

WHY THE COAL FIRED POWER PLANT (CFPP) SHOULD NOT BE ALLOWED IN LAMU

Summary of objection Points By:

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(Note: The EMCA 1999, and the EIA & EA Regulations 2003, Reviewed in 2015, do not mention any document called Environmental and Social Impact Assessment (ESIA) but rather the Law recognises Environmental Impact Assessment (EIA) and or Environmental Audit (EA). That's why I have deliberately ignored the word ESIA for EIA).

1. The CFPP violates the constitution (**Chapter 5**) on the rights of citizens to clean environment – the flue gases that will be emitted from the plant stack will contain toxic gases common of these being carbon dioxide, sulphur, mercury, arsenic. Nitrous oxide gases among others (**see Annex:1 –pollution gases from CFPP**). The effects of these gases will be felt away from the plant site when they descend from the 210m stack down to ground surface. The known health impacts of **flue gases are eye damage, breathing problems, renal problems, effects on nervous system, pulmonary effects, cardio-vascular diseases and potential for cancer**. Exposure to mercury in food and water will have serious consequences to livelihoods. According to studies done around CFPP it was found there was an increase in hospital admissions of patients with flue gases related ailments (USEPA, 2011)
2. The CFPP will depend on limestone mined from a **land concession of 2,000 acre piece of land in Witu yet THERE IS NO EIA for the limestone concession site. This is a large land that will be laid waste due to quarrying of limestone**. How did NEMA issue a EIA License **without first the EIA license for the limestone concession**? Large quarries require EIA because the quarry strips vegetation bare, it destroys aesthetic value, it accumulates water that can breed mosquitoes and livestock and people can drown in such enormous pit hence an EIA should have been done to mitigate some of these impacts. It is said the Limestone source will be from Witu a distance of over 50 km where limestone will be mined and transported. This will also be a problem to traffic and road damage. These must be mitigated and EIA was essential.
3. The Project goes against the National Climate Change Action Plan (A creature created by the Climate Change Act, 2016) where the government pledges for low carbon development pathway. **The project will raise the carbon level by a massive 8.8 million tonnes instantly from only one source!** Kenya government promised in the Paris Climate Agreement to maintain a low emission

development pathway (**see Annex:2**). The government departments also get a lot of support from global climate resilience funds. These include Ministry of Water, Ministry of Agriculture and Livestock, Ministry of Environment and Natural resources among others

4. The EIA/ESIA that was done has serious flaws and is inconsistent with the Legal framework governing such processes namely the Kenya constitution, EMCA - EIA & EA (Regulations, 2003) – This problem is shown as follows:
 - a. Public gathering on Friday when its known fact that day is a day of prayer for Muslims
 - b. Not conducting adequate public hearing on Lamu island which guarantees more participation due to proximity
 - c. A more comprehensive Public awareness is necessary in such sensitive projects. This should involve use of printed posters in both English and Kiswahili
 - d. In the absence of signed attendance list or minutes the public participation cannot be authenticated by merely mentioning institutions and dates of the event

5. It is possible the touchdown of these toxic flue gases could be in densely populated areas because the touchdown distance will depend on wind direction and speed – the EIA mentions the following vital statistics – prevailing wind direction – South, average wind speed 3.4 m/s, maximum 10yr 15.5 m/s (See Table 4 -1, site particulars). However the EIA did not explain the implication of these statistics on pollution for example what **lies to the south of the site where the impact of the flue gases will be highly felt is towards Mukowe and Lamu Island itself**. With the wind speeds provided what will be the touchdown of the flue gases from the stack height? (**See Annex 3**)

6. The **minimum and maximum temperatures at the site are 27.2°C and 30.3°C respectively, (Table 4 -1) while the design temperatures are given as 27°C. Will we be justified to say that the design needs to be redone to comply with the site prevailing room temperatures?** Will it affect the safety of the plant if its designed to operate under lower temperatures compared to the average prevailing temperatures of the site?

