# Environmental and Social (E&S) Risk Management Sector-Specific Guidance

## Power and Energy

# Preamble to All Sector Specific Guidance

While the guidance notes to the Principles provide high-level, all-sector guidance on the purpose and implementation of (and additional resources for) each Principle, some sectors represent higher environmental and social risk and require greater scrutiny. Therefore, we have provided sector-specific guidance notes, to assist with the implementation of the Principles in these high-risk sectors. These notes draw upon the IFC Environmental, Health and Safety Industry Sector Guidelines and the EBRD Subsectoral Environmental and Social Guidelines and have been adapted to reflect the Ghana-specific context.

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# Power and Energy in Ghana

**Power and Energy in Ghana**

The Power and Energy sector in Ghana is central to the supply of electricity to people and businesses around the country. Electricity is generated at various power plants around the country and then distributed to users via a power transmission network (also known as a grid) and a distribution network. Most of Ghana's total power is generated by hydro and thermal power plants, comprising 42.7% and 57.1% respectively. Recent investments have meant that 0.04% of Ghana's energy in 2016 was generated through solar technology.

The power sector in Ghana is unbundled. This means that the various functions of power generation, transmission and distribution are performed by separate entities to ensure quality power supply. These entities are headed by the Ministry of Energy.

The Electricity Company of Ghana distributes electricity mainly in the southern sector of the country whiles the Volta River Authority is responsible for the northern sector.

**Relevant regulations in the Power and Energy sector**

The Energy Commission is the technical regulator of Ghana's electricity, natural gas and renewable energy industries, and the advisor to Government on energy matters. This was created by an act of parliament *The Energy Commission Act, 1997 (Act 541)*

*The Public Utilities Regulatory Commission Act, 1997* created the Public Utilities Regulatory Commission (PURC). This entity regulates the provision of utilities in Ghana. It covers all aspects of utility provision and ensures the fair provision of services to consumers. Given the unbundled structure of the power generation, transmission, and distribution sectors, different regulations apply to the different components of this sector. The National Energy Policy 2010 is the underlying policy guiding governmental actions and strategies in the power and energy sector.

The Energy Commission issues licences to the different bodies engaged in the supply of electricity. This serves to improve capacity and service delivery while holding operators to the terms of their licence. It is through this licensing system that capacity is added to the network. The Commission launched the *National Electricity Grid Code* in 2010. It lays out the technical standards and requirements for the electricity distribution network including its safe management and other relevant issues. Complementary to this is the *National Electricity Distribution Code* that sets out the minimum acceptable technical standards of the electricity distribution network, as well as other standards relating to the safe and reliable operation of the electricity distribution network.

For small scale solar solutions, the Energy Commission runs a rooftop solar programme where homes and small businesses can apply to receive a capital subsidy to cover the cost of photovoltaic (PV) panels. The aim of this is to lower the daily national peak load by 200MW. It provides an alternate source of electricity if there are problems with electricity supplied by the grid. An increasing number of Ghana's island communities are benefitting from the technology, where off grid solar-diesel hybrid systems provide access to electricity for the first time. It is not economically viable to connect these areas to the national grid, but the mini-grid solutions provide a reliable source of electricity that can be used for both personal and business activities, boosting island economies. The Renewable Energy Act 2011 (Act 832) (the Renewable Energy Act) is the energy-related legislation geared towards the encouragement of Ghana's drive to boost the renewable energy sector.

Finally, *The Environmental Protection Agency Act 490*, 1994 allows the Ghana Environmental Protection Agency to request an Environmental Impact Assessment from any company undertaking a project, clearly setting out the impacts of the project on the environment. This could apply to power generation projects: for instance this was the case for the construction of the Bui Hydroelectric Power Project.

## Power Generation

**Thermal Power Plants:** Thermal power plants burn fuels to produce heat, which is turned into electrical energy through a variety of methods: a steam turbine, a combustion turbine, a combined cycle gas turbine (CCGT), an internal combustion engine or a cogeneration system. The majority of thermal power plants in Ghana burn oil or natural gas. In 2015, 44% of natural gas for power generation was supplied by Nigeria via the West African Gas Pipeline (WAGP), which was the first regional natural gas transmission system in sub-Saharan Africa. The remaining 56% came from the Atuabo processing plant, which is located in the Western Region of Ghana. Thermal power plants are usually connected to a grid for distribution, but smaller scale plants may be isolated from the national grid for specific purposes such as powering a factory.

