

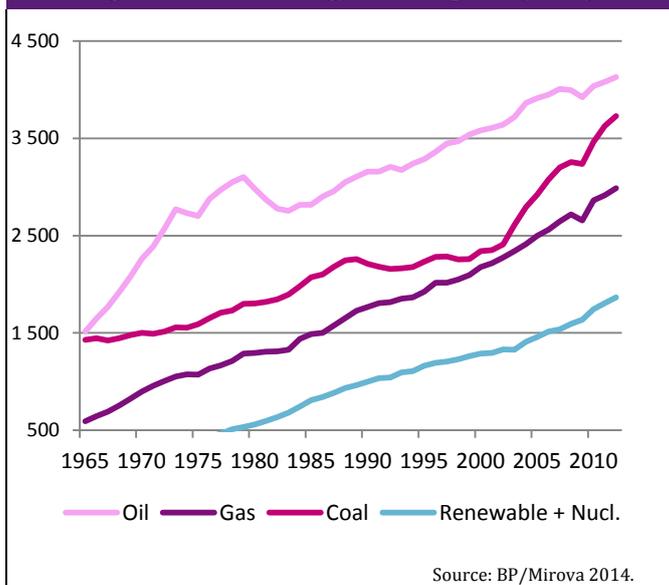
Coal is history. Or is it?

Written 14/03/2014

Given the spikes of pollution known as ‘airpocalypses’ that have become the third most urgent concern in China, and the tightening of regulations in Europe and the United States, it would appear that coal’s cycle of high growth is set to begin winding down. In light of this observation, certain investors such as the EIB and the Norwegian pension fund have modified their investment criteria. But despite this trend, the sheer magnitude of coal reserves, coupled with the potential for innovations in using this resource (liquefaction, gasification), suggest that coal will, in the long term, continue to pose a significant threat to climate stability.

In the course of the 1990s, worldwide coal consumption stabilized and the progress of renewable energies fostered hope that coal would soon begin to lose ground within the global energy mix. However, catapulted by growth in China, coal consumption began to exhibit tremendous growth in the early 2000s. If this tendency were to continue, the proportion of coal in the world energy mix could pass that of oil by 2017.

Figure 1. World Energy Consumption (Mtoe)



Coal is one of the most polluting sources of energy there is. In addition to the nitrogen and sulphur oxides (NO_x and SO_x) and particulate matter emitted, coal produces the most CO₂ of any combustible. To provide an idea of scale, a coal-burning power plant emits more than 800g CO₂/KWh, compared to around 400g CO₂/KWh for a comparable gas driven plant. In the first 13 years of the millennium, more than 60% of energy-related CO₂ emissions¹ were due to coal.

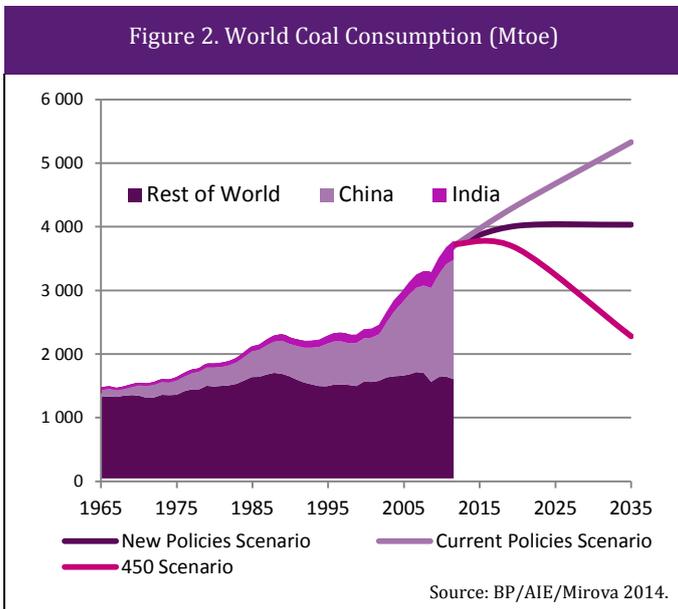
Even if we set aside the polluting emissions responsible for respiratory ailments, coal causes the death of several thousand miners each year, for the most part in emerging countries. Miners are exposed to a multitude of risks: collapsing tunnels, landslides, toxic fumes etc.