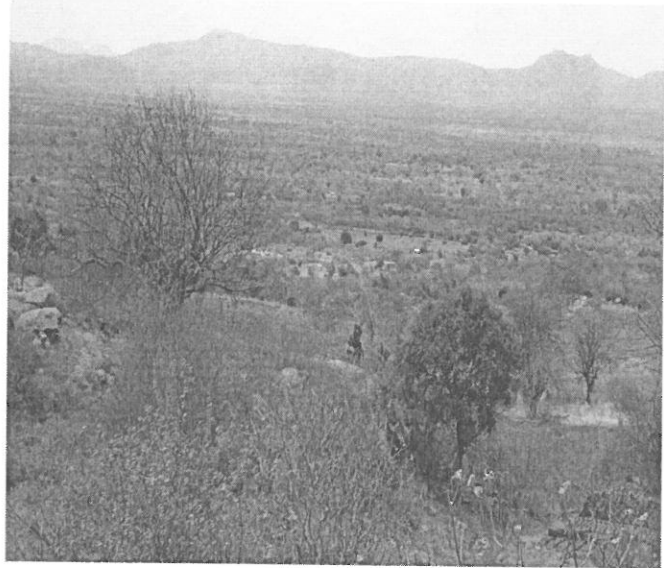
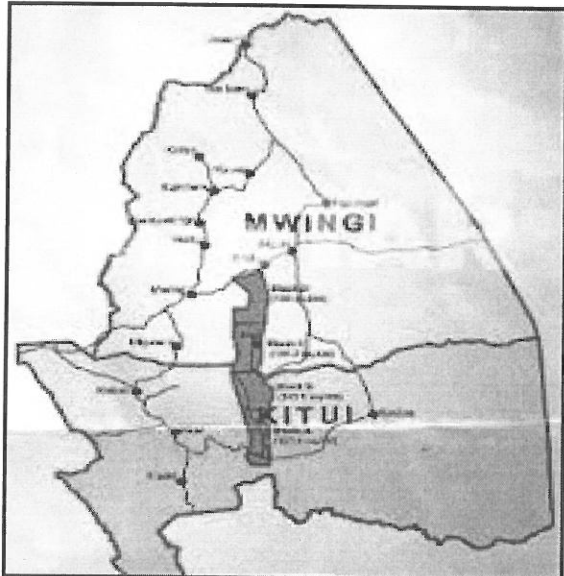
7. Every EIA is required to provide options analyses for a proposed project, these cover:
 - i. **Project option: Zero option, avoidance or Business as Usual (BAU)** where the environmental and socio-economic considerations are evaluated to make decision on whether the planned project is absolutely necessary. If it is found that the negative impacts cannot entirely be mitigated to a bare minimum – it means **abandon the plan** – this should have been the obvious option if it wasn't the case of the **"He who pays the piper calls the tune"**.

EIA should not be an apologist document meant only to satisfy the paper work before project implementation. Unfortunately, until Nema becomes an independent body with the security of tenure its effectiveness in protecting our environment will remain weak. Moreover, polluters a normally economically powerful corporations while the plaintiff are many times ordinarily citizens with low economic power

- ii. **Energy type options** – here a cost benefit analysis needs to be done and more importantly, consider the renewability of the option considered and whether the area is endowed with renewable energy potential – **the Lamu area is endowed with adequate sunlight 6hours daily for 365 days! There is also adequate land at the same site to lay solar panels. Opting for coal fired plant instead of other renewable energy sources is not clever**
- iii. Product quality – there are various qualities of coal that provide different calorific value during combustion. They also differ in flue gas emissions. Coal quality can also be improved by washing. There is no indication that there will be coal washing to improve calorific value and reduce flue gases for the Lamu Plant. **It will have been prudent to import the highest quality of coal if the option of importation was the only option available**
- iv. Technology options – Using more advanced pressurised coal heating system technology (**ultra-critical pulverized coal fired boiler technology**) could have provided better emission results than the designed **super-critical pulverised coal fired boiler technology**.
- v. **Site location:** something is not adding up here, **Mui Basin in Mwingi sub-county, Kitui County** has massive coal deposits (for example there are 4 Blocks namely A, B, C & D. Block C alone has an estimated 400Million Tones of coal deposits). All the coal in these Blocks is of almost similar quality as that of south African coal (**MoEP,2013**) that will be imported for the Lamu CFPP. The area has low population and good transport network so **why could the government wait and locate the CFPP in this area if it must use coal to generate electricity?**
- vi. The assertion that the coal from MUI Basin will be **transported 350 km away to Lamu once the mines begin for the CFPP is not factual**. The proposal for the **Mui Basin coal** is to develop its CFPP *in situ*. There was never any plan to transport coal from MUI to Lamu! This means there was no need of the Lamu CFPP in the first place. The people of Kitui from my experience while doing SEA for Fenxi Industrial & Mining Co. Ltd said their

coal will never be transported to Lamu because that deprives them of employment for their people.