**Hydro Power Plants:** Hydroelectric or 'hydro' power plants usually involve building a dam across a river to create a reservoir. Ghana's hydro power is supplied by the Kpong Dam, the Akosombo Dam and the Bui Dam. While hydro plants provide a more reliable electricity supply than other renewables such as wind, they are vulnerable to natural factors such as levels of rainfall. Rainfall in Ghana can be unpredictable and in recent years, Ghana has received below average rainfall. As a result, the country's hydro power plants have not been able to operate at their predicted high capacity.

**Solar Power Plants and other Renewable Energy:** Photovoltaic (PV) panels, also known as solar panels, provide a renewable source of electricity. As stated above, solar comprises a tiny portion of energy generation in Ghana at present. However, this is likely to change as Ghana looks to solar as part of the solution in its struggle to meet growing electricity demand. Ghana is well poised to increase the amount of power generated through solar means, as the country is located very close to the equator and receives large amounts of sunlight. For example, Accra averages more than 150 hours of sunshine a month. The Navrongo Solar Power Plant is owned by the Volta River Authority (VRA) and first delivered electricity in 2013, with a modest capacity of 2.5 MW. The BXC Company solar plant came online in 2016 with a more significant 20MW capacity. In 2016, fifty-five provisional wholesale electricity supply licences and two construction permits were issued.

Other renewable energy proposals have been granted licenses as Ghana looks for a diverse range of solutions to meet the growing demand for electricity.

## Power Transmission and Distribution

Power transmission in Ghana is managed by Ghana Grid Company Ltd. (GRIDCo), which operates the National Interconnected Transmission System (NITS). Ghana's transmission grid comprises more than 4,000km of high voltage transmission lines and 53 transformer/ switching stations and is interconnected with the electrical network of Côte d'Ivoire.

Two companies are involved in the distribution of electricity: The Northern Electricity Distribution Company (NEDCo) and the Electrical Company of Ghana (ECG). There is an extensive distribution network in Ghana, which serves approximately 72% of the total population. However, access to electricity in the three northern regions is only about 30%.

Transmission infrastructure has suffered from a lack of investment, which has led to some inefficiencies. In 2015 transmission losses as a percentage of gross transmission was at 3.8%, this represents a decline from previous years and the lowest level since 2010.

Off-grid electricity, in particular solar powered off-grid electricity, has the potential to become an important part of the supply in the future.

## Growing demand and the stability of electrical supply for the economy

In Ghana, electricity demand remains high, growing at 7% a year on average over the last ten years. The power sector is essential to economic growth but the World Bank has identified that lack of access to electricity is one of the most significant constraints to business in Ghana. This is illustrated by the fact that Ghana's 2007 power crisis led to the country losing 1.8% of its GDP.

Economic growth in Ghana continues to increase demand for electricity. Ghana has been increasing its installed capacity, especially in thermal power generation. To ensure security of supply in the future, Liquefied Natural Gas (LNG) and nuclear power could begin to play a larger role in the energy mix. Construction has started on a LNG terminal in Tema, which is expected to produce 3.4 million tonnes of LNG annually. Ghana has completed the first of the three phases of the International Atomic Energy Agency (IAEA) required milestones, which every country has to complete prior to developing a national infrastructure for nuclear power.

