

Environmental and Social Review Summary

Name of Project

This Environmental and Social Review Summary (ESRS) is prepared by MIGA staff and disclosed prior to the date on which MIGA's Board of Directors considers the proposed issuance of a Contract of Guarantee. Its purpose is to enhance the transparency of MIGA's activities. This document should not be construed as presuming the outcome of the decision by MIGA's Board of Directors. Board dates are estimates only.

Any documentation that is attached to this ESRS has been prepared by the project sponsor, and authorization has been given for public release. MIGA has reviewed the attached documentation as provided by the applicant, and considers it of adequate quality to be released to the public, but does not endorse the content.

Country:	Nigeria
Sector:	Manufacturing
Project Enterprise:	China Glass Nigeria
Environmental Category:	B
Date ESRS Disclosed:	March 13, 2017
Status:	Due Diligence

A. Project Description

China Glass Holdings Limited (CGHL) is constructing a float glass and on-line solar control glass production line with a capacity of 500tpd. The Project, which will be developed and operated by CGHL's wholly-owned subsidiary, China Glass Nigeria (CNG), is CGHL's first construction material project in Africa. The plant will be located in the Ogun Guangdong Free Trade Zone (OGFTZ), 30km from Lagos. Three sub-contractors have been engaged to carry out construction: SinoSunny Nigeria Company Ltd.; Shaanxi Nigeria Company Ltd.; and China Railway Construction Nigeria Company Ltd. (CRCC). All three are Chinese companies that are incorporated locally and have been operating in Nigeria for many years. Civil works are currently underway and are expected to be completed by the end of 2016. The plant's machinery is expected to be shipped to Nigeria by March 2017 and its commercial operation date is scheduled for September 2017.

The Project will require an area of approximately 250,000 m², and will include construction of a raw material storage warehouse and batching; float glass combined workshop; finished products warehouse; cooling water circulation system; protective gas preparation system; furnace and chimney; and offices and worker accommodation. The production process consists of charging the raw materials required to make clear or colored glass through weighing, mixing and conveying to the furnace which produces molten glass. The molten glass then passes into a bath of molten tin where the temperature is gradually reduced and the glass sheets can be pulled off the bath by rollers. Variation in the flow speed and roller speed enables glass sheets of varying thickness to be formed. This is followed by annealing, cutting and loading.

The Project will also include construction of a natural gas power generating system (installed capacity 6 MW) and a back-up diesel generating system (installed capacity 6 MW). Natural gas

will be supplied by the local natural gas company via a pipeline, which has already been constructed to supply the Ogun Guangdong Free Trade Zone. Diesel will be brought to site via truck.

The Project is located within the OGFTZ located in the Igbessa Region of Ogun State. The zone opened in 2009 as a partnership between the Ogun State Government and the Guangdong Provincial Government in China. A total of 10,000 ha has been allocated for the zone, but thus far, only 250 ha has been developed (i.e. land prepared and fully fenced). As of March 2016, 27 companies are operating within the zone and an additional 14 have committed investments.

Raw materials for the glass production, including silica sand, dolomite, feldspar, limestone, glauber salt and coal powder, will be sourced domestically. Soda Ash will import from oversea. Raw materials will be transported via powder truck by a licensed contractor. Both raw materials and the final product will be transported by existing roads.

CGHL, through their local trading company, also owns 3 distribution warehouses in Nigeria: one located between Lagos and Ogun State to supply Lagos and Ogun State; another in Onitsha to cover the south; and one in Abuja to cover the north and east. These warehouses are already operating, as part of CGHL distribution network in the country, and are not considered part of the project or associated facilities (as defined by Performance Standard 1).

B. Environmental and Social Categorization

The Project is categorized as B according to MIGA's Policy on Environmental and Social Sustainability. The main E&S risk and impacts of the project are expected to relate to air emissions, water resource use and effluent discharge, material sourcing, workers' and community health and safety risks, and waste and hazardous materials management.

C. Applicable Standards

While all Performance Standards are applicable to this investment, based on our current information indicates that the investment will have impacts which must be managed in a manner consistent with the following Performance Standards:

- PS1: Assessment and Management of Environmental and Social Risks and Impacts
- PS2: Labor and Working Conditions
- PS3: Resource Efficiency and Pollution Prevention
- PS4: Community Health, Safety and Security

The Project is within OGFTZ, and the land for the Project is leased from the OGFTZ Management Company ("Management Company"). The OGFTZ was established by the Government, and land compensation was undertaken in 2004. As the site is vacant, no physical or economic resettlement is required, and therefore, PS5 Land Acquisition and Involuntary Resettlement does not apply.