- vii. It is not factual to say that the Kitui Coal mining programme was far from being implemented. Indeed the paper work to start mining initially in Block C and D was at an advanced stage but then when the idea of importing coal from South Africa and locating CFPP in lamu surfaced all the plans for MUI Coal stalled!



Mui Basin-Mwingi –Kitui able space, low population and plenty of coal deposits. This is better site for CFPP than Lamu

- viii. The CFPP EIA states in 6.1: that in choosing the better site they “**considered a location away from populated areas and away from LAPSSET project activities**”. **So the other mortals near the project don’t matter?** Again, analysis of prevailing wind pattern of the area does not vindicate the populated areas either because the prevailing wind blows south and with the very high stack (Chimney) of 210 Metres it’s **possible the flue touchdown will be in the high population density areas including being transported to Mokowe, LAPSSET harbour and the Lamu Island itself!**
 - ix. The EIA states that Mombasa location was discarded because “large coal tankers would cause detrimental coal dust impacts within the Port. Just wondering i though the **LAPSSET Port is planned to be a very busy Port than even Mombasa Port, how come it will not be disturbed by the mentioned large coal tankers?**
- 8. Clearing bear an area of 80 Ha of natural forest is really massive.** The area will be experiencing a project with **massive carbon footprint (8.8 million Tonnes annually)** and at the same time being deprived of vegetation which acts as

carbon sink hence **no carbon sequestration** (see 10.33 of the EIA). It's really not worth it! The clearance will also **permanently change the hydrology of the area including runoff characteristics, soil erosion acceleration, water table decrease hence experience of hydrological drought**. The proposed mitigation measures of planting trees cannot entirely mitigate this problem because the **displaced vegetation includes both indigenous trees and undergrowth which have reached their climax and hence cannot be easily replaced in a period of less than 100yrs.**

9. It is estimated that about 2,000 – 3,000 workers will be used in the construction works. This large population of people **requires well planned sewerage development** in advance which there is none on sight. There is therefore high possibility of waterborne disease outbreaks resulting from poor sanitation. Cholera, diarrhoea, typhoid outbreaks will be real possibilities.
10. The management of both bottom and fly ash is cumbersome and its storage will constitute a big mountain of ash that will be susceptible to being blown by wind and becoming a source of pollution in and around the plant
11. The wet scrubbing using limestone to remove SO₂ is not well explained and especially how the slurry will be managed
12. The waste in form of fly, bottom and gypsum according to this project **will be treated as waste**. In countries with CFPP, these are used as follows:
 - a. Road building or **concrete blocks manufacturing**
 - b. Gypsum – **cement manufacturing industry or manufacture of wall boards**

This factory must be forced to recycle these by products that will otherwise become toxic waste. Why are they so much in hurry? Moreover no reasonable plan has been given to manage both ash, slurry and human waste to avoid environmental contamination and health hazard.
13. The EIA (in 4.1) says coal will be procured based on the **“government to government negotiated price”**. The proposed **CFPP in Lamu is a private enterprise how does government negotiate prices for a private company? Is Kenya a Banana Republic?**
14. In spite of the fact that CFPP are known to be the cause of many occupation Health related diseases to the workers and also diseases emanating from the plant to the neighbourhood community, however there is **no comprehensive mitigation measures provided for the ailments. One will have expected a recommendation for the construction of a hospital on the Plant Land to cater for both employees and locals.** The **“Polluter pays principle”** states that those who cause pollution must be responsible for its abatement and its

consequences as well! This is in our EMCA Law and also is part of global best practices in dealing with pollution. **The AMU Power in due cause is probably going to be ruined by a massive compensation case related to pollution**