# Summary of Key E&S Issues

**ESG Risk category key**

- Environment – Affects the natural environment
- Health and safety – Affects the health and safety of employees
- Labour – Affects workplace conditions and treatment of employees
- Community – Affects the health and safety, livlihoods and environment of the community and wider public

**Note:**

Key risk ordering based on significance of the potential financial impact to the company in question.

| Key risks | Power & Energy |
|---|---|
| Fire and explosion | ● ▲ ◆ |
| Air emissions | ● ▲ ◆ |
| Electrical safety | ▲ ■ ◆ |
| Hazardous materials | ● ▲ ◆ |
| Occupational health and safety | ▲ |
| Soil and surface water contamination | ● ▲ ◆ |
| Habitat Loss and Biodiversity | ● ◆ |
| Electromagnetic fields (EMF) | ▲ ■ ◆ |
| Community engagement | ◆ |
| Labour rights | ■ |
| Visual impact | ● ◆ |
| Cultural heritage | ● ◆ |

# Potential Costs Associated with Key E&S Issues

## Potential costs *to banks' clients* associated with key E&S issues

**Fines from regulatory authorities, or third party claims for fatalities and injuries to employees or local communities due to accidents or exposure to toxins.**

**Fines from regulatory authorities or third party claims for clean-up/ remediation costs associated with environmental impacts.**

**Fines from regulatory authorities or third party claims for impacts to natural capital resource.**

**Reputational damage leading to protests and increased operational costs.**

**Potential capital expenditure required to meet environmental and labour conditions attached to operating licenses.**

## Potential costs *to banks' credit portfolios* associated with key E&S issues

Any of the above costs to clients could cause a client's operations to be suspended

This may impede the client's cash flow, potentially leading to credit default

This may lead to a potentially significant loss in revenue for lending banks

In order to protect themselves, banks should consider including, in loan documentation, environmental and social Conditions Precedent, Warranties, Covenants and Events of Default.
Please see the Guidance Note associated with Principle 1 for further details.

# Analysis of Key E&S Issues

## Fire and Explosion

Many aspects of the power and energy sector can pose fire and explosion risks. As the majority of thermal power plants in Ghana burn oil or natural gas, these plants will store and burn large volumes of these fuels, which are highly flammable. Furthermore, trees and other vegetation can interfere with transmission lines which, depending on weather conditions can lead to forest fires if left unchecked. Major accidents from explosions, fires and forest fires can lead to fatalities, injuries, and production downtimes. They can also lead to detrimental impacts to the surrounding environment and nearby infrastructure which can negatively affect local populations.

The Ghana National Fire Service Act, 1997 (Act 537) provided the regulation for the management of undesirable fire and explosion in the sector. This is guided by the Fire Precaution (Premises) Regulations 2003, LI 1724 which makes it obligatory for certain premises to have fire certificates to meet fire safety standards.

**Risk Management**

Client companies should implement the following risk management practices:

- Ensure that power generation facilities are designed, constructed, and operated according to the latest local Ghanaian regulations (and international standards, where appropriate) for the prevention and control of fire and explosion hazards.
- Monitor vegetation in power transmission corridors in order to minimize risk of fallen trees and other interference from vegetation.
- Ensure that equipment undergoes scheduled inspection and maintenance activities and meets international standards of operational performance in order to avoid failure.
- Ensure that appropriate emergency procedures are in place in the event of an accident. This includes establishing suitable communications with the appropriate local emergency authorities.
- Ensure all staff have been trained on safety procedures in the case of a fire or explosion emergency.

# Air Emissions

Thermal power generation has the potential to release the following as air emissions:

- Carbon dioxide ($CO_2$) – a greenhouse gas that contributes to the acceleration of climate change
- Nitrogen oxides (NOx) – one of the main components of ground level ozone that can contribute to serious respiratory problems in humans and wildlife
- Carbon monoxide (CO) – prevents humans and wildlife from breathing oxygen and can lead to mortality
- Volatile organic compounds (VOCs) – one of the main contributors to smog and can lead to serious health problems in humans and wildlife

Other, more toxic, substances such as heavy metals and halide compounds may also be released in smaller quantities. Because thermal power plants in Ghana tend to burn gas, they are less likely to emit sulphur dioxide and particulate matter than coal-fired plants. Air emissions are not a significant concern for hydropower plants and for power transmission and distribution.

**Risk Management**

Client companies should implement the following risk management practices:

- Adhere to all air emissions related conditions attached to any operating licences obtained these may include but many not be limited to the following:
  - Ensure that any previously installed and new combustion systems are run as cleanly and efficiently as possible.
  - Ensure that storage equipment has been designed and is maintained to minimise any toxic air emissions.
  - Ensure facilities are equipped with reliable air emissions detection systems.
  - Ensure that plans are in place to minimise personnel exposure to any toxic air emissions.
  - Ensure that plans are in place to minimise community and wildlife exposure to toxic air emissions.

