

WHITE PAPER 08 · CAMEROON STEEL

CAMEROON CAN STAFF ITS STEEL INDUSTRY IF TRAINING STARTS BEFORE THE FURNACE DOES

Skills for steel: jobs, training and local content in Cameroon's steel industry, with an illustrative workforce plan for a phased electric arc furnace works at Kribi.

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What this paper is not. It is not a recruitment notice, a feasibility study, an offer or a commitment. Workforce figures for the Mboro project are planning values that will change as engineering, procurement and phasing are confirmed.

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EXECUTIVE SUMMARY

Cameroon can staff a modern steel industry with its own people, but only if the training starts before the furnace does. A phased electric arc furnace (EAF) steelworks at Kribi would create about 500 direct, formal and technical jobs in its first phase (planned) and 900 to 1,300 at its full design capacity of 1 Mtpa (indicative), with a supply chain that supports one to several further jobs for each of them [S11][S01]. Cameroon has the young people, the engineering schools, the institutes of technology, the vocational centres and the legal framework to fill those jobs. What it lacks is steelmaking content in its curricula, industrial-scale practice, recognised certification for heavy-industry trades, and a mechanism that makes employers, schools and equipment suppliers train together. Because a melter takes two to three years to form and a shift manager closer to ten, those gaps must start to close at least three years before first steel, planned for the second half of 2030, with experienced supervisors recruited or seconded while Cameroonian successors are formed.

~500

Direct jobs, Phase 1 (0.3 Mtpa nameplate; planned) [S11]

900 to 1,300

Direct jobs at the full 1 Mtpa works (indicative) [S11]

~730 k

Reaching working age each year (derived, WDI 2025); about 550k on the provisional 2026 census [S14][S19]

5.1 %

Share of workers in a formal private-sector job, 2021 [S12]

24 %

Firms offering formal training, 2024, down from 38% in 2016 [S15]

Ten findings

- 01

A steelworks creates few jobs per tonne, but good ones. Direct employment ranges from about 500 to 5,000 jobs per million tonnes across published cases; Cameroon Steel's planning values, about 1,670 per million tonnes in the first phase and about 1,100 at full capacity, sit in the middle of that range. Almost all are formal, salaried and technical, in a country where only 5.1% of workers hold a formal private-sector job [S02][S03][S05][S11][S12].
- 02

The jobs span eleven occupational families and every level of technical education. About 60% of the planned first-phase workforce are operators, 20% technicians, 10% engineers and 10% administrative and support staff; about a quarter of all posts are in maintenance, automation, quality and safety functions whose skills transfer to the rest of the Kribi industrial cluster [S11].
- 03

Cameroon's constraint is experience, not people. About 730,000 young people reach working age every year on World Bank estimates, or about 550,000 if the provisional 2026 census count of 22.7 million is confirmed, while about 197,000 new jobs were recorded in 2025. Unemployment rises with education, to 17.6% among graduates and 28.2% among women graduates [S14][S19][S17][S12]. Chapter 2 sets out the three explanations usually advanced: graduates queue for scarce formal, salaried jobs; much higher edu-

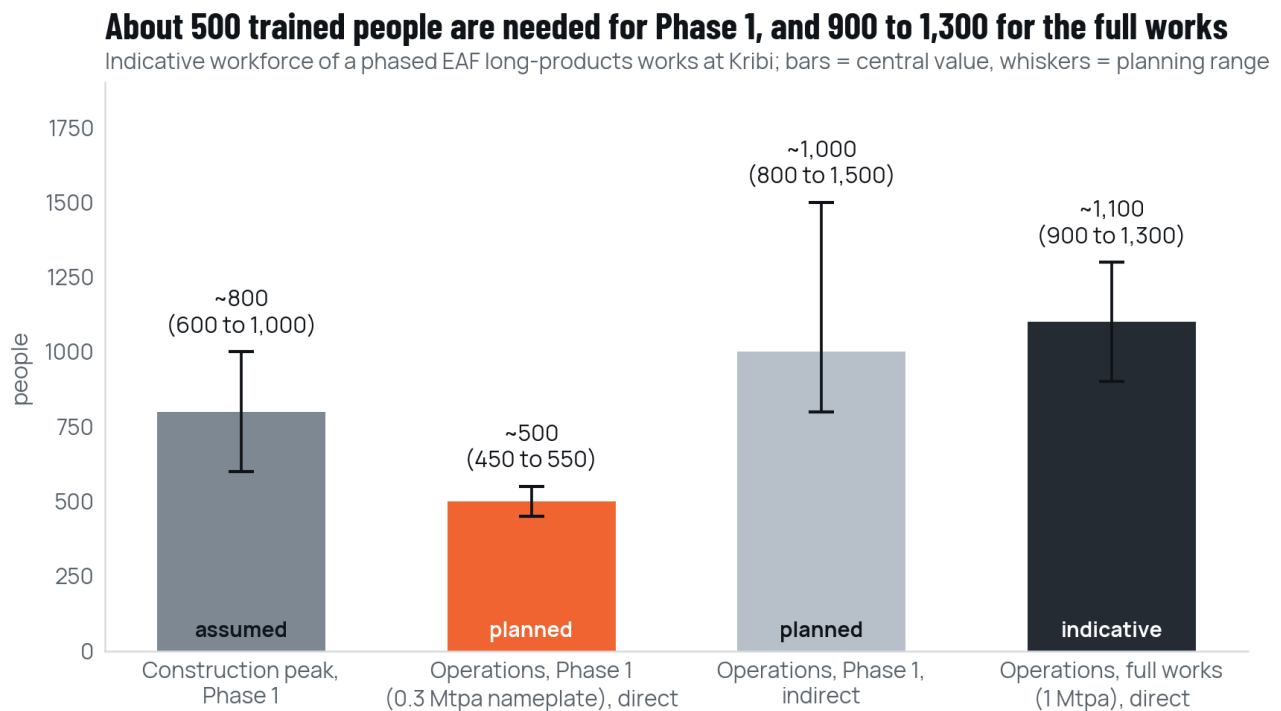
cation is general rather than technical; and links between schools and employers are weak. An employer can act on all three by offering formal technical jobs in which schooling becomes competence.

-
- 04 The schools exist; steelmaking content, workshops and industry links do not.** ENSPY (École nationale supérieure polytechnique de Yaoundé), the University of Douala's engineering school and institute of technology, the University of Ngaoundéré's institute and mining schools, the new University of Ebolowa and three vocational centres of excellence cover mechanical, electrical, chemical and maintenance disciplines, most within 260 km of Kribi. No programme dedicated to steelmaking has been identified, and 2,694 vocational trainers lack a professional diploma [S18][S21][S22][S23][S24][S28].
-
- 05 The critical gaps are in the melt shop, the caster and supervision.** Furnace and casting operation and the supervision of a 24-hour process have almost no local base and take two to ten years to form; maintenance, welding and electrical skills exist but need industrial upgrading and, above all, certification.
-
- 06 Certification is the cheapest lever.** International standards exist for welders (ISO 9606-1) and safety management (ISO 45001), and Law No. 2018/010 provides for apprenticeship, work-linked training and validation of experience. What is missing is a set of steel-occupation competence standards written by employers with the ministry, and a centre to test against them [S59][S58][S26].
-
- 07 Training models that work combine school, plant and supplier, and start early.** Germany's dual system, the corporate academies of OCP, Dangote and Tata Steel, vendor training written into equipment contracts and process simulators all point the same way: employers lead, schools certify, suppliers transfer know-how, and the pipeline opens years before production [S48][S42][S47][S43][S50].
-
- 08 Cameroon's law now ties incentives to local skills and suppliers, but preference is not capability.** The 2025 investment-incentives ordinance requires a local-skills, local-hiring and local-subcontracting programme and allows commitments to be verified. Local suppliers will qualify only through structured development. Dangote Cement's local procurement share rose from 72% to 82% between 2023 and 2025, a period in which it reports investing in supplier development; the effect of exchange-rate changes on the shares is not separated [S36][S42].
-
- 09 Women are the largest untapped pool of technical talent.** Women are 43.9% of Cameroon's labour force but about 11% of steel workforces worldwide. Reaching them requires a lawful route past the 1992 Labour Code's ban on women's night work in industry, which mirrors ILO Convention No. 89, still in force for Cameroon; a pipeline through schools and scholarships; and facilities and conduct rules designed for a mixed workforce [S14][S51][S33][S69][S73].
-
- 10 Safety must be the first skill taught.** In 2021, 15.4% of workers in the South Region reported a work accident in the previous year and only 6.6% were insured; the best steel companies run below one lost-time injury per million hours. Closing that gap requires certified safety-critical authorisations, a common safety passport for the zone and supervisors who lead in the field [S12][S51].
-

The opportunity: durable, technical jobs and a cluster around them

Cameroon Steel is developing a steel complex at Mboro, in the Kribi industrial-port zone, with a design capacity of 1 Mtpa built in phases; its foundation stone was laid on 30 December 2024 by the Prime Minister, representing the Head of State [S09][S10]. The first phase, of 0.3 Mtpa nameplate capacity (expected sustained output 270,000 to 300,000 t a year), centres on an EAF melt shop that makes billets, with output flexible between rolled

products (wire rod and reinforcing bar) and merchant billets for Cameroon's re-rollers, which import about 60% of their charge (161,000 t of billets in 2023). Because rebar capacity is already well above demand, Phase 1 tonnage is aimed at replacing imports and at exports within CEMAC (White papers 04 and 09) [S11][S08][S76]. On the RC-1.1 schedule, financing is planned for 2028, works from the first quarter of 2029, first heat in the second half of 2030 and ramp-up in 2031 [S11]. The company's public planning figures put the first-phase operating workforce at about 500 direct jobs, with about 1,000 indirect jobs, and the full works at 900 to 1,300 direct jobs; the construction of the first phase is expected to employ 600 to 1,000 workers at its peak [S11]. Figure ES.1 summarises these values with their status.



ILLUSTRATIVE Figure ES.1. Indicative workforce of a phased EAF long-products works at Kribi, by phase. Bars show central planning values, whiskers the planning range; each bar is labelled with its status.

Source: Cameroon Steel reference configuration RC-1 (planning estimate), edition 10 October 2026 (RC-1.1) [S11].

These numbers are modest against a labour force of about 11.5 million [S14]. The value of a steelworks for Cameroon's labour market lies elsewhere: in the kind of jobs it creates, in the skills it leaves, and in the industrial cluster it anchors. A steelworks needs melters, casters and mill operators, but it also needs hydraulics and electrical technicians, automation specialists, welders, laboratory analysts, safety officers and supervisors, whose skills are portable across cement, aluminium, energy, ports and agro-industry. The Kribi Port Industrial Zone (KPIZ), created in February 2026, plans clusters in steel linked to mineral exports, wood, petrochemicals, agro-industry and construction materials and expects up to 150,000 direct and indirect jobs over 15 years [S38]. A steel skills pipeline is, in practice, a cluster skills pipeline.

The constraint: experience, not candidates

Cameroon's labour market has an abundance of young candidates with schooling and a scarcity of people with industrial experience. Only 5.1% of workers are employed in the formal private sector, 86.6% of jobs are informal, and of the quarter of adults who have followed vocational training, 39.3% learned on the job, mostly in small workshops [S12]. Employers train less than they did: the share of firms offering formal training fell from 37.6% in 2016 to 24.0% in 2024 [S15]. The result is a self-perpetuating gap: formal firms do not train, so newcomers cannot recruit experienced workers, so they must train from scratch.

The South Region, which hosts Kribi, has the highest labour-force participation of any survey region and an above-average share of adults with vocational training (32.2% against 25.0% nationally), but also the highest rates of work accidents and occupational disease, and among the lowest insurance cover [S12]. Its new university at Ebolowa, the polytechnic annex at Meyomessala and the vocational centre of excellence at Sangmélina give it, for the first time, a local base of technical education on which an industrial employer can build [S23][S18][S24].

THE BINDING CONSTRAINT IS NOT THE NUMBER OF YOUNG CAMEROONIANS WITH SCHOOLING; IT IS THE ABSENCE OF FORMAL INDUSTRIAL JOBS IN WHICH THEY COULD HAVE LEARNED.

Cameroon Steel

What must change

The paper's analysis leads to five shifts in how industrial skills are built in Cameroon.

From school-led to employer-led training. Employers should define competences, provide tutors and equipment and hire graduates; schools should teach and certify. Law No. 2018/010 already provides the legal basis for apprenticeship and work-linked training [S26]; a phased steelworks is the kind of employer, large and long-lived, that can anchor it.

From diplomas to certified competence. Steel-occupation competence standards, international certificates for welders and safety-critical tasks, and vendor certificates for equipment operation should sit on top of national diplomas, so that competence is visible and portable.

From training after hiring to training before production. The pipeline must open about three years before first steel, which for a first heat in the second half of 2030 means 2027, before financial close: engineers recruited first and placed in operating plants, a dual apprenticeship for maintenance and mill trades started 30 months ahead, operators trained on simulators from 18 months ahead, and vendor training specified, measured and paid for in every equipment contract.

From preference to supplier development. Local content will multiply jobs only if Cameroonian suppliers are helped up a ladder of registration, qualification, pilot orders, coaching and approval, at the scale of the KPIZ zone, and if local content is measured honestly.

From a male workforce to a mixed one, and from compliance to a safety culture. A new works can design inclusion and safety in from the start: facilities and rosters for women, a code of conduct for all contractors, certified safety-critical authorisations and supervisors trained to lead in the field.

An illustrative workforce plan

The workforce plan in Chapter 9 allocates the planned first-phase workforce of about 500 across process areas and functions. About half of it, the melt-shop, caster, maintenance and engineering cadres (240 posts), must be in training 18 to 36 months before first steel; the rest 6 to 18 months ahead, including about 140 posts in the yard, finishing, dispatch and support that can be recruited and trained in the final year before first steel, largely from the South Region. The 50 engineers must be recruited first because they will become trainers, supervisors and successors to expatriate specialists. On the RC-1.1 schedule, with first heat in the second half of 2030, the skills partnership and graduate recruitment start in early to mid 2027 and the first apprenticeship intake in early 2028. Both fall before financial close, planned for 2028: they would be funded at risk by Cameroon Steel and the

proposed cluster fund, and sized to the RC-1.1 schedule [S11]. Cameroon Steel's objective is that about 90% of its operating workforce, within a range of 85 to 95%, be Cameroonian by the fifth year of operation [S11], with each expatriate post paired from the start with a named Cameroonian successor. Each later phase should be staffed largely by people trained in the phase before it, through promotion, annual apprenticeship intakes and Cameroonian trainers.

Twelve actions

Chapter 10 sets out twelve actions with leads, partners, timing and indicators. Three are enablers that can be put in place within a year:

1. **A Kribi steel and heavy-industry skills partnership** convened by the Ministry of Employment and Vocational Training with the education and industry ministries, KPIZ, employers, unions and training providers.
2. **A cluster training fund** combining part of the foreign-worker visa levy introduced in 2023, employer contributions and development-finance support, paying providers partly on results [S31][S29].
3. **A fiscal incentive for apprenticeships**, using the provision for tax incentives in Law No. 2018/010 and linked to certified outputs [S26].

The other nine cover curricula co-designed with ENSPY, ENSPD, the ISTD, ENSET and the University of Ebolowa; a dual apprenticeship programme; steel-occupation competence standards and a test centre; training clauses in equipment contracts; women's access to heavy-industry careers; a common safety passport and contractor standard for the zone; zone-wide supplier development and local-content reporting; careers outreach in schools; and annual publication of workforce indicators.

BOTTOM LINE

Cameroon does not need new institutions to staff a steel industry. It needs its existing schools, its employers and their equipment suppliers to train together, to a timetable set by the plant's construction schedule, and to certify what they teach. Skills built ahead of the furnace are the most durable part of an industrial project: they stay in the country whatever happens to the market for steel.

How to read this paper

Chapters 1 to 3 describe the demand (what jobs a steelworks creates) and the supply (Cameroon's labour market and education system). Chapters 4 to 8 examine the gaps and the means to close them: skills and certification, training models, local content and supplier development, women's participation and safety culture. Chapter 9 brings these together in an illustrative workforce plan, Chapter 10 sets out recommendations and Chapter 11 lists what is not yet known. Annex A explains methods and assumptions, Annex B defines terms, Annex C lists every source and Annex D prints the data behind every chart.

Every number in the paper carries a source marker and, in figures and tables, a status label: sourced, derived, assumed or illustrative. Workforce figures for Cameroon Steel's project are public planning values from its reference configuration, labelled planned, indicative, assumed or objective; they are not commitments and will be refined as engineering and phasing are confirmed. Generated images are labelled "Illustrative view" and do not depict the project, its staff or any real person.

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

A STEELWORKS CREATES HUNDREDS OF SKILLED, DURABLE JOBS AND A SUPPLY CHAIN SEVERAL TIMES LARGER

An electric arc furnace (EAF) steelworks is not a large employer by headcount, but it is an unusually demanding and durable one. Benchmarks from plants in the United States, Europe and Africa put direct employment at roughly 500 to 5,000 jobs per million tonnes of annual capacity, depending on automation, product scope and how much maintenance and logistics are contracted out [S03][S04][S02][S05]. Cameroon Steel's public planning figures for its phased works at Mboro, in the Kribi industrial-port zone, are about 500 direct jobs for the first phase (planned) and 900 to 1,300 for the full 1 Mtpa works (indicative) [S11]. Almost all of these posts are formal, salaried and technical, and each one sits inside a supply chain that, on international evidence, supports several further jobs. This chapter maps the occupations a steelworks needs, sets the employment numbers against benchmarks, and separates the temporary construction peak from the permanent operating workforce, because the two call for different skills policies.

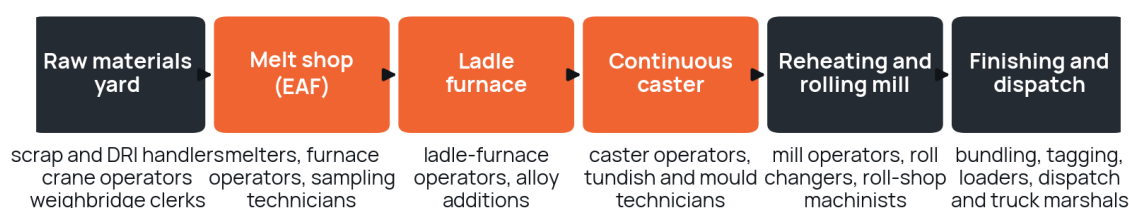
1.1 An EAF works is a chain of process areas, each with its own trades

A long-products EAF works turns a cold metallic charge into finished bars and coils in six steps, and every step has its own crew. In the raw-materials yard, scrap and direct-reduced iron (DRI, iron ore from which the oxygen has been removed with gas) are unloaded, sorted, weighed and loaded into charging baskets by overhead cranes. In the melt shop, an electric arc between graphite electrodes and the charge melts it; the melter and furnace operators control power input, oxygen and carbon injection, slag and temperature, and take samples for chemical analysis. The liquid steel is tapped into a ladle and moved to the ladle furnace, where its chemistry and temperature are adjusted by alloy additions. At the continuous caster it solidifies in water-cooled copper moulds into square billets. The billets are reheated and passed through a rolling mill, a line of stands that reduce them step by step to reinforcing bar or wire rod. Finally the product is cooled, cut, bundled, tagged and dispatched.

Around this chain run five support functions that employ as many skilled people as production itself: mechanical maintenance; electrical, automation and instrumentation; quality and metallurgy; health, safety and environment (HSE); and logistics and administration. Figure 1.1 shows the map. The furnace-orange boxes, the melt shop, the ladle furnace and the caster, are where Cameroon has the thinnest pool of experienced workers, a point developed in Chapter 4.

A steelworks is a chain of six process areas held together by five support functions

Occupational map of an electric arc furnace long-products works (process flow left to right)



PROCESS AREAS ABOVE · SUPPORT FUNCTIONS SERVING ALL AREAS BELOW



Furnace-orange boxes: the melt-shop and casting areas where Cameroon has no installed base of experienced workers (Chapter 4).

ILLUSTRATIVE Figure 1.1. Occupational map of an EAF long-products works: six process areas and five support functions, with typical roles in each.

Source: Cameroon Steel analysis of a generic EAF, ladle-furnace, billet-caster and bar-and-rod-mill configuration; process description consistent with IFC, EHS Guidelines for Integrated Steel Mills, 2007 [S55].

The map matters for policy because it shows that a steelworks recruits across the whole spectrum of technical education. A crane operator or a bundling-line operator can be trained from a technical baccalaureate or a vocational certificate in months. An electrical and automation technician needs a two- to three-year higher technical diploma before plant training starts. A process metallurgist or a melt-shop engineer needs an engineering degree and several years of plant experience. A national skills strategy for steel therefore has to work at three levels at once: secondary technical schools and vocational centres, university institutes of technology (IUTs) and engineering schools.

1.2 The occupational map: eleven families, one plant

Table 1.1 groups the roles into eleven occupational families, with the entry route that would typically apply in Cameroon. The share of each family in the workforce varies with automation and outsourcing, but the planned first-phase mix published by Cameroon Steel gives an order of magnitude: about 300 operators, 100 technicians, 50 engineers and 50 administrative and support staff, out of about 500 direct jobs [S11].

Table 1.1 Occupational families of an EAF long-products works, typical roles and entry routes in Cameroon

Occupational family	Typical roles	Core tasks	Typical entry route in Cameroon
Raw materials and yard	Scrap and DRI handlers, crane operators, weighbridge clerks	Receive, sort, store and charge metallics; inspect for hazardous items	Technical baccalaureate, CAP or CQP; crane licence
Melt shop (EAF)	Melter, furnace operator, sampler	Run the furnace programme, oxygen and carbon injection, slag control, tapping	Technical baccalaureate or DUT, then long in-plant training

Occupational family	Typical roles	Core tasks	Typical entry route in Cameroon
Secondary metallurgy	Ladle-furnace operator, alloy controller	Adjust chemistry and temperature; argon stirring; additions	DUT or BTS (chemistry, process), in-plant training
Continuous casting	Caster operator, tundish and mould technicians	Control casting speed, cooling, mould level; cut billets	Technical baccalaureate or DUT, in-plant training
Reheating and rolling	Mill operator, roll changer, roll-shop machinist	Run reheating furnace and stands; change rolls and guides; machine grooves	CAP or DUT (mechanics), in-plant training
Finishing and dispatch	Bundling and tagging operators, loaders, dispatch clerks	Cut, count, bundle, label, load trucks and wagons	Vocational certificate, short induction
Mechanical maintenance	Fitters, hydraulics technicians, welders, planners	Preventive and breakdown maintenance; lubrication; repairs	DUT or BTS (mechanical, industrial maintenance); welder certification
Electrical, automation and instrumentation	Electricians, PLC technicians, instrument technicians, high-voltage operators	Maintain drives, transformers, control systems, sensors	DUT or BTS (electrical, industrial IT); engineering degree for leads
Quality and metallurgy	Laboratory analysts, metallurgists, testers, inspectors	Spectrometry, tensile and bend tests, certification to standards	Licence or engineering degree (chemistry, materials, mechanical)
Health, safety and environment	HSE officers, medical staff, fire crew, environmental monitors	Permits, inspections, emergency response, monitoring	Degree or diploma in HSE; first-aid and fire certificates
Logistics and administration	Planners, buyers, storekeepers, HR, finance, IT, security	Supply, stores, payroll, compliance, systems	Commercial, management and IT diplomas

Source: Cameroon Steel analysis. Diploma names follow Cameroonian usage: CAP (certificat d'aptitude professionnelle), CQP (certificat de qualification professionnelle), DUT (diplôme universitaire de technologie, awarded by IUTs), BTS (brevet de technicien supérieur). Planned first-phase mix from Cameroon Steel's public planning figures [S11].

Two features of the table deserve emphasis. First, about a quarter of the posts sit in maintenance, automation, quality and HSE, functions whose skills transfer readily to other heavy industries: cement, aluminium, power, ports and mining. Training for steel is therefore training for the Kribi industrial cluster as a whole, which the Kribi Port Industrial Zone (KPIZ) plans to grow around metallurgy, wood, agro-industry and construction materials [S38][S39]. Second, the process roles in the melt shop and caster have few equivalents in Cameroon's existing industry. The country's steel firms are mainly re-rollers that convert imported billets and local scrap, with a handful of small melt shops in Douala [S08], so the pool of experienced melters and casters is small and already employed; most will have to be formed.