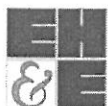
15. The justification for the project is not correct - vide - the power will be used by:
- a. **LAPSSET projects** – which projects? – it is important to note that **LAPSSET future is in doubt** as Uganda - prefers link to Tanga Port in Tanzania, Ethiopia has linked itself to the sea port of Djibouti, Rwanda prefers Tanzania route as well, while South Sudan is in conflict turmoil. **So which LAPSSET?**
 - b. **Resort cities** - these are the proposed Konza city and Isiolo – Konza **will get power from the 65 billion ADBF Thwake Dam** and not AMU Power Plant, while Isiolo can easily be powered by the Ethiopia power import which has already been constructed from the GIBBE III dam on River Omo by KETRACO
 - c. **Standard Gauge Railway (SGR) is diesel driven** and NOT Electricity driven so large supply of power to it is out of the question
 - d. **Iron and Steel smelting** – the only known deposits of these and limestone are found in **Kitui hence if CFPP must be implemented, then it has to be in Kitui where there are huge deposits of coal, limestone and Iron Ore, certainly NOT in Lamu which is a fragile ecosystem and UNESCO world heritage area.**

ANNEX I

Table I. Toxicological and Environmental Properties of Hazardous Air Pollutants (HAPs) Emitted from Electric Generating Stations Fueled by Coal.

Class of HAP	Notable HAPs	Human Health Hazards	Environmental Hazards
Acid Gases	Hydrogen chloride, Hydrogen fluoride	Irritation to skin, eye, nose, throat, breathing passages.	Acid precipitation, damage to crops and forests.
Dioxins and Furans	2,3,7,8-tetrachlorodioxin (TCDD)	Probable carcinogen: soft-tissue sarcomas, lymphomas, and stomach carcinomas. May cause reproductive and developmental problems, damage to the immune system, and interference with hormones.	Deposits into rivers, lakes and oceans and is taken up by fish and wildlife. Accumulates in the food chain.
Mercury	Methylmercury	Damage to brain, nervous system, kidneys and liver. Causes neurological and developmental birth defects.	Taken up by fish and wildlife. Accumulates in the food chain.
Non-Mercury Metals and Metalloids (excluding radioisotopes)	Arsenic, beryllium, cadmium, chromium nickel, selenium, manganese	Carcinogens: lung, bladder, kidney, skin. May adversely affect nervous, cardiovascular, dermal, respiratory and immune systems.	Accumulates in soil and sediments. Soluble forms may contaminate water systems.
	Lead	Damages the developing nervous system, may adversely affect learning, memory, and behavior. May cause cardiovascular and kidney effects, anemia, and weakness of ankles, wrists and fingers.	Harms plants and wildlife; accumulates in soils and sediments. May adversely affect land and water ecosystems.
Polynuclear Aromatic Hydrocarbons (PAH)	Naphthalene, benzo-a-anthracene, benzo-a-pyrene, benzo-b-fluoranthene, chrysene, dibenzo-a-anthracene	Probable carcinogens. May attach to small particulate matter and deposit in the lungs. May have adverse effects to the liver, kidney, and testes. May damage sperm cells and cause impairment of reproduction.	Exists in the vapor or particulate phase. Accumulates in soil and sediments.
Radioisotopes	Radium	Carcinogen: lung and bone. Bronchopneumonia, anemia, brain abscess.	Deposits into rivers, lakes and oceans and is taken up by fish and wildlife. Accumulates in soils, sediments, and in the food chain.
	Uranium	Carcinogen: lung and lymphatic system. Kidney disease.	
Volatile Organic Compounds	Aromatic hydrocarbons including benzene, toluene, ethylbenzene, xylene	May cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; impaired function of the lungs; delayed response to a visual stimulus; impaired memory; stomach discomfort; and effects to the liver and kidneys. May also cause adverse effects to the nervous system. Benzene is a known carcinogen.	Degrade through chemical reactions in the atmosphere and contribute to carbon-based radicals that contribute to formation of ground-level ozone and its human health effects.
	Aldehydes including formaldehyde	Probable carcinogen: lung and nasopharyngeal cancer. Eye, nose, and throat irritation, respiratory symptoms.	

Hazard information compiled from toxicological profiles and concise chemical assessment documents for specific pollutants published by the Agency for Toxic Substances and Disease Registry and World Health Organization and available on-line (ATSDR, 2011; WHO, 2011).





