



## **South African Kusile 4,800-MW Coal-Fired Power Project** **Background Information and Fact sheet**

**Background:** The proposed South African coal-fired power project, Kusile, with a projected life-span of 50 years, will further lock South Africa into carbon-intensive electricity supply, and, by crowding out investment, undermine the potential for renewable energy development. More importantly, this power plant is not going to address the energy needs of poor South Africans. Since the April, 2010 approval of World Bank-funded Medupi (another 4,800 MW) power plant, the electricity prices have gone up 137%, thus increasing the likelihood of poor people dropping off the grid.<sup>1</sup>

### ***Kusile Won't Fix Energy Poverty***

- **Rate Hikes:** Eskom has recently indicated that it will seek an additional 25% rate increase primarily to cover the cost of Kusile.
- **Special Pricing Agreements:** Apartheid-era “special pricing agreements” give industrial users, which consume the lion’s share of South Africa’s electricity, guaranteed rates that are among the lowest in the world. Thus, the every-day consumer will be forced to bear the weight of these rate increases.<sup>2</sup>
- **The Poor Spend More on Energy:** Poorer urban homes spend between 12% and 20% of household income on energy. Tariff increases for poor households will make even basic levels of electricity consumption prohibitively expensive<sup>3</sup>.
- **The Kusile project does not include electrification lines for the poor.** 25% of the South African population has no electricity *at all* & another 33% are considered “under-electrified,” i.e., they face power outages or only have enough to power lights & a television<sup>4</sup>. 56% of households consume no more than 50kWh per month (an electric stove used one hour a day for a month uses 42kWh).

### **Kusile 4,800-MW Coal Project and Associated Mine Impacts:**

#### ***Air Pollution***

- **Sulphur Pollution:** The Kusile EIA states “*The exceedances [of existing sources] were a factor of 6 times above hourly SO2 limits, for more than 200 hours per year; and 20 to 30 days per year ... even for the best case scenario, exceedances still increased by some 30% above the future base case scenario...Impacts on human*

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<sup>1</sup> <http://www.southafricaweb.co.za/article/electricity-price-hike-south-africa>

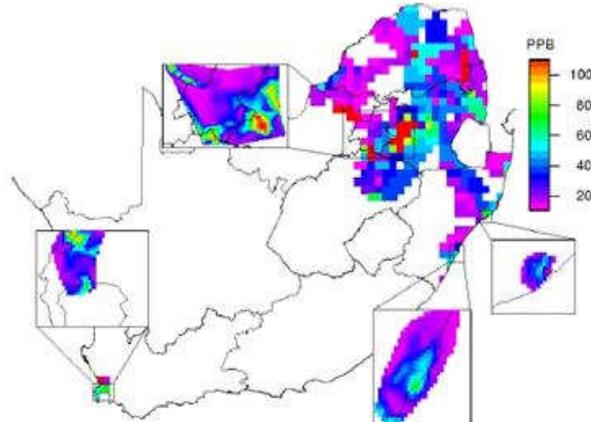
<sup>2</sup> <http://www.earthlife.org.za/wordpress/wp-content/uploads/2010/03/Free-Basic-Electricity-Final-Low-res.pdf>

<sup>3</sup> <http://www.earthlife.org.za/wordpress/wp-content/uploads/2010/03/Free-Basic-Electricity-Final-Low-res.pdf>

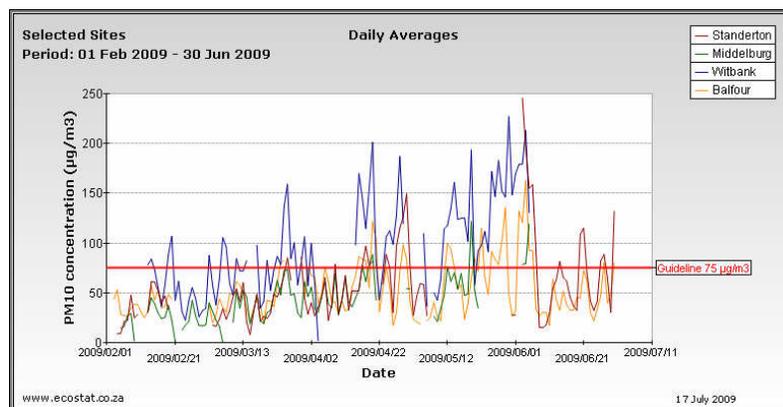
<sup>4</sup> [http://www.worldenergyoutlook.org/database\\_electricity10/electricity\\_database\\_web\\_2010.htm](http://www.worldenergyoutlook.org/database_electricity10/electricity_database_web_2010.htm)