# Electrical Safety

Power transmission and distribution lines inherently represent a large occupational hazard in terms of electrical safety as they are designed to carry massive quantities of electrical energy. Workers may be exposed to live power lines during construction and maintenance, which can be a major health and safety hazard. There are also electrical hazards for workers at thermal power plants due to the presence of energised electrical equipment (with live electrical currents) and live power lines.

**Risk Management**

Client companies should implement the following risk management practices:

- In both thermal power plants and power transmission networks, ensure that the deactivation and proper grounding of live power equipment and distribution lines takes place according to applicable legislation.
- Install hazard lights and high voltage sensors inside electrical equipment enclosures.
- Workers should have specialised electrical safety training that includes hazard awareness, safe work procedures and first aid. This means they should be able to understand minimum approach distances, make proper use of safety equipment and procedures as well as distinguish live parts from other elements of the electrical system.
- Only trained and certified workers should work on power transmission and distribution lines where they are dealing with energised equipment.
- Workers not dealing directly with power transmission lines should adhere to local legislation relating to minimum approach distances.

# Hazardous Materials

The power generation sector is associated with a host of hazardous materials including insulating oils and gases. In particular these include: Polychlorinated Biphenyls (PCB) and Sulphur Hexafluoride (SF6). PCBs are especially toxic and are, in particular, carcinogenic. SF6 has been shown to be a substantial contributor to climate change. Thermal power plants can typically host a broad range of additional hazardous materials that are stored at combustion facilities including: treatment chemicals and large quantities of coal or oil (in Ghana oil is more likely than coal as most thermal power plants in Ghana burn oil).

Electrical transmission poles, when made from wood, are typically treated with preservatives to protect against rot and various bacteria and fungi. Commonly used preservatives such as creosote are being limited in some countries due to their potentially toxic nature. Pesticides are also widely used in and around transmission sites and may pose a risk to biodiversity and human health if not managed or used correctly.

If they are working in older facilities, workers may also be exposed to asbestos. This is less likely to be the case in Ghana as asbestos is typically found in insulation used in colder climates. However, given that asbestos has also been used in the past for its fire prevention qualities, it may still pose a risk in facilities in the power and energy sector in Ghana.

The Hazardous and Electronic Waste Control and Management Act 2016 (Act 917) provides for the control of management and disposal of hazardous waste, electrical and electronic waste and for related purposes.

**Risk Management**

Client companies should implement the following risk management practices:

- Conduct hazard assessments in line with widely accepted international standards and methodologies such as the Hazardous Operations Analysis (HAZOP). Aspects of these assessments should include hazard identification, handling procedures and basic emergency procedures.
- Ensure that there is adequate provision of secondary containment (e.g. double walled storage tanks) for the containing of hazardous materials should they leak.
- Replace existing transformers that still use PCBs and safely dispose of them.
- Evaluate the use of alternative materials such as concrete in the construction of transmission poles to avoid the requirement of chemical treatment.
- Inspect any materials that have the potential to contain asbestos and take measures to prevent airborne particles.
- Only allow trained personnel in well-lit and ventilated areas to undertake the mixing and transfer of pesticides.
- Provide personnel with appropriate personal protective equipment (PPE) and with training for its use and maintenance.

# Occupational Health and Safety

Work in the power and energy sector can present various types of health and safety risks, in addition to the fire, explosion and hazardous materials risks referenced above.

In electrical power transmission, personnel work on high structures during all phases of a project (including both construction and maintenance) and are at risk of serious personal injury if they fall. Workers in thermal and hydro power plants may also need to work at height as part of construction and maintenance of the plants, which also presents similar risks of injury.

There is also the potential for serious injury from working in confined spaces. During the operation of a thermal power plant workers may be required to work in confined spaces such as cooling water containers. The dangers of working in confined spaces include overexposure to toxic gases and dust, oxygen deficiency and exposure to excessive heat. These can lead to negative health impacts for workers including (but not limited to) respiratory conditions, skin conditions, disorientation and asphyxiation. The dangers of confined spaces are compounded by the difficulty inherent in attempting rescue operations.