Kenya's Intended Nationally Determined Contribution (INDC)

The Paris Agreement

On 12th December 2015, countries under the United Nations Framework Convention on Climate Change (UNFCCC) adopted the Paris Agreement. The Paris Agreement aims to reach global peaking of greenhouse gas (GHG) emissions as soon as possible. In order to achieve this goal, countries are expected to determine at the national level what actions that are willing and able to take to achieve this goal. Countries will communicate their Nationally Determined Contributions (NDCs) – national climate change action plans that include a GHG emission reduction target – every five years that detail action towards meeting the goal. Countries are expected to submit a new NDC in 2020, and each NDC will represent an increase in ambition.

For the agreement to enter into force, 55 countries that account for at least 55 per cent of global greenhouse gas (GHG) emissions must ratify or approve the agreement and deposit this approval with the United Nations. The Paris Agreement opened for signature on 22 April 2016 and it shall remain open for signature until 21 April 2017.

Kenya's Cabinet Secretary for Foreign Affairs and International Trade signed the Paris Agreement on behalf of the Government of Kenya at the signing ceremony held in New York on 22 April. By signing, the Executive Arm of the Government has not in any way expressed the State's consent to be bound by the treaty until it is ratified. Thus, signature is an act whereby Kenya has expressed its

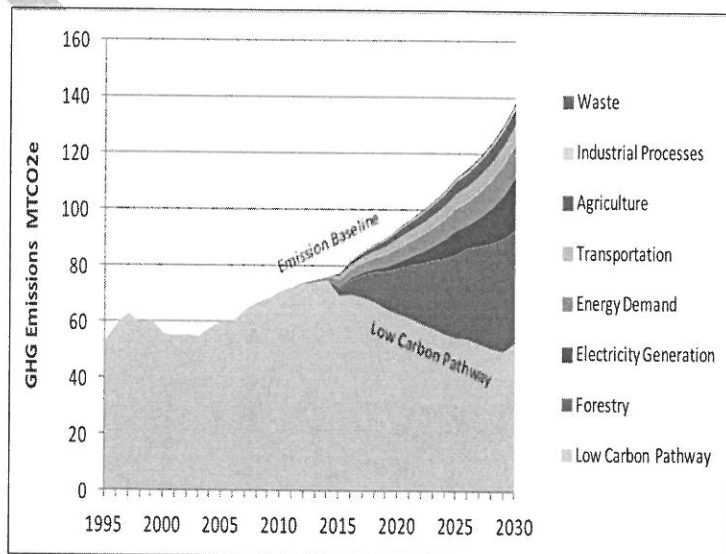
willingness to consent to the text of the Paris agreement and has the effect of obligating Kenya ... to refrain, in good faith, from acts that would defeat the object and purpose of the Agreement. After signing the Paris Agreement, Cabinet and National Assembly approvals are mandatory before Kenya can ratify the Paris Agreement. Upon ratification, the Paris Agreement will become part of Kenya's legal system. The Constitution of Kenya, 2010 Article 2 (6) states that: "Any treaty or convention ratified by Kenya shall form part of the law of Kenya under this Constitution." Best practice requires that the Paris Agreement be domesticated through an Act of Parliament.

When depositing the ratification instruments, Kenya may decide to submit the Intended Nationally Determined Contribution (INDC) submitted in 2015 as the Nationally Determined Contribution (NDC) under the Paris Agreement; or Kenya may opt to submit a new NDC as its first NDC.¹ However, Kenya will not backtrack from the initial 30% emission reduction.

Kenya's Mitigation INDC

Kenya's mitigation INDC is based on its National Climate Change Action Plan (NCCAP), which sets out a low climate development pathway that supports efforts towards the attainment of Vision 2030. Kenya's "seeks to abate its

Figure 1: Composite abatement potential for all sectors for Kenya (technical potential) in MtCO₂e



Source: Government of Kenya (2015), Second National Communication, page 172.