The Project is not expected to have any significant impact on terrestrial or aquatic biodiversity or ecosystem services, and therefore, PS 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources is not applicable. No indigenous people were identified in the area affected by the Project; therefore, PS7 does not apply. As the Project is located in an area which has been developed as an industrial zone, no archaeological or historically important structures are present in the area, therefore PS8 does not apply.

In addition, the WBG EHS General Guidelines and Guidelines for Glass Manufacturing apply to this Project.

D. Key Documents and Scope of MIGA Review

The following documents were reviewed by MIGA:

- Nigeria 500 t/d Float Glass and On-line Solar Control Coated Glass Production Line Feasibility Study Report. Sinoma International Engineering Co., Ltd. November 2015.
- Bench-mark Environmental Characteristics of Ogun Guangdong Free Trade Zone in Igbesa Area (Ado-Odo / OTA Local Government) of Ogun State. Undated (ca. 2004).
- Environmental Management Plan. CNG Glass (Nigeria) FZE. December 2016.
- Annual Environmental and Social Monitoring Report for Facilities in China (prepared for IFC) – 2010 and 2014.

MIGA's review also included a site visit to the CNG site and OGFTZ, as well as meetings with CNG, sub-contractors, Management Company and Nigeria Export Processing Zones Authority (NEPZA).

E. Key Issues and Mitigation

MIGA's due diligence review considered the environmental and social management planning process and documentation for the project and gaps, if any, between these and MIGA's requirements. Where necessary, corrective measures, intended to close these gaps within a reasonable period of time, are summarized in the paragraphs that follow and (if applicable) in an agreed Environmental and Social Action Plan (ESAP). Through the implementation of these measures, the project is expected to be designed and operated in accordance with Performance Standards objectives.

PS1: Assessment and Management of Environmental and Social Risks and Impacts

Environmental and Social Assessment:

Some consideration of potential environmental impacts is included in the Feasibility Study, but no independent environmental and social impact assessment has been undertaken (see section on environmental permitting). The issues considered in the Feasibility Study include air emissions; noise; solid waste; wastewater; and energy efficiency. General management measures, particularly those related to design, are included.

Cumulative impacts have not been considered in the Feasibility Study. The project will operate in the OGFTZ, which currently has 27 operating companies. Management Company (China Africa Investment Company) reported that an Environmental Impact Assessment had been undertaken in 2008 for the OGFTZ, which considered the types of industries that would be located within the zone. Potential cumulative impacts from pollution are largely controlled by limiting the industrial activities allowed in the OGFTZ to those activities that were considered in the EIA (i.e. relatively low pollution activities). MIGA requested, but did not receive a copy of, the EIA for the OGFTZ, so it was not possible to determine whether cumulative impacts had been assessed and whether the EIA was compliant with MIGA's requirements.

Management Program and Monitoring:

As a condition of the contract of guarantee, MIGA will require CNG to establish an Environmental and Social Management System (ESMS) (ESAP Action #1). A stand-alone Environmental Management Plan (EMP), covering both construction and operations phases, was recently prepared (following a request from MIGA). The EMP includes a summary of responsibilities, potential impacts, mitigation measures and monitoring requirements. It is recommended that ESMS be integrated with the Occupational Health and Safety (OHS) System (see under Performance Standard 2). MIGA will also require CNG to obtain ISO 14001 and OHSAS 18001 certification for the facility (ESAP Action #4). During operations, CNG will submit monthly monitoring reports, including air emissions, effluent discharge, health and safety and labor statistics, to China Africa Investment FZC (the Management Company). CNG will also provide MIGA with an Annual Environmental and Social Report.

Organizational Capacity and Training:

The majority of technical staff will be brought over from China, and the remainder will be hired locally. Due to IFC investment into the operations in China, staff from China will have some familiarity with Performance Standards and World Bank Group environmental, health and safety (EHS) guideline requirements. Still, there will be a need for ongoing EHS training, and therefore, the ESMS will include an EHS training plan for all staff and contractors.

During construction, the three contractors are operating simultaneously on site – each contractor is responsible for a different component of the construction. All three (3) contractors report to the CNG construction manager, who is ultimately responsible for ensuring quality, construction to technical specifications and EHS management. On a day-to-day basis, implementation of EHS measures is the responsibility of the construction superintendent for each contractor. As indicated above, training will be required for both staff and contractors on the implementation of the new EMP.