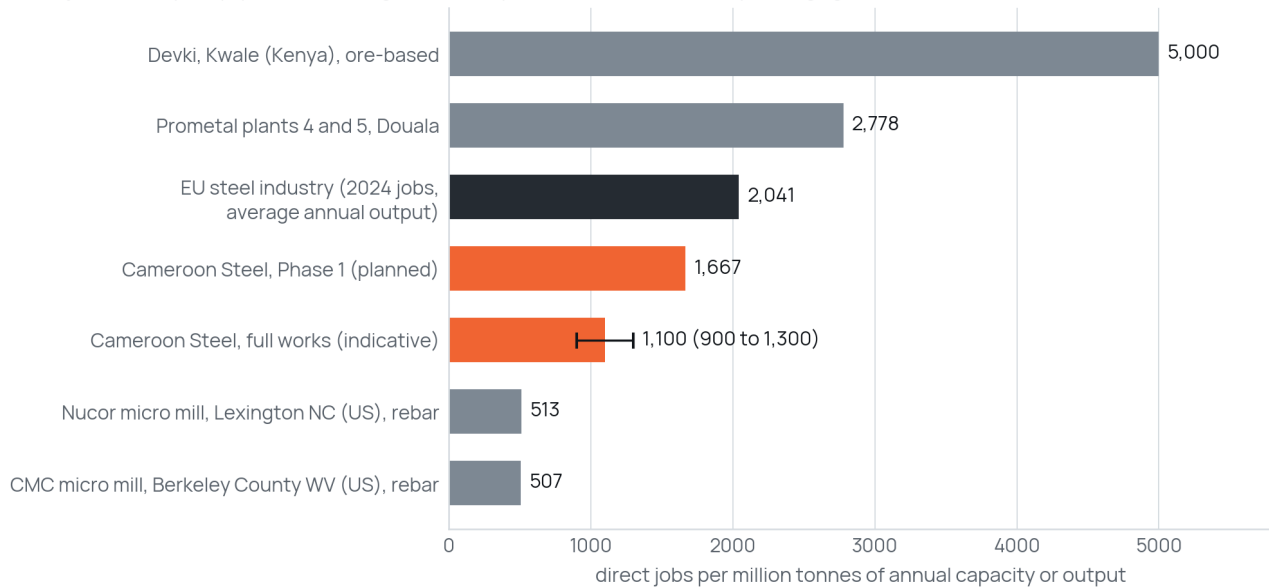
1.3 Direct jobs per million tonnes vary tenfold

The number of people a steelworks employs per tonne depends less on the furnace than on everything around it. Figure 1.2 compares published cases. At one end, the new generation of US "micro mills" making rebar from scrap employs about 200 to 230 people for about 0.39 to 0.45 Mt of capacity: Nucor's Lexington mill in North Carolina (430,000 tons, about 200 permanent jobs) and CMC's mill in Berkeley County, West Virginia (500,000 tons, 230 jobs) [S03][S04]. The announcements say "tons": CMC's annual report defines its ton as the US short ton [S82], and the Nucor figure is read in the same way, so 500,000 tons is about 0.45 Mt and 430,000 tons about 0.39 Mt. These plants are highly automated, run a single product family and buy in many services. At the other end, Devki's ore-based steel plant at Kwale in Kenya announced 2,500 direct jobs for 500,000 t a year [S05], and Prometal's two new plants in Douala were reported to create 1,000 direct jobs for about 360,000 t a

year of rolling capacity [S07]. In Algeria, Tosyali's 2.5 Mtpa flat-products complex was reported to employ about 2,200 workers when it was commissioned in 2024 [S06], fewer than 1,000 per million tonnes, which shows how large single lines lower the ratio. The European Union's steel industry as a whole, which includes blast furnaces, flat-product lines and research centres, employed 298,000 people directly in 2024 for an average output of about 146 Mt of steel a year, about 2,040 per million tonnes [S02].

Direct jobs per million tonnes vary tenfold with automation, scope and outsourcing

Direct jobs over capacity (plants) or average annual output (EU); Cameroon Steel: planning figures



DERIVED Figure 1.2. Direct jobs per million tonnes of annual capacity (plants) or of average annual output (EU). Cameroon Steel values are planning figures, shown with their status.

Source: Nucor, 7 April 2022 [S03]; West Virginia Public Broadcasting, 8 December 2022 [S04]; EUROFER, European Steel in Figures 2025 [S02]; Journal du Cameroun, 19 January 2024 [S07]; Capital FM Kenya, 20 November 2022 [S05]; Cameroon Steel public planning figures [S11]. Ratios are Cameroon Steel arithmetic; Nucor and CMC capacities converted at 0.907 t per short ton.

Cameroon Steel's planning values sit in the middle of this range: about 1,670 direct jobs per million tonnes for a first phase of 0.3 Mtpa nameplate capacity (1,670 to 1,850 per million tonnes of its expected sustained output of 270,000 to 300,000 t a year), falling to about 1,100 (900 to 1,300) per million tonnes at the full 1 Mtpa, because shared functions such as the laboratory, the power substation, administration and the medical service do not grow in proportion to tonnage [S11]. Three choices will move the final number within that range:

- **Make or buy for maintenance and services.** A works that employs its own maintenance crews, laboratory and logistics will have more direct jobs and fewer contractor jobs; one that outsources them shifts employment to local suppliers, which is the subject of Chapter 6.
- **Degree of automation.** Modern melt shops and rolling mills run with automated furnace programmes, robotic sampling and tagging, and camera-based inspection. These reduce manual posts but raise the share of technicians and engineers.
- **Product scope.** Each new product line (sections, beams, merchant bar) adds a mill crew; a future direct-reduction module for Cameroonian ore would add a further process area with its own operators and maintainers.

A STEELWORKS EMPLOYS FEWER PEOPLE PER TONNE THAN IT ONCE DID, BUT EACH OF THEM NEEDS MORE TRAINING.

Cameroon Steel

The direction of travel is clear from the benchmarks: fewer people per tonne, each with more training. The most automated plants in Figure 1.2 employ the fewest people, but a larger share of them are technicians who maintain drives, sensors and control software. For Cameroon, this means that the quality of the training pipeline matters more than its volume.

1.4 Construction jobs are many but temporary; operating jobs are fewer but durable

A steelworks creates two very different labour demands. The construction phase brings a peak of civil, structural, mechanical and electrical trades lasting, on Cameroon Steel's planning assumption, 18 to 30 months per phase; the operating phase brings a smaller permanent workforce for the life of the plant, typically several decades. Nucor's Lexington micro mill illustrates the ratio: about 500 construction jobs for about 200 permanent posts [S03]. For the first phase at Mboro, Cameroon Steel uses a planning assumption of a construction peak of about 800 workers (600 to 1,000), against about 500 permanent direct jobs [S11]. Table 1.2 compares the two.

Table 1.2 Construction and operations compared, first phase of a phased EAF works (planning values)

Dimension	Construction	Operations
Duration	18 to 30 months for a phase, repeated for later phases (assumed)	Life of the plant, typically several decades
Peak or steady headcount, Phase 1	About 800 workers at peak, range 600 to 1,000 (assumed)	About 500 direct jobs, range 450 to 550 (planned)
Main employers	Civil, steel-erection, mechanical and electrical contractors; equipment suppliers' supervisors	The steel company; maintenance, logistics and service contractors
Dominant trades	Masons, formworkers, steel fixers, welders, pipefitters, riggers, electricians, crane operators	Process operators, maintenance and automation technicians, metallurgists, HSE staff
Skill legacy	Welders and electricians certified on site keep portable credentials	Plant-specific competence that grows with tenure; career ladders
Main labour risks	Influx, short contracts, working at height, lifting, heat	Molten metal, moving machinery, electrical energy, process safety
Policy lever	Local hiring quotas for contractors; certification of trades on site	Apprenticeships, career paths, retention and succession

Source: Cameroon Steel public planning figures (construction peak assumed; operations planned) [S11]; Nucor, 7 April 2022 [S03]; hazards from IFC, EHS Guidelines for Integrated Steel Mills, 2007 [S55].

The construction phase is the first and best chance to build portable skills. Each phase of a steelworks needs hundreds of welders, electricians, scaffolders and riggers. If the contracts require those trades to be tested and certified on site, a share of them leave the project with recognised qualifications that the Kribi cluster's later builders will use. If they are not, the peak passes and leaves little behind. Chapter 9 sets out how the phasing of a works can be used to roll trained construction workers into later phases and into operations.

1.5 Each direct job supports several more along the supply chain

Steel's employment effect extends well beyond the plant fence. The World Steel Association and Oxford Economics estimated that the industry employed 6.1 million people directly worldwide in 2017 and that "for every 2 jobs in the steel sector, 13 more jobs are supported" across its supply chain [S01]. For the European Union,

EUROFER estimates a Type I employment multiplier of 6.2 and a Type II multiplier, which also counts jobs supported by employees' spending, of 8.6 [S02]. In Kenya, Devki's ore-based plant announced 9,000 indirect jobs alongside its 2,500 direct ones, a ratio of 3.6 to 1 [S05].

These multipliers are upper bounds for Cameroon, because they reflect economies where steel plants buy most of their goods and services from domestic suppliers. Cameroon's industrial supply chains are thinner, and many inputs to a steelworks (graphite electrodes, refractories, ferro-alloys, spare parts) are imported. Cameroon Steel's planning figure for indirect employment in the first phase is accordingly conservative: about 1,000 indirect jobs (800 to 1,500), or roughly two per direct job [S11]. Whether the real ratio is closer to two or to six depends on deliberate supplier development, which Chapter 6 treats as a skills question as much as a procurement one.

FINDING

The indirect employment of a steelworks is not a fixed multiplier but a policy outcome. In Cameroon it will be closer to two jobs per direct job if inputs and services are imported, and could rise towards the higher international ratios only if local suppliers are trained and qualified.

A detailed view of a universal testing machine in a laboratory setting. The machine is a large, grey, industrial-grade device with two vertical columns and a central testing area. A thick, cylindrical steel bar is positioned vertically within the machine, held between two grips. The background shows a typical laboratory environment with various equipment, including a furnace, a fume hood, and storage cabinets. The lighting is bright and even, highlighting the metallic surfaces of the machine and the steel bar. The overall tone is professional and technical.

**BETWEEN THE FURNACE AND THE DISPATCH BAY, A
STEELWORKS EMPLOYS ELEVEN FAMILIES OF
TRADES, AND ONLY A FEW OF THEM EXIST IN
CAMEROON TODAY.**

Illustrative view. Generated image of a materials-testing laboratory with a universal testing machine for tensile tests on steel bar; not a photograph of any project, place or person.

1.6 Steel jobs are formal, salaried and technical, which is rare in Cameroon

The quality of steel jobs matters as much as their number. In Cameroon in 2021, 86.6% of employment was in the informal sector and only 5.1% of workers held a job in the formal private sector [S12]. Workers in the formal private sector earned on average 118,200 FCFA a month in their main job, against 77,100 FCFA in the non-agricultural informal sector and 48,200 FCFA in informal agriculture; 71.7% of their dependent workers had a written fixed-term or open-ended contract, against 19.8% in the non-agricultural informal sector [S12]. Only 11.0% of all employed persons were covered by an insurance scheme in their main job [S12].

A steelworks offers the opposite profile: written contracts, payslips, social-security registration, structured training and a career ladder from operator to manager. It also trains people in skills, such as high-voltage electrical work, hydraulics, precision welding, programmable logic controllers and laboratory testing, that command a premium across industry. That is why the employment case for steel in Cameroon rests less on the raw number of jobs, which is modest against a labour force of 11.5 million [S14], than on the kind of jobs and on the skills they leave in the economy.

The policy implication follows directly. Because the jobs are technical, they will go to Cameroonians only if Cameroonians have been trained for them before the plant opens. A works that starts without a local pipeline has to rely on expatriate staff for its first years, and every expatriate post is a training opportunity deferred. The chapters that follow examine whether Cameroon's labour market and education system can supply that pipeline, and what it would take.

CHAPTER 2

CAMEROON HAS YOUNG WORKERS IN ABUNDANCE BUT FEW FORMAL INDUSTRIAL JOBS IN WHICH TO TRAIN THEM

Cameroon's labour market does not lack people; it lacks formal, skilled jobs and the experience that only such jobs provide. About 730,000 young Cameroonians reach working age every year on World Bank estimates, or about 550,000 if the provisional 2026 census count is confirmed, while the national employment observatory recorded about 197,000 new jobs in 2025 [S14][S19][S17]. Open unemployment looks low, at 6.1% on the national survey definition in 2021, but it hides two harder facts: more than half of workers (56.4%) are underemployed, and unemployment rises with education, reaching 17.6% among people with higher education and 28.2% among women graduates [S12]. Only one worker in twenty holds a formal private-sector job [S12]. For a steelworks, this means a deep pool of candidates with schooling but very few with industrial experience, and a responsibility to build that experience rather than to recruit it.

2.1 A young population adds 550,000 to 730,000 people of working age each year

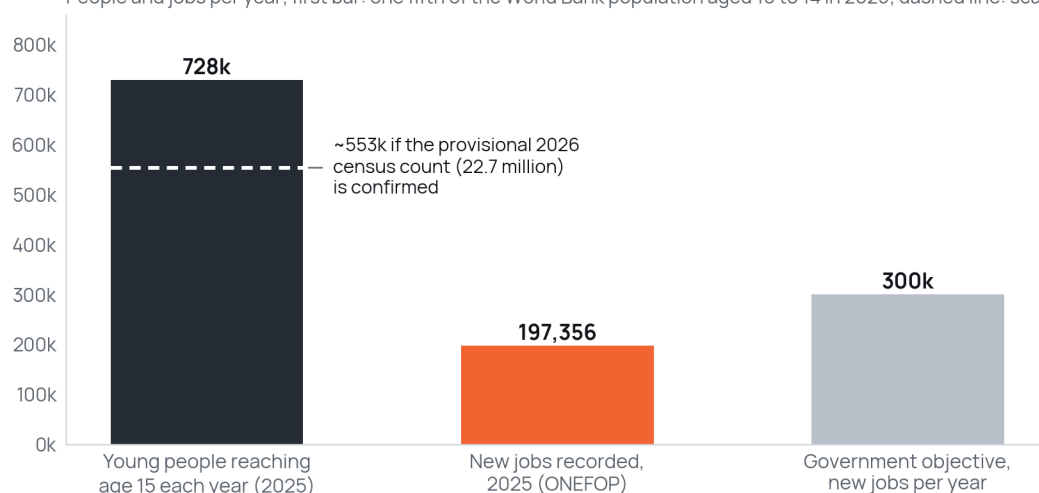
Cameroon's population reached about 29.9 million in 2025, growing at 2.6% a year; 41.1% of Cameroonians are under 15 and 56.1% are aged 15 to 64 [S14]. The country is now majority urban, at 55.7% [S14]. The cohort now aged 10 to 14 numbers about 3.64 million, which means that roughly 728,000 young people will reach the age of 15 in each of the next five years, and the population aged 15 to 24 already stands at about 5.95 million [S14]. The labour force, on International Labour Organization (ILO) modelled estimates, was about 11.5 million in 2025, of whom 43.9% were women [S14].

These are World Bank estimates. The fourth general population and housing census (RGPH4) closed its field count in October 2026 with about 22.7 million residents recorded [S19], about 24% fewer than the World Bank's 2025 figure. The provisional 2026 census count of 22.7 million, if confirmed, would lower this cohort to about 550,000 ($728,122 \times 22.7 / 29.9$), and would lower the other absolute numbers in this section in the same proportion; the rates and shares used in this chapter, which come from surveys, are not affected. Until the final census results are published, this paper shows both values (Figure 2.1).

These numbers frame the scale of any industrial project. A steelworks with 500 to 1,300 direct jobs will not change national labour aggregates; Cameroon's challenge is measured in hundreds of thousands. What a steelworks can do is different and, for skills, more important: it can create a training ground in which several thousand Cameroonians acquire industrial competences over its life, and it can anchor a cluster at Kribi in which those competences are used again. KPIZ, the company created in February 2026 to develop the Kribi industrial-port zone, expects the zone as a whole to generate up to 150,000 direct and indirect jobs over 15 years [S38].

Each year 550,000 to 730,000 Cameroonians reach working age, against about 200,000 new jobs in 2025

People and jobs per year; first bar: one fifth of the World Bank population aged 10 to 14 in 2025; dashed line: scaled to the census count



DERIVED Figure 2.1. Young people reaching working age each year compared with new jobs recorded in 2025 and the government's annual objective. The marker on the first bar shows the cohort scaled to the provisional 2026 census count.

Source: World Bank, World Development Indicators, population aged 10 to 14 in 2025 divided by five (Cameroon Steel arithmetic) [S14]; provisional 2026 census count, Journal du Cameroun, 5 October 2026 [S19]; Observatoire national de l'emploi et de la formation professionnelle (ONEFOP), as reported by Cameroon Tribune, 8 May 2026 [S17].

The comparison in Figure 2.1 is not a measure of unemployment: many young people stay in education, work in family farms or enterprises, or take informal work that no registry records. But it shows why industrial jobs that come with training carry a value beyond their number. Every formal technical job is a place where a young person can convert schooling into a recognised skill.

2.2 Open unemployment is low; underemployment is the real problem

Cameroon's open unemployment rate is low by international standards. The ILO's modelled estimate puts it at 3.6% of the labour force in 2025, and youth unemployment (ages 15 to 24) at 6.5% [S14]. The National Institute of Statistics (INS) third employment and informal-sector survey (EESI3), conducted between May and July 2021, measured an ILO unemployment rate of 6.1% for persons aged 14 and over [S12]. Unemployment is concentrated in the cities: 15.4% in Douala, 11.7% in Yaoundé, 9.4% in urban areas overall and 1.6% in rural areas [S12]. In urban areas it reaches 22.0% among people aged 20 to 24, and 31.5% among young urban women of that age [S12].

Unemployment, however, captures only those who have no work at all and are actively looking. The broader measure that the INS uses, global underemployment, also counts people who work fewer hours than they wish (visible underemployment) and people whose earnings from their main job fall below the minimum hourly wage (invisible underemployment). It stood at 56.4% of employed persons aged 14 and over in 2021. On the series comparable with earlier surveys, which covers persons aged 10 and over, it fell from 70.6% in 2010 to 61.4% in 2021; the national development strategy, SND30, targets less than 50% by 2030 [S12][S41]. On the ILO's composite measure of labour underutilisation, which adds time-related underemployment and the potential labour force to unemployment, 26.2% of the extended labour force was underused in 2021 [S12].

Table 2.1 Cameroon labour-market indicators relevant to industrial recruitment

Indicator	Value	Year	Source
Population	29.9 million	2025	World Bank WDI [S14]
Population, provisional census field count (RGPH4)	22.7 million	2026	Journal du Cameroun [S19]
Population growth	2.6% a year	2025	World Bank WDI [S14]

Indicator	Value	Year	Source
Share aged under 15	41.1%	2025	World Bank WDI [S14]
Population aged 15 to 24	about 5.95 million	2025	WDI cohorts, Cameroon Steel sum [S14]
Labour force (ILO modelled)	11.5 million, 43.9% women	2025	World Bank WDI [S14]
Labour force participation, women and men (ILO modelled)	56.6% and 73.9%	2025	World Bank WDI [S14]
Unemployment (ILO modelled), total and ages 15 to 24	3.6% and 6.5%	2025	World Bank WDI [S14]
Unemployment, ILO definition, ages 14+ (national survey)	6.1%; Douala 15.4%; Yaoundé 11.7%	2021	INS, EESI3 [S12]
Global underemployment, ages 14+	56.4% (ages 10+: 61.4%, against 70.6% in 2010)	2021	INS, EESI3 [S12]
Share of employment in the informal sector	86.6%	2021	INS, EESI3 [S12]
Share of employment in the formal private sector	5.1%	2021	INS, EESI3 [S12]
Salaried share of employment	38.6%	2021	INS, EESI3 [S12]
Employment in industry (ILO modelled)	14.6%	2025	World Bank WDI [S14]
Vulnerable employment (own-account and contributing family workers)	67.6%	2025	World Bank WDI [S14]
Youth not in employment, education or training (ILO harmonised)	23.2%; women 30.4%, men 14.7%	2021	World Bank WDI [S14]
Mean and median monthly income from main job	75,700 and 45,000 FCFA	2021	INS, EESI3 [S12]
National minimum wage, non-agricultural sector	60,000 FCFA a month	2023	Decree No. 2023/00338/PM [S34]

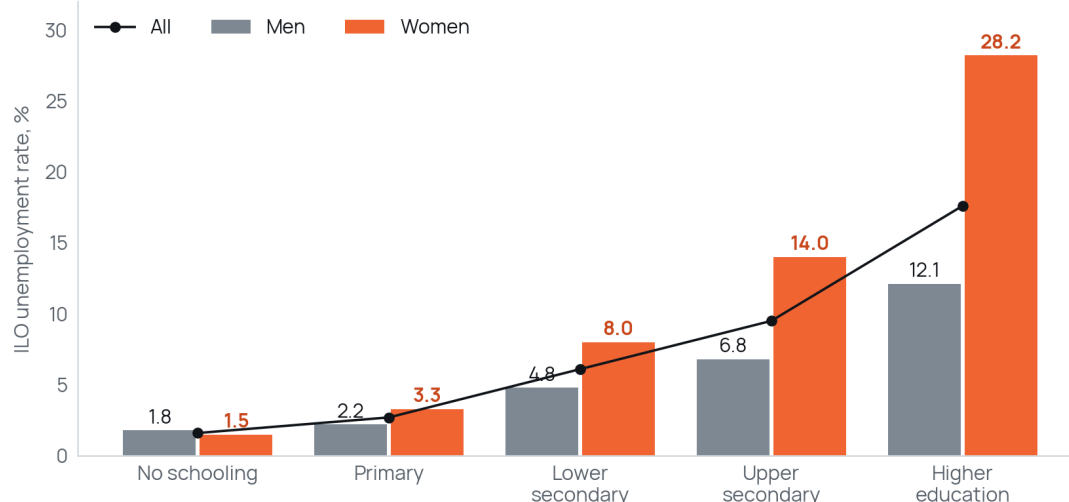
Source: as listed in the table. ILO modelled estimates are harmonised international series and differ in definition and age band from the national survey.

2.3 In Cameroon, more schooling has meant more unemployment

The most striking feature of Cameroon's labour market for an industrial employer is that unemployment rises with education. In 2021 the ILO unemployment rate was 1.6% among people with no schooling, 6.1% among those with lower secondary education, 9.5% with upper secondary and 17.6% with higher education [S12]. The gap between women and men widens at every level and is largest among graduates: 28.2% of women with higher education were unemployed, against 12.1% of men (Figure 2.2). The World Bank's series, based on the same survey, shows the same pattern: unemployment of 18.8% among people with advanced education against 4.4% among those with basic education [S14]. Graduates are also the only education group whose global underemployment rose between 2010 and 2021, from 44.3% to 49.9% [S12].

Unemployment rises with schooling: 17.6% of graduates are unemployed, 28.2% of women graduates

ILO unemployment rate (SU1) by level of education and sex, persons aged 14+, Cameroon, 2021



SOURCED Figure 2.2. ILO unemployment rate by level of education and sex, persons aged 14 and over, 2021.

Source: INS, EESI3 Phase 1, main employment report, Table 4.1 [S12].

Three explanations are usually advanced, and all three bear on a steelworks. First, educated young people queue for formal, salaried jobs, which are scarce, rather than enter informal work; the unemployed interviewed by the INS wanted an average of 188,625 FCFA a month and said they would accept no less than 122,780 FCFA, far above the national median income of 45,000 FCFA [S12]. Second, much of higher education has been general rather than technical, so graduates often lack the practical competences employers look for. Third, links between schools and employers are weak: only 1.1% of the unemployed used a public employment or placement agency to look for work, while 34.5% relied on family and friends [S12].

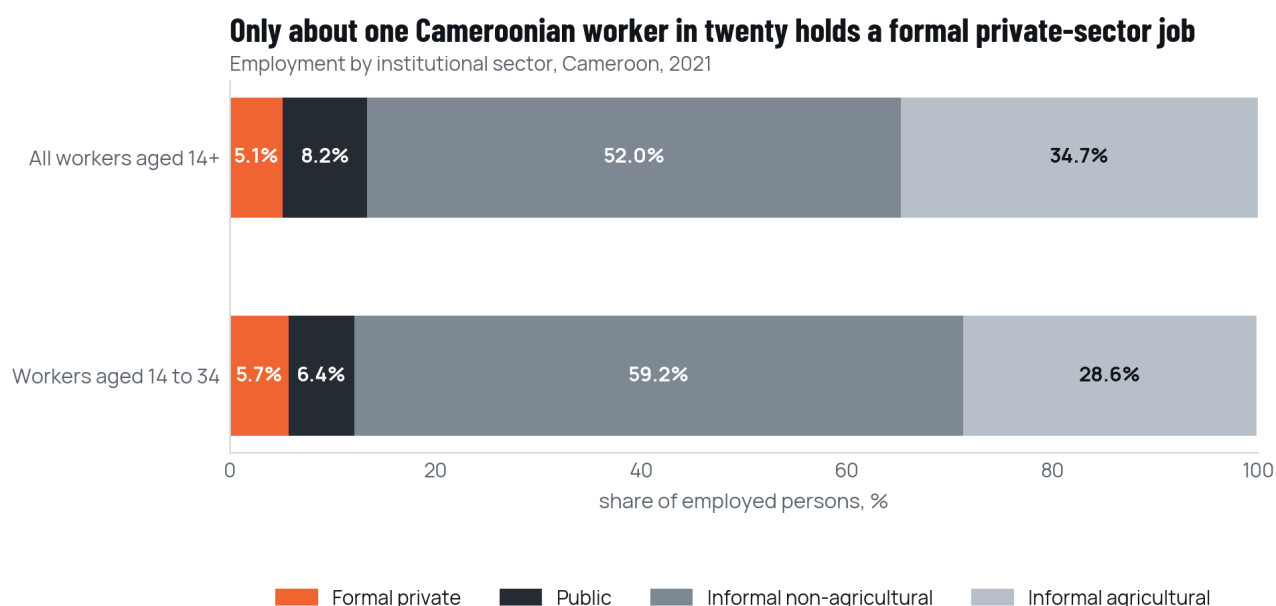
For Cameroon Steel and other industrial employers, the first explanation is an opportunity: a formal, technical job with training and a career path is exactly what educated young Cameroonians are queuing for. The second and third explanations are the problem this paper addresses. A diploma is a starting point, not a competence, and the plant will need to work with schools to close the distance between the two.

A DIPLOMA IS A STARTING POINT, NOT A COMPETENCE; THE DISTANCE BETWEEN THEM IS WHAT INDUSTRY AND SCHOOLS MUST CLOSE TOGETHER.

Cameroon Steel

2.4 Only one worker in twenty holds a formal private-sector job

Cameroon's employment is overwhelmingly informal. In 2021 the non-agricultural informal sector accounted for 52.0% of jobs and informal agriculture for 34.7%; the public sector employed 8.2% of workers and the formal private sector only 5.1% (Figure 2.3) [S12]. The picture for young workers aged 14 to 34 is similar: 5.7% in the formal private sector and 59.2% in the non-agricultural informal sector [S12]. On the ILO's modelled estimates, 67.6% of employment is "vulnerable", that is own-account or contributing family work [S14].



SOURCED Figure 2.3. Employment by institutional sector, all workers and young workers, 2021.

Source: INS, EESI3 Phase 1, main employment report, Table 3.7 [S12].

