

WHITE PAPER 07 · CAMEROON STEEL

BUILDING RESPONSIBLY IN KRIBI: A STEELWORKS CAN MEET INTERNATIONAL STANDARDS ON FOUR CONDITIONS

Environmental and social stewardship for Cameroon Steel's complex at Mboro: early assessment, baselines measured across seasons, engagement with integrity including with Bagyeli communities, and IFC Performance Standards applied from design.

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This paper is a desk study. No environmental and social impact assessment has yet been carried out for the steel complex. All targets are objectives or commitments for a plant not yet built, labelled as such. Distances are approximate, from public geodata, measured to a generalised indicative area rather than a surveyed boundary. Images marked Illustrative view are generated visualisations, not photographs of the project or its site.

Statement of interest. This paper is published by Cameroon Steel, which is developing a steelworks at Kribi. It is written to inform public debate; its analysis is independent of any commercial offer, and every figure is sourced or labelled with its status.

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EXECUTIVE SUMMARY

A steelworks can be built responsibly in Kribi's coastal, biodiverse and culturally rich setting, on four conditions. The assessment must start early, while the design can still change. Baselines must be measured on site across the wet and dry seasons, rather than borrowed from regional averages. Communities must be engaged with integrity, including the Bagyeli (Bakola) peoples, whose consent is required in the circumstances defined by international standards. And the IFC Performance Standards, the World Bank Group EHS Guidelines and the Equator Principles must be applied from design, not at the end. This paper sets out the evidence for that conclusion, the commitments Cameroon Steel makes in response, and the indicators against which those commitments can be checked.

10 $\mu\text{g}/\text{m}^3$

Modelled background PM2.5 at Kribi, twice the WHO 2021 annual guideline of $5 \mu\text{g}/\text{m}^3$

12 km

Approximate distance from the indicative site area to the marine national park, to the nearest kilometre

2,850 mm

Planning value for annual rainfall at Kribi (station mean 2,836 mm); no month is truly dry

5.8 %

HIV prevalence among adults in the South Region, the highest in Cameroon (2018)

<5 mg/Nm^3

Design objective for melt-shop stack dust, the EU best-available-technique level

Ten findings

- 01 The setting is sensitive, but the steel site is set back from its most valued assets.** The site area lies on the coastal plateau about 3 to 4 km inland from the port frontage. The marine national park begins about 12 km away, the Lobé falls about 18 km and Campo-Ma'an National Park about 29 km. Villages and small streams are closer: the nearest mapped stream is about 2 to 3 km away and the nearest village, Boussibelika, about 3 to 4 km (Chapter 1 and Annex D, Table D.1).
- 02 Cameroonian law already requires a detailed, public assessment.** Steelmaking needs a detailed EIES under the 2016 order, with consultations during the study, public hearings, an interministerial review and a certificate before any works. A separate classified-establishment authorisation requires a hazard study and an emergency plan. The administrative clock is four to five months, but seasonal baselines make the realistic timetable 12 to 18 months (Chapter 2).
- 03 National law sets no numeric emission or ambient limits for steel, so international values must fill the gap.** Cameroon Steel will apply the stricter of national and international requirements for every parameter, and will ask for them to be written into its permits (Chapters 2 and 3).
- 04 Phase 1 sits at the Equator Principles' climate threshold.** Indicative Scope 1 and 2 emissions are about 97,000 tCO₂e a year in Phase 1 and about 328,000 tCO₂e at full capacity. We will carry out the full climate risk and alternatives assessment and report publicly from the first year (Chapter 3).

-
- 05 The airshed is already above the WHO fine-particle guideline.** Modelled background PM_{2.5} is about 10 µg/m³, twice the guideline, mostly from harmattan dust and regional smoke. The plant must therefore add as little as possible. Our objectives are melt-shop dust below 5 mg/Nm³, dioxins below 0.1 ng I-TEQ/Nm³, and a project contribution at any village below a quarter of the WHO guideline (Chapter 4).
-
- 06 In Kribi, water design is about rain, not supply.** Planned fresh-water demand is about 2 m³ per tonne, less than 1% of the Lobé's low flow even at full capacity. The challenge is about 2,850 mm of rain a year and a 100-year day of 264 mm. Our objectives are no process-water discharge in normal operation and no direct or indirect abstraction from the Lobé without a specific study (Chapter 5).
-
- 07 Four fifths of the residues can become products; the hazardous dust needs a secure route first.** At full capacity, residues are about 185,000 t a year, mostly slag suitable for aggregate after testing. EAF dust, about 16,000 t a year, is hazardous. There will be no first heat without a contracted, compliant outlet (Chapter 6).
-
- 08 Critical habitat is unlikely on the site but present in the landscape.** The main risks come from what a project brings, such as in-migration, hunting, traffic and coastal pressure, rather than from its footprint. We commit to two-season surveys, no net loss of natural habitat and a contribution to conservation co-designed with communities (Chapter 7).
-
- 09 The social licence depends on engagement with integrity.** The land has a history dating from the 2009 declaration of public utility. HIV prevalence in the South Region is the highest in Cameroon. Bagyeli communities live in the department. We commit to a land legacy review, early Indigenous Peoples screening, free, prior and informed consent where required, and a grievance mechanism open before any fieldwork (Chapter 8).
-
- 10 Kribi's own record shows that timing and transparency decide outcomes.** Land questions outlived the port's construction. The coast changed after the breakwater, and a park offset was designed without the people who used the land. A shared approach to cumulative effects, with published data, is the main lesson (Chapter 9).
-

Why this paper

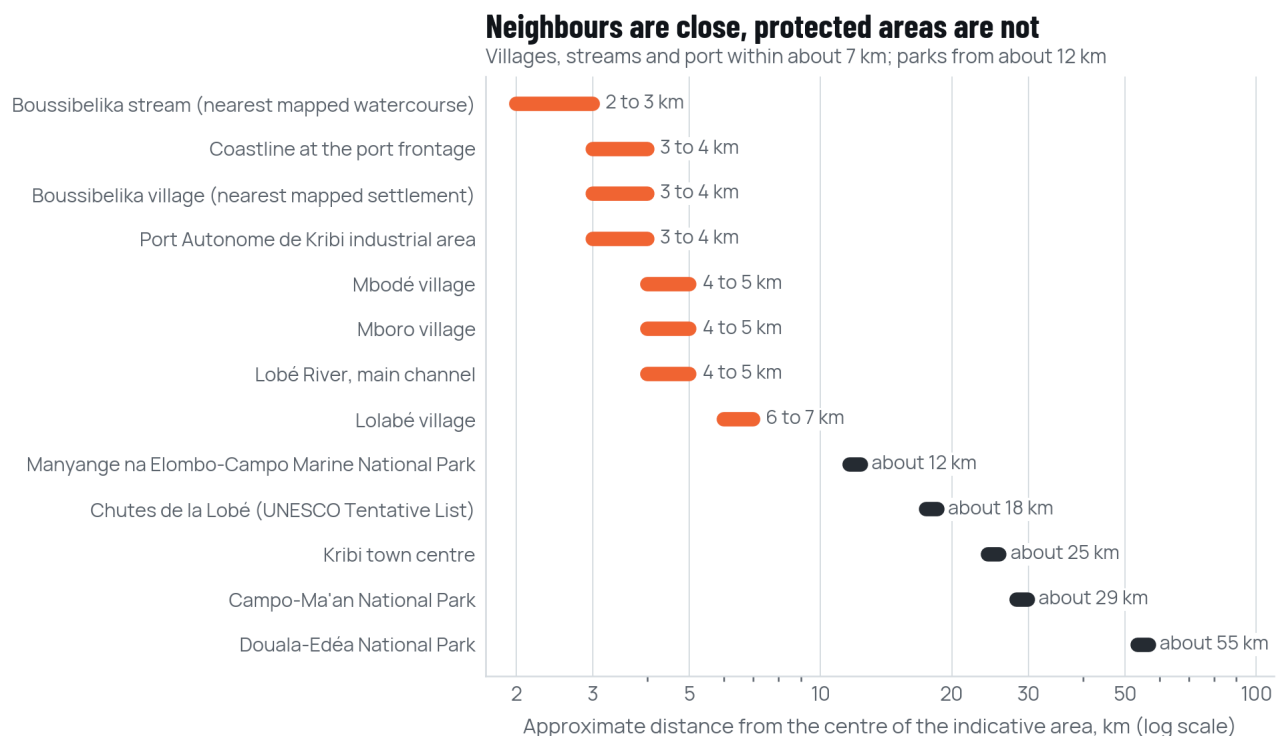
Cameroon Steel is developing a steel complex at Mboro, in the Kribi industrial-port zone. Its design capacity is 1 Mtpa, to be built in phases. The first phase is an electric arc furnace (EAF) melt shop making billets, which are rolled into reinforcing bar and wire rod or sold to existing re-rollers. The Prime Minister, representing the Head of State, laid the foundation stone on 30 December 2024 [X01][X02]. The Kribi Port Industrial Zone lists steelmaking linked to mineral exports among its development clusters [K02].

A steelworks is a heavy industrial plant. Kribi is a coast of forests, rivers, fishing villages, a young marine national park, a waterfall sacred to three peoples, and the forest homeland of the Bagyeli. Both statements are true, and this paper does not pretend otherwise. Its purpose is to show, with sources, how the two can coexist. It explains what national law already requires and what international standards add. It sets out what the main environmental and social risks are and how they will be controlled. It reviews what Kribi's own recent history teaches. And it states what Cameroon Steel commits to, in terms specific enough to be checked.

Nothing in this paper describes performance already achieved. The plant is not yet built, and its environmental and social impact assessment has not yet been carried out. Every target in these pages is an objective or a commitment, labelled as such.

The setting in brief

Kribi lies in one of the wettest belts of Cameroon's coast, with about 2,800 to 2,900 mm of rain a year. September and October are the wettest months, but even December to February brings about 90 to 120 mm a month [E01]. Winds come mainly from the sea: south-westerly and southerly winds account for about 72% of hours in modelled data [E04]. The coastal plateau on which the site lies is a mosaic of secondary forest, farms and fallows, crossed by small streams that drain west to the sea and east to the Lobé. The coast itself has changed fast since the port was built. It shifted from slow accretion before 2000 to an average retreat of about 2 m a year in 2015 to 2020, with much faster local rates [E02].



DERIVED **Figure ES.1.** Approximate distances from the indicative steel site area to sensitive receptors. Villages, small streams, the coast and the port lie within about 7 km; the nearest protected area begins about 12 km away. Distances are measured from the centre of the indicative area and given in whole-kilometre bands; values in Annex D, Table D.1.

Source: OpenStreetMap (extract base 24 July 2026) [E11]; Décret 2021/4804/PM [B01]; UNESCO Tentative List [B04]. Cameroon Steel analysis from public geodata; no site boundary is used.

The protected areas around Kribi are of global importance (Figure ES.1). Campo-Ma'an National Park shelters forest elephants and western lowland gorillas, both Critically Endangered on the IUCN Red List [B08][B10]. The Manyange na Elombo-Campo Marine National Park, created in 2021, protects turtle nesting beaches and the Ntem mangroves [B01]. The Chutes de la Lobé, where a river falls directly into the sea, are on Cameroon's UNESCO Tentative List as a cultural landscape sacred to the Batanga, Mabi and Bagyeli [B04]. The population is diverse and growing [H02][E13], and the South Region carries the country's highest HIV prevalence [H01].

Four conditions, and what each requires

Early assessment. The decisions that matter most for the environment are made early: where the stockyards go, how large the bag filter is, whether there is an outfall, where the trucks drive. An assessment that starts after the layout is frozen can only add mitigation. One that starts before can avoid impacts altogether. Cameroon Steel will run the environmental assessment and the hazard study in parallel with the basic engineering, so that their findings shape the layout (Chapters 2 and 10).

Seasonal baselines. There are no measured air, noise, water or ecological data for the site area. Modelled data are useful for planning but cannot support predictions. We will run at least twelve months of on-site weather and air monitoring. Water, ecological and noise surveys will cover both the drier and the wetter seasons. Baseline data will be published quarterly as they are collected (Chapters 4, 5, 7 and 11).

Engagement with integrity. Engagement is required twice by Cameroonian law, during the study and at public hearings. International standards add continuous engagement, a grievance mechanism and, for Indigenous Peoples in defined circumstances, free, prior and informed consent. We will open the grievance mechanism before any fieldwork. We will screen for Bagyeli presence and customary use before other social surveys, and seek consent where IFC Performance Standard 7 requires it. Communities will choose their own representatives (Chapter 8).

International standards from design. The IFC Performance Standards and the World Bank Group EHS Guidelines apply in full to projects financed by Equator banks in Cameroon. The AfDB, a partner of the industrial zone, applies its own similar safeguards [G05][G06][K04]. Cameroon Steel will apply them whatever the financing structure, using European best-available-technique levels as the design benchmark for EAF emissions (Chapter 3).

What Cameroon Steel commits to

The commitments in this paper are summarised below and detailed, with indicators and reporting frequencies, in Chapter 10.

- **Standards.** For every parameter, the stricter of Cameroonian law and international standards; values written into permit conditions where possible.
- **Air.** Melt-shop dust below 5 mg/Nm³; dioxins below 0.1 ng I-TEQ/Nm³; radiation screening of every scrap load; a project contribution to fine particles at any village below a quarter of the WHO guideline; stack and ambient data published online.
- **Water.** About 2 m³ of fresh water per tonne; supply from the zone network and rainwater first; no direct or indirect abstraction from the Lobé without a specific study; no process-water discharge in normal operation; IFC effluent values at every outfall.
- **Residues.** Slag released as aggregate only after ageing and batch testing; no first heat without a compliant outlet for EAF dust; no open burning.
- **Biodiversity.** Two-season surveys and a critical habitat assessment; buffers of at least 30 m on water-courses; zero tolerance for hunting and wildlife trade; no net loss of natural habitat; a co-designed contribution to conservation of the landscape.
- **People.** A land legacy review and census before clearing; Indigenous Peoples screening and FPIC where required; workers' accommodation and conduct to international standards; heavy traffic kept inside the port domain where possible; local hiring and purchasing targets.
- **Climate.** Full climate risk assessment; Scope 1 and 2 emissions reported publicly every year from the first year of operation; a decarbonisation pathway within two years of start-up.
- **Transparency.** A disclosure calendar, an independent environmental and social consultant, community participatory monitoring and a corrective action plan tracked to closure.

WHAT THESE COMMITMENTS ARE NOT

They are not descriptions of achieved performance; the plant does not yet exist. They are not a substitute for the environmental and social impact assessment, which will test them against measured data and may tighten them. And they are not unconditional on others: some depend on public authorities sharing data and on the zone developing shared facilities. Where that is the case, the paper says so.

What remains unknown

Chapter 11 lists the evidence gaps and how each will be closed. The most important are:

- the absence of any measured air quality, noise, water or ecological data for the site area;
- the unknown water-table depth and the condition of the small streams that would receive treated stormwater;
- the vegetation and possible current users of the land;
- whether Bagyeli communities hold customary interests in the site or its area of influence;
- the content of documents held by others, notably any strategic environmental assessment of the zone and the land records from 2009 to 2010.

None of these gaps undermines the conclusion that the project can be built responsibly. All of them must be closed before its impacts can be predicted with confidence.

How to read this paper

Chapter 1 describes the Kribi setting. Chapters 2 and 3 set out the national procedure and the international standards. Chapters 4 to 6 cover air, water and residues. Chapters 7 and 8 cover biodiversity and people. Chapter 9 draws lessons from Kribi's port and from other heavy-industry projects. Chapter 10 sets out commitments and indicators. Chapter 11 lists the evidence gaps. Annexes describe the methods and assumptions, define the technical terms, list every source and tabulate the data behind every chart.

Each number carries a source marker in square brackets that refers to Annex C. Each exhibit carries a status: "sourced" for published data, "derived" for Cameroon Steel calculations from sourced inputs, "assumed" for planning assumptions, and "illustrative" for diagrams and generated visualisations. Distances are approximate and measured from public geodata to a generalised indicative area, not to a surveyed boundary. Planned figures, such as capacities, water demand, emissions and residues, come from Cameroon Steel's planning model of 10 October 2026. They are indicative and will be revised as the design advances.

Statement of interest. This paper is published by Cameroon Steel, which is developing a steelworks at Kribi. It is written to inform public debate; its analysis is independent of any commercial offer, and every figure is sourced or labelled with its status.

CHAPTER 1

THE KRIBI SETTING: A SENSITIVE COAST, WITH THE STEEL SITE SET BACK FROM IT

The steel complex is planned on the coastal plateau of the Kribi industrial-port zone, about 3 to 4 km inland from the port frontage, in a farm and forest mosaic crossed by small streams and ringed by fishing and farming villages. The region's most valued natural and cultural assets are farther away: the Manyange na Elombo-Campo Marine National Park begins about 12 km to the south-west, the Chutes de la Lobé lie about 18 km to the north and Campo-Ma'an National Park about 29 km to the east. They are not on the site, but air, water, traffic and people link them to it. The assessment therefore has to cover the whole landscape, not just the fence line, and it has to start from measured local data rather than regional averages.

1.1 A coastal plateau inside a declared industrial-port zone

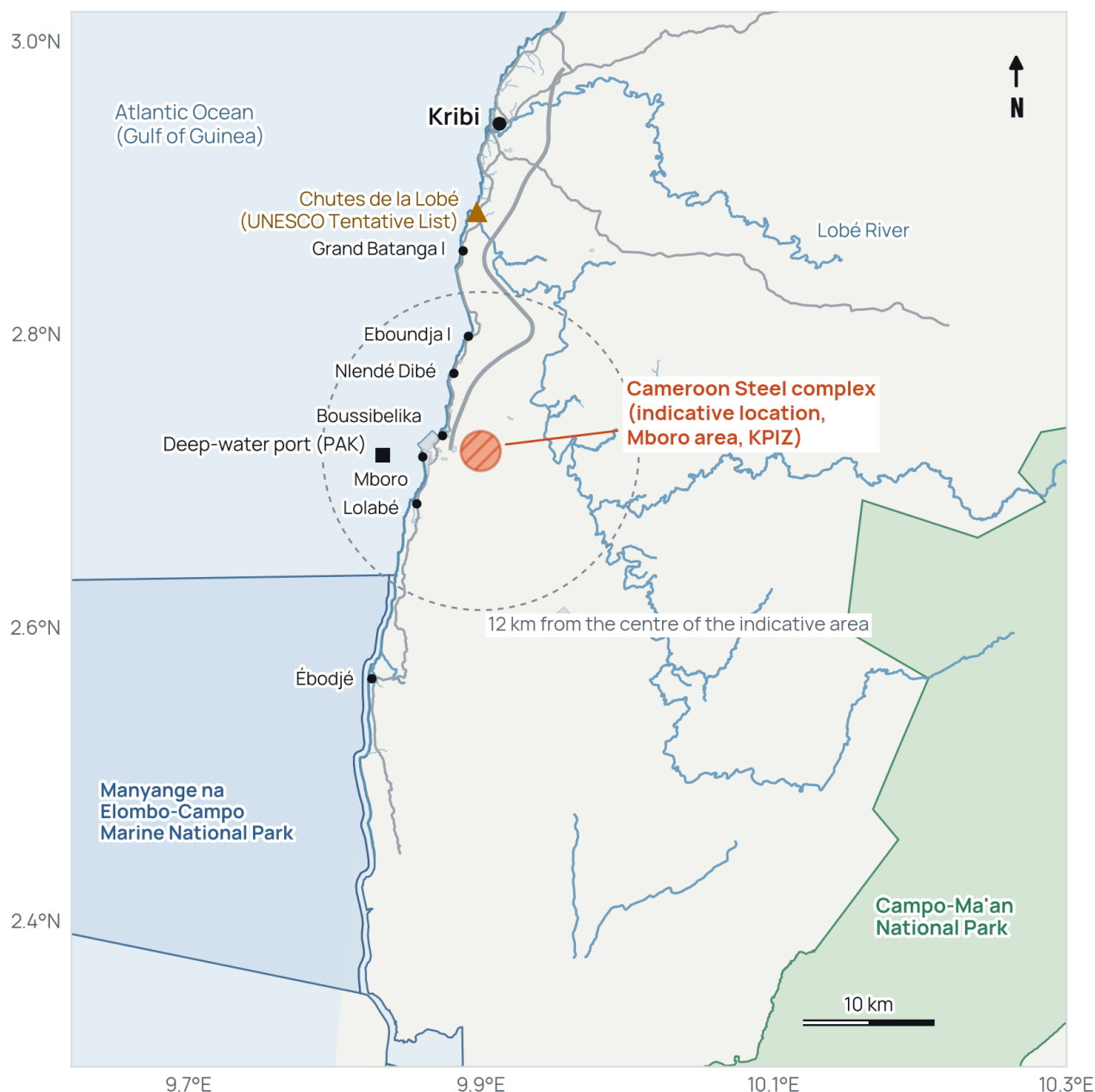
Cameroon Steel is developing its steel complex at Mboro, inside the Kribi industrial-port zone in the Océan department of the South Region. The Prime Minister, representing the Head of State, laid the foundation stone on 30 December 2024 [X01]. The design capacity is 1 Mtpa, to be built in phases [X02]. The first phase is a melt shop with an electric arc furnace (EAF) whose billets feed mills for reinforcing bar and wire rod or are sold to existing re-rollers [X03]. The site lies in an area that the State has set aside for heavy industry for more than fifteen years. A ministerial order of 6 February 2009 declared the deep-water port of public utility. The port and its industrial hinterland were then developed on land at Mboro, Lolabé and Grand Batanga [H03]. A presidential decree of 23 June 2023 fixed the public port domain at about 15,000 ha, within a larger industrial-port complex of about 26,000 ha [K05][K06].

On 26 February 2026 the Port Autonome de Kribi (PAK) and its partners launched Kribi Port Industrial Zone S.A. (KPIZ). The company's mandate is to design, finance, develop and operate an integrated industrial zone of about 4,000 ha over 15 years, at a total investment of €795 million [K02][K03]. KPIZ lists "steelmaking linked to mineral exports" among its development clusters [K02]. The African Development Bank (AfDB), the European Union and the International Finance Corporation (IFC) are named as financing partners of the zone [K03][K04]. This has two consequences for a steelworks. First, the land use is already industrial by public decision, so the question is how to build well rather than whether to industrialise a pristine site. Second, the zone's lenders apply the same international standards discussed in Chapter 3, and they will expect tenants to meet them.

The plateau stands well above the sea. Satellite surface models give elevations of roughly 50 to 120 m across the wider area. Because these models include the forest canopy, true ground levels are probably 20 to 30 m lower in wooded cells; we estimate the ground at about 40 to 100 m above sea level (rounded; to be confirmed by survey) [E17]. The terrain is an undulating lateritic plateau, dissected by small valleys that drain westwards to the sea near the port and eastwards towards tributaries of the Lobé. A topographic survey at sub-metre resolution is one of the first studies we need (Chapter 11), because drainage paths and earthworks decide where stormwater, and any spill, would go.

A port and an industrial zone between two protected landscapes

Coast, rivers, settlements and protected areas around the Kribi industrial-port zone



DERIVED Figure 1.1. Regional setting of the Kribi industrial-port zone. The steel complex is shown as a generalised indicative area, not a site boundary. The dashed ring marks 12 km from the centre of the indicative area, close to the northern limit of the marine national park. Protected-area outlines are as mapped in OpenStreetMap and must be checked against the creation decrees and the World Database on Protected Areas.

Source: OpenStreetMap contributors (ODbL), Overpass extract base 24 July 2026 [E11]; Natural Earth admin-0 [E12]; Décret 2021/4804/PM [B01]; Décret 2000/004/PM [B02]; UNESCO Tentative List [B04]. Cameroon Steel analysis.

1.2 An equatorial climate with no truly dry month

Kribi is one of the wettest places on Cameroon's coast outside the Mount Cameroon area. The homogenised Kribi station record for 1937 to 1976 gives a mean annual rainfall of 2,836 mm, with a 95% confidence interval for the mean of 2,719 to 2,953 mm [E01]. Climate normals published by the World Meteorological Organization (WMO) for Kribi, supplied by the national meteorological service, give about 2,900 mm a year for 1981 to 2010 [E09]. A modelled ERA5 series for 1991 to 2020 gives 2,836 mm, with individual years ranging from about 2,200 to

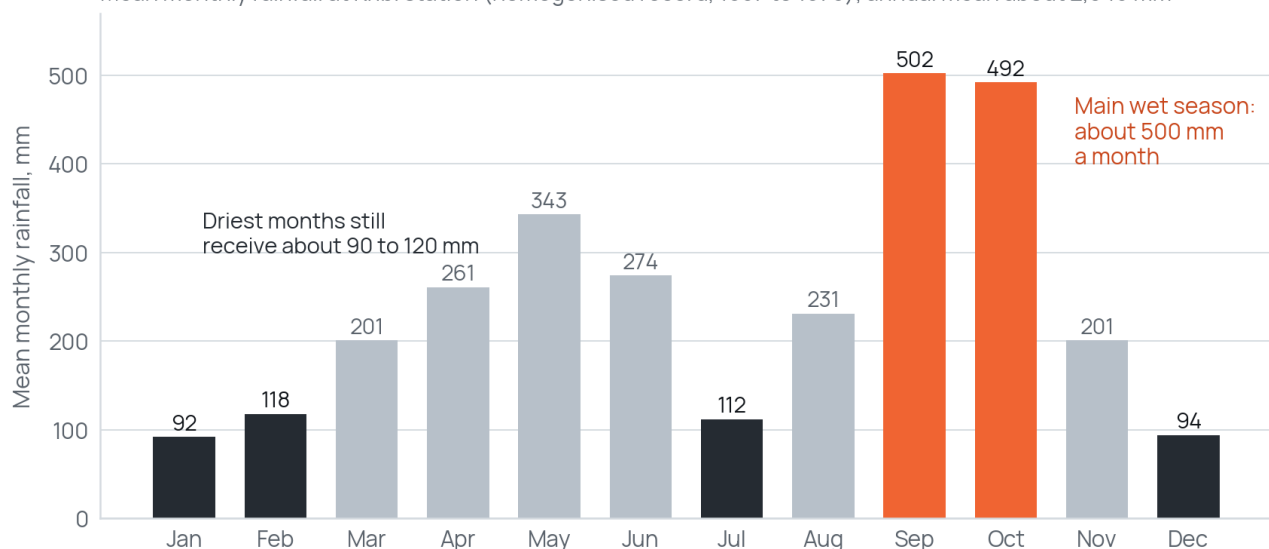
3,400 mm [E04]. We therefore plan on about 2,800 to 2,900 mm a year. We also note two widely circulated figures that should not be used. One, at about 3,000 mm, is in fact a Douala series. The other, at about 1,450 mm, is implausibly low [E01].

The rainfall regime has four seasons, damped by the ocean. Figure 1.2 shows the monthly means. December to February is the main "dry" season, yet each month still brings about 90 to 120 mm. The first rains run from March to June. A short, weak relative dry spell comes in July. The main wet season, in September and October, brings about 500 mm a month [E01]. Mean daily maxima are about 28 to 31.5 °C and mean minima about 22 to 24 °C [E09]. Relative humidity reaches 92 to 96% at night [E01]. These figures matter for four reasons:

- stormwater systems must work every month of the year;
- open stockpiles will generate run-off in every season;
- heat stress is a year-round occupational issue;
- ecological surveys must be scheduled around access in the wettest months.

There is no truly dry month at Kribi

Mean monthly rainfall at Kribi station (homogenised record, 1937 to 1976); annual mean about 2,840 mm



SOURCED Figure 1.2. Mean monthly rainfall at Kribi station. Even the three driest months bring about 90 to 120 mm each; September and October bring about 500 mm each.

Source: J.-C. Olivry, Monographie du Nyong et des fleuves côtiers, ORSTOM, 1979 [E01]. The monthly means as published sum to about 2,920 mm; the homogenised annual mean is 2,836 mm.

The prevailing winds come from the sea. The port authority describes the predominant wind as south to south-west [E07]. A modelled ERA5 series for 2011 to 2020 gives a mean wind speed of 2.3 m/s. The south-west sector accounts for 44.7% of hours and the south for 27.2% [E04]. By day the onshore sea breeze dominates. At night a south to south-east land-breeze component appears. Squall lines can bring short, violent gusts of about 20 m/s that stations rarely record [E01][E02]. Chapter 4 explains why this pattern is broadly favourable for the coastal villages by day, but needs care at night.

1.3 Rivers, streams and groundwater

Two coastal rivers frame the area. The Lobé drains about 2,300 km² and reaches the sea over the Lobé falls. Its mean flow is 102 m³/s, its median low flow 8.35 m³/s (minimum recorded 3.5 m³/s), and its estimated 100-year flood 565 m³/s [E01]. The Kienké, which reaches the sea at Kribi town, has a mean flow of 49.2 m³/s and a 10-year

dry-season low flow of 4.68 m³/s [E01]. The nearest mapped segment of the Lobé's main channel lies about 4 to 5 km east of the indicative steel site area; other mapped segments of the main stem lie up to about 7 km away [E11].

The water bodies that matter most for the plant are much smaller. The nearest mapped watercourse is the Boussibelika stream, about 2 to 3 km to the west, which drains to the sea near the port [E11]. Small, unnamed streams and seasonal wetlands probably drain the plateau itself, but public maps omit most of them. There are no flow or quality data for any of these streams. They are the probable receiving waters for treated stormwater, so we treat their survey as a critical-path task (Chapter 5).

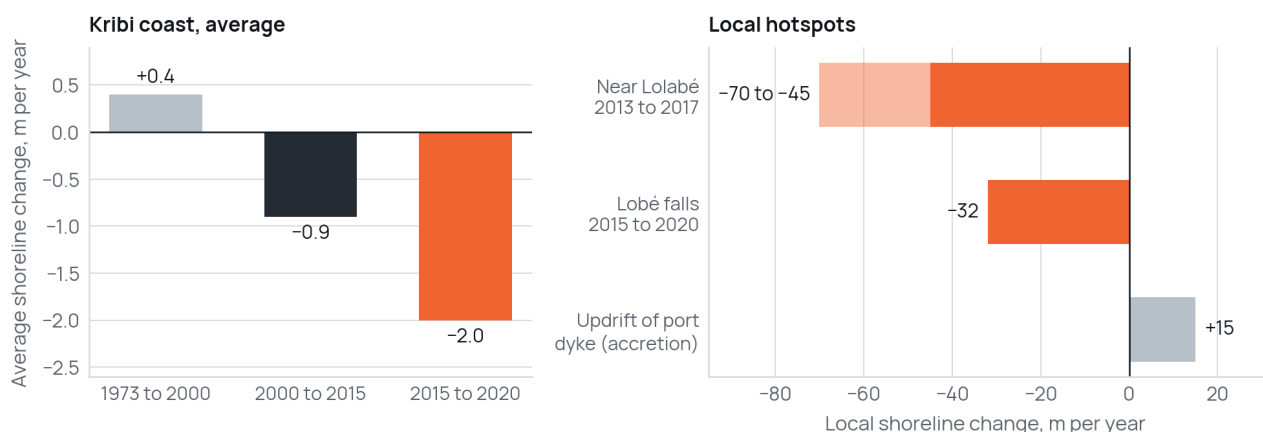
Groundwater is equally undocumented. The soils are deep, strongly acidic yellow ferrallitic (lateritic) soils, with a weathered mantle that can exceed 15 m over gneiss of the Nyong complex [E01][E02]. Aquifers are expected in the weathered layer and in fractured rock. The nearby Kribi gas power plant draws on boreholes [E15]. We found no published water-table depth, yield or quality for the site area. The aquifer's vulnerability to spills, and its value to villages that use wells, can only be established by drilling and monitoring.

1.4 A coast already reshaped by the port

The shoreline south of Kribi has changed sharply since the port was built. A peer-reviewed study of satellite and map records found net accretion of about 0.4 m a year between 1973 and 2000. It then found average retreat of 0.9 m a year between 2000 and 2015, and about 2 m a year between 2015 and 2020 [E02]. Local rates are far higher. The study reports retreat of about 32 m a year at the Lobé falls in 2015 to 2020, and 45 to 70 m a year near Lolabé in 2013 to 2017. Updrift of the port's breakwater, the beach has accreted by more than 15 m a year as the structure traps sand carried by the northward longshore drift [E02]. A 2025 assessment rates 68.3% of the 31.5 km Kribi coast as highly vulnerable and links this to sediment trapping by the breakwater [E03]. Turtle specialists report about 15 m of retreat in places at Ebodjé, inside the marine park [B05].

Since the port, the Kribi shoreline has switched from slow accretion to retreat

Shoreline change rates from satellite and map analysis; negative values are retreat



SOURCED Figure 1.3. Shoreline change on the Kribi coast. The regional average has moved from slow accretion to retreat since 2000, with local hotspots near the Lobé falls and Lolabé.

Source: Fendoung, Tchindjang and Hubert-Ferrari, Land 11:1557, 2022 [E02]; Perabi et al., 2025 [E03].

Sea-level rise will add to this pressure. The Intergovernmental Panel on Climate Change (IPCC) projects a likely global mean rise by 2100, relative to 1995 to 2014, of 0.44 to 0.76 m under an intermediate-emissions scenario (SSP2-4.5). Under a very high-emissions scenario (SSP5-8.5) the likely rise is 0.63 to 1.01 m. A rise of about 2 m by 2100 cannot be ruled out as a low-likelihood outcome [E08]. Kribi-specific projections have not yet been obtained.

For the steel complex, this is a matter of where things are placed. The melt shop, mills and stockyards sit on the plateau, tens of metres above the sea, and are not exposed to coastal flooding. Any coastal component would be exposed. That includes a dedicated berth, a seawater intake, an outfall or a conveyor landfall. Such a component would need a shoreline-change analysis and sea-level-rise allowance of its own. Our current planning assumes that raw materials and products move through the port's existing and planned terminals rather than a dedicated jetty. Under that assumption, the steel complex adds no new coastal structure. We will confirm this in the project description filed with the terms of reference.

1.5 Protected areas and a cultural landscape

Four protected or internationally recognised areas lie within about 60 km (Table 1.1). None is on or adjacent to the site. Their distances are approximate, and every receptor distance quoted in this paper is taken from one reference table (Annex D, Table D.1). We measured them from public geodata (OpenStreetMap and the boundary points published in the creation decrees) from the centre of a generalised indicative area, not from a surveyed boundary, and round them to whole kilometres.