<sup>5</sup> [http://lightingafricaconference.org/fileadmin/user\\_upload/Conference\\_2010/Day1/DAY1\\_PDF/Gaurav\\_Gupta-Lighting\\_Africa\\_2010\\_Dalberg\\_SPL\\_market\\_trends.pdf](http://lightingafricaconference.org/fileadmin/user_upload/Conference_2010/Day1/DAY1_PDF/Gaurav_Gupta-Lighting_Africa_2010_Dalberg_SPL_market_trends.pdf)

health as a result of the additional emissions of SO<sub>2</sub> are therefore **deemed to have a high significance.**” Map of Sulphur Pollution in South Africa Below: The heavily polluted area in the middle of the north east corner of the country is where Kusile is sited<sup>6</sup>.



- **NO<sub>x</sub> pollution:** NO<sub>x</sub> can mix with other compounds to cause or worsen respiratory and cardiovascular illnesses such as emphysema, bronchitis, and heart disease, increasing hospital admissions and premature death. Despite the fact that this major pollutant is a byproduct of burning coal, the project completely avoids addressing specific mitigation measures for NO<sub>x</sub> pollution saying they are “...not considered in any further detail.” Furthermore, particulate matter fraction, PM-10 concentrations are regularly above the guidelines especially in winter months, which are prone to heavy inversion levels. This is evident in the daily averages according to the Mpumalanga local government’s assessment shown in the chart below:<sup>7</sup>



### Health Impacts

- **\$486 million in Health Care Costs in 2002:** As a result of this pollution, total admissions to hospitals across the towns adjacent to fuel-burning areas numbered approximately 118,900 estimated to be ~ \$486 million in 2002<sup>8</sup>.

<sup>6</sup> <http://soer.deat.gov.za/140.html#3547>

<sup>7</sup> South Africa, Mpumalanga Provincial Government Presentation.

<sup>8</sup> <http://soer.deat.gov.za/140.html#3547>

- *Project sited for a heavily polluted area:* According to research undertaken by South African Weather Services and the University of the Witwatersrand between 2003 and 2006, the sulfur dioxide (SO<sub>2</sub>) levels in ambient air pollution are highest in the Highveld Area, where Kusile is being constructed.<sup>9</sup>
- The research also concluded that the highest impact on human health is where there is 'low level domestic combustion' sources near large industrial developments.<sup>10</sup>
- Coal-fired boiler operations were the most significant industrial source grouping cited in respiratory hospital admissions cases involving the inhalation of fuel-burning related emissions<sup>11</sup>.

### ***Water Impacts & Mining***

- *No Assessment of New Mining:* The Kusile plant will require a supply of 17 metric tons of coal per year, which will stimulate demand for new mines, which will contaminate scarce water supplies. Much of South Africa's coal will require washing before being burned in the plant, thus further polluting the water. The Kusile Environmental Impact Report does not assess environmental and social impact of mining to supply Kusile with coal.
- *Existing Water Shortage:* Eskom faces a 786 million cubic meter shortfall in water requirements for its already existing coal plants. The Kusile plant will add 7.7 million cubic meters of demand. Pollution controls for Sulphur will add another 3.4 to 5.5 million cubic meters.
- *Increased Water Demand and Pollution:* Eskom needs high quality water to generate electricity. But herein lies a dilemma : coal mining has a direct impact on water quality. The water in the Witbank area, near to Kusile is unsuitable for power generation because of coal mining and other industrial impacts. Thus water has to be piped in from hundreds of kilometres away.<sup>12</sup>
- *100 mines without water permits:* Nationally, over 100 mines (not only coal mines) are operating without water permits.<sup>13</sup>
- *6,000 abandoned mines:* There are more than 6,000 abandoned mines in South Africa and some of these are coal mines burning underground in the Highveld area, where Kusile is to be developed.<sup>14</sup>

### ***Fly Ash Pollution***

- *Toxic Fly Ash* – Fly ash from coal burning contains heavy metals and other toxic elements such as arsenic, uranium, and mercury, which can cause cancer, and neurological and developmental disorders. Approximately 1,000 hectares of land would be required to accommodate a toxic above-ground fly ash dump for the life (40 – 50 years) of the coal fired power station. According to the Kusile Environmental Impact Report, this dump “*could have direct and indirect impacts on the aquatic*

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<sup>9</sup> Piketh, *et al*, 2006, Airborne Measurements of Air Pollutants over South Africa,

<sup>10</sup> Ibid.