The consequences for industrial skills are direct. Most Cameroonian workers acquire their skills on the job in small informal enterprises: of the quarter of the population aged 14 and over who had followed vocational training, 39.3% had learned on the job, and only 18.9% in a training institute or centre [S12]. Informal apprenticeship in workshops produces real competences in welding, mechanics and electrical work, but it rarely teaches the procedures, standards and safety disciplines that a continuous-process plant requires, and it rarely leads to a certificate an employer can trust. Cameroon's formal private sector, in turn, is small, so few young people have had the chance to work inside one. The formal private sector also works long hours, 51.6 hours a week on average against a legal norm of 40 hours for non-agricultural establishments [S12], a reminder that the shift systems of a steelworks have to be designed and staffed properly from the start.

Steel jobs would also be relatively well paid by national standards. The mean monthly income in the formal private sector was 118,200 FCFA in 2021, and the median 90,000 FCFA, against a national median of 45,000 FCFA and a minimum wage of 60,000 FCFA set in 2023 [S12] [S34]. Those differences make formal industrial jobs attractive and retention manageable, provided the jobs come with training and progression. They also mean that once trained, technicians will be sought by other employers, a point that argues for sector-wide rather than company-only training (Chapter 10).

2.5 The South Region works more but trains and insures less

The Kribi industrial-port zone lies in the South Region, in the Océan department. The EESI3 survey shows a regional labour market with distinctive features [S12]:

- **High participation and employment.** The South has the highest labour-force participation rate of any survey region, 64.9%, and the highest employment rate, 63.5%; its youth employment rate (ages 15 to 34) is 52.6%, second only to the East.
- **Low open unemployment.** The ILO unemployment rate in the South was 2.2% in 2021, against 6.1% nationally; women's unemployment was 3.5% and men's 1.2%.
- **Above-average vocational training.** 32.2% of people aged 14 and over in the South had followed vocational training, against 25.0% nationally, and a larger share of it at secondary and post-secondary level than elsewhere.

- **High accident rates and low insurance.** 15.4% of employed persons in the South reported a work accident in the previous twelve months, against 9.1% nationally, and only 6.6% were covered by an insurance scheme in their main job (Chapter 8).

Low unemployment in a largely rural region means that most people work, often in farming, fishing, small trade or informal services, rather than that skilled labour is idle. Recruitment for a Kribi steelworks will therefore draw on three pools: young people from the South Region who need training, experienced technicians from Douala and Yaoundé who will relocate if jobs are attractive, and a national pool of graduates from the country's engineering schools and IUTs (Chapter 3).

Kribi itself has grown quickly with the deep-water port, but its current population is not known with any precision. The last census with published local results, in 2005, counted 70,565 people in the two Kribi communes, 29,886 in Kribi 1er and 40,679 in Kribi 2e [S62]; the 2026 census had published no commune results at the time of writing [S19]. Any plan that recruits several hundred workers locally, and brings several hundred more during construction, needs better data on the local labour pool, housing and services; this is listed among the evidence gaps in Chapter 11.

FINDING

Cameroon's labour market can supply candidates for every role in a steelworks, but not experience. The binding constraint is not the number of young people with schooling; it is the absence of formal industrial jobs in which they could have learned, and the weak bridges between schools and employers.

2.6 Where a steelworks' workforce will come from

The survey data allow a first sketch of the pools from which a Kribi employer would recruit, and of their characteristics.

Young people of the South Region. The region's young people are more likely to be working than their peers elsewhere, but mostly in farming, fishing, small trade and informal services, and they have had more exposure to vocational training than the national average [S12]. They are the natural recruits for operator, yard, dispatch and support roles, and for the first apprenticeship intakes, provided that training is offered close to home and that selection rewards aptitude rather than prior industrial experience.

Graduates in the large cities. Douala and Yaoundé concentrate both the institutions that train technicians and engineers and the highest unemployment rates in the country: 15.4% and 11.7% respectively in 2021, and far higher among young graduates [S12]. Unemployed or underemployed graduates of mechanical, electrical, chemical and industrial programmes are the fastest source of technicians and junior engineers, provided they are willing to move to Kribi and are offered structured conversion training.

Experienced industrial workers. Douala's rolling mills, wire and mesh plants, cement works, breweries, power plants and port operators employ people with years of experience in maintenance, electrical work, rolling and logistics. The country's steel and metalworking firms alone were reported in 2026 to employ about 5,000 people [S08]. These workers are the most valuable recruits for supervisory and senior technical posts in the first years, but recruiting them takes skills from other employers; a responsible plan combines a limited number of experienced hires with a large training effort, rather than relying on poaching.

Migrants and the diaspora. One employed person in five in Cameroon is a migrant within the country, and in the Littoral region outside Douala the share reaches 43% [S12], a sign that Cameroonian workers move for work. Cameroonian engineers and technicians working abroad, including in steel and other heavy industries, are a further pool that no statistic currently measures; a targeted recruitment campaign could reach them.

Two further features of the labour market favour an employer that trains. Employment is stable once obtained: the average tenure in a job was 10.6 years in 2021, which the INS describes as reflecting very low job mobility [S12]. And the average age of employed people was 38.3 years [S12], so a works that recruits mainly young people will need to plan for leadership succession from within rather than through external hiring.

2.7 What this means for a steelworks

Four implications follow for any heavy-industry employer at Kribi.

- **Recruit for potential, train for competence.** Selection should test aptitude, numeracy, mechanical reasoning and safety attitude rather than prior industrial experience, which few candidates will have. Training budgets and timelines must be sized accordingly.
- **Use the educated unemployed.** Graduates of IUTs and engineering schools who are unemployed or underemployed in Douala and Yaoundé are an immediate source of technicians and engineers, provided the plant offers structured conversion training.
- **Hire locally where the training can be local.** Operator and support roles can be filled largely from the South Region if training starts early enough; technician and engineering roles will draw nationally at first.
- **Plan for competition.** As KPIZ grows, port operators, energy producers, cement and agro-industrial plants will compete for the same maintenance and electrical technicians. A shared training pipeline is cheaper than a wage war.

The next chapter examines the institutions that would supply that pipeline.

CHAPTER 3

CAMEROON HAS THE SCHOOLS A STEEL INDUSTRY NEEDS, BUT NOT YET THE METALLURGY, THE WORKSHOPS OR THE INDUSTRIAL LINKS

Cameroon's education system already produces most of the profiles a steelworks employs: mechanical, electrical and industrial engineers from its polytechnic schools, maintenance and automation technicians from its institutes of technology, and tradespeople from technical secondary schools and vocational centres. Most of that capacity lies within 260 km of Kribi. What the system lacks is specific: no programme dedicated to ferrous metallurgy and steelmaking has been identified, practical training on industrial-scale equipment is scarce, many vocational trainers have never worked in industry, and links between schools and employers are thin. These are gaps that targeted partnerships can close in the three years before a melt shop starts, provided they begin now.

3.1 Three tiers of supply feed an industrial workforce

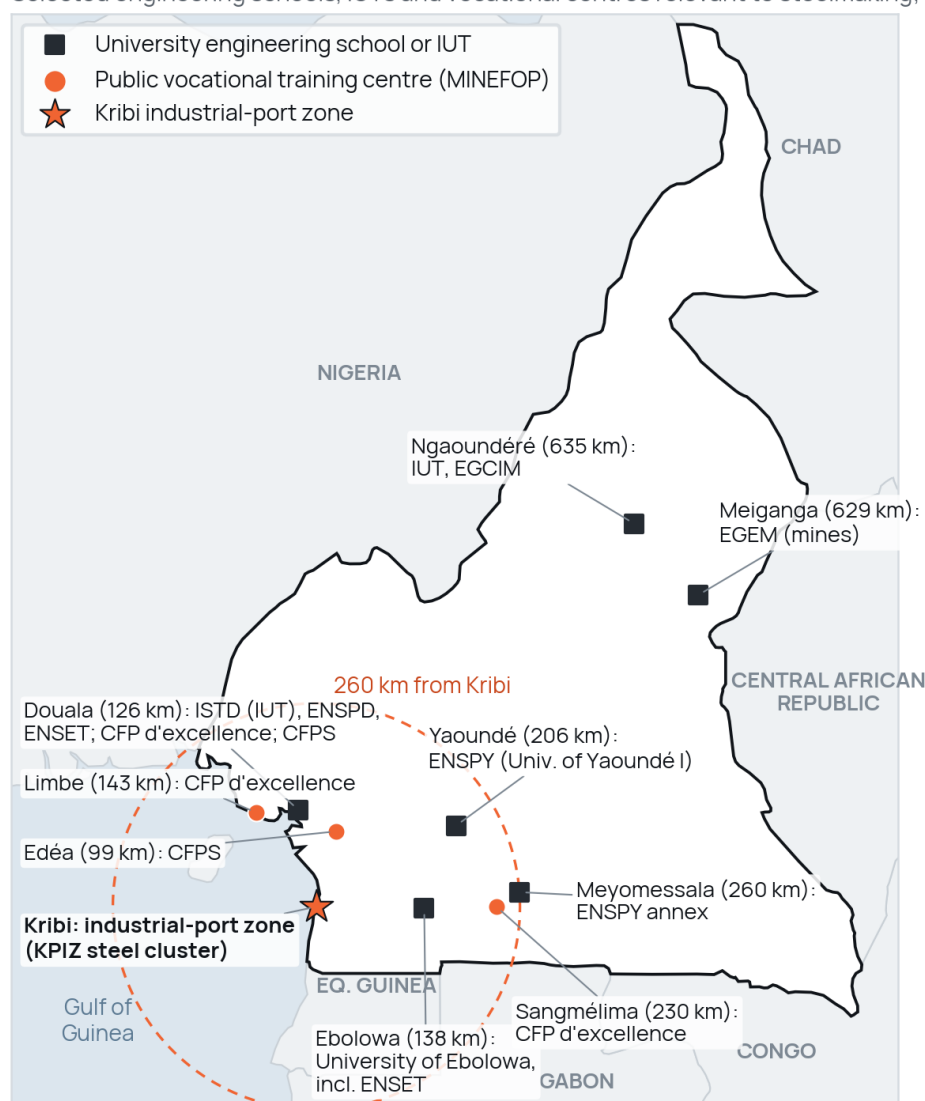
Industrial skills in Cameroon come from three systems under three ministries. Secondary general and technical education, under the Ministry of Secondary Education (MINESEC), enrolled about 2.0 million pupils in 2023 [S16]. The latest internationally reported figure for technical and vocational streams within secondary education is 477,192 pupils in 2016, 21.6% of secondary enrolment, of whom 36.6% were girls [S16]. Vocational training proper, under the Ministry of Employment and Vocational Training (MINEFOP), runs public and approved private centres that award trade certificates. Higher education, under the Ministry of Higher Education (MINESUP), enrolled 330,793 students in 2018, the latest reported total, and the gross tertiary enrolment ratio reached 16.7% in 2024 [S16].

The balance between these tiers is not tilted towards industry. The latest available breakdown of tertiary graduates by field, for 2010, showed only 4.3% graduating in engineering, manufacturing and construction [S16]. Public spending on education was 2.8% of GDP in 2023 and 13.8% of government expenditure in 2024 [S16], so expansion will have to come from better use of existing institutions and from employer co-financing rather than from large new budgets.

Figure 3.1 locates the institutions most relevant to steelmaking. Seven of the nine cities shown lie within 260 km of Kribi in a straight line: Douala, Limbe, Edéa, Yaoundé, Ebolowa, Sangmélina and Meyomessala. The two northern centres, Ngaoundéré and Meiganga, host the country's chemical-engineering and mining schools.

Seven of the nine training cities shown lie within 260 km of Kribi

Selected engineering schools, IUTs and vocational centres relevant to steelmaking; straight-line distance from Kribi



SOURCED Figure 3.1. Selected engineering schools, institutes of technology and public vocational centres relevant to steelmaking, with straight-line distance from Kribi.

Source: Drawn by Cameroon Steel from Natural Earth admin-0 boundaries (public domain); institutions from ENSPY [S18], Université de Douala [S20], ISTD Douala [S21], Université de Ngaoundéré [S22], Université d'Ebolowa [S23], Business in Cameroon, 20 December 2016 [S24] and AFD [S25]. City locations from OpenStreetMap [S75]; distances are Cameroon Steel arithmetic.

3.2 Engineering schools and institutes of technology cover the core disciplines

ENSPY. The polytechnic engineering school of the University of Yaoundé I was created in 1971 and has trained engineers for more than five decades [S18]. Its departments include industrial and mechanical engineering (GIM), electrical engineering and telecommunications (GET), civil and urban engineering, computer engineering, and modelling and industrial applications [S18]. For the 2026 to 2027 academic year, ENSPY opened an entrance competition for an annex at Meyomessala, in the South Region [S18], the first polytechnic presence in the region that hosts Kribi.

University of Douala. Cameroon's economic capital hosts three relevant schools: the École nationale supérieure polytechnique de Douala (ENSPD), the École normale supérieure d'enseignement technique (ENSET), which trains technical teachers, and the Institut supérieur de technologie (ISTD), formerly the university's institute of technology [S20]. The ISTD's departments include mechanical and production engineering

(GMP), industrial engineering and maintenance (GIM), electrical engineering and industrial computing (GEII) and thermal engineering (GTE), and it reports more than 3,000 students [S21]. These four departments correspond almost exactly to the technician profiles of a steelworks' maintenance, automation and reheating-furnace crews.

University of Ngaoundéré. Its institute of technology, opened in 1993, has departments of mechanical, electrical, energy, chemical and computer engineering and of food engineering and quality control [S22]. The university also runs the École de géologie et d'exploitation minière (EGEM) at Meiganga and the École de génie chimique et des industries minérales (EGCIM) at Ngaoundéré [S22], which form mining and mineral-processing engineers relevant to a future direct-reduction module using Cameroonian ore.

University of Ebolowa. Created by Decree No. 2022/009 of 6 January 2022 as one of three new State universities, with its seat at Ebolowa in the South Region, it installed its first rector and board chair in August 2022 [S23] [S77]. Its establishments include faculties of medicine, law and science, an École normale supérieure d'enseignement technique (ENSET) that trains technical teachers, and a higher institute of agriculture, wood, water and environment (ISABEE) [S23]. It is the natural academic partner for Kribi: close to the site, technically oriented, and still shaping its programmes.

Table 3.1 Institutions relevant to a steel workforce, with steel-relevant programmes

Institution	Location (distance from Kribi)	Tier	Programmes relevant to steelmaking	Source
ENSPY, University of Yaoundé I	Yaoundé (206 km); annex at Meyomessala (260 km)	Engineering school	Industrial and mechanical; electrical; civil; computer; industrial modelling	[S18]
ENSPD, University of Douala	Douala (126 km)	Engineering school	Engineering programmes of the Douala polytechnic	[S20]
ISTD (former IUT), University of Douala	Douala (126 km)	Institute of technology	Mechanical and production; industrial maintenance; electrical and industrial computing; thermal	[S21]
ENSET Douala, University of Douala	Douala (126 km)	Teacher-training school	Trains teachers for technical schools and centres	[S20]
IUT, University of Ngaoundéré	Ngaoundéré (635 km)	Institute of technology	Mechanical; electrical; energy; chemical; computer; quality control	[S22]
EGEM and EGCIM, University of Ngaoundéré	Meiganga (629 km); Ngaoundéré	Engineering schools	Mining, mineral processing, chemical engineering	[S22]
University of Ebolowa (incl. ENSET Ebolowa)	Ebolowa (138 km)	University	Technical teacher training (ENSET); agriculture, wood, water and environment (ISABEE)	[S23]
Centres de formation professionnelle d'excellence (MINEFOP)	Douala, Limbe (143 km), Sangmélima (230 km)	Vocational	14 trades including mechanics and electricity and electronics	[S24]
Centres de formation professionnelle sectoriels (CFPS)	Douala; Edéa (99 km)	Vocational, employer-managed	Industrial maintenance; transport and logistics; agro-food	[S25]

Source: as listed. Distances are straight-line from Kribi. The table is selective: it lists institutions verified for this paper, not every school in Cameroon.

3.3 No programme yet forms steelmakers

The departments listed above cover mechanical, electrical, chemical, mining and industrial engineering, but none of the institutions reviewed for this paper offers a programme dedicated to ferrous metallurgy, steelmaking or casting [S18][S21][S22]. Materials science is taught within mechanical and chemical programmes, and mining schools teach mineral processing up to the concentrate. The step that turns ore or scrap into liquid steel, refines it and solidifies it, the core of a melt shop, is not taught anywhere in the country as a discipline. This is consistent with Cameroon's industrial history: its steel firms mainly re-roll imported billets, with only a few small melt shops [S08], so domestic demand for melt-shop engineers has been too small to justify a programme.

The gap is narrower than it looks. A good mechanical, chemical or materials engineer can become a competent steelmaking engineer within two to three years through a structured programme combining a specialised module, placement in an operating melt shop abroad and plant-specific training from equipment suppliers. What Cameroon needs is not a new university, but a steelmaking specialisation embedded in existing engineering and IUT programmes, taught partly by industry practitioners and linked to placements. Chapter 5 describes models that have done this elsewhere, and Chapter 10 proposes how to do it at ENSPY, ENSPD and the University of Ebolowa.

CAMEROON DOES NOT NEED A NEW UNIVERSITY FOR STEEL; IT NEEDS A STEELMAKING SPECIALISATION INSIDE THE SCHOOLS IT ALREADY HAS.

Cameroon Steel

3.4 Vocational training is legally modern but under-equipped

Cameroon's vocational training is governed by Law No. 2018/010 of 11 July 2018, a text of 55 articles in seven chapters [S26]. It provides for apprenticeship under a written contract between a master and an apprentice from the age of 14 (articles 22 and 23), for work-linked training ("formation par alternance") under agreements between training centres and enterprises (articles 24 to 26), for the validation of acquired experience as a right (articles 37 to 39) and for employers' organisations to take part in designing and implementing training policy (articles 45 and 46) [S26]. Decree No. 2020/2592/PM of 9 June 2020 sets the rules for establishing, organising and running vocational training and learning centres [S27]. The legal basis for dual training with industry therefore exists; what has been missing is the industry.

Three recent investments show what modern provision looks like:

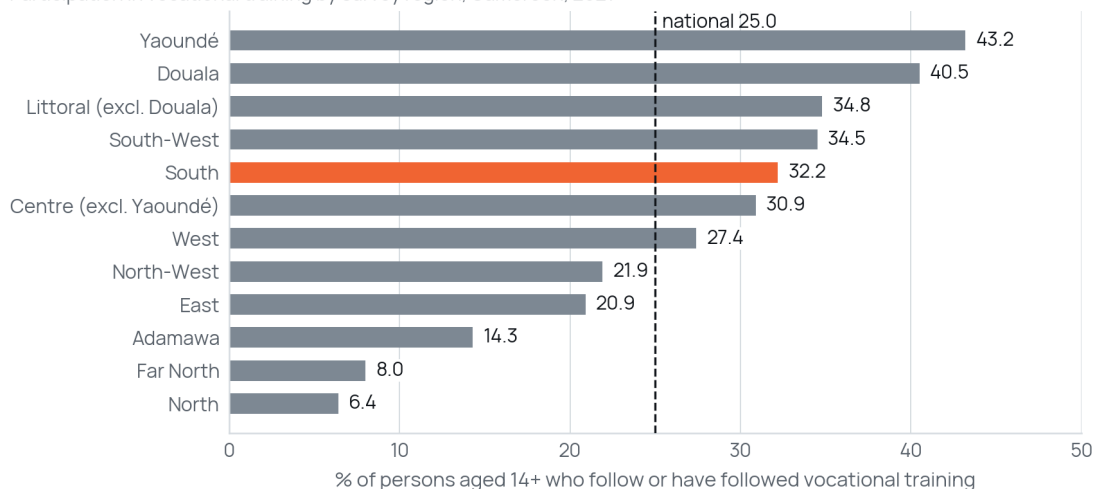
- **Centres of excellence.** Three Centres de formation professionnelle d'excellence, built with South Korean financing at a cost of about FCFA 24 billion, were commissioned in December 2016 in Douala, Limbe and Sangmélina. They train in 14 trades, including mechanics and electricity and electronics [S24].
- **Employer-managed sectoral centres.** The French Development Agency (AFD) financed a €15 million programme, from December 2014 to June 2020, to train skilled workers and technicians in growth trades, including industrial maintenance, through Centres de formation professionnelle sectoriels in the Douala and Edéa employment areas, managed by the private sector with the employers' association GICAM. The design target was 1,200 initial trainees and 800 continuing-training trainees a year, with continuing modules of about ten days [S25].
- **A financing instrument.** Since the 2023 Finance Law, employers of foreign workers pay a levy on the work-contract visa equal to two months of gross salary for non-African workers, and to one month, at half rate, for

African workers; the government has said the revenue will finance vocational training [S30][S31]. Collection reached about FCFA 5 billion in 2023, against an objective of FCFA 14 billion [S31].

The weaknesses are equally clear. MINEFOP's own analysis, reported in January 2026, found 2,694 trainers in vocational centres without any professional diploma, and 60% of the trainers who do hold higher degrees working as temporary staff [S28]. In December 2024 the minister estimated that transforming a traditional training centre into a modern one costs FCFA 2 to 3 billion, that the ministry's 2025 budget was FCFA 33.1 billion, and that existing resources covered less than 6% of the transformation objective [S29]. Survey data confirm the consequence: of the quarter of Cameroonians aged 14 and over who have followed vocational training, 39.3% learned on the job and only 18.9% in an institute or centre [S12].

One adult in four has had vocational training; in the South Region, close to one in three

Participation in vocational training by survey region, Cameroon, 2021



SOURCED **Figure 3.2.** Participation in vocational training by survey region, persons aged 14 and over, 2021. The South Region is above the national average.

Source: INS, EESI3 Phase 1, main employment report, Table 2.9 [S12].

The South Region does relatively well on this measure: 32.2% of its adults have followed vocational training, against 25.0% nationally, and a larger share than elsewhere did so at secondary and post-secondary level [S12]. A Kribi employer can build on that base, and on the centre of excellence at Sangmélima, rather than start from nothing.

3.5 Secondary technical education is the base of the operator pipeline

Most of the operators and many of the technicians of a steelworks will enter with a secondary technical qualification or a vocational certificate. The breadth of that base matters. The gross enrolment ratio in secondary education was 44.8% in 2023, and 42.5% for girls [S16]. Among adults aged 25 and over, 14.3% had completed at least upper-secondary education and 6.4% held at least a bachelor's degree or equivalent in 2018; adult literacy was 72.6% [S16]. The World Bank's Human Capital Index, which estimates the productivity a child born today can expect to reach given education and health conditions, stood at 0.40 for Cameroon in 2020 [S14].

These figures argue for two design choices. First, selection for operator roles should rely on aptitude tests in reading, numeracy and mechanical reasoning, because diplomas vary widely in what they certify. Second, initial training must include a foundation module, covering technical reading, measurement, basic electricity and mechanics, safety and teamwork, before plant-specific content. Technical teachers trained at ENSET Douala and ENSET Ebolowa are the people best placed to deliver that module, if they themselves are given industrial placements [S20][S23].

Technical secondary schools also matter for the long term. The proportion of secondary pupils in technical and vocational streams, 21.6% in 2016 [S16], is the pool from which apprentices and IUT students will be drawn for each later phase of the works. Careers information in those schools, plant visits and scholarships for the best pupils, especially girls, would widen the pipeline at very low cost (Chapter 10).

3.6 Capacity is adequate in volume; relevance and practice are the constraints

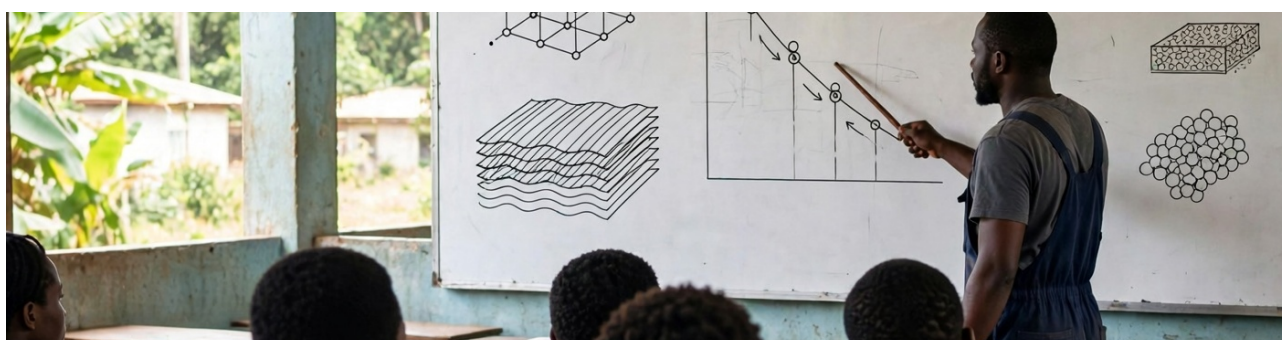
Set against these institutions, the first-phase need of a steelworks is modest in volume: about 300 operators, 100 technicians and 50 engineers, plus support staff, recruited over two to three years [S11]. The ISTD alone enrolls more than 3,000 students [S21]; ENSPY has graduated engineers for more than five decades [S18]; the three centres of excellence and the sectoral centres train in mechanics, electricity and industrial maintenance every year [S24][S25]. The issue is not whether Cameroon can produce enough graduates for one plant; it is whether those graduates arrive with the right content, enough hands-on practice and a recognised certificate.

Four constraints recur in the evidence:

- **Content.** No steelmaking or casting content; little high-temperature process control; limited exposure to industrial automation platforms of the type used in modern mills.
- **Equipment.** Workshops sized for teaching, not for industrial practice; no melt-shop or caster simulators; limited access to electrical and hydraulic test benches of industrial scale.
- **Trainers.** Many trainers lack diplomas or industrial experience, and many are temporary [S28]; the technical teacher-training schools (ENSET Douala and ENSET Ebolowa) are the lever to change this [S20][S23].
- **Links with industry.** Few formal employers offer placements, and the share of firms offering formal training fell to 24.0% in 2024 (Chapter 4) [S15].