GHG emissions by 30% by 2030 relative to the BAU scenario of 143 MtCO₂eq; and in line with its sustainable development agenda. This is also subject to international support in the form of finance, investment, technology development and transfer, and capacity building.” The 30% emissions reduction target means that Kenya’s GHG emissions in 2030 are expected to be 30% lower than the projected emissions or business as usual (BAU) scenario. Policies, programs and technologies are expected to be introduced to encourage lower emissions and move Kenya on to a low-carbon development pathway. Priority actions to reduce GHG emissions were identified in the Kenya’s 2013 NCCAP, and further elaborated in the Second National Communication (SNC) that was submitted to the UNFCCC in December 2015.⁸

The mitigation analysis of the SNC determined that Kenya has the potential to reduce projected emissions by 85.79 MtCO₂eq, or 60% lower than the projected BAU scenario (detailed in Table 1). The mitigation potential determined through the low carbon analysis undertaken for the NCCAP and

SNC is ambitious and based on the technical potential – or what is expected to be achieved if Kenya takes up technology advances, introduces appropriate and enabling policies and regulations, and moves forward on all potential mitigation actions. In short, it is aspirational and based on a best case scenario – with the intent of providing information and guidance on what is possible to guide decision makers.

Kenya opted for a conservative approach in determining the mitigation potential for the INDC, considering what was feasible and doable in 2015 using known technologies and within established policy and regulatory frameworks. Kenya’s INDC is half of the total mitigation potential identified in the SNC, equal to 42.9 MtCO₂eq or 30% lower than the projected 2030 BAU scenario. The decision to take a less ambitious approach is based on the recognition that the NCCAP and SNC used a low-carbon approach that is aspirational; while the INDC should be grounded in reality and reflect what the government is willing and able to commit to.

The INDC target assumes that all sectors will work toward mitigation goals. The detailed NCCAP mitigation chapters provide information on priority technologies to achieve expected emission reductions, but this information requires review and updating before using as underlying analysis for an implementation plan.⁹ The INDC is based on research undertaken in 2011 and 2012 for the NCCAP. Since then, data and information has improved for all sectors that can inform detailed assessments by sector experts. In addition, the analysis needs updating to consider future emissions out to 2050.

Kenya’s Adaptation INDC

The Paris Agreement established a global goal on adaptation to ensure an adequate adaptation response in the context of the 2°C temperature goal. All countries should submit adaptation communications, detailing adaptation priorities, support needs, plans and actions, which should be updated periodically. Collective adaptation efforts will also be subject to review under the global stocktaking process.

Table 1: Emission reduction potential by sector: Technical potential and INDC 30% GHG emission reduction targets

Sector	GHG Emission Reductions Potential (MTCO ₂ eq)				INDC Target
	2015	2020	2025	2030	2030
Forestry	2.71	16.24	29.76	40.2	20.10
Electricity Generation	0.28	2.24	8.61	18.63	9.32
Energy Demand	2.74	5.16	7.92	12.17	6.09
Transportation	1.54	3.52	5.13	6.92	3.46
Agriculture	0.63	2.57	4.41	5.53	2.77
Industrial Processes	0.26	0.69	1.03	1.56	0.78
Waste	0.05	0.33	0.5	0.78	0.39
Total Emission Reduction Potential				85.79	42.90
Total Emissions in 2030				143.00	143.00
% of Total Emissions in 2030				60%	30%

Source: Government of Kenya (2015), Second National Communication, page 172.

Kenya's INDC sets out priority adaptation actions, stating that: "Kenya will ensure enhanced resilience to climate change towards the attainment of Vision 2030 by mainstreaming climate change adaptation into the Medium Term Plans (MTPs) and implementing adaptation actions. Any reasonable achievement of the adaptation goal will require financial, technology and capacity building support."

The adaptation goals in the INDC are based on priority adaptation actions that are identified and elaborated in the Kenya's National Adaptation Plan: 2015-2030 (NAP).

The plan adopts a mainstreaming approach across all sectors in the national planning, budgeting and implementation processes. Priority macro-level actions and sub-actions are identified in 20 Medium Term Plan planning sectors for the short, medium and long term. For each sector, the NAP identifies gaps, estimates costs of the macro-level actions projected to 2030, and identifies key institutions required for their implementation. These actions form the basis of Kenya's international contribution on adaptation, and implementing these actions will enable enhanced resilience to climate change, which

will assist the country in attaining Vision 2030 goals. The identified adaptation actions are expected to be mainstreamed into Kenya's Medium Term Plan (2017-2022) and implemented by sector ministries and county governments. The Government of Kenya will report to the UNFCCC on progress in implementing the priority actions.