Table 1.1 Protected and internationally recognised areas around the Kribi industrial-port zone

Area	Legal basis	Size	Approximate distance and bearing	Key values
Manyange na Elombo-Campo Marine National Park	Décret 2021/4804/PM, July 2021 [B01]	110,300 ha plus a 3,400 ha buffer zone	About 12 km, south-west (northern limit)	Turtle nesting beaches at Ebodjé, cetaceans, Ntem estuary mangroves; covers ten villages
Chutes de la Lobé	UNESCO Tentative List, ref. 6330, 2018 [B04]	Cultural landscape	About 18 km, north	A river falling directly into the sea; sacred to the Batanga, Mabi and Bagyeli
Campo-Ma'an National Park	Décret 2000/004/PM, 6 January 2000 [B02]	264,064 ha	About 29 km, east	Western lowland gorilla and forest elephant (both Critically Endangered), central chimpanzee (Endangered); 302 bird species recorded [B08][B10][B11]
Douala-Edéa National Park	Decree of 2018 converting the former wildlife reserve [B03]	262,935 ha	About 55 km, north-north-west	Mangroves, lowland forest, African manatee, marine turtles

Source: creation decrees and UNESCO listing as cited; distances derived by Cameroon Steel from OpenStreetMap (queried 10 October 2026) and decree boundary points [E11][B01]. Press reports quote a distance of 22.9 km from the port to the marine park boundary [B05]; the decree's boundary points take precedence.

The marine park is the youngest and closest of these areas. It was created in 2021 and its management was appointed in 2023 [E13]. Its buffer zone includes a 300 m strip at sea, a land strip above the high-water line, Lake Pitché and the mouth of the Ntem [B01]. The park covers ten villages. Among them is Ebodjé, a community of about 3,000 people, around 80% of whom work in fishing [B05]. Local monitoring and a port-supported turtle programme have documented olive ridley and leatherback nesting there [B06][B07].

The Chutes de la Lobé are both a natural feature and a cultural one. The UNESCO Tentative List entry describes a cultural landscape where the river falls over cascades directly into the sea. The site is associated with the beliefs and rites of the Batanga, Mabi and Bagyeli peoples [B04]. The falls lie downstream of any discharge to the Lobé basin. This is one reason for our design rule that no process water will be discharged to that basin without a specific study (Chapter 5).

1.6 Forests, farms and fishing villages

The coastal plateau between Kribi and Lolabé lies in the Atlantic coastal equatorial forest belt of Lower Guinea [B08]. Today it is a mosaic of secondary forest, cassava, plantain and cocoyam fallows, small cocoa and oil-palm plots, and older forest along the valleys. The actual vegetation of the steel site area has not yet been mapped. Public building maps show no mapped structures within about 1 km of the indicative area, but those maps are clearly incomplete [E11]. A ground-truthed land-cover map and a census of any users of the land are therefore among the first tasks of the assessment.

The nearest mapped settlements are Boussibelika, about 3 to 4 km to the west-north-west, Mbodé, about 4 to 5 km to the north-west, and Mboro, about 4 to 5 km to the west. Lolabé is about 6 to 7 km to the south-west and the Eboundja villages are farther north along the coast [E11]. The population is diverse:

- Batanga coastal fishing and farming families;
- Mabi lineages;
- Bagyeli (also called Bakola) hunter-gatherer communities, recognised as Indigenous Peoples under international standards;
- migrants from other regions of Cameroon, drawn by the port and the zone [B04][H05][E13].

Chapter 8 sets out what is known about them, and what is not.

The landscape is also changing fast for reasons unrelated to steel. Traffic through the port rose from 7 Mt in 2018 to 12.7 Mt in 2025, according to the port authority [K08]. A press report in 2024 put the population of Kribi at about 90,000, with projections of 300,000 by 2040 [E13]. Other projects are planned or under way in the same coastal strip. They include a mineral terminal, new railways, a cement plant, quarries and an iron ore mine on the Lobé (Chapter 9). Any honest assessment of a steelworks here has to separate its own contribution from these cumulative pressures, and has to contribute to managing them.

An aerial photograph of a tropical coastline. A river with brown water flows from the left into a sandy bay. The bay is surrounded by dense green forest. The ocean is a deep blue, and the sky is a lighter blue. The text is overlaid on the bottom half of the image.

**THE RECEPTORS THAT MATTER MOST ARE REACHED
THROUGH AIR, WATER, TRAFFIC AND PEOPLE. THE
ASSESSMENT HAS TO FOLLOW THEM.**

Illustrative view. Generated image of a tropical Atlantic coastline with forest and a river mouth; not a photograph of any project, place or person.

1.7 What the setting means for design

FIVE CONSEQUENCES WE DRAW FROM THE SETTING

1. **Assess the landscape, not the fence line.** The receptors that matter most (the marine park, the Lobé falls, Campo-Ma'an, the coastal villages) are reached through air, water, traffic and people, so the area of influence extends well beyond the site.
2. **Design for water every month.** With about 2,850 mm of rain a year and no dry month, stormwater, not water supply, is the main hydrological design driver.
3. **Stay off the coast.** Keeping all process units on the plateau and using the port's terminals avoids adding to a shoreline that is already retreating.
4. **Protect the small streams first.** The unmapped streams on the plateau are the most likely receiving waters, and the ones about which least is known.
5. **Measure before modelling.** No measured air, noise, water or ecological data exist for the site area; each must be collected across seasons before impacts are predicted.

These five points run through the rest of this paper. Chapter 2 sets out the national procedure that turns them into permit conditions. Chapter 3 explains the international standards that turn them into lender requirements.

CHAPTER 2

THE REGULATORY PATH: CAMEROONIAN LAW ALREADY REQUIRES A DETAILED, PUBLIC ASSESSMENT

Under Cameroonian law, a steelworks must undergo a detailed environmental and social impact assessment (EIES détaillée). The law requires public consultations during the study, public hearings on the finished report, an interministerial review, and a certificate of environmental compliance before any works start. In parallel, the plant must be authorised as a first-class classified establishment, with a hazard study and an emergency plan. The statutory deadlines add up to about four or five months of administrative time. The real timetable is 12 to 18 months, because it is set by baselines measured across the wet and dry seasons. National law sets no numeric emission or ambient air limits for steel, so we propose that international values become the permit conditions.

2.1 The framework law sets the obligation and the penalties

The foundation is Loi n° 96/12 of 5 August 1996, the framework law on environmental management [L01]. Article 17 requires the promoter of any project likely to harm the environment to carry out an impact study at its own cost. Article 18 states that a study that does not meet the prescribed terms of reference is null and void. Article 19 sets the minimum content:

- the initial state of the site;
- the reasons for choosing it;
- the expected effects;
- mitigation and compensation measures with their cost;
- the alternatives considered [L01].

Article 72 establishes public participation. Article 77 makes the operators of classified establishments strictly liable for damage. Article 79 punishes carrying out a project without the required study, or failing to respect its measures, with fines of 2 to 5 million FCFA, imprisonment of six months to two years, or both [L01].

The law is old but still in force. National consultations on its revision were held in September 2024 with support from the United Nations Environment Programme [L14]. An assessment of Cameroon's environmental and social management system, published by the AfDB in July 2026, still describes Loi 96/12 as the backbone of the national system [L13]. We plan on the basis of the current texts. We will update this analysis if a new framework law is promulgated before the certificate is issued.

2.2 Steelmaking is classified for a detailed assessment

Cameroonian practice does not use the "Category A, B, C" labels familiar to lenders. It distinguishes three instruments:

- the Notice d'Impact Environnemental (NIE), for minor operations;
- the EIES sommaire, for operations of moderate impact;
- the EIES détaillée, for operations with significant impacts.

FOR A STEELWORKS, THE QUESTION UNDER CAMEROONIAN LAW IS NOT WHETHER TO ASSESS, BUT HOW WELL.

Cameroon Steel, reading Arrêté n° 00001/MINEPDED of 8 February 2016

It also provides for a strategic environmental assessment (évaluation environnementale stratégique, EES) of plans, programmes and zones [L03]. Arrêté n° 00001/MINEPDED of 8 February 2016 lists the operations in each class. Article 4, under industries and metalworking, places "installation de production et fabrication des métaux" in the detailed category [L03]. Several facilities associated with a steelworks are also listed in their own right:

- thermal power plants above 10 MW;
- port facilities for ships of 1,350 t or more;
- fuel storage above 140 m³;
- industrial waste treatment [L03].

Article 3 of the same order requires an EES for "la création et l'aménagement des zones industrielles" and for "la création de complexes industriels-portuaires" [L03]. If an EES exists for the Kribi industrial-port zone, our assessment should build on it: it should adopt its zoning, its cumulative-impact findings and any conditions it sets for tenants. If it does not, the burden of cumulative assessment on each tenant rises. We will request this information from the port and zone authorities at scoping, and we list it as an evidence gap in Chapter 11.

2.3 The procedure, step by step

Décret n° 2013/0171/PM of 14 February 2013 sets out how an EIES is carried out and reviewed [L02]. Its main provisions are summarised in Table 2.1. Three features matter most for a project of this kind.

The study must be done by an approved firm. The consultant must hold an approval (agrément) from the Ministry of Environment, Protection of Nature and Sustainable Development (MINEPDED). Foreign firms may work only in association with an approved Cameroonian firm [L02][L11]. We welcome this rule. Local consultants bring knowledge of language, tenure and administration that no international team can replace.

Public participation is required twice. Public consultations take place during the study. MINEPDED must approve the programme, and it must reach representatives of the affected population at least 30 days before the first meeting, with signed minutes of every meeting [L02]. Public hearings (audiences publiques) are then held on the finished report. An ad hoc commission reports on them [L02]. The ministry's procedure manual confirms that hearings are reserved for detailed studies [L10].

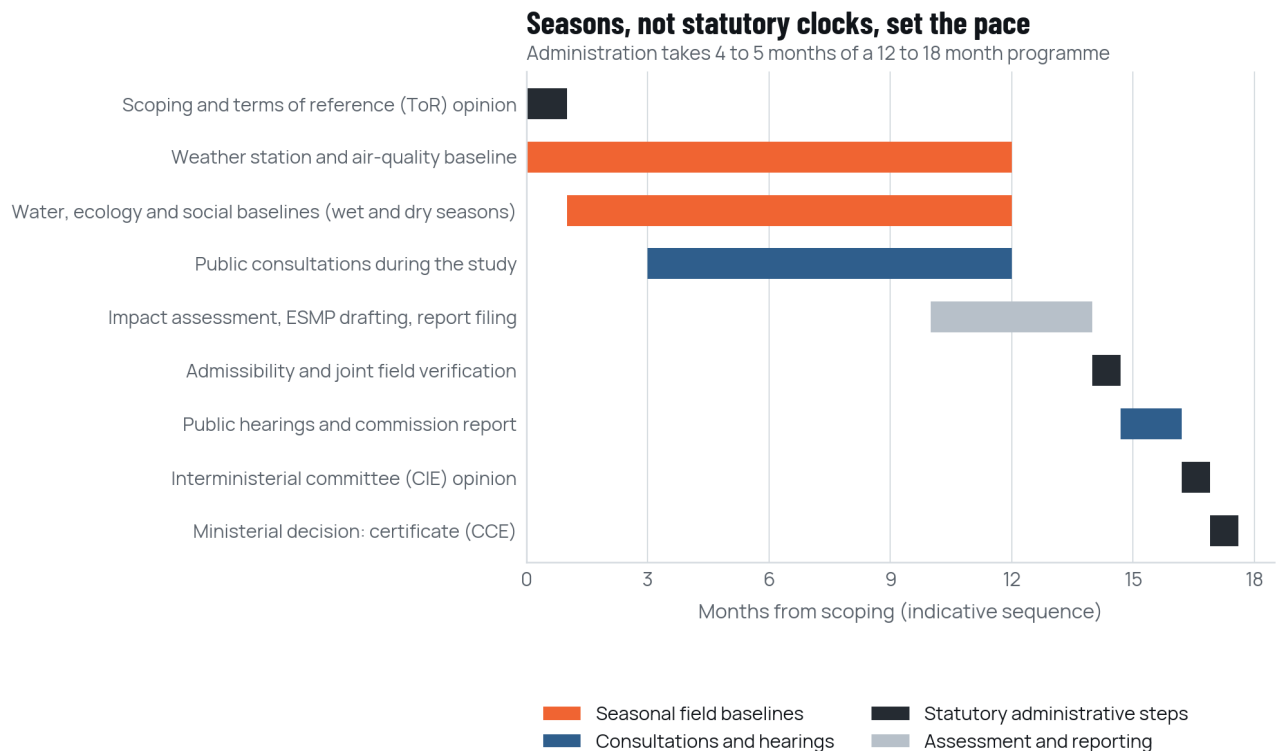
No works before approval. Article 3 forbids any implementation before the study is approved. The ministry's decision, issued after the opinion of the Interministerial Committee on the Environment (Comité Interministériel de l'Environnement, CIE), is a Certificate of Environmental Compliance (Certificat de Conformité Environ-

nementale, CCE). The certificate lapses if the project is not implemented within three years [L02]. Once the plant operates, the operator sends MINEPDED half-yearly reports on implementation of the environmental and social management plan (plan de gestion environnementale et sociale, PGES). Departmental committees monitor that implementation [L02][L12].

Table 2.1 Main steps and statutory deadlines of a detailed EIES under Décret 2013/0171/PM

Step	Requirement	Statutory deadline	Article
Terms of reference (ToR)	Filed with the sector ministry and MINEPDED; MINEPDED issues its opinion and the terms of reference (cahier des charges)	Sector ministry 10 days; MINEPDED 20 days; ToR deemed acceptable after 30 days of silence	13
Content	Bilingual (French and English) summary; initial state; site choice; project description and alternatives; legal framework; impacts and mitigation; awareness programme with signed minutes; PGES with monitoring; approved ToR	Not applicable	10
Consultant	Approved by MINEPDED; foreign firms only with an approved Cameroonian partner	Not applicable	14
Public consultations	Programme approved by MINEPDED and sent to population representatives in advance; signed minutes	At least 30 days' notice before the first meeting	20 to 21
Filing and admissibility	20 copies to MINEPDED, 2 to the sector ministry; joint field verification	Admissibility within 20 days (silence means admissible)	18
Public hearings	On the finished study, run by an ad hoc commission	Commission report in about 30 days	20 to 22
Interministerial review	Opinion of the CIE	20 days (silence means favourable)	24
Decision	Favourable (CCE), conditional or unfavourable	20 days after the CIE opinion	26
Validity and follow-up	CCE lapses if the project is not implemented within 3 years; half-yearly PGES reports	Continuous	25, 27 to 30
Fees	2,000,000 FCFA for the ToR review and 5,000,000 FCFA for the report review (detailed EIES)	Paid on filing	17

Source: Décret n° 2013/0171/PM of 14 February 2013 [L02]; MINEPDED procedure manual [L10]; Arrêté n° 0010/MINEP of 3 April 2013 [L12].



DERIVED **Figure 2.1.** Indicative sequence of a detailed EIES. The statutory administrative steps (dark) add up to about four to five months; seasonal field baselines (orange) set the overall pace.

Source: Décret 2013/0171/PM [L02]; MINEPDED procedure manual [L10]; Cameroon Steel indicative sequence.

The statutory clock looks fast. Ten plus twenty days for the terms of reference, then about twenty, thirty, twenty and twenty days after filing, add up to about four to five months of administrative time. The ministry's manual cites 120 days from filing to decision for non-petroleum sectors [L10]. In practice, field baselines set the timetable. Air quality and meteorology need at least a full year. Ecological surveys must cover both wet and dry seasons. Public consultations need time to be meaningful. A realistic programme runs 12 to 18 months from filing the terms of reference to the certificate (Figure 2.1). Any schedule that compresses this into a few months either skips the seasons or skips the people. We will not do either.

2.4 A classified establishment, with a hazard study and an emergency plan

The environmental certificate is necessary but not sufficient. Loi n° 98/015 of 14 July 1998 on classified establishments, and its implementing Décret n° 99/818/PM of 9 November 1999, create a separate authorisation track run by the ministry in charge of mines and industry (MINMIDT) [L04]. A steelworks will almost certainly be a first-class establishment. The application must include the environmental study, a hazard study (étude des dangers) and an emergency plan (plan d'urgence), with maps at 1:50,000 and 1:10,000 [L04]. The process involves a 30-day public inquiry, a decision within one month (extendable to two) and an authorisation fee of 500,000 FCFA [L04]. Article 7 of the law requires a safety perimeter free of housing. Article 8 requires emissions self-monitoring, and the authorisation lapses after two years of non-use [L04].

For an EAF works, the hazard study should model the consequences of several major-accident scenarios:

- contact between molten metal and water, the classic cause of steam explosions in melt shops;
- releases from oxygen storage and supply;
- fuel gas or liquefied petroleum gas systems for ladle preheating and reheating furnaces;
- carbon-monoxide-rich off-gas;

- transformer fires.

The safety perimeter must then be reconciled with the zone's land-use plan and with the nearest village, Boussibelika, which lies about 3 to 4 km away (Annex D, Table D.1). We intend to run the classified-establishment and environmental tracks in parallel. A hazard study prepared late, after the layout is frozen, can only add protective measures. A hazard study prepared early can move hazardous units away from people.

2.5 Pollution, water, waste, forest and labour permits

Several sector decrees add specific obligations (Table 2.2):

- **Air.** Décret n° 2011/2582/PM on atmospheric protection requires stationary sources to meet emission standards and to keep records for ten years. Its article 9(2) provides for sector limits by ministerial order, and its annex names iron and steel production [L05]. We did not find the steel-sector order in force.
- **Noise and odours.** Décret n° 2011/2583/PM contains no numeric decibel limits and leaves them to the national standards body [L05].
- **Discharges.** Décret n° 2011/2585/PM requires prior authorisation to discharge metals such as iron, zinc, chromium, nickel, lead and cadmium. It also requires monthly sampling by an approved laboratory [L05].
- **Waste.** Décret n° 2012/2809/PM and its implementing orders restrict industrial hazardous waste to approved operators. They require an environmental permit, a tracking manifest and a generator's register [L06].
- **Water.** Loi n° 98/005 prohibits polluting discharges to surface water, groundwater and the sea without authorisation, and requires new installations to meet discharge norms from start-up [L07]. Industrial abstraction needs prior authorisation after a 30-day public inquiry, valid for five years and renewable. Discharge authorisations are granted for at most five years [L07].
- **Forests.** The new forest and wildlife law, Loi n° 2024/008, governs clearing and the salvage of timber [L15].
- **Labour.** The Labour Code requires occupational health and safety measures and a company medical service [L17].

Table 2.2 Indicative permits and approvals for the steel complex

Permit or approval	Authority	Legal basis	What triggers it
ToR approval and Certificate of Environmental Compliance	MINEPDED, after CIE opinion	Loi 96/12; Décret 2013/0171/PM; Arrêté 00001/2016	The whole works and listed associated facilities
First-class classified-establishment authorisation	MINMIDT	Loi 98/015; Décret 99/818/PM	Melt shop, gas and oxygen storage
Authorisation to occupy and develop the port domain	PAK and KPIZ	Décret 2020/251 (art. 11) and occupation conditions	Land occupation and works in the port domain
Water abstraction and discharge authorisations	Ministry of Water and Energy (MINEE), with MINEPDED opinion	Loi 98/005; Décrets 2001/164 and 2001/165; Décret 2011/2585/PM	Boreholes or surface intake; any treated-water outfall
Environmental permit for hazardous waste	MINEPDED	Décret 2012/2809/PM; Arrêtés 001 and 002/MINEPDED of 2012	EAF dust, oily wastes, sludges
Clearing and timber salvage	Ministry of Forests and Wildlife (MINFOF)	Loi 2024/008	Clearing of vegetation
Building permits	Kribi urban council	Urban planning law	Buildings
Grid connection and any captive power above 10 MW	MINEE and the electricity regulator	Electricity law; Arrêté 00001/2016	Substation connection; any on-site generation

Source: legal texts as cited [L02][L03][L04][L05][L06][L07][L15][L19]. Indicative list, to be confirmed with each authority during scoping.

2.6 Where national standards are silent, we apply the stricter international value

Two gaps stand out. First, no national numeric emission limits for steelmaking, and no adopted national ambient air quality standard, were found in force [L05][L13]. A 2008 ministerial document on environmental norms for industrial installations is widely cited in Cameroonian studies, but we could not obtain a primary copy, so we do not quote its values. Second, national land law compensates customary occupants without title only for their improvements, not for the land. It uses crop rates fixed in 2003 and contains no explicit requirement to restore livelihoods [L08][L09]. Both gaps are well known to lenders, and both have a well-known remedy.

OUR APPROACH TO STANDARDS

For every parameter, Cameroon Steel will apply the more stringent of the national requirement and the relevant international value: the World Bank Group EHS Guidelines, the WHO 2021 air quality guidelines, and, for EAF emissions, the levels associated with best available techniques in the European Union. We will ask MINEPDED to write these values into the certificate's conditions, so that they bind us in law and not only by contract. For land and livelihoods, we will apply IFC Performance Standard 5 where it goes beyond national law (Chapter 8).

The port domain adds a further layer. Under Décret n° 2020/251, every private activity inside the port's area of jurisdiction requires the port authority's authorisation [L19]. The port authority has stated that it monitors health, safety and environmental performance on occupied sites [K24]. The 2013 law on economic zones obliges enterprises admitted to a zone to protect the environment [L20]. Our assessment will be shared with the port and zone authorities so that their own conditions, and ours, point in the same direction.

2.7 A realistic timetable, and why it serves everyone

Early assessment costs time at the start and saves it later. Three features of the national procedure reward early starts:

- the certificate's three-year validity;
- the 30-day notice for consultations;
- the requirement that the hazard study accompany the classified-establishment application.

Starting the twelve-month air and weather monitoring immediately puts the critical path in the field, where it belongs, rather than in review. Filing a complete study, with seasonal data and signed minutes, avoids repeated requests for information. Running the environmental and classified-establishment tracks together lets one layout answer both. Chapter 10 sets out the sequence we intend to follow. Chapter 11 lists the information we still need from public authorities to complete it.

CHAPTER 3

INTERNATIONAL STANDARDS FILL THE GAPS NATIONAL LAW LEAVES, SO WE APPLY THEM FROM DESIGN

Cameroon is a "non-designated country" under the Equator Principles. Any project financed by an Equator bank there must therefore meet the IFC Performance Standards and the World Bank Group Environmental, Health and Safety (EHS) Guidelines in full [G05]. The AfDB, a financing partner of the Kribi industrial zone, applies its own Integrated Safeguards System of 2023, which is close in substance [G06][K04]. These standards matter for more than financing. They fill exactly the gaps that national law leaves open: numeric emission limits, livelihood restoration, the consent of Indigenous Peoples, biodiversity and climate. Cameroon Steel will apply them from the design stage, whatever the final financing structure, because a steelworks is far cheaper to design right than to retrofit.

3.1 Four frameworks, one logic

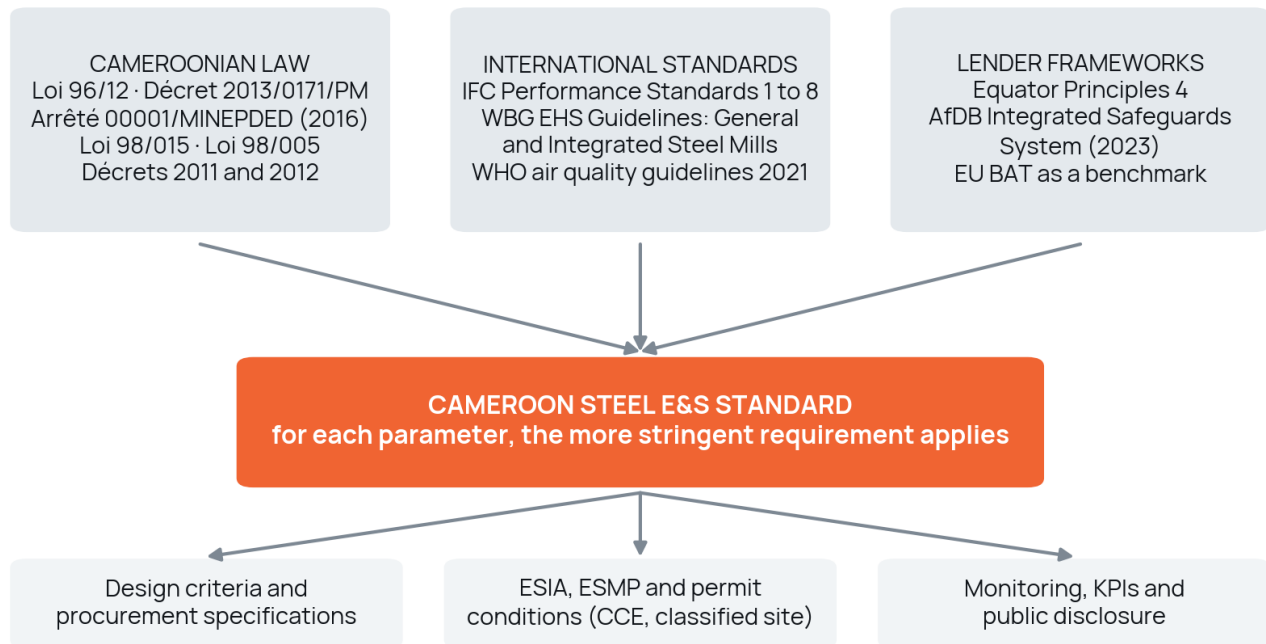
Four sets of international instruments apply to a steelworks of this kind. They are layered rather than competing (Figure 3.1).

- **The IFC Performance Standards (2012)** set the outcomes. There are eight standards, covering risk management, labour, pollution, community safety, land, biodiversity, Indigenous Peoples and cultural heritage [G01].
- **The World Bank Group EHS Guidelines (2007)** set the numbers. The General Guidelines cover cross-cutting issues such as ambient air, noise and waste. The Guidelines for Integrated Steel Mills set sector-specific emission and effluent values and performance benchmarks. Despite their title, they cover electric arc furnace (EAF) steelmaking and rolling as well as blast furnaces [G03][G04].
- **The Equator Principles (EP4, 2020)** set how private lenders apply the first two. They add requirements on climate risk, human rights and disclosure [G05].
- **The AfDB Integrated Safeguards System (2023)** sets the AfDB's requirements through ten operational safeguards. It gives stakeholder engagement a standalone safeguard and gives particular attention to vulnerable groups [G06].

Two reference documents complete the picture. The WHO global air quality guidelines of 2021 update the ambient values that the 2007 EHS Guidelines reproduce [G09]. The European Union's conclusions on best available techniques (BAT) for iron and steel production set achievable emission levels for modern EAF melt shops [G07]. Lenders increasingly use both as benchmarks.

One standard, built from three sources

National law is the floor; international standards fill the gaps; the stricter value governs design and permits



ILLUSTRATIVE Figure 3.1. How national law and international standards combine into a single project standard. For each parameter, the more stringent requirement governs design, permits and monitoring.

Source: Loi 96/12 [L01]; Décret 2013/0171/PM [L02]; IFC Performance Standards [G01]; WBG EHS Guidelines [G03][G04]; EP4 [G05]; AfDB ISS [G06]; WHO 2021 [G09]; EU BAT [G07].

3.2 The eight Performance Standards, read for Kribi

The Performance Standards are written for every sector and every country. Their value lies in how they are applied to a specific place. Table 3.1 summarises what each standard means for an EAF long-products works on the Kribi plateau. The following chapters develop each point.

Table 3.1 What each IFC Performance Standard requires of a steelworks in Kribi

Standard	Core requirement	What it means in Kribi
PS1 Assessment and management	Environmental and social assessment; management system; stakeholder engagement; grievance mechanism	Full assessment including cumulative impacts with the port, the zone, rail and mining projects; grievance mechanism open before fieldwork
PS2 Labour and working conditions	Fair terms, non-discrimination, worker grievance mechanism, occupational health and safety, supply-chain checks	Molten metal, gas, cranes, heat and noise; construction contractors and worker accommodation; checks on scrap supply chains for child labour
PS3 Resource efficiency and pollution prevention	Apply EHS Guidelines; efficiency in water and energy; quantify GHG above 25,000 tCO ₂ e per year	EAF dust and dioxin controls; closed-loop water; annual GHG inventory from the first year
PS4 Community health, safety and security	Hazardous materials, traffic, disease, emergency preparedness, proportionate security	Truck traffic on the N7 and port roads; influx and disease risks; oxygen and gas hazards; security personnel conduct
PS5 Land acquisition and involuntary resettlement	Avoid or minimise displacement; replacement-cost compensation; livelihood restoration	Due diligence on the land's history since 2009; any current users or graves; legacy gaps addressed

Standard	Core requirement	What it means in Kribi
PS6 Biodiversity	Mitigation hierarchy; no net loss in natural habitat; net gain in critical habitat	Critical habitat unlikely on site but present in the wider landscape (marine park, Campo-Ma'an, estuaries)
PS7 Indigenous Peoples	Informed consultation and participation; free, prior and informed consent in defined circumstances	Bagyeli communities in the Océan department; early specialised screening; consent if customary lands, relocation or critical heritage are affected
PS8 Cultural heritage	Protect heritage; chance-finds procedure; consultation on critical heritage	Lobé falls cultural landscape; sacred sites and graves of Batanga, Mabi and Bagyeli lineages

Source: IFC Performance Standards on Environmental and Social Sustainability, 1 January 2012 [G01]; Cameroon Steel analysis.

The standards share one method: assess first, then avoid, minimise, restore and only then compensate or off-set. They also share one demand that is easy to state and hard to meet: engage the people affected early enough that their views can change the project. Most of this paper is about how to meet that demand in Kribi.

3.3 The EHS Guidelines provide the numbers

The EHS Guidelines translate the Performance Standards into values that can be designed, measured and audited. For an EAF works, the most relevant values are the stack emission guidelines. These apply for at least 95% of operating time, without dilution and at standard reference conditions [G03]:

- particulate matter 20 to 50 mg/Nm³, with the lower value where toxic metals are present;
- polychlorinated dibenzo-p-dioxins and furans (PCDD/F) 0.1 ng toxic equivalent (TEQ)/Nm³;
- carbon monoxide 100 mg/Nm³ for the EAF;
- nitrogen oxides 500 mg/Nm³;
- metals: chromium 4, cadmium 0.2, lead 2 and nickel 2 mg/Nm³.

For effluent discharged directly to surface water, the guidelines set a full suite of limits (Chapter 5): pH 6 to 9, total suspended solids 35 mg/L, oil and grease 10 mg/L, zinc 2 mg/L and lead 0.2 mg/L, among others [G03].

The General Guidelines add two rules that are especially important in Kribi [G04]. The first concerns air. A project should not cause ambient concentrations to exceed national standards or, where there are none, the WHO guidelines. As a general rule, it should use no more than 25% of the applicable ambient standard, so as to leave room for other development in the same airshed. Where the airshed is already degraded, the project's increment should be minimal. Chapter 4 shows why this matters: modelled background fine particulate matter at Kribi is already above the WHO 2021 guideline. The second rule concerns noise. Off-site noise should not exceed 55 dB(A) by day and 45 dB(A) at night at residential receptors, or 70 dB(A) at industrial receptors. Nor should it raise background levels by more than 3 dB at the nearest receptor [G04].

The guidelines are from 2007, and better techniques now exist. The EU BAT conclusions of 2012 associate the following levels with modern EAF primary and secondary dedusting [G07]:

- dust below 5 mg/Nm³ as a daily mean;
- mercury below 0.05 mg/Nm³;
- PCDD/F below 0.1 ng I-TEQ/Nm³;
- a fume capture efficiency above 98%.

Later phases will add gas-fired reheating furnaces, for which the EU's 2022 conclusions for ferrous metals processing set the relevant levels [G16]. For a new furnace burning natural gas, the BAT-associated level for nitrogen oxides is 80 to 200 mg/Nm³ at 3% oxygen, as a daily average, against 100 to 350 mg/Nm³ for existing furnaces; the indicative level for carbon monoxide is 10 to 50 mg/Nm³. Table 3.2 sets these values side by side with the national position and our design objectives.

Table 3.2 Key air emission values for the melt shop and reheating furnaces: national, IFC, EU BAT and Cameroon Steel design objective

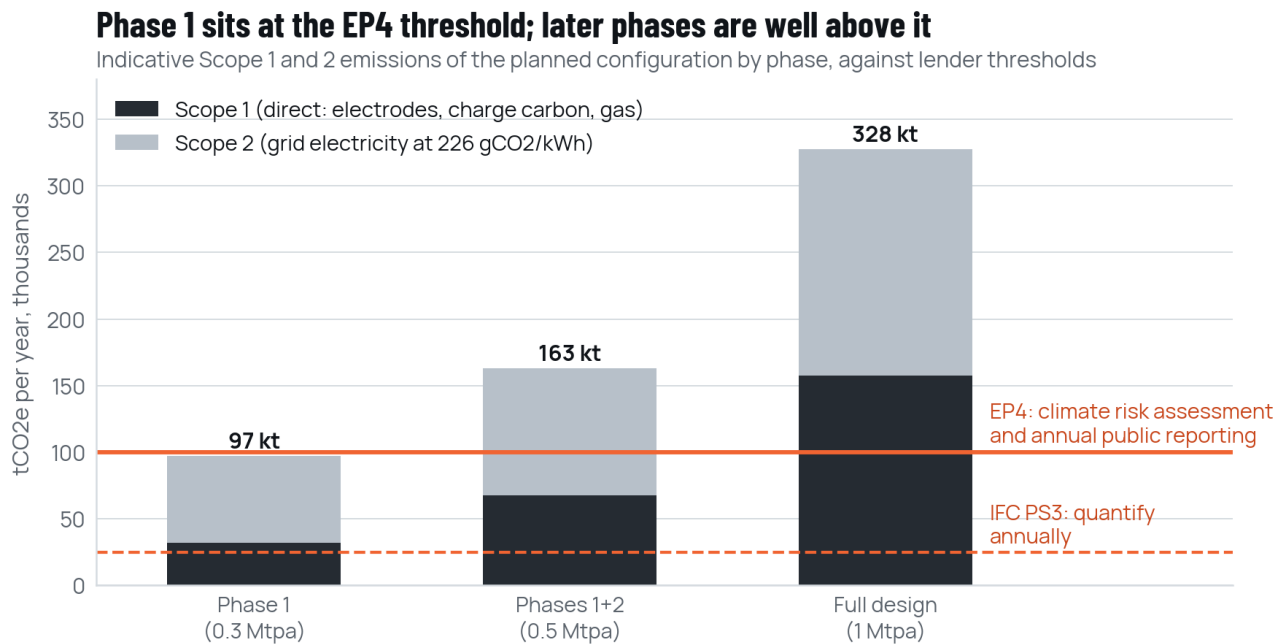
Parameter	Cameroon (national)	IFC EHS Integrated Steel Mills (2007)	EU BAT conclusions: EAF (2012); reheating furnaces (FMP, 2022)	Cameroon Steel design objective (planned)
Dust (particulate matter), mg/Nm ³	No sector limit found in force	20 to 50	Below 5 (daily mean)	Below 5 at the melt-shop bag filter
PCDD/F, ng TEQ/Nm ³	No sector limit found	0.1	Below 0.1	Below 0.1, verified twice a year at first
Mercury, mg/Nm ³	No sector limit found	Not specified for EAF	Below 0.05	Below 0.05
Carbon monoxide, mg/Nm ³	No sector limit found	100 (EAF)	EAF: none set; gas-fired reheating furnaces: indicative 10 to 50 (FMP, 2022)	EAF: 100; reheating furnaces (later phases): 50 or less
Nitrogen oxides, mg/Nm ³	No sector limit found	500	EAF: none set; new gas-fired reheating furnaces: 80 to 200 at 3% O ₂ (FMP, 2022)	Low-NOx burners; reheating furnaces (later phases): 200 or less at 3% O ₂ ; Phase 1 heats billets electrically
Fume capture efficiency	Not specified	Not specified	Above 98%	Above 98% (primary and secondary capture)

Source: Décret 2011/2582/PM [L05]; IFC EHS Guidelines for Integrated Steel Mills, Table 1 [G03]; Commission Implementing Decision 2012/135/EU, BAT 88 to 89 [G07]; Commission Implementing Decision (EU) 2022/2110, BAT 22, Table 1.9 [G16]. Design objectives are Cameroon Steel targets for the assessment and procurement, not measured performance.