FINDING

Cameroon's schools can supply the volume of graduates a phased steelworks needs. They cannot yet supply steelmaking content, industrial-scale practice or trainers with plant experience. Each of these can be bought in through partnerships with equipment suppliers, operating steel plants abroad and the employer itself.



ILLUSTRATIVE Illustrative view. Generated image of a technical classroom in which students in work overalls follow a lesson on materials and processes; not a photograph of any project, place or person.

The policy response follows from this diagnosis. Rather than building new institutions, a Kribi steel skills partnership should equip and staff existing ones: a steelmaking specialisation at the engineering schools, an industrial-maintenance and automation track with plant placements at the ISTD and the centres of excellence, a trainer-upskilling programme through ENSET, and a dual apprenticeship with the employer in the South Region. Chapter 4 identifies the precise skills to target; Chapter 5 shows how others have done it.

CHAPTER 4

THE CRITICAL GAPS ARE IN THE MELT SHOP, THE CASTER AND SUPERVISION, AND CERTIFICATION IS THE WEAKEST LINK

The skills a steelworks needs fall into three groups when set against what Cameroon can supply today. Site trades, logistics and crane operation can be sourced locally with short training. Maintenance, welding, electrical and automation skills exist in the country but need upgrading to industrial standards and, above all, recognised certification. Melt-shop, ladle-furnace and casting operation, steelmaking metallurgy and the supervision of a continuous 24-hour process have almost no local base and take two to ten years to form. A skills plan for steel should therefore concentrate scarce training resources on the last group, start it first, and use certification to turn the second group's informal competence into recognised qualifications.

4.1 Where the gaps are: an assessment by occupational family

Figure 4.1 summarises Cameroon Steel's assessment of the gap between what a phased EAF works needs and what Cameroon can supply, for ten occupational families and four dimensions: the stock of experienced workers in Cameroon, the capacity of Cameroonian institutions to train new ones, the availability of a recognised certification, and the time needed to reach independent competence. Scores are judgements on a four-step scale, informed by the evidence in Chapters 2 and 3 and by the training durations in Chapter 5; the method is set out in Annex A. They are meant to set priorities, not to rank people or institutions.

Melt-shop, casting and supervisory skills are the critical gaps; logistics and site trades are not

Size of the gap by occupational family and dimension, Cameroon, 2026 (Cameroon Steel assessment, method in Annex A)

	Experienced supply in Cameroon	Training capacity in Cameroon	Recognised certification available	Time to competence
EAF and ladle-furnace operation	critical	critical	critical	critical
Continuous casting	critical	critical	critical	large
Rolling and roll-shop	large	large	large	large
Mechanical maintenance	moderate	moderate	large	moderate
Electrical, automation, instrumentation	large	moderate	large	large
Welding and fabrication	moderate	moderate	large	moderate
Metallurgy and quality lab	large	large	moderate	large
Crane, mobile plant and logistics	small	moderate	moderate	small
HSE and emergency response	moderate	moderate	moderate	moderate
Supervision and shift management	large	large	critical	critical

ASSUMED Figure 4.1. Size of the skills gap by occupational family and dimension, Cameroon, 2026. Assessment on a four-step scale.

Source: Cameroon Steel assessment (method and scoring rules in Annex A), drawing on INS, EESI3 [S12], institutional sources in Chapter 3 [S18][S21][S22] [S24][S25] and World Bank Enterprise Surveys [S15].

Three groups emerge.

Critical gaps: steelmaking process and supervision. Electric arc furnace and ladle-furnace operation, continuous casting and the supervision of a continuous process are rated critical on most dimensions. Cameroon's steel industry is made up mainly of re-rollers with a few small melt shops [S08], so the pool of experienced melters and casters is small and already employed; no Cameroonian programme teaches steelmaking (Chapter 3); and no national certificate exists for these occupations. Forming a competent melter takes two to three years after initial training; forming a shift manager who can run a melt shop and caster through the night takes much longer (Chapter 5).

Large gaps: rolling, automation and metallurgy. Rolling-mill operation and roll-shop machining, electrical and automation work, and laboratory metallurgy have a partial local base. Douala's rolling mills employ experienced operators and roll-shop machinists, and the ISTD and IUTs train electrical and mechanical technicians [S07] [S21][S22]. But the base is small relative to demand from a growing cluster, much of it is already employed, and the step from a teaching laboratory to a modern mill's drives, programmable logic controllers (PLCs) and spectrometers is large.

Moderate or small gaps: maintenance, welding, HSE, logistics. Mechanical maintenance and welding draw on a wide base of technicians and tradespeople trained formally or on the job; health, safety and environment (HSE) officers are trained for other industries; crane operation, driving and logistics are common skills. Here the gap lies less in competence than in proof of competence: recognised certificates, documented experience and familiarity with the procedures and permit systems of a heavy-industry site.

4.2 A skills matrix for a phased EAF works

Table 4.1 translates the assessment into a matrix of the main roles, the competences that define them, the entry qualification that fits Cameroon's education system, the certification or standard that demonstrates competence, and the training route. It is the basis for the workforce plan in Chapter 9 and for curriculum co-design with schools (Chapter 10).

Table 4.1 Skills matrix for the main roles of a phased EAF long-products works

Role	Critical competences	Entry qualification in Cameroon	Certification or standard	Main training route	Time to competence
EAF and ladle-furnace operator (melter)	Furnace programme and power control; oxygen and carbon injection; slag practice; tapping; sampling; molten-metal safety	Technical baccalaureate or DUT (chemistry, mechanics, electrical)	Employer competence card; vendor training certificate	Simulator, vendor training, placement in an operating melt shop, mentored shifts	24 to 42 months
Caster operator	Tundish and mould operation; casting speed and cooling; breakout prevention; billet cutting and quality	Technical baccalaureate or DUT	Employer competence card; vendor certificate	Simulator, vendor training, mentored shifts	18 to 30 months
Rolling-mill operator and roll changer	Pass schedules; guides and stands; roll change; cobble prevention; product tolerances	CAP, technical baccalaureate or DUT (mechanics)	Employer competence card	On-the-job with experienced operators; vendor modules	9 to 24 months
Roll-shop machinist	Lathe and CNC work on rolls and guides; groove profiles; inspection	CAP or BTS (machining)	National trade certificate; employer card	Dual apprenticeship; vendor modules	18 to 36 months
Mechanical maintenance technician	Hydraulics, lubrication, bearings, gearboxes; condition monitoring; planned maintenance	DUT or BTS (industrial maintenance, mechanics)	National diploma; employer card	Dual apprenticeship or conversion programme	30 to 42 months from school entry
Electrical and automation technician	Medium and high-voltage switching; drives; PLC and instrumentation; electrical safety	DUT or BTS (electrical, industrial computing)	National diploma; electrical authorisation; vendor PLC certificates	IUT plus vendor training; mentored authorisations	36 to 48 months from school entry
Certified welder	Fusion welding of carbon steel in several positions and processes; reading procedures	CAP or CQP (welding)	ISO 9606-1 welder qualification	Test and coding on site; refresher	12 to 18 months
Crane and mobile-plant operator	Overhead and mobile crane operation; rigging signals; load charts	Driving licence; trade certificate	Operator licence; employer authorisation	Short course and supervised hours	6 to 12 months
Laboratory analyst and quality inspector	Spectrometry; tensile and bend testing; sampling; product certification to the national rebar standard	Licence or DUT (chemistry, materials, mechanics)	Laboratory quality system; standard test methods	On-the-job; external laboratory courses	12 to 24 months

Role	Critical competences	Entry qualification in Cameroon	Certification or standard	Main training route	Time to competence
Process metallurgist	Steelmaking thermodynamics; alloying; defect analysis; process optimisation	Engineering degree (mechanical, chemical, materials)	Professional record; internal qualification	Specialisation module; placement abroad; mentoring	72 to 84 months from school entry
HSE officer	Risk assessment; permits; incident investigation; emergency response	Degree or DUT in HSE or engineering	ISO 45001 lead auditor or equivalent; first aid; fire	External courses; mentoring	12 to 24 months
Shift supervisor and shift manager	Leading crews through a 24-hour cycle; production and safety decisions; coordination across areas	Experienced operator, technician or engineer	Internal leadership programme	Progression, leadership training, rotations	6 to 10 years of experience

Source: Cameroon Steel analysis. Times to competence are planning assumptions (Annex A; Figure 5.2). Standards: ISO 9606-1 [S59]; ISO 45001 [S58]; mandatory national rebar standard NC 236/2024/06 [S67].

4.3 Welding is the most portable skill, and the easiest to certify

Welding deserves particular attention because it is needed throughout a plant's life, from construction to maintenance, and because its competence can be tested objectively. The international standard ISO 9606-1 specifies the qualification testing of welders for fusion welding of steels: a welder is tested on a specific process, material, joint type and position, and receives a certificate valid for a defined period if the test piece passes visual and destructive or radiographic examination [S59]. The International Institute of Welding, launched in June 1948 and counting 59 member countries at its 2015 peak, runs a harmonised qualification system, coordinated with the European Federation for Welding, Joining and Cutting since 2009. Authorised Nominated Bodies administer its examinations, issue diplomas and authorise Approved Training Bodies; where a country has no IIW member, organisations can work with an Authorised Nominated Body of another country [S60][S78].

Cameroon has a large population of welders trained informally in workshops, but few of them hold a certificate that a heavy-industry employer or a foreign equipment supplier will accept. For this paper we did not identify a body in Cameroon that tests and certifies welders to ISO 9606-1 on a regular basis; this is listed as an evidence gap (Chapter 11). The opportunity is straightforward: a welding test centre, run with an accredited international certification body, could test workshop-trained welders, certify those who pass and train those who do not. During construction, each phase of a steelworks will need hundreds of welders; making certification a contractual requirement, with testing on site, would leave the Kribi cluster with a certified workforce after each peak (Chapter 9).

Electrical and automation technicians present a similar but harder case. A modern EAF draws power through a dedicated furnace transformer fed at high voltage, and the rolling mill runs on variable-speed drives controlled by PLCs. Working on such systems requires formal electrical authorisations, issued by the employer under a written procedure, and familiarity with specific control platforms that vendors teach on their own equipment. Cameroonian IUT graduates in electrical engineering and industrial computing (GEII) have the theoretical base [S21]; what they lack is supervised practice on industrial equipment, which can only be gained in a plant, at a vendor's facility or on industrial-grade training benches.

Metallurgy and quality control carry a regulatory dimension. Reinforcing bar sold in Cameroon must conform to the mandatory national standard NC 236/2024/06; in January 2026 the government refused an industry request to revise it [S67][S68]. Each heat and each batch has to be analysed and tested, and the results certified. Laboratory analysts and quality inspectors therefore need training in standard test methods and in a documented quality system, which a laboratory can later have accredited.



ILLUSTRATIVE Illustrative view. Generated image of a trainee welder in protective equipment guided by an instructor at a workshop bench; not a photograph of any project, place or person.

4.4 Supervision is the slowest skill to build

The most underestimated gap is supervisory. A steelworks runs 24 hours a day in rotating shifts. At three in the morning, a shift supervisor in the melt shop decides whether a furnace with a suspected water leak keeps melting, whether a ladle with a worn lining is used once more, and whether a crew that has been short-handed for two shifts continues. Those decisions combine technical judgement, safety leadership and authority over experienced workers. They cannot be taught in a classroom, and they are the decisions most often at the root of serious accidents in heavy industry (Chapter 8).

Supervisors are grown, not hired. The career ladders in Figure 4.2 show the typical path: an operator becomes a senior operator after three to six years, a shift supervisor after six to ten, and a production manager after more than ten. Maintenance and engineering ladders are similar. A new works in a country with no steelmaking base must therefore accept that its first supervisors will be expatriates or experienced Cameroonians recruited from other heavy industries (cement, aluminium, power, oil and gas), and must name and develop their Cameroonian successors from the first day.

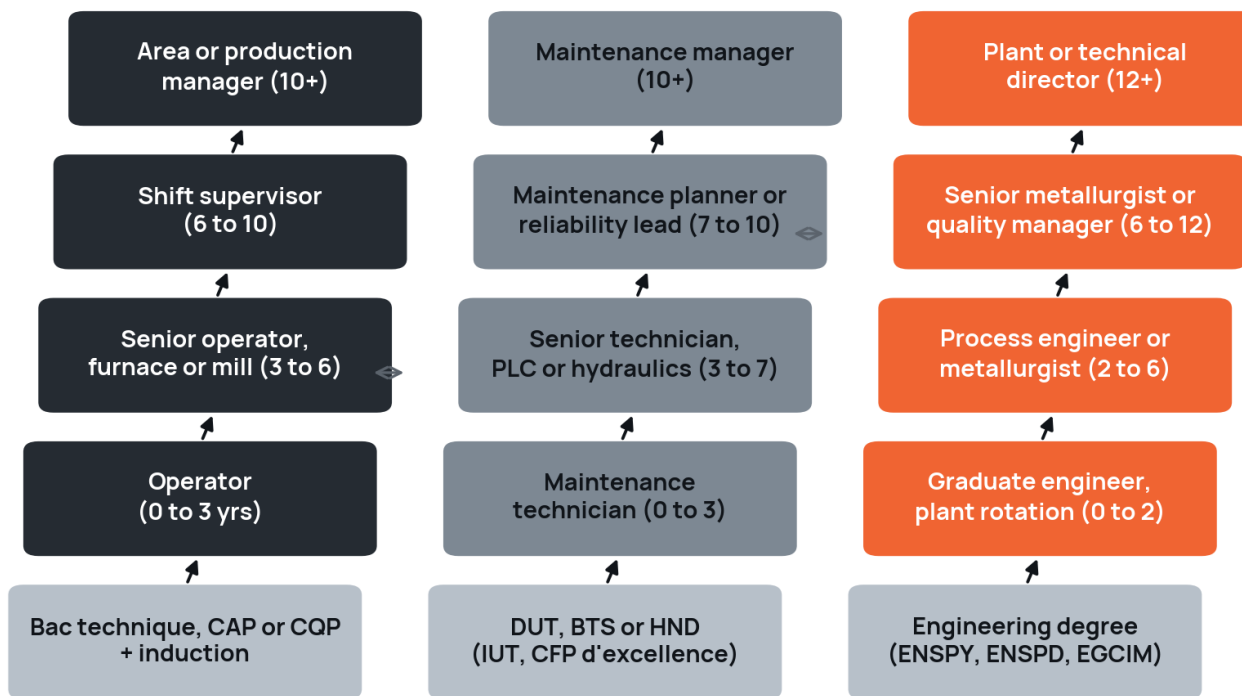
Three career ladders lead from a Cameroonian diploma to the top of a steelworks

Indicative career paths; years are typical cumulative experience, not guarantees

PRODUCTION

MAINTENANCE AND AUTOMATION

ENGINEERING AND METALLURGY



ILLUSTRATIVE Figure 4.2. Career paths from a Cameroonian diploma to senior roles in production, maintenance and engineering. Years are typical cumulative experience.

Source: Cameroon Steel analysis of typical career progression in EAF long-products works; diplomas as awarded by Cameroonian institutions [S18][S21][S24].

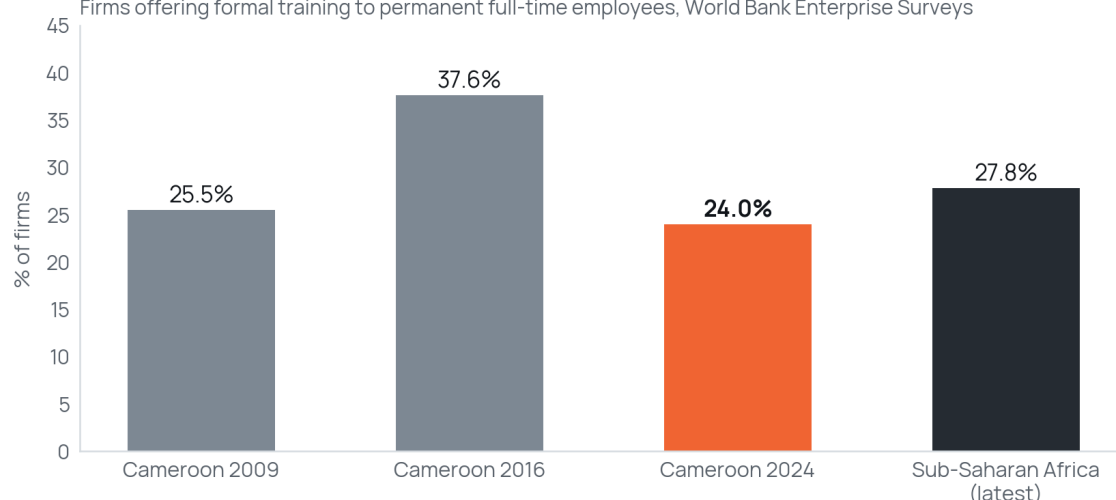
The ladders also show where lateral moves are possible: a senior operator with an aptitude for equipment can move into maintenance, and a senior technician can move into engineering with further study. Making those bridges explicit, and financing the study that some of them require, is one of the most effective retention tools available to an employer in a tight labour market.

4.5 Employers train less than they did, which makes the gap self-perpetuating

Skills gaps persist where employers do not train. The World Bank's Enterprise Surveys show that the share of Cameroonian firms offering formal training to their permanent full-time employees fell from 37.6% in 2016 to 24.0% in 2024, below the latest Sub-Saharan African average of 27.8% (Figure 4.3) [S15]. Formal firms that do not train cannot supply experienced workers to newcomers; newcomers who cannot recruit experienced workers must train from scratch; and firms that train risk losing their trainees to those that do not. This is the classic case for a shared, sector-level training effort financed by all employers who benefit (Chapter 10).

Fewer than one Cameroon firm in four offered formal training in 2024, down from 38% in 2016

Firms offering formal training to permanent full-time employees, World Bank Enterprise Surveys



SOURCED Figure 4.3. Share of firms offering formal training, Cameroon (2009, 2016, 2024) and Sub-Saharan Africa (latest).

Source: World Bank, Enterprise Surveys, indicator "Firms offering formal training (% of firms)", via the World Development Indicators API, updated 8 October 2026 [S15].

4.6 Language, numeracy and digital skills underpin everything else

Three foundation skills cut across every role in the matrix and deserve explicit attention in any training plan.

Language. Cameroon has two official languages, and Law No. 2018/010 commits the State to equal access to vocational training in both [S26]. Most technical secondary schools and vocational centres teach in French, while much equipment documentation, control-system software and vendor training is produced in English. A steelworks recruiting nationally will employ francophone and anglophone Cameroonians side by side, and will receive manuals, alarms and training material in at least one language that part of its workforce does not read fluently. Procedures, safety signs and permits should therefore be bilingual, and technical English for operators and technicians should be part of the training programme, not an assumption.

Numeracy and process thinking. Running a furnace or a caster means reading trends, interpreting set points and tolerances, and understanding cause and effect in a continuous process. These skills vary widely among holders of the same diploma, which is why aptitude testing at selection and a foundation module at the start of training are recommended (Chapter 3).

Digital skills. Modern melt shops and rolling mills are run from control rooms through process-automation systems, and maintenance is planned in computerised systems. Operators and technicians need to be comfortable with screens, data and simple software before they learn plant-specific systems. Simulators, discussed in Chapter 5, train these skills and the process at the same time.

Cameroon has a full set of national diplomas, from the CAP and the technical baccalaureate to the BTS, the DUT and the engineering degree, and Law No. 2018/010 adds the validation of acquired experience as a right [S26]. What it lacks for heavy industry is a set of competence standards that describe what a melter, a caster, a roll changer or an electrical authorisation holder must be able to do, and a certification process that tests it. Without them, three problems arise:

- **Employers cannot trust informal competence.** A welder or mechanic trained in a workshop may be excellent, but without a certificate the employer must test every candidate itself.
- **Workers cannot carry their competence.** A melter trained by one employer has no document that another employer, or a training centre, will recognise.

- **Schools cannot align curricula.** Without occupational standards co-written with industry, training centres teach to their own syllabus.

FINDING

Certification is the cheapest lever in the system. International standards already exist for welders and for occupational safety management; vendor certificates exist for equipment operation; Law No. 2018/010 already provides for validation of experience. What is missing is a set of steel-occupation competence standards, written by employers with MINEFOP, and a test centre to apply them.

The answer is not to create new diplomas, but to build an employer-led layer of competence standards and assessments on top of the national ones: international certificates where they exist (ISO 9606-1 for welders [S59], ISO 45001-based management for HSE [S58]), vendor certificates for equipment, and employer competence cards for process roles, all mapped to the national diplomas so that a worker's progress is recorded and portable. Chapter 10 proposes that MINEFOP and the employers of the Kribi cluster develop these standards together and recognise them nationally.

CHAPTER 5

TRAINING MODELS THAT WORK COMBINE SCHOOL, PLANT AND SUPPLIER, AND START YEARS BEFORE PRODUCTION

Industrial training succeeds where three parties share the work: a school that teaches the theory and the basic trade, an employer that provides real equipment, tutors and a job at the end, and an equipment supplier that knows the machines best. The strongest international models, from Germany's dual apprenticeship system to the corporate academies of OCP in Morocco, Dangote in Nigeria and Tata Steel in India, all combine these three, and all treat training as an investment made years before the output it serves. For a Kribi steelworks the lesson is practical: begin dual apprenticeships and graduate programmes about three years before first steel, write training obligations into equipment contracts, use simulators to teach what cannot yet be practised on site, and build a shared academy for the cluster rather than a private one for a single plant.

5.1 Five models, each with a role

Table 5.1 compares five training models that a heavy-industry employer can combine. None is sufficient alone. Dual apprenticeship builds the operator and technician base; vendor training transfers equipment-specific knowledge; simulators allow safe practice before the plant exists; placements in operating plants give experience that no school can; and an academy gives continuity once the plant runs.

Table 5.1 Training models for a heavy-industry workforce compared

Model	Target group	Typical duration	What it does best	Main limitation	Cameroonian basis
Dual apprenticeship (school and plant alternating)	School leavers and young adults entering operator and technician trades	2 to 3 years	Builds a broad base of practical, certified trades; integrates newcomers into plant culture	Needs a functioning plant or workshop and trained tutors	Law No. 2018/010, articles 22 to 26 [S26]; employer-managed CFPS model [S25]
Vendor (OEM) training in equipment contracts	Operators, maintainers and engineers of specific equipment	Weeks to months, before and during commissioning	Transfers equipment-specific know-how; certifies operators on the actual machines	Often narrow; quality depends on contract terms	Contract terms negotiated by the employer
Simulators and e-learning	All process roles, before and alongside plant training	Modules of hours to weeks	Safe repetition of rare or dangerous situations; training before the plant exists	Cannot replace hands-on experience; needs instructors	worldsteel steeluniversity offers EAF and casting simulations [S50]

Model	Target group	Typical duration	What it does best	Main limitation	Cameroonian basis
Placements in operating plants abroad	Engineers, supervisors and key operators	3 to 12 months	Experience of real production and incidents; mentoring by peers	Costly; selection and return conditions matter	To be arranged with technology partners and steel producers
Corporate or cluster academy	Whole workforce, continuously	Permanent	Continuity, leadership development, succession, links with universities	Fixed cost; risk of insularity if not shared	Dangote, OCP and Tata examples (Table 5.2)

Source: Cameroon Steel analysis; legal and institutional references as cited.

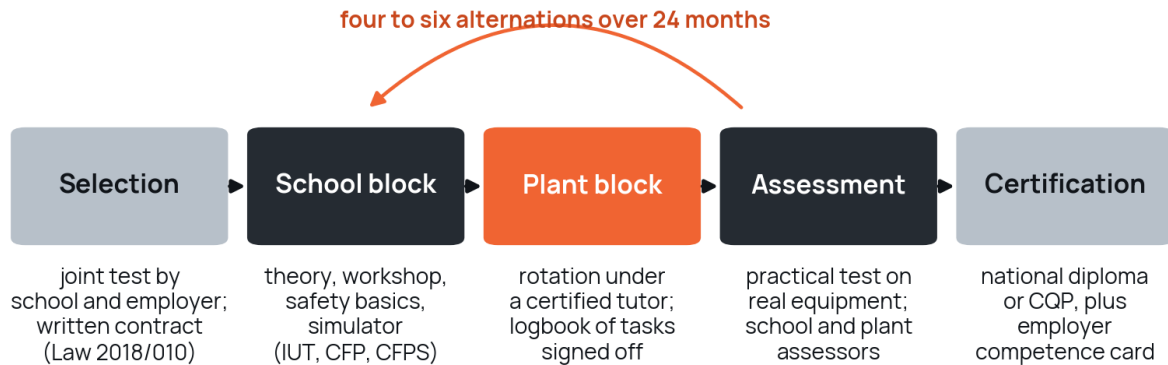
5.2 Dual apprenticeship: the employer trains, the school certifies

Germany's dual system is the reference model for industrial apprenticeship. Apprentices sign a contract with a company, work and learn there for most of the week, and attend a vocational school for the rest; at the end they sit a national examination. In 2022, 468,900 people in Germany concluded a new apprenticeship contract in the dual system, and about 1.21 million were in training, 35% of them women [S48]. The Federal Institute for Vocational Education and Training (BIBB) lists 324 state-recognised training occupations in 2026, each defined by a national training regulation that specifies the skills to be acquired [S65]. The system is driven by employers' demand: in 2025, with a weaker economy, the number of training places fell and about 84,400 young people did not find one, according to BIBB [S49]. That sensitivity is the price of the system's strength: apprenticeships exist where real jobs exist.

Cameroon's legal framework already allows this model. Law No. 2018/010 provides for apprenticeship contracts and for work-linked training under agreements between training centres and enterprises, in which the enterprise undertakes to transmit professional knowledge and to give trainees the information and means they need [S26]. The AFD-financed sectoral centres in Douala and Edéa showed that employer management of a training centre is possible in Cameroon [S25]. What has been missing is an employer large enough, and with a long enough planning horizon, to anchor a dual programme in heavy-industry trades. A phased steelworks is such an employer.