Emergency Preparedness and Response:

The OGFTZ Management Company is ultimately responsible for emergency preparedness and response within the OGFTZ. There is currently a clinic on site, and the plan is to eventually have a hospital in the OGFTZ, and the OGFTZ Management Company reported that they also intend to invest in firefighting equipment and ambulances in the near future.

As part of the ESMS, the Project will prepare a specific Emergency Preparedness and Response Plan for the Project (ESAP Action #5).

Stakeholder Engagement:

Engagement with the local communities is largely the responsibility of the Management Company. The Management Company prefers to coordinate the engagement with the community on behalf of all of the tenants in the OGFTZ – rather than have each individual project have its own engagement program. CNG has indicated that they will support Management Company programs as requested. For example, the Project has indicated that they will have interns from the local technical college through a program that is being established by the Management Company. CNG will also work with the Management Company to ensure compliance with MIGA's requirements regarding stakeholder engagement and information disclosure (ESAP Action #6).

PS2: Labor and Working Conditions

For construction, CNG currently has two employees on site to oversee the three sub-contractors. The three sub-contractors have a total of between 124 and 144 employees currently on site (depending on the work going on at the time). SinoSunny has 4 Chinese staff and 21 Nigerian staff currently working at site; CRCC has 8 Chinese staff and 40 Nigerian staff; and Shaanxi has 11 Chinese staff and 40 – 70 Nigerian staff (depending on the stage). Currently, only the Chinese staff live on the site. Worker accommodation on site is currently at a standard consistent with the requirements of IFC / EBRD Guidelines for Worker Accommodation.

The three sub-contractors do not have a Human Resource Policy or plan. They have existing local staff that they have used on other projects in the area, and then use the existing staff to identify additional staff, as required. The OGFTZ also has a list of registered day workers that the contractors can use. All Chinese staff are on contracts, but only some Nigerian staff have contracts. The rest are employed on a casual 'as needed' basis. CNG contracts with sub-contractors requires that they do not engage employees under the age of 18, and sub-contractors ensure that they do not engage under-age labor by verifying ID cards prior to hiring employees. The OGFTZ also restricts their list of day workers to those over the age of 18.

During operations, the Project will employ approximately 230 employees – initially 130 from China and 100 locally recruited. All of the employees will be directly engaged by CNG, and all will have employment contracts. The plant will operate continuously with three shifts per day of eight hours each. The company has confirmed that they will not hire workers below 18 years of age which is in line with national regulations. The employee accommodation for the operations phase is currently under construction. The Project will have dormitories for at least 200 workers. All rooms will be single occupancy, and will include an en-suite bathroom and closet. A canteen and recreation building are also currently under construction.

CNG will develop a Human Resources Policy in line with PS2 requirements to cover non-discrimination and equal opportunity, grievance mechanism, employee appraisals, workers organization, OHS, and training and development (ESAP Action #7). CNG will also prepare plans and procedures to support implementation of the Human Resource Policy (ESAP Action #8). All CNG employees will have written contracts of employment (ESAP Action #9). Contracts are typically 1 year renewable contracts, and all have a 3 month probation period. Contracts will define the rights and responsibilities of both parties. Remuneration will comprise a basic salary, performance-related bonus and a year-end bonus, details of which will be documented in the employment contract.

Workers Organization

There are currently no unions operating within the OGFTZ. While there is no explicit prohibition against employees in the OGFTZ forming or joining a union, in reality, unionization is discouraged by the requirement for any union to have NEPZA's permission prior to entering any FTZ.

Grievance Mechanism

One of the roles of the Management Company is to act as a grievance redress mechanism for workers within the zone. Complaints can be written, emailed or verbally given to the Management Company. The Management Company then reaches out to the tenant to resolve the issue. This same mechanism applies to sub-contractor employees during the construction phase of the Project. CNG will also establish an internal grievance process for its workers (ESAP Action #11).

Occupational Health and Safety

Occupational health and safety (OHS) has been considered in the Feasibility Study. In its operations in China, CGHL has implemented best practice health and safety practices, such as provision of protective equipment for persons handling glass (gloves, arm-protecting gauntlets, and body and leg-protecting aprons). CNG will develop an OHS Management System, and as indicated above, MIGA will require CNG to achieve OHSAS 18001 certification for the facility (ESAP Action #12).