These serious social and environmental issues are likely to jeopardize the increase of coal consumption in the long term.

China is sick of coal

China alone consumes as much coal today as the rest of the world combined. Veritably fueling China’s growth, coal use in the country has more than doubled in the last decade.

¹ Energy-related CO₂ from oil, gas, and coal combustion accounts for around two thirds of all GHG emissions. The remaining third is attributable to deforestation, agriculture and waste management.



The country now experiences such pollution as a result of burning coal that the issue has become as much a public health concern as an environmental one. Spikes of extreme pollution, known as ‘airpocalypses’, have become an increasingly frequent phenomenon in China.

During these events, the density of the most harmful particulate matter (PM2.5) can reach from 27 to 40 times the recommended maximum set by the WHO (World Health Organization). Air quality has become the third most serious cause of concern among the Chinese population, in turn forcing the government to strengthen its environmental policy. Consequently, in January 2014, the city of Beijing announced that no new coal-fired power plants would be permitted. This ‘exit’ of coal may find itself reinforced by structural economic changes China has undertaken. The stated goal of the Chinese government to foster an economy less entirely focused on production and exports should produce a slowdown of growth, accompanied by a commensurate trend in the demand for energy.

“ China consumes as much coal as the rest of the world combined

It is to be expected that this inflection will nonetheless take several years. Despite the Chinese government’s desire to decrease its dependence on coal, the contribution of renewables and nuclear power to the energy mix is currently too low to meet the country’s need for electricity. An increase in the use of gas would entail substantial investments in infrastructure (construction of pipelines, LNG terminals, and gas-fired power plants) and must be considered a medium-term solution. Given these constraints, China’s coal usage is likely to continue increasing for several years to come, as witness a 2013 decision to authorise construction of 15 new mines, thereby stepping up annual production capacity by 100 million tonnes (Mt).²

Meanwhile, the West is tightening regulations

In the United States, coal consumption already shows some decline, from 910 Mt in 2011 to 808 Mt in 2012. The United States EPA (Environmental Protection Agency) has focused on power plants, with 2020 goal of reducing GHG emissions by 17% compared to 2005 levels. The EPA is seeking to impose a limit of 500 gCO₂/MWh on existing facilities, and to effectively halt construction of new coal-fired plants.

The easing of coal consumption in the US is also due to the development of shale gas, which improves the competitiveness of gas-fired power production. A certain number of coal mines, notably in the Appalachians have depreciated, and American mining corporations have already started closing the least profitable concerns.

In Europe, coal prices are currently in a low bracket, between \$80 and \$85 USD per tonne, in part because of an increase in exports from the United States caused by the development of shale gas. These low prices are responsible for a considerable progression of coal use in Europe over the last years. The carbon intensity of power production in Europe is thus creeping upwards following several years of decline driven by the expansion of renewables and gas.

² For comparison, China’s total production was 3,650 Mt in 2012. The additional facilities thus represent an increase of about 3% in total capacity.

