Coal brief

November 2016

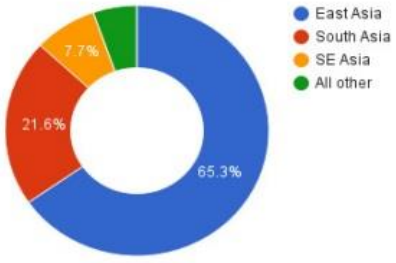
Why coal is not the way forward – facts versus myths –

Coal is the single biggest contributor to global climate change. If plans to build up to 1500 coal power plants[1] worldwide are realised, the greenhouse gases released from these plants will put us on track for a five degree Celsius rise in global temperatures, a track to planetary collapse.

CEE Bankwatch Network and its partners in the Central and Eastern Europe, Western Balkans and former Soviet Union regions have advocated for years that the international financial institutions (IFIs) must move from climate-damaging energy projects to energy efficiency and sustainable renewable energy sources. We are campaigning for IFIs to restrict their activities in the coal sector exclusively to improvements of environmental and social standards – for example health and safety – as long as they do not result in prolongation of facility's operation or increase of its production, as well as support for closures and environmental remediation of existing coal mines and power plants.

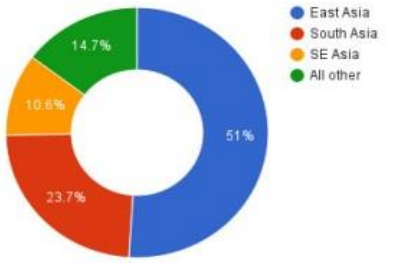
In 2013, several finance institutions have introduced strict limitations to their coal lending, among them the World Bank, the European Investment Bank and the European Bank for Reconstruction and Development, making it virtually impossible for new coal fired power plants to get funding. This was a major policy turning point in development finance, to which Bankwatch contributed. Yet, worldwide, 338 GW of new coal capacity is under construction and 1,086 GW is in various stages of planning – the equivalent of 1,500 coal plants, expected to be financed mainly by Chinese policy banks, Export Credit Agencies and commercial banks, with the blind political support of many governments.

Figure 5. Regional Distribution of Coal Power Capacity in the Construction Phase, January 2016



Source: Global Coal Plant Tracker, January 2016

Figure 6. Regional Distribution of Coal Power Capacity in the Pre-Construction Phase, January 2016



Source: Global Coal Plant Tracker, January 2016

[1] *Boom and Bust 2016: Tracking The Global Coal Plant Pipeline*,, Sierra Club, http://www.sierraclub.org/files/uploads-wysiwig/final%20boom%20and%20bust%202017%20(3-27-16).pdf

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CEE Bankwatch Network is today the largest network of grassroots, environmental groups in countries of central and Eastern Europe and a leading force in preventing dubious public investments that harm the planet and people's well-being in this region and beyond.

Operating since 1995 in countries that have undergone significant social and economic transformation, we have the know-how to effectively work in unpredictable environments from North Africa to Central Asia.

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The power industry continues to plan and build new capacities, despite the fact that the amount of electricity generated from coal has declined for two years in a row, thus creating an increasingly severe capacity bubble. The amount of capital potentially wasted on these plants amounts to US$981 billion, or close to one trillion dollars[2].

What are the myths that the industry has created and cultivated around coal for years, that make governments worldwide still go for coal?

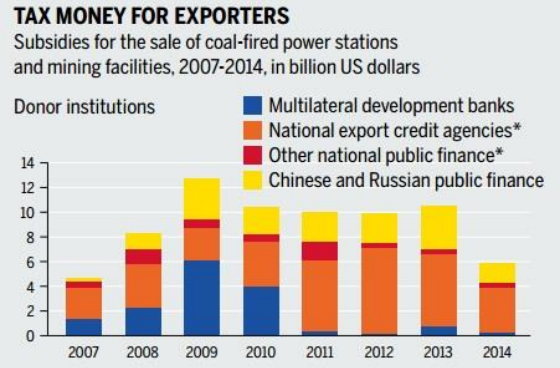
Coal is cheap – myth

This dirty fuel is only considered cheap because coal plants do not have to pay for the full social and environmental costs of coal burning on people's health, the natural environment, and our climate. Nor does the final price reflect the impacts of coal mining, and loss of ecosystems. A Harvard University study[3] has revealed that these costs, known as **"externalities", would double or triple the price of electricity from coal if they were reflected in the electricity bill**, making renewables much cheaper.