3.4 Equator Principles 4: climate, human rights and disclosure

Equator Principles categorisation is based on the magnitude of environmental and social risks and impacts, not on size. We expect lenders to categorise the project as Category A under EP4, which brings the most demanding review [G05]. In a non-designated country, the bank must verify compliance with the Performance Standards and EHS Guidelines. An independent environmental and social consultant reviews the assessment. The borrower commits to an environmental and social action plan (ESAP) through covenants, and at least a summary of the assessment must be published online [G05]. EP4 also expects the project to assess its human-rights risks against the UN Guiding Principles on Business and Human Rights [G05][G13].

EP4's climate requirements turn on two thresholds (Figure 3.2). All Category A projects need a climate change risk assessment that covers physical risks. Where combined Scope 1 and 2 emissions are expected to exceed 100,000 tonnes of carbon dioxide equivalent (tCO₂e) a year, the assessment must also cover transition risks. It must include an alternatives analysis of lower-carbon technologies, and the borrower must report emissions publicly each year [G05]. IFC Performance Standard 3 separately requires annual quantification above 25,000 tCO₂e [G01].



DERIVED **Figure 3.2.** Indicative Scope 1 and 2 emissions of the planned configuration by phase, against the IFC PS3 quantification threshold and the EP4 reporting and alternatives threshold. Phase 1 sits at or about 100,000 tCO₂e a year: about 97,000 t in the planning model, and 100,000 to 104,000 t with minor sources (diesel, LPG and switchgear SF₆; White paper 06, Chapter 9). Later phases are well above it.

Source: Cameroon Steel planning model, edition of 10 October 2026 (planned capacities multiplied by IFC and worldsteel benchmarks; grid factor 226 gCO₂/kWh for 2024 [T04]) [X03]; IFC PS3 [G01]; EP4 [G05]. Indicative values, not measurements.

Our planning model estimates Scope 1 and 2 emissions of about 97,000 tCO₂e a year for Phase 1 (0.3 Mtpa of finished products). It estimates about 163,000 tCO₂e for Phases 1 and 2 (0.5 Mtpa) and about 328,000 tCO₂e at the full design capacity of 1 Mtpa [X03]. These are planning estimates, built from benchmark energy intensities. They are not measurements. Diesel, LPG and switchgear SF₆, which are outside the planning model, would add about 3,000 to 7,000 t a year, taking Phase 1 to about 100,000 to 104,000 tCO₂e (White paper 06, Chapter 9). Phase 1 sits so close to the EP4 threshold that the distinction is academic. We will therefore carry out the full climate change risk assessment, including the alternatives analysis, and report Scope 1 and 2 emissions publicly every year from the first year of operation.

The same model gives an indicative intensity of about 0.32 tCO₂ per tonne of finished product in Phase 1 (about 0.33 t at full build-out) for Scope 1 and 2 emissions. That figure excludes the upstream emissions of any imported direct-reduced or hot-briquetted iron. Including them raises the estimate to about 0.58 t/t [X03]. Published route averages are not directly comparable, because their boundaries differ. For orientation only, worldsteel's 2024 averages are 2.34 tCO₂/t for the blast furnace route, 1.47 for gas-based direct reduction with an EAF, and 0.69 for the scrap-based EAF route [T01]. Two factors keep the Kribi figure low. The first is the route itself: an EAF melts metallic charge rather than reducing ore with coal. The second is Cameroon's electricity. The latest published emission factor for the grid is about 226 gCO₂/kWh, for 2024, a year in which the same Ember dataset puts hydropower at about 72% of generation [T04][T05]. The electricity regulator reports a higher hydropower share for 2025, about 90% [T10]; no emission factor has yet been published for that year, and the papers of this series keep 226 g as a conservative planning value. Both advantages depend on firm, low-carbon power, which Chapter 10 treats as a monitored commitment.

Climate rules in export markets add a commercial reason to measure carefully. The definitive regime of the EU Carbon Border Adjustment Mechanism (CBAM) has applied to iron and steel imports since 1 January 2026. Certificates were priced at €82.32/tCO₂ for the third quarter of 2026 [T06][T07]. Our planned markets are mainly in Cameroon and the wider Central African region, so CBAM would bite only on any exports to the EU. Even so, buyers and lenders will ask for a verified product carbon footprint, and the inventory we commit to here will provide it.

3.5 The AfDB Integrated Safeguards System

The AfDB revised its safeguards in 2023. The system now has ten operational safeguards (OS), covering [G06]:

- assessment and management of environmental and social risks (OS1);
- labour and working conditions (OS2);
- resource efficiency and pollution prevention (OS3);
- community health, safety and security (OS4);
- land acquisition, restrictions on land use and involuntary resettlement (OS5);
- biodiversity and living natural resources (OS6);
- vulnerable groups, including Indigenous Peoples and historically underserved traditional local communities (OS7);
- cultural heritage (OS8);
- financial intermediaries (OS9);
- stakeholder engagement and information disclosure (OS10).

We paraphrase the subjects here; the exact titles should be confirmed against the published text. Three features make the system relevant to Kribi even before any AfDB financing decision. First, the AfDB is a named partner of the industrial zone, so its standards will shape the zone's own environmental management [K04]. Second, its treatment of vulnerable groups is broad enough to cover the Bagyeli, women fish processors and others whose situation national law does not single out. Third, its standalone safeguard on engagement and disclosure makes the quality of consultation a reviewable requirement in its own right.

3.6 Why the standards matter beyond financing

A STEELWORKS IS FAR CHEAPER TO DESIGN RIGHT THAN TO RETROFIT.

Cameroon Steel

It would be possible to treat international standards as a lender's checklist, completed late and filed away. That approach fails on its own terms. A bag filter sized for 50 mg/Nm³ cannot later be tuned to 5. A stockyard placed on a stream cannot later be moved. A consultation held after the layout is fixed cannot change it. The standards are useful precisely because they force decisions early, while those decisions are still cheap.

Recent practice shows what lenders now ask of an EAF rebar mill. In January 2026 the IFC disclosed its environmental and social review of a loan to an existing EAF works in Malaysia with 600,000 t a year of steelmaking capacity [T08]. The review records several features:

- particulate emissions held at or below 30 mg/Nm³ by a dedusting plant;
- noise kept below 65 dB at the plant boundary, with the nearest homes about 300 m away;
- about 6,000 t a year of EAF dust collected in silos for zinc extraction or reuse;
- about 70,000 t of EAF slag and 18,000 t of ladle slag sold each year to licensed recovery companies;
- about 8,000 m³ of water recycled each day against 2,000 m³ of make-up;
- annual reporting of about 247,000 tCO₂e.

It also required a stakeholder engagement plan and an external grievance mechanism by a set date [T08]. That is an existing plant in an industrial estate. A new plant in Kribi, in a landscape that holds a marine park and Indigenous Peoples' lands, should aim higher, and can, because nothing has yet been built.

HOW CAMEROON STEEL WILL APPLY THE STANDARDS

- Adopt a written environmental and social policy that commits to Cameroonian law, the IFC Performance Standards, the WBG EHS Guidelines and EP4, applying the stricter requirement in each case.
- Prepare one assessment that satisfies both the national procedure and the Performance Standards, rather than two documents that diverge.
- Commission an independent gap analysis of the assessment against the Performance Standards and the AfDB safeguards before filing, and publish its conclusions.
- Build an environmental and social management system aligned with ISO 14001 and ISO 45001 during construction, with certification as an objective for the first years of operation.
- Report Scope 1 and 2 emissions publicly every year from the first year of operation.

CHAPTER 4

AIR QUALITY: THE AIRSHED ALREADY EXCEEDS THE WHO FINE-PARTICLE GUIDELINE, SO THE WORKS MUST ADD AS LITTLE AS POSSIBLE

Modelled background fine particulate matter (PM_{2.5}) at Kribi is about 10 µg/m³, twice the WHO 2021 annual guideline of 5 µg/m³. The main causes are harmattan dust and smoke from regional biomass burning. If on-site monitoring confirms this, the airshed counts as degraded for fine particles under the World Bank Group General EHS Guidelines, and the project's allowance shrinks to a minimal increment. The main air issues of an electric arc furnace (EAF) melt shop are dust carrying zinc and lead, dioxins and furans, and carbon monoxide. Fired reheating furnaces add nitrogen oxides, and stockyards and roads add fugitive dust. Proven techniques control all of them. Cameroon Steel's design objective is the European best-available-technique level: dust below 5 mg/Nm³ and dioxins and furans below 0.1 ng I-TEQ/Nm³ at the melt-shop stack.

4.1 What the airshed looks like today

There is no air quality monitoring network in Cameroon. The environmental study for the Kribi gas power plant recorded this gap as early as 2007 [E06], and we found no evidence that it has since been filled near Kribi. The only measured data we found nearby come from that study. Diffusion tubes deployed at Mpolongwe, about 30 km north of Mboro, in April to June 2006 recorded sulphur dioxide (SO₂) at 1.4 to 1.5 µg/m³ and ozone at 33.8 to 44.1 µg/m³. Nitrogen dioxide (NO₂) was reported as far below World Bank and WHO values [E06]. The Multilateral Investment Guarantee Agency (MIGA) later reported that the plant's 2012 monitoring complied with the applicable guidelines, without publishing the figures [E16]. These data are old, distant and short.

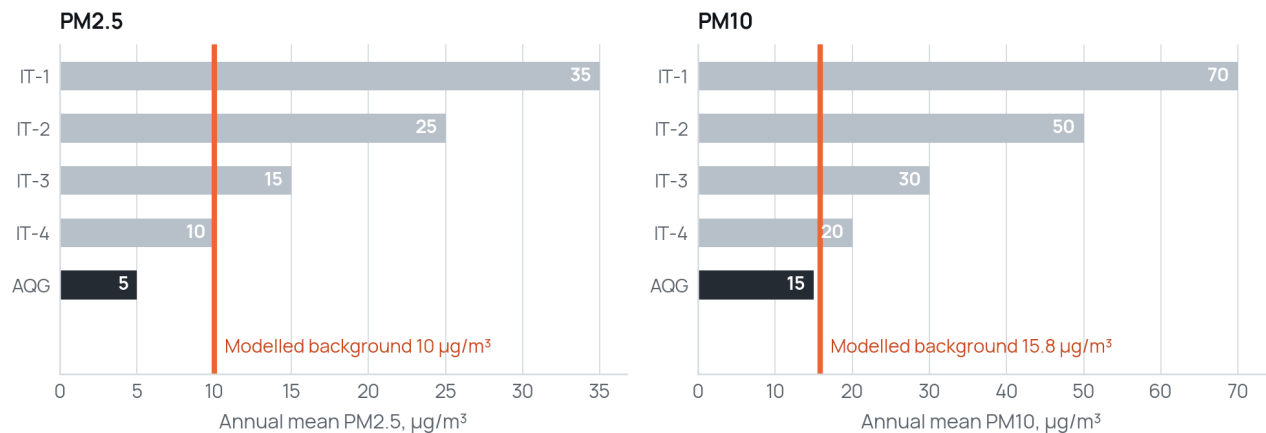
Modelled data fill part of the gap. The Copernicus Atmosphere Monitoring Service (CAMS) global reanalysis for the Kribi area in 2024 to 2025 gives the following annual means [E05]:

- PM₁₀ 15.8 µg/m³, with a 98th-percentile daily value of 49 µg/m³ and a daily maximum of 84 µg/m³;
- PM_{2.5} 10.0 µg/m³, with a 98th-percentile daily value of 30 µg/m³;
- NO₂ 1.2 µg/m³;
- SO₂ 0.35 µg/m³;
- ozone 54 µg/m³.

Fine particles peak in January and February at 16.6 to 20.0 µg/m³ as monthly means, when harmattan dust reaches the coast. A second, smaller peak in June to August probably reflects smoke from biomass burning in southern Africa [E05]. Gaseous pollutants are low, as one would expect in a rural coastal area with little industry and modest traffic.

Modelled background PM2.5 is already twice the WHO guideline

WHO 2021 annual guideline (AQG) and interim targets (IT) against the CAMS modelled background at Kribi, 2024 to 2025



SOURCED Figure 4.1. Modelled annual background particulate matter at Kribi against the WHO 2021 annual guideline (AQG) and interim targets (IT). PM2.5 is at interim target 4, twice the guideline; PM10 is just above the guideline.

Source: WHO global air quality guidelines, 2021 [G09]; Copernicus CAMS global reanalysis via Open-Meteo, 2024 to 2025 [E05]. Modelled, not measured.

The comparison with the WHO guidelines is the most important fact in this chapter (Figure 4.1). The 2021 guidelines set annual mean levels of 5 µg/m³ for PM2.5 and 15 µg/m³ for PM10. They also set interim targets for countries working towards them: for PM2.5, 35, 25, 15 and 10 µg/m³ [G09]. On the modelled data, Kribi already sits at the last interim target for PM2.5. This is not caused by industry. It is the regional background of a tropical coast downwind of the Sahel and of Africa's seasonal fire belt. But it changes the rules for any new source. The General EHS Guidelines ask a project to use no more than a quarter of the applicable ambient standard, and to keep its increment minimal where the airshed is already degraded [G04]. In Kribi, "applicable standard" should mean the WHO 2021 guideline, because Cameroon has adopted no national ambient standard.

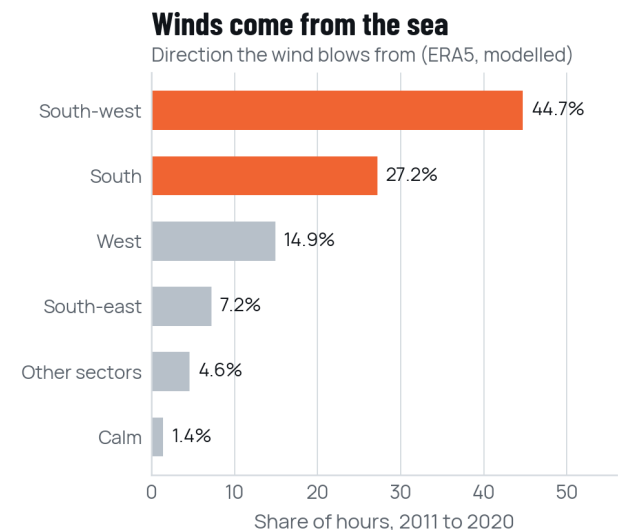
Modelled data are not enough to decide the matter. CAMS resolves the atmosphere at a coarse grid and cannot see local sources such as unpaved roads, cooking fires or the port's bulk handling. Before any impacts are predicted, we will run at least twelve months of on-site monitoring: reference-equivalent PM10 and PM2.5 monitors, passive tubes for gases and dust deposition gauges (Chapter 11).

4.2 Where the wind takes emissions

Kribi's winds come mostly from the sea (Figure 4.2). In the modelled 2011 to 2020 series, south-westerly winds account for 44.7% of hours, southerlies for 27.2% and westerlies for 14.9% [E04]. By day, between late morning and evening, 92% of winds come from the south-west or west, a classic onshore sea breeze. At night a land-breeze component appears, and the wind backs to the south and south-east [E04]. The port authority's observations confirm the predominance of south to south-westerly winds [E07].

This pattern is broadly favourable but not benign. By day, the sea breeze carries stack and fugitive emissions towards the east-north-east, inland and away from the coastal villages. At night, southerly and south-easterly flows can carry them towards the north and north-west, where Boussibelika, Mbodé, Nlendé Dibé and the Eboundja villages lie. Wind speeds are low: the modelled mean is 2.3 m/s and the 95th percentile only 3.8 m/s [E04]. Low winds mean weak dilution, especially on still nights when the lower atmosphere is stable and plumes from low sources stay near the ground. That is why fugitive dust from stockyards and roads, released close to the ground, can matter as much as the main stack.

These are modelled winds at a coarse grid. Local topography and the sea-land boundary shape the real flow at the site. An on-site weather station with a 10 m mast will start the assessment. It will provide at least a year of hourly data to drive the dispersion model, so that predicted concentrations at each village rest on measured meteorology.



SOURCED Figure 4.2. Wind direction frequencies, 2011 to 2020 (modelled). South-westerly and southerly winds account for about 72% of hours. Source: ECMWF ERA5 reanalysis via Open-Meteo [E04]; PAK Port Guide [E07].

4.3 What an EAF melt shop emits

An EAF melts a metallic charge of steel scrap and, in our planned configuration, imported direct-reduced or hot-briquetted iron. It does so with electric arcs, oxygen and injected carbon. It does not reduce iron ore with coke, so the coke-oven and sinter-plant emissions that dominate integrated steelworks are absent [G03]. The remaining emissions are well characterised:

- **Primary fume.** During melting, the furnace releases hot gas laden with dust. The dust contains iron oxides and, from galvanised and coated scrap, zinc, lead and cadmium. The gas also contains carbon monoxide from injected carbon and electrodes.
- **Dioxins and furans.** Polychlorinated dibenzo-p-dioxins and furans (PCDD/F) can form when scrap carries chlorinated plastics or oils. They can also re-form in the off-gas as it cools through roughly 450 to 200 °C, a process known as de novo synthesis.
- **Secondary fume.** Fume escapes at charging, tapping and in the ladle furnace, and is captured by a roof canopy or an enclosure around the furnace.
- **Mercury.** Small quantities come from scrap containing switches and lamps.
- **Nitrogen oxides.** Gas-fired reheating furnaces produce them. Our planned Phase 1 heats billets electrically by induction, so this source becomes significant only with the gas-fired reheating furnaces of later phases [X03]. Those furnaces will be designed to the EU level for new natural-gas furnaces, 200 mg/Nm³ or less at 3% oxygen [G16].
- **Fugitive dust.** Scrap and iron storage, slag handling, truck movements and wind erosion of open surfaces all release dust.

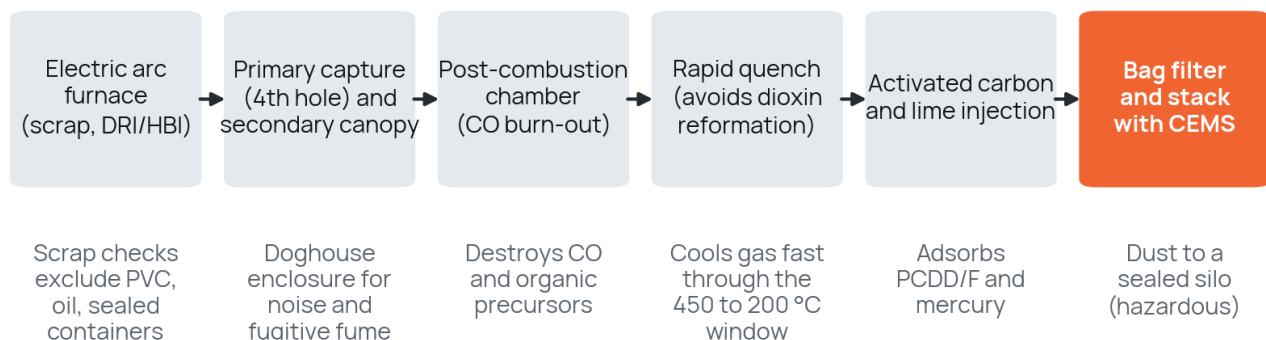
Benchmarks show the scale. The IFC EHS Guidelines give a controlled EAF particulate emission of about 0.02 kg per tonne and a PCDD/F range of 0.07 to 9 µg I-TEQ per tonne [G03]. The width of that range reflects scrap quality and gas-cleaning design more than anything else. Across all routes and all member plants, worldsteel's 2024 sector averages were 0.32 kg of dust, 0.66 kg of nitrogen oxides and 0.64 kg of sulphur oxides per tonne of steel [T01]. An EAF works without sinter or coke ovens should sit well below those averages.

4.4 Controls that work

None of these emissions requires new technology to control. Figure 4.3 shows the standard off-gas train of a modern EAF melt shop, and the purpose of each step. The key design choices are made early: the capacity of the fume system, the layout of the scrap yard, the enclosure of the furnace and the size of the bag filter.

Dioxins and dust are controlled along the whole gas path

Typical off-gas treatment train for an EAF melt shop, with the purpose of each step



Design objective: dust below 5 mg/Nm³ and PCDD/F below 0.1 ng I-TEQ/Nm³ (EU BAT levels)

ILLUSTRATIVE Figure 4.3. Typical EAF off-gas treatment train, from scrap control to stack. Dioxin control depends on three steps acting together: clean scrap, complete combustion, and rapid cooling followed by adsorption.

Source: IFC EHS Guidelines for Integrated Steel Mills [G03]; EU BAT conclusions for iron and steel, BAT 88 to 89 [G07]; Cameroon Steel design objectives (planned).

Control starts at the scrap gate. Most dioxin and metal emissions enter the furnace with the charge. We will inspect and grade incoming scrap. Loads containing PVC, oily residues, sealed containers or batteries will be rejected. Every load will pass a radiation portal monitor, because orphaned radioactive sources in scrap are a known risk worldwide. Directly reduced iron, which is clean and dense, also dilutes contaminants in the charge.

Capture is the second line. Primary fume will be drawn directly from the furnace roof (the "fourth hole"). Secondary fume will be collected by a canopy and, as a design objective, by a full enclosure around the furnace (a "doghouse"), which also reduces noise. The EU BAT conclusions associate capture efficiencies above 98% with good practice [G07].

Treatment is the third. The off-gas will pass through:

- a post-combustion chamber, which burns out carbon monoxide and organic precursors;
- a rapid quench, which cools the gas quickly through the temperature window in which dioxins re-form;
- injection of activated carbon and lime, which adsorbs residual dioxins and mercury;
- a fabric (bag) filter.

Bag filters on EAF melt shops routinely achieve dust concentrations below 5 mg/Nm³, the level the EU associates with best available techniques [G07]. The collected EAF dust is hazardous because of its metal content. It will go to sealed silos and be managed as described in Chapter 6.

Fugitive dust is controlled by housekeeping and design. Our measures include:

- covered storage for direct-reduced and hot-briquetted iron, which also prevents re-oxidation;
- paved and regularly cleaned internal roads;
- wheel washing at the exit;
- enclosed or covered conveyors;
- water sprays at slag handling;
- a green belt of native trees around the stockyards.

These measures are cheap and effective, but only if they are maintained, which is why they appear in the monitoring plan rather than only in the design.

4.5 Design objectives and monitoring

Table 4.1 sets out the air quality objectives we will carry into the assessment, the procurement specifications and the permit, together with how each will be verified. They are objectives for a plant that is not yet built. The assessment will test them, and they will be reported against once the plant operates.

Table 4.1 Air quality design objectives and monitoring plan (planned)

Parameter	Design objective	How it will be verified
Melt-shop stack dust	Below 5 mg/Nm ³ (daily mean)	Continuous emission monitoring system (CEMS); annual third-party calibration
PCDD/F at the melt-shop stack	Below 0.1 ng I-TEQ/Nm ³	Isokinetic sampling by an accredited laboratory twice a year for the first two years, then at least annually
Mercury and metals (zinc, lead, cadmium, chromium, nickel)	Mercury below 0.05 mg/Nm ³ ; metals within IFC values	Quarterly isokinetic sampling in the first year, then half-yearly
Carbon monoxide and nitrogen oxides	EAF: CO at or below 100 mg/Nm ³ . Gas-fired reheating furnaces of later phases: NOx at or below 200 mg/Nm ³ and CO at or below 50 mg/Nm ³ , at 3% O ₂ (EU BAT levels for new furnaces)	CEMS on the main stacks
Fume capture	Above 98% primary and secondary capture	Design verification at commissioning; visible-emission observations at each shift
Ambient PM10 and PM2.5	Project contribution at any village below 25% of the WHO 2021 annual guideline (below 1.25 µg/m ³ PM2.5 and 3.75 µg/m ³ PM10)	Dispersion modelling with on-site meteorology; at least three continuous stations (upwind, downwind, nearest village)
Ambient NO ₂ and SO ₂	No exceedance of the WHO 2021 guidelines attributable to the plant	Passive diffusion tubes at six or more points, monthly
Dust deposition and metals	No measurable increase over the pre-construction baseline at villages	Deposition gauges with monthly metal analysis
Dioxins in soil	No measurable increase over the pre-construction baseline	Baseline soil grid before construction, repeated every three years

Source: IFC EHS Guidelines [G03][G04]; WHO 2021 [G09]; EU BAT conclusions [G07][G16]; Cameroon Steel objectives (planned), subject to the assessment and to permit conditions.

The contribution objective in the sixth row deserves explanation. The General EHS Guidelines' rule of thumb is to use no more than 25% of the applicable standard [G04]. We apply it to the WHO 2021 guideline itself, not to an interim target, because the background already exceeds the guideline. If the assessment shows that this objective cannot be met at a village with the planned controls, we will change the design rather than the objective. The options include taller stacks, more enclosure and a different layout of stockyards and roads.

We will publish the monitoring results, as described in Chapter 10. Continuous emission data are only credible if others can see them. Our objective is to publish daily averages of stack dust and ambient PM2.5 online, with quarterly summaries in plain language, in French and English.

4.6 Noise, light and odour

Noise is the most local of the air-borne nuisances. An EAF is loud at source, as are scrap handling, oxygen plant compressors and rolling mill operations. The General EHS Guidelines set off-site limits of 55 dB(A) by day and 45 dB(A) at night at residential receptors. They also limit the increase over background to 3 dB at the nearest receptor [G04]. With the nearest mapped village about 3 to 4 km away, compliance is likely with ordinary attenuation and design. But "likely" is not a baseline. No measured noise data exist for Mboro or the port's surroundings, so we will measure 24-hour levels at six to eight receptors in both the dry and the wet season before predicting impacts.

Our design measures follow standard practice:

- an enclosure around the furnace;
- silencers on fans;
- earth berms planted with trees along the site boundary facing the villages;
- no drop-ball scrap breaking or night-time scrap unloading near the boundary.

Lighting matters for a different reason. Marine turtles nesting at Ebodjé and along the coast are sensitive to artificial light, which can disorient hatchlings. Our process units are inland and screened, but we will specify shielded, downward-facing, warm-spectrum lighting throughout. We will apply the same standard to any facility we use near the coast.

Odour is a minor issue for an EAF works without coke ovens. Occasional odours can arise from scrap contamination and slag handling. Both are covered by the scrap-gate controls and housekeeping described above, and by the grievance mechanism described in Chapter 8.

WHAT WE COMMIT TO ON AIR

Twelve months of on-site weather and air quality monitoring before impacts are predicted. A melt-shop bag filter designed for below 5 mg/Nm³ of dust. Dioxin control by scrap inspection, post-combustion, rapid quench and activated carbon. Radiation screening of every scrap load. A project contribution at any village below a quarter of the WHO 2021 annual guideline for fine particles. Publication of stack and ambient data online.

CHAPTER 5

WATER: IN KRIBI THE DESIGN CHALLENGE IS RAIN, NOT SUPPLY, AND THE GOAL IS NO PROCESS DISCHARGE

Kribi receives about 2,850 mm of rain a year, and a 100-year storm can drop 264 mm in a single day. Stormwater, not water supply, is therefore the main hydrological design driver. Process water demand is modest. Our planning estimates are about 0.6 million m³ a year for Phase 1 and about 2 million m³ at full capacity, assuming closed-loop cooling at about 2 m³ per tonne. Even the full-capacity figure is less than 1% of the Lobé's median low flow. The real risks lie elsewhere: contaminated run-off from stockyards and slag areas, and oily water from casting and rolling, reaching small streams that have never been surveyed. Our objectives are closed-loop cooling, no discharge of process water in normal operation, and treated stormwater only. Every outfall will be monitored continuously, and the public will be able to see the results.

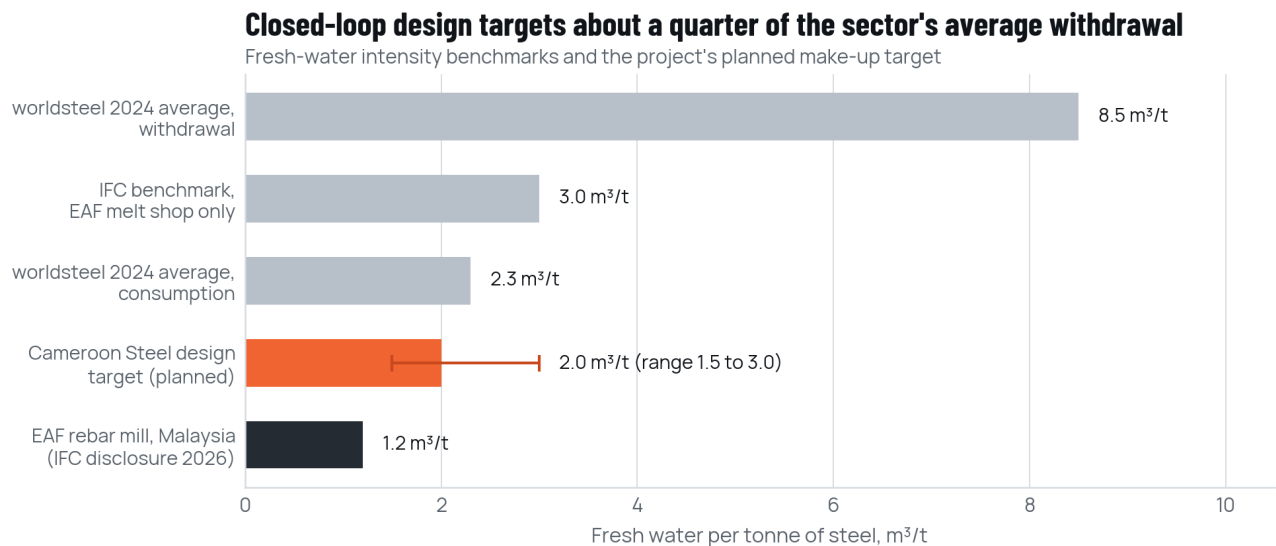
5.1 How an EAF long-products works uses water

Water in an electric arc furnace (EAF) works is used mainly for cooling, and most of it can be recirculated. There are two kinds of circuit:

- **Indirect cooling circuits** carry heat away from the furnace's water-cooled panels and roof, the ladle furnace, transformers, compressors and the oxygen plant. The water never touches the product, stays clean, and is recirculated through cooling towers or closed coolers.
- **Direct-contact circuits** spray water onto the hot billet in the continuous caster and onto the bar in the rolling mill. This water picks up mill scale (iron oxide flakes) and traces of lubricating oil. It needs settling in scale pits, oil skimming and filtration before it returns to the circuit.

Losses come from evaporation in cooling towers, from blowdown, which purges the circuit of dissolved salts, and from water used to cool slag and to suppress dust. Fresh water is needed only to replace those losses.

Benchmarks show how efficient this can be. The IFC EHS Guidelines give about 3 m³ per tonne for the EAF and 1 to 15 m³ per tonne for rolling, depending on recirculation [G03]. worldsteel's 2024 averages, across all routes and all member plants, were a fresh-water withdrawal of 8.5 m³ per tonne of steel and a consumption of 2.3 m³ per tonne [T01]. Well-run EAF mills do better. The Malaysian EAF rebar works reviewed by the IFC in 2026 recycles about 8,000 m³ of water a day against 2,000 m³ of make-up, for 600,000 t a year of steelmaking capacity [T08]. On a 365-day basis that is about 1.2 m³ of fresh water per tonne.



DERIVED Figure 5.1. Fresh-water intensity benchmarks and the planned make-up target. The design target of about 2 m³ per tonne (range 1.5 to 3.0) is roughly a quarter of the sector's average withdrawal.

Source: worldsteel Sustainability Indicators 2025 [T01]; IFC EHS Guidelines for Integrated Steel Mills, Table 3 [G03]; IFC ESRS 51259, January 2026 (derived on 365 days) [T08]; Cameroon Steel planning basis [X03].

Our planning basis assumes about 2.0 m³ of fresh make-up per tonne of finished product, with a range of 1.5 to 3.0 m³ per tonne [X03]. This is an assumption to be refined by the design, not a measured value. It sits between the sector's average consumption and the best EAF performance (Figure 5.1). The assessment will report the design water balance in detail. We will treat any upward revision as a matter to explain publicly.

5.2 How much water, and from where

Table 5.1 converts the planning basis into annual and daily volumes for each phase. It compares them with the low flows of the two coastal rivers. The comparison is for scale only. We do not plan to abstract from the Lobé, for reasons explained below.

