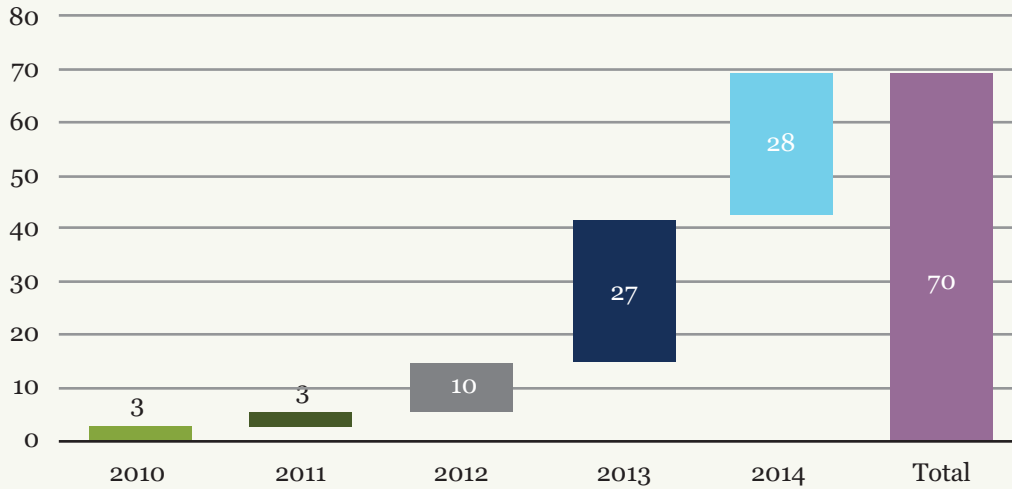


Source: UBS

In April, several media outlets reported on analysis by UBS on how renewables are pushing coal and gas out of the power market. According to their data, some 70 GW of coal and gas-fired generation shut-downs have occurred in the last five years, and the pace is increasing.

The combination of reduced demand and yet more renewable energy additions over the next two years will force the closure of at least 24 GW of thermal capacity (coal and gas), and could lead to another 30 GW of closures just to ensure that the remaining coal and gas fired plants can stabilise profits.

Figure 8. Coal and CCGT closures show major acceleration in 2013 -14 (GW)



Source: UBSe, Company data

Source: [reneweconomy](#)

WIND POWER GENERATES 140 PER CENT OF DENMARK'S ELECTRICITY DEMAND (JULY 2015)

Based on data of Danish transmission systems operator Energinet, The Guardian reports that: 'On an unusually windy day, Denmark found itself producing 116 per cent of its national electricity needs from wind turbines yesterday evening. By 3 am on Friday, when electricity demand dropped, that figure had risen to 140 per cent. Interconnectors allowed 80 per cent of the power surplus to be shared equally between Germany and Norway, which can store it in hydropower systems for use later, Sweden took the remaining fifth of excess power.'

Source: [The Guardian](#)



Young activists in black T-shirts take part in the People's Climate March in protest to stop the use of Coal and start using Renewable Energy Resources in New Delhi, Delhi, India. 20 September 2014.

WHAT IS NEW IN INDIA?

POLICY

INDIA TO BOOST NATIONAL SOLAR TARGET TO 100 GW BY 2022 (NOVEMBER 2014)

In November 2014, India's energy minister Piyush Goyal said the nation's solar target is to be multiplied from 20 to 100 GW by 2022. The minister also announced the target of adding 8 GW of wind power per year.

To meet these goals India will need to increase its pace of renewable energy capacity addition seven times, from an average 3 GW/year to 20+ GW/year. Since 2007, the country has averaged 15 GW of new power capacity each year from all technologies.

Sources: [Bloomberg](#)

INDIA USES COAL TAX TO HELP FUND 21 GW OF NEW SOLAR DEVELOPMENT (DECEMBER 2014)

The Indian government announced in December 2014 the approval of 21GW in new solar development with over US\$800 million in government funding made available.

The new solar projects will predominantly use Viability Gap Funding (VGF). VGF is available from National Clean Energy Fund (NCEF). The NCEF gets its funds from the cess levied on coal companies (INR 200/tonne) for domestic production and import of coal. The NCEF is operated by the Ministry of Finance, and awarded to the Ministry of New and Renewable Energy (MNRE) for funding research and innovative projects in clean energy technologies.

The national government is providing INR5050 crore (US\$809 million) in total, for two solar development schemes, one for at least 20GW of 'ultra mega' solar power parks, and another for 1GW of on-grid solar. Till date, 17 solar parks of aggregate capacity 12,739 MW have been approved to 12 States.

Source: [PV tech](#), [Indian Government](#)

USA AND INDIA AGREE ON CLEAN ENERGY COOPERATION (JANUARY 2015)

The website of the White House notes: 'to further support the achievement of our ambitious climate and clean energy goals, the United States and India have pledged to enhance our cooperation in this area. The United States ... intends to support India's goal by enhancing cooperation in clean energy and climate change. USAID will install a field investment officer in India this summer, backed by a transactions team to help mobilize private capital for the clean energy sector.'

An analysis of IEEFA further looks into the potential for close cooperation with the USA: 'India's decision to allow US dollar-based investment in solar energy could well be a game-changer for global energy markets and investors alike. Indian energy minister Goyal's plan is to overcome this limitation by pricing solar power purchase agreements in US dollar terms, allowing solar project developers to access the significantly larger debt market globally that currently has an insatiable appetite for U.S.-dollar denominated, longer duration debt. Goyal will then centrally pool the currency hedging costs, and price this into the cost of the fully hedged rupiah-denominated electricity rates offered to power utilities.'

Source: [White House](#), [IEEFA](#)

NATIONAL RENEWABLE ENERGY ACT TO CHANGE INDIAN RENEWABLE ENERGY LANDSCAPE (JULY 2015)

According to press report, to consolidate the renewable energy (RE) sector and give it an institutional structure, the Union government has drafted the National Renewable Energy Bill, 2015. After it is passed by Parliament it would enable a National Renewable Energy Policy, Renewable Energy Corporation of India, an advisory group and a committee on the same.

Source: [business standard](#)

COAL MARKET

COAL INDIA NET PROFITS DECLINED BY 28 PER CENT YEAR-ON-YEAR (NOVEMBER 2014)

Live Mint reports that the ‘combination of muted realizations and higher costs meant that CIL’s net profit declined by 28 per cent year-on-year to Rs.2,192 crore, which was much lower than the estimated figure of Rs.3,033 crore based on a Bloomberg poll of analysts... CIL’s share has declined by 17 per cent from its high in June.’

Source: [Live Mint](#)

COALSWARM AMOUNT OF COAL CAPACITY UNDER CONSTRUCTION DROPS BY 33 PER CENT IN 2 YEARS TIME (MARCH 2015)

CoalSwarm conducted a plant-by-plant examination of proposed coal plants in India early 2012. It finds that the amount of capacity under construction dropped from 103,292 MW in 2012 to 69,471 MW in 2014, a decline of 33 per cent. Overall, only 9,536 MW actually entered construction during the period from mid-2012 to mid 2014.