Dual training alternates school and plant so that apprentices arrive productive

Two-year dual apprenticeship cycle proposed for operator and technician trades (illustrative)



The split of time between school and plant, the stipend and the tutor ratio are to be fixed with training partners (Chapter 10).

ILLUSTRATIVE Figure 5.1. A two-year dual apprenticeship cycle proposed for operator and technician trades. The split between school and plant, the stipend and the tutor ratio are to be fixed with partners.

Source: Cameroon Steel proposal, drawing on the dual-system model [S48][S65] and on Law No. 2018/010 [S26].

The design choices that matter most are practical ones:

- **Selection jointly by school and employer**, on aptitude and attitude rather than on prior experience.
- **A written contract and a stipend**, so that apprentices can afford to stay the course and the employer has a commitment to honour.
- **Certified tutors in the plant**, chosen among experienced workers and paid for the role; the tutor ratio determines quality more than any classroom.
- **A logbook of tasks** signed off as the apprentice masters them, which becomes the basis for the competence card (Chapter 4).
- **Assessment on real equipment**, by assessors from both the school and the plant, leading to a national diploma or a CQP.

The difficulty for a new works is that it has no plant in which apprentices can learn during its first two years. The solution is to place the first cohort's plant blocks in existing heavy-industry sites in Douala and Edéa, in vendor workshops abroad and in the works' own maintenance shops as soon as they are built, and to start the dual programme in trades, such as maintenance and electrical work, that can be practised before the melt shop exists.



ILLUSTRATIVE Illustrative view. Generated image of trainees in overalls listening to an instructor in a technical workshop with lathes and welding booths; not a photograph of any project, place or person.

5.3 Vendor training: write it into the equipment contract

Every major equipment package for a steelworks (the furnace, the ladle furnace, the caster, the reheating furnace, the rolling mill, the power supply and the automation) comes with a supplier that knows the equipment better than anyone. Suppliers normally offer training as part of the contract: classroom modules on the process and the control system, practice at a reference plant, and on-site instruction during commissioning. Its value depends almost entirely on the contract terms.

Four terms make the difference. The contract should specify the **number of trainees** by role and the **content and duration** of each module; it should require **hands-on time** at a reference plant and on the actual equipment, not only observation; it should include **train-the-trainer** modules so that Cameroonian instructors can teach later cohorts; and it should define **acceptance criteria**, such as tests passed and tasks performed independently, linked to payment milestones. These conditions are routine in well-run projects but are easily traded away in price negotiations. Because they determine how quickly expatriate roles can be handed to Cameroonian staff, they should be treated as part of the plant's performance, not as an extra.

5.4 Simulators teach what the plant cannot yet show

A melt shop is a dangerous place to learn. Water ingress into a furnace, a breakout at the caster or a cobble in the rolling mill are rare events that every operator must know how to handle but that no trainer wants to stage. Simulators allow operators to practise them safely and repeatedly. The World Steel Association's learning platform, steeluniversity, offers simulations of steelmaking in the electric arc furnace, secondary steelmaking and continuous casting, e-learning courses on these processes, and 3D animated videos of the most common safety incidents at steel plants and how to avoid them [S50]. Equipment suppliers and specialist firms offer operator-training simulators for furnaces, cranes and control rooms.

For Cameroon, simulators solve a timing problem. They allow operator candidates to start learning the process 18 months or more before the furnace exists, at a training centre in Kribi or Douala, and to arrive at vendor training and commissioning already familiar with the logic of the process. They also allow training to continue during operation without stopping production. They do not replace mentored shifts on real equipment, and they need instructors who understand both the simulator and the plant.

5.5 Placements and twinning: experience that cannot be taught

Some competences can only be acquired by working in a running plant: judging the condition of a furnace from its sound and its off-gas, reacting to a breakout at the caster, leading a crew through a night shift with an equipment failure. For a country without an operating melt shop of comparable scale, placements in operating plants abroad are the only route to that experience before first steel. The engineers, the future shift supervisors and a core of senior operators should spend several months on shift in plants that use the same or similar equipment, with defined learning objectives, a mentor on each site and an obligation to return and train others.

Twinning arrangements between a new works and an established steel producer, often a technology partner or a supplier's reference customer, make such placements easier to organise and continue after start-up, through exchanges of supervisors and joint problem-solving. Their value depends on three conditions: careful selection of the people sent, written learning objectives, and a contractual commitment from returning staff to remain with the employer for a defined period. Cameroon's vocational training law allows employers to require trained workers to remain in their service for a set time after training [S26].

5.6 Training the trainers

Every model in Table 5.1 depends on trainers: tutors in the plant, instructors in schools and centres, simulator instructors and the engineers who will teach the next cohorts. Trainers are also the weakest link in Cameroon's current vocational system, where many lack a professional diploma or industrial experience [S28]. A steel skills programme should therefore invest in trainers before trainees: select experienced workers as plant tutors and train them in instruction techniques; give school and centre instructors industrial placements; and require equipment suppliers to deliver train-the-trainer modules so that Cameroonian instructors can teach later cohorts. A trainer trained once teaches dozens of people over a career, which makes this the highest-return spending in any programme.

5.7 Company academies: three examples from industrial groups

Large industrial groups in emerging economies have built their own training institutions when the national system could not supply the skills they needed. Table 5.2 summarises three that are relevant to Cameroon: OCP in Morocco, Dangote in Nigeria and Tata Steel in India.

Table 5.2 Corporate training models in three industrial groups

Group	Training institution or programme	What the evidence shows	Lesson for a Kribi steelworks
OCP Group (Morocco, phosphates and fertilisers)	Mohammed VI Polytechnic University (UM6P), owned by OCP through its foundation	Campus at Benguerir operating since 2015, with 2,182 students in 2021 [S47]; a ten-year programme with the Mastercard Foundation for 575 young African women scholars [S46]	Anchor higher education next to the industry, owned and financed for the long term
Dangote Cement (Nigeria and 10 other African countries, including Cameroon)	Dangote Academy; graduate trainee programme	Academy serves as a centre for leadership, technical and vocational training; graduate trainees rose from 81 (2023) to 141 (2025); training spending rose 50% to ₦2.05 billion in 2025; 455,639 training hours in 2025; expatriate roles transitioned to local professionals [S42]	Budget for training as a line of operating cost; track graduates and localisation explicitly

Group	Training institution or programme	What the evidence shows	Lesson for a Kribi steelworks
Tata Steel (India, integrated steel)	Technical institute founded in 1921, now the Shavak Nanavati Technical Institute; vocational training institute since 2015; scholarships for women engineering students	More than 75,000 graduates of the technical institute by 2021 and more than 5,000 vocational trainees placed in jobs [S43]; scholarship programmes for women in engineering colleges [S44]; first batch of women firefighter trainees in 2023 [S45]	Training and inclusion are long-term institutions; build them from the first year

Source: as cited: company and institutional sources [S42][S43][S44][S45][S46]; World Bank Group, Multilateral Investment Guarantee Agency [S47].

Three common features stand out. First, each group treats training as a permanent function with its own budget, not as a project. Dangote Cement, for example, reports training expenditure, hours and graduate-trainee numbers in its annual report alongside its production figures [S42]. Second, each links its training to a university or a recognised qualification, so that what workers learn has value outside the company. Third, each uses training to replace expatriate staff with nationals over time, and reports on it. Dangote Cement's Cameroonian subsidiary, for instance, employed 272 people in 2025, 84 of them women [S42]. That is a useful reminder that Cameroonian heavy-industry employers already run structured training at modest scale, and that a steel training effort can learn from them.

TRAINING IS NOT A COST OF STARTING A STEELWORKS; IT IS THE FIRST PART OF THE STEELWORKS TO BE BUILT.

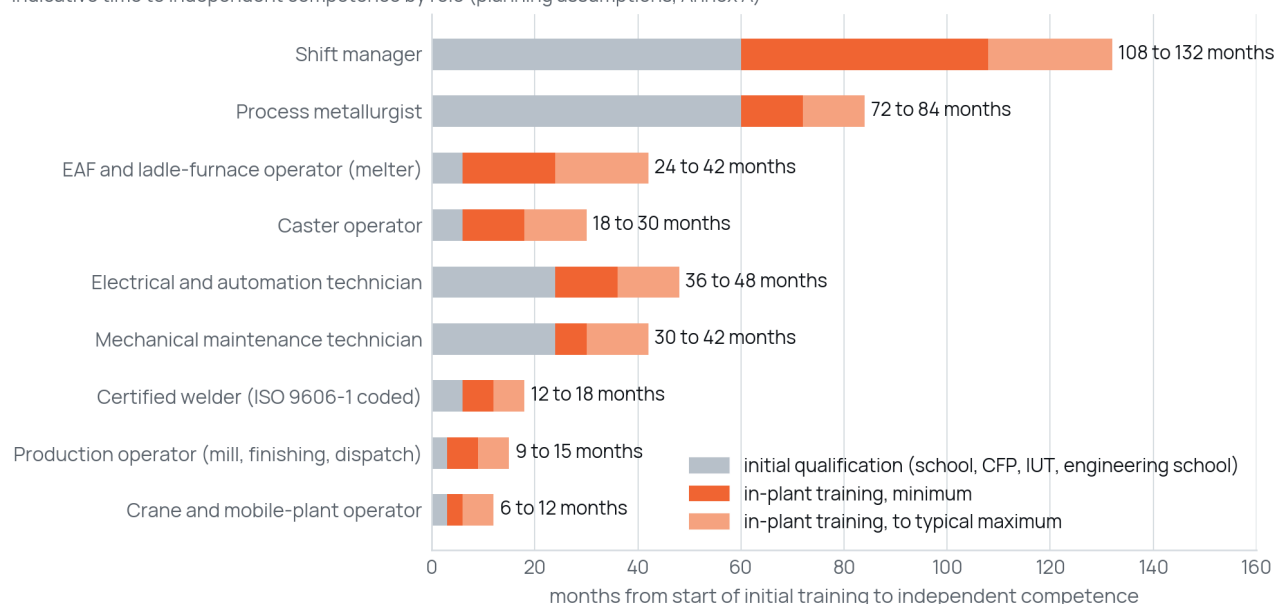
Cameroon Steel

5.8 Time to competence sets the start date

The single most important planning variable for a skills programme is the time it takes to make a person competent in a role. Figure 5.2 sets out Cameroon Steel's planning assumptions, from the start of initial training to independent work, for nine representative roles. A crane operator or production operator can be ready within a year. A certified welder needs 12 to 18 months from the start of a vocational course. An electrical and automation technician needs three to four years from entry into an IUT. A melter needs two to three and a half years even when recruited with a technical diploma, and a process metallurgist six to seven years from entry into engineering school. A shift manager who can run a melt shop and caster takes about nine to eleven years.

A melter or a shift manager takes years to form, which is why training must precede the plant

Indicative time to independent competence by role (planning assumptions, Annex A)



ASSUMED Figure 5.2. Indicative time from the start of initial training to independent competence, by role.

Source: Cameroon Steel planning assumptions (Annex A), based on typical durations of Cameroonian diplomas (CQP, DUT and BTS, engineering degree) and of in-plant training in EAF long-products works.

The arithmetic is unforgiving. If the first phase of a works is to start with Cameroonian melters, recruitment and training must begin two to three years before first steel; if it is to start with Cameroonian shift supervisors, they must be found among experienced workers in other heavy industries and converted, because none can be grown from scratch in time. The workforce plan in Chapter 9 is built on this logic.

5.9 Seven lessons for Cameroon

The evidence reviewed in this chapter suggests seven practical lessons:

- 1. The employer leads, the school delivers.** Training succeeds when employers define the competences, provide tutors and equipment and hire the graduates; schools and centres provide the teaching and the national certificate.
- 2. Train ahead of the plant.** The pipeline must open about three years before first steel for operators and technicians, and earlier for engineers and supervisors.
- 3. Buy training with equipment.** Vendor training should be specified, measured and paid for as a deliverable of each equipment contract, including train-the-trainer modules.
- 4. Use simulators early.** Process simulators allow training to start before the plant exists and to continue safely during operation.
- 5. Place key people in operating plants.** No substitute exists for months on shift in a working melt shop, under the supervision of experienced peers.
- 6. Share the academy.** A training centre serving all heavy-industry tenants of the Kribi zone would be cheaper per trainee and would reduce poaching between employers.
- 7. Measure and publish.** Graduate numbers, placement rates, certification rates and localisation should be tracked and reported, as the best corporate academies do.

CHAPTER 6

LOCAL CONTENT MULTIPLIES A STEELWORKS' JOBS ONLY IF SUPPLIERS ARE DEVELOPED, NOT MERELY PREFERRED

Most of the jobs a steelworks supports are outside its fence, in the firms that build it, maintain it, feed it, transport its products and serve its workers.

Cameroon's law now pushes investors towards local hiring and local suppliers: the 2025 investment-incentive ordinance makes a local-skills, local-hiring and local-subcontracting programme a condition of eligibility, and the 2023 Mining Code sets detailed local-content obligations for the ore supply chain [S36] [S35]. Legal preference alone, however, does not create capable suppliers. The evidence from other African heavy industries is consistent with local procurement rising where buyers invest in suppliers' capabilities, step by step, and measure the result, although no published case isolates the effect of that investment. For a Kribi steelworks, services and site works can be largely local from the first year; maintenance, machining and some consumables can follow within five years with a structured supplier-development programme; the remaining imported inputs set the agenda for the cluster's longer-term industrial development.

6.1 What a steelworks buys

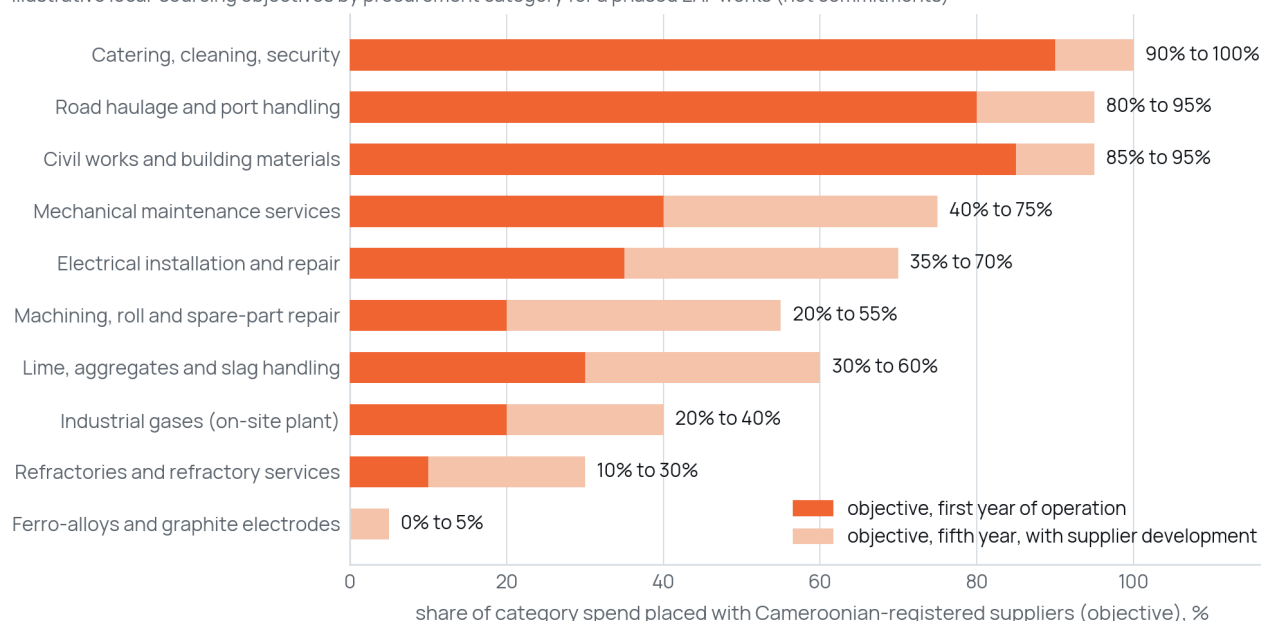
A steelworks' purchases fall into four groups with very different local potential.

- **Metallic charge and energy.** Scrap, DRI or hot-briquetted iron and electricity are the largest operating costs of an EAF works. They come from wherever the metallics and the power are; in the long term, Cameroonian iron ore reduced to DRI and Cameroonian hydropower are the largest local-content opportunity of all, but they are industrial projects in their own right rather than supply contracts.
- **Process consumables.** Graphite electrodes, refractories, ferro-alloys, lime, industrial gases, rolls and spare parts. Most are imported today; some, such as lime, aggregates and gases produced on site, can be local; others, such as refractory installation and roll repair, have a local service component even when the material is imported.
- **Services.** Mechanical and electrical maintenance, machining and repair, laboratory testing, cleaning, catering, security, transport, port handling, IT and training. These are labour-intensive and largely localisable.
- **Capital works.** Civil works, buildings, steel structures, erection and installation in each construction phase. Local firms can take a large share if packages are sized to their capacity.

Figure 6.1 sets out illustrative objectives for the share of each category that could be placed with Cameroonian-registered suppliers in the first and fifth years of operation. The objectives are not commitments; they show where supplier development can change outcomes and where it cannot in the short term.

Services and site works can be local from the first year; consumables need supplier development

Illustrative local-sourcing objectives by procurement category for a phased EAF works (not commitments)



ILLUSTRATIVE Figure 6.1. Illustrative local-sourcing objectives by procurement category, first and fifth years of operation of a phased EAF works.

Source: Cameroon Steel analysis. Objectives, not commitments or forecasts; method in Annex A.

6.2 Category by category

The categories in Figure 6.1 differ in what local suppliers need in order to qualify.

- **Catering, cleaning and security** are labour-intensive services that Cameroonian firms already provide to industry. Qualification is mainly a question of hygiene, safety and labour-law compliance, and of paying staff properly; these services can be almost entirely local from the start.
- **Road haulage and port handling** are also largely local today, but steel brings heavy and long loads, strict delivery windows and high safety standards for loading and securing. Haulage firms need vehicle standards, driver training and fatigue management to qualify.
- **Civil works and building materials** can be local if construction packages are sized to the capacity of Cameroonian contractors, and if cement, aggregates and reinforcing steel are bought locally where they meet the specifications.
- **Mechanical maintenance and electrical installation** require certified welders, electrical authorisations, method statements and quality documentation. They are the categories where supplier development changes outcomes most, and where trained technicians from the plant's own programmes can create their own firms.
- **Machining, roll and spare-part repair** need machine tools, metrology and metallurgical knowledge. Douala's engineering workshops are the starting point; the step up is in precision, documentation and turnaround time.
- **Lime, aggregates and slag handling** depend on geology and logistics as much as on skills. Steel slag, a by-product, can become a local input for road and construction aggregates, creating a supply chain that runs from the plant outwards.
- **Industrial gases, refractories, ferro-alloys and graphite electrodes** are specialised, capital-intensive or imported products. Local content in these categories will come first from services, such as operating an on-site oxygen plant or relining furnaces and ladles, rather than from manufacturing.

6.3 Cameroon's legal framework now ties incentives to local content

Cameroon's legal framework for local content has been strengthened in three steps since 2023 (Table 6.1). The most important for an industrial investor is Ordinance No. 2025/002 of 18 July 2025 fixing investment incentives, ratified by Law No. 2025/015 of 17 December 2025, which replaced the 2013 investment-incentives law [S36] [S37].

The 2013 law it replaced had already listed the iron and steel industry among the priority sectors eligible for specific incentives [S63], and in December 2025 the Prime Minister set up a committee on the integration of mining and metallurgy whose mandate includes the supply of iron ore to local steelmakers [S64]. Under article 6 of the ordinance, any investor seeking incentives must produce "a programme for developing local skills and transferring technology, a plan for the priority recruitment of Cameroonian workers and for priority recourse to local subcontractors and contractors" (Cameroon Steel translation), together with proof that the investment is financed [S36]. Under article 7, a new project must meet at least two of a list of criteria, which include creating direct jobs for Cameroonians at a threshold of at least one job per FCFA 50 million of planned investment, taking local subcontracting into account; for industrial projects, using national natural resources for at least 50% of the value of inputs (excluding labour, water, energy and telecommunications) unless they are unavailable; increasing value added by at least 30%; and exporting at least 25% of turnover [S36]. The ordinance provides for the control of commitments, including the jobs created, and allows the investment convention to be revoked if commitments are not met [S36].

Table 6.1 Cameroonian legal provisions on local employment, skills and suppliers relevant to a steelworks

Instrument	Provision	What it requires or allows	Source
Ordinance No. 2025/002 of 18 July 2025 (investment incentives), ratified by Law No. 2025/015	Art. 6(2) (a)	Local-skills and technology-transfer programme; priority recruitment of Cameroonians; priority use of local subcontractors and contractors	[S36] [S37]
Same	Art. 7	At least two criteria, including one direct job per FCFA 50 million invested, and for industry 50% national natural-resource inputs	[S36]
Same	Control provisions	Verification of commitments, local purchases and jobs created; possible revocation of the convention	[S36]
Law No. 2023/014 of 19 December 2023 (Mining Code)	Art. 40(4)	Mining conventions must set the share of production dedicated to local transformation, at least 15%	[S35]
Same	Arts. 121 to 123	Local-content component with a human-resources and a local-enterprise strand; recruitment plan by category; training programme; priority to local SMEs; contribution to a local-capacity development account	[S35]
Same	Arts. 124 to 126	Priority to qualified Cameroonians at equal competence; 95% of posts not requiring particular qualification reserved for Cameroonians; preference for Cameroonian companies; technology-transfer programmes to replace expatriates	[S35]
Law No. 92/007 of 14 August 1992 (Labour Code)	Art. 27	Employment contracts of foreign workers must be approved (visa) by the Minister of Labour before execution	[S33]
Finance Law 2023	Work-visa levy	Two months' gross salary for non-African workers, one month at half rate for African workers; revenue intended for vocational training	[S30] [S31]
Finance Law 2025	Art. 8, "préférence nationale"	Imported goods with locally made equivalents lose customs facilities, with exceptions for trade agreements and certified shortages	[S40]

Source: as listed. Translations and summaries by Cameroon Steel; the original French texts prevail.

The Mining Code does not apply to a steelworks itself, which holds no mining title. It matters for two reasons. First, its local-content chapter is the most detailed statement of what the Cameroonian State expects from large resource investors, and the same expectations are now generalised by the investment ordinance. Second, it links the ore supply chain to local industry: by requiring that mining conventions dedicate at least 15% of production to local transformation [S35], it creates the legal basis for Cameroonian ore to be processed into iron and steel in Cameroon. Cameroon Steel's sister company, Cameroon Mining Company, holds the Mbalam exploitation permit [S09].

FINDING

Cameroon's law no longer treats local content as optional for large investors. The 2025 ordinance makes a skills, local-hiring and local-subcontracting programme a condition of incentives, and allows commitments to be checked and conventions revoked. The question is no longer whether to localise, but how to do it without sacrificing safety, quality and cost.

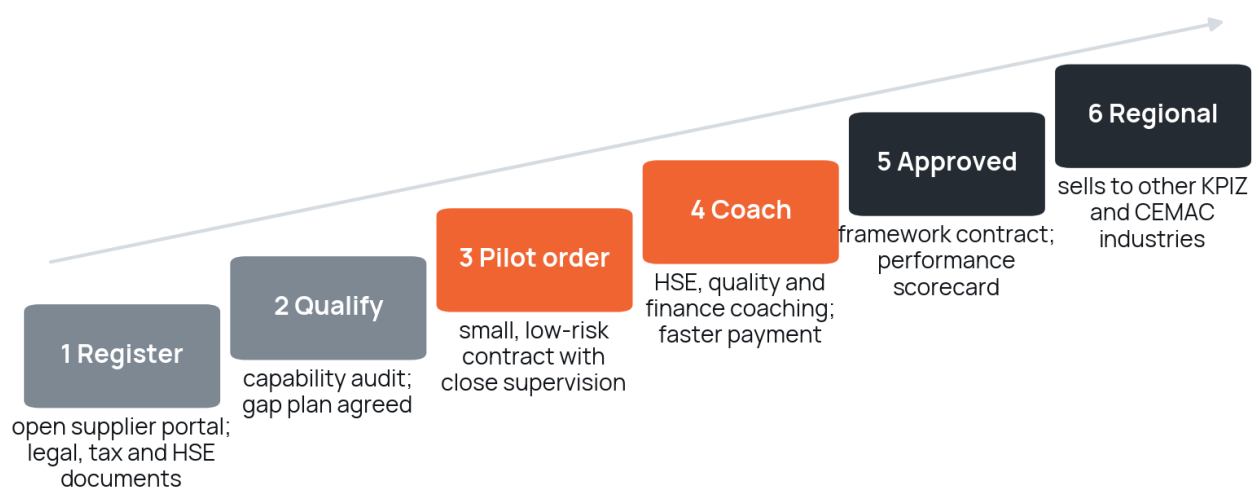
6.4 Preference is not capability

Legal preference for Cameroonian suppliers solves only half the problem. A preference rule can oblige a buyer to choose a local firm when one is qualified; it cannot make a firm qualified. In heavy industry, the gap is usually in four areas: health and safety systems, quality assurance and documentation, technical capacity for specific tasks, and the working capital to finance contracts paid in arrears. A local maintenance contractor that cannot produce a method statement, a lifting plan or a certified welder will not be allowed on a steel plant site, whatever the law says.

Supplier development closes that gap through a sequence of steps (Figure 6.2). A supplier registers and provides basic legal, tax and safety documents; it is audited for capability and agrees a gap plan; it receives a small, low-risk pilot order under close supervision; it is coached on safety, quality and finance, and paid faster while it grows; it becomes an approved supplier under a framework contract with a performance scorecard; and, at the top of the ladder, it sells to other industries in the zone and the region.

Supplier development is a ladder, not a quota: each rung has a test and a reward

Steps for a Cameroonian supplier moving into a steelworks supply chain (illustrative)



ILLUSTRATIVE Figure 6.2. The supplier-development ladder: six steps for a Cameroonian firm entering a steelworks supply chain.