Table 5.1 Indicative fresh-water demand by phase compared with river low flows

Phase	Finished products (planned)	Fresh-water make-up	Average daily make-up	Share of the Lobé's median low flow	Share of the Kienké's 10-year low flow
Phase 1	0.3 Mtpa	About 0.6 million m³ a year	About 1,600 m³ a day	About 0.2%	About 0.4%
Phases 1 and 2	0.5 Mtpa	About 1.0 million m³ a year	About 2,700 m³ a day	About 0.4%	About 0.7%
Full design	1.0 Mtpa	About 2.0 million m³ a year	About 5,500 m³ a day	About 0.8%	About 1.4%

Source: Cameroon Steel planning model (2.0 m³ per tonne, 365 days) [X03]; Lobé median low flow 8.35 m³/s and Kienké 10-year low flow 4.68 m³/s [E01]. Derived values, rounded.

Three sources of supply are available, and we will rank them as follows.

First, the zone's network. The port authority is building a dedicated water intake and treatment plant for the port platform, with production planned for early 2027 [K12]. A supply from the zone keeps abstraction under one managed authorisation and avoids a separate intake on a sensitive river. The public record does not say where

that intake draws its water [K12]. If it draws on the Lobé, a commitment limited to our own intake would be met only on paper, so our commitment covers indirect abstraction too: no direct or indirect abstraction from the Lobé without a specific study. The source of the zone's intake is listed as an evidence gap (Chapter 11).

Second, rainwater. Each hectare of roof in Kribi receives about 28,500 m³ of rain in an average year (2.85 m multiplied by 10,000 m²). The large halls of a melt shop and mills can therefore supply a meaningful share of make-up water, if collected and stored. Because there is no truly dry month (Chapter 1), storage requirements are moderate. We will size rainwater harvesting in the design and report its contribution.

Third, groundwater, but only after study. Boreholes supply the Kribi gas power plant [E15], so local aquifers can yield water. Nothing is known, however, about their depth, yield or quality near the site, or about how many village wells depend on them. Industrial abstraction needs prior authorisation after a 30-day public inquiry under the water law [L07]. We will not drill production boreholes until a hydrogeological study has identified safe yields and the protection of community wells.

We exclude direct abstraction from the Lobé, and indirect abstraction through a third-party supply unless a specific study shows it causes no harm. The river reaches the sea over the Chutes de la Lobé, a cultural landscape on Cameroon's UNESCO Tentative List [B04]. Its estuary is a candidate habitat for the African manatee (Chapter 7). The volumes are small, but the symbolic and ecological weight of the river is not. A supply from the zone network or from rainwater avoids the question entirely.

5.3 Stormwater is the design driver

Rain in Kribi is heavy, frequent and intense. Annual totals are about 2,800 to 2,900 mm. The one-day rainfall expected once in two years is 144 mm. Once in ten years it is 193 mm, once in fifty years 243 mm and once in a hundred years 264 mm. The largest day observed at Kribi station in 33 years of record brought 205.3 mm [E01]. Reanalysis data badly underestimate these extremes: ERA5 gives a mean annual maximum of only 76 mm a day for the same area [E04]. Drainage must therefore be designed from station statistics, not from models.

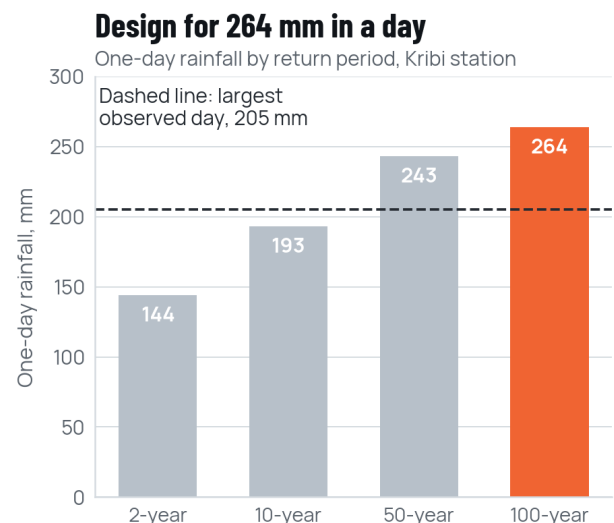
Short-duration intensities are the missing piece. Gutters, pipes and channels must cope with the peak hour, not just the daily total, so drainage design needs intensity-duration-frequency curves. We found none published for Kribi. We will obtain pluviograph data from the national meteorological service and install an on-site tipping-bucket gauge at the start of the assessment (Chapter 11).

The plateau setting is an advantage. At about 40 to 100 m above sea level (rounded; to be confirmed by survey; Chapter 1), the platforms face no river or marine flood risk. The risks are local:

- flash flooding in valley bottoms;
- gullying of bare lateritic soil during earthworks;
- run-off that picks up dust, oil or metals from industrial surfaces.

Our drainage design follows four principles.

1. **Separate clean from dirty water.** Rain on roofs and landscaped areas is clean and can be harvested or released. Rain on stockyards, slag areas, workshops and fuel stores is potentially contaminated and must be collected separately.



SOURCED Figure 5.2. One-day rainfall by return period at Kribi station. Source: Olivry, ORSTOM 1979, Pearson III fit on 33 years [E01].

2. **Capture the first flush.** The first part of a storm washes most pollutants off paved surfaces. Contaminated-area drainage will pass through retention basins sized to capture and treat it. The basins will have oil separators, sedimentation and pH correction where needed.
3. **Design for the 100-year storm.** Retention basins and the main drainage network will be sized against the 100-year event. Overflows will be engineered so that, if they are ever exceeded, they release settled water rather than raw run-off.
4. **Control erosion before clearing.** Lateritic soils erode quickly once their cover is removed. Sediment ponds and silt fences will be built before vegetation is cleared. Earthworks will be phased to keep bare areas small, especially before the September to October peak.

5.4 Effluents and the limits we will meet

In normal operation the works will produce three kinds of liquid effluent:

- blowdown from cooling circuits;
- treated water from the scale pits and filters of the direct-contact circuits;
- sanitary wastewater from canteens and washrooms.

Our objective is to reuse the first two inside the plant, for slag cooling, dust suppression and make-up to less demanding circuits. If that works, process water would leave the site only in exceptional circumstances. Sanitary wastewater will be treated in a package plant or, when available, in the zone's wastewater treatment works. The port authority has tendered serviced land at Mboro that includes wastewater treatment [K13].

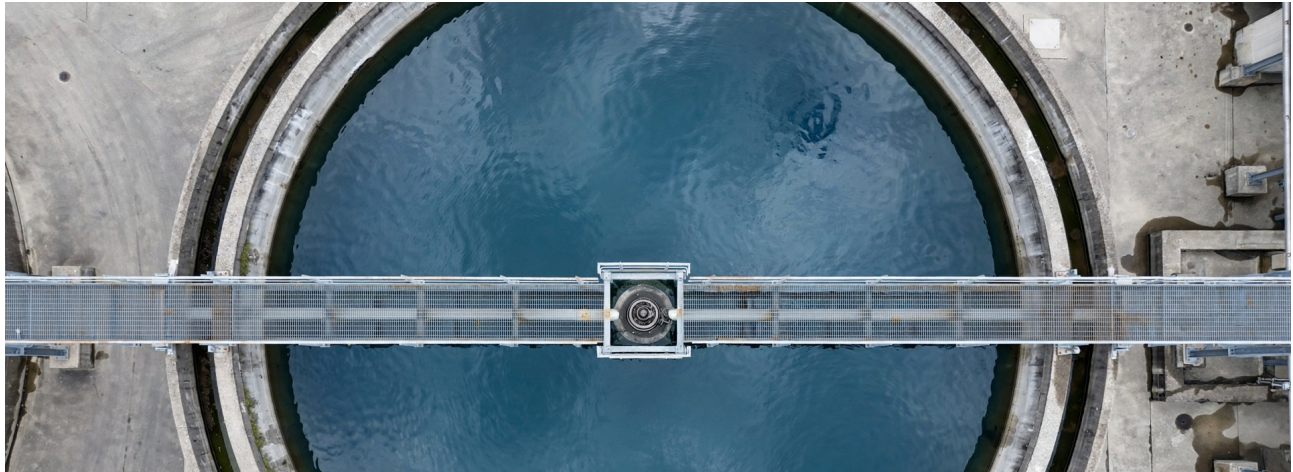
Where any water is discharged, Cameroonian law requires prior authorisation for effluents containing metals and monthly sampling by an approved laboratory [L05]. The IFC EHS Guidelines set the values in Table 5.2 for direct discharge to surface water [G03]. We will meet the IFC values at every outfall, or the national values if any are stricter.

Table 5.2 Effluent guideline values for direct discharge and Cameroon Steel objectives (selected parameters)

Parameter	IFC EHS value (Integrated Steel Mills)	Cameroon Steel objective (planned)
pH	6 to 9	6 to 9, continuous measurement
Total suspended solids	35 mg/L	35 mg/L; lower where the receiving stream is sensitive
Oil and grease	10 mg/L	10 mg/L
Chemical oxygen demand	250 mg/L	250 mg/L or lower
Zinc	2 mg/L	2 mg/L
Lead	0.2 mg/L	0.2 mg/L
Cadmium	0.01 mg/L	0.01 mg/L
Chromium total / hexavalent	0.5 / 0.1 mg/L	0.5 / 0.1 mg/L
Nickel	0.5 mg/L	0.5 mg/L
Iron	5 mg/L	5 mg/L
Mercury	0.01 mg/L	0.01 mg/L
Temperature increase	Below 3 °C at the edge of the mixing zone	Below 3 °C

Parameter	IFC EHS value (Integrated Steel Mills)	Cameroon Steel objective (planned)
Process-water discharge in normal operation	Not specified	None (reuse inside the plant)

Source: IFC EHS Guidelines for Integrated Steel Mills, Table 2 [G03]; Décret 2011/2585/PM [L05]; Cameroon Steel objectives (planned).



ILLUSTRATIVE Illustrative view. Generated image of a circular clarifier in an industrial water-treatment plant; not a photograph of any project, place or person.

5.5 Zero discharge: an aspiration we will test, not a slogan

"Zero liquid discharge" is often promised and less often delivered. Strictly, it means that no process water leaves the site and that all dissolved salts are recovered as solids, usually by evaporation. That takes energy, which in Kribi would come largely from the grid. We will therefore treat zero discharge as an aspiration to be reached in steps rather than a headline claim.

- **Step 1 (design objective from Phase 1):** no discharge of process water in normal operation. Cooling blow-down and treated direct-contact water are reused inside the plant. Only treated stormwater and treated sanitary wastewater are released.
- **Step 2 (to be evaluated in the assessment):** recovery of blowdown salts by membrane treatment and evaporation, so that even exceptional releases of process water stop. We will publish the energy and carbon cost of this step alongside its benefit.
- **What zero discharge cannot mean:** stormwater. In a climate with about 2,850 mm of rain a year, clean rain must leave the site, and treated run-off from industrial areas must be released after storage. The objective there is quality, not zero volume.

5.6 Protecting the receiving waters

The weakest point in today's knowledge is the receiving environment. The small streams that drain the plateau have no flow or quality data. Neither does the Boussibelika stream that reaches the sea near the port, nor the Lobé tributaries to the east [E11]. Some of these coastal streams may hold restricted-range freshwater fishes (Chapter 7). We will therefore treat their protection as a design input:

- **Survey before design is frozen.** We will gauge and sample six to eight points in four campaigns over twelve months, covering both rainy and both drier seasons. The suite covers physico-chemistry, metals, hydrocarbons, microbiology and sediment, and we will survey fish and invertebrates (Chapter 11).

- **Buffers.** We will keep vegetated buffers of at least 30 m along watercourses and around wetlands, wider where the surveys justify it.
- **No discharge to the Lobé basin without study.** Any outfall will be located and designed on the basis of the stream surveys. No treated water will be released into the Lobé catchment unless a specific study shows it causes no harm.
- **Groundwater watch.** At least four monitoring piezometers, sampled quarterly, will detect any leakage from stores, basins or slag areas.
- **Continuous outfall monitoring.** Each outfall will have continuous pH, temperature and flow measurement and monthly laboratory analysis. Upstream and downstream sampling, and biological monitoring of invertebrates and fish, will show whether the stream itself is changing.

WHAT WE COMMIT TO ON WATER

A fresh-water target of about 2 m³ per tonne, reported annually. Supply from the zone network and rainwater first, groundwater only after study, no direct or indirect abstraction from the Lobé without a specific study. Separate clean and contaminated drainage, with retention sized for the 100-year storm. No discharge of process water in normal operation. IFC effluent values at every outfall. Upstream and downstream monitoring of each receiving stream, published.

CHAPTER 6

WASTES AND BY-PRODUCTS: MOST RESIDUES CAN BECOME PRODUCTS, BUT THE HAZARDOUS DUST NEEDS A SECURE ROUTE BEFORE START-UP

At full capacity, our planning estimates put the main process residues at about 185,000 t a year. About 149,000 t of that would be EAF slag, about 20,000 t mill scale and about 16,000 t EAF dust. Slag and mill scale have established uses as construction aggregate and as recycled iron. EAF dust is different. It is classed as hazardous because it concentrates zinc, lead and cadmium, and we know of no licensed facility in the Océan department that can treat it. The decisive commitment in this chapter is therefore a matter of timing: a compliant route for EAF dust will be secured before the furnace is first lit. That route is either zinc recovery abroad under the Basel and Bamako Conventions, or stabilisation and a permitted secure cell.

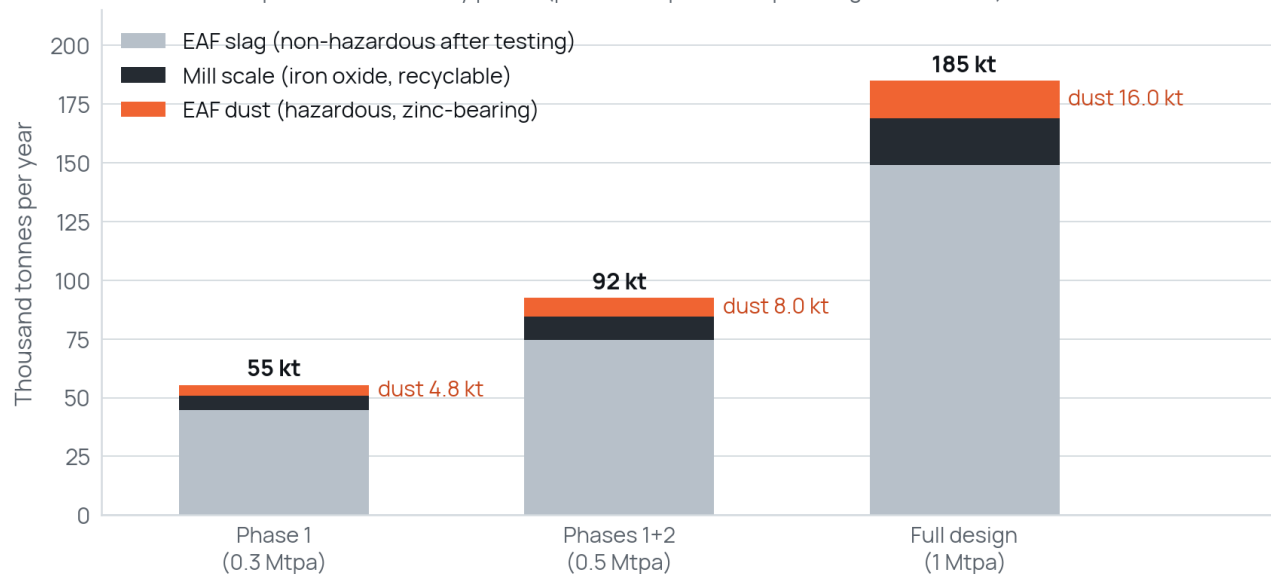
6.1 What an EAF works leaves behind

Steelmaking is efficient in its use of materials. worldsteel's indicators put the industry's material efficiency, the share of solid materials converted to products and co-products, at 92.8% in 2024, against 97.6% in 2022 [T01]. On average, each tonne of steel made in an EAF yields about 200 kg of co-products, and slags make up about 90% of the industry's solid co-products by mass [T02]. The IFC EHS Guidelines give a benchmark of 110 to 180 kg of solid waste per tonne of EAF steel [G03]; most of it is slag.

Our planning model applies these benchmarks to the planned capacities. It assumes 140 kg of EAF slag per tonne of liquid steel (within the IFC solid-waste range of 110 to 180), 15 kg of EAF dust (planning range 10 to 20; the European reference document reports 10 to 30 [G17]) and 20 kg of mill scale per tonne of product (range 15 to 25) [X03][G03]. Figure 6.1 shows the result by phase. For comparison, the Malaysian EAF works reviewed by the IFC in 2026 reports about 6,000 t of EAF dust a year from 600,000 t of steelmaking capacity, or about 10 kg per tonne. It reports about 70,000 t of EAF slag (about 117 kg per tonne) and 18,000 t of ladle slag [T08]. Our planning values are deliberately conservative.

About four fifths of the residues are slag that can become aggregate

Indicative main process residues by phase (planned capacities x planning benchmarks)



DERIVED Figure 6.1. Indicative main process residues by phase. Slag accounts for about four fifths of the total; EAF dust, the hazardous stream, for under a tenth.

Source: Cameroon Steel planning model, 10 October 2026 [X03]; IFC solid-waste benchmark [G03]; dust planning range [X03][G17]. Indicative values; ladle slag, refractories and minor wastes not shown.

Beyond the three main streams, an EAF long-products works generates several smaller ones:

- ladle-furnace slag;
- spent refractory linings from furnaces and ladles;
- sludges from the water-treatment circuits;
- used oils and greases;
- electrode stubs;
- packaging;
- workshop and office waste;
- during construction, cleared vegetation, spoil and building waste.

Table 6.1 lists each stream with its nature, first-choice outlet and fallback. The assessment will quantify the minor streams once the design is fixed.

Table 6.1 Residue register: nature, first-choice outlet and fallback (planned)

Residue	Nature	Indicative quantity at full capacity	First-choice outlet	Fallback
EAF slag	Non-hazardous after testing; hard, dense, angular	About 149,000 t a year	Road base and asphalt aggregate after ageing, metal recovery and leach testing	Engineered stockpile on site pending market
Ladle-furnace slag	Fine, alkaline, may disintegrate to powder	To be quantified	Trials as cement raw material or soil stabiliser	Lined storage on site
EAF dust	Hazardous; zinc, lead, cadmium, chlorides	About 16,000 t a year	Zinc recovery in a Waelz kiln, exported under the Basel and Bamako rules	Stabilisation and disposal in a permitted secure cell

Residue	Nature	Indicative quantity at full capacity	First-choice outlet	Fallback
Mill scale	Iron oxide with traces of oil	About 20,000 t a year	Briquetting and recharge to the EAF, or sale as iron units	Sale to cement producers as an iron corrective
Water-treatment sludges	Iron-rich; oily fraction possible	To be quantified	De-oiling and recharge with mill scale	Approved hazardous-waste operator
Spent refractories	Mostly inert ceramic	To be quantified	Supplier take-back or reuse as slag conditioner	Inert landfill
Used oils and greases	Hazardous	To be quantified	Approved recycler (re-refining)	Approved hazardous-waste operator
Construction spoil and cleared vegetation	Inert; timber and biomass	To be quantified	Reuse of spoil on site; timber salvage under the forest law	Approved disposal; no open burning

Source: IFC EHS Guidelines [G03]; worldsteel co-products [T02]; Décret 2012/2809/PM [L06]; Cameroon Steel planning model [X03]. Quantities indicative and rounded.

6.2 Slag: from residue to aggregate

EAF slag forms when lime and other fluxes combine with the oxides of the metallic charge. Once cooled and crushed it is a hard, dense, angular stone. Around the world it is used as road base, in asphalt wearing courses, as railway ballast and in hydraulic structures. The IFC guidelines note the sale of steel slags for civil engineering, road building and cement making [G03]. worldsteel describes the same uses and notes that, in some uses, physical properties rather than chemistry determine suitability [T02].

Two technical conditions must be met before slag leaves a site as a product. First, the slag must be volume-stable. Steel slags can contain free lime and magnesia, which expand slowly when they react with water. If laid too early they can crack roads. The standard remedy is ageing in weathered stockpiles for several months, with regular wetting and turning, followed by expansion testing. Second, the slag must not leach harmful substances. worldsteel's position is that leachate criteria for slags in road construction should match those applied to natural aggregates [T02]. We will test every production batch with a recognised leaching test, such as EN 12457, before release (Table 6.2).

The market exists. The road and motorway network around Kribi is expanding. An international tender to reconstruct the 110 km Édéa to Kribi road was signed in February 2025 [K09]. The industrial zone will itself need large volumes of fill and pavement for internal roads and platforms [K02]. A cement plant has operated in the zone since 2024 [K10]. A locally produced aggregate that meets specification can substitute for quarried stone, reducing quarrying elsewhere in the coastal strip.



ILLUSTRATIVE Illustrative view. Generated image of crushed slag aggregate being laid as a road base; not a photograph of any project, place or person.

One regulatory point needs early attention. We found no Cameroonian framework that defines when a processed residue ceases to be waste and becomes a product. Without one, a road contractor buying slag aggregate could be treated as receiving waste. We will ask MINEPDED, as part of scoping, to agree product criteria for processed slag, including stability and leaching limits and traceability by batch. The criteria would be written into the environmental certificate, giving buyers and regulators the same reference.

6.3 EAF dust: the hazardous fraction

EAF dust is the fine material caught by the melt shop's bag filters. Its composition depends on the charge. Galvanised scrap brings zinc, coated scrap brings lead and cadmium, and plastics and salts bring chlorides. Dust from a charge rich in galvanised scrap carries enough zinc to make it both a hazard and a resource. Cameroonian law treats it as industrial hazardous waste [L06]. Only approved operators may handle it. The generator needs an environmental permit, must keep a register and must track every consignment with a manifest [L06].

Three management routes exist:

- **Zinc recovery.** In a Waelz kiln, EAF dust is heated with a reducing agent. The zinc volatilises, re-oxidises and is collected as a concentrate for zinc smelters, while the residue can be used in construction [T02]. Waelz kilns need large feed volumes, and none is known to operate in Central Africa. Recovery would therefore mean export. The Basel Convention governs transboundary movements of hazardous wastes. Within Africa, the Bamako Convention bans imports of hazardous wastes into the continent and controls movements between African states [G15]. Export to a recovery facility requires prior informed consent from the importing and transit countries, and documentation from start to finish.
- **Recirculation and enrichment.** Part of the dust can be injected back into the EAF. This raises the zinc content of the remaining dust and makes recovery more economic. It reduces the volume but does not remove the need for an outlet.
- **Stabilisation and secure disposal.** Dust can be mixed with binders to immobilise metals, tested for leaching, and placed in an engineered cell with liners, leachate collection and groundwater monitoring. It is the fallback, not the preferred route, because it locks away zinc that could be recovered.

The Malaysian works reviewed by the IFC collects its EAF dust in silos for zinc extraction or reuse [T08]. That is the practice we intend to follow. The decisive point is timing. A melt shop produces dust from its first heat. If no outlet is ready, dust accumulates in temporary storage, and temporary storage of hazardous dust in an equatorial climate is exactly where problems begin.

NO OUTLET FOR EAF DUST, NO FIRST HEAT.

Cameroon Steel commitment

We will therefore treat a signed contract with a licensed recovery facility, or a permitted secure cell on site, as a condition of starting the furnace. Until dust leaves the site, it will be held in sealed silos or closed bags inside a roofed, bunded store, with a maximum storage period set in the waste management plan. The register and manifests will be open to inspection by MINEPDED and to the independent monitor described in Chapter 10.

6.4 Mill scale, sludges, refractories and the rest

Mill scale is the iron oxide that forms on hot steel and flakes off during casting and rolling. It is collected in the scale pits of the direct-contact water circuits. It is one of the most valuable residues of a steelworks, a rich source of iron units. Once de-oiled, it can be briquetted with a binder and recharged to the EAF, or sold to cement producers who use iron oxide to correct their raw-material chemistry. Water-treatment sludges can follow the same route after de-oiling.

Spent refractories are mostly inert ceramic. Suppliers increasingly take them back for recycling, and some magnesia-based materials can replace part of the lime used to condition slag. Used oils will go to an approved recycler. Electrode stubs are reused in the furnace. General waste will be segregated at source, with recyclables separated. Nothing will be burned in the open, on site or by contractors.

6.5 The register, the tests and the zone

Good residue management is mostly a matter of records and discipline. Our waste management plan will rest on four elements:

- a register that tracks every stream from generation to final outlet;
- segregated, labelled and roofed storage, with bunding for liquids and hazardous materials;
- testing before any residue leaves as a product (Table 6.2);
- audits of every contractor and receiving facility before first use and at least once a year thereafter.

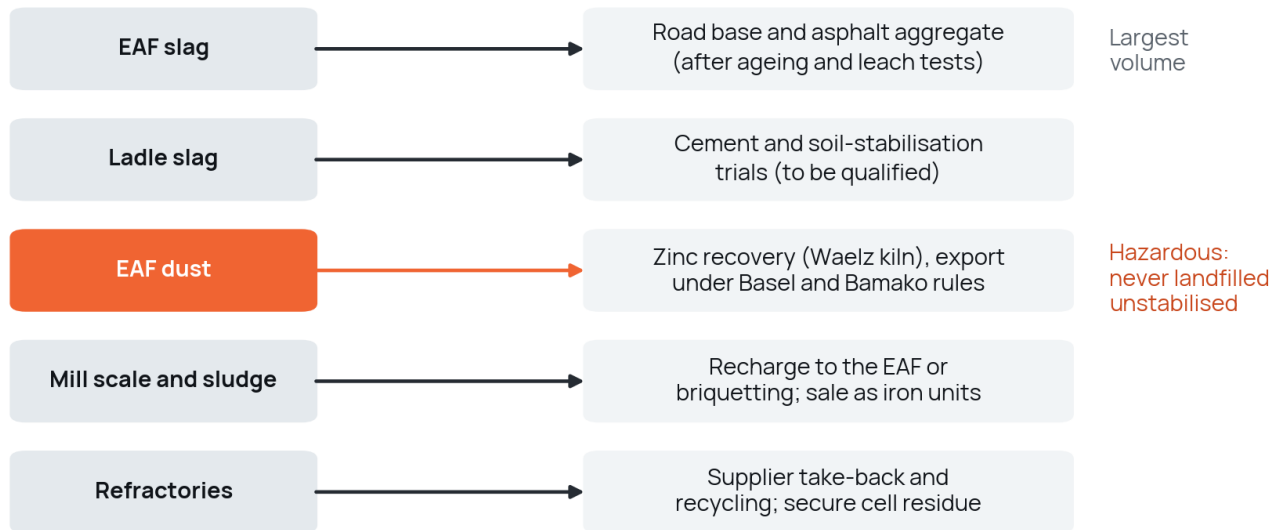
Table 6.2 Tests before a residue leaves the site as a product (planned)

Residue	Test	Frequency	Release criterion
Processed EAF slag	Leaching (EN 12457 or equivalent); volume stability (expansion test); grading and strength	Each production batch, plus quarterly full characterisation	Leachate within criteria for natural aggregates agreed with MINEPDED; expansion within road-specification limits
Mill scale and de-oiled sludge	Oil content; iron content	Each consignment	Oil content below the receiving process's specification
EAF dust (for export)	Zinc, lead, cadmium, chlorides, moisture	Each consignment	Within the receiving facility's acceptance criteria; manifest complete
Stabilised dust (if disposed)	Leaching after stabilisation	Each batch	Within the secure cell's permitted criteria
Secure cell and stockpiles	Groundwater wells up- and down-gradient	Quarterly	No statistically significant increase over baseline

Source: IFC EHS Guidelines [G03]; worldsteel co-products [T02]; Décret 2012/2809/PM [L06]; Cameroon Steel objectives (planned).

Every residue stream has a first-choice outlet

Valorisation pathways for the main residues of an EAF long-products works



ILLUSTRATIVE Figure 6.2. Valorisation pathways for the main residues of an EAF long-products works. Every stream has a first-choice outlet; EAF dust, the hazardous stream, must never be landfilled without stabilisation.

Source: IFC EHS Guidelines [G03]; worldsteel [T02]; Décret 2012/2809/PM [L06]; Basel and Bamako Conventions [G15].

A wider problem lies beyond any single tenant. We found no information on a shared hazardous-waste facility, engineered landfill or slag processing area planned for the industrial zone. As heavy industry arrives in Kribi, each tenant building its own small secure cell would be costly and hard to supervise. We will propose to the zone's management that the tenants and the authorities jointly assess shared facilities, from slag processing and a licensed hazardous-waste transfer station to an engineered landfill. We will contribute our data and a share of the study's cost.

6.6 Construction waste and cleared vegetation

The construction phase brings its own residues: vegetation from clearing, topsoil, excavated spoil, concrete and steel offcuts, packaging and workers' camp waste. Clearing will follow the forest law, including the salvage and declaration of any merchantable timber [L15]. Topsoil will be stripped and stockpiled for later landscaping and for the green belt. Spoil will be balanced across the site wherever the earthworks design allows, to limit haulage. Contractors will be bound by a construction waste plan with the same register, segregation and no-burning rules as the operating plant. Compliance will be checked by the site environmental team and reported in the half-yearly reports to MINEPDED.

WHAT WE COMMIT TO ON RESIDUES

A residue register from the first day of construction. Slag released as aggregate only after ageing and batch leach testing, against product criteria agreed with MINEPDED. A contracted, compliant outlet for EAF dust before the first heat. No open burning. A proposal to the zone for shared slag and hazardous-waste facilities. Annual publication of residue quantities and the share recovered.

CHAPTER 7

BIODIVERSITY: CRITICAL HABITAT IS UNLIKELY ON THE SITE BUT PRESENT IN THE LANDSCAPE, SO THE PLAN REACHES BEYOND THE FENCE

The steel site area is most likely modified or secondary natural habitat, within a farm and forest mosaic that the State declared for industry in 2009. Critical habitat, in the sense of IFC Performance Standard 6, is not expected on the site itself. It cannot be ruled out, though, until two seasons of surveys are complete: pangolins could use the site, and its small streams could hold freshwater fishes found nowhere else. Critical habitat is very likely present in the wider landscape. It includes the turtle beaches of the marine park, the coastal estuaries, and the great apes and elephants of Campo-Ma'an. The greatest risks to these come less from the plant's footprint than from what it brings: more people, more traffic, more hunting and more pressure on the coast. We will apply the mitigation hierarchy strictly on the site. Beyond it, we plan a measurable contribution to conservation, designed with the conservation authorities and with the communities who live from these places.

7.1 A landscape of global importance

The Kribi to Campo coast lies in the Lower Guinean, or Atlantic Biafran, coastal forest belt, one of the richest forest regions of Africa. Campo-Ma'an National Park was created by decree on 6 January 2000 and covers 264,064 ha of evergreen and mixed semi-deciduous forest, from mangroves and coastal forest near the sea to low hills of about 1,100 m [B02][B08]. It was created partly to offset the impacts of the Chad to Cameroon oil pipeline, and it is the core of a larger management unit in which forest concessions and plantations form a peripheral zone [B08]. It shelters several threatened species [B08][B10][B11]:

- the western lowland gorilla and the African forest elephant, both Critically Endangered;
- the central chimpanzee, which is Endangered;
- 302 recorded species of birds [B11], and important populations of more than 120 globally threatened species in all [B08].

The park was placed on Cameroon's Tentative List of sites proposed for UNESCO World Heritage status in February 2018 [B11].

The sea is just as important. The Manyange na Elombo-Campo Marine National Park, created in 2021, covers 110,300 ha of ocean and coast, plus a 3,400 ha buffer zone. It runs south to the border with Equatorial Guinea and includes the mangroves of the Ntem estuary [B01]. Its beaches at Ebodjé and southwards are nesting sites for olive ridley and leatherback turtles. Juvenile green and hawksbill turtles forage along the coast [B06]. Farther

north, the Douala-Edéa National Park protects mangroves, lowland forest and the African manatee [B03]. The coastal rivers, the Lobé, Lokoundjé, Nyong and Ntem, link forest and sea. Their estuaries are habitat for the manatee and nursery areas for fish.

7.2 Species of concern

Table 7.1 lists the threatened species most likely to occur in the project's area of influence, with their global status on the Red List of the International Union for Conservation of Nature (IUCN). It is a screening list compiled from desk sources, not a survey result. Several statuses have changed recently. Green turtles, for example, were reassessed as Least Concern globally in October 2025, having previously been listed as Endangered [B10][B12]. Every status in the table was checked on the IUCN Red List (version 2026-1) on 10 October 2026 and will be checked again at the time of the assessment [B09][B10].

Table 7.1 Screening list of threatened species likely in the area of influence

Species	Global status (IUCN)	Likely occurrence relative to the steel site area	Why it matters here
African forest elephant (<i>Loxodonta cyclotis</i>)	Critically Endangered (assessment published 2021)	Campo-Ma'an and adjacent forest blocks; unlikely on the site	Sensitive to forest fragmentation and induced access, for example along transport corridors
Western lowland gorilla (<i>Gorilla gorilla gorilla</i>)	Critically Endangered (2016, amended 2018)	Campo-Ma'an; possibly larger forest blocks inland	Vulnerable to hunting pressure from population influx
Central chimpanzee (<i>Pan troglodytes troglodytes</i>)	Endangered (2016)	Campo-Ma'an and forest mosaics	Bushmeat pressure
White-bellied and giant pangolins (<i>Phataginus tricuspis</i> , <i>Smutsia gigantea</i>)	Endangered (2019, both species)	Secondary forest and farm mosaic; could occur on the site	Trafficking; pre-clearance surveys and rescue needed
Grey parrot (<i>Psittacus erithacus</i>)	Endangered (2018)	Forest mosaic	Trade
African manatee (<i>Trichechus senegalensis</i>)	Vulnerable (2015)	Lower Lobé, Lokoundjé, Nyong and Ntem estuaries	Sensitive to river water quality and turbidity
Leatherback turtle (<i>Dermochelys coriacea</i>)	Vulnerable globally (2013); subpopulations assessed separately	Nests on the Ebodjé to Campo beaches	Sensitive to beach erosion, lighting and pollution
Olive ridley turtle (<i>Lepidochelys olivacea</i>)	Vulnerable (2008)	Main nesting species at Ebodjé	Same pressures as leatherback
Hawksbill turtle (<i>Eretmochelys imbricata</i>)	Critically Endangered (2008)	Juveniles forage along the coast	Coastal water quality
Green turtle (<i>Chelonia mydas</i>)	Least Concern globally (assessment published 2025; formerly Endangered)	Rare nester; juveniles forage	Some subpopulations remain of concern
Killifishes of coastal streams (<i>Aphyosemion</i> , <i>Epiplatys</i> spp.)	Several restricted-range species; species and statuses to be identified by survey	Could occur in the small streams draining the plateau	Possible critical habitat under criterion 2; need for a fish survey

Source: IUCN Red List of Threatened Species, version 2026-1, accessed 10 October 2026, assessments listed in Annex C [B09][B10][B12]; Kew Tropical Important Plant Areas factsheet [B08]; Rufford Foundation project on Ebodjé turtle nesting [B06]. Years are those of the latest global assessment. Killifish species can only be identified by survey.