PS3: Resource Efficiency and Pollution Prevention

Energy and Material Efficiency Projects

It is planned that the main energy used in production will be natural gas. Natural gas will be used in the melting furnace, and will also be used to generate electricity to operate all other production equipment including the batch unit, bath unit, annealing lehr and cold end cutting. To further reduce energy consumption and associated emissions, the Project will adopt an advanced kiln structure where combustion air is pre-heated in a preheating chamber. Back-up fuel for the production line is either diesel or petroleum-coke. Diesel generators will provide back-up electricity.

After the first year of operation, the project will undertake an energy audit to identify opportunities to improve efficiency (ESAP Action #13).

Waste glass resulting from glass cutting and defected products (known as 'cullet') will be recycled in the process, which will result in waste reduction and reduction in energy consumption in the furnace.

Water

Production and fire control water will be obtained from a deep well (200 m) drilled on site. Water requirements for the process are approximately 33,020 t/d; however, as a closed-water process system will be used, approximately 32,400 t/d is recycled. Water for industrial purposes is mainly

for compensating the blow down and evaporation from the closed cycle cooling system and for compensating the evaporation from the firefighting emergency tank. Water will also be used for washing the ground surface in the raw material workshop and sand washing. Sedimentation basins will be constructed within the factory to allow settling of suspended solids prior to discharge. The baseline undertaken prior to establishment of the OGFTZ (ca. 2004) indicates that groundwater in the project area is available all year round.

Green House Gases (GHG) Emissions

Based on the estimated consumption of natural gas, if operating the furnace and power generating system on natural gas, estimated GHG emissions are 95,000 tCO₂e per year. If natural gas is not available, and the Project is required to run on petro coke and diesel, estimated GHG emissions will be approximately 115 – 120,000 tCO₂e per year). The majority of emissions (approximately 75%) are from gas consumption. The remaining 25% is from process emissions occur due to the de-carbonization of the carbonate raw material in the process input, mainly limestone CaCO₃ and dolomite CaMg(CO₃)₂. As set forth in the ESAP, the company will quantify annually the GHG emission in line with an international methodology (ESAP Action #14).

Air emission and ambient air quality

Prior to the development of the OGFTZ, the project area was predominately agriculture, and therefore, the airshed was relatively pristine – with the exception of elevated dust / particulate concentrations during the dry season. CGN will develop a baseline of current conditions in the project area and at sensitive receptors prior to starting operations (ESAP Action #16).

During construction, the primary air emission is dust. Dust emissions will be controlled by the implementation of mitigation measures described in the EMP, including watering roads and material stockpiles and, when necessary, covering material stockpiles.

During operations, air emissions include dust from transporting, pouring and mixing raw materials and gas emissions (SO_x, CO₂ and NO_x) from the furnace, moulding area and annealing process. Sand storage, handling and washing will be carried out in open area adjacent to (separated by a wall) the plant area. After washing, the sand will be transported via conveyor to the raw material storage area at the plant site. Loading and unloading of the sand will result in dust within the plant site. As per the EMP, the company will implement storage and handling measures, such as dust removal systems and humidification, to minimize dust generation associated with this source.

The Project plans to use natural gas to fuel the furnace, which is expected to effectively limit sulfur dioxide emissions. The Project is designed to use an advanced combustion control system to reduce the amount of flue gas emissions. Project design also includes an advanced flue gas treatment system for dust removal, desulphurization and denitrification. A flue gas monitoring system will also be installed for real-time monitoring of emissions. Estimated SO₂ emissions are 185 mg/Nm³; estimated NO_x emissions are 700 mg/Nm³ and estimated particulate emissions are 23 mg/Nm³ – all within national regulatory limits and WBG EHS guideline limits.

If petroleum coke is used, desulfurization and denitration equipment will be installed (ESAP Action #17). Estimated SO₂ emissions, then, are expected to be 400 mg/Nm³; estimated NO_x emissions are 700 mg/Nm³ and estimated particulate emissions are 50 mg/Nm³ (within national regulatory limits and WBG EHS Guideline limits). Use of diesel fuel would result in emissions somewhere between those for natural gas and petroleum coke, but due to the price of diesel, it is only likely to be used as a short-term alternative.

The project EMP for operations will be updated to include plans for monitoring of flue emissions (ESAP Action #18).

Hazardous Materials and Waste

Hazardous waste generated from the plant includes used filters, spent oil, and used florescent lamps and empty containers of hazardous chemical substances. These wastes are collected and disposed by a licensed contractor. CNG will also prepare a Hazardous Materials Management Plan (ESAP Action #19).