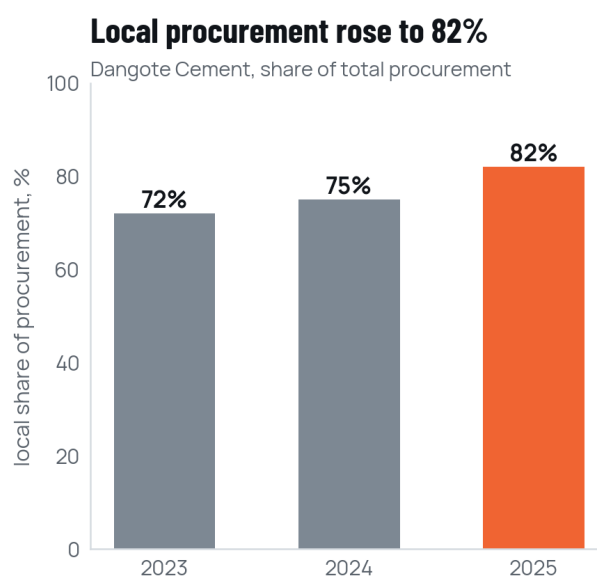
Source: Cameroon Steel proposal.

Each rung combines a test and a reward. The test protects the plant; the reward, a larger order, faster payment or a longer contract, gives the supplier a reason to invest. The two most effective rewards for small Cameroonian firms are often the least expensive for the buyer: predictable volumes, so the firm can hire and train, and payment within agreed terms, so it does not finance the buyer with borrowed money.

6.5 Dangote Cement: local procurement rose while the company reported investing in suppliers

The best-documented African example close to Cameroon's situation is Dangote Cement, which operates in Nigeria and ten other African countries, including Cameroon [S42]. Its 2025 annual report states that local procurement reached ₦1,719 billion, 82% of total procurement, up from 75% in 2024 and 72% in 2023 (Figure 6.3) [S42]. The share thus rose from 72% to 82% between 2023 and 2025, a period in which the company reports investing in supplier development; the shares are computed on naira amounts, and the effect of exchange-rate changes on them is not separated, so the rise cannot be attributed to supplier development alone. The company describes engaging local small and medium enterprises for quarry services, packaging materials, logistics, catering and facility maintenance across its African operations, and, in Nigeria, supporting haulage operators, block moulders, retailers, artisans and maintenance service providers with capacity-building on health and safety standards, technical training for contractors and mechanics, and stable off-take arrangements [S42].

Two points in the Dangote evidence matter for a steelworks. First, local procurement is reported as a share of total spend, year by year, with the method stated in the company's sustainability reporting; that is the discipline that makes a local-content claim credible. Second, the categories it reports localising are the same as those in Figure 6.1: logistics, catering, facility maintenance and site services, and more technical maintenance. A cement plant is not a steelworks, but its supply chain for services, maintenance and logistics is similar.



SOURCED Figure 6.3. Dangote Cement: local share of total procurement, 2023 to 2025, a period in which the company reports investing in supplier development; exchange-rate effects on the shares are not separated. Source: Dangote Cement Plc, Annual Report and Accounts 2025, pages 53 to 54 [S42].

6.6 Cameroon already has a supplier base to build on

Cameroon's steel and metalworking sector is not starting from nothing. Its producers and processors, grouped in professional associations, were reported in May 2026 to account for about 5,000 jobs and about FCFA 500 billion of turnover [S08]. Douala has rolling mills, wire drawers, mesh makers, fabricators and engineering workshops with experience of industrial maintenance. Kribi itself is acquiring an industrial base: the KPIZ zone plans clusters in wood processing and logistics, steelmaking linked to mineral exports, petrochemicals, agro-

industry and construction materials [S38], with a first-phase development programme of €400 million out of €795 million planned, to be financed with the African Development Bank, the European Union and the International Finance Corporation [S39].

For a steelworks, these firms are both potential suppliers and potential customers. Fabricators and wire drawers buy bar and rod; machine shops can repair rolls, guides and spare parts; engineering firms can maintain cranes, hydraulics and electrical systems; and construction-materials producers can use steel slag as aggregate, a by-product that a works must find outlets for. A supplier-development programme run at the scale of the zone, rather than of a single plant, would spread the cost of audits, coaching and certification across several buyers and give suppliers a larger market to grow into.

A PREFERENCE RULE CAN OBLIGE A BUYER TO CHOOSE A LOCAL FIRM; ONLY SUPPLIER DEVELOPMENT CAN MAKE THAT FIRM QUALIFIED.

Cameroon Steel

6.7 Measuring local content honestly

Local-content figures are easy to inflate. A purchase from a Cameroonian-registered trading company that imports a finished product counts as "local" in many reports, but it creates few jobs and little value in Cameroon. A credible reporting framework distinguishes at least four measures:

- **Spend with Cameroonian-registered suppliers**, as a share of total procurement, by category.
- **Spend with Cameroonian-owned small and medium enterprises**, and with firms based in the South Region.
- **Local value added**, estimated as the share of each contract's value that pays for work, materials and services produced in Cameroon.
- **Supplier capability outcomes**: number of firms audited, coached, approved and certified, and the jobs and training at those firms.

Cameroon Steel's proposed objectives for the share of spend placed locally are shown in Figure 6.1; Chapter 10 proposes that the cluster publish a common local-content report for the KPIZ zone, using these four measures, so that progress can be compared across employers and over time.

6.8 Risks and how to manage them

Supplier development carries risks that must be managed openly. The first is **safety and quality**: an under-qualified contractor on a steel plant site is a danger to its own workers and to others, so no local preference should override the safety and quality gates on the ladder. The second is **cost**: local suppliers may at first be more expensive than imports, and the price difference should be treated as a time-limited development cost with an exit date, not a permanent subsidy. The third is **integrity**: lists of preferred suppliers attract rent-seeking, so qualification criteria, audit results and contract awards should be documented and auditable, with a grievance channel for firms that are refused. The fourth is **dependence**: small firms that rely on a single large buyer are fragile, which is another reason to develop them at the scale of the zone and to help them sell to other industries in Cameroon and the Central African region.

Handled in this way, local content becomes what the 2025 ordinance intends: not a quota to be reported, but a channel through which the skills built inside the plant spread into the economy around it.

CHAPTER 7

WOMEN ARE 44% OF CAMEROON'S LABOUR FORCE BUT ONE STEELWORKER IN TEN WORLDWIDE; A NEW WORKS CAN DO BETTER BY DESIGN

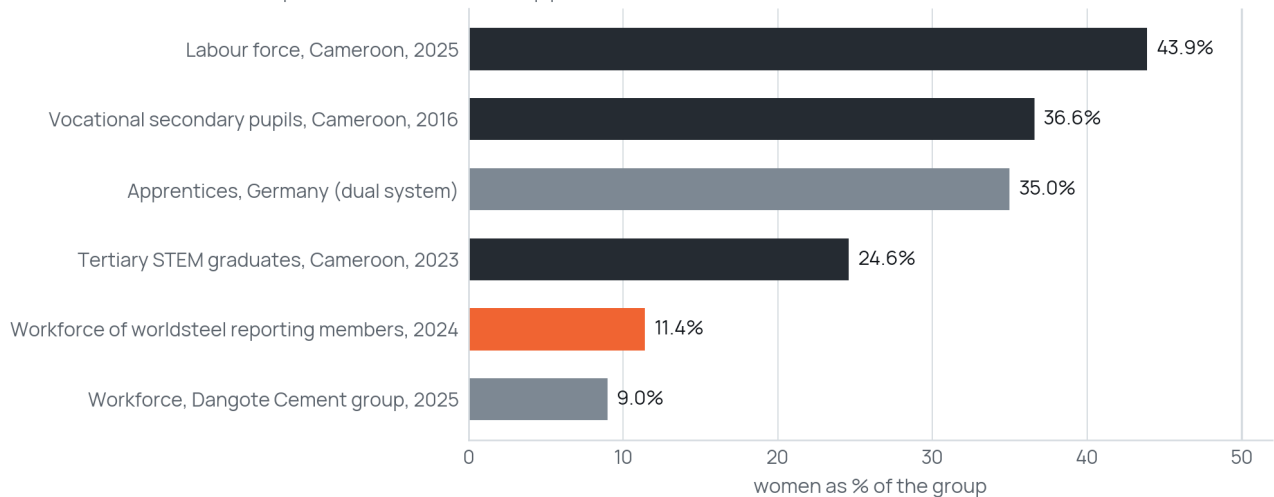
Steel has been one of the most male industries in the world, and it remains so: women made up 11.4% of the workforce of the steel companies reporting to the World Steel Association in 2024 [S51]. Cameroon's starting point is different. Women are 43.9% of its labour force [S14], and they are more likely than men to be unemployed when they hold a degree [S12]. A new steelworks therefore has a large pool of qualified women to draw on, and an opportunity that established plants do not have: to design recruitment, facilities, shift systems and culture for a mixed workforce from the start. Three obstacles stand in the way: a narrow pipeline of women in technical training, a ban on women's night work in industry set by the 1992 Labour Code and by an ILO convention still in force for Cameroon, and workplace conditions that have historically excluded them. Each can be addressed, and the earlier the better.

7.1 A leaking pipeline from school to steel

Figure 7.1 follows the share of women at successive points of the industrial skills pipeline. Women are 43.9% of Cameroon's labour force on the ILO's 2025 estimate [S14]. They were 36.6% of pupils in technical and vocational secondary streams in 2016, the latest year reported [S16], and 24.6% of tertiary graduates in science, technology, engineering and mathematics in 2023 [S16]. In steel companies worldwide, they are about one employee in nine [S51]; at Dangote Cement, an African heavy-industry group with operations in Cameroon, about one in eleven in 2025 [S42]. Germany's dual apprenticeship system, a benchmark for industrial training, counts 35% women among its apprentices [S48], although most of them train in commercial and service occupations rather than metal trades.

Women are 44% of Cameroon's labour force but about one steelworker in ten worldwide

Share of women at successive points of the industrial skills pipeline



SOURCED Figure 7.1. Women's share at successive points of the industrial skills pipeline: Cameroon's labour force and education system, and heavy-industry benchmarks.

Source: World Bank, World Development Indicators (ILO modelled labour force, 2025; UNESCO Institute for Statistics enrolment and graduates) [S14][S16]; Destatis, vocational training statistics [S48]; worldsteel, Sustainability Indicators 2025 [S51]; Dangote Cement Plc, Annual Report 2025 [S42].

Several features of Cameroon's labour market sharpen the picture:

- **Lower participation.** On ILO modelled estimates, 56.6% of women aged 15 and over were in the labour force in 2025, against 73.9% of men [S14]. The national survey shows the same gap for persons aged 14 and over: 47.3% of women and 61.4% of men [S12].
- **Fewer women in vocational training.** In 2021, 21.6% of women aged 14 and over had followed vocational training, against 28.6% of men [S12].
- **Higher unemployment among educated women.** 28.2% of women with higher education were unemployed in 2021, against 12.1% of men; in urban areas, 31.5% of women aged 20 to 24 were unemployed [S12].
- **More young women outside work and education.** On the ILO's harmonised measure, 30.4% of young women were not in employment, education or training in 2021, twice the rate for young men (14.7%) [S14].

The fourth point is the most important for an employer. A large number of young Cameroonian women with secondary or higher education are not working. Many of them have studied sciences or technical subjects; many more could do so if they saw a realistic path into industrial careers.

7.2 What keeps women out of steel

Barriers to women's employment in heavy industry are well documented internationally, and most apply in Cameroon. They can be grouped into five families.

The law on night work. Cameroon's Labour Code, Law No. 92/007 of 14 August 1992, defines night work as work between 10 p.m. and 6 a.m. and provides that "the night work of women and children is prohibited in industry", with exceptions for women in supervisory positions and in services that do not involve manual work (articles 81 and 82, Cameroon Steel translation) [S33]. It also provides that an order of the Minister of Labour sets the kinds of work prohibited to women and to pregnant women (article 83) [S33]. A steelworks runs continuously, so operator and maintenance roles in production areas are organised in rotating shifts that include nights. Read literally, the 1992 provision would confine women to day work, supervisory posts or non-manual services, and keep them out of the operator roles that form the base of every career ladder in Figure 4.2. The provision is not only domestic. Cameroon ratified the ILO Night Work (Women) Convention (Revised), 1948 (No. 89) on 25 May 1970,

and it remains in force for the country [S73]. Its article 3 prohibits the night employment of women in industrial undertakings, and its article 8 exempts women in responsible managerial or technical positions and in health and welfare services not ordinarily engaged in manual work, the same exceptions as the Labour Code [S69]. International standards have since moved towards protecting all night workers rather than excluding women. The 1990 Protocol to Convention No. 89 allows national laws, adopted after consulting employers' and workers' organisations, to introduce exemptions from the prohibition, with protection of at least 16 weeks around child-birth [S72]; the Night Work Convention, 1990 (No. 171) protects all night workers [S70]. Cameroon has ratified neither [S74]. Convention No. 89, which the ILO classifies as an instrument with interim status, can next be denounced between 27 February 2031 and 27 February 2032 [S69]. The practical route before a 2030 start-up is therefore the ratification of the 1990 Protocol and an implementing regulation; this is a decision for the Ministry of Labour and Social Security with the social partners, and the current application of article 82 is listed in Chapter 11.

PROTECTION SHOULD FOLLOW THE WORKER RATHER THAN EXCLUDE HER: INTERNATIONAL STANDARDS NOW PROTECT ALL NIGHT WORKERS.

Cameroon Steel

The training pipeline. Few girls enter technical secondary streams in mechanics or electrical work, and few women graduate in engineering; those who do often go into civil engineering, IT or services. Without deliberate outreach, a recruitment campaign for melt-shop operators and maintenance technicians will attract very few women applicants.

Workplace facilities and equipment. Plants designed for men often lack separate changing rooms, showers and toilets for women in production areas, and personal protective equipment is often available only in men's sizes. Ill-fitting equipment is a safety issue, not a matter of comfort.

Safety from harassment and violence. Heavy-industry sites, and construction sites in particular, carry risks of sexual harassment and gender-based violence, which deter women and harm those who stay. The ILO's Violence and Harassment Convention, 2019 (No. 190), in force since 25 June 2021, recognises the right to a world of work free from violence and harassment, including gender-based violence [S71]; Cameroon has not ratified it [S74]. The International Finance Corporation's Performance Standard 2, which applies to projects financed by development finance institutions, requires employers to base employment decisions on equal opportunity and fair treatment and to take measures against harassment [S57]. Cameroon's South Region has an HIV prevalence of 5.8% among adults aged 15 to 49, the highest of any region in the 2018 health survey [S61], which adds a public-health dimension to managing a construction workforce responsibly.

Family responsibilities and transport. Shift work is harder for workers who carry most of the care for children and relatives. Cameroon's Labour Code already provides for maternity protection and for daily breastfeeding breaks of up to one hour during the 15 months after birth (article 85) [S33]; practical measures such as predictable rosters, safe transport for night shifts and access to childcare determine whether women can stay in shift-based careers.

Table 7.1 Barriers to women's employment in a steelworks and practical measures

Barrier	Effect	Measures for a Kribi works	Lead
Labour Code, art. 82, and ILO Convention No. 89 (in force): night work of women prohibited in industry, with exceptions	Excludes women from rotating-shift operator roles	Ratify the 1990 Protocol to Convention No. 89 and adopt a regulation allowing night work with protective measures for all night workers	Ministry of Labour, employers, unions
Few women in technical streams and engineering	Very few women applicants for technical roles	School outreach; scholarships for girls in mechanics, electrical and process programmes; women mentors from industry	Employer, schools, MINESEC, MINESUP

Barrier	Effect	Measures for a Kribi works	Lead
Recruitment practices	Implicit bias; job adverts aimed at men	Gender-neutral job descriptions; aptitude-based tests; mixed selection panels; objectives for women in each intake	Employer
Facilities and PPE designed for men	Discomfort and safety risks	Separate facilities in all production areas; PPE in women's sizes; ergonomic review of tasks	Employer, designers, suppliers
Harassment and gender-based violence	Women leave or never apply; harm to workers	Code of conduct for employees and contractors; confidential grievance channel; training for supervisors; zero-tolerance enforcement	Employer, contractors
Shift work and family responsibilities	Women leave shift careers	Predictable rosters; safe night transport; childcare partnerships; maternity and breastfeeding provisions applied in full	Employer
Few women role models in steel	Low aspiration and retention	Visible women in technical and leadership roles; women's network; career-path monitoring	Employer

Source: Cameroon Steel analysis; legal references from Law No. 92/007 [S33]; standards from IFC Performance Standard 2 [S57] and ILO instruments [S69] [S71][S72]; ratification status from ILO NORMLEX [S73][S74].

7.3 What has worked elsewhere

Employers in other heavy industries have combined targeted training, visible role models and changes to working conditions; the examples below illustrate the approach, although none publishes an evaluation of its effect on women's participation.

- **Tata Steel**, the Indian steel producer, runs scholarship programmes for women in engineering colleges to create a pipeline into the company [S44] and in 2023 introduced its first batch of women firefighter trainees, a role traditionally reserved for men [S45].
- **Mohammed VI Polytechnic University**, owned by Morocco's OCP group through its foundation [S47], has committed with the Mastercard Foundation to support 575 young African women scholars over ten years, in a partnership announced in January 2025 [S46][S79].
- **Dangote Cement** reports women's representation by country; in its Cameroonian subsidiary, 84 of 272 employees (31%) were women in 2025, well above the group average of about 9% [S42]. That is a reminder that local employers in Cameroon already reach far higher shares than the global steel average.

A WORKS THAT IS DESIGNED FOR WOMEN FROM THE FIRST DRAWING DOES NOT HAVE TO RETROFIT INCLUSION LATER.

Cameroon Steel

The lesson common to these cases is that inclusion is cheaper to design in than to retrofit. Changing rooms and toilets are a minor cost on a new building and an expensive alteration on an old one; a recruitment campaign that targets women from the first intake creates role models for the second; a code of conduct written into construction contracts protects women from the first day on site.

7.4 Keeping women in technical careers

Recruiting women into a steelworks is the first step; keeping them, and seeing them promoted, is the harder one. Steel companies publish little on this, but mining, the closest heavy industry with published evidence, offers a guide: in a 2021 survey of more than 1,000 mining employees in 52 countries, the 549 women who responded were most likely to plan to leave, or to be undecided, before reaching middle management, and most

often cited fewer growth opportunities than male colleagues, work that no longer interested them, the lack of a sponsor or mentor and not fitting into the culture [S81]. The strain of shift work combined with family responsibilities, discussed above, adds to these risks. Several measures address them at low cost; their effect at Kribi should be measured rather than assumed.

- **Cohorts rather than individuals.** Women recruited in groups into the same area and crew are less likely to be isolated, which should help retention. Apprenticeship and operator intakes should be organised accordingly.
- **Mentoring and networks.** Each woman entering a technical role should have a mentor, and a women's network across the plant and the zone can give visibility, peer support and a channel for raising problems early.
- **Transparent progression.** Promotion criteria based on certified competence, as proposed in Chapter 4, reduce the scope for bias and give women a visible path from operator to supervisor.
- **Equal pay, verified.** Pay should be set by role and grade and reviewed for gender gaps. Dangote Cement, for example, reports a male-to-female remuneration ratio of one to one across employment categories [S42].
- **Maternity and return to work.** Full application of the Labour Code's maternity and breastfeeding provisions [S33], with temporary transfer to day work or non-exposed tasks during pregnancy where needed and a structured return to shift work afterwards, keeps trained women in the workforce.

The labour-market data show why these measures matter in Cameroon. Among young people aged 15 to 34, the employment rate was 47.2% for men and only 31.3% for women in 2021 [S13]. Young women have fewer alternatives in formal work than young men, so a technical job is worth more to them; whether that translates into better retention is a hypothesis to test with the indicators in Section 9.8.

7.5 Objectives for a new works

Cameroon Steel proposes the following objectives for its phased works, as illustrative targets to be refined with training partners and reported publicly:

- **Apprenticeship and graduate intakes:** at least one place in four filled by a woman in each intake of the dual apprenticeship and the graduate engineering programme.
- **Direct workforce:** women at least 15% of the direct workforce by the fifth year of operation, above the 11.4% average of worldsteel's reporting members [S51], with women in operator, technician and engineering roles, not only in administration.
- **Leadership:** at least one woman among the successors identified for each senior technical post.
- **Contractors:** the same code of conduct, grievance channel and facilities standards applied to contractors during construction and operation.

FINDING

The largest untapped source of technical talent for a Kribi steelworks is young Cameroonian women with secondary or higher education who are not working. Reaching them requires a lawful route past the night-work ban of the 1992 Labour Code and ILO Convention No. 89, building a pipeline through schools and scholarships, and designing facilities, rosters and conduct rules for a mixed workforce from the outset.

These objectives are modest by the standards of some industries, and ambitious by the standards of steel. They are deliberately set at a level that requires change in recruitment and training rather than in reporting. If they are met, a Kribi steelworks would employ a larger share of women than most steel plants in the world, in a country whose educated young women are among those most in need of formal technical jobs.

CHAPTER 8

SAFETY IS A SKILL TO BE TRAINED, CERTIFIED AND LED, AND IN THE SOUTH REGION IT STARTS FROM A LOW BASE

A steelworks concentrates almost every serious industrial hazard on one site: molten metal at furnace temperature, suspended loads of tens of tonnes, high-voltage electricity, fast-moving rolling lines, toxic and asphyxiating gases, heat and noise [S55]. The best steel companies have shown that these hazards can be controlled: the lost-time injury frequency of companies reporting to the World Steel Association fell by 15% between 2022 and 2024, to 0.72 injuries per million hours worked [S51]. Cameroon's starting point is very different. In 2021, 9.1% of employed Cameroonians reported a work accident in the previous twelve months, and in the South Region, where Kribi lies, 15.4%, with only 6.6% of workers insured [S12]. Closing that gap is not a matter of rules and equipment alone. It requires treating safety as a competence that every worker, supervisor and contractor must learn, demonstrate and practise, and as the first skill taught in every training programme described in this paper.

8.1 A steelworks concentrates the hazards of heavy industry

The International Finance Corporation's environmental, health and safety guidelines for steel identify the occupational hazards specific to the industry: physical hazards from heavy loads, grinding and cutting and rolling; heat and hot liquids; radiation; respiratory hazards from dust and fumes; chemical hazards; noise; and fire and explosions, on top of the hazards common to all large industrial facilities, such as electricity, work at height and confined spaces [S55][S56]. In an EAF works, the most severe of these come together in the melt shop and the caster, where a small quantity of water trapped under molten steel can cause a violent explosion, and in the cranes that carry ladles of liquid steel overhead.

Globally, work remains a major cause of death. The International Labour Organization estimates that nearly three million workers die every year from work-related accidents and diseases: about 2.6 million from diseases and about 330,000 from accidents [S54]. Agriculture, construction, forestry and fishing, and manufacturing are the most hazardous sectors, accounting together for about 200,000 fatal injuries a year, 63% of the total [S54]. Men die from work-related causes at about three times the rate of women (51.4 against 17.2 per 100,000 working-age adults), reflecting their concentration in hazardous jobs [S54].

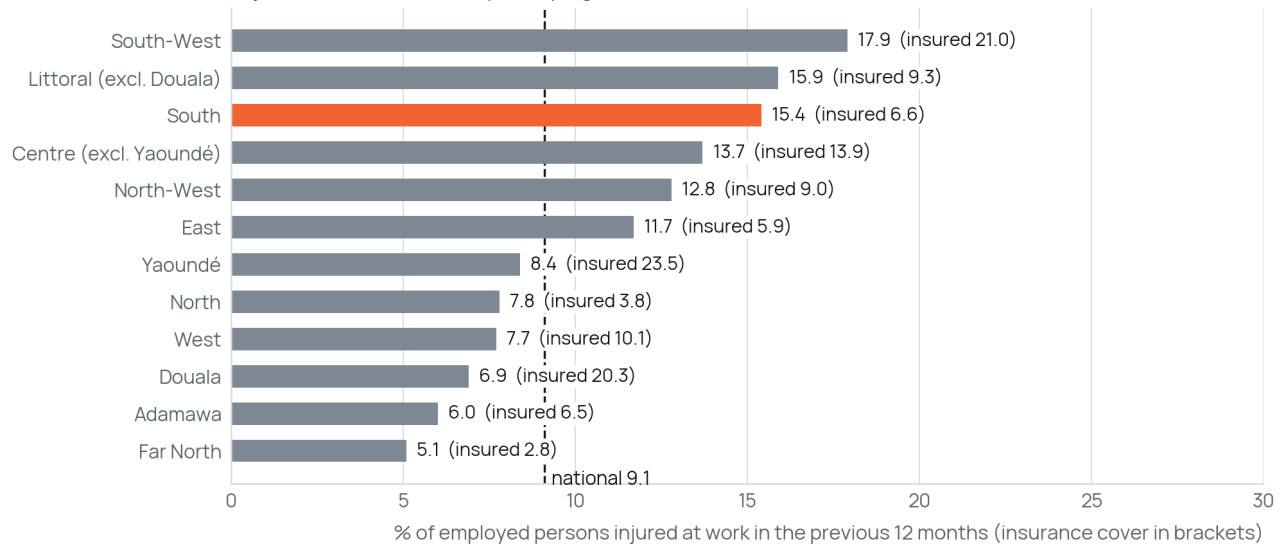
8.2 Cameroon's baseline: frequent accidents and little insurance

Cameroon's national employment survey asked workers whether they had suffered a work accident or an occupational disease in the previous twelve months. In 2021, 9.1% of employed persons reported an accident in their main job and 6.5% an occupational disease; only 11.0% were covered by insurance in their main job [S12]. The

figures vary sharply by region (Figure 8.1). In the South Region, 15.4% of workers reported an accident and 15.5% an occupational disease, the highest disease rate of any region, while only 6.6% were insured [S12]. Workers in the formal private sector reported an accident rate of 9.3%, close to the average, but 55.8% of them were insured, against 5.6% in the non-agricultural informal sector [S12].