The last row is easy to overlook and may matter most for the site itself. Small coastal streams in this part of Cameroon are known for killifishes, tiny, colourful fishes, some of which occur in only a handful of streams. If a stream draining the steel site area held such a species, it could meet the IFC's criterion for restricted-range species, even though the site itself is unremarkable. Only an ichthyological survey in high and low water can tell. Until it does, we treat the streams as potentially critical (Chapter 5).

7.3 Screening for critical habitat

IFC Performance Standard 6 defines critical habitat by five criteria [G01][G02]:

1. habitat of significant importance to Critically Endangered or Endangered species;
2. habitat of significant importance to endemic or restricted-range species;
3. habitat supporting globally significant concentrations of migratory or congregatory species;
4. highly threatened or unique ecosystems;
5. areas associated with key evolutionary processes.

Guidance Note 6 sets numerical thresholds for the first three [G02]. For example, a site qualifies at the highest tier if it holds at least 10% of the global population of a Critically Endangered or Endangered species. It can also qualify if it supports the regular occurrence of a single individual of a Critically Endangered species. Where critical habitat exists, a project may proceed only if it causes no measurable adverse impact on the values that make it critical, causes no net reduction in the population of any Critically Endangered or Endangered species, and achieves a net gain [G01].

Critical habitat is unlikely on the site, likely in the wider landscape

Desk screening against the five IFC PS6 criteria; to be confirmed by two-season surveys

	1 CR/EN species	2 Endemic or restricted-range	3 Migratory or congregatory	4 Threatened ecosystems	5 Evolutionary processes
Steel site area (farm-forest mosaic)	Possible	Unlikely	Unlikely	Unlikely	Unlikely
Small coastal streams (Boussibelika, Lobé tributaries)	Unlikely	Candidate	Unlikely	Possible	Unlikely
Lobé and Lokoundjé estuaries	Possible	Unlikely	Possible	Candidate	Unlikely
Marine park and nesting beaches	Candidate	Unlikely	Likely	Candidate	Unlikely
Campo-Ma'an forest block	Likely	Possible	Unlikely	Candidate	Possible

DERIVED **Figure 7.1.** Preliminary critical habitat screening by feature and criterion. On desk evidence the site itself is unlikely to qualify, while the marine park, Campo-Ma'an and possibly the small coastal streams are candidates or likely qualifiers.

Source: IFC PS6 and Guidance Note 6 [G01][G02]; species information as in Table 7.1; Cameroon Steel desk screening. Qualitative screening, not a critical habitat assessment.

Our desk screening (Figure 7.1) suggests three conclusions.

The steel site area is unlikely to be critical habitat. It is a mosaic of secondary forest and farmland inside an industrial zone, not a refuge for a globally significant population. Endangered pangolins could use it, which makes criterion 1 "possible" rather than "unlikely". The surveys will settle the question.

The small streams are the main open question for the site. They are candidates under criterion 2 because of the possibility of restricted-range fishes.

The wider landscape almost certainly contains critical habitat. Campo-Ma'an qualifies through its Critically Endangered elephants and gorillas. The marine park's nesting beaches are likely to qualify for their concentrations of migratory turtles. Mangroves and estuaries may qualify as threatened ecosystems.

The project will not occupy any of these areas. But it can affect them indirectly, and PS6 requires those effects to be assessed and managed with the same seriousness.

7.4 How a steelworks could affect a landscape it does not touch

The direct footprint is the least of the issues. Clearing the site will remove secondary forest and farm fallows, and with them the habitat of the animals that use them. That loss is real and must be minimised, restored where possible and, if it involves natural habitat, compensated. But it is bounded and predictable.

The indirect and induced pathways are larger and harder to control.

- **Influx.** A construction workforce of several hundred, plus the job seekers and traders a large project attracts, raises demand for bushmeat, timber, charcoal and land. Campo-Ma'an's apes and elephants are threatened mainly by hunting, and hunting follows people and roads.
- **Access.** New roads, rail sidings and power lines open forest to hunters and settlers. Any corridor the project needs must be assessed for induced access, even if another party builds it.
- **Water.** Sediment and pollutants that reach the coastal streams flow on to the estuaries used by manatees and juvenile fish (Chapter 5).
- **Coast and light.** Turtles depend on beaches that are already retreating near the port, and are disoriented by artificial light (Chapter 1). Any coastal component, and lighting visible from the beaches, matters.
- **Cumulative pressure.** The port's expansion, a planned mineral terminal, rail lines, other industries in the zone and an iron ore project on the Lobé all act on the same landscape. Press reports have flagged, for example, the risk of dust from the Lobé iron ore project reaching the river [B05]. No single project can manage these pressures alone (Chapter 9).

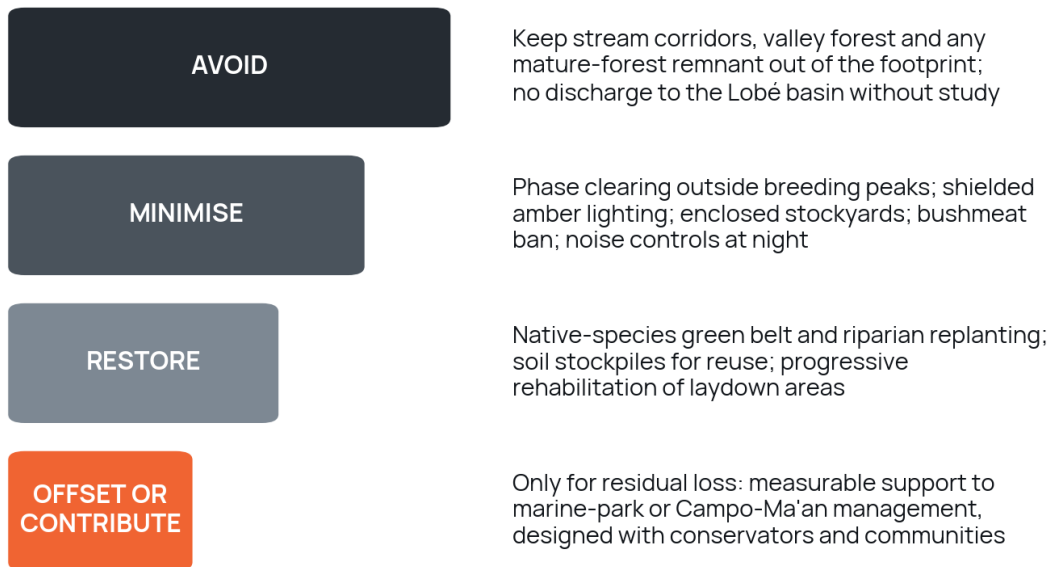
One lesson from Kribi's own history shapes our approach to compensation. Campo-Ma'an National Park was created in 2000 partly as an environmental offset for the Chad to Cameroon oil pipeline, which ends at Kribi. Participatory mapping later found that much of the park covered land used by Bagyeli communities for hunting and gathering [H06]. Press reporting has also noted that the marine park was created without prior community consultation [B05]. Conservation that excludes the people who live from the land can harm them, and in the end the conservation itself. Any contribution we make beyond the fence will therefore be designed with the affected communities, including the Bagyeli, and with respect for their rights (Chapter 8).

7.5 The mitigation hierarchy, applied

The mitigation hierarchy orders the responses: avoid first, then minimise, then restore, and only then offset what remains [G01]. Figure 7.2 summarises how we will apply it. The discipline lies in the order. Offsets are not a substitute for avoidance, and a promise to compensate later does not justify a choice that could have been avoided now.

Avoidance first, offsets last

The mitigation hierarchy applied to a steelworks in Kribi's forest-coast mosaic



ILLUSTRATIVE Figure 7.2. The mitigation hierarchy applied to the steel complex, with the main measures at each step.

Source: IFC Performance Standards 1 and 6 [G01]; Guidance Note 6 [G02]; Cameroon Steel commitments (planned).

Avoid. The layout will be fitted to the land-cover map and stream survey, not the reverse. Stream corridors, wetlands and valley forest will be kept out of the footprint. Vegetated buffers of at least 30 m will run along watercourses, wider where surveys justify it. Any remnant of mature forest will be retained as part of the green belt. We plan no coastal infrastructure of our own and no discharge to the Lobé basin without study.

Minimise. Clearing will be phased, to keep exposed areas small, and timed to avoid peak breeding periods identified by the surveys. Before each clearing front advances, trained teams will survey it and move slow-moving animals such as pangolins and tortoises. A strict code of conduct will apply to the workforce and all contractors: no hunting, no purchase or transport of bushmeat or live wildlife, and dismissal for breaches. Camps will be provisioned so that workers have no reason to buy bushmeat. Speed limits will apply on all project roads, and lighting will be shielded and warm in spectrum.

Restore. Topsoil will be stored and reused. Laydown areas will be rehabilitated progressively. A native-species nursery will supply a green belt around the site and riparian replanting along the buffers. We will work with a local partner and prefer species chosen with communities for their usefulness as well as their ecology.

Offset or contribute. Residual loss of natural habitat will be quantified in the assessment and compensated so that there is no net loss. If any critical habitat is affected, the aim will be a net gain [G01]. Beyond these requirements, we intend to make a measurable contribution to the management of the wider landscape. Candidate fields include support to the marine park's turtle monitoring with the Ebodjé community, anti-poaching and law enforcement around Campo-Ma'an, and protection of estuarine habitats. Contributions will be designed with the conservation authorities, the communities and specialist organisations, and will be reviewed by an independent biodiversity adviser.



**THE GREATEST RISKS COME LESS FROM THE
PLANT'S FOOTPRINT THAN FROM WHAT IT BRINGS:
PEOPLE, TRAFFIC, HUNTING AND PRESSURE ON THE
COAST.**

Illustrative view. Generated image of a mangrove estuary on the Atlantic coast of Central Africa; not a photograph of any project, place or person.

7.6 From screening to a biodiversity action plan

The screening in this chapter is a starting point. The assessment will replace it with evidence in five steps.

1. **Land-cover mapping.** A habitat map from very-high-resolution imagery and satellite classification, ground-truthed in the field, will distinguish modified from natural habitat on the site and around it.
2. **Two-season surveys.** We will survey flora and vegetation plots, and mammals with camera traps (at least 20 units for 60 days per season), transects and interviews. Birds will be covered by point counts, reptiles and amphibians by searches, and fishes and invertebrates by survey in high and low water (Chapter 11).
3. **Critical habitat assessment.** A formal assessment under Guidance Note 6 will use the survey data and a screening from the Integrated Biodiversity Assessment Tool (IBAT), and will define the ecologically appropriate area of analysis for each feature.
4. **Biodiversity action plan.** The plan will set measurable objectives, actions, responsibilities, budgets and indicators for every residual impact, including the no-net-loss or net-gain accounting.
5. **Independent review and publication.** An independent biodiversity specialist will review the action plan, and a summary will be published with the assessment.

Monitoring will continue for the life of the plant. The indicators will include:

- area cleared against plan;
- integrity of buffers;
- species occupancy from camera traps;
- fish and invertebrate indices in the receiving streams;
- wildlife incidents and code-of-conduct breaches;
- for the landscape contribution, the agreed indicators of the partner programmes, such as turtle nest counts recorded with the park authority.

Chapter 10 sets out how these indicators will be reported.

WHAT WE COMMIT TO ON BIODIVERSITY

Two-season surveys before the layout is frozen, including a fish survey of every stream draining the site. A formal critical habitat assessment. No-net-loss accounting for natural habitat, and net gain if any critical habitat is affected. A workforce code with zero tolerance for hunting and wildlife trade. A contribution to conservation of the wider landscape, designed with communities and authorities, never at the expense of the rights of the people who live there.

CHAPTER 8

PEOPLE AND COMMUNITIES: THE PROJECT'S SOCIAL LICENCE DEPENDS ON ENGAGEMENT WITH INTEGRITY, ABOVE ALL WITH THE BAGYELI

Several groups will live beside the steel complex: Batanga and Mabi coastal communities, migrants drawn by the port, women who smoke and trade fish, and Bagyeli (Bakola) communities, recognised as Indigenous Peoples under international standards. The works will occupy State land within the port domain, but that land carries a history. It was declared of public utility in 2009 and compensated under a decree of 2010. The main social risks are four:

-
- legacy land claims and any current users;
 - effects on fishing and farming livelihoods;
 - population influx, with its health and safety consequences, in the region with Cameroon's highest HIV prevalence;
 - impacts on Bagyeli lands, resources and culture.

Our approach can be stated simply: verify before we build, engage before we decide, seek consent where the standards require it, and open a grievance mechanism before any fieldwork begins.

8.1 Who lives here

Kribi is growing fast, and official figures lag behind. The 2005 census counted 29,886 people in Kribi 1er, the commune in which the industrial-port zone lies, and 40,679 in Kribi 2e, a total of 70,565 for the two communes, of whom about 59,900 lived in Kribi town [H02]. The fourth general census was completed in October 2026 with a provisional national count of about 22.7 million people; no commune results had been published at the time of writing [H10]. A press report in 2024 put the current population at about 90,000, with projections of 300,000 by 2040 [E13]. Port-driven migration since 2011 makes the 2005 figures unreliable. We found no recent official estimates by village.

The nearest mapped settlements to the steel site area are Boussibelika (about 3 to 4 km), Mbodé (about 4 to 5 km) and Mboro (about 4 to 5 km), to the west and north-west. Lolabé lies about 6 to 7 km to the south-west, and the Eboundja villages farther north [E11]. All distances are from the reference table in Annex D (Table D.1). The coastal population is mixed [B04][H05][E13]:

- Batanga families, who fish and farm;
- Mabi lineages;
- Bagyeli communities;
- migrants from other regions of Cameroon, drawn by the port and the industrial zone.

We have seen unverified local reports that Bagyeli families once lived at Mboro and were affected by the port's land acquisition. We have not been able to confirm them, and the first task of our Indigenous Peoples screening will be to establish the facts.

What is not known matters as much as what is. There is no census of the area of influence, no household survey of livelihoods, and no map of customary land use. The assessment will begin with a census and asset inventory of the site and a surrounding band. It will add a sample survey of at least 400 households across the area of influence, with focus groups disaggregated by gender, age and community (Chapter 11).

8.2 Land: State land with a history

The land for the industrial-port complex was acquired by the State under the expropriation law. A ministerial order, Arrêté n° 156/MINDAF of 6 February 2009, declared the port project of public utility. Décret n° 2010/3312/PM of 30 November 2010 provided for compensation of the people expropriated [H03]. According to interviews reported in a 2021 academic study, the following rates applied [H03]:

- 2,000 FCFA per square metre for titled land;
- 1,500 FCFA per square metre for land in the course of registration.

By 2015, land compensation was reported to be about 90% complete, and compensation for crops, buildings and graves 100% complete [H03]. The compensation process was later the subject of public controversy over the eligibility of some claimants, reported in the national press. We have not verified those reports against primary records and do not repeat their figures. In 2023 a presidential decree delimited the port domain [K05].

Cameroonian expropriation law and IFC Performance Standard 5 differ in three important ways [L08][L09][G01]:

- customary occupants without title are compensated under national law only for their improvements, not for the land;
- crop compensation rates fixed in 2003 lag behind full replacement cost;
- national law contains no explicit obligation to restore livelihoods.

Where land was acquired by the State before a private project arrived, PS5 asks the project to review that process. If the review finds gaps against the standard, the project must address them. A project cannot rely on the fact that the State did the acquiring.

A PROJECT CANNOT RELY ON THE FACT THAT THE STATE DID THE ACQUIRING.

Reading of IFC Performance Standard 5

We will therefore carry out a land legacy review before any clearing. It will establish five things:

- who occupied or used the land before 2009;
- whether they were compensated, and at what rates;
- whether anyone farms, lives on or otherwise uses the land today;
- whether there are graves or sacred sites;
- whether any grievances or court cases remain open.

The review will draw on the 2009 and 2010 records held by the port authority and the land administration, on interviews in the villages, and on a census of current users. If it finds people who still use the land, we will first try to avoid displacing them through the layout. Where that is not possible, we will prepare a resettlement or livelihood restoration plan to PS5 standards: replacement-cost compensation, restoration of livelihoods to at

least their previous level, and support for the vulnerable. No one will be removed by force. If the review finds legacy gaps in the original process, we will discuss with the State and the port authority how to address them, and we will report the outcome.

8.3 Livelihoods: fishing, farming and the money economy

Artisanal fishing is the economic backbone of the coast. Batanga and Iyassa fishermen, and foreign fishers in some camps, catch sardinella, bonga, shrimp and lobster. Women dominate the smoking and trading of fish. Ebodjé, inside the marine park, is a community of about 3,000 people, about 80% of whom work in fishing [B05]. Fishermen interviewed in 2024 reported catches falling from about 100 to 150 kg to about 70 to 80 kg per trip over the decade since port construction began [E13]. These are personal accounts, not survey data, but they show a perceived loss that any new project will be measured against. Inland, households combine food-crop farming with cocoa and oil palm, palm wine, non-timber forest products, sand extraction and work in town.

The steel complex will not build in the sea, so its direct effect on fishing should be small. Its indirect effects are of three kinds. First, water quality in the streams and estuaries matters to fish nurseries (Chapter 5). Second, the plant will add to port traffic, through imported metallic charge and exported products. Third, and probably largest, a big project transforms the local money economy. Wages raise prices for food, rent and land. Labour moves from fishing and farming to construction. Women who process fish face rising costs while their customers' incomes change. These effects are not inevitably negative, but they fall unevenly. The assessment will measure them by household and by gender, and the management plan will target those who lose out.

500 jobs

Planned direct operating jobs in Phase 1 (range 450 to 550)

1,000 jobs

Planned indirect jobs in Phase 1 (range 800 to 1,500)

600 to 1,000

Assumed construction workforce at peak, Phase 1

90 %

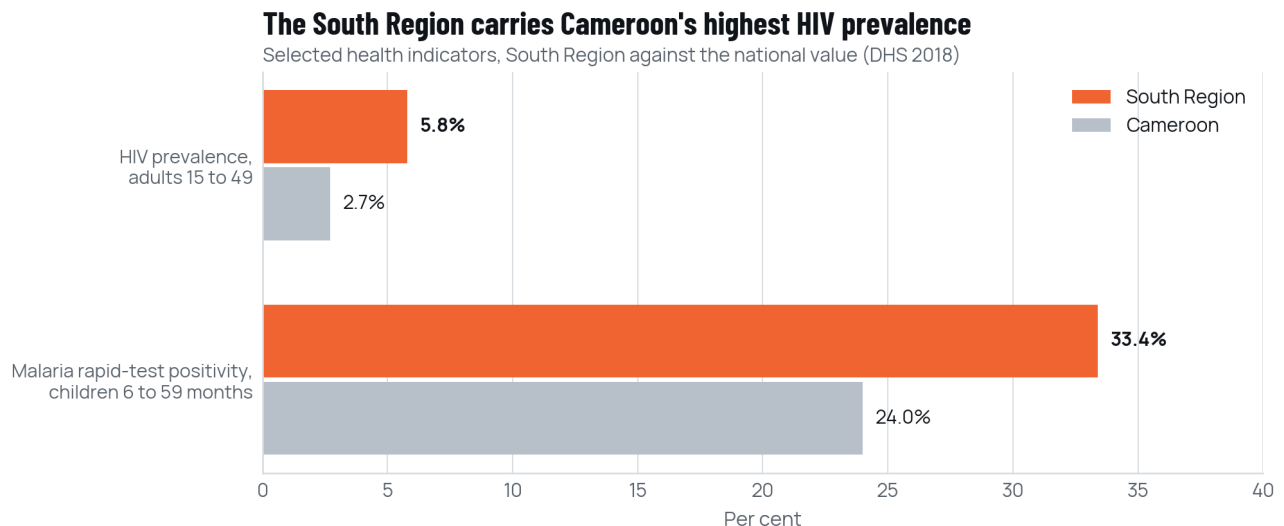
Objective: Cameroonian nationals in operating jobs by year 5 (range 85 to 95%)

The project's main positive contribution will be employment and purchasing. Our planning figures for Phase 1 are about 500 direct jobs in operations (range 450 to 550) and about 1,000 indirect jobs (range 800 to 1,500). A construction workforce of about 600 to 1,000 at peak is a planning assumption [X03]. Our objective is that Cameroonian nationals hold about 90% of operating jobs (range 85 to 95%) by the fifth year [X03]. We also aim to give real priority to people from the surrounding communities, backed by training that starts before construction rather than after it. Local purchasing of food, services and materials is the second channel. We will set targets and report against them (Chapter 10).

8.4 Influx, health and safety

Large projects attract more people than they employ. Job seekers, traders and service providers arrive in numbers that can exceed the workforce several times over. They put pressure on water, sanitation, housing, health services and natural resources. The IFC's handbook on project-induced in-migration sets out how to anticipate and manage this [G11]. In Kribi, the port and the industrial zone are already driving in-migration. A steelworks will add to it, and should share the responsibility for managing it.

The health baseline makes this a first-order issue (Figure 8.1). In the 2018 Demographic and Health Survey, HIV prevalence among adults aged 15 to 49 in the South Region was 5.8%, the highest of any region, against 2.7% nationally. Malaria rapid-test positivity among children aged 6 to 59 months was 33.4% in the South Region, against 24.0% nationally [H01]. A large, mostly male construction workforce raises the risks of transmission and of gender-based violence, sexual exploitation and abuse, unless it is managed deliberately.



SOURCED Figure 8.1. Selected health indicators, South Region against the national value. HIV prevalence in the South is more than twice the national level, and childhood malaria positivity about 40% higher.

Source: INS and ICF, Enquête Démographique et de Santé du Cameroun 2018 (EDSC-V), 2020 [H01].

Our measures will follow international good practice:

- **Workers' accommodation** built and run to the IFC and EBRD guidance on workers' accommodation: fenced camps with adequate space, sanitation, catering, health care and recreation [G12].
- **A worker health programme:** HIV and sexually transmitted infection prevention, testing and treatment referral, malaria vector control in and around camps, and screening at recruitment.
- **A code of conduct** binding on every worker and contractor, prohibiting sexual exploitation and abuse. It will be backed by training, a confidential reporting channel and mapped referral services for survivors.
- **An influx management plan** prepared with the commune and the zone. It will cover visible local recruitment procedures, so that people do not move simply in the hope of work at the gate. It will also cover support to health and water services in the most affected villages.

Traffic is the most immediate safety risk to the public. Before any rail siding exists, the planning model estimates about 74 truck loads a day for Phase 1 and about 245 a day at full capacity, if everything moves by road [X03]. The N7 coastal road passes through villages, and children walk to school along it. We will route heavy traffic inside the port domain between the port and the plant wherever possible. We will apply journey management, speed limits and driver training to all hauliers. We will audit road safety on the routes that remain, and support crossings and signage near schools. A rail connection, if feasible, would remove most of these movements.

Two further obligations complete the picture. The hazard study and emergency plan required by law (Chapter 2) will be shared with the neighbouring communities and local authorities, and tested in joint drills. Any security personnel will be screened and trained, and their use of force will be proportionate and governed by written rules. Incidents involving the public will be reported and investigated.

8.5 Indigenous Peoples and free, prior and informed consent

The Bagyeli, also called Bakola, are forest peoples of the Océan department. They are estimated at around 4,000 people and live across about 12,000 km² in the south of Cameroon, particularly in the districts of Akom II, Bipindi, Kribi and Lolodorf [H11]. Their language, Gyele (also written Gyeli), is an endangered Bantu language with an estimated 4,000 to 5,000 speakers [H12]. Many Bagyeli live in small settlements near Bantu farming

villages. They combine hunting and gathering with farming and work for their neighbours, and their rights to the land and forest they use are often not recognised [H05][H06]. The Lobé falls are associated with their beliefs, as with those of the Batanga and Mabi [B04].

Kribi's history gives this relationship particular weight. The Chad to Cameroon oil pipeline, which ends at Kribi, crossed more than 100 km of Bagyeli lands. It came with an Indigenous Peoples Plan and with the creation of Campo-Ma'an National Park as an environmental offset [H06]. Participatory mapping by five Bagyeli communities in 2003 and 2004 found that up to 85% of the livelihood activities of one community took place within the new park's boundaries. The same work concluded that implementation of the plan remained incomplete years later [H06]. The lesson for any new project is plain: consultation that comes late, plans that are not published and offsets designed without the people who use the land can all harm the communities they were meant to protect.

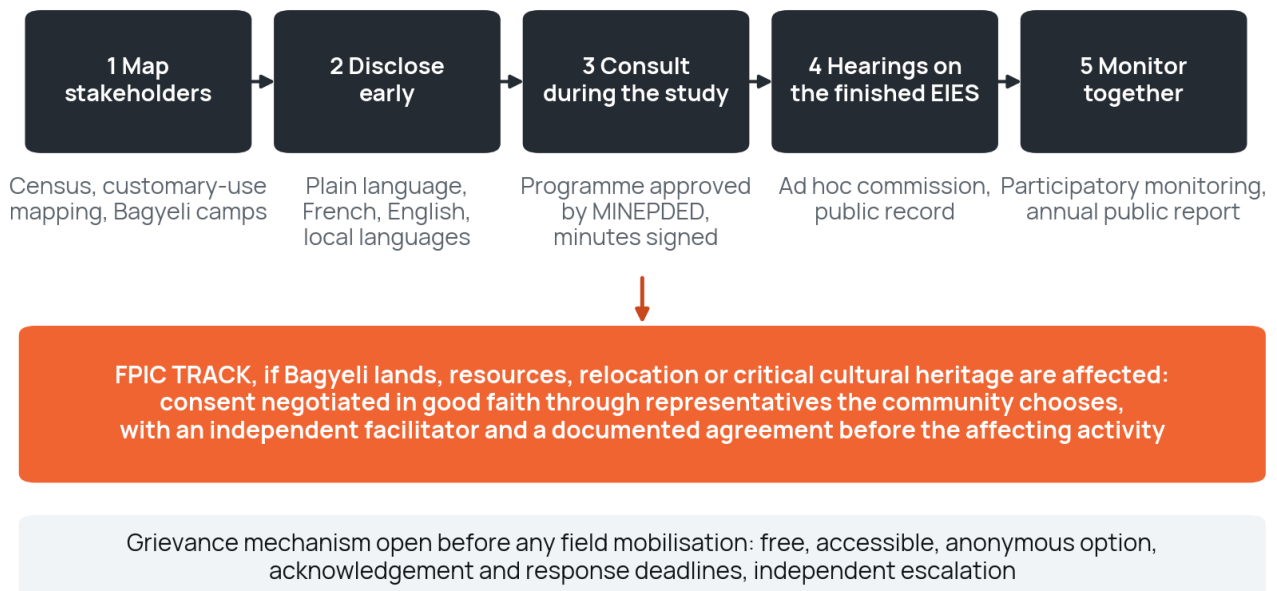
IFC Performance Standard 7 requires informed consultation and participation with Indigenous Peoples whenever they may be affected. It requires their free, prior and informed consent (FPIC) in three circumstances [G01]:

- impacts on lands and natural resources subject to traditional ownership or under customary use;
- relocation from such lands;
- significant impacts on critical cultural heritage.

The UN Declaration on the Rights of Indigenous Peoples sets the broader framework [G14]. The AfDB's safeguard on vulnerable groups covers the same ground [G06].

Consent is a process, not a signature

Stakeholder engagement sequence, with the FPIC track triggered under IFC PS7



ILLUSTRATIVE **Figure 8.2.** The stakeholder engagement sequence required by Cameroonian law, with the FPIC track triggered under IFC PS7 and a grievance mechanism open throughout.

Source: Décret 2013/0171/PM [L02]; IFC Performance Standards 1 and 7 [G01]; UN Declaration on the Rights of Indigenous Peoples [G14]; Cameroon Steel commitments (planned).

Our process will be as follows (Figure 8.2).

1. **Early, specialised screening.** An anthropologist with experience of forest peoples, working with Bagyeli organisations, will establish whether Bagyeli communities live in, use or hold cultural ties to the site or its area of influence. The screening will happen before the assessment's other social fieldwork, so that its findings shape everything else.
2. **Engagement on the communities' terms.** Meetings will take place in the communities, in Gyele and French, with interpreters the communities trust. They will be held at times that fit hunting and farming calendars, and with enough time for internal deliberation.
3. **Representatives chosen by the communities.** We will not select interlocutors. Communities will decide who speaks for them, including women.
4. **Consent where it is required.** If the screening shows that the project would affect customary lands or resources, relocate Bagyeli people, or significantly affect critical cultural heritage, we will seek FPIC through good-faith negotiation. An independent facilitator will support the process, and its outcome will be documented. The agreement will come before the affecting activity, not after it.
5. **A plan the communities can hold us to.** If impacts are identified, an Indigenous Peoples Plan will set out measures, benefits and monitoring in a form the communities can use. It will be published, and its implementation will be monitored independently.

The same principles will apply to our contribution to biodiversity conservation (Chapter 7). No conservation measure we support will restrict Bagyeli access to land or resources without their consent.

8.6 Gender and vulnerable groups

Impacts and benefits fall unevenly. Table 8.1 lists the groups most likely to be vulnerable and the specific measures we plan for each. The assessment will collect gender-disaggregated data and map the services available to survivors of gender-based violence before construction begins.

Table 8.1 Groups at risk and specific measures (planned)

Group	Why vulnerable	Specific measures
Women fish processors and traders	Rising costs of fuelwood, fish and rent; limited access to credit and to project jobs	Livelihood support and market access; priority in canteen and catering supply; targets for women's recruitment and training
Female-headed households	Lower assets and labour; greater exposure to price inflation	Identification in the census; targeted livelihood restoration if affected
Bagyeli communities	Insecure land rights; history of exclusion from consultation and benefits	Specialised screening; FPIC where triggered; Indigenous Peoples Plan; culturally appropriate grievance access
Elderly people, orphans and people living with HIV	Limited mobility and income; stigma	Health programme partnerships; accessible engagement; confidential grievance channels
Households affected by the 2009 to 2010 land acquisition	Possible unresolved losses	Land legacy review; corrective measures if gaps are found
Young job seekers	Expectations of employment; risk of exploitation by intermediaries	Visible recruitment process with no fees; training before construction; local hiring targets

Source: desk baseline; IFC Performance Standards 1, 5 and 7 [G01]; AfDB ISS [G06]; Cameroon Steel commitments (planned).

8.7 Cultural heritage

The best-known heritage site in the area is the Chutes de la Lobé. This cultural landscape on the UNESCO Tentative List lies about 18 km north of the site [B04]. The works will not affect it directly. Our commitment not to discharge to the Lobé basin without study (Chapter 5) protects its waters. At about 18 km, the plant is unlikely to be visible from the falls; the assessment will verify this.

Closer heritage is less documented. Lineages of the Batanga and Mabi have sacred forests, graves and ancestral sites within the port domain. The region may also hold archaeological remains such as pottery and evidence of early iron-working, an apt reminder that metallurgy here is older than any modern plant. None of these is documented for the site, which is a data gap rather than evidence of absence. Before any clearing, we will commission an archaeological walkover and map sacred sites with chiefs and elders. We will adopt a chance-finds procedure that stops work at any discovery, so that it can be assessed with the competent authorities and the community concerned, as IFC Performance Standard 8 requires [G01].

8.8 A grievance mechanism that works before anything is built

A grievance mechanism is a project's early warning system. The IFC's good practice note sets out principles that have since become standard: proportionality, cultural appropriateness, accessibility, transparency, confidentiality and freedom from retaliation [G10]. We will open ours before any field mobilisation, so that the first contact people have with the project's survey teams already comes with a way to complain. It will have the following features:

- several channels: a free phone and text number, community liaison officers who visit the villages, suggestion boxes and in-person meetings, in French, English and local languages including Gyele;
- an anonymous option and protection against retaliation;
- acknowledgement within 3 working days and a reasoned response within 30 days, as our objectives;
- escalation to an independent panel if the complainant is not satisfied;
- no restriction on anyone's right to go to the administration or the courts;
- quarterly publication of statistics: numbers, categories, time to resolution and outcomes.

Workers and contractors' employees will have a separate mechanism, as Performance Standard 2 requires. Its statistics will be published in the same way.

WHAT WE COMMIT TO ON PEOPLE

A land legacy review and census before any clearing. Specialised Indigenous Peoples screening before other social fieldwork, and FPIC where IFC PS7 requires it. A grievance mechanism open before field mobilisation. Workers' accommodation and a code of conduct to international standards. Heavy traffic kept inside the port domain where possible. Local hiring and purchasing targets, published annually with gender-disaggregated data.



ILLUSTRATIVE Illustrative view. Generated image of fishing pirogues on a palm-lined beach; not a photograph of any project, place or person.

CHAPTER 9

LESSONS FROM KRIBI'S PORT AND OTHER HEAVY INDUSTRY: PROBLEMS USUALLY CAME FROM TIMING, AND TRANSPARENCY USUALLY HELPED

Kribi has fifteen years of experience with large-scale industrial development. A declaration of public utility came in 2009, followed by compensation under a decree of 2010. A port was built that has reshaped the shoreline, a marine park was created after it, and an industrial zone was launched in 2026. Elsewhere in Cameroon, the Chad to Cameroon oil pipeline, the Kribi gas power plant and the Nachtigal hydropower project offer further lessons. Read neutrally, the record shows four recurring weaknesses:

-
- land and livelihood questions that outlive the projects that raised them;
 - informal resource users, such as fishers, sand miners and hunter-gatherers, who fall between compensation categories;
 - cumulative effects that no single project owns;
 - plans that were not published or monitored independently.