For every one coal plant built in India, six are shelved or cancelled. This hesitancy derives from a confluence of negative factors, including the following: (1) citizen opposition, which appears to be effective in blocking projects even at advanced stages of development, (2) ongoing coal shortages due to Coal India’s inability to meet production targets, (3) very low operating efficiency for India Railways in actually freighting coal on time and as specified, (4) the Coalgate scandal, (5) upheaval in the international coal markets, (6) competition from renewables, and (7) a hugely ineffective transmission and distribution grid (with electricity loss rates regularly exceeding 25 per cent).

Source: [CoalSwarm report](#)

RENEWABLES

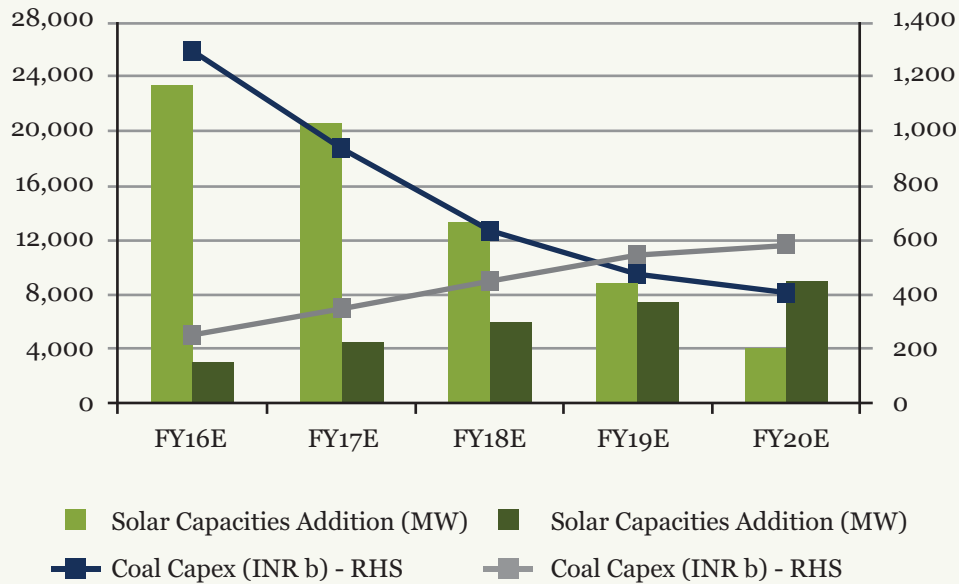
DEUTSCHE BANK INDIA SOLAR POWER INVESTMENTS COULD SURPASS THOSE OF COAL (JULY 2015)

In its ‘Make way for the sun’ report, Deutsche Bank sets out its upward-adjusted expectations for the development of solar power in India.

The report identifies the government as an important driver for the favourable context for solar in India: ‘India could become one of the largest renewable producers in the world, with an increase in its target from 20 GW to an ambitious 100 GW by 2022 – similar to China’s target of 100 GW by 2020. State administrations are providing the necessary framework and infrastructure to achieve this goal, attracting interest from not just domestic corporate houses but also global players.’

A second driver is the decreasing capital costs and solar tariffs: grid parity is in sight, and solar could generate a reasonable return on investment (19 per cent on average for the lifetime of the project).

Figure 11. Solar capex and capacities could overtake coal



In light of these two drivers, Deutsche Bank believes it technically achievable to add 100 GW solar power capacity by 2022. Realistically, however, ‘challenges of weak financials of distribution companies and grid constraints need to be addressed. Hence, our forecasts consider 34 GW solar power capacities in India by 2020. The intent is in place, but a comprehensive strategy is still needed to achieve this large number’.

Deutsche Bank forecasts ‘20 per cent renewable from 13 per cent currently over the next five years. By 2020, solar power capacity additions and investments could surpass those for coal-based power projects’. When modelling for 30 GW solar power capacity additions, ‘India could cut coal dependence by 8 per cent (70 mt) by 2020. This could represent a large saving of costs, helping to cut down costly imports (total imports amount US\$17-18 billion per year), as well as bring about a major reduction in the carbon footprint’.

Finally, companies have started to ride the wave of solar development: ‘utilities - NTPC, Reliance and Adani - are early adopters and making large-scale commitments’.

Source: [Deutsche Bank research paper](#)

IEEFA INDIA’S AMBITIOUS RENEWABLE ENERGY TARGETS CAN BECOME GAME CHANGER FOR ITS ELECTRICITY MARKET (AUGUST 2015)

In this report, IEEFA puts to light the targets that the Indian government presented in order to reform its energy system: ‘The goal for India is to build energy security by diversifying supply reliance beyond coal, hydro, nuclear and gas, to significantly expand levels of wind, solar and biomass. The Modi government’s goal of adding 175 GW of renewables by 2022 and accelerating the deployment of distributed-energy microgrids underpins this transformation’.

The study finds that: ‘India could supply net electricity sufficient to underpin 7 per cent annual GDP growth in the seven years to 2021-22 (60 per cent overall) with coal-fired electricity delivering only 32 per cent of the overall expanded electricity production required.’

It also finds: ‘Energy Minister Piyush Goyal’s hope for India to cease thermal coal imports is entirely feasible. In this context, the Government of India’s ambition to double Indian domestic coal production to 1,500Mtpa by 2021-22 is actually likely to oversupply India with coal by 400 Mtpa. On this basis, we believe it would be prudent for India to go slow on new thermal power plant additions, lest they end up stranded similar to generator fleets in China, the U.S. and Australia’.

Source: [IEEFA report](#)



Woman carrying fuelwood from Cinnamon trees, Kerinci area Sumatra, Indonesia

WHAT IS NEW IN INDONESIA?

COAL MARKET

COALSWARM ONLY ONE THIRD OF PROPOSED COAL PLANTS UNDER CONSTRUCTION (MARCH 2015)

Indonesia is currently the world's largest exporter of thermal coal, with roughly 75 per cent of coal production leaving the country, primarily to Asia (EIA 2014). While the country has recently proposed over 32 GW of new coal-fired plants, only 6.7 GW of capacity is permitted or under construction.

Source: [CoalSwarm report](#)

INDONESIAN COAL PRODUCTION FALLS FOR THE FIRST TIME IN 30 YEARS (FEBRUARY TO JUNE 2015)

In January the Indonesian government published its projections for coal production in 2015: 425 million tonnes of coal with 333 million tonnes earmarked for exports. This compares to production of 435 million tonnes in 2014 and exports of 359 million tonnes. The government also announced its intentions to boost income from the sector by increasing royalties for coal mining companies that hold Mining Business Permits, and intended to revoke 4,600 mining permits from firms who do not hold the correct certification.