Endnotes

¹ Kenya's INDC can be accessed at:

http://www4.unfccc.int/submissions/INDC/Published%20Documents/Kenya/1/Kenya_INDC_20150723.pdf.

² MtCO₂eq or MtCO₂e is an abbreviation for million tonnes of carbon dioxide equivalent, or the amount of GHG emissions expressed as an equivalent amount or concentration of carbon dioxide. The main greenhouse gases that are measured in a GHG inventory are: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).

³ The NCCAP can be accessed at: <http://www.kccap.info>. The SNC can be accessed at: <http://unfccc.int/resource/docs/nate/kenne2.pdf>.

⁴ The Government of Kenya worked with the International Institute for Sustainable Development (IISD), Energy research Centre of the Netherlands, and local consultants to develop the NCCAP methodology and analysis. ClimateCare, working with IISD experts, developed the SNC analysis.



The INDC sector analysis is supported by the Technical Assistance (TA) component of the Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+) Programme. The StARCK+ TA component is funded by the United Kingdom's Department for International Development (DFID), and implemented by a consortium of DAI, Matrix Development Consultants and the International Institute for Sustainable Development (IISD).

observations are consistent with the measurements of local mercury deposition that were described in Section 3.3.

Local impacts of coal-fired power plant HAP emissions are not limited to HAPs with short atmospheric residence times, however. Longer-lived HAPs are also present in the immediate vicinity of the source before being transported to other areas. These include metals such as lead, arsenic, cadmium and chromium. Potential exposures to these HAPs can therefore be elevated in areas surrounding a coal-fired power plant. For instance, a study of coal-fired power plants in New England found that public health damages per person are two to five times greater for communities near the facilities than for populations living at a greater distance from the plants (Levy and Spengler, 2002).

In addition to properties of a given pollutant and weather, the location and magnitude of local impacts from emissions of coal-fired power plant HAP are influenced by the height of the emission point above ground level. In general, lower stacks result in higher impacts near the source than taller stacks. The relationship between stack height and location of ground-level impacts is illustrated in Figure 10.

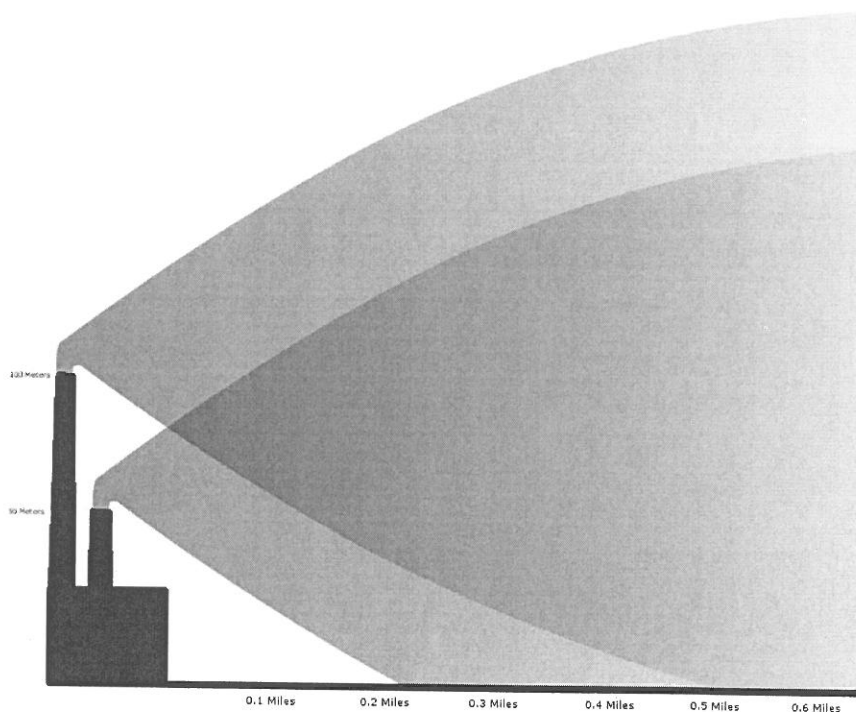


Figure 10 Schematic of location of initial ground-level impacts in relation to height of hazardous air pollutant release.