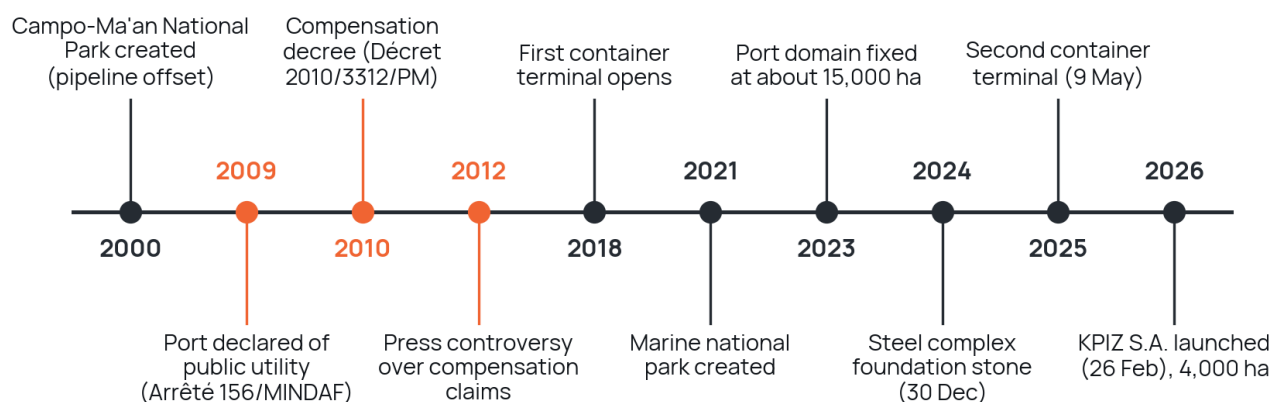
The record also shows what works: early, measured baselines, public disclosure and independent oversight. This chapter draws those lessons together and states what we will do differently because of them.

9.1 Fifteen years of change at Kribi

The deep-water port changed the scale of everything around it. The State declared the port of public utility in February 2009 and set the compensation framework in November 2010 [H03]. The first container terminal opened in 2018. A second container terminal began operating on 9 May 2025 [K07]. Traffic through the port rose from about 7 Mt in 2018 to 10.84 Mt in 2024 and 12.7 Mt in 2025, according to the port authority [K08][K09]. Meanwhile, the land reserve was formalised: the 2023 decree delimited a public port domain of about 15,000 ha within the larger industrial-port complex [K05]. In February 2026, KPIZ was launched to develop an integrated zone of about 4,000 ha over 15 years, with a target of up to 150,000 direct and indirect jobs [K02]. Demand for land is strong. By mid-2025 the port authority had received about 150 requests for space covering 3,883 ha, and had granted 48 occupation authorisations covering 196 ha [K25].

Land questions date from 2009, before most of the zone was built

Milestones in the Kribi port land and protected-area history



Events evenly spaced; not to time scale

SOURCED Figure 9.1. Milestones in the Kribi port land and protected-area history. Land questions date from 2009, before most of the industrial zone was built.

Source: Décret 2000/004/PM [B02]; Arrêté 156/MINDAF and Décret 2010/3312/PM as cited in [H03]; Décret 2021/4804/PM [B01]; PAK [K05]; Cameroon Tribune [X01]; Business in Cameroon [K07]; KPIZ launch [K02].

Table 9.1 Key figures of the Kribi industrial-port complex

Indicator	Value	Date	Source
Industrial-port complex (original land reserve)	About 26,000 to 26,300 ha, along about 30 km of coast	2018 to 2023	[K05] [K06]
Public port domain (presidential decree)	About 15,000 ha	23 June 2023	[K05]
Integrated industrial zone managed by KPIZ	About 4,000 ha, developed over 15 years	Launched 26 February 2026	[K02] [K03]
Planned investment in the industrial zone	€795 million, of which €400 million in phase 1	February 2026	[K03]
Port traffic	7 Mt (2018); 10.84 Mt (2024); 12.7 Mt (2025)	2018 to 2025	[K08] [K09]
Requests for space and authorisations granted	About 150 requests for 3,883 ha; 48 authorisations for 196 ha	Mid-2025	[K25]
Job target of the industrial zone	Up to 150,000 direct and indirect jobs	15-year horizon	[K02]
Kribi population (press estimate)	About 90,000; projected 300,000 by 2040	2024	[E13]

Source: as cited in the table. Port authority documents are cited by title and date.

These numbers describe a coast in rapid transition. Whatever a steelworks does, it does so in a landscape where land, labour, traffic and coastal processes are already changing quickly. That has two implications. The project's own effects must be separated carefully from the background trend, or the project will be blamed for everything or for nothing. And the project has an interest in helping to manage the trend, because its own social licence depends on it.

9.2 Land and compensation: what the record shows

The land for the port and its industrial hinterland was acquired under national law. Compensation was paid at official rates: 2,000 FCFA per square metre for titled land and 1,500 FCFA for land being registered. Crops, buildings and graves were compensated according to official schedules. By 2015, land compensation was reported to be about 90% complete, and compensation for crops, buildings and graves complete [H03]. The process later attracted public controversy, reported in the national press, over the eligibility of some claimants. We have not verified those reports and do not repeat their figures.

Three lessons follow, and none of them requires taking sides on contested facts.

Compensation at official rates can leave gaps. National law compensates customary occupants without title only for their improvements, and uses crop rates fixed in 2003 [L08][L09]. People who lose access to land they farmed under custom may receive little, even when every legal step is followed. This is why IFC Performance Standard 5 requires replacement cost and livelihood restoration [G01], and why we will review the legacy of the land we occupy (Chapter 8).

Records matter as much as payments. When it is unclear who was compensated, for what and on what basis, grievances persist for years. A project that arrives later inherits them unless it can show, from the records, what happened. Our legacy review will start with the 2009 and 2010 files, and we will ask the port authority to share them.

Grievances do not expire. A complaint about land taken in 2010 is as real to the person making it in 2027 as it was then. Our grievance mechanism will accept legacy complaints related to the land we occupy, refer them to the competent authority where they fall outside our responsibility, and track them to an answer.

WHAT WE TAKE FROM THE LAND RECORD

We do not need to resolve past controversies to learn from them. We need the records, a census of who uses the land today, a grievance mechanism that accepts old complaints, and the willingness to address gaps against PS5 with the State and the port authority. All four are commitments in Chapter 8.

9.3 The coast: an unintended consequence

The port's breakwater and quays changed the movement of sand along the coast. Before 2000 the Kribi coastline was accreting slowly. Since then it has retreated, by about 2 m a year on average between 2015 and 2020, with much faster local rates near the Lobé falls and Lolabé (Chapter 1) [E02]. A 2025 study rates more than two thirds of the 31.5 km Kribi coast as highly vulnerable, and links this to sediment trapping by the breakwater [E03]. A turtle specialist reports about 15 m of retreat in places at Ebodjé [B05]. The port authority has supported turtle conservation at Ebodjé through its social programme [B07], and has stated that it installed monitoring equipment, though it has not published the data [E13].

The lesson is not that the port should not have been built. The sediment budget of a sandy coast with strong longshore drift is complex, and its response to large structures can only be predicted by measurement and modelling over years. Coastal effects need long, measured baselines and continued monitoring that others can see. They also need management at the scale of the coast rather than the project. For a steelworks on the plateau, the practical lesson is to add nothing to the coast: no jetty, intake or outfall of our own (Chapter 1). The port's existing and planned terminals serve our logistics, and we support coast-wide monitoring.

9.4 Conservation designed without people

The Chad to Cameroon oil pipeline ends at Kribi. Its environmental and social programme included an Indigenous Peoples Plan for the Bagyeli and Bakola communities along its route. As an offset, it also funded the creation of Campo-Ma'an National Park and a foundation, the Fondation pour l'Environnement et le Développement au Cameroun (FEDEC), to fund the plan and the parks [H06]. On paper, this was ambitious practice for its time. In the field, participatory mapping by Bagyeli communities in 2003 and 2004 found that up to 85% of one community's livelihood activities took place inside the new park. The Indigenous Peoples Plan was still unpublished and described as a work in progress years later [H06]. More recently, press reporting has said that the marine national park was created without prior community consultation [B05].

The lesson is that conservation and Indigenous Peoples' rights must be designed together, and with the people concerned. A biodiversity contribution that restricts access to land used for hunting and gathering is a resettlement impact by another name. It requires consent where Performance Standard 7 applies [G01]. Our commitment in Chapter 7, that no conservation measure we support will restrict Bagyeli access without their consent, follows directly from this history.

9.5 Informal users fall through the gaps

The Nachtigal hydropower project on the Sanaga, 420 MW and in operation since 2025, is one of Cameroon's largest internationally financed projects, prepared under lender standards. It, too, shows how informal livelihoods can fall between categories. Sand miners and fishers who lost access to their workplaces received compensation. Their representatives later described it as inadequate. They filed complaints with the project's lenders in 2022, and a mediation process concluded in May 2024 [H08]. Sand miners received 6.6 million FCFA for six months of compensation, according to their representative, who said that promised livelihood restoration had not yet materialised [H08]. Closer to Kribi, civil-society organisations have raised concerns about displacement at Lolabé in connection with the planned Lobé iron ore project [H09].

LIVELIHOOD RESTORATION IS MEASURED BY HOUSEHOLD INCOME, NOT BY CHEQUES ISSUED.

Cameroon Steel

Fishers, sand miners, gatherers of forest products and hunter-gatherers do not own the river bank, the beach or the forest they work. Their losses are real but hard to see on a cadastral plan. The lesson is to identify them early, in the census and in specialised studies, and to design livelihood restoration with them rather than for them. Restoration should be measured by household income and not by cheques issued, and grievances should be resolved before they need outside mediation. In Kribi, the groups most at risk are artisanal fishers and fish processors, sand extractors along the streams and coast, and Bagyeli communities.

9.6 What disclosure added at the Kribi gas power plant

The 216 MW Kribi gas power plant was financed with support from the IFC and MIGA. Its environmental study produced the only measured air quality data we could find for the Kribi area: diffusion-tube measurements of sulphur dioxide and ozone in 2006 [E06]. The lenders' review summaries are public [E15][E16]. MIGA reported in 2014 that monitoring in 2012 complied with the applicable guidelines, but did not publish the measurements [E16].

A STATEMENT THAT MONITORING "COMPLIED" CANNOT BE CHECKED. PUBLISHED DATA CAN.

Cameroon Steel

That is better than nothing, and it is the reason we have any baseline at all. It also shows the limit of disclosure without data. A statement that monitoring "complied" cannot be checked, compared or reused. Had the monitoring data been published, they would now form a ten-year record of air quality on the Kribi coast, valuable to every project that followed. We will publish our monitoring data, not just our conclusions (Chapter 10).

9.7 What modern EAF plants show

Two disclosures by the IFC show what EAF plants achieve under lender supervision. The first is a 2010 review of an Egyptian steelmaker's expansion with direct reduction, EAFs and a hot strip mill. It records baghouse dedusting, the crushing and sale of slag to the construction industry, and large-scale recycling of process water [T09]. The second is a 2026 review of a Malaysian EAF rebar works with 600,000 t a year of steelmaking capacity. It records dust held at or below 30 mg/Nm³, recovery of EAF dust for zinc, sale of slag, about 80% water recycling, and grievance and engagement plans with deadlines [T08]. Neither plant is a perfect model for Kribi. Both confirm that the techniques described in Chapters 4 to 6 are proven, affordable and expected.

9.8 Cumulative effects need a shared table

The most important lesson is also the hardest. The pressures on the Kribi coast come from many projects, each assessed on its own. They include:

- the port's existing and planned phases, among them a mineral terminal of 125 Mt a year, for which a memorandum of understanding was signed on 4 November 2025 and which the port's Director General expects to be completed within five to six years [K19][K02];
- new railways, including a memorandum of understanding signed in June 2026 for an Édéa to Kribi, Lolabé and Campo line [K20], and the agreements for a railway from the Mbalam iron ore deposit to Kribi [K21];
- the planned Lobé iron ore project [H09];
- cement plants and quarries;
- the gas power plant;
- the build-out of the industrial zone itself.

Each may be acceptable alone. Together they determine the airshed, the sediment budget, traffic on the N7, immigration and hunting pressure on Campo-Ma'an.

Table 9.2 Lessons from the record and Cameroon Steel's response

Lesson	Evidence	Our response
Land and livelihood questions outlive projects	Compensation completed at official rates; later public controversy; national law gaps against PS5	Land legacy review before clearing; legacy grievances accepted and tracked; PS5 gap measures if needed
Informal users fall between categories	Nachtigal sand miners and fishers; Lolabé displacement concerns	Early identification of fishers, sand extractors, gatherers and Bagyeli users; livelihood restoration measured by income

Lesson	Evidence	Our response
Conservation without people harms both	Campo-Ma'an offset over Bagyeli lands; marine park created without prior consultation	Biodiversity contribution co-designed with communities; FPIC before any restriction of access
Coastal effects need long baselines	Shoreline switched from accretion to retreat after the breakwater	No coastal structures of our own; support for coast-wide monitoring
Disclosure without data cannot be checked	Gas plant monitoring reported as compliant without figures	Publication of monitoring data online, not only conclusions
Cumulative effects belong to no one	Many projects in one landscape, each assessed alone	Proposal for a zone-wide cumulative assessment and monitoring forum, with our data and a share of the cost

Source: as cited in the text [H03][H06][H08][H09][E02][E16][B05]; Cameroon Steel commitments (planned).

Decree n° 2013/0171/PM and the 2016 order already provide a vehicle for this. A strategic environmental assessment is required for industrial zones and industrial-port complexes [L03]. We will support an assessment at that scale, in which the port and zone authorities, MINEPDED, tenants, communities and the conservation authorities agree on shared baselines, thresholds and monitoring. We will offer our own baseline data to it from the start. We will propose that the zone's tenants co-fund shared monitoring stations for air, water and the coast, with results published in one place. A steelworks cannot solve Kribi's cumulative pressures. It can refuse to add to them unknowingly, and it can help build the institutions that manage them.

CHAPTER 10

COMMITMENTS AND HOW TO MEASURE THEM: OBJECTIVES THAT OTHERS CAN CHECK

The previous chapters set out what Cameroon Steel intends to do. This chapter turns those intentions into a framework that others can verify. It has four parts: key performance indicators with stated objectives, a sequence of environmental and social workstreams that runs ahead of construction, a disclosure calendar, and independent monitoring. Everything here is a commitment or an objective for a plant that is not yet built. None of it describes performance already achieved. We will report against each item every year, including where we fall short and what we are doing about it.

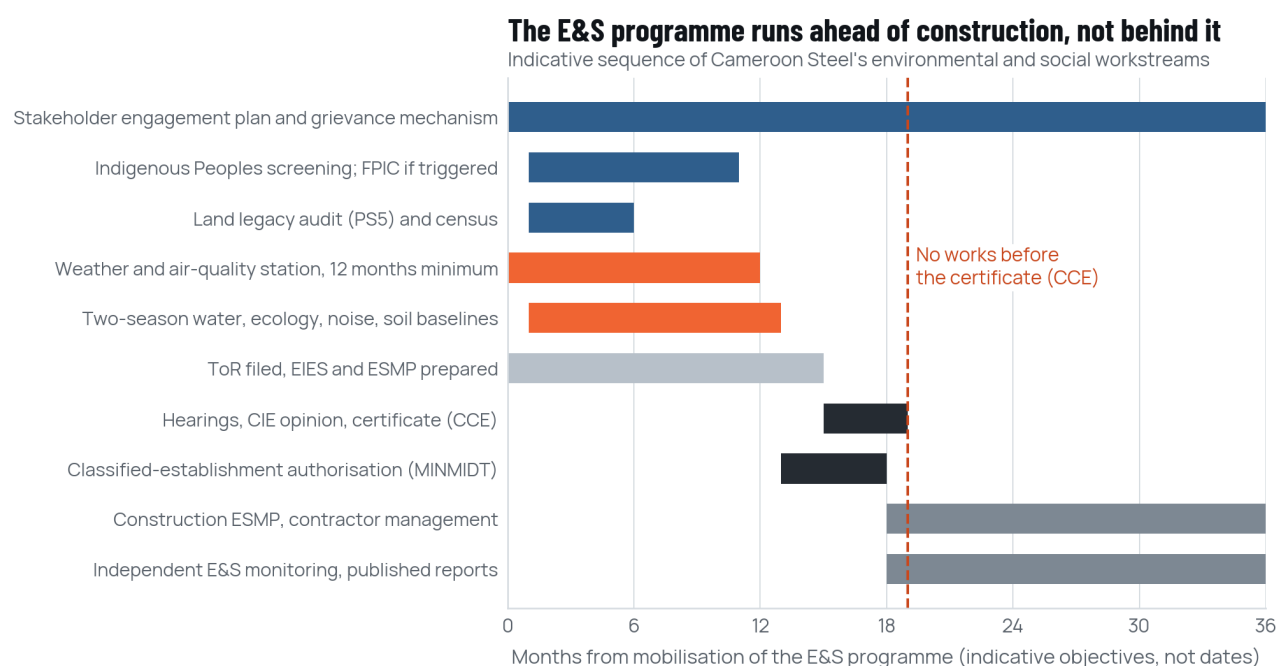
10.1 Five principles

Five principles run through the commitments in this paper. They are the test against which we invite readers to judge what follows.

1. **The stricter standard applies.** For every parameter, we apply the more stringent of Cameroonian law and the relevant international value (Chapters 2 and 3).
2. **Measure before predicting.** No impact will be predicted without measured, seasonal baseline data for the parameter concerned (Chapters 4 to 8 and 11).
3. **Publish data, not only conclusions.** Monitoring results will be published in a form others can check, not summarised as "compliant" (Chapter 9).
4. **Verify independently.** An independent environmental and social consultant and accredited laboratories will verify what we report. Communities will take part in monitoring.
5. **Correct and report.** When an objective is missed, the corrective action, its owner and its deadline will be published, and tracked until closed.

10.2 A sequence that runs ahead of construction

The order of work matters as much as its content. Under Décret 2013/0171/PM, no works may begin before the environmental certificate is issued [L02]. Under the Performance Standards, engagement and grievance management must begin before field activities that could affect people [G01]. Figure 10.1 shows the indicative sequence we intend to follow, in months from the mobilisation of the environmental and social programme. It is a planning objective, not a commitment to dates. The timing of each step depends on the authorities' review times, the seasons and what the surveys find. On the indicative calendar of Cameroon Steel's reference configuration, the seasonal baselines run through 2027 and 2028, public hearings are targeted for the third quarter of 2028 and the certificate for the fourth quarter of 2028. Phase 1 works would start in the first quarter of 2029, after the certificate, with a first heat in the second half of 2030 and ramp-up through 2031 [X03]. These dates are targets, not commitments.



ASSUMED Figure 10.1. Indicative sequence of Cameroon Steel's environmental and social workstreams, in months from mobilisation. Engagement, grievance management and the long-lead baselines start first; construction follows the certificate.

Source: Cameroon Steel objectives (planned); Décret 2013/0171/PM art. 3 [L02]; IFC PS1 [G01].

Three features of the sequence deserve emphasis.

Engagement comes first. The stakeholder engagement plan and the grievance mechanism open at month 0, before survey teams arrive in the villages. The Indigenous Peoples screening and the land legacy review start in the first month, because their findings can change the layout and the scope of everything else.

The long-lead baselines start immediately. The weather station and air quality monitors need a full year. The water, ecology and noise surveys need both seasons. Starting them at once puts the critical path in the field.

The two permitting tracks run together. The hazard study and emergency plan for the classified-establishment authorisation will be prepared alongside the environmental study, so that one layout answers both.

10.3 Key performance indicators

Table 10.1 sets out the indicators against which we will report, with an objective for each. The objectives draw on the chapters above. Where a value is still to be set from baseline data, the table says so rather than inventing a number. The assessment will confirm or tighten each objective. MINEPDED may make some of them conditions of the certificate, in which case they will bind us in law.

Table 10.1 Key performance indicators and objectives (planned; to be confirmed in the assessment)

Domain	Indicator	Objective	Frequency of reporting
Air	Melt-shop stack dust (daily mean)	Below 5 mg/Nm ³ on at least 95% of operating days	Daily online; annual summary
Air	PCDD/F at the melt-shop stack	Below 0.1 ng I-TEQ/Nm ³ in every campaign	Each campaign (twice a year at first)
Air	Modelled and measured project contribution to PM _{2.5} at villages	Below 25% of the WHO 2021 annual guideline (1.25 µg/m ³)	Annual

Domain	Indicator	Objective	Frequency of reporting
Noise	Night-time level at the nearest residential receptor	45 dB(A), or no more than 3 dB above background	Quarterly in construction; half-yearly in operation
Water	Fresh-water make-up per tonne of product	About 2 m ³ /t (range 1.5 to 3.0), reported against design	Annual
Water	Process-water discharge in normal operation	None	Monthly
Water	Outfall samples within IFC effluent values	100%	Monthly; continuous pH, temperature and flow
Residues	Share of slag and mill scale recovered as products	Objective to be set after the market study; reported from year 1	Annual
Residues	EAF dust sent to a compliant, contracted outlet	100%; no first heat without one	Quarterly
Climate	Scope 1 and 2 emissions, absolute and per tonne	Reported from year 1; decarbonisation pathway published within two years of start-up	Annual
Safety	Fatalities; lost-time injury frequency rate (employees and contractors)	Zero fatalities; frequency rate published with its trend	Quarterly
People	Cameroonian nationals in the operating workforce	About 90% (range 85 to 95%) by year 5	Annual
People	Women in the workforce and in training programmes	Objective set after the baseline; reported from year 1	Annual
People	Grievances acknowledged within 3 working days and answered within 30 days	At least 95%	Quarterly
Land	Land legacy review completed before clearing	Yes, published summary	Once, then follow-up
Indigenous Peoples	Screening completed; FPIC documented where triggered	Yes, before any affecting activity	On completion
Biodiversity	Clearing within the approved footprint; buffers intact	100%	Half-yearly
Biodiversity	Breaches of the hunting and wildlife-trade code	Zero tolerance; every case reported	Quarterly
Community safety	Road incidents involving project vehicles and the public	Every incident investigated and reported	Quarterly

Source: Chapters 2 to 9 of this paper; IFC EHS Guidelines [G03][G04]; WHO 2021 [G09]; EU BAT [G07]; Cameroon Steel planning basis [X03]. All values are objectives for a plant not yet built.

Three observations on the table. First, the safety objective is zero fatalities. Melt shops are among the most hazardous industrial workplaces. Molten metal, heavy lifting, rotating machinery and confined spaces leave no room for a lower ambition, and frequency rates must always be read alongside the absolute record. Second, the climate commitment is to measure and report from the first year, and to publish a pathway within two years. We do not set a reduction target before we have a measured baseline, because a target set without one would not be credible. Third, some objectives are blank by design. A target for women's employment, or for the share of slag sold, set before the baseline would be a guess. We commit to setting these objectives publicly once the data exist.

10.4 What we will publish, and when

Disclosure is the commitment that makes all the others checkable. Table 10.2 sets out what we will publish and when. Documents will be published in French and English, with plain-language summaries. Summaries for affected communities will also be given orally, in local languages including Gyele.

Table 10.2 Disclosure calendar (planned)

Document or data	When	Where and how
Stakeholder engagement plan; grievance mechanism procedures	Before field mobilisation	Online; posted in villages; explained at community meetings
Baseline monitoring data (air, weather, water)	Quarterly during the baseline programme	Online data files and plain-language summaries
Terms of reference approved by MINEPDED	On approval	Online
Environmental and social impact assessment, with non-technical summary	At filing, ahead of the public hearings	Online; copies in the commune and villages; hearings under Décret 2013/0171/PM
Environmental and social management plan and action plan	On issue of the certificate	Online
Land legacy review; resettlement or livelihood plan if required; Indigenous Peoples Plan if required	On completion; before implementation	Online and in the communities concerned, in appropriate languages
Grievance statistics	Quarterly	Online; community meetings
Half-yearly ESMP implementation reports to MINEPDED	Every six months, as required by law	Summaries online
Stack and ambient air data	Daily averages from start of operations	Online dashboard
Annual environmental, social and GHG report	Yearly from the first year of construction	Online; independent consultant's opinion attached
Independent monitoring reports	Half-yearly during construction; yearly in operation	Online, with our responses

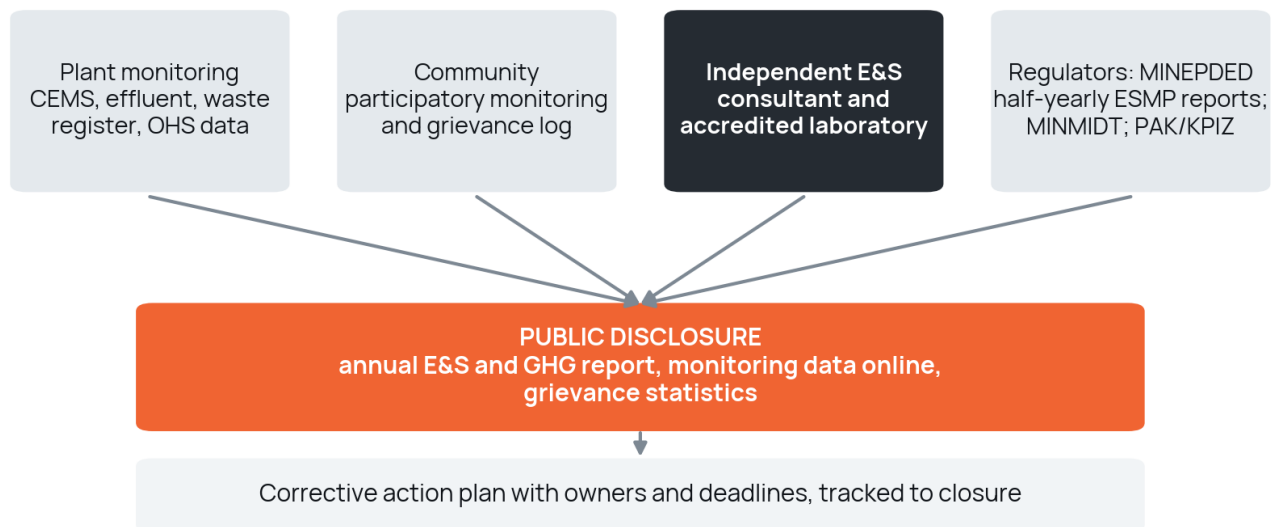
Source: Décret 2013/0171/PM arts 20 to 30 [L02]; IFC PS1 [G01]; EP4 [G05]; AfDB ISS OS10 [G06]; Cameroon Steel commitments (planned).

10.5 Independent monitoring and participation

Self-reported data are necessary but not sufficient. Figure 10.2 shows how monitoring, verification and disclosure fit together.

Data that others can check

How monitoring, verification and disclosure are intended to fit together



ILLUSTRATIVE Figure 10.2. Monitoring, verification and disclosure architecture. Plant data, community monitoring and regulators' oversight converge on public disclosure, with a corrective action plan tracked to closure.

Source: Décret 2013/0171/PM arts 27 to 30 [L02]; Arrêté 0010/MINEP [L12]; IFC PS1 [G01]; EP4 [G05]; Cameroon Steel commitments (planned).

An independent environmental and social consultant will be appointed for construction and the first years of operation. The consultant will report half-yearly during construction and yearly thereafter. Its reports will be published with our responses. If lenders appoint their own independent consultant, as EP4 requires for Category A projects, we will publish that consultant's summaries too, subject to the lenders' agreement [G05].

Accredited laboratories will analyse stack, effluent, groundwater and residue samples. Where no accredited laboratory exists in Cameroon for a parameter, such as dioxins, samples will go to an accredited laboratory abroad, with chain-of-custody records.

Community participatory monitoring will give representatives of the neighbouring villages, chosen by them and including women and Bagyeli members, training and a role in sampling and observation. A community monitoring committee will meet quarterly with the plant's environmental team and the independent consultant. It will receive the data and raise questions.

Regulators will receive the half-yearly reports required by law, and will have access to the site and to the data at any time. The departmental committees for monitoring environmental and social management plans, created in 2013, are the natural local forum [L12]. We will invite the port and zone authorities to the same meetings.

10.6 Governance inside the company

Commitments are only as strong as the internal governance behind them. Cameroon Steel will:

- adopt an environmental and social policy at board level, and review E&S performance at every board meeting;
- appoint a senior environmental and social manager reporting directly to the general management, with authority to stop work on safety or environmental grounds;
- ring-fence an environmental and social budget for the assessment, the baselines, the management plans and the community programmes, so that these are not traded off against schedule;

- write the relevant standards and objectives into every engineering, procurement and construction contract, with penalties and stop-work rights;
- link a share of managers' performance assessment to environmental, social and safety indicators.

10.7 What the first annual report will contain

The first environmental, social and GHG report will cover the first full year of construction, not the first year of production. By then most of the risks described in this paper will either be under control or visibly not. It will report five things in a fixed format, so that later reports can be compared with it:

1. **Progress against the sequence** in Figure 10.1: what was done, what slipped, and why.
2. **Every indicator in Table 10.1** that applies during construction, with the measured value, the objective and the trend. Indicators not yet applicable will be listed as such, not omitted.
3. **The grievance record**: numbers received, categories, time to answer and outcomes, including complaints still open.
4. **Incidents**: safety incidents, environmental incidents and community road incidents, with their investigations and corrective actions.
5. **The independent consultant's opinion**, published in full, with our response to each finding.

The report will be published in French and English, presented in the neighbouring villages and sent to MINEPDED, the port and zone authorities and any lenders.

10.8 What could go wrong, and how we will tell you

RISKS TO THESE COMMITMENTS, STATED IN ADVANCE

- **Schedule pressure.** The temptation to shorten baselines or consultations will be real. Our safeguard is the sequence in Figure 10.1 and the legal rule of no works before the certificate.
- **The EAF dust outlet.** A compliant recovery contract may be hard to secure for small volumes. Our safeguard is the rule of no first heat without one, with a permitted secure cell as fallback.
- **Power.** The low-carbon advantage of the EAF route depends on firm, hydro-dominated grid power. If supply requires fossil back-up, our emissions will rise, and we will report that openly.
- **Influx and contractors.** The largest social risks arise during construction and through contractors. Our safeguards are contract clauses, the independent consultant and the grievance mechanism.
- **Missing data.** Some of what we need, such as the zone's strategic assessment and the 2009 to 2010 land records, is held by others. Chapter 11 lists these gaps and how we will close them.

The test of this paper is not what it promises but what can later be checked against it. We have tried to write each commitment so that a minister's adviser, a lender's officer, a journalist or a fisherman at Boussibelika can ask, in a year's time, whether it was kept. We will publish the answer.

A close-up photograph showing a person's hands, with some soil on them, carefully planting a small green seedling into a hole in the ground. The soil is a rich, reddish-brown color. The background is blurred, showing more of the same soil and some greenery in the distance. The lighting is natural, suggesting an outdoor setting.

**THE TEST OF THIS PAPER IS NOT WHAT IT
PROMISES BUT WHAT CAN LATER BE CHECKED
AGAINST IT.**

Illustrative view. Generated image of a native seedling being planted in laterite soil; not a photograph of any project, place or person.

CHAPTER 11

EVIDENCE GAPS: WHAT IS NOT YET KNOWN, AND HOW IT WILL BE FOUND OUT

This paper rests on desk research: public laws and standards, published science, reanalysis data, public maps and the press. That is enough to set the right questions and the right commitments. It is not enough to predict impacts. No measured air, noise, water, soil or ecological data exist for the steel site area. No census exists of the people who live around it. Several important documents are held by public bodies and have not been published. This chapter lists the main gaps, explains why each matters and states how and when it will be closed. Closing them is the first phase of the work described in Chapter 10.

11.1 Why the gaps matter

Each gap stands between a general statement and a specific prediction. Modelled background fine particles at Kribi already exceed the WHO guideline (Chapter 4). But the margin left for the project depends on what a year of on-site monitoring shows. The small streams on the plateau may hold restricted-range fishes (Chapter 7), and only a survey in high and low water can tell. The land may have been fully released by its former users, or it may still be farmed (Chapter 8), and only a census and a legacy review can establish which. Until these questions are answered, any confident prediction would be guesswork.

The gaps fall into four groups:

- physical baselines that must be measured on site across seasons;
- biological and social surveys that must be done in the field, with communities;
- documents and data held by public authorities and other projects;
- technical and market questions that the engineering design must answer.