In April it seemed that projections had been too optimistic: Indonesian coal output dropped by 21 per cent in the first three months of the year as low prices for the commodity forced mining companies to reduce activities to cut production costs. Data from the Energy and Mineal Resources Ministry's directorate general for mineals and coal shows the total output for the first quarter of the year amounted to 97 million tons, down from 124 million tons in the same period last year.

Indonesian Coal Mining Association (APBI) chairman Pandu Sjahrir said: 'Having seen pressures in the last few years, mining firms have tried to cut costs. The industry is now very efficient. As the price continues to decline, companies have no other choice other than cutting down production. Of 14 publicly listed companies whose production makes up around 80 per cent of the national output, only five reported net profits last year. Thus smaller firms were suffering more in the current situation and many had decided to discontinue business.' 40 per cent of coal mining companies have stopped their activities according to the association.

Later in April, Sjahrir added that Indonesian coal production may fall to between 350 and 400 million metric tons in 2015, from 458 million tons in 2014 as the Chinese slowdown is worse than expected. This decline is extremely unusual considering that the country's coal output has been growing for at least 30 years.

Reporting from Reuters in June confirms the January reporting about the Indonesian government's plans to consolidate its mining sector in light of the low coal prices: 'Indonesia will push for consolidation in its mining sector while coal prices are low and may soon revoke more than 4,000 licences that have caused problems in the coal and mineals sectors. Indonesia had issued around 10,100 of the newer mining licences known as IUPs, but only around 6,000 of these had been certified as complying with government rules.'

Sources: Jakarta Post, Indonesia Investments ([one](#), [two](#)), [CNN Indonesia](#), [Reuters](#)

COAL MARKET

INDONESIAN PRESIDENT PRIORITIZES CLEAN SOLUTIONS TO REACH ENERGY TARGETS (JULY 2015)

The Jakarta Post reports on the government initiation of the development of several geothermal-fueled power plants (PLTP) in several regions.

The article quotes a speech President Widodo delivered at the inauguration of a geothermal power plant, stating that the government would gradually shift its focus from coal power plants to power plants that are more environmentally friendly: 'I have ordered the coordinating economic minister [Sofyan Djalil], the state-owned enterprises minister [Rini Soemarno] and the energy and mineal resources minister [Sudirman Said] that, in the future, environmentally friendly electricity plants must be prioritized. Of the total 35,000 MW worth of power plants targeted to be built within the next five years, 90 per cent of them are coal fueled. This must be changed in stages as there are renewable energy sources, such as wind, waves, solar and biomass, that can produce thousands of MW of electricity, although their development may be a bit costly. There will be special incentives for investors who agree to develop environmentally friendly power plants.'

Source: [Jakarta Post](#)



The Ivory Park EcoCity, just outside Johannesburg, has created an EcoVillage, funded by the SA Department of Environmental Affairs and Tourism's Poverty Relief Programme, and partnered by WWF's Beddington Zero Energy Development project. The EcoVillage is meant as a showcase of how eco-friendly living is also community friendly. All buildings are constructed for maximum energy-efficiency, using recycled materials wherever possible. Energy-efficient heating and cooking methods are also showcased here. Republic of South Africa

WHAT IS NEW IN SOUTH AFRICA?

COAL MARKET

ESKOM RUNS IN FINANCIAL PROBLEMS AS KUSILE AND MEDUPI COAL PLANT ARE DELAYED (JANUARY TO MARCH 2015)

Eskom, which supplies 95 percent of South Africa's power, is struggling to plug a 225 billion-rand funding gap required to build new plants and maintain existing ones. It has difficulties to provide stable supplies because of technical faults that lead to emergency repairs, and implemented almost daily rolling blackouts at the start of 2015.

Illustrative for the malaise are the issues that arise over the operationalization of the Kusile and Medupi coal plants:

- In January 2015, Eskom announced that the first unit of the Kusile coal plant would not come online before the first half of 2017. This represents a major delay from earlier indications that this milestone could be achieved in the first half of 2016.
- It also appeared, at that time, that plans to bring the 10 units of the Kusile and Medupi plants online with 6 months intervals was no longer tenable, with the University of Cape Town even suggesting that the time lapse between the first two Medupi units could run up to 2.5 years.
- The first unit of the Medupi coal plant was only connected in March 2015, while it was expected to begin producing power in 2012. The unit was officially opened at the end of August.

The South African government was forced to come to the aid of Eskom, a state-owned company:

- President Zuma noted that power outages had shaved off 1 percentage point off growth and contributed to South Africa's economic contraction in the second quarter of 2015.
- The South African government included in its budget that Eskom will receive 10 billion rand (\$816 million) in June, the first payment of a 23 billion-rand cash injection for the utility.

Source: [Mining Weekly](#), [Bloomberg](#), [Business Report](#)

SOUTH AFRICAN COAL EXPORTS EXPECTED TO GO DOWN (MARCH TO JUNE 2015)

Platts reports that local producers may be getting a financial incentive to halt exports, as Eskom would be willing to pay a premium for this coal in order to feed its power plants. A deal would be under discussion for one particular coal mine only, but a more widely-adopted approach could have a notable effect on export supply from South Africa.

Despite this analysis, Reuters reported on plans to upgrade the South Africa's Richards Bay Coal Terminal (RBCT). Five existing substations will be reconfigured and one new station will be built in a project that will be completed in January 2018. The total investment is worth 1.34 billion rand (\$108 million).

Source: [Oil price](#), [Reuters](#)

ENGIE DROPS PLANS TO INVEST IN SOUTH AFRICAN COAL PLANT (JUNE 2015)

In June 2015, Engie decided to no longer continue its plans to invest in the Thabametsi coal plant (1200MW) that is planned to be built in the area of Waterberg.

Source: [Mediapart](#)

COAL IMPACTS

COAL MINING RISKS DESTRUCTION OF PROTECTED AREAS AND LOCAL COMMUNITIES' INCOME (JULY 2014)

Several news articles report about the risk that coal mining projects impact protected areas and local communities, and the resistance against such activities go forward:

- In July 2014, The Guardian reported about how plans for an open cast coal mine threatens to impact the Hluhluwe-Imfozoli park in KwaZulu-Natal province. This park is home to, amongst other wildlife, White Rhinos. Coal mining would add to the threat of illegal poaching, and also impact the local communities (health, clean water, farming, etc.).
- In December 2014, local opposition against another coal mining project in Makhado (Limpopo Province) – that impacts farming practices – led to a court order that halted portions of the work.
- In April 2015, a broad-based coalition of eight civil society and community organisations launched an appeal to the Minister of Mineal Resources to set aside the Department of Mineal Resources' decision to grant a mining right to a mining company inside a declared protected environment near Wakkerstroom in the Mpumalanga grasslands. The activities fall in an area of immense hydrological importance that is the source of three major rivers in South Africa and is composed mostly of wetlands, wetland clusters and pans.