In accordance with the Labour Act 2003 (Act 651), it is obligatory for employers to ensure health, safety and welfare of persons at workplace by minimizing the causes of hazards inherent in the working environment.

**Risk Management**

Client companies should implement the following risk management practices:

- Put in place a health and safety management system that is independently certified to a recognised standard (such as OHSAS 18001).
- Provide personnel with appropriate personal protective equipment (PPE) and/or respiratory protective equipment (RPE) to include training on its use and maintenance.
- Ensure that fall prevention and protection measures are in place whenever personnel are at risk of falling more than two metres (into water, or onto the ground or machinery).
- Install fall prevention infrastructure including guard rails and devices including lifelines and harnesses.
- Test the composition of air in confined spaces and take necessary measures to ensure personnel are not exposed to harmful toxins.
- Ensure areas adjoining confined spaces provide room for emergency and rescue operations to take place should the need arise.
- Implement recovery plans and procedures should a worker have to enter a confined space.
- Ensure that adequate safety precautions exist including lifelines and safety watch workers outside the confined space.

## Soil and Surface Water Contamination

Thermal power generation in Ghana involves the storage and use of oil on site at large combustion plants. This means that any fuel storage tank leaks or rainwater runoff has the potential to contaminate the soil and groundwater. Moreover, given the large amounts of water consumed by thermal power plants in cooling, there is a high likelihood of other contaminants entering into water which may then be discharged into the nearby environment.

Hydro power installations may cause surface water contamination through spilled oils or chemicals. This can occur during both construction and operation of the installation. Furthermore, during operation, turbines may cause sediment to build up in the lake above the plant before being discharged into the river below.

Finally, pesticides used around transmission assets can leach into soil and surface water which may cause negative impacts to biodiversity or human health.

**Risk Management**

Client companies should implement the following risk management practices:

- Ensure that wastewater treatment systems are installed, operational and subject to regularly scheduled maintenance and cleaning.
- Ensure that oil storage tanks at thermal power plants are maintained to local Ghanaian standards or, where appropriate, internationally recognized standards (such as ISO 16961:2015 and ISO 28300:2008).
- Consider the availability of environmental impairment liability insurance that covers the liability and in some cases the clean-up costs associated with pollution of land. This will require the client to prove (at its own cost) that the land is not already contaminated before cover can be provided.
- Ensure that the facility is regularly subject to soil and groundwater monitoring. This should include comparison of tested water and/or soil samples against relevant contaminated site regulations. In the absence of national standards, recognised criteria for evaluation should be used such as the USEPA Region 3 Risk Based Concentrations.
- Ensure that any power plant has an up to date and detailed map of its different wastewater streams and their treatment.
- Develop an Oil Spill Response Plan which includes training of personnel and local communities in spill prevention and response.
- Estimate and record the extent of oil spills by comparing the amount of oil spilled against the amount of oil collected through clean-up efforts.

## Habitat Loss and Biodiversity

Cooling facilities at thermal power plants may discharge water with elevated temperature and chemical contaminants. This may lead to damage to aquatic ecosystems. Moreover, as explained previously, thermal power plants can release a variety of air pollutants, such as Nitrogen oxides (Nox) and Sulphuric oxides (Sox) that may have a negative impact on plant life and animal life. Dams and hydroelectric power stations can affect the movement of fish as they affect water levels and flow.

Transmission and distribution infrastructure pose a potentially fatal risk to avian and bat life through collision. Furthermore, the construction of lines and associated access roads may result in the disruption of watercourses and wetlands if vegetation must be cut back to enable this construction. If construction activities lead to erosion, storm water runoff may increase the turbidity of surface watercourses.

**Risk Management**

Client companies should implement the following risk management practices:

- Thermal power plants should seek to minimise and control environmental impacts associated with water discharge.
- Hydropower plants should guarantee minimum water flow and river levels to ensure marine life is safeguarded.
- Install technologies such as barrier nets or mesh screens to prevent harm to fish species.
- During construction of transmission infrastructure, avoid critical habitats and migration corridors.
- Minimise the clearing of vegetation during construction of infrastructure.
- Retrofit existing transmission infrastructure by installing obstructive perch deterrents.