In the South Region, 15% of workers reported a work accident in a year; fewer than 7% were insured

Work accidents in the main job and insurance cover, by survey region, Cameroon, 2021



SOURCED Figure 8.1. Share of employed persons who reported a work accident in their main job in the previous 12 months, and share insured, by survey region, 2021.

Source: INS, EESI3 Phase 1, main employment report, Table 3.24 [S12].

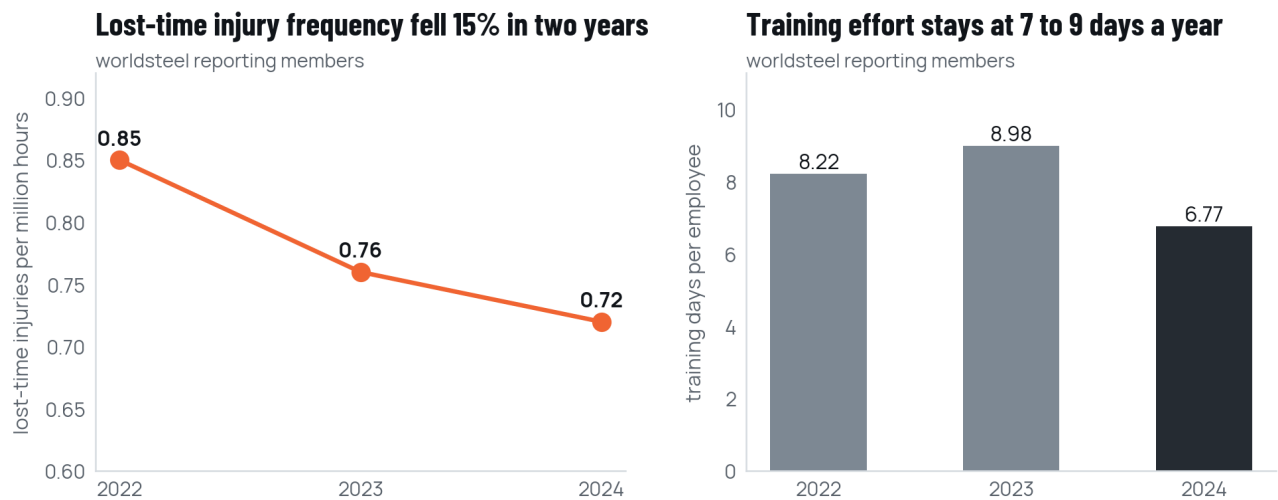
These self-reported figures are not comparable with the injury frequency rates that companies publish, which count lost-time injuries per million hours worked. They are, however, a clear signal: most Cameroonian workers, including those a Kribi steelworks would hire, have worked in environments where injuries are common, procedures are informal and insurance is absent. Fires and explosions are a recognised melt-shop hazard [S55][S56]. In 2024 the Ministry of Defence began building a fire and rescue centre to serve Douala's industrial zone [S80].

The legal framework is in place. Cameroon's Labour Code requires occupational health and safety conditions to be set by ministerial order in line with international labour standards and allows labour inspectors to order immediate measures (articles 95 and 96); makes a company medical service compulsory (articles 98 and 99); and creates a national commission for occupational health and safety (article 120) [S33]. Cameroon also ratified the ILO Occupational Safety and Health Convention, 1981 (No. 155) on 1 October 2021, which the ILO now counts among its fundamental conventions; it has not ratified the conventions on the promotional framework for occupational safety and health (No. 187), safety and health in construction (No. 167) or the prevention of major industrial accidents (No. 174) [S73][S74]. Employers pay occupational-injury contributions of 1.75%, 2.5% or 5% of gross salary according to the risk class of their activity [S32], which gives every employer a direct financial interest in preventing accidents. What the framework cannot supply is the competence and culture to apply it on the shop floor.

8.3 What good performance looks like in steel

The steel industry measures and publishes its safety performance more systematically than most. The World Steel Association's sustainability indicators show a lost-time injury frequency rate (lost-time injuries and fatalities per million hours worked) of 0.85 in 2022, 0.76 in 2023 and 0.72 in 2024 for its reporting members, and an average of 6.77 to 8.98 training days per employee a year over the same period (Figure 8.2) [S51]. Its annual

safety and health data report tracks potential serious injuries and fatalities, total recordable injuries, lost-time injuries, fatalities, process safety and sickness absence [S52], and the association has published a set of safety and health principles for the industry [S53].



SOURCED Figure 8.2. Lost-time injury frequency and training days per employee, worldsteel reporting members, 2022 to 2024.

Source: worldsteel, Sustainability Indicators, 2025 edition (2022 to 2024 data) [S51].

Two points stand out. First, frequency rates of below one lost-time injury per million hours are achievable in an industry with severe hazards; they result from systems, not luck. Second, training is continuous: the best performers spend several days a year per employee on training throughout working lives, not only at induction. For a new works, the benchmark is therefore not the Cameroonian average but the industry's best practice, and the training budget should be sized to reach it.

8.4 Critical risks call for specific competences

Most fatal accidents in steel arise from a small number of critical risks, each with known controls. Table 8.1 lists the main ones for an EAF long-products works, with the controls and the competences each requires. The competences are the safety core of every role in the skills matrix of Chapter 4.

Table 8.1 Critical risks in an EAF long-products works, controls and competences

Critical risk	Where	Key controls	Competence and training required
Molten metal and steam explosions	Melt shop, ladle furnace, caster	Water-leak detection; dry materials and tools; exclusion zones during tapping and casting; aluminised protective clothing	Molten-metal awareness; emergency drills; leak recognition; caster breakout response
Suspended loads and overhead cranes	Yard, melt shop, caster, dispatch	Crane inspection; rated lifting gear; exclusion under loads; signaller certification	Crane-operator licence; rigging and signalling; lift planning for non-routine lifts
Moving machinery	Rolling mill, conveyors, bundling	Guarding; interlocks; lockout and tagout of energy sources; permit to work	Isolation and lockout; permit-to-work systems; cobble-clearing procedures
Electrical energy	Substation, furnace transformer, drives	Electrical authorisations; switching procedures; arc-flash protection	Graded electrical authorisations; high-voltage switching; arc-flash awareness
Gases and confined spaces	Furnace off-gas system, ladles, pits, tanks	Gas detection; ventilation; entry permits; standby rescue	Gas testing; confined-space entry and rescue; breathing apparatus
Work at height	Maintenance, construction	Platforms and guardrails; harness systems; scaffold inspection	Working at height; scaffold inspection; rescue from height

Critical risk	Where	Key controls	Competence and training required
Heat stress	Melt shop, caster, reheating furnace	Work-rest cycles; hydration; cooled rest areas; medical screening	Recognition of heat illness; first aid
Traffic and mobile plant	Yard, dispatch, port interface	Segregated routes; speed limits; reversing aids	Mobile-plant licences; site traffic rules
Hot work and fire	Maintenance, oil and hydraulic systems	Hot-work permits; fire watch; fixed fire protection	Hot-work permit holders; fire response teams

Source: Cameroon Steel analysis based on IFC, EHS Guidelines for Integrated Steel Mills and General EHS Guidelines, 2007 [S55][S56], and on worldsteel safety principles [S53].

IN A MELT SHOP, THE MOST IMPORTANT SKILL IS KNOWING WHEN TO STOP THE JOB.

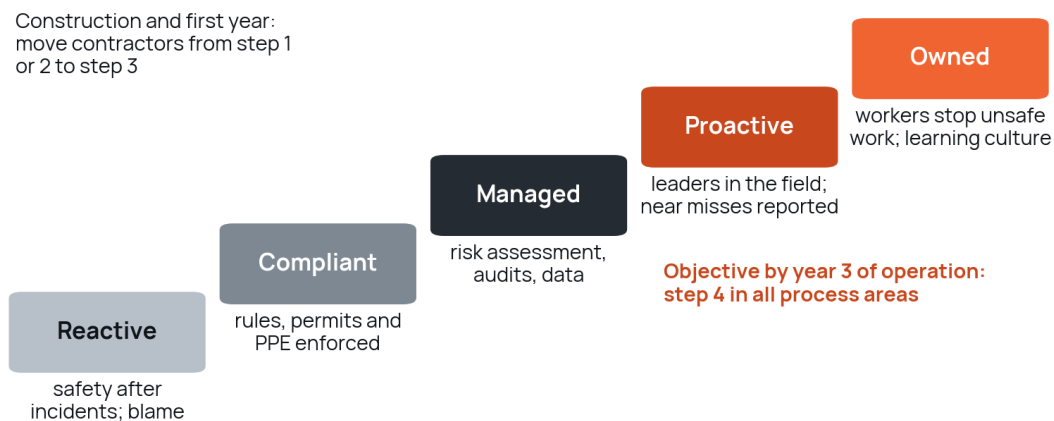
Cameroon Steel

8.5 Culture matures step by step, and leaders set the pace

Rules and equipment do not on their own prevent accidents; behaviour does. Organisations typically move through recognisable steps, from a reactive culture in which safety is addressed after incidents and blame is the norm, through compliance with rules and permits, to a managed system of risk assessment and audit, and then to proactive and finally owned cultures in which leaders spend time in the field, near misses are reported freely and any worker can stop unsafe work without fear (Figure 8.3).

Safety culture matures from rules imposed to risks owned by every worker

Five-step maturity ladder used in this paper to set training and leadership objectives (illustrative)



ILLUSTRATIVE Figure 8.3. A five-step safety-culture maturity ladder used in this paper to set training and leadership objectives.

Source: Cameroon Steel framework, adapted from common practice in heavy-industry safety management.

For a new works in Cameroon, two transitions matter most. During construction, the challenge is to bring contractors, many of whom come from informal or reactive environments, to a managed system quickly: every worker on site needs a safety induction, a record of training and a clear right to refuse unsafe work, and every contractor needs a safety plan that is checked and enforced. During the first years of operation, the challenge is to build a proactive culture in which supervisors, most of them newly promoted, lead safety in the field. Cameroon Steel's objective, set out in Figure 8.3, is a managed system across all contractors from the first year and a proactive culture in all process areas by the third year of operation.



ILLUSTRATIVE Illustrative view. Generated image of personal protective equipment (helmet, gloves, ear defenders and high-visibility vest) laid out on a workbench; not a photograph of any project, place or person.

8.6 Construction is the first test

The first safety test of a steelworks comes long before the first heat. During construction, between 600 and 1,000 workers employed by many contractors will work at height, lift heavy steel structures and equipment, dig foundations and trenches, and install high-voltage systems, often in tropical heat and heavy rain [S11]. Many of them will come from informal workplaces where procedures are rarely written down. Experience on large projects shows that a few practices determine whether construction is safe:

A single set of site rules applied to every contractor

and subcontractor, with the owner's safety team empowered to stop work.

- **Induction and competence checks** before anyone starts work, recorded in the safety passport, with additional authorisations for lifting, work at height, excavation, hot work and electrical work.
- **Supervision ratios** that keep a competent supervisor close to every crew engaged in high-risk work, and daily briefings on the day's hazards.
- **Lift planning** for every heavy or non-routine lift, approved by a competent person, with exclusion zones enforced.
- **Heat and rain management**, including work-rest cycles, drinking water, shaded rest areas and suspension of work at height or lifting in storms.
- **Medical cover and emergency response** on site from the first day, with evacuation arrangements to a hospital able to treat serious trauma and burns.

Construction is also where the safety culture of the future plant is set. Workers who move from construction into operations, and supervisors who learn to run a disciplined site, carry those habits into the works. Contractors who perform well on safety should be rewarded with future work; those who do not should be removed.

8.7 Process safety and emergency response

Beyond personal safety, a steelworks must manage process safety: the prevention of major events such as explosions from water in contact with molten metal, failures of furnace cooling systems, releases of carbon monoxide from off-gas systems, oxygen fires and large fires in hydraulic or cable systems. The worldsteel safety and health data report tracks process safety as a distinct indicator [S52], and the IFC's steel guidelines identify fire and explosion as a specific hazard of the industry [S55]. Process safety depends on design, but also on skills: operators who understand why interlocks exist and do not bypass them, maintenance technicians who restore protective systems correctly, and emergency teams trained and drilled for the plant's worst credible events. A works at Kribi should also coordinate its emergency plans with neighbouring tenants of the industrial zone and with local emergency services, so that resources can be shared in a major incident.

8.8 Health is part of the same skill set

Occupational health in a steelworks covers heat, noise, dust and fumes, and the ergonomic strain of manual tasks. The Labour Code's requirement for a company medical service [S33] provides the base: pre-employment and periodic medical examinations, hearing and lung-function monitoring, and heat-stress management. The

South Region adds public-health priorities that a responsible employer cannot ignore: in the 2018 national health survey, HIV prevalence among adults aged 15 to 49 was 5.8% in the South, the highest of any region, and 33.4% of children aged 6 to 59 months tested positive for malaria, against 24.0% nationally [S61]. A workforce health programme that includes prevention, testing and treatment referrals for HIV, malaria prevention at accommodation and on site, and health education for workers' families protects both people and production.

NO AUTHORISATION, NO CRITICAL TASK: A SAFETY PASSPORT MAKES COMPETENCE VISIBLE ON EVERY SITE OF THE ZONE.

Cameroon Steel

8.9 Making safety a certified skill

Safety becomes a skill when it is taught to a standard, tested and recorded. Four instruments can make that happen in the Kribi cluster:

- **A management system to an international standard.** ISO 45001, published in 2018, specifies requirements for occupational health and safety management systems [S58]. Designing the works' system to that standard from the start, and requiring it of major contractors, gives a common language for audits and improvement.
- **A safety passport for every worker.** A personal record of inductions, training modules, authorisations and medical clearances, recognised by all employers in the zone, would allow contractors' workers to move between sites without repeating basic training, and would make it impossible to work on a critical task without the right authorisation.
- **Competence-based authorisations.** Permits to work, lockout and tagout, confined-space entry, crane operation and electrical switching should be authorised only after training and a practical assessment, renewed periodically.
- **Simulation and incident learning.** Simulators and animated incident videos, such as those offered by world-steel's steeluniversity [S50], allow workers to rehearse emergencies; a no-blame system for reporting and learning from near misses turns everyday events into training material.

International lenders will expect this. IFC Performance Standard 2 requires employers to provide a safe and healthy work environment and to protect workers, including those engaged by contractors and in the supply chain [S57]. For Cameroon Steel, however, the reason is more direct: a works whose workforce is largely new to heavy industry can only be safe if safety is taught first, tested always and led by example.

FINDING

Safety performance in steel is a product of training and leadership. A Kribi works recruiting from a labour market where more than one worker in seven in the South Region reports a work accident each year must make safety the first module of every programme, certify safety-critical authorisations, and invest in supervisors who lead safety in the field.

CHAPTER 9

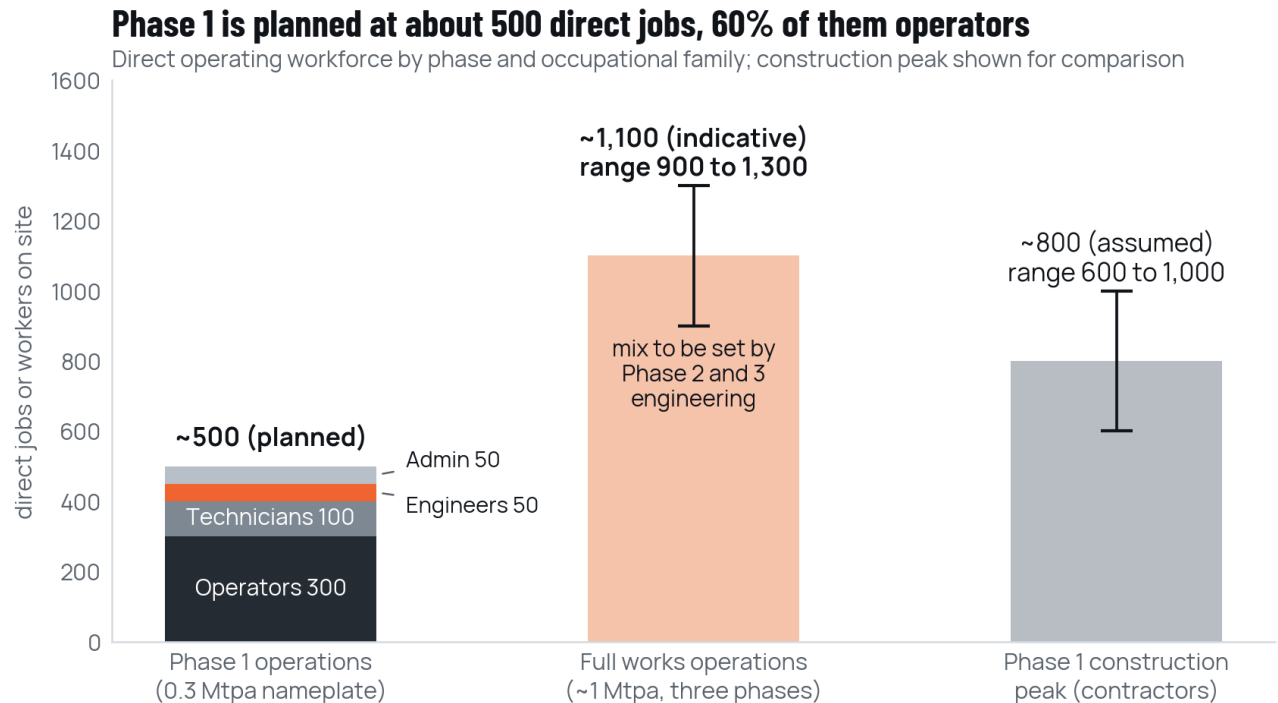
AN ILLUSTRATIVE WORKFORCE PLAN: ABOUT 500 PEOPLE TRAINED BEFORE FIRST STEEL, AND A CASCADE THAT GROWS TO 900 TO 1,300

This chapter turns the analysis of the previous chapters into an illustrative workforce plan for Cameroon Steel's phased EAF works at Mboro, in the Kribi industrial-port zone. It uses only the public planning figures of Cameroon Steel's reference configuration, each labelled with its status: about 500 direct jobs for a first phase of 0.3 Mtpa nameplate capacity (planned), about 1,000 indirect jobs in that phase (planned), 900 to 1,300 direct jobs at the full design capacity of 1 Mtpa (indicative), a construction peak of 600 to 1,000 workers for the first phase (assumed), and an objective of about 90% Cameroonian nationals in operations by the fifth year (objective) [S11]. The central conclusion is a matter of timing: about half of the first-phase workforce, the melt-shop, caster, maintenance and engineering cadres, must be in training 18 to 36 months before first steel; the rest 6 to 18 months ahead. With first heat planned for the second half of 2030, the pipeline must open in 2027, before financial close, and every later phase should be staffed largely by people trained in the phase before it.

9.1 The planning basis

Cameroon Steel is developing a steel complex at Mboro with a design capacity of 1 Mtpa, built in phases; the foundation stone was laid on 30 December 2024 by the Prime Minister, representing the Head of State [S09] [S10]. Its public reference configuration, in its edition RC-1.1, describes three phases, all subject to engineering and financing [S11]. The first phase, of 0.3 Mtpa nameplate capacity with an expected sustained output of 270,000 to 300,000 t a year (planned), comprises an EAF melt shop of the 40 t class, a ladle furnace, a billet caster and a bar and rod mill. Its melt shop makes billets, and its output is flexible between rolled products (wire rod and reinforcing bar) and merchant billets for Cameroon's re-rollers, which import about 60% of their charge; billet imports were 161,000 t in 2023 [S08][S76]. With rebar capacity already well above demand, Phase 1 tonnage is aimed at replacing imports and at exports within CEMAC (White papers 04 and 09). A second phase adds a second melt line and a light and medium sections mill of about 0.2 Mtpa, indicatively in 2032 to 2034, and a third phase adds heavier sections and melt capacity to reach about 1 Mtpa after 2034; a direct-reduction module for Cameroonian ore is held in reserve (all indicative) [S11].

Public reports of the foundation-stone ceremony referred to more than 2,000 direct and indirect jobs [S66], an order of magnitude consistent with the planning figures used here once construction, indirect and later-phase employment are counted. The workforce figures are planning values, not commitments, and they will change as engineering, automation choices and the make-or-buy decisions discussed in Chapter 1 are made. Their purpose here is to size the training effort and to show its timing. Figure 9.1 summarises them.



ILLUSTRATIVE Figure 9.1. Direct operating workforce by phase and occupational family, with the first-phase construction peak for comparison. Status of each value as labelled.

Source: Cameroon Steel reference configuration RC-1 (planning estimate), edition 10 October 2026 (RC-1.1): Phase 1 direct jobs and mix (planned); full-works direct jobs (indicative); construction peak (assumed) [S11].

9.2 Phase 1: about 500 people, 60% of them operators

The planned first-phase mix is about 300 operators, 100 technicians, 50 engineers and 50 administrative and support staff [S11]. Table 9.1 allocates these numbers across the process areas and functions of Figure 1.1, and adds for each group the likely recruitment source, the training route and the time at which training must start. The allocation within each family is illustrative; the family totals are the planned values.

Table 9.1 Illustrative Phase 1 staffing by area, recruitment source and training start

Group	Indicative headcount	Main recruitment source	Training route	Training starts (months before first steel)
Operators, raw materials yard and cranes	40	South Region and Douala; technical baccalaureate, CAP, CQP	Crane licences; induction; simulator; mentored shifts	9 to 12
Operators, melt shop and ladle furnace	70	National; technical baccalaureate or DUT	Simulator; vendor training; placements in operating melt shops; mentored shifts	24 to 30

Group	Indicative headcount	Main recruitment source	Training route	Training starts (months before first steel)
Operators, continuous caster	40	National; technical baccalaureate or DUT	Simulator; vendor training; placements; mentored shifts	18 to 24
Operators, reheating furnace and rolling mill	100	National, including experienced Douala mill workers; CAP or DUT	Vendor training; dual apprenticeship cohort; mentored shifts	12 to 18
Operators, finishing and dispatch	50	South Region; vocational certificates	Induction; on-the-job training	6 to 9
Technicians, mechanical maintenance	45	National; ISTD, IUT, CFP d'excellence graduates; dual apprentices	Dual apprenticeship or conversion programme; vendor modules	24 to 30
Technicians, electrical, automation and instrumentation	35	National; GELL and electrical graduates	Vendor PLC and drives training; electrical authorisations	24 to 30
Technicians, laboratory, quality and HSE	20	National; chemistry, materials and HSE graduates	Laboratory and standards training; ISO 45001-based HSE training	12 to 18
Engineers (process, metallurgy, maintenance, electrical, production, quality and HSE)	50	National engineering schools; Cameroonian engineers abroad; some expatriates at start	Graduate programme; placements abroad; vendor training	30 to 36
Administration and support (HR, finance, procurement and stores, IT, logistics planning, medical)	50	South Region and national	Systems and procedures training	6 to 12
Total direct workforce, Phase 1 (planned)	500			

Source: Cameroon Steel public planning figures for family totals (operators 300, technicians 100, engineers 50, administration 50) [S11]; allocation within families, recruitment sources and training timing are illustrative (Annex A).

Three features of the table drive the plan. First, the melt-shop and caster crews, about 110 people, and the maintenance and automation technicians, about 80, need the longest lead times; with the 50 engineers, these cadres make up about half of the workforce (240 of 500) and must be in training 18 to 36 months ahead, while the other 260 posts start 6 to 18 months ahead. Second, the engineering cadre needs to be recruited first, because its members will become the trainers, supervisors and successors to expatriate specialists. Third, about 140 posts in the yard, finishing, dispatch and support functions can be recruited and trained in the final year before first steel, and those are the posts where recruitment from the South Region can be highest at the start.

EVERY LATER PHASE SHOULD BE STAFFED BY PEOPLE TRAINED IN THE PHASE BEFORE IT.

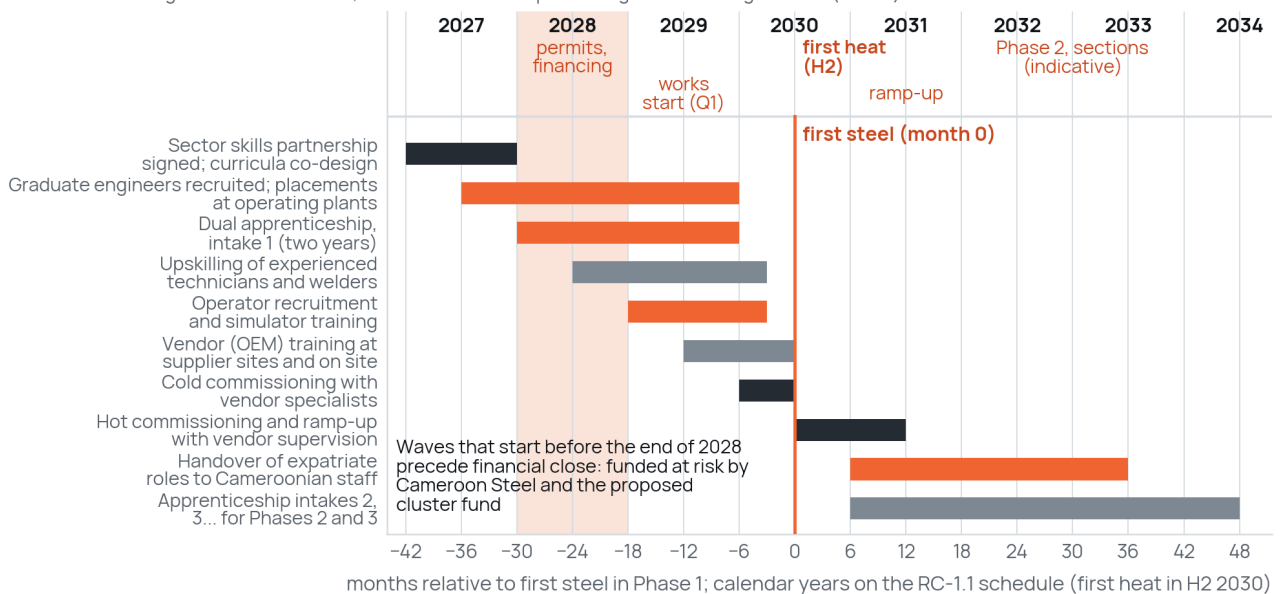
Cameroon Steel

9.3 The training pipeline opens three years before first steel

Figure 9.2 shows the resulting timeline for the first phase, with the calendar dates that follow from the RC-1.1 schedule if first heat comes at the start of the second half of 2030. A skills partnership with schools and training centres is agreed about three and a half years before first steel (early 2027), so that curricula and dual-apprenticeship agreements are in place for the first intake. Graduate engineers are recruited about three years ahead (mid-2027) and spend much of the following period in placements at operating plants and with equipment suppliers. The first dual-apprenticeship cohort starts about two and a half years ahead (early 2028). Experienced technicians and welders are upskilled from two years ahead (mid-2028). Operators are recruited and trained on simulators from about 18 months ahead (early 2029, as works start), and join vendor training at supplier sites and on site in the final year. Cold commissioning, in the first half of 2030, is the first time the crews work on their own equipment, alongside the suppliers' specialists.