Source: [The Guardian](#), [BDlive](#), [Centre for environmental rights](#)

LAX POLLUTION LIMITS COULD CAUSE 19.000 PREMATURE DEATHS (MARCH 2015)

In March 2015, the South African government gave a five-year reprieve to some top polluters, including power utility Eskom, to meet new air emissions standards. Environmental watchdogs warned that the postponements were likely to come at a heavy cost to human lifespans, leading to as many as 19 000 premature deaths nationwide from lung cancer, heart disease and respiratory illness in coming decades.

Source: [Reuters](#), [Iol Skytech](#)

RENEWABLE MARKET

SOLAR POWER DEVELOPMENT EXCEEDS EXPECTATIONS (JANUARY TO JUNE 2015)

Business Report reported in January that 'South Africa has so far procured about 3900 megawatts of capacity through three competitive rounds of bids by independent producers of renewable energy, with about \$10 billion invested. That already exceeds the 3725 megawatts initially sought from five bid windows. An additional 3600 megawatts will be sought.'

The national energy regulator stated in that regard that 'there is growing interest from South African electricity customers to install rooftop photovoltaic systems in order to reduce their electricity bill and supplement their consumption'.

Realising that solar power could be a part of the solution for the dire energy situation of the country; the regulator has started reflections on the implementation of feed-in tariffs and net-metering to further support the growing solar energy market. The Council for Scientific and Industrial Research contributed to this reflection by publishing a study on how such measures could be constructed, citing: 'Due to drastically reduced prices for Photovoltaic (PV) systems and significantly increased electricity tariffs in the last five years, embedded PV generators are now attractive for many electricity customers in South Africa as a supplement to their main electricity supply. But embedded PV is not only attractive for individual electricity customers; it is also a cost-competitive new-build option in South Africa for the power system as a whole and a supplement to the fleet of new large, central power generators.'

Source: [Business Report](#), [CSIR](#)

GOVERNMENT'S RENEWABLE ENERGY PROGRAMME REAPS SUCCESS (JUNE 2015)

Tina Joemat-Pettersson, the South African minister of energy said in a recent speech that the country has added a total of 4,322MW of renewable energy capacity in less than four years. Medupi is designed to supply 4,764MW.

Part of this success can be explained by the Renewable Energy Independent Power Producers Procurement Programme [REIPPPP] – set up in 2009 by the Department of Energy – that invites companies and consortia to competitively bid around clearly constructed criteria.

Analysis by Rezco Asset Management indicates that: ‘round one bids were accepted at 115c/kWh, round two came in at 100c/kWh, round three at 74c/kWh, and by the time round four was reached in August 2014, the bid price had dropped to 62c/kWh. The same process caused solar power to be bid down from 275c/kWh in round one to 79c/kWh in round four. This should be compared to the expected cost of 128c/kWh of new coal power from Medupi. Coal-generated cost increases to 168c/kWh if the cost of infrastructure like dams is included. The final costs of nuclear power are forecast to be more expensive than coal.’

On 16 April, the Department of Energy approved 13 more new renewable IPP bids, which means there will now be 79 REIPPPP projects with 5 243MW being added to the national grid.

Source: [South Africa Info](#), [The Guardian](#)

RENEWABLES GENERATE HUGE SAVINGS FOR THE SOUTH AFRICAN ECONOMY (JUNE 2015)

The Council for Scientific and Industrial Research calculated that renewables generated net total benefit of R4 billion (or R2 per kWh of renewable energy) to the economy between January and June 2015 due to fuel cost savings and so-call ‘unserved energy’ (i.e. hours during which the supply situation was so tight that some customers’ energy would have had to be curtailed if it had not been for renewables).

CSIR stated in this regard: ‘Our study shows that in the first six months of 2015, the trend that started in 2014 continued and speeded up, and that renewable energy provided a huge net financial benefit to the country.’

Source: [CSIR](#)



The world's largest solar power facility, named Solar 2, which produces 10 megawatts of electricity. The 1'926 heliostats provide 81'400 square meters of sun-capturing surface area. Daggett, near Barstow, California, Mojave Desert, United States of America

WHAT IS NEW IN THE USA?

POLICY

WHITE HOUSE AND EPA PRESIDENT OBAMA PRESENTS FINAL CLEAN POWER PLAN (AUGUST 2015)

On 3 August, President Obama and the Environmental Protection Agency presented the final clean power plan, an implementation rule under the clean air act.

The New York Times summarized the main elements of the regulation as follows: ‘The most aggressive of the regulations requires the nation’s existing power plants to cut emissions 32 per cent from 2005 levels by 2030, an increase from the 30 per cent target proposed in the draft regulation’.

‘That new rule also demands that power plants use more renewable sources of energy like wind and solar power. While the proposed rule would have allowed states to lower emissions by transitioning from plants fired by coal to plants fired by natural gas, which produces about half the carbon pollution of coal, the final rule is intended to push electric utilities to invest more quickly in renewable sources, raising to 28 per cent from 22 per cent the share of generating capacity that would come from such sources’.

The final rule retains the same basic structure as the draft proposal: it assigns each state a target for reducing its carbon pollution from power plants, but allows states to create their own custom plans for doing so. States have to submit an initial version of their plans by 2016 and final versions by 2018.

The White House formulated the regulation as follows: ‘The Clean Power Plan establishes the first-ever national standards to limit carbon pollution from power plants. We already set limits that protect public health by reducing soot and other toxic emissions, but until now, existing power plants, the largest source of carbon emissions in the United States, could release as much carbon pollution as they wanted.

According to the White House, the regulation will ‘create tens of thousands of jobs while ensuring grid reliability, drive more aggressive investment in clean energy technologies resulting in 30 per cent more renewable energy generation in 2030’.

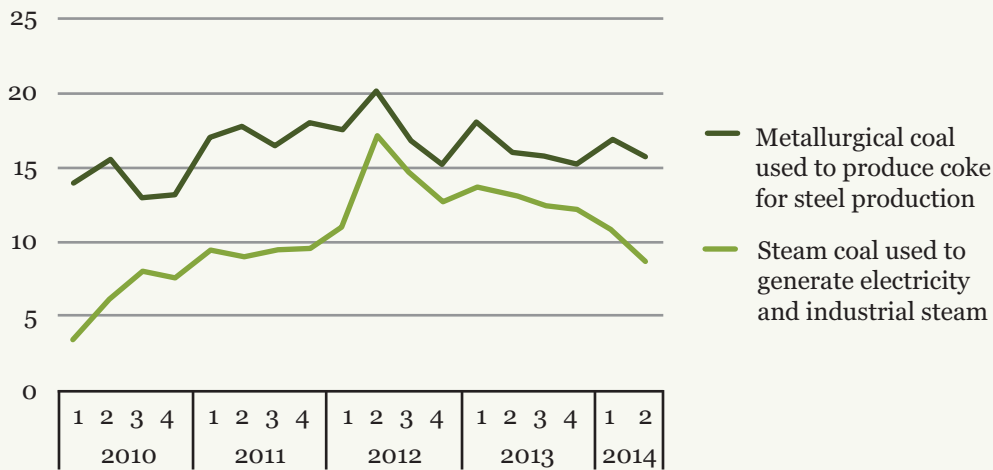
Sources: [White House](#), [EPA](#), [New York Times](#)

COAL MARKET

ENERGY INFORMATION ADMINISTRATION US COAL EXPORT FALL BY 16 PER CENT DURING FIRST HALF OF 2014 (OCTOBER 2014)

U.S. coal exports have continued to decline from their record volumes in 2012. During the first half of 2014, coal exports totaled 52.3 million short tons (MMst), 16 per cent below the same period in 2013. Most of these exports go to countries in Europe and Asia. Export declines reflect both lower European demand for steam coal and increased steam coal supply from Australia and Indonesia. Metallurgical coal supply from Australia, Canada, and Russia has also increased. These factors have led to a cumulative decline of 9.0 MMst in coal exports to Europe and Asia during the first half of 2014.