# Electromagnetic fields (EMF)

Electromagnetic fields are invisible lines of force that are emitted by any electrical device. Both electric and magnetic fields decrease with distance from the source but as voltage increases so does the strength of the electromagnetic field. This means that high voltage transmission lines can produce especially strong electromagnetic fields.

The scientific community and the public both hold some concern over the potential risks associated with human exposure to electromagnetic fields. However, a recent review of existing scientific literature by the World Health Organization concluded that there is currently no evidence of health consequences associated with exposure to electromagnetic fields. Nevertheless, scientific knowledge is always evolving and some limited concern for negative impacts not yet discovered is perhaps warranted.

Moreover, the idea that transmission lines pose a health risk has taken hold in the public consciousness in a way that creates potential reputational risks to companies that do not work to minimise public exposure to transmission lines.

Electromagnetic fields can also pose an occupational risk to workers in thermal power plants. This is because they work in proximity to power generators and high voltage electrical equipment.

**Risk Management**

Client companies should implement the following risk management practices:

- Identify potential exposure levels in the workplace through the use of personal monitors. This should include surveys of exposure levels in new projects.
- Implement action plans to address exposure levels that exceed reference occupational exposure levels developed by international organizations such as the International Commission on Non-Ionizing Radiation.
- Put in place occupational procedures such as work rotation to minimise exposure time, and increasing the distance between worker and source if possible or the use of shielding materials if not.
- Workers should be trained in the identification of electromagnetic field hazards and sources.
- Minimise public exposure by installing lines away from residential or highly frequented areas.
- Shield transmission lines from the public through the use of natural barriers, specific metal alloys, burying transmission lines or increasing the height of transmission towers.

## Community Engagement

The Power and Energy sector can have both positive and negative impacts on local communities. It can bring jobs to communities but it can also cause harm or inconvenience to these same communities.

The construction of power plants and transmission systems can result in the displacement of communities or can lead to increases in noise, traffic and health risks for communities. For instance, the recent Bui Hydroelectric Dam involved the resettlement of 1,216 people. More specific information about the potential negative impacts on communities is also detailed in many of the other sections of this document.

**Risk Management**

Client companies should implement the following risk management practices:

- In the case that any community members need to be resettled, ensure that a resettlement action plan (RAP) is put in place and adhered to. This should include sufficient compensation to any members of the community who are resettled.
- Attempt to minimise disruption to neighbouring communities during operations.
- Build public trust through public engagement with community stakeholders.
- Ensure implementation of a grievance system in order to address community complaints.
- Develop a system to warn local communities if they are at risk of exposure to fire, explosion or toxic substances.
- Develop an evacuation plan for the local community in the event that it becomes threatened by fire, explosion or exposure to toxic substances.

# Labour Rights

Ghana has ratified all 8 of the International Labour Organisation (ILO) Fundamental Conventions. Moreover, labour regulation in Ghana stems from the Labour Act 2003. The Act consolidated all laws relating to labour, employers, trade unions and industrial relations, as well as establishing a National Labour Commission.

The power and energy sector may attract short term workers who may be hired directly or by sub-contractors. It is important to ensure that all workers, and in particular those who might be more vulnerable to exploitation, are treated fairly.

The Labour Act, 2003 regulates employment and labour issues in Ghana. It covers a broad array of topics such as employee security, sick leave, domestic and compensation, works and wages in Ghana.

**Risk Management**

Client companies should implement the following risk management practices:

- Ensure migrant workers, or their labour supply agencies, comply with the latest ILO requirements on working hours, pay, and overtime.
- Ensure they or their labour supply agencies include all of the latest ILO prohibitions on child labour in contracting agreements (for further details please refer to the Child Labour section of this document).
- Ensure compliance with the *Labour Act, 2003* including areas regarding:
    - Protection of employment
    - General conditions of employment
- As needed, provide appropriate worker accommodation which meets, at a minimum, the basic needs of workers, and adheres to local Ghanaian law or international good practice, whichever is the higher standard.
- Provide a code of conduct in a language accessible by migrant workers and sub-contractors.