<sup>11</sup> <http://soer.deat.gov.za/140.html#3547>

<sup>12</sup> Pretorius, K. Federation for a Sustainable Environment.

<sup>13</sup> Esmarie Swanepoel, Over 100 South African mines operating without water licences, Engineering News, 29th September 2009.

<sup>14</sup> Hallowes, D, 2011, Working Manuscript.

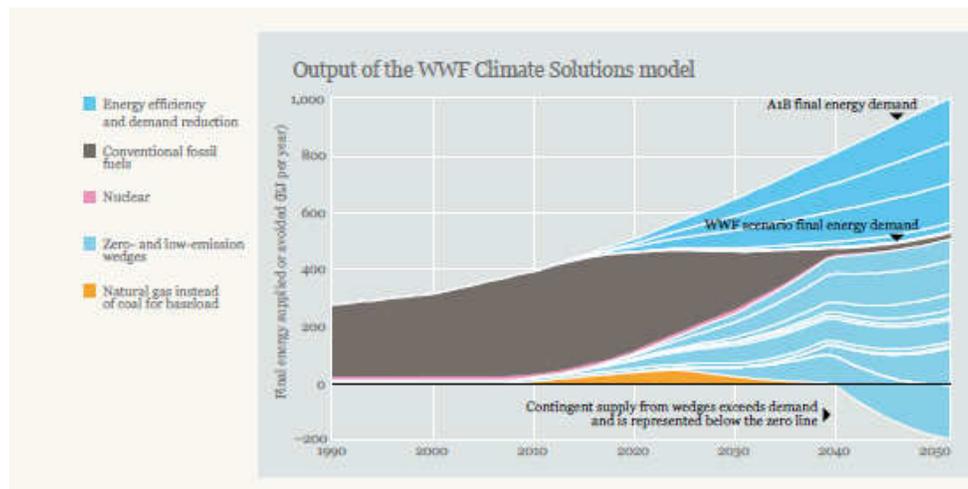
environment...The impact would have a high magnitude and long term duration...accordingly a **high-significance impact is anticipated.**"

### **Contribution to Climate Change**

- The annual Green House Gas (GHG) equivalent emissions for the Kusile Project alone – 36.8 million tons - would increase South African energy sector emissions by 12.8%, and the country's total contribution to climate change by 9.7%. South Africa already has the distinction of being among the top global greenhouse gas emitters per capita. According to the International Energy Agency, the country's energy sector is four times more CO<sub>2</sub>-intensive than even that of the USA. Despite the enormity of its climate impacts, the EIA dedicated less than 1 page of a 174-page document to the Kusile Project with no mitigation measures proposed. Financing of such a project is clearly not an appropriate choice for Ex-Im Bank's low carbon policy.

### **Alternative Energy Scenarios to Kusile**

- The government version of the energy scenarios (IRP2) takes Medupi and Kusile as 'given,' creating a stranded cost for the entire modeling exercise. Thus renewable energy costs are viewed in addition to, and not instead of, Medupi and Kusile.
- World Wildlife Fund South Africa has conducted a modeling scenario that does not include Kusile. In this scenario 50% of electricity is derived from renewable energy by 2030<sup>15</sup>. This scenario focuses heavily on energy-efficiency measures in addition to increased production of wind farms, concentrated solar power, and solar hot-water heaters. The combination of these measures brings average electricity costs *down* over the long term while creating jobs<sup>1617</sup>.



<sup>15</sup> <http://www.wwf.org.za/?3021/WWF-report-calls-for-50-renewable-energy-by-2030>

<sup>16</sup> [http://assets.wwfza.panda.org/downloads/cheaper\\_electricity\\_with\\_renewable\\_energy.pdf](http://assets.wwfza.panda.org/downloads/cheaper_electricity_with_renewable_energy.pdf)

<sup>17</sup> <http://www.earthlife.org.za/wordpress/wp-content/uploads/2010/03/Free-Basic-Electricity-Final-Low-res.pdf>