Quarterly U.S coal exports by type (2010 -14) million short tons



Source: [EIA](#)

WOOD MACKENZIE LOW PRICES PUT 17 PER CENT OF US COAL PRODUCTION AT RISK (MARCH 2015)

In its Coal Market Outlook, Wood Mackenzie states that: ‘around 17 per cent of forecast US coal production for 2015 –162 million short tons - to be at risk of idling or closure, as many mines find that they are unable to cover their operating costs plus sustaining capital in the current low price environment.’ Especially production in Central Appalachia is at risk.

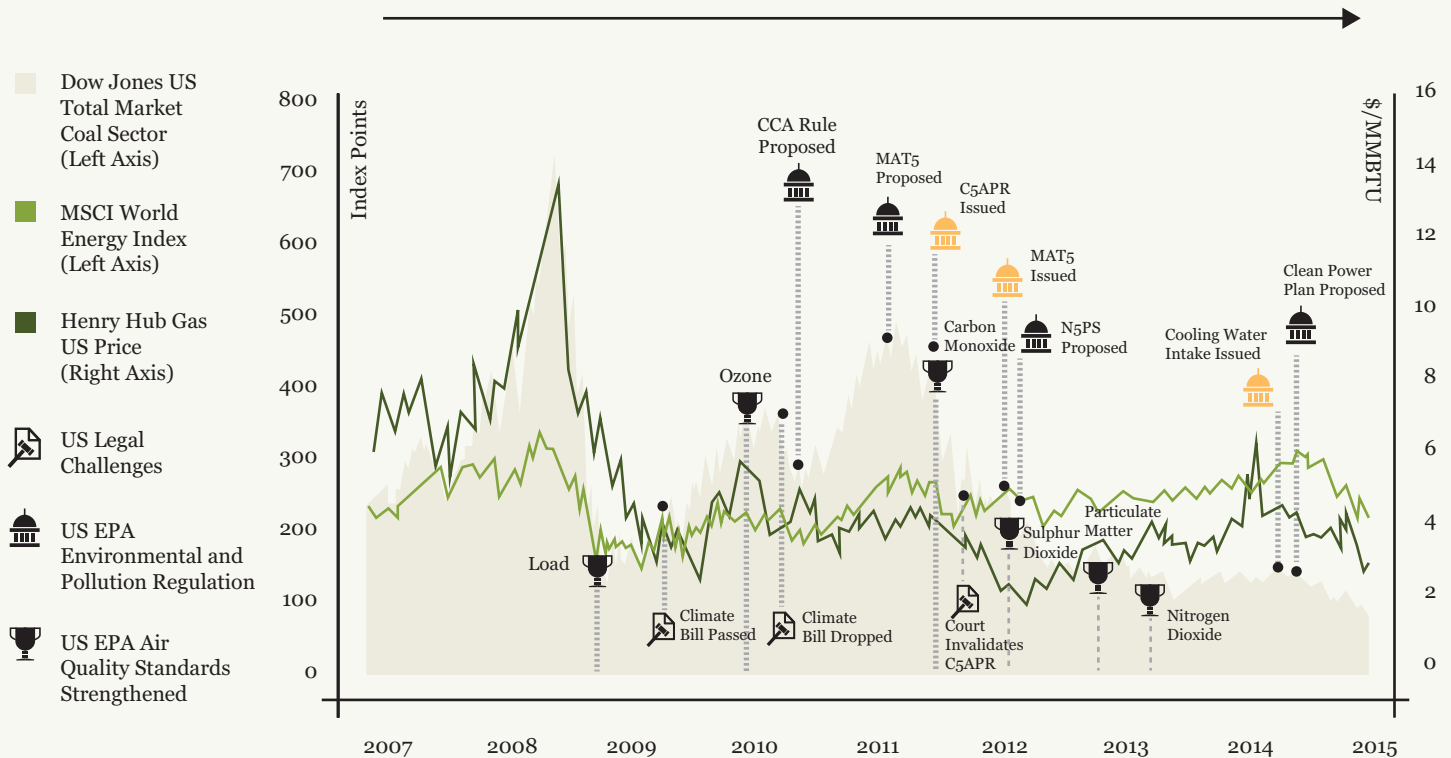
It continues: ‘For prices to rise, either global demand for coal - largely driven by the steel and power sectors - must increase, or the supply of coal must decrease. In reality, the only practical way for the market to rebalance is to cut production. This will need to happen sooner rather than later, as the losses these mines are generating cannot be sustained.’

Source: [Wood Mackenzie](#)

CARBON TRACKER INITIATIVE THE US COAL CRASH - EVIDENCE FOR STRUCTURAL CHANGE (MARCH 2015)

This report of Carbon Tracker Initiative ‘paints a bleak picture and makes grim reading for investors:’

- ‘The Dow Jones Total Market Coal Sector Index is down 76 per cent over the last five years compared to the Dow Jones Industrial Average that is up 69 per cent over the same period... 26 US coal companies go into bankruptcy, including once major producers such as James river coal and Patriot Coal Corporation.
- Main structural driver were the emergence of cheap shale gas... and additional and increasingly stringent EPA regulation.
- Between 2006 and 2013, coal lost 10.5 per cent of the US power market and oil lost 2.3 per cent market share that was picked up by gas generation and renewables.
- Some operators were hoping that increased international exposure through exports or acquiring overseas production would improve their fortunes, but a similar pattern of structural decline is emerging in the seaborne coal market.
- We believe that investors should expect greater capital discipline from companies and challenge capex on high-cost projects.’



Source: [Carbon Tracker Initiative report](#)

COALSWARM ONLY 41 OUT OF 151 PROPOSED COAL PROJECT WERE ACTUALLY BUILT (MARCH 2015)

Of 151 proposed coal projects still proposed in 2007, only 41 were built, and only very few remain in development today.

The United States has proposed a rule that essentially requires any new coal plant to have carbon capture and storage (CCS) technology (EPA 2013). The US EPA has, moreover, been moving forward with carbon pollution standards for existing power plants, designed to limit the power sector’s carbon emissions by at least 30 per cent by 2030.