# Visual Amenity

Transmission and distribution facilities can cause visual disturbance as above ground high voltage pylons are highly visible. The presence of these transmission lines and towers as well as associated infrastructure and equipment can cause visual disturbances of varying severity depending on the characteristics of the land and area. These are likely to be undesirable to local residents, particularly in urban areas and in areas of natural beauty.

Power plants in themselves are large industrial installations and as such may be visible over a wide area, especially if they feature tall smokestacks or cooling towers. Renewable power generation can also have a negative visual impact. Dams, such as the Akosombo, can have an impact on visual amenity as they are large constructions in the middle of natural environments. Moreover, they can create large reservoirs like Lake Volta, which may cover other areas of natural beauty with water.

Although still nascent in Ghana, wind turbines can potentially have substantial impacts on visual amenity. This would be of particularly concern if they were installed near residential or tourism sites.

**Risk Management**

Client companies should implement the following risk management practices:

- During planning phases for power generation and transmission infrastructure, ensure that sufficient consideration is given to the landscape and how changes to it could impact the nearby environment and local communities.
- Use existing transmission and distribution corridors rather than creating new ones.
- Bury transmission lines underground where possible, especially in dense residential or commercial areas.
- Locate high voltage transmission lines in less populated areas so as to minimise visibility to local populations.
- Conduct sufficient public consultation during the planning phases of new transmission and distributions lines if they will affect residential areas.
- For all new infrastructure projects, ensure that all potentially affected parties are given the opportunity to communicate their views to regulators and planners.
- Revegetate disturbed areas with native flora, helping to rehabilitate unsightly landscapes.
- Explore offshore wind sites as a first option if wind power grows in Ghana.

# Cultural Heritage

The IFC E&S Sustainability Performance Standard 8 recognises three types of cultural heritage[1]:

- Tangible forms of cultural heritage, such as tangible moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values
- Unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls;
- Certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles

Ghana has ratified seven UNESCO conventions for the protection of its cultural heritage and The Ghana Museums and Monuments Board (GMMB) is the legal custodian of Ghana's material cultural heritage. The GMMB has the power to designate national monuments, thereby giving them statutory protection[2].

Construction of power plants and transmission lines can potentially pose a threat to cultural heritage. This is particularly true in areas that stand in the path of proposed transmission corridors. Construction in the power and energy sector would be most likely to threaten tangible and natural cultural heritage.

**Risk Management**

Client companies should implement the following risk management practices:

- Seek to minimise disruption to cultural heritage during planning, construction and operations of power generating plants and transmission corridors.
- In cases where power and energy sector construction and operation is deemed to put cultural heritage at risk, develop a management plan for the preservation of cultural heritage which includes:
    - Information gathering on the cultural heritage in question
    - Assessing the value and significance of this cultural heritage
    - Procedures for the protection of this cultural heritage

1https://www.ifc.org/wps/wcm/connect/c8f524004a73daeca09afdf998895a12/IFC_Performance_Standards.pdf?MOD=AJPERES
http://www.ghanamuseums.org/functions-activities.php

# Key E&S Opportunities

There are also a variety of opportunities for power and energy sector clients to deliver positive E&S impacts which can benefit their financial bottom lines and engender good will.

**In turn, these benefits to power and energy sector clients can also lead to benefits to banks in the form of:**

- **Increased revenue and profitability from working with clients that have strong, sustainable financial positions;**
- **Increased business opportunities for work with new clients that arise as a result of working in strong sustainable, affluent communities; and**
- **Improved reputation from working with clients who effectively manage E&S issues.**

In order to benefit from these opportunities, banks must first encourage their power and energy sector clients to pursue the opportunities specific to their sector, which are detailed below.