In the European Union alone, the economic costs of the health impacts from coal combustion have been estimated at up to €42.8 billion per year[4].

The apparent cheapness of coal is also a result of subsidies from the taxpayers' pockets, both current and in the past. There are many less obvious activities that count as subsidies – loans and guarantees at favourable rates, price controls, and governments providing resources like land and water to coal companies at below-market rates, research and development funding.

Energy producers are still profiting from the support they received in the past. Between 1990 and 2007, the current 28 members of the European Union subsidized the expansion of coal-related infrastructure to the amount of 200 billion euro[5]. Developed countries, which have adopted stringent environmental standards, support their coal technology exports generously. Between 2007 and 2014, more than $73 billion in public finance was approved for coal. Nearly half (47 percent) of the total international finance for coal came through export credit agencies in countries that are members of the Organisation for Economic Co-operation and Development (OECD). Japan is the leader with $20 billion, followed by China (nearly $15 billion), South Korea (over $7 billion) and Germany ($6.8 billion).



Source: "Coal Atlas 2015", Heinrich Boell Stiftung

Phasing out subsidies to fossil fuels would reduce wasteful energy use by sending more accurate price signals, while also improving the case for investing in energy efficiency and competing non-fossil energy supply technologies. Subsidies that support the consumption of fossil fuels are typically intended to make energy more accessible for the poor, but they are often an inefficient means of doing so and other forms of support would cost much less.

"Clean coal" technology is here – myth!

The phrase "clean coal" refers to a more efficient way of burning coal, however the current state-of-the-art thermal efficiency of a coal power plant in Europe is between 34% and 40%. The new generation "high efficiency" coal plants have a maximum 46% efficiency for hard coal and 43% for lignite. In other words, **more than half the coal burnt in a "high efficiency" coal plant is not converted to useful electricity.**

In addition, there is a general trade-off between improvements in efficiency and improvements in air pollution control: current filter technology decreases the thermal efficiency by about 1%.[6] The better the

[2] idem

[3] http://www.chgeharvard.org/resource/full-cost-accounting-life-cycle-coal

[4] HEAL, "Unpaid health bill: how coal power plants make us sick", 2013, http://www.env-health.org/IMG/pdf/heal_report_the_unpaid_health_bill_how_coal_power_plants_make_us_sick_final.pdf

[5] http://arnejungjohann.de/cheap-coal-hidden-subsidies-unpaid-bills/

[6] MVV Consulting and ECOFYS (2008): Efficiency and Capture Readiness of New Fossil Power Plants in the EU. http://www.ecofys.com/files/files/rptenergy-efficie

different filters can catch particulates, sulphur and nitrogen oxides, the more energy or steam they consume within the power plant.

Importantly, the power plants with a dry-cooling system – a relatively new and expensive cooling system developed for thermal power plants operating in arid areas in some countries – are vulnerable to hot temperatures, which lower the efficiency dramatically, by 7-8%. Power plants with dry-cooling use significant amount of fresh water for scrubbing of air pollutants, which amounts to 20-25 % of the typical amount water demand of re-circulating wet cooling. A 500MW, supercritical coal-fired power plant would withdraw around 2 million m^3 and consume 1.7 million m^3 of water per year[7].

The coal industry also advocates that carbon capture and storage (CCS) can reduce carbon dioxide emissions from coal-fired power plants. However, CCS is an unproven technology which has not yet been implemented at a large-scale fossil fuel plant. The greatest barrier to CCS is its economic viability. Between 25-40% more coal would be required to produce the same amount of energy using this technology. Consequently, more coal would be mined, transported, processed and burned, increasing the amount of air pollution and hazardous waste generated by coal plants.

Coal power plants are water thirsty – fact!

Apart from the dry-cooling system, there are 2 traditional ones, much more water thirsty:

- Once-through Cooling systems take water from nearby sources (e.g., rivers, lakes, aquifers, or the ocean), circulate it through pipes to absorb heat from the steam in systems called condensers, and discharge the now warmer water to the local source.
- Wet-recirculating or closed-loop systems reuse cooling water in a second cycle rather than immediately discharging it back to the original water source. Most commonly, wet-recirculating systems use cooling towers to expose water to ambient air.

Using the same power plant as in the previous example, a 500MW, supercritical coal-fired power plant would:

- withdraw around 500 million m3 and consume 2.9 million m3 of water per year, if fitted with a once-through cooling system and
- withdraw around 10 million m3 and consume 8.4 million m3 of water per year, if fitted with a wet recirculating cooling system[8].