11.2 The gaps and how they will be closed

Table 11.1 Main evidence gaps and how they will be resolved

Gap	Why it matters	How it will be resolved	Who	When (months from mobilisation)
Land cover and habitat on and around the site	Distinguishes modified from natural habitat; fixes the footprint and the buffers	Very-high-resolution imagery and satellite classification, ground-truthed in the field	ESIA consultant (approved firm); remote-sensing specialist	0 to 3
Topography and drainage	Drives earthworks, stormwater design and spill pathways	Drone or airborne survey to a sub-metre terrain model; catchment delineation	Cameroon Steel, survey contractor	0 to 3 (dry season preferred)

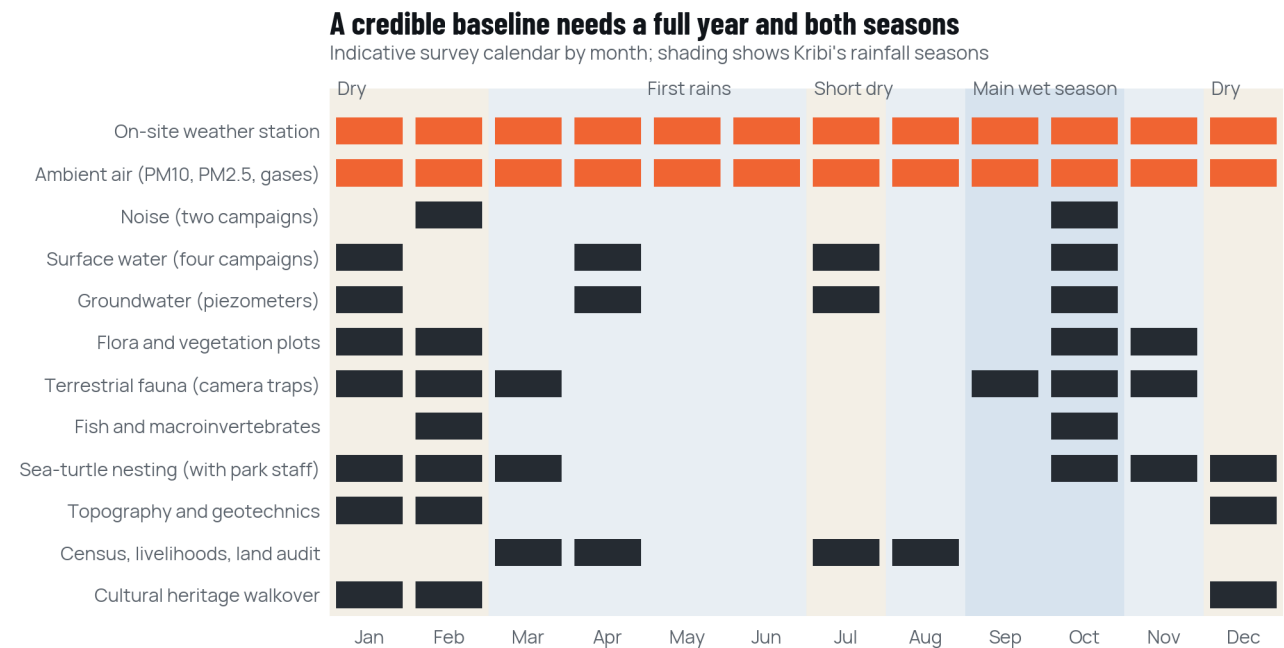
Gap	Why it matters	How it will be resolved	Who	When (months from mobilisation)
On-site meteorology	Drives the dispersion model for every air prediction	Automatic weather station with a 10 m mast, at least 12 months	ESIA consultant	0 to 12
Ambient air quality and dust deposition	Confirms whether the airshed is degraded; sets the project's margin	Reference-equivalent PM10 and PM2.5 monitors, passive tubes for gases, deposition gauges with metal analysis at 6 to 10 sites	ESIA consultant; accredited laboratory	0 to 12
Noise	No measured data at any receptor	24 to 72 hour measurements at 6 to 8 receptors, dry and wet seasons	ESIA consultant	1 to 10
Short-duration rainfall intensities	Needed to size drains and basins	Pluviograph records from the national meteorological service; on-site rain gauge	ESIA consultant; national meteorological service	0 to 12
Surface water and the small streams	Probable receiving waters; possible restricted-range fishes	Gauging and sampling at 6 to 8 points in four campaigns; sediment; fish and invertebrate surveys	ESIA consultant; accredited laboratory; ichthyologist	1 to 12
Groundwater	Supply option and pollution pathway; village wells	At least 6 piezometers, pumping tests, quarterly chemistry	Hydrogeologist (ESIA team)	2 to 12
Soil quality, including dioxin baseline	Reference against which any future deposition is measured	Grid sampling before construction, accredited laboratory	ESIA consultant; accredited laboratory	1 to 4
Flora, fauna and critical habitat	Confirms or rules out critical habitat; drives the biodiversity action plan	Two-season surveys; camera traps; critical habitat assessment with an IBAT screening	Specialist ecologists (ESIA team)	1 to 14
Sea-turtle nesting	Landscape-level indicator and possible contribution	Data sharing and joint patrols with the marine park authority and the Ebodjé community; nesting season to be confirmed	Cameroon Steel with the marine park authority and the Ebodjé community	One nesting season
Census, livelihoods and land legacy	Identifies users of the land and gaps from 2009 to 2010	Census and asset inventory; household survey of at least 400 households; review of the 2009 and 2010 records	ESIA social team; land administration and PAK for the records	1 to 6
Indigenous Peoples	Determines whether FPIC is triggered	Specialised anthropological screening with Bagyeli organisations; customary-use mapping	Specialist anthropologist with Bagyeli organisations	1 to 10
Cultural heritage	Sacred sites, graves, archaeology	Archaeological walkover; mapping with chiefs and elders; chance-finds procedure	Archaeologist; chiefs and elders	1 to 4
Community health	Baseline for influx management	District health records; key-informant interviews; rapid health impact assessment	ESIA consultant; district health services	2 to 6
Traffic	Baseline for road safety	Classified counts on the N7, motorway and port gates; road safety audit	ESIA consultant	2 and 8 (two campaigns)

Gap	Why it matters	How it will be resolved	Who	When (months from mobilisation)
Documents held by others	Avoids duplication; tiers the assessment	Formal requests to PAK and KPIZ (port assessments, any zone strategic assessment, land files, utility plans), MINEPDED, and other projects (rail, mining, gas plant monitoring)	Cameroon Steel (formal requests)	0 to 6
National norms	Confirms whether national limits exist that are stricter than international values	Request to MINEPDED and the national standards body for the 2008 norms and any steel-sector order	Cameroon Steel (request to MINEPDED and ANOR)	0 to 3
Utilities and shared facilities	Water supply, wastewater, hazardous waste, grid connection	Data requests and design coordination with PAK, KPIZ and the power utilities	Cameroon Steel engineering, with PAK, KPIZ and the utilities	0 to 9
Source of the zone's water intake	A port-platform intake on the Lobé would make our supply an indirect abstraction from it	Request to PAK and KPIZ for the intake design and its abstraction authorisation; specific study if the Lobé is the source	Cameroon Steel, with PAK, KPIZ and MINEE	0 to 3
Slag market and EAF dust outlet	Turn residues into products; secure the hazardous route	Market study for aggregates; tenders for zinc recovery; secure-cell feasibility	Cameroon Steel	3 to 18

Source: Cameroon Steel analysis of the desk baseline; methods follow IFC guidance [G01][G02][G03][G04] and Décret 2013/0171/PM [L02].

11.3 The calendar is set by the seasons

Several surveys must catch particular conditions: low and high river flow, the dry-season window for earthworks and archaeology, the main wet season for drainage, and the turtle nesting season on the beaches. Figure 11.1 lays out an indicative calendar by month against Kribi's rainfall seasons. Its message is simple. A credible baseline needs a full year and both seasons. Starting it as early as possible is the single most effective way to shorten the overall programme without cutting corners.



ASSUMED Figure 11.1. Indicative baseline survey calendar by month. Weather and air quality run continuously for twelve months; water, ecology and noise campaigns are placed to capture both the drier and the wetter seasons.

Source: Cameroon Steel analysis; seasons from Olivry, 1979 [E01]; turtle nesting season to be confirmed with the marine park authority.

11.4 Questions we cannot answer alone

Some gaps can only be closed by others, or jointly with them.

The zone's strategic assessment. The 2016 order requires a strategic environmental assessment for industrial zones and industrial-port complexes [L03]. If one exists for Kribi, our assessment should build on it. If none exists, we will support its preparation (Chapter 9).

The land records. The files of the 2009 declaration of public utility and the 2010 compensation decree are held by the land administration and the port authority. We will ask for access as a first step of the land legacy review.

Existing baselines. The port, the gas power plant, the motorway and the rail and mining projects have each produced environmental studies and, in some cases, years of monitoring. Shared access would improve every project's assessment, including ours, and would reduce the burden on communities who are asked the same questions repeatedly.

Status of species. The global statuses in Chapter 7 were checked on the IUCN Red List (version 2026-1) for this edition [B10]; they will be checked again when the assessment is filed, because statuses change. Key Biodiversity Area and Important Bird Area designations for the area of influence need confirming through IBAT, which requires a subscription. We will include it in the assessment budget.

11.5 What we will do with what we learn

The purpose of the baseline is to change the project where the evidence requires it. If the surveys find a stream with a restricted-range fish, the layout will move away from it. If the census finds current users of the land, we will try to avoid displacing them through the layout before we plan compensation. If the air monitoring shows less headroom than expected, the controls will be strengthened before the permit is sought. If the Indigenous Peoples screening triggers FPIC, the affecting activities will wait for the outcome. We will publish the baseline data quarterly as they are collected (Chapter 10), so that others can check our reasoning as well as our conclusions.

ANNEX A

METHODS, ASSUMPTIONS AND CONVENTIONS

This annex explains how the evidence in this paper was assembled. It describes how distances, climate statistics and planning estimates were derived, and which assumptions were made, with their ranges. It also sets out the conventions used for status labels, units and language.

A.1 Scope and approach

This paper is a desk study prepared in September and October 2026. It draws on four kinds of evidence:

1. **Primary legal texts.** Cameroonian laws, decrees and orders were read in their published versions, mainly through the FAO's FAOLEX database and ministry websites. International standards were read in the issuing bodies' own publications.
2. **Published science and official data.** These include hydrological monographs, peer-reviewed studies of the Kribi coast, the national Demographic and Health Survey, protected-area decrees and the UNESCO Tentative List.
3. **Reanalysis and open geodata.** Modelled climate, wind and air quality data come from ERA5 and CAMS. Settlements, watercourses, coastline and protected-area outlines come from OpenStreetMap, and country outlines from Natural Earth.
4. **The public record and Cameroon Steel's planning basis.** These are press reports of the project's public milestones, and the company's planning model of 10 October 2026 for planned capacities and benchmark-based estimates.

No field survey has yet been carried out for the steel site area. All site-specific predictions are deferred to the environmental and social impact assessment (Chapter 11). Secondary sources such as press articles are used only where no primary source was available, and are identified as such in Annex C. Where sources conflict, the paper states the range, the source preferred and the reason.

A.2 Distances and maps

Distances to receptors were measured from public geodata to the centre of a generalised indicative area within the Mboro sector of the industrial-port zone (9.90° E, 2.72° N, the centre of the indicative area shown on Cameroon Steel's public website). They were not measured to a surveyed site boundary. The geodata are OpenStreetMap features queried through the Overpass API on 10 October 2026 (extract base 24 July 2026), and the boundary points published in the marine park's creation decree [E11][B01]. Up to 10 km, each distance is given as a whole-kilometre band (for example 3 to 4 km); beyond 10 km it is rounded to the nearest kilometre. Every receptor distance quoted in the paper comes from Annex D, Table D.1. OpenStreetMap is crowd-sourced. It is incomplete for small streams and buildings, and its protected-area outlines can differ from the legal boundaries. The assessment will replace these distances with surveyed values and with boundaries checked against the World Database on Protected Areas and the decrees.

The regional map (Figure 1.1) shows the steel complex as a hatched circle 1.5 km in radius around the centre of the indicative area, the same indicative area as on Cameroon Steel's public website. The circle is a generalised marker of the indicative location, not the site boundary. Satellite surface models give elevations of roughly 50 to 120 m across the wider area; allowing for the tree canopy they include, we estimate the ground at about 40 to 100 m above sea level (rounded; to be confirmed by survey) [E17].

A.3 Climate and air quality data

Rainfall statistics come from the homogenised Kribi station record for 1937 to 1976, as published by Olivry [E01]. This record includes the monthly means and the Pearson III fit of one-day extremes over 33 years. WMO climate normals for 1981 to 2010 [E09] and the ERA5 reanalysis [E04] were used as cross-checks. Reanalysis was not used for extremes, because it underestimates point rainfall maxima. Wind frequencies come from hourly ERA5 data for 2011 to 2020 [E04], cross-checked against the port authority's observations [E07]. Background air quality comes from the CAMS global reanalysis for 2024 to 2025 [E05]. All reanalysis values are labelled "modelled". They are used to frame the questions and the objectives, never as substitutes for measurement.

A.4 Planning estimates for the steel complex

Planned capacities, water demand, residues, electricity use, greenhouse gas emissions and traffic come from Cameroon Steel's planning model, edition of 10 October 2026 [X03]. The model multiplies planned capacities by benchmark intensities from the IFC EHS Guidelines, worldsteel and standard industry practice. The capacities are 0.3 Mtpa of finished products in Phase 1, 0.5 Mtpa after Phase 2 and 1.0 Mtpa at full design. Its outputs are indicative planning values. They are not engineering design values or measurements, and they will be replaced by the design basis in the assessment. Table A.1 lists the main assumptions and their ranges.

Table A.1 Main assumptions of the planning model, with ranges

Parameter	Planning value	Range	Status	Basis
EAF electricity	450 kWh/t liquid steel (RC-1 planning value, within the IFC range); about 490 with 30% DRI/HBI (upper planning value)	347 to 500	Planned	IFC EHS Guidelines: 1,250 to 1,800 MJ/t [G03]
Rolling electricity	110 kWh per tonne of product	70 to 140	Sourced	IFC EHS Guidelines [G03]
Induction billet heating (Phase 1)	300 kWh per tonne of billet, applied to the tonnage rolled	150 to 400	Assumed	Electric heating, partly hot-charged
Auxiliary electricity	70 kWh per tonne of liquid steel	50 to 100	Assumed	Ladle furnace, caster, oxygen, water, compressed air
Gas-fired reheating (Phases 2 and 3)	1.3 GJ per tonne of product	1.1 to 1.6	Assumed	Walking-beam furnaces
Fresh-water make-up	2.0 m ³ per tonne of product	1.5 to 3.0	Assumed	Closed-loop design; worldsteel average consumption 2.3 m ³ /t [T01]
EAF slag	140 kg per tonne of liquid steel	110 to 180	Derived	IFC: 110 to 180 kg of solid waste per tonne of EAF steel [G03], taken as mostly slag
EAF dust	15 kg per tonne of liquid steel	10 to 20	Assumed	Planning range [X03]; the European reference document for iron and steel reports 10 to 30 kg [G17]
Mill scale	20 kg per tonne of product	15 to 25	Assumed	Rolling practice
Metallic yield	0.88 t liquid steel per t metallic charge	0.85 to 0.91	Assumed	Scrap and DRI mix
Casting and rolling yield	0.94 t product per t liquid steel	0.92 to 0.96	Assumed	Caster and mill combined
Imported DRI/HBI share of metallic charge	30%	20 to 50%	Assumed	Balance scrap, domestic and imported

Parameter	Planning value	Range	Status	Basis
Grid emission factor	226 gCO ₂ per kWh	200 to 300	Sourced	Cameroon 2024 average [T04]; kept as a conservative planning value
Direct (Scope 1) emissions of the melt shop	0.10 tCO ₂ per tonne of liquid steel	0.06 to 0.15	Assumed	Electrodes, charge carbon, lime, burners
Upstream emissions of imported DRI/HBI	0.7 tCO ₂ per tonne of DRI	0.5 to 0.9	Assumed	Gas-based shaft furnace
Natural gas emission factor	0.0561 tCO ₂ per GJ	Not applicable	Sourced	IPCC 2006 default
Truck payload and operating days	30 t per load; 300 days a year	Not applicable	Assumed	All road transport before any rail siding

Source: Cameroon Steel planning model, edition of 10 October 2026 [X03], with benchmark sources as cited.

Derived values in the text are calculated from these assumptions. They are:

- Scope 1 and 2 emissions of about 97,000, 163,000 and 328,000 tCO₂e a year by phase;
- residues of about 55,000, 92,000 and 185,000 t a year;
- fresh water of about 0.6, 1.0 and 2.0 million m³ a year;
- about 74, 123 and 245 truck loads a day.

They are rounded, and their uncertainty follows from the ranges above. For example, using the full range of slag intensity changes the full-capacity slag estimate from about 117,000 to about 191,000 t a year. Water shares of river low flow divide the average daily make-up, on a 365-day basis, by the median low flow of the Lobé (8.35 m³/s) or the 10-year low flow of the Kienké (4.68 m³/s) [E01].

A.5 Critical habitat screening

The screening in Figure 7.1 is qualitative. For each feature it rates each IFC criterion as unlikely, possible, candidate or likely. The rating reflects whether species or ecosystems meeting that criterion are known or expected to occur in the feature, according to the desk sources [G02][B08][B06]. It is not a critical habitat assessment. Such an assessment requires survey data, an IBAT screening and the definition of an ecologically appropriate area of analysis for each feature, and these are listed in Chapter 11.

A.6 Status labels

Every figure carries a status label, and every planning value in the text is identified as planned or indicative.

- **Sourced:** published data used as published, from the source cited.
- **Derived:** calculated by Cameroon Steel from sourced inputs, with the method stated.
- **Assumed:** a planning assumption or indicative sequence, with its range where relevant.
- **Illustrative:** a diagram or a generated visualisation. Generated images are not photographs of the project or its site.

A.7 Conventions

Units follow the International System, with tonnes (t), million tonnes per annum (Mtpa) and normal cubic metres (Nm³) at 273 K and 101.3 kPa, dry. Currency amounts are in CFA francs (FCFA), pegged at 655.957 FCFA to the euro. Dates are given in full. The paper uses British English. Legal instruments are cited by their French titles, with English explanations on first use. Documents published by the Port Autonome de Kribi are cited by title and date, without web links.

ANNEX B

GLOSSARY AND ABBREVIATIONS

This glossary explains the technical terms, institutions and abbreviations used in this paper. Where a French term is in common use in Cameroon, it is given with its English equivalent.

Term	Meaning
AfDB	African Development Bank. Its Integrated Safeguards System (ISS, 2023) sets environmental and social requirements through ten operational safeguards (OS1 to OS10).
Airshed	The volume of air over an area within which pollutants mix. An airshed is "degraded" when ambient concentrations already exceed the applicable standard.
AQG	Air quality guideline level of the WHO (2021): the concentration below which health effects are considered minimal.
Area of influence	The area in which a project's direct, indirect, induced and cumulative impacts may occur; usually much larger than the site.
Audiences publiques	Public hearings held on a finished detailed EIES in Cameroon, run by an ad hoc commission.
Bag filter (fabric filter)	Gas-cleaning equipment in which dust is captured on fabric bags; the standard technique for EAF fume.
Bagyeli (Bakola)	Forest peoples of the Océan department of Cameroon, recognised as Indigenous Peoples under international standards; their language is Gyele.
BAT	Best available techniques, as defined in European Union law; BAT conclusions set associated emission levels.
Baseline	The measured state of the environment and of communities before a project, against which impacts are predicted and monitored.
Blowdown	Water purged from a cooling circuit to limit the build-up of dissolved salts.
CAMS	Copernicus Atmosphere Monitoring Service, which produces modelled air quality reanalyses.
CBAM	The European Union's Carbon Border Adjustment Mechanism, in its definitive regime since 1 January 2026 for iron and steel imports.
CCE	Certificat de Conformité Environnementale: the certificate issued by MINEPDED after a favourable review of an EIES.
CEMS	Continuous emission monitoring system, installed on a stack.
CIE	Comité Interministériel de l'Environnement: the interministerial committee that gives its opinion on an EIES before the decision.
Critical habitat	In IFC Performance Standard 6, an area of high biodiversity value meeting one or more of five criteria; projects there must achieve net gains.
Cumulative impacts	The combined effects of a project with other existing, planned or reasonably foreseeable developments on the same receptors.
DRI / HBI	Direct-reduced iron / hot-briquetted iron: iron produced by removing oxygen from ore without melting, used as clean metallic charge in an EAF.
DUP	Déclaration d'utilité publique: the declaration of public utility that opens the expropriation procedure.

Term	Meaning
EAF	Electric arc furnace: a furnace that melts scrap and other metallic charge with electric arcs.
EAF dust	Fine dust collected from EAF off-gas; classed as hazardous because of its zinc, lead and cadmium content.
EES	Évaluation environnementale stratégique: strategic environmental assessment of a plan, programme or zone.
EHS Guidelines	The World Bank Group's Environmental, Health and Safety Guidelines (General, and sector guidelines such as Integrated Steel Mills, 2007).
EIES	Étude d'impact environnemental et social: the environmental and social impact assessment. Cameroon distinguishes the EIES détaillée (detailed) from the EIES sommaire (summary).
EP4	The fourth version of the Equator Principles (2020), a risk-management framework adopted by financial institutions.
ERA5	The fifth-generation global climate reanalysis of the European Centre for Medium-Range Weather Forecasts.
ESAP	Environmental and social action plan agreed with lenders and made a condition of financing.
ESMP / PGES	Environmental and social management plan (plan de gestion environnementale et sociale).
Établissement classé	Classified establishment: an installation subject to authorisation or declaration because of its hazards or nuisances.
Étude des dangers	Hazard study required for first-class classified establishments, covering major-accident scenarios.
FPIC	Free, prior and informed consent: the agreement of affected Indigenous Peoples, reached through good-faith negotiation, required by IFC PS7 in defined circumstances.
GHG	Greenhouse gases, expressed in tonnes of carbon dioxide equivalent (tCO ₂ e).
Grievance mechanism	A process through which people can raise concerns or complaints about a project and receive a response.
IBAT	Integrated Biodiversity Assessment Tool, a database for screening biodiversity features near a site.
IFC	International Finance Corporation, the private-sector arm of the World Bank Group.
Interim target (IT)	An intermediate air quality level in the WHO guidelines for places where the guideline is not yet met.
IUCN Red List	The International Union for Conservation of Nature's assessment of species' extinction risk (Critically Endangered, Endangered, Vulnerable, and so on).
KPIZ	Kribi Port Industrial Zone S.A., the company that develops and manages the integrated industrial zone of the Port of Kribi.
Ladle furnace	Secondary steelmaking unit in which liquid steel is refined and its temperature adjusted after the EAF.
MINEE	Ministry of Water and Energy.
MINEPDED	Ministry of Environment, Protection of Nature and Sustainable Development.
MINFOF	Ministry of Forests and Wildlife.
MINMIDT	Ministry of Mines, Industry and Technological Development, responsible for classified establishments.
Mill scale	Iron oxide that forms on hot steel and flakes off during casting and rolling; recyclable as iron units.
Mitigation hierarchy	The sequence avoid, minimise, restore, offset, applied in that order to adverse impacts.
Natural habitat	Areas composed of viable assemblages of largely native species, or where human activity has not essentially modified primary functions (IFC PS6).

Term	Meaning
NIE	Notice d'impact environnemental: the simplest environmental instrument in Cameroon, for minor operations.
Non-designated country	Under EP4, a country not listed as having robust environmental and social governance; the IFC Performance Standards apply in full.
PAK	Port Autonome de Kribi, the public company that manages the port and its domain.
PCDD/F	Polychlorinated dibenzo-p-dioxins and dibenzofurans ("dioxins and furans"), expressed as toxic equivalents (TEQ or I-TEQ).
PM10 / PM2.5	Particulate matter with aerodynamic diameter below 10 or 2.5 micrometres.
Performance Standards (PS1 to PS8)	The IFC's eight environmental and social standards (2012).
Post-combustion	Burning of carbon monoxide and organic compounds in EAF off-gas before cooling.
Quench	Rapid cooling of off-gas through the temperature window in which dioxins re-form.
Reanalysis	A model-based reconstruction of past weather or air quality, constrained by observations; labelled "modelled" in this paper.
Return period	The average interval between events of a given size; a 100-year storm has a 1% chance of occurring in any year.
Scope 1, 2, 3	Direct emissions (Scope 1), emissions from purchased electricity (Scope 2), and other value-chain emissions (Scope 3).
Slag	Non-metallic by-product of steelmaking, formed from fluxes and oxides; processed EAF slag is used as aggregate.
Waelz kiln	Rotary kiln used to recover zinc from EAF dust.
WHO	World Health Organization.

Source: Cameroon Steel, from the legal texts and standards cited in Annex C.

ANNEX C

SOURCES

Every source cited in this paper is listed below by its identifier. Sources are grouped by type. Within each group, identifiers follow the order in which sources were registered, so some numbers are not used. Web addresses were accessed on 10 October 2026 unless stated otherwise. Documents published by the Port Autonome de Kribi are cited by title and date only, without web links. Press articles are secondary sources, used only where no primary source was available; no encyclopaedia entry is cited.

Cameroonian law and regulation (L)

ID	Title	Publisher	Date	URL
L01	Loi n° 96/12 portant loi-cadre relative à la gestion de l'environnement	Presidency of the Republic (FAOLEX copy)	5 Aug 1996	https://faolex.fao.org/docs/pdf/cmr19578.pdf
L02	Décret n° 2013/0171/PM fixant les modalités de réalisation des études d'impact environnemental et social	Prime Minister (FAOLEX copy)	14 Feb 2013	https://faolex.fao.org/docs/pdf/cmr179401.pdf
L03	Arrêté n° 00001/MINEPDED fixant les catégories d'opérations soumises à une évaluation environnementale stratégique ou à une étude d'impact environnemental et social	MINEPDED (FAOLEX copy)	8 Feb 2016	https://faolex.fao.org/docs/pdf/cmr172054.pdf
L04	Loi n° 98/015 relative aux établissements classés dangereux, insalubres ou incommodes; Décret n° 99/818/PM fixant les modalités d'implantation et d'exploitation	Presidency; Prime Minister (FAOLEX copies)	14 Jul 1998; 9 Nov 1999	https://faolex.fao.org/docs/pdf/cmr141675.pdf ; https://faolex.fao.org/docs/pdf/cmr26717.pdf
L05	Décrets n° 2011/2582/PM (atmosphere), 2011/2583/PM (noise and odours), 2011/2584/PM (soils) and 2011/2585/PM (discharges)	Prime Minister (FAOLEX copies)	23 Aug 2011	https://faolex.fao.org/docs/pdf/cmr195746.pdf ; https://faolex.fao.org/docs/pdf/cmr195745.pdf ; https://faolex.fao.org/docs/pdf/cmr195748.pdf
L06	Décret n° 2012/2809/PM fixant les conditions de tri, collecte, stockage, transport, récupération, recyclage, traitement et élimination finale des déchets; Arrêtés n° 001 and 002/ MINEPDED	Prime Minister; MINEPDED	26 Sep 2012; 15 Oct 2012	https://faolex.fao.org/docs/pdf/cmr195749.pdf
L07	Loi n° 98/005 portant régime de l'eau; Décrets n° 2001/164/PM and 2001/165/PM	Presidency; Prime Minister (FAOLEX copies)	14 Apr 1998; 8 May 2001	https://faolex.fao.org/docs/pdf/cmr33974.pdf ; https://faolex.fao.org/docs/pdf/cmr26656.pdf ; https://faolex.fao.org/docs/pdf/cmr26658.pdf
L08	Loi n° 85/09 relative à l'expropriation pour cause d'utilité publique et aux modalités d'indemnisation	Presidency (FAOLEX copy)	4 Jul 1985	https://faolex.fao.org/docs/pdf/cmr1474.pdf
L09	Nachtigal Hydropower Project, ESIA update, legal and institutional chapter (Décret n° 2003/418/PM crop rates; building valuation)	AECOM and Sogreah (European Investment Bank register)	Sep 2011	https://www.eib.org/attachments/registers/86536111.pdf
L10	Manuel de procédure générale des études d'impact et audits environnementaux	MINEPDED	n.d.	https://minepded.gov.cm/wp-content/uploads/2021/09/Manuel-de-procedure-generale-des-etudes-d'impact-et-audits-environnementaux.pdf

ID	Title	Publisher	Date	URL
L11	Arrêté n° 00004/MINEP fixant les conditions d'agrément des bureaux d'études	MINEP	3 Jul 2007	https://minepded.gov.cm/wp-content/uploads/2021/09/Arrêté-n°00004-MINEP-du-03-juillet-2007.pdf
L12	Arrêté n° 0010/MINEP portant organisation et fonctionnement des comités départementaux de suivi de la mise en œuvre des PGES	MINEP	3 Apr 2013	https://minepded.gov.cm/wp-content/uploads/2021/09/Arrêté-n°0010-MINEP-du-03-avril-2013.pdf
L13	Rapport d'évaluation du Système de Gestion Environnementale et Sociale (SGES) du Cameroun	African Development Bank (published by MINFI)	Jul 2026	https://minfi.gov.cm/wp-content/uploads/2026/08/Rapport-Evaluation-SGES_GPD-Durable-Cameroun.-REVSNSC-180826.pdf
L14	National consultations advance revision of Cameroon's framework environmental law	UNEP Law and Environment Assistance Platform	Sep 2024	https://leap.unep.org/en/about/news/national-consultations-advance-revision-camerouns-framework-environmental-law
L15	Loi n° 2024/008 portant régime des forêts et de la faune	Presidency of the Republic	24 Jul 2024	https://www.prc.cm/fr/actualites/actes/lois/7298-loi-n-2024-008-du-24-juillet-2024-portant-regime-des-forets-et-de-la-faune
L17	Loi n° 92/007 portant Code du travail	Presidency (FAOLEX copy)	14 Aug 1992	https://faolex.fao.org/docs/pdf/cmr198304.pdf
L19	Décret n° 2020/251 portant réorganisation et fonctionnement du Port Autonome de Kribi	Presidency of the Republic (copy published by the Port Autonome de Kribi)	5 May 2020	Cited by title and date
L20	Loi n° 2013/011 régissant les zones économiques au Cameroun	Presidency (FAOLEX copy)	16 Dec 2013	https://faolex.fao.org/docs/pdf/cmr141879.pdf

International standards and guidance (G)

ID	Title	Publisher	Date	URL
G01	Performance Standards on Environmental and Social Sustainability	International Finance Corporation	1 Jan 2012	https://www.ifc.org/en/insights-reports/2012/ifc-performance-standards
G02	Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources (updated)	International Finance Corporation	27 Jun 2019	https://www.ifc.org/en/insights-reports/2012/ifc-performance-standards
G03	Environmental, Health, and Safety Guidelines for Integrated Steel Mills	IFC / World Bank Group	30 Apr 2007	https://www.ifc.org/content/dam/ifc/doc/2000/2007-integrated-steel-mills-ehs-guidelines-en.pdf
G04	Environmental, Health, and Safety (General) Guidelines	IFC / World Bank Group	30 Apr 2007	https://www.ifc.org/content/dam/ifc/doc/2000/2007-general-ehs-guidelines-en.pdf
G05	The Equator Principles EP4	Equator Principles Association	Jul 2020 (effective 1 Oct 2020)	https://equator-principles.com/app/uploads/The-Equator-Principles_EP4_July2020.pdf
G06	African Development Bank Group's Integrated Safeguards System (2023)	African Development Bank	2023	https://www.afdb.org/en/documents/african-development-bank-groups-integrated-safeguards-system-2023
G07	Commission Implementing Decision 2012/135/EU establishing the best available techniques (BAT) conclusions for iron and steel production	European Commission	28 Feb 2012	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32012D0135
G09	WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide	World Health Organization	22 Sep 2021	https://www.who.int/publications/i/item/9789240034228
G10	Addressing Grievances from Project-Affected Communities (Good Practice Note)	International Finance Corporation	Aug 2009	https://www.ifc.org/content/dam/ifc/doc/mgrt/ifc-grievance-mechanisms.pdf
G11	Projects and People: A Handbook for Addressing Project-Induced In-Migration	International Finance Corporation	Sep 2009	https://www.ifc.org/en/insights-reports/2011/handbook-for-addressing-project-induced-in-migration

ID	Title	Publisher	Date	URL
G12	Workers' accommodation: processes and standards	IFC and European Bank for Reconstruction and Development	Aug 2009	https://www.ifc.org/content/dam/ifc/doc/mgrt/workers-accommodation.pdf
G13	Guiding Principles on Business and Human Rights	United Nations Office of the High Commissioner for Human Rights	2011	https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf
G14	United Nations Declaration on the Rights of Indigenous Peoples	United Nations General Assembly	13 Sep 2007	https://www.un.org/development/desa/indigenouseoples/declaration-on-the-rights-of-indigenous-peoples.html
G15	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa	Secretariat of the Basel Convention (UNEP); African Union	22 Mar 1989; 30 Jan 1991	https://www.basel.int ; https://au.int/en/treaties/bamako-convention-ban-import-africa-and-control-transboundary-movement-and-management
G16	Commission Implementing Decision (EU) 2022/2110 establishing the best available techniques (BAT) conclusions for the ferrous metals processing industry (BAT 22, Table 1.9: feedstock heating in hot rolling)	European Commission (Official Journal L 284, p. 69)	11 Oct 2022	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32022D2110
G17	Best Available Techniques Reference Document for Iron and Steel Production (EUR 25521)	European Commission, Joint Research Centre	2013	https://bureau-industrial-transformation.jrc.ec.europa.eu/sites/default/files/2019-11/IS_Adopted_03_2012.pdf

Steel sector, climate and peer projects (T)

ID	Title	Publisher	Date	URL
T01	Sustainability Indicators Report 2025 (2024 data)	World Steel Association (worldsteel)	Nov 2025 (updated Feb 2026)	https://worldsteel.org/wider-sustainability/sustainability-indicators/
T02	Steel industry co-products	World Steel Association (worldsteel)	Accessed 10 Oct 2026	https://worldsteel.org/wider-sustainability/steel-industry-co-products/
T04	Carbon intensity of electricity generation (Ember data), Cameroon	Our World in Data	Accessed Oct 2026	https://ourworldindata.org/grapher/carbon-intensity-electricity
T05	Electricity production by source (Ember and Energy Institute data), Cameroon	Our World in Data	Accessed Oct 2026	https://ourworldindata.org/grapher/electricity-prod-source-stacked
T06	CBAM definitive regime	European Commission, DG Taxation and Customs Union	Accessed 10 Oct 2026	https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism/cbam-definitive-regime_en
T07	Price of CBAM certificates	European Commission, DG Taxation and Customs Union	Q3 2026 price published 5 Oct 2026	https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism/price-cbam-certificates_en
T08	Environmental and Social Review Summary 51259, Estee Loan (EAF steel and rebar works, Malaysia)	International Finance Corporation	6 Jan 2026	https://disclosures.ifc.org/project-detail/ESRS/51259/estee-loan
T09	Environmental and Social Review Summary 8638, Alexandria National Iron and Steel (flat steel production)	International Finance Corporation	5 Feb 2010 (updated 30 Sep 2022)	https://disclosures.ifc.org/project-detail/ESRS/8638/alexandria-national-iron-and-steel-and-sk-flat-steel-production
T10	Rapport d'activités 2025 de l'ARSEL	Agence de Régulation du Secteur de l'Électricité (ARSEL)	7 Sep 2026	https://arsel-cm.org/wp-content/uploads/2026/09/Rapport-ARSEL-2025.pdf

Physical environment and geodata (E)

