

SMART ELECTRICITY PLANNING

Fast-tracking our transition to a healthy, modern, affordable electricity supply for all.

FACT FILE 3 THE TRUE COST OF ELECTRICITY

South Africa's economy is built on the back of extremely cheap electricity. One of the reasons users don't pay more for every kilowatt hour is because the negative consequences of mining for the fuel, burning it, and shipping the power across the grid, are not included in the final bill.

If government is to make realistic electricity planning decisions, these must be built on evidence-based modelling that includes the full social, environmental and economic costs of each fuel option. At the moment, the Department of Energy (DoE) plans to invest in electricity infrastructure that will lock the country into a heavily coal- and nuclear-dependent grid. One of the justifications is that these technologies are cheaper than renewable energy alternatives.

Counting the hidden costs of electricity

The 1998 White Paper on Energy Policy recognises that 'the production and consumption of energy has many undesirable impacts on the environment, often resulting in external costs, also known as negative externalities'.

Since South Africa has a carbon-intensive power sector and historically low levels of electrification and housing in poor areas, many communities have had to face a double burden of lack of electricity and poor air quality from neighbouring power plants and coal mines.

Recognising the environmental impacts of fossil fuels and the social benefits of improved energy services, the White Paper aimed to incorporate external costs into energy prices, since that would remove some of the distortions that make renewable energy appear more costly than conventional fuels.

But the government's Integrated Resource Plan, which lays out the design for how to meet the country's electricity needs in coming decades, is based on a complex modelling process which does not include these external costs.



COAL

There are 'hidden' costs along the entire coal value chain, from cutting it out of the Earth's crust, cleaning it, shipping it, and burning it in power stations, through to disposing of the ash and other associated waste.

Air

- Burning coal releases soot into the air, as well as sulphur dioxide, nitrous oxides, mercury and other heavy metals and substances which are known to cause cancer.
- Ash, blowing off waste heaps, can also add to ambient air pollution.

Water

- Coal deposits are often found beneath wetlands, which are critical for purifying water, and regulating water flow in times of flood and drought. Digging up coal often means destroying the wetland and losing these valuable and often irreplaceable 'ecosystem services'.
- Acid Mine Drainage (AMD) is threatening groundwater supplies and river health, agriculture and associated livelihoods.
- Sludge and slurry pools from coal washing can leak out and contaminate water systems.

Climate

- Carbon emissions released during the energy-intensive coal mining process, as well as through burning of the coal itself, take decades to work their way through the atmospheric system and cause warming around the globe. This will have profound impacts on health, human settlements, agriculture, economies and the environment. Tomorrow's children will pay the debt of today's energy users.

Health

- The air pollution from burning coal causes lung diseases and is a major contributor towards the build up of neurotoxins in the environment, which can find their way into the food chain and undermine our health. An example would be the highly toxic mercury which makes its way through a polluted water system into the food chain, and into our bodies. Coal-fired power stations produce over half of the world's 2 190 tonnes of mercury that are pumped into the atmosphere every year.

NUCLEAR

Full Value Chain

- There are externalities along the full nuclear fuel cycle: from mining and milling, through the conversion of uranium, enrichment, fuel fabrication, electricity generation, interim spent fuel storage, possibly in reprocessing, and finally in the high level waste disposal.

Radioactivity

- The radioactive nature of the fuel means the cost of waste disposal and decommissioning of nuclear plants are extremely high, something which future taxpayers will probably have to cover.

SHALE GAS

Although South Africa does not currently rely on gas for direct electricity generation, there is increasing focus on the potential for hydraulic fracturing ('fracking') to provide an alternative energy source to coal in South Africa's energy mix.

Land, Water & Air

- Pollution and noise from multiple tanker and other vehicle journeys to and from well sites will have negative impacts on local areas, and there will be ongoing costs associated with road maintenance.

Greenhouse Gas Emissions or Hydrocarbons

- Fugitive methane and volatile organic compound emissions, and from carbon emissions will contribute to South Africa's overall emissions.

Below & Above Ground Pollution

- If chemically-laden fracking fluid remains underground, or if there is surface spillage of fracking fluid or contaminated waste water, the resulting pollution would be serious and costly to mitigate.

The *Smart Electricity Planning* report is a civil society response, under the Electricity Governance Initiative of South Africa (EGI-SA), to the South African government's Integrated Resource Plan, which lays out a blueprint for how to meet the country's electricity needs in coming decades.

For more information, please find the full report at <http://irp2.wordpress.com/smart-electricity/>.

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