A 500 MW supercritical coal-fired power plant, using once through cooling, can withdraw enough water to suck dry an Olympic-sized swimming pool roughly every three minutes[9].

The impacts of coal mining are huge and irreversible – fact!

Even if underground coal mining is hidden from the public's eye and seems less damaging than open-cast coal mines, it is not. Its biggest problem is subsidence or collapse of earth into underground mines. It damages roads, buildings and the landscape sitting on top of the mine, and these "inherited liabilities" will continue to be a burden to future generations.

Underground coal mining lowers the water table, changing the flow of groundwater and streams. In Germany, the mining industry pumps over 500 million cubic meters of water out of the ground every year. Only a small percentage of this water is used by industry or local towns — the rest is wasted.[10] It also brings large amounts of waste earth and rock to the surface, which often becomes toxic when in contact with air and water.

In many underground coal mines around the world, there have been fires burning for decades. This is called "coal steam fire" and can release smoke laden gases including carbon monoxide (CO), carbon dioxide (CO2), methane (CH4), and sulphur dioxide (SO2). Coal fires also cause fly ash to release from mine vents and fissures. Coal fires can cause temperatures to rise at the surface, and contaminate

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[7] "The Great water grab", Greenpeace, page 13, http://www.greenpeace.org/international/Global/international/publications/climate/2016/The-Great-Water-Grab.pdf

[8] idem

[9] idem

[10] http://www.greenpeace.org/international/en/campaigns/climate-change/coal/Mining-impacts/

groundwater, soil and air. Perhaps the best known example is in the USA, in Pennsylvania's three dozen underground fires which include America's most notorious subterranean blaze, a 48-year-old fire in Centralia, whose noxious emissions sickened residents and eventually prompted the federal government in the late 1980s and early '90s to evict homeowners and pay them a collective $40 million for what is now a virtual ghost town[11].

Open-cast mining, on the other hand, has more visible impacts: it clears trees, plants and topsoil. Mining companies scrape away earth and rocks to get to coal buried near the surface. Mountains may be blasted apart to reach thin coal seams within, leaving permanent scars on the landscape. In this way, open-cast mining destroys landscapes, forests and wildlife habitats. It leads to soil erosion and destruction of agricultural land. It also lowers groundwater levels around the mine. This is because, in order to remove coal, vast quantities of groundwater must be pumped out of the mine[12].

Coal maintains/ creates jobs – myth!

The coal sector is employing less and less people every year. Fewer workers are needed in coal countries because productivity is rising quickly. A few examples:

- The European Union is cutting thousands of jobs every year. In 2008, 342,000 miners worked in both lignite and hard coal sectors; in 2013 the number was only 326,000.
- Out of these, in Germany, a country still reliant on coal for its electricity, the number of people directly employed in mining the lignite has fallen from 130,000 in 1990 to 21,000 today. As for hard coal, it is estimated that by 2018 all mines will be closed.
- In India, Coal India, the state-controlled producer, cut down its employee rolls from 500,000 in 2005 to 350,000 in 2014. In the same period, its output rose by one-third[13].

Meanwhile, renewables are growing in importance. **In 2014, 7.7 million people were employed in the renewable energy sector**, directly or indirectly, around the world (excluding large hydropower). This is an 18% increase from the number reported the previous year[14]. The world's leading countries for renewable energy employment remain the same as in previous years: China, Brazil, the United States, India, and some members of the European Union, notably Germany, proving thus a transition from coal.

Coal can alleviate poverty – myth!

In a frantic struggle for survival in the new economic and environmental reality, as well as a response to growing fight backs from local communities and NGOs around the world, the coal industry has come up with a PR campaign claiming that coal is needed to reduce energy poverty in the Global South. But this is nothing more than a blatant "save-face" by the industry to keep itself alive.

It's true, direct access to electricity – at home, in schools, health clinics and businesses – helps improve incomes, health, safety, education and gender equality. But coal is definitely not the way to deliver modern energy services to those who lack them. According to the International Energy Agency (IEA), almost 85% of the 1.2 billion people without access to electricity live in rural areas. Without massive investments in transmission infrastructure, advancing coal-fired generation capacity will do little for rural and remote communities. **The IEA says that mini-grids or off-grid solutions will the best way of bringing modern energy services to 70% of the people who currently lack these, and 90% of that electricity must be provided by renewables[15]**. Coal plants will simply not reach the vast majority of people without access to electricity.