Solid Waste Management

Non-hazardous solid waste is collected by the Management Company. Waste such as used spare parts and office equipment will be stored in an area within the company premises in preparation of being sold to contractors. As per the ESAP, the company will develop a plan for managing and disposing the accumulated waste and will establish a dedicated waste storage collection area within the facility, including that related to hazardous waste (ESAP Action #20).

PS4: Community Health, Safety and Security

As the Project is located within the OGFTZ with no communities located immediately adjacent, potential impacts on community health and safety are limited. The most significant risk is associated with the use of heavy vehicles to transport raw materials and finished products to and from the Project site. Some raw materials will be transported by the supplier, while others will be transported using licensed contractors. The finished product will be transported using licensed contractors, as is current practice with CGN's distribution network in the country. The site is accessed via the existing road network in Nigeria (A 5-1 from Lagos and then Itohun-Ilogbo-Igbesa Road). Prior to the establishment of the OGFTZ, the Itohun-Ilogbo-Igbesa Road was primarily used by local residents to transport agricultural crops. Heavy vehicle use of the road by tenants of the OGFTZ has caused significant damage to the road, and the road is now in poor condition.

Security Arrangements:

Entry to the FTZ is controlled by local police and national guard forces. The FTZ also employs private security contractors. The FTZ is fully fenced and there is only one gated entrance. Currently, the Project site does not have its own security, but when in operations, there will be security at the entrance of the Project site. Security guards will be unarmed, and will also be responsible for fire-fighting; first aid and inspection of trucks entering and leaving the site.

F. Environmental Permitting Process and Community Engagement

Environmental permitting is not required for individual operations within the OGFTZ. The Management Company informed MIGA that prior to establishment of the OGFTZ, an EIA was undertaken. The EIA, however, was not provided to MIGA for review. Based on available information, the EIA was undertaken in 2008 by a consultant engaged by the Ogun State Government. The EIA was approved and an environmental permit was issued for the creation and operation of the OGFTZ. The OGFTZ operates essentially independently of the Government of Nigeria. Projects within the OGFTZ report to the Management Company, who in turn liaises with the NEPZA. The Management Company is responsible for monitoring environmental and social performance of the projects within the zone, and they are not required to report environmental and social performance to NEPZA or any government agency.

As per NEPZA Regulations (2004), environmental measures are considered in the Project Feasibility Study, which was submitted to the zone Management Company and NEPZA in order to receive approval to operate within the zone.

Projects within the OGFTZ are not to engage with communities unilaterally, as all community relations are managed by the OGFTZ management company on behalf of all of the companies within the zone. CNG participates in community engagement and community development activities as requested by the OGFTZ management company (for example, providing internships for students from the local technical school).

MIGA supports its clients (as defined in MIGA Policy on Environmental and Social Sustainability) in addressing environmental and social issues arising from their business activities by requiring them to set up and administer appropriate grievance mechanisms and/or procedures to address complaints from Affected Communities.

In addition, Affected Communities have unrestricted access to the Compliance Advisor/Ombudsman (CAO), the independent accountability mechanism for MIGA. The CAO is mandated to address complaints from people affected by MIGA-guaranteed business activities in a manner that is fair, objective, and constructive, with the goal of improving environmental and social project outcomes and fostering greater public accountability of MIGA.

Independent of MIGA management and reporting directly to the World Bank Group President, the CAO works to resolve complaints using a flexible, problem-solving approach through its dispute resolution arm and oversees project-level audits of MIGA's environmental and social performance through its compliance arm.

Complaints may relate to any aspect of MIGA-guaranteed business activities that is within the mandate of the CAO. They can be made by any individual, group, community, entity, or other party affected or likely to be affected by the environmental or social impacts of a MIGA-guaranteed business activity. Complaints can be submitted to the CAO in writing to the address below:

*Compliance Advisor/Ombudsman
International Finance Corporation
2121 Pennsylvania Avenue NW
Room F11K-232
Washington, DC 20433 USA
Tel: 1 202 458 1973
Fax: 1 202 522 7400*

E-mail: cao-compliance@ifc.org

G. Availability of Documentation

- [Environmental Management Plan. CNG Glass \(Nigeria\) FZE. February 2017.](#)
- [Environmental and Social Action Plan. February 2017](#)

The above listed documentation is available electronically as PDF attachments to this ESRS at www.miga.org. It is also available for viewing at the project site (upon request) and at the following locations:

- <http://www.chinaglassholdings.com/index.aspx>