**Opportunities that may improve a client's profitability include but are not necessarily limited to:**

- Utilising more up-to-date tools and equipment for improved energy and resource efficiency, while also reducing the likelihood of accidents.
- Developing new innovative product lines (such as smart technology, solar panels, etc.) that address energy challenges. Banks have the opportunity to agree preferred credit lines with utility companies, who can then sell these innovative products with finance plans directly to their customers.
- Implementing requisite health and safety and security procedures to reduce the likelihood of accidents and may in some cases also lead to lower insurance premiums.
- Diversification of powers sources towards renewable and/or clean energy technologies may generate long-term savings and decrease the carbon foot print of companies.
- Utilising drone technology to monitor and inspect power stations and power lines to prevent individuals being exposed to occupational health and safety risks.

**Opportunities that may strengthen communities and lead to improved reputation:**

- Creating awareness of renewable energy options could influence community knowledge and preference.
- Providing highly reliable systems and services to the electricity infrastructure market may positively impact brand.
- Providing solutions to energy challenges through collaborative actions with local communities may also positively impact brand.
- Providing resources for local communities in line with the Sustainable Development Goals, such as access to fresh water, health care and education. access to power in remote areas.

# Due Diligence Questions for Clients

- Do you have a board member dedicated to addressing E&S issues?
- Does your company have any links between E&S performance and executive compensation?
- Do you have a code of conduct?
- Have you had an environmental impact assessment, if so how did you perform, if not then why not?
- Do you have an environmental impairment liability insurance policy?
- Do you operate in a stable ecosystem or one with biodiversity risks?
- Do you track emissions?
- Do you have any programmes for energy efficiency?
- Are you aligned with the Voluntary Principles for Security and Human Rights?
- Are you compliance with Ghana's *Labour Act, 2003*?
- Do you have non-zero accident targets for workers?
- Do you offer health and safety training to workers?
- Do you have emergency response procedures in place in the case of any accidents?
- Have you conducted hazard assessments in line with international standards and methodologies such as the Hazardous Operations Analysis (HAZOP)?
- Have you had any local community opposition?
- Do you devote resources to community investment?
- Do you have a system in place to respond to community grievances?
- Do you have a management plan for the preservation of cultural heritage?
- Have you incurred any environmentally or socially related fines in the last 5 years?
- Do you have recognized certifications of your operating system e.g. ISO 14001 (environmental management) and/or OHSAS 18001/ISO 45001 (health and safety management)?

# Key Performance Indicators

- Release of Sulphur oxides (SOx), Nitrogen oxides (NOx), and volatile organic compounds (VOCs)
- Green House Gas emissions
- Capital committed to pollution avoidance
- Capital committed to mitigation of unforeseen environmental costs
- Presence and performance on environmental impact assessment(s)
- Number of fires and explosions
- Number of incidents
- Number of injuries
- Number of fatalities
- Number of near misses
- Cases of employee opposition
- Land area converted for operations
- Sustainability policies implemented at the operational level (not just the corporate level)
- Cases of local community opposition
- Expenditure on community investment
- Human rights incidents
- Adherence to Voluntary Principles for Security and Human Rights
- Fines incurred in the last 5 years

# Sources for Additional Information

For further reading banks may find resources from the following organisations useful:

- IFC Environmental, Health and Safety Industry Sector Guidelines (http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/EHS-Guidelines/)
- IFC Performance Standards on Environmental and Social Sustainability (https://www.ifc.org/wps/wcm/connect/c8f524004a73daeca09afdf998895a12/IFC_Performance_Standards.pdf?MOD=AJPERES)
- EBRD Sub-sectoral Environmental and Social Guidelines (http://www.ebrd.com/who-we-are/our-values/environmental-emanual-toolkit.html)
- Energy Commission Ghana (ECG) (http://www.energycom.gov.gh/)
- Ministry of Energy Ghana (MoE) (http://www.energymin.gov.gh/)
- Ghana Environmental Protection Agency (EPA) (http://www.epa.gov.gh/epa/)
- European Energy Forum (EEF) (http://www.europeanenergyforum.eu/)
- International Hydropower Association (IHA) (https://www.hydropower.org/)
- International Renewable Energy Agency (IRENA) (http://www.irena.org/)
- Ghana Grid Company (http://www.gridcogh.com/)
- Volta River Authority (http://www.vra.com/)
- Electricity Company of Ghana (http://www.ecgonline.info/)