The share of electricity generated from coal in the US dropped from about 50 per cent in 2004 to 39 per cent in 2013 (EIA 2014). Reasons for the decline in coal capacity and generation include grassroots opposition to coal plants; a flat electricity demand profile over 2007–2014; implementation of long-pending coal regulations on aging coal plants, such as the Mercury and Air Toxics Standards; increased domestic supply and use of natural gas; and increased utilization of wind and solar power.

Source: [CoalSwarm report](#)

A ‘WAVE OF BANKRUPTCIES’ ABOUT TO HIT COAL INDUSTRY (APRIL 2015)

Oilprice.com reports on an analysis by Macquarie Research that paints a very bleak picture of the US coal industry. **It describes the perfect storm in which coal producers have landed:** ‘U.S. coal producers first had to compete ferociously with shale gas in America’s electric power sector as fracking took off about a decade ago. That forced an array of coal plants to shut down as cheap gas washed over the country. Subsequently a regulatory crack down from the federal government – including forthcoming restrictions on greenhouse gases – further dimmed the growth prospects of coal. But U.S. coal producers always had the international market, and exports stepped up in concert with falling domestic consumption. Now the foreign buyers are shrinking as well. China, the one country that the coal industry could count on for ceaseless growth in coal consumption, actually burned 2.9 per cent less coal in 2014 than it did the year before.’

The article continues: ‘U.S. coal producers had predicted that the pain would be temporary and that coal markets would rebound. But that does not appear to be the case. In fact, U.S.

domestic coal prices are at six-year lows, having declined to \$45 per short ton this year, a nearly 20 per cent drop off from 2014.’

Finally: ‘investors are starting to abandon the industry. Peabody Energy (NYSE: BTU), one of the larger coal producers, had to pay a 10 per cent interest rate on its latest bond offering. Worse off companies may struggle even to access financing, forcing them to close up shop. Arch Coal (NYSE: ACI) and Alpha Natural Resources (NYSE: ANR), for example – once prominent and stable coal producers – have seen their share prices plummet into penny-stock territory. The clouds are darkening over U.S. coal.’

Source: [Oil Price](#)

IEEFA PEABODY’S DISMAL NUMBERS SPEAK VOLUMES ABOUT THE COAL INDUSTRY AS A WHOLE (APRIL/JULY 2015)

An April article by IEEFA gives an overview of Peabody’s financial situation, as a reflection of the wider malaise of the American coal industry. Peabody is the world’s largest private pure play coal mine. **The article notes notably:**

- Earnings before interest and taxes were down 24 per cent, not quite covering Peabody’s quarterly net interest expenses.
- Peabody is losing considerable cash on average for every tonne of coal sold in Australia.
- Peabody Energy shares are currently trading at about \$4.50 per share, down more than 40 per cent year-to-date in 2015 alone, and down more than 90 per cent over the past five years, even though Peabody is one of the stronger U.S. coal companies.

In July, it notes: ‘for the first six months of 2015, Peabody reported total coal volumes down 8.5 per cent and revenues down 15 per cent year-on-year to US\$2.9 billion. Peabody’s Australian operations reporting a 18 per cent year-on-year price decline to US\$60.58/t, while the US domestic operations saw prices down 5 per cent year-on-year. Peabody’s Australian coal division reported revenues down 20 per cent year-on-year on a 2.8 per cent decline in volumes... Net debt rose by US\$129m over the last six months to US\$5,818m. The sharemarket is currently valuing the equity of Peabody Energy at US\$344m, a shadow of the US\$18 billion of five years ago. Peabody Energy shares are down 84 per cent just to-date in 2015.’

Source: [IEEFA](#)

BLOOMBERG NEW ENERGY FINANCE LARGEST WAVE OF COAL RETIREMENTS IN US HISTORY AHEAD (APRIL 2015)

The Bloomberg New Energy Finance white paper expects ‘23 GW of coal to retire in 2015 alone, in what marks the largest wave of coal retirements in US history. Over 50 GW are expected to retire by 2020.’ Old age, cheap gas and environmental regulation – in particular the Mercury and Air Toxics Standard – would be the drivers of this retirement. BNEF states that: ‘the coal units now slated to come offline accounted for over 270 TWH/year from 2013-2014 – roughly 7 per cent of US generation...the result should be a fundamental reduction in coal’s share of the US power mix.’

Renewable build will total 18.3 GW in 2015 – 9.1 GW from solar (an all-time high); 8.9 GW from wind (third-most ever). Both technologies are in the midst of a temporary build rush, as developers race to capture important federal tax incentives that are set to step down or expire by 2017.

Source: [Bloomberg](#)

UBS PAIN BECOMES MORE ACUTE FOR NORTH AMERICAN COAL INDUSTRY (APRIL 2015)

A UBS analysis of the US coal market brings to light a number of tendencies and projections, notably:

- US export production cuts of met coal are coming slowly but surely – but export have been running higher than expected because of financial, operational and competitive reasons. UBS reduces its price forecast with 10 to 18 per cent in the next few years.
- In the seaborne thermal coal market, UBS foresees an ongoing market weakness that reflects in large part Chinese demand reduction by almost 80Mt on an annualised basis due to: reduced coastal demand, encouraging of domestic suppliers, increase in internal coal rail capacity, mine mouth coal fired power in central and western provinces, shift of energy intensive industry to cheap coal provinces in the North. In that context, it foresees ‘a need for rationing to rebalance the market: despite a steady trickle of closures, we have not yet seen shuts in large enough magnitude to rebalance the market.’ Price forecasts are cut to US\$58/t.
- In the domestic thermal coal market, UBS foresees that ‘state-by-state coal-to-gas switching suggests thermal coal demand could fall by more than 80Mt (9 per cent) in 2015’ and adds that coal retirements due to environmental legislation (in particular MATS) may add to that number.