Unless we target energy access directly – by improving the availability of off-grid electricity systems and modern cooking technologies and by helping the energy poor to afford them – we will not achieve our target of universal energy access by 2030.

[11] http://content.time.com/time/health/article/0,8599,2006195,00.html

[12] http://www.greenpeace.org/international/en/campaigns/climate-change/coal/Mining-impacts/

[13] "Coal Atlas 2015", Heinrich Boell Stiftung, p.20, https://www.boell.de/sites/default/files/coalatlas2015.pdf

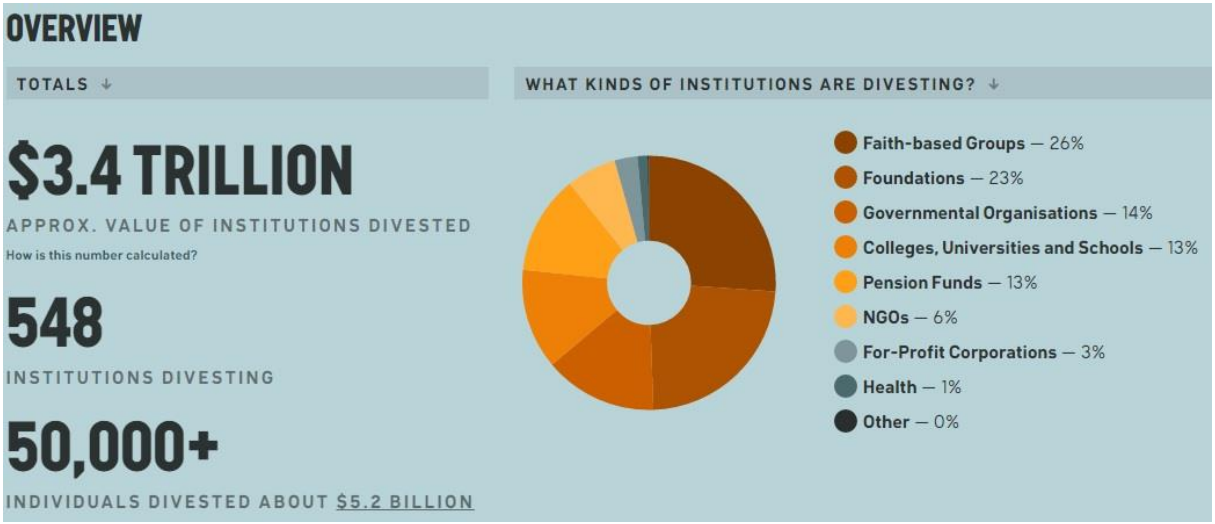
[14] IRENA 2015 Renewable Energy and Jobs report, http://www.irena.org/menu/index.aspx?mnu=Subcat&PriMenuID=36&CatID=141&SubcatID=585

[15] World Energy Outlook 2011, IEA, http://www.worldenergyoutlook.org/media/weowebsite/energydevelopment/weo2011_energy_for_all.pdf

The wave of coal divestment is growing – who's next?

Seizing the global momentum, next to IFIs, the world's wealthiest countries – the members of the Organization for Economic Co-operation and Development (OECD) – agreed in November 2015 to limit export credit agency support for coal. The OECD deal covers finance provided under the Arrangement on Officially Supported Export Credits, an agreement that limits the subsidies that participating countries can provide to their exporters. It does not allow support for subcritical coal units above 300 MW in even the world's poorest countries, but it will allow finance for supercritical units 500 MW or below in International Development Agency eligible countries and for ultra-supercritical in all countries. According to the OECD statement, "Over two-thirds of the coal-fired power projects receiving official export credit support from participants between 2003 and 2013 would not have been eligible for such support under the new rules." (OECD 2015). This provision will come into force in January 2017, which explains many countries' rush to get financing deals signed beforehand. Together with the US-China announcement[16] – to use public resources to finance and encourage the transition toward low-carbon technologies as a priority – in less than one year there will be limits on the use of officially supported export credit financing by the world's top overseas coal backers.

Additionally, governments (national and regional), private banks, pension funds, education institutions and corporations are divesting from fossil fuels, acknowledging coal as the dirtiest and most urgent fuel to stop investing in.



Source: http://gofossilfree.org/commitments/

[16] https://www.whitehouse.gov/the-press-office/2015/09/25/us-china-joint-presidential-statement-climate-change