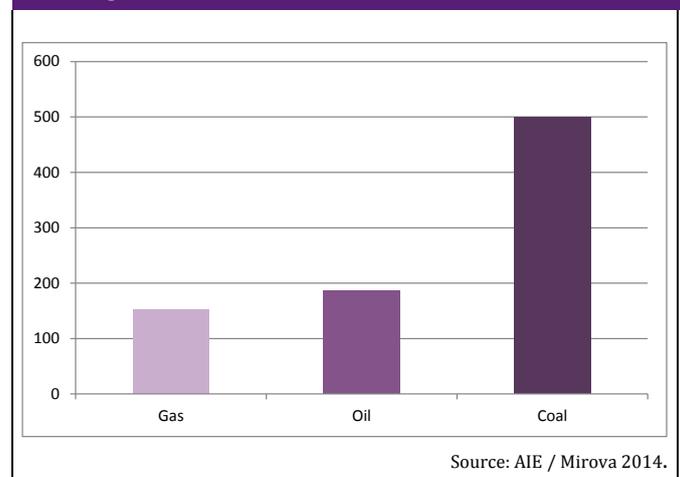
However, the price of coal is expected to bounce back over the medium term, buoyed by a stabilization of the American market.³ The per tonne cost of CO₂, which had also dropped drastically, should start climbing again in Europe over the medium term as well. A concatenation of these two factors could raise costs for the operators of coal-fired facilities and jeopardize the long term economic viability of new investments. Building a power plant takes about six years on average, the costs of which are amortized over a period of about 20 years. Indeed, the industry's lack of projects new coal burning plants suggest that such looming risks are already being taken into account.

Furthermore, the EU regulatory environment is piling new demands on power plants as regards the release of particulate matter into the atmosphere. Energy companies will henceforth be obliged to make ever larger investments in order to bring existing plants up to code. For instance, the European IED (Industrial Emissions Directive), which replaces the LCPD (Large Combustion Plants Directive), contains provisions tightening restrictions on NO_x and SO_x emissions. This directive took effect in early 2013 for the construction of new facilities, and applies to existing ones as of January 2014. This directive will have a considerable impact on the UK, forcing a 10 GW/year reduction of capacity, which amounts to 12% of all electricity derived from coal in the country. British plants are on the whole older and thus less efficient than those of other countries, such as Germany. Indeed, certain British energy companies have already announced closure of several sites.

Liquefaction and gasification: are they long-term climate threats?

Despite these trends, the sheer abundance of this resource makes coal a long-term threat to the environment.

Figure 3. Proven Reserves Worldwide 2011 (Gtoe)



While dependence on coal for electricity production (currently 70% of total coal usage) and industry (30%) could eventually be reduced, there remain certain industrial applications in metallurgy for which there are currently no substitutes for coal, and none likely for as long as recycling cannot fully meet all needs. Furthermore, processes for liquefying and for gasifying coal are becoming more competitive, and may become attractive alternatives for countries lacking in oil or gas resources. Unfortunately, these processes entail CO₂ emissions that exceed those of the energy sources they would replace.

The magnitude of coal reserves is a reminder that simply waiting for fossil fuel resources to be exhausted is not a viable solution to the problems of climate change. The achievement of a binding agreement at the Paris Conference of the Parties on Climate Change 2015 appears an urgent necessity if we are to make headway against climate change.

³ The shale gas revolution in the US has provoked an explosion of drilling sites and caused gas prices to tumble. Since actors have suspended investments while waiting for the price of gas to bounce back, energy prices should start climbing again in the medium term.



A growing topic of investor concern

In tandem with the increasing restrictiveness of legislation, a growing number of investors are expressing concern. As of July 2013, the EIB (European Investment Bank) has excluded coal-fired power plants from its investments. In Norway, the Finance committee is expected to rule shortly on a proposal from the Workers Party that would require the Norwegian sovereign wealth funds to desist from investing in companies involved in coal production. While discussions are still largely motivated by ethical considerations related to the ecological transition, some investors are beginning to look seriously at the matter from a financial point of view, and consider that increasingly restrictive regulations will have a negative impact on companies in the sector.

“ Since July 2013, the EIB has excluded coal from its investments

Stances such as these regarding the opportunities available to invest in the coal sector are interesting, not only from an ethical or financial standpoint: ‘Should investors actively engage in the fight against climate change?’ versus ‘Will these investments be profitable?’ They also both reflect a shift that breaks with years of index driven and passive strategies, and highlights a return to the roots of investment: choosing how to allocate capital.

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