Figure 43: UBS US Coal supply-demand model

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Supply												
Appalachia	392	378.5	391.2	343.2	336.3	337.2	294	271.5	270.4	214.	214	215.5
Interior	151.4	147.1	147.1	146.6	158.4	170.9	179.7	182.7	187.4	183.	188	188
Western	619.3	621	633.8	585.1	591.6	587.4	542.6	529.8	539	512.	511	508.4
Primary production	1162.7	1146.6	1172.1	1074.9	1084.3	1095.5	1016.3	984	996.8	909.	913	911.9
YOY (%)	2.7%	-1.4%	2.2%	-8.3%	0.9%	1.0%	-7.2%	-3.2%	1.3%	-8.8%	0.0	0.0
Primary Inventory Withdrawals	-1.5	2.5	-0.7	-13	-2.1	-2.1	5.7	3.5	-0.7	-1.3	1.9	0.0
Imports	36.1	36.4	34.2	22.7	19.5	12.9	9.2	9	11.8	11	10.8	10.5
Exports	49.7	59.1	81.6	59.2	81.7	107.2	125.7	117.7	97.1	82.4	81.9	79.8
Metallurgical coal	27.5	32.2	42.4	37.3	56.1	69.5	70	65.6	62.7	46.9	47.5	44.6
Steam Coal	22.2	26.9	39.2	21.9	25.6	37.7	55.7	52.1	34.5	35.3	34.5	34.7
Total Primary Supply	1147.6	1126.4	1124	1025.4	1020	999.1	905.5	878.8	910.8	836.3	843.8	842.6
Secondary Inventory Withdrawals	-41.1	-8.4	-11.6	-26.7	15.2	1.8	-12.6	37.9	-3.3	6.4	1.6	0.0
Waste Coal	14.2	14	14.2	13.6	13.7	13.2	11.2	10	11.4	10.8	10.8	10.1
Total Supply	1120.7	1132	1126.6	1012.3	1048.9	1014.1	904.1	926.7	918.9	853.5	856.2	852.7
	-1.3%	1.0%	-0.5%	-10.1%	3.6%	-3.3%	-10.8%	2.5%	-0.8%	-7.1%	0.0	0.0
Demand												
Coke Plants	22.9	22.7	22	15.3	21.2	21.5	20.9	21.4	20.5	20	22.1	22.9
Electric Power Sector	1026.5	1045.1	1040.7	933.6	975	932.5	823.5	858.3	857.4	782.4	780	765.6
Retail and Other Industry	62.8	60	57.7	48.4	52.4	49	44.8	45.2	44.8	43.4	44.2	43.4
Residential and Commercial	3.1	3.4	3.5	3	2.9	2.8	1.9	1.7	2.1	2.2	2.3	2.3
Other Industry	59.6	56.7	54.4	45.3	49.4	46.2	42.9	43.5	42.5	41.3	41.7	40.9
Total Consumption	1112.2	1127.8	1120.4	997.3	1048.6	1003	889.2	924.9	922.7	845.8	846.3	831.8
Discrepancy	8.5	4.2	6.2	15	0.3	11.1	14.9	1.8	-3.8	7.7	9.9	20.9
End of Period Inventories												
Primary Inventories	36.5	34	34.7	47.7	49.8	51.9	46.2	42.7	43.4	44.7	42.8	42.8
Secondary Inventories	150.4	158.8	170.4	197.1	181.9	180.1	192.7	154.8	158.1	151.6	150.1	150.1
Electric Power Sector	14.1	151.2	161.6	189.5	174.9	172.4	185.1	148	151.4	144.2	142.2	142.2
Retail and General Industry	6.5	5.6	6	5.1	4.5	4.5	4.5	4.1	4.8	5.5	5.9	5.9
Coke Plants	2.9	1.9	2.3	2	1.9	2.6	2.5	2.2	1.9	1.9	2	2
Total Inventories	186.9	192.8	205.1	244.8	231.7	232	238.9	197.5	201.5	196.3	192.9	192.9

Source: UBS estimates, EIA

BLOOMBERG GROWING NUMBER OF AMERICAN COAL COMPANIES FILE FOR BANKRUPTCY (MAY TO JULY 2015)

On 12 May, Bloomberg reported that Patriot Coal filed for bankruptcy for the second time in three years. **The article pointed how this filing is part of a larger trend:** ‘among the coal-related energy producers to file for protection since 2012 are Longview Power LLC, Dynegy Inc. and Edison Mission Energy. They and other filings -- including those of James River Coal Co., America West Resources Inc., Trinity Coal Corp., Americas Energy Co., Clearwater Resources LP and Consolidated Energy -- point to the deteriorating market for U.S. coal.’

On 15 July, Bloomberg reported that Walter Energy Co. filed for bankruptcy after reaching a deal that would hand control of the struggling mine to key creditors.

Sources: Bloomberg ([one](#), [two](#))

BB&T CAPITAL MARKETS UGLY BALANCE SHEETS MAY LEAD COAL COMPANIES TO RUN OUT OF TIME

COAL FINANCE

(MARCH 2015)

Mark Levin, an analyst at BB&T Capital Markets states: ‘Many coal companies could run out of time. If they don't run out of time, they may make the proactive decisions to restructure some of their balance sheets.’

US coal company debt / EBITDA

	2008	2014
Arch Coal	1.6x	14.9x
Alpha Natural resources	-0.3x	11.2x
Alliance Resource Partners	1.1x	1.0x
Peabody energy Corp.	1.3x	7.0x
Cloud Peak	0.9x	1.9x
CONSOL Energy	0.8x	3.0x
Walter Energy	3.4x	195.0x

Source: BB&T Capital Markets March 12, 2015, presentation

The balance sheets of American mines have deteriorated quickly between 2008 and 2014. Mark Levin states that ‘a commodity cyclical company should probably not have a net debt to EBITDA ratio higher than three to four times. In those terms, it may be easy to see why some in the sector are the have-nots when it comes to being able to access capital.’ The BB&T analysis shows that the issue is most pressing for met coal, but that ‘on the steam side, it's not a whole lot better’.

Chiza Vita, associate director of commodities at Standard & Poor's Ratings Services, added: ‘The rating agency has no positive outlooks for any covered coal companies. About a quarter of the agency's ratings are negative — twice as high as 2014.’

Source: [SNL](#)

BANK OF AMERICA'S NEW COAL POLICY WILL REDUCE COAL SUPPORT (MAY 2015)

On 4 May, Bank of America presented a new coal policy in which it states:

‘Bank of America recognizes that climate change poses a significant risk to our business, our clients, and the communities in which we operate. As one of the world's largest financial institutions, the bank has a responsibility to help mitigate climate change by leveraging our scale and resources to accelerate the transition from a high-carbon to a low-carbon society.’

‘Over the past several years, Bank of America has significantly reduced our exposure to coal extraction companies. Going forward, Bank of America will continue to reduce our credit exposure to coal extraction companies. This commitment applies globally, to companies focused on coal extraction and to divisions of diversified mining companies that are focused on coal.’

Source: [Bank of America](#)

MOODY'S PEABODY'S RATING IS DOWNGRADED (JUNE 2015)

The rationale behind the downgrading of the corporate family rating from B2 to B3 is as follows: 'The downgrade reflects our expectation of continued deterioration in the company's credit metrics, more precipitous than we had forecasted previously, due to the ongoing decline in the seaborne metallurgical coal markets... We estimate that the approximately 300 million-ton seaborne market is currently oversupplied by roughly 5 per cent-10 per cent. Global suppliers, mostly in Australia and the US, have already announced over 30 million metric tonnes of supply cuts since early 2014. However, these are slow to take hold. Production volumes are also being propped up by cost curves shifting lower, due to falling oil prices and currencies weakening against the US dollar... Despite the downward trend of the global cost curve, we believe a significant portion of global met coal production remains uneconomic and further production cuts will be necessary to bring the markets back into balance.'