ID	Title	Publisher	Date	URL
E01	Monographie du Nyong et des fleuves côtiers, tome 1 (J.-C. Olivry)	ORSTOM (now IRD)	Jul 1979	https://horizon.documentation.ird.fr/exl-doc/pleins_textes/divers11-03/01948.pdf
E02	Weakening of coastlines and coastal erosion in the Gulf of Guinea: the case of the Kribi coastline in Cameroon (Fendoung, Tchindjang and Hubert-Ferrari), Land 11:1557	MDPI	2022	https://doi.org/10.3390/land11091557
E03	Geomatics-based assessment of coastal vulnerability in Kribi (Perabi et al.), Urban Resilience and Sustainability 3(4)	AIMS Press	Nov 2025	https://www.aimspress.com/aimspress-data/urs/2025/4/PDF/urs-03-04-012.pdf
E04	ERA5 hourly reanalysis (precipitation, wind, temperature), accessed through the Open-Meteo historical weather API	ECMWF; Open-Meteo	Accessed 10 Oct 2026	https://open-meteo.com/en/docs/historical-weather-api
E05	CAMS global atmospheric composition reanalysis (PM10, PM2.5, NO2, SO2, O3, dust), accessed through the Open-Meteo air quality API	Copernicus Atmosphere Monitoring Service; Open-Meteo	Accessed 10 Oct 2026	https://open-meteo.com/en/docs/air-quality-api
E06	Kribi Power Project, Environmental and Social Impact Assessment Addendum (gas reciprocating engines)	Scott Wilson for AES SONEL (World Bank disclosure)	Oct 2007	http://documents1.worldbank.org/curated/en/760181468239362187/txt/E18210v120EA0P17332B01PUBLIC11paper.txt
E07	Guide du Port de Kribi	Port Autonome de Kribi	Aug 2020	Cited by title and date
E08	Climate Change 2021: The Physical Science Basis, Summary for Policymakers	Intergovernmental Panel on Climate Change	2021	https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf
E09	World Weather Information Service: Kribi, climatological information (rainfall 1981 to 2010; data from the Direction de la Météorologie Nationale)	World Meteorological Organization	Accessed 10 Oct 2026	https://worldweather.wmo.int/en/city.html?cityId=1517
E11	OpenStreetMap data, Overpass API extract for the Kribi area (coastline, watercourses, roads, settlements, landuse, protected areas)	OpenStreetMap contributors (ODbL)	Base 24 Jul 2026; queried 10 Oct 2026	https://www.openstreetmap.org
E12	Natural Earth 1:50m cultural vectors, admin-0 countries	Natural Earth	Version 5	https://www.naturalearthdata.com
E13	As a megaport rises in Cameroon, a delicate coastal ecosystem ebbs (E. Toto)	Mongabay (secondary source)	5 Apr 2024	https://news.mongabay.com/2024/04/as-a-megaport-rises-in-cameroon-a-delicate-coastal-ecosystem-ebbs/
E15	Environmental and Social Review Summary 25978, Kribi (gas-fired power plant)	International Finance Corporation	2010	https://disclosures.ifc.org/project-detail/ESRS/25978/kribi
E16	Kribi Power Development Corporation, Environmental and Social Review Summary	Multilateral Investment Guarantee Agency	2014	https://www.miga.org/project/kribi-power-development-corporation
E17	SRTM 30 m digital surface model, accessed through the OpenTopoData API	NASA; OpenTopoData	Accessed 10 Oct 2026	https://www.opentopodata.org/datasets/srtm/

Biodiversity and protected areas (B)

ID	Title	Publisher	Date	URL
B01	Décret n° 2021/4804/PM portant création du Parc National Marin Manyange na Elombo-Campo	Prime Minister (FAOLEX copy)	9 Jul 2021	https://faolex.fao.org/docs/pdf/cmr220623.pdf
B02	Décret n° 2000/004/PM portant création du Parc National de Campo-Ma'an	Prime Minister (FAOLEX copy)	6 Jan 2000	https://faolex.fao.org/docs/pdf/cmr26727.pdf

ID	Title	Publisher	Date	URL
B03	Décret portant mutation de la Réserve de Faune de Douala-Edéa en Parc National	Services du Premier Ministre	2018	https://www.spm.gov.cm/site/sites/default/files/mutation%20de%20la%20reserve%20de%20la%20faune.pdf
B04	Le paysage culturel des chutes de la Lobé (Tentative List, ref. 6330)	UNESCO World Heritage Centre	2018	https://whc.unesco.org/fr/listesindicatives/6330/
B05	Unchecked development threatens Cameroon's Manyange Na Elombo-Campo marine park (L. Bongben)	Global Voices (secondary source)	22 Nov 2025	https://globalvoices.org/2025/11/22/unchecked-development-threatens-camerouns-manyange-na-elombo-campo-marine-park/
B06	Beach patrols for marine turtle nesting stock estimation in the Atlantic coastline of Ebodje, Cameroon (A. H. Nibam)	Rufford Foundation	2018	https://www.rufford.org/projects/abi-henry-nibam/beach-patrols-for-marine-turtle-nesting-stock-estimation-in-the-atlantic-coastline-of-ebodje-cameroon/
B07	Protecting biodiversity: the Port Authority of Kribi supports turtle conservation in Ebodje	Port Autonome de Kribi	16 Mar 2023	Cited by title and date
B08	Campo Ma'an National Park, Tropical Important Plant Areas factsheet CMNTIPA025 (B. Murphy and J. M. Onana)	Royal Botanic Gardens, Kew	Accessed 10 Oct 2026	https://tipas.kew.org/site/campo-maan-national-park/
B09	The IUCN Red List of Threatened Species	International Union for Conservation of Nature	Accessed Oct 2026	https://www.iucnredlist.org
B10	IUCN Red List assessments (version 2026-1): Gobush et al. 2021, <i>Loxodontia cyclotis</i> , e.T181007989A204404464; Maisels et al. 2018, <i>Gorilla gorilla gorilla</i> , e.T9406A136251508; Maisels et al. 2016, <i>Pan troglodytes troglodytes</i> , e.T15936A102332276; Pietersen et al. 2019, <i>Phataginus tricuspidis</i> , e.T12767A123586469; Nixon et al. 2019, <i>Smutsia gigantea</i> , e.T12762A123584478; BirdLife International 2018, <i>Psittacus erithacus</i> , e.T22724813A129879439; Keith Diagne 2015, <i>Trichechus senegalensis</i> , e.T22104A97168578; Wallace et al. 2013, <i>Dermochelys coriacea</i> , e.T6494A43526147; Abreu-Grobois and Plotkin 2008, <i>Lepidochelys olivacea</i> , e.T11534A3292503; Mortimer and Donnelly 2008, <i>Eretmochelys imbricata</i> , e.T8005A12881238; Wallace and Broderick 2025, <i>Chelonia mydas</i> , e.T4615A285108125	International Union for Conservation of Nature	2008 to 2025; accessed 10 Oct 2026	https://www.iucnredlist.org
B11	Parc national de Campo Ma'an (Tentative List, ref. 6312)	UNESCO World Heritage Centre	2 Feb 2018	https://whc.unesco.org/en/tentativelists/6312/
B12	Arctic seals threatened by climate change, birds decline globally: IUCN Red List (press release; green turtle moved from Endangered to Least Concern)	International Union for Conservation of Nature	10 Oct 2025	https://iucn.org/press-release/202510/arctic-seals-threatened-climate-change-birds-decline-globally-iucn-red-list

Social, health and cultural heritage (H)

ID	Title	Publisher	Date	URL
H01	Enquête Démographique et de Santé du Cameroun 2018 (EDSC-V), final report FR360	Institut National de la Statistique and ICF (DHS Program)	2020	https://dhsprogram.com/pubs/pdf/FR360/FR360.pdf

ID	Title	Publisher	Date	URL
H02	Répertoire actualisé des villages du Cameroun, 3e Recensement général de la population et de l'habitat (2005), volume IV, tome 07 (arrondissements of Kribi I and Kribi II)	Bureau Central des Recensements et des Études de Population (BUCREP); copy published by the Institut National de la Statistique	Census of 2005 (report n.d.)	https://ins-cameroun.cm/wp-content/uploads/2025/06/Repertoire_actualise_villages_cameroun1-3.pdf
H03	Le port de Kribi: force ou menace pour la proposition d'inscription des chutes de la Lobé sur la liste du patrimoine mondial (academic thesis)	Memoire Online	2021	https://www.memoireonline.com/12/21/12599/m_Le-port-de-Kribi-Force-ou-menace-pour-la-proposition-dinscription-des-chutes-de-la-lobe-sur20.html
H05	Bagyeli/Bakola documentation project: geography	DoBeS programme (Documentation of Endangered Languages), Max Planck Institute for Psycholinguistics	Accessed 11 Oct 2026	https://dobes.mpi.nl/?p=984
H06	Pipelines, parks, and people: Bagyeli document land use near Campo Ma'an National Park (J. Nelson and B. Tchoumba), Cultural Survival Quarterly 28-1	Cultural Survival	2004 (web edition 7 May 2010)	https://www.culturalsurvival.org/publications/cultural-survival-quarterly/pipelines-parks-and-people-bagyeli-document-land-usenear
H08	Cameroon inaugurates controversial dam despite local dissent (Y. Kenné)	Mongabay (secondary source)	10 Oct 2025	https://news.mongabay.com/2025/10/cameroon-inaugurates-controversial-dam-despite-local-dissent/
H09	Cameroon: Lobé-Kribi iron ore project poses social and environmental challenges, warns NGO (title shortened)	Business and Human Rights Resource Centre	Feb and Dec 2025	https://www.business-humanrights.org/en/latest-news/cameroon-lob%C3%A9-kribi-iron-ore-project-led-by-chinas-state-owned-sinosteel-poses-social-and-environmental-challenges-warns-ngo/
H10	Cameroun: bouclage du 4e RGPH, 22,7 millions d'habitants recensés (provisional field count)	Journal du Cameroun	5 Oct 2026	https://fr.journalducameroun.com/cameroun-bouclage-du-4e-rgph-227-millions-dhabitants-recenses-en-mode-digital/
H11	The Indigenous World 2026, 40th edition (general editor D. Mamo), chapter "Cameroon" (H. Hamman Boubba), pp. 43 to 50; the figures cited are on p. 44; ISBN 978-87-93961-87-6	International Work Group for Indigenous Affairs (IWGIA), Copenhagen	Apr 2026 (accessed 11 Oct 2026)	https://www.iwgia.org/images/publications/indigenous-world/indigenous-world-2026.pdf
H12	A grammar of Gyeli (N. Grimm), Comprehensive Grammar Library 2, publisher's synopsis	Language Science Press, Berlin (open access, peer-reviewed)	2021 (accessed 11 Oct 2026)	https://langsci-press.org/catalog/book/298

Kribi port, industrial zone and infrastructure (K)

ID	Title	Publisher	Date	URL
K02	Zone industrielo-portuaire de Kribi (KPIZ): jusqu'à +8 points de croissance et 150 000 emplois attendus sur 15 ans	Investir au Cameroun	4 Mar 2026	https://www.investiraucameroun.com/gestion-publique/0403-23163-zone-industriale-portuaire-de-kribi-kpiz-jusqu-a-8-points-de-croissance-et-150-000-emplois-attendus-sur-15-ans
K03	Cameroon launches \$860m Kribi industrial zone to process raw materials locally; PAK, AGL, Arise IIP and Belmont launch €795m Kribi Port Industrial Zone	Ecofin Agency; Business in Cameroon	27 Feb 2026	https://www.ecofinagency.com/news/2702-53326-cameroon-launches-860m-kribi-industrial-zone-to-process-raw-materials-locally ; https://www.businessincameroon.com/public-management/2202-15797-pak-agl-arise-iip-and-belmont-launch-795m-kribi-port-industrial-zone
K04	Cameroon: African Development Bank Group supports development of integrated industrial zone at the Port of Kribi	African Development Bank (via AllAfrica)	2 Mar 2026	https://allafrica.com/stories/202603100682.html
K05	Le PAK tient enfin son titre foncier (presidential decree of 23 June 2023 on the port domain)	Port Autonome de Kribi	26 Jun 2023	Cited by title and date

ID	Title	Publisher	Date	URL
K06	Présentation du Port Autonome de Kribi (brochure)	Port Autonome de Kribi	Oct 2018	Cited by title and date
K07	Cameroon's Kribi port triples capacity with launch of second container terminal	Business in Cameroon	May 2025	https://www.businessincameroon.com/infrastructures/1205-14650-cameroon-s-kribi-port-triples-capacity-with-launch-of-second-container-terminal
K08	Port de Kribi: la performance au service de la Nation (op-ed by the Director General of the port)	Port Autonome de Kribi	21 Apr 2026	Cited by title and date
K09	Bilan et perspectives: les voyants sont au vert	Port Autonome de Kribi	13 Mar 2025	Cited by title and date
K10	La zone industrialo-portuaire de Kribi rayonne avec l'inauguration de la cimenterie CIMPOR	Port Autonome de Kribi	19 Jul 2024	Cited by title and date
K12	Énergie et infrastructures: un nouvel élan pour la compétitivité du Port de Kribi	Port Autonome de Kribi	19 Aug 2026	Cited by title and date
K13	Le port de Kribi engage 3,5 milliards FCFA pour préparer l'arrivée de nouveaux industriels	Ecomatin	11 May 2026	https://ecomatin.net/cameroon-le-port-de-kribi-engage-35-milliards-fcfa-pour-preparer-larrivee-de-nouveaux-industriels
K19	Kribi Deep Sea Port, investors partner to construct 125-million-tonne mineral terminal worth \$2 billion	Business in Cameroon	5 Nov 2025	https://www.businessincameroon.com/transport/0511-15300-kribi-deep-sea-port-investors-partner-to-construct-125-million-tonne-mineral-terminal-worth-2-billion
K20	Ligne ferroviaire Édéa, Kribi, Lolabé, Campo: une nouvelle étape pour la connectivité du Port de Kribi	Port Autonome de Kribi	4 Jun 2026	Cited by title and date
K21	Chemin de fer Mbalam-Kribi et terminal minéralier: un tournant pour l'intégration régionale	Port Autonome de Kribi	25 Feb 2022	Cited by title and date
K24	Visites des projets et autorisations d'occupation temporaire: le PAK au cœur du développement industriel (acronym in the original title expanded)	Port Autonome de Kribi	28 Aug 2025	Cited by title and date
K25	Avis à manifestation d'intérêt n° 013/AMI/PAK/2026 (statistics on requests for space and authorisations granted)	Agence de Régulation des Marchés Publics (ARMP)	30 Jan 2026	https://www.arpmp.cm/details?type_publication=AMI&id_publication=6073

Project public record and planning basis (X)

ID	Title	Publisher	Date	URL
X01	Kribi: le Premier ministre, chef du gouvernement est là (foundation stone of the Kribi steel complex)	Cameroon Tribune	30 Dec 2024	https://cameroon-tribune.cm/article.html/68499/fr.html/details_2
X02	Industrialisation: la voie royale de l'émergence (1 Mtpa capacity)	Cameroon Tribune	2 Jan 2025	https://cameroon-tribune.cm/article.html/68558/fr.html/details_2
X03	Cameroon Steel reference configuration RC-1 (planning estimate): planned capacities, phases, indicative schedule and benchmark-based estimates, edition of 10 October 2026	Cameroon Steel	10 Oct 2026	Not published separately; the planned and indicative figures used are reproduced in this paper (Annex A) and in the data files of its web edition

ANNEX D

DATA TABLES

This annex gives, for every chart, map and diagram in this paper, the values plotted or the content shown, with their units, status and source. It makes each exhibit reproducible, and readable without the graphic. The same data are published as machine-readable files with the web edition. Values are reproduced exactly as plotted; where a chart rounds a value, the table gives the unrounded figure, except for distances, which are given only in bands (Table D.1).

D.1 Executive summary and Chapter 1: setting

Table D.1 Reference table of receptor distances, quoted throughout this paper (data for Figure ES.1)

Receptor	Distance from the centre of the indicative area	Within about 7 km
Boussibelika stream (nearest mapped watercourse)	2 to 3 km	Yes
Coastline at the port frontage	3 to 4 km	Yes
Boussibelika village (nearest mapped settlement)	3 to 4 km	Yes
Port Autonome de Kribi industrial area	3 to 4 km	Yes
Mbodé village	4 to 5 km	Yes
Mboro village	4 to 5 km	Yes
Lobé River, main channel (nearest mapped segment)	4 to 5 km	Yes
Lolabé village	6 to 7 km	Yes
Manyange na Elombo-Campo Marine National Park	About 12 km	No
Chutes de la Lobé (UNESCO Tentative List)	About 18 km	No
Kribi town centre	About 25 km	No
Campo-Ma'an National Park	About 29 km	No
Douala-Edéa National Park	About 55 km	No

Source: OpenStreetMap, Overpass extract base 24 July 2026, queried 10 October 2026 [E11]; Décret 2021/4804/PM boundary points [B01]; UNESCO Tentative List ref. 6330 [B04]. Distances are measured from the centre of the generalised indicative area (9.90° E, 2.72° N) and given in whole-kilometre bands up to 10 km, rounded to the nearest kilometre beyond. For the Lobé, the band refers to the nearest mapped segment of the main channel; other mapped segments of the main stem lie up to about 7 km away. Every receptor distance quoted in the text is taken from this table. Status: derived.

Table D.2 Data for Figure 1.1: content of the regional map

Element	Content or value
Layers shown	Coastline, rivers, streams, trunk roads, industrial land use, protected areas, villages
Steel complex marker	Generalised circle of radius 1.5 km around the centre of the indicative area, not the parcel boundary
Marine national park, distance	About 12 km
Chutes de la Lobé, distance	About 18 km
Campo-Ma'an National Park, distance	About 29 km
Reference ring	12 km from the centre of the indicative area

Source: OpenStreetMap contributors (ODbL), Overpass extract base 24 July 2026 [E11]; Natural Earth 1:50m admin-0 [E12]; protected-area boundaries as mapped in OpenStreetMap, to be checked against the World Database on Protected Areas and the creation decrees [B01][B02]. Status: derived.

Table D.3 Data for Figure 1.2: mean monthly rainfall at Kribi station, 1937 to 1976

Month	Mean rainfall, mm
January	92
February	118
March	201
April	261
May	343
June	274
July	112
August	231
September	502
October	492
November	201
December	94
Sum of the monthly means	2,921

Source: J.-C. Olivry, Monographie du Nyong et des fleuves côtiers, ORSTOM, 1979, Kribi station, homogenised record [E01]. Status: sourced. The monthly means as published sum to about 2,921 mm; the homogenised annual mean is 2,835.8 mm.

Table D.4 Data for Figure 1.3: shoreline change on the Kribi coast

Location	Period	Change, m per year	Direction
Kribi coast, average	1973 to 2000	+0.4	Accretion
Kribi coast, average	2000 to 2015	-0.9	Retreat
Kribi coast, average	2015 to 2020	-2.0	Retreat
Updrift of the port dyke	Since construction	+15 or more	Accretion
Lobé falls	2015 to 2020	-32	Retreat
Near Lolabé	2013 to 2017	-45 to -70	Retreat

Source: Fendoung, Tchindjang and Hubert-Ferrari, Land 11:1557, 2022 [E02]; Perabi et al., Urban Resilience and Sustainability 3(4), 2025 [E03]. Negative values are retreat. Status: sourced.

D.2 Chapters 2 and 3: procedure and standards

Table D.5 Data for Figure 2.1: indicative sequence of a detailed EIES

Step	Start, month	Duration, months	Type
Scoping and terms of reference (ToR) opinion	0.0	1.0	Statutory administrative step
Weather station and air-quality baseline	0.0	12.0	Seasonal field baseline
Water, ecology and social baselines (wet and dry seasons)	1.0	11.0	Seasonal field baseline
Public consultations during the study	3.0	9.0	Consultation or hearing
Impact assessment, ESMP drafting, report filing	10.0	4.0	Assessment and reporting
Admissibility and joint field verification	14.0	0.7	Statutory administrative step
Public hearings and commission report	14.7	1.5	Consultation or hearing
Interministerial committee (CIE) opinion	16.2	0.7	Statutory administrative step
Ministerial decision: certificate (CCE)	16.9	0.7	Statutory administrative step

Source: Décret 2013/0171/PM, articles 13, 18 and 20 to 26 [L02]; MINEPDED procedure manual, 120 days from filing to decision [L10]; Cameroon Steel indicative sequence. Status: derived. Statutory deadlines: sector ministry ToR opinion 10 days; MINEPDED ToR opinion 20 days (deemed acceptable after 30 days of silence); admissibility 20 days; hearings commission about 30 days; CIE 20 days; decision 20 days.

Table D.6 Data for Figure 3.1: content of the standards diagram

Layer	Content
Cameroonian law	Loi 96/12; Décret 2013/0171/PM; Arrêté 00001/MINEPDED (2016); Loi 98/015; Loi 98/005; sector decrees of 2011 and 2012
International standards	IFC Performance Standards 1 to 8; WBG EHS Guidelines (General, and Integrated Steel Mills); WHO air quality guidelines 2021
Lender frameworks	Equator Principles 4; AfDB Integrated Safeguards System (2023); EU BAT as a benchmark
Combination rule	For each parameter, the more stringent requirement applies
Where the standard is applied	Design criteria and procurement specifications; ESIA, ESMP and permit conditions (CCE, classified establishment); monitoring, key performance indicators and public disclosure

Source: Loi 96/12 [L01]; Décret 2013/0171/PM [L02]; IFC Performance Standards (2012) [G01]; WBG EHS Guidelines (2007) [G03][G04]; EP4 (2020) [G05]; AfDB ISS (2023) [G06]; WHO AQG (2021) [G09]. Status: illustrative.

Table D.7 Data for Figure 3.2: indicative Scope 1 and 2 emissions by phase against lender thresholds

Phase or threshold	Scope 1, tCO ₂ e/ yr	Scope 2, tCO ₂ e/ yr	Total, tCO ₂ e/ yr
Phase 1 (0.3 Mtpa)	31,915	65,304	97,219
Phases 1 and 2 (0.5 Mtpa)	67,777	95,281	163,058
Full design (1 Mtpa)	157,434	170,221	327,655
Threshold: IFC PS3, quantify annually			25,000
Threshold: EP4, climate risk assessment and annual public reporting			100,000

Source: Cameroon Steel planning model of 10 October 2026 (planned capacities multiplied by IFC and worldsteel benchmarks; grid electricity at 226 gCO₂/kWh, Our World in Data and Ember, 2024) [X03][T04]; IFC PS3 (2012) [G01]; Equator Principles 4 (2020) [G05]. Status: derived. Indicative planning values, not measured. Upstream emissions of imported DRI/HBI are excluded.

D.3 Chapter 4: air quality

Table D.8 Data for Figure 4.1: modelled background particulate matter against WHO 2021 levels

Level	PM _{2.5} , annual mean, µg/m ³	PM ₁₀ , annual mean, µg/m ³
Interim target 1 (IT-1)	35	70
Interim target 2 (IT-2)	25	50
Interim target 3 (IT-3)	15	30
Interim target 4 (IT-4)	10	20
Air quality guideline (AQG)	5	15
Modelled background at Kribi	10.0	15.8

Source: WHO global air quality guidelines, 22 September 2021 [G09]; Copernicus CAMS global reanalysis via Open-Meteo, grid cell nearest the Kribi port, 2024 to 2025 (modelled, not measured) [E05]. Status: sourced. Modelled values must be confirmed by at least 12 months of on-site monitoring.

Table D.9 Data for Figure 4.2: wind direction frequencies at the site area, 2011 to 2020

Direction the wind blows from	Share of hours,%
South-west	44.7
South	27.2
West	14.9
South-east	7.2
Other sectors	4.6
Calm	1.4
Total	100.0

Source: ECMWF ERA5 hourly reanalysis via Open-Meteo, 2011 to 2020 (modelled) [E04]; PAK Port Guide, August 2020, for the observed south to south-west predominance [E07]. Status: sourced. By day (11:00 to 18:00), 92% of winds are from the south-west or west (sea breeze); at night a south to south-east land-breeze component appears.

Table D.10 Data for Figure 4.3: typical EAF off-gas treatment train

Step	Unit	Purpose
1	Electric arc furnace (scrap, DRI/HBI)	Scrap checks exclude PVC, oil and sealed containers
2	Primary capture (4th hole) and secondary canopy	Doghouse enclosure for noise and fugitive fume
3	Post-combustion chamber (CO burn-out)	Destroys CO and organic precursors
4	Rapid quench (avoids dioxin reformation)	Cools gas fast through the 450 to 200 °C window
5	Activated carbon and lime injection	Adsorbs PCDD/F and mercury
6	Bag filter and stack with CEMS	Dust to a sealed silo (hazardous waste)
Design objective		Dust below 5 mg/Nm ³ ; PCDD/F below 0.1 ng I-TEQ/Nm ³ (EU BAT levels)

Source: IFC EHS Guidelines for Integrated Steel Mills (2007) [G03]; Commission Implementing Decision 2012/135/EU (BAT 88 to 89) [G07]; Cameroon Steel design objectives (planned). Status: illustrative.

D.4 Chapter 5: water

Table D.11 Data for Figure 5.1: fresh-water intensity benchmarks and the planned target

Benchmark	Fresh water, m ³ per tonne of steel
worldsteel 2024 average, withdrawal	8.5
IFC benchmark, EAF melt shop only	3.0
worldsteel 2024 average, consumption	2.3
Cameroon Steel design target (planned)	2.0
EAF rebar mill, Malaysia (IFC disclosure 2026)	1.2

Source: worldsteel Sustainability Indicators 2025 (2024 data); IFC EHS Guidelines for Integrated Steel Mills (2007), Table 3; IFC ESRS 51259, Estee loan, 6 January 2026: 2,000 m³/d make-up for 600,000 t/yr (derived, 365 days); Cameroon Steel planning basis (assumed 2.0 m³/t, range 1.5 to 3.0) [T01][G03][T08][X03]. Status: derived.

Table D.12 Data for Figure 5.2: one-day rainfall by return period at Kribi station

Return period	One-day rainfall, mm
2 years	144
10 years	193
50 years	243
100 years	264
Largest observed day	205.3

Source: Olivry, ORSTOM, 1979, Pearson III fit on 33 years of Kribi station data [E01]. Status: sourced. Short-duration intensity-duration-frequency curves are a data gap; reanalysis underestimates point extremes.

D.5 Chapter 6: residues and by-products

Table D.13 Data for Figure 6.1: indicative main process residues by phase

Phase	EAF slag, t/yr	Mill scale, t/yr	EAF dust, t/yr	Total, t/yr	Slag share
Phase 1 (0.3 Mtpa)	44,681	6,000	4,787	55,468	81%
Phases 1 and 2 (0.5 Mtpa)	74,468	10,000	7,979	92,447	81%
Full design (1 Mtpa)	148,936	20,000	15,957	184,893	81%

Source: Cameroon Steel planning model of 10 October 2026: EAF slag 140 kg/t, EAF dust 15 kg/t, mill scale 20 kg/t (assumed range 15 to 25) [X03]; IFC solid-waste benchmark [G03]; dust planning range [X03][G17]. Status: derived. Totals and shares are Cameroon Steel calculations from the plotted values.

Table D.14 Data for Figure 6.2: valorisation pathways for the main residues

Residue	First-choice outlet
EAF slag	Road base and asphalt aggregate (after ageing and leach tests)
Ladle slag	Cement and soil-stabilisation trials (to be qualified)
EAF dust	Zinc recovery (Waelz kiln), export under Basel and Bamako rules
Mill scale and sludge	Recharge to the EAF or briquetting; sale as iron units
Refractories	Supplier take-back and recycling; secure cell residue

Source: IFC EHS Guidelines for Integrated Steel Mills (2007); worldsteel, steel industry co-products (accessed October 2026) [G03][T02]; Décret 2012/2809/PM [L06]; Basel and Bamako Conventions [G15]. Status: illustrative. EAF dust is hazardous and is never landfilled unstabilised.

D.6 Chapter 7: biodiversity

Table D.15 Data for Figure 7.1: preliminary critical habitat screening by feature and IFC PS6 criterion

Feature	1. CR/EN species	2. Endemic or restricted-range	3. Migratory or congregatory	4. Threatened ecosystems	5. Evolutionary processes
Steel site area (farm-forest mosaic)	Possible	Unlikely	Unlikely	Unlikely	Unlikely
Small coastal streams (Boussibelika, Lobé tributaries)	Unlikely	Candidate	Unlikely	Possible	Unlikely
Lobé and Lokoundjé estuaries	Possible	Unlikely	Possible	Candidate	Unlikely
Marine park and nesting beaches	Candidate	Unlikely	Likely	Candidate	Unlikely
Campo-Ma'an forest block	Likely	Possible	Unlikely	Candidate	Possible

Source: IFC Performance Standard 6 and Guidance Note 6 (2019) [G01][G02]; desk baseline screening, with IUCN statuses to be verified on the Red List at the time of the ESIA; Décrets 2000/004/PM and 2021/4804/PM [B01][B02]. Status: derived. Qualitative desk screening, not a critical habitat assessment. CR: Critically Endangered; EN: Endangered.

Table D.16 Data for Figure 7.2: the mitigation hierarchy applied to the steel complex

Step	Measures
Avoid	Keep stream corridors, valley forest and any mature-forest remnant out of the footprint; no discharge to the Lobé basin without study
Minimise	Phase clearing outside breeding peaks; shielded amber lighting; enclosed stockyards; bushmeat ban; noise controls at night
Restore	Native-species green belt and riparian replanting; soil stockpiles for reuse; progressive rehabilitation of laydown areas
Offset or contribute	Only for residual loss: measurable support to marine-park or Campo-Ma'an management, designed with conservators and communities

Source: IFC Performance Standards 1 and 6 (2012) [G01]; Guidance Note 6 (2019) [G02]; Cameroon Steel commitments (planned). Status: illustrative.

D.7 Chapter 8: people and communities

Table D.17 Data for Figure 8.1: selected health indicators, South Region and Cameroon

Indicator	South Region	Cameroon
HIV prevalence, adults 15 to 49, %	5.8	2.7
Malaria rapid-test positivity, children 6 to 59 months, %	33.4	24.0

Source: INS and ICF, Enquête Démographique et de Santé du Cameroun 2018 (EDSC-V), final report FR360, 2020 [H01]. Status: sourced. The national HIV value is taken from the report text and is to be verified to the decimal.

Table D.18 Data for Figure 8.2: stakeholder engagement sequence and FPIC track

Step	Content
1. Map stakeholders	Census, customary-use mapping, Bagyeli camps
2. Disclose early	Plain language; French, English and local languages
3. Consult during the study	Programme approved by MINEPDED; minutes signed
4. Hearings on the finished EIES	Ad hoc commission; public record
5. Monitor together	Participatory monitoring; annual public report
FPIC track	Triggered under IFC PS7 by impacts on lands and natural resources under customary use, by relocation, or by significant impacts on critical cultural heritage
Grievance mechanism	Open before any field mobilisation; free, accessible, with an anonymous option

Source: Décret 2013/0171/PM, articles 20 to 22 [L02]; IFC Performance Standards 1 and 7 (2012) [G01]; United Nations Declaration on the Rights of Indigenous Peoples (2007) [G14]; Cameroon Steel commitments (planned). Status: illustrative.

D.8 Chapter 9: lessons from Kribi

Table D.19 Data for Figure 9.1: milestones in the Kribi port land and protected-area history

Year	Event
2000	Campo-Ma'an National Park created (pipeline offset)
2009	Port declared of public utility (Arrêté 156/MINDAF)
2010	Compensation decree (Décret 2010/3312/PM)
2012	Press controversy over compensation claims
2018	First container terminal opens
2021	Marine national park created
2023	Port domain fixed at about 15,000 ha
2024	Steel complex foundation stone (30 December)
2025	Second container terminal (9 May)
2026	KPIZ S.A. launched (26 February), 4,000 ha

Source: Décret 2000/004/PM [B02]; Arrêté 156/MINDAF (6 February 2009) and Décret 2010/3312/PM as cited in a 2021 thesis [H03]; press reports from about 2012, not verified against primary records; Décret 2021/4804/PM [B01]; PAK, 26 June 2023 [K05]; Cameroon Tribune, 30 December 2024 [X01]; Business in Cameroon, May 2025 [K07]; KPIZ launch, February 2026 [K02]. Status: sourced.

D.9 Chapter 10: commitments

Table D.20 Data for Figure 10.1: indicative sequence of environmental and social workstreams

Workstream	Start, month	Duration, months	End, month	Type
Stakeholder engagement plan and grievance mechanism	0	36	36	Engagement
Indigenous Peoples screening; FPIC if triggered	1	10	11	Engagement
Land legacy audit (PS5) and census	1	5	6	Engagement
Weather and air-quality station, 12 months minimum	0	12	12	Field baseline
Two-season water, ecology, noise, soil baselines	1	12	13	Field baseline
ToR filed, EIES and ESMP prepared	0	15	15	Study
Hearings, CIE opinion, certificate (CCE)	15	4	19	Approval
Classified-establishment authorisation (MINMIDT)	13	5	18	Approval
Construction ESMP, contractor management	18	18	36	Construction phase
Independent E&S monitoring, published reports	18	18	36	Construction phase

Source: Cameroon Steel objectives (planned); Décret 2013/0171/PM, article 3(3), no works before approval [L02]; IFC PS1 (2012) [G01]. Status: assumed. Months are counted from mobilisation of the programme; they are planning objectives, not commitments to dates. End months are Cameroon Steel calculations from the plotted values.

Table D.21 Data for Figure 10.2: monitoring, verification and disclosure architecture

Component	Content
Plant monitoring	CEMS, effluent, waste register, occupational health and safety data
Community monitoring	Participatory monitoring and grievance log
Independent verification	Independent E&S consultant and accredited laboratory
Regulators	MINEPDED half-yearly ESMP reports; MINMIDT; PAK and KPIZ
Public disclosure	Annual E&S and GHG report, monitoring data online, grievance statistics
Corrective action plan	Owners and deadlines, tracked to closure

Source: Décret 2013/0171/PM, articles 27 to 30 [L02]; Arrêté 0010/MINEP (2013) [L12]; IFC PS1 (2012) [G01]; EP4 (2020) [G05]; Cameroon Steel commitments (planned). Status: illustrative.

D.10 Chapter 11: evidence gaps

Table D.22 Data for Figure 11.1: indicative baseline survey calendar (● = survey month)

Survey	J	F	M	A	M	J	J	A	S	O	N	D
On-site weather station	●	●	●	●	●	●	●	●	●	●	●	●
Ambient air (PM10, PM2.5, gases)	●	●	●	●	●	●	●	●	●	●	●	●
Noise (two campaigns)		●								●		
Surface water (four campaigns)	●			●			●			●		
Groundwater (piezometers)	●			●			●			●		
Flora and vegetation plots	●	●								●	●	
Terrestrial fauna (camera traps)	●	●	●						●	●	●	
Fish and macroinvertebrates		●								●		
Sea-turtle nesting (with park staff)	●	●	●							●	●	●
Topography and geotechnics	●	●										●
Census, livelihoods, land audit			●	●			●	●				
Cultural heritage walkover	●	●										●

Source: Desk ESIA baseline scoping, October 2026; Olivry (1979) for seasons [E01]; nesting season to be confirmed with the marine-park authority. Status: assumed. Columns run from January to December. Seasons shaded in the chart: dry, December to February; rains, March to June, August and November; short dry spell, July; main wet season, September and October.

CAMEROON STEEL

FROM MINERAL RESOURCE TO INDUSTRIAL VALUE

Cameroon Steel is developing a phased steel complex at Mboro, in the Kribi industrial-port zone, to turn Cameroonian resources into construction steel for the region. This paper is published for information and does not constitute an offer or a commitment.