Source: [Moody's](#)

BLOOMBERG FALLING PRICE OF COAL COMPANIES' BONDS (JULY 2015)

This article concerns the dropping signs of coal bonds: 'Bonds are where coal companies turn to raise money for such things as new mines and environmental cleanups. But investors are increasingly reluctant to lend to them. Coal bond prices tumbled 17 per cent in the second quarter, according to an analysis by Bloomberg Intelligence. It's the fourth consecutive quarter of price declines and the worst performance of any industry group by a long shot.' Bond prices for Alpha Natural Resources (-70 per cent), Peabody (-40 per cent) and Arch (-30 per cent) each declined drastically.

Bloomberg gives four reasons for the decline: a changing US grid, imminent peak coal in China, financial distress and the rise of renewables.

Source: [Bloomberg](#)

NUMBER OF PLANNED COAL PLANT RETIREMENTS PASSES THE POST OF 200 (JULY)

On 15 July, the total of planned coal plant retirements had passed the post of 200, out of a total 523.

Sources: [Sierra Club](#)

BLOOMBERG NEW ENERGY FINANCE US WIND POWER INSTALLATIONS ROSE SIXFOLD IN 2014 (JANUARY 2015)

RENEWABLES

The U.S. added 4.7 GW of new onshore wind capacity in 2014 compared with 764 MW a year earlier, largely due to the extension of the Production Tax Credit in January 2013. Total U.S. onshore wind installations are now 64.2 GW.

The article also gives numbers of other countries, in particular China: China remains the biggest market for wind with installations rising a record 38 per cent, or 20.7 GW, from a year earlier, according to BNEF. China's grid-connected wind-energy capacity now is 96 GW, more than that of the entire U.K. power fleet. Wind energy is China's largest power source after coal and hydropower.

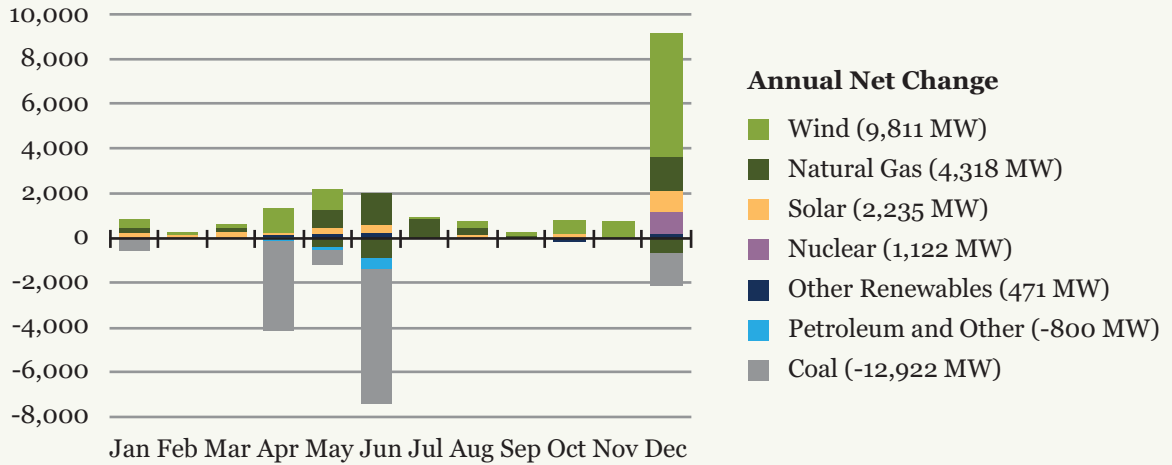
Source: [Bloomberg](#)

INFORMATION ENERGY ADMINISTRATION 20 GW OF RENEWABLES CAPACITY ADDITION VS. 12.9 GW OF COAL RETIREMENTS IN 2015 (MARCH 2015)

In 2015, electric generating companies expect to add more than 20 GW of utility-scale generating capacity to the power grid. The additions will be dominated by wind (9.8 GW), natural gas (6.3 GW), and solar (2.2 GW), which combine to make up 91 per cent of total additions.

Nearly 16 GW of generating capacity is expected to retire in 2015, 81 per cent of which (12.9 GW) is coal-fired generation. The large number of coal plant retirements is primarily because of the implementation of the Environmental Protection Agency's Mercury and Air Toxics Standards (MATS) this year. These values reflect reported additions and retirements, not model projections.

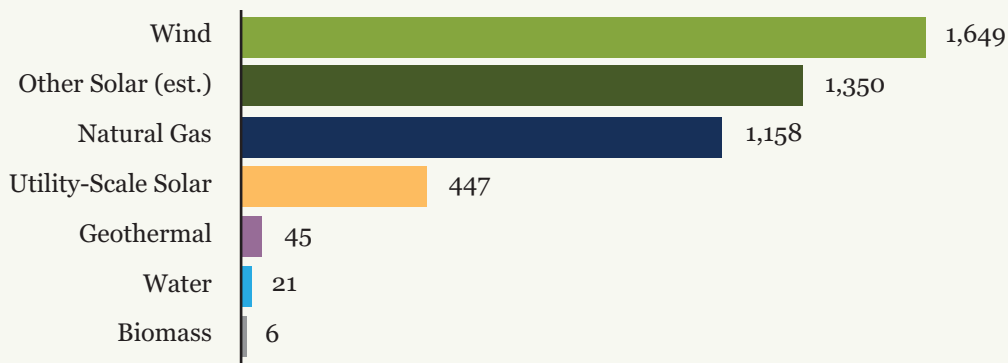
Scheduled electricity generation capacity additions and retirements in 2015 - megawatts



Source: [EIA](#)

SOLAR AND WIND ENERGY ACCOUNT FOR 74 PER CENT OF NEW ELECTRICITY CAPACITY IN EARLY 2015 (JULY 2015)

Based on data from the federal energy regulatory commission amongst others, cleantechnica concludes that solar and wind energy account for 74 per cent of new electricity capacity in the first five months of 2015. In June, all renewables together accounted for even 98 per cent of added capacity.



Source : Clean Technica ([one](#), [two](#))

About WWF

WWF's mission is to stop the degradation of the Earth's natural environment and to build a future in which people live in harmony with nature. The Global Climate & Energy Initiative is WWF's global programme addressing climate change through promoting renewable and sustainable energy, scaling up green finance, engaging the private sector and working nationally and internationally on implementing low-carbon, climate-resilient development.

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Sources for back page

29 per cent down source: Chinese government

Half the value lost source: Bloomberg

6:1 source: REN21

Down for the first time in 30 years

source: Indonesian government

59 per cent source: REN21

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GLOBAL COAL: THE ACCELERATION OF MARKET DECLINE



HALF THE VALUE LOST

The Bloomberg Global Coal Equity Index lost half of its value while broad market indices are up to 30 per cent over the last three years

2.9 PER CENT DOWN

Chinese coal consumption fell by 2.9 per cent in 2014

59 PER CENT

Renewables represented 59 per cent of net additions to global power capacity in 2015



6:1

In India, 6 coal plants are shelved or cancelled for every coal plant built

DOWN FOR THE FIRST TIME IN 30 YEARS

2015 coal production from Indonesia – the world largest exporter – will fall for the first time in thirty years



Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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