Training must start in 2027, three years before first heat and before financial close

Illustrative training timeline for Phase 1; shaded band: 2028 permitting and financing window (RC-1.1)



ILLUSTRATIVE Figure 9.2. Illustrative training timeline for Phase 1, in months relative to first steel, with calendar years on the RC-1.1 schedule (first heat in the second half of 2030); the shaded band marks the 2028 permitting and financing window.

Source: Cameroon Steel proposal, based on the times to competence in Figure 5.2 (Annex A); project milestones from the Cameroon Steel reference configuration RC-1 (planning estimate), edition RC-1.1 [S11].

The timeline carries two risks that must be managed together. If training starts too late, the plant opens with an expatriate-heavy workforce and a slow handover. If it starts too early, or the project is delayed, trained people wait without work and some leave. The mitigation is to sequence training by lead time, to keep trainees productively employed (in other plants, in construction and commissioning, or in maintenance shops), and to tie the later waves, operator recruitment and vendor training, to firm project milestones such as financial close and the delivery of major equipment.

The earliest waves cannot wait for those milestones. Graduate recruitment and the first apprenticeship intake fall before financial close; they would be funded at risk by Cameroon Steel and the proposed cluster fund (Chapter 10), and sized to the RC-1.1 schedule: public hearings in the third quarter of 2028, the environmental certificate in the fourth quarter of 2028, financing in 2028, works from the first quarter of 2029, first heat in the second half of 2030 and ramp-up in 2031 towards the 0.3 Mtpa nameplate (expected sustained output 270,000 to 300,000 t a year) [S11]. Sizing them to that schedule limits the exposure: the first intakes are small (an engineering cadre of about 50 and a first apprenticeship cohort), they train in trades such as maintenance and

electrical work that are needed across the Kribi cluster, and a delay of a year or two would leave Cameroon with certified technicians rather than stranded trainees. Table 9.2 sets the training milestones against the project schedule.

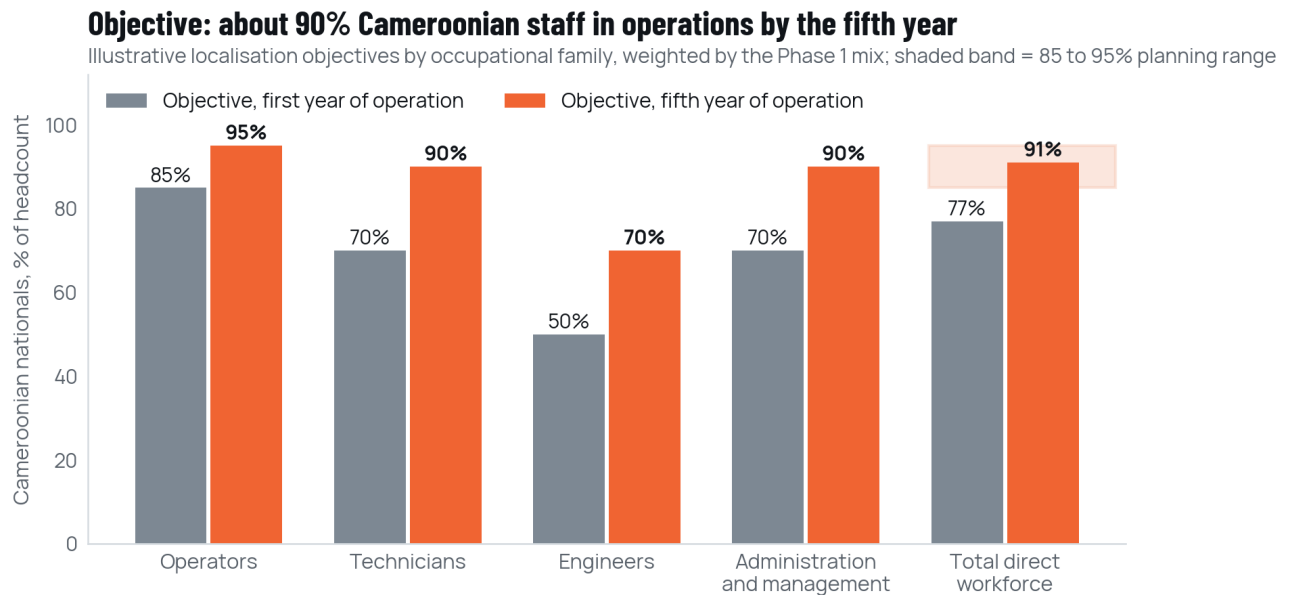
Table 9.2 Phase 1 project schedule (RC-1.1) and training milestones

Date	Project milestone (RC-1.1)	Training milestone (illustrative; months relative to first steel)
Early 2027		Skills partnership agreed; curricula co-design begins (month -42)
Mid-2027		Graduate engineers recruited and placed in operating plants (-36)
Early 2028		First dual-apprenticeship intake; melt-shop, maintenance and electrical cadres start training (-30)
2028	Public hearings (third quarter); environmental certificate (fourth quarter); financing	Caster crews start training; experienced technicians and welders upskilled (-24 to -18)
First quarter of 2029	Works start	Operator recruitment and simulator training; rolling-mill, laboratory and HSE crews start (-18)
Mid-2029 to early 2030	Construction	Vendor training; yard, finishing, dispatch and support staff recruited (-12 to -6)
First half of 2030	Construction completes	Cold commissioning with vendor specialists (-6 to 0)
Second half of 2030	First heat	Hot commissioning with vendor supervision (from 0)
2031	Ramp-up towards 0.3 Mtpa nameplate	Handover of expatriate roles begins (from +6)
2032 to 2034	Phase 2, second melt line and sections mill (indicative)	Annual apprenticeship intakes sized to Phase 2
After 2034	Phase 3 (indicative)	Cascade training from Phases 1 and 2

Source: project milestones from the Cameroon Steel reference configuration RC-1 (planning estimate), edition RC-1.1 [S11]; training milestones illustrative (Figure 9.2; Annex A). Calendar dates assume first heat at the start of the second half of 2030; a later first heat moves every training date by the same interval.

9.4 Localisation: from about three quarters to about nine in ten

Cameroon Steel's planning objective is that about 90% of its operating workforce, within a range of 85 to 95%, should be Cameroonian nationals by the fifth year of operation [S11]. Figure 9.3 breaks the objective down by occupational family and adds an illustrative starting point for the first year. Operators and support staff can be overwhelmingly Cameroonian from the start; the expatriate share is concentrated among melt-shop and caster supervisors, process metallurgists and commissioning specialists, and should fall as Cameroonian successors qualify.



ILLUSTRATIVE Figure 9.3. Illustrative localisation objectives by occupational family, first and fifth years of operation, weighted by the planned Phase 1 mix.

Source: Cameroon Steel planning objective of 0.90 (0.85 to 0.95) Cameroonian share of operating workforce by year 5 [S11]; family split and first-year values are illustrative objectives, not commitments.

Localisation will be achieved by design, not by attrition. Each expatriate post should be paired from the start with a named Cameroonian successor, a development plan and a target date, reviewed every six months. Cameroonian law reinforces the incentive: the employment contracts of foreign workers require a visa from the Minister of Labour before they take effect [S33], and since 2023 employers pay a levy equal to two months of gross salary for each non-African worker's contract visa, revenue the government intends for vocational training [S31]. A localisation plan that shortens expatriate assignments therefore saves costs as well as building national capacity.

9.5 Construction: 600 to 1,000 workers and a chance to certify trades

The first-phase construction peak is assumed at about 800 workers, within a range of 600 to 1,000 [S11]. Most will be employed by civil, steel-erection, mechanical and electrical contractors, under the supervision of equipment suppliers. Construction offers the largest immediate opportunity for local employment and the first opportunity to build certified skills. Cameroon Steel proposes the following illustrative principles for its contractors, to be refined with KPIZ and the authorities:

- **Local hiring.** Priority to qualified Cameroonians at equal competence, with an objective that the large majority of construction workers be Cameroonian and that posts not requiring particular qualifications be filled from the South Region and surrounding areas first. The Mining Code's rule reserving 95% of such posts in mining projects for Cameroonians [S35] is a useful benchmark, although it does not apply to a steelworks.
- **Certification on site.** Welders, electricians, scaffolders, riggers and crane operators tested and certified on site, so that each worker leaves with a recognised credential (Chapter 4).
- **Safety induction and passport.** Every worker inducted and issued a safety passport before starting work (Chapter 8).
- **Worker accommodation and conduct.** Accommodation, where provided, managed to the standard required by IFC Performance Standard 2 [S57], with a code of conduct and grievance channel applied to all contractors.

- **Transition to operations.** Construction electricians, mechanics and welders who perform well offered places in the maintenance conversion programme, so that some of the peak's skills stay on site.

9.6 Phases 2 and 3: a training cascade

Moving from the first phase to the full works, with Phase 2 indicated for 2032 to 2034 and Phase 3 after 2034, adds, on the planning figures, about 400 to 800 direct jobs [S11]. Those jobs should be filled largely by people who have already been trained. Each phase can act as the training ground for the next:

- **Promotion from within.** Experienced operators and technicians from the first phase become supervisors, trainers and team leaders in the next; their places are filled by apprentices and new recruits.
- **Annual apprenticeship intakes.** Once the first phase operates, dual-apprenticeship intakes can run every year, sized to the next phase's needs and to natural turnover.
- **Cameroonian trainers.** Trainers trained under the vendors' train-the-trainer modules in the first phase teach the next phase's crews, reducing the need for expatriate instructors.
- **New disciplines.** A sections mill and, later, a direct-reduction module bring new process roles; the engineering cadre formed in the first phase, with partners such as the mining and chemical engineering schools of the University of Ngaoundéré [S22], provides the base for them.

Indirect employment should grow with each phase, from about 1,000 planned for the first [S11], as supplier development (Chapter 6) brings more maintenance, machining, logistics and services work to Cameroonian firms.

FINDING

The workforce plan of a phased steelworks is a training plan. For the first phase, about 500 people must be recruited and trained, about half of them starting 18 to 36 months before first steel, that is from 2027 for a first heat in the second half of 2030; every later phase can then be staffed largely by promotion and by apprentices trained in the plant.



**EVERY CONSTRUCTION PEAK SHOULD LEAVE
BEHIND CERTIFIED WELDERS, ELECTRICIANS AND
RIGGERS, NOT ONLY BUILDINGS.**

Illustrative view. Generated image of a reinforced-concrete building under construction in a West African town, with starter bars, formwork, scaffolding and workers in high-visibility vests; not a photograph of any project, place or person.

9.7 Retention, housing and transport

A trained workforce is valuable to its competitors as well as to its employer. As the Kribi zone grows, port operators, power producers, cement plants and agro-industries will look for the same maintenance and electrical technicians, and some trained people will leave. Four measures limit that risk without wage escalation.

- **Competitive pay and visible progression.** Formal private-sector wages in Cameroon averaged 118,200 FCFA a month in 2021, with a median of 90,000 FCFA [S12]; a steelworks should pay at or above the formal-sector norm for comparable skills and link pay progression to certified competence, so that workers see a path up the ladders in Figure 4.2.
- **Training agreements.** Cameroon's vocational training law allows an employer that finances training to require the trained worker to remain in its service for a set period [S26]. Used fairly, with periods proportionate to the cost of training, such agreements protect the employer's investment without trapping workers.
- **Housing and transport.** A works at Mboro will recruit many people from outside Kribi. Affordable housing, developed with the municipality, KPIZ and private developers, and reliable shift transport, especially at night, will determine whether recruits settle in the area or leave after a few months.
- **A shared training system.** If every major employer of the zone trains to the same standards and contributes to the same fund (Chapter 10), the cost of losing a trained worker to a neighbour is shared rather than borne by one company alone.

9.8 Indicators to track

The plan should be monitored with a small set of indicators, reported publicly each year: direct headcount by occupational family and by nationality; the share of employees from the South Region; the number of apprentices, graduate trainees and placements abroad; certification rates (welders, electrical authorisations, competence cards); the number of expatriate posts and of named successors ready; training days per employee, against the worldsteel benchmark of about 7 to 9 days [S51]; women's share by occupational family and the retention of women and men one and three years after hiring (Chapter 7); and lost-time and recordable injury frequency rates (Chapter 8). Publishing these indicators turns the objectives in this chapter into commitments that can be tested.

CHAPTER 10

TWELVE ACTIONS WOULD PUT A TRAINED CAMEROONIAN WORKFORCE IN PLACE BEFORE THE FIRST HEAT

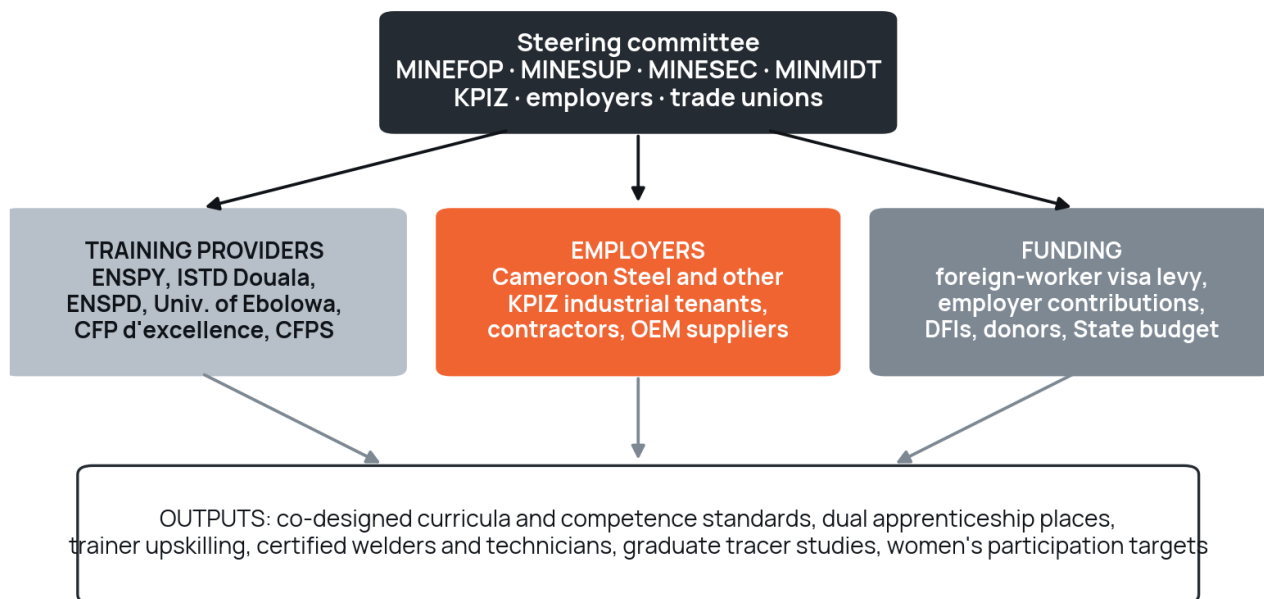
The evidence in this paper points to a simple conclusion: Cameroon has the young people, the institutions and the legal framework to staff a modern steel industry with its own citizens, but not yet the industry-specific content, the practical training capacity, the certification or the financing mechanisms to do so on time. None of the missing pieces requires a new institution or a large public budget. They require partnership between the State, schools, employers and equipment suppliers, organised around a clear timetable that starts about three years before first steel, that is in 2027 on the RC-1.1 schedule. This chapter sets out twelve actions, grouped under four headings: governance and financing, curricula and certification, inclusion and safety, and suppliers and information. For each, it names the lead, the partners and an indicator of success.

10.1 Governance and financing

1. Create a Kribi steel and heavy-industry skills partnership. A standing partnership, chaired by the Ministry of Employment and Vocational Training (MINEFOP) with the ministries in charge of higher and secondary education (MINESUP, MINESEC) and of mines and industry (MINMIDT), KPIZ, employers of the zone, trade unions and the main training providers, would set competence standards, co-design curricula, allocate training places and report on results (Figure 10.1). Its added value is to turn one employer's training needs into a cluster's training system, so that skills built for steel also serve cement, aluminium, energy, port and agro-industrial employers, and so that employers share costs rather than poach each other's trainees.

A Kribi steel skills partnership links ministries, schools, employers and funders

Proposed governance (illustrative); names are institutions that exist today, not signatories



ILLUSTRATIVE Figure 10.1. Proposed governance of a Kribi steel and heavy-industry skills partnership. Institutions named exist today; they are not signatories.

Source: Cameroon Steel proposal; institutions as described in Chapter 3 [S18][S20][S21][S23][S24][S25].

2. Establish a training fund with clear rules. Cameroon already has three potential sources of finance for industrial training: the levy on foreign workers' contract visas introduced by the 2023 Finance Law, which the government has said will finance vocational training and which raised about FCFA 5 billion in its first year [S30] [S31]; the national fund for vocational training proposed by the Minister of Employment and Vocational Training in December 2024 [S29]; and the development finance institutions that are financing the KPIZ zone [S39]. A cluster training fund should combine a share of these public resources with employer contributions, and should pay training providers partly on results: trainees certified and placed in jobs. Employers whose expatriates generate the levy would see part of it return as training for the Cameroonians who will replace them, which aligns the incentive with the policy objective. In its first two years, before the plant's financial close in 2028, the fund and Cameroon Steel would carry at risk the cost of graduate recruitment and the first apprenticeship intake (Chapter 9).

3. Give apprenticeships a fiscal incentive. Law No. 2018/010 already provides for subsidies, donations and "particular tax incentives" to support vocational training [S26], and every formal employer pays 2.5% of its payroll to the housing-loan and employment funds [S32]. A simple, verifiable incentive would allow employers to deduct certified expenditure on apprentices' stipends, tutors and training from taxable income at an enhanced rate, or to credit part of it against their employment-fund contribution. The test of eligibility should be output-based: apprentices registered under a written contract, trained to a recognised standard and assessed.

10.2 Curricula and certification

4. Co-design curricula with industry. Three programmes should be developed with the engineering schools and institutes named in Chapter 3, with industry practitioners teaching part of each:

- a **steelmaking specialisation** (ferrous metallurgy, EAF and secondary steelmaking, continuous casting, rolling) as a final-year option in mechanical, chemical and materials engineering at ENSPY and ENSPD, with a placement in an operating plant;
- an **industrial maintenance and automation track** with plant placements at the ISTD in Douala and the Centres de formation professionnelle d'excellence, focused on hydraulics, drives, PLCs and electrical authorisations;
- a **technical-teacher programme** with ENSET Douala and the University of Ebolowa to give vocational trainers industrial experience, addressing the shortage of qualified trainers documented by MINEFOP [S28].

5. Launch a dual apprenticeship programme. Under Law No. 2018/010 and Decree No. 2020/2592/PM [S26] [S27], the employer and its partner centres should open a two-year dual apprenticeship for maintenance, electrical, mill and process trades, with written contracts, stipends, certified tutors and joint assessment (Figure 5.1). The first intake should start about 30 months before first steel, in early 2028 on the RC-1.1 schedule (Figure 9.2), with plant blocks in existing heavy-industry sites until the works' own shops are available.

6. Write steel-occupation competence standards and build a test centre. MINEFOP and the partnership's employers should write competence standards for the main steel occupations (melter, caster operator, mill operator, roll-shop machinist, maintenance and electrical technician, laboratory analyst) and map them to national diplomas and the CQP. A test and certification centre, operated with an internationally accredited certification body, should certify welders to ISO 9606-1 [S59] and assess competence cards. Because the International Institute of Welding allows organisations in a country without an IIW member to work with an Authorised Nominated Body of another country, such a centre could later serve the Central African region [S78].

7. Buy training with equipment. Every equipment contract for the works should specify the number of trainees by role, the content and duration of training at reference plants and on site, train-the-trainer modules for Cameroonian instructors, and acceptance tests linked to payment milestones (Chapter 5). Simulators for the melt shop, caster and cranes should be procured early, so that operator training can start 18 months or more before first steel.

NONE OF THE MISSING PIECES REQUIRES A NEW INSTITUTION; ALL OF THEM REQUIRE PARTNERSHIP AND A TIMETABLE.

Cameroon Steel

10.3 Inclusion and safety

8. Open heavy-industry careers to women. The Ministry of Labour and Social Security, employers and unions should agree how women can work night shifts in continuous-process plants. Article 82 of the 1992 Labour Code prohibits night work by women in industry with limited exceptions [S33], as does ILO Convention No. 89, which Cameroon ratified in 1970 and which remains in force [S69][S73]. The quickest lawful route is to ratify the 1990 Protocol to that convention, which allows exemptions by national regulation after consulting the social partners and with maternity safeguards, and to adopt the regulation before operator recruitment starts in 2029 [S72]; ratifying the Night Work Convention, 1990 (No. 171), which protects all night workers, would complete it

[S70]. Employers should adopt the measures in Table 7.1: scholarships for girls and women in technical programmes, facilities and protective equipment for women, gender-neutral recruitment, a code of conduct and grievance channel, and objectives for women in each apprenticeship and graduate intake.

9. Make safety a certified skill across the zone. KPIZ and its tenants should adopt a common safety passport recognised on all sites, require contractors to meet a common standard of induction, training and supervision, and design their management systems to ISO 45001 [S58]. Safety-critical authorisations (permits to work, lock-out and tagout, confined-space entry, crane operation, electrical switching) should be granted only after training and practical assessment. A workforce health programme should address heat, noise and dust, and the regional priorities of HIV and malaria [S61].

10.4 Suppliers and information

10. Run supplier development at the scale of the zone. A single supplier portal, common qualification criteria and a shared programme of audits, coaching and certification for KPIZ tenants would spread costs and give Cameroonian firms a larger market (Chapter 6). Large employers should commit to payment terms that small suppliers can live with, and to pilot orders for firms on the development ladder. The partnership should publish an annual local-content report for the zone using four measures: spend with Cameroonian-registered suppliers, spend with Cameroonian-owned SMEs and South Region firms, estimated local value added, and supplier capability outcomes.

11. Reach young people before they choose a career. A careers outreach programme in secondary schools of the South Region, Douala and Yaoundé, run with MINESEC and the University of Ebolowa, should show what industrial careers involve, what they pay and how to enter them, with particular attention to girls in technical and science streams. Open days, plant visits once the works operates, and a simple online guide to the training routes in Table 4.1 would cost little and widen the recruitment pool. The new ENSPY annex at Meyomessala and the University of Ebolowa, both in the South Region [S18][S23], are natural partners.

12. Measure and publish. The partnership should commission a labour-market and skills survey of the Kribi area, where current population and workforce data are lacking (Chapter 11), run tracer studies of graduates of the programmes it supports, and publish the indicators listed at the end of Chapter 9 every year. Employers should report training days, certifications, localisation, women's participation and safety performance on a common basis, as the best international companies do [S42][S51].

10.5 A roadmap

Table 10.1 sets out the twelve actions with their leads, partners, timing and indicators. Timing is expressed relative to the first steel of the first phase, because the critical path for skills is the critical path of the plant.

Table 10.1 Roadmap of recommended actions

No.	Action	Lead	Main partners	Timing (months relative to first steel; calendar on RC-1.1)	Indicator of success
1	Kribi steel and heavy-industry skills partnership	MINEFOP	MINESUP, MINESEC, MINMIDT, KPIZ, employers, unions	From month –42 (early 2027)	Charter signed; work programme adopted
2	Cluster training fund	MINEFOP, Ministry of Finance	Employers, DFIs, KPIZ	From month –36 (mid-2027)	Fund rules published; first disbursements tied to results

No.	Action	Lead	Main partners	Timing (months relative to first steel; calendar on RC-1.1)	Indicator of success
3	Fiscal incentive for apprenticeships	Ministry of Finance	MINEFOP, employers' associations	Next Finance Law	Measure enacted; number of registered apprentices
4	Co-designed curricula (steelmaking, maintenance and automation, technical teachers)	Engineering schools, ISTD, ENSET	Employers, equipment suppliers	From month –36 (mid-2027)	Programmes accredited; first cohorts enrolled
5	Dual apprenticeship programme	Employer and partner centres	MINEFOP, CFP d'excellence, CFPS	First intake at month –30 (early 2028)	Apprentices enrolled, retained and certified
6	Steel competence standards and test centre	MINEFOP	Employers, certification body	From month –30 (early 2028)	Standards published; welders and technicians certified
7	Vendor training clauses and simulators	Employer	Equipment suppliers	At contract award	Trainees trained to acceptance criteria
8	Women in heavy-industry careers	Ministry of Labour, employers	Unions, schools, MINESUP	From month –36 (mid-2027)	Protocol of 1990 to ILO Convention No. 89 ratified and regulation adopted; women's share of intakes
9	Zone safety passport and contractor standard	KPIZ, employers	Contractors, Ministry of Labour	Before construction starts	Passports issued; injury frequency rates
10	Zone supplier-development programme and local-content report	KPIZ, employers	Chambers, banks, SME agencies	From month –24 (mid-2028)	Suppliers approved; local-content report published
11	Careers outreach	Employers, MINESEC	University of Ebolowa, ENSPY	From month –36 (mid-2027), annually	Applications received; share of women applicants
12	Skills survey, tracer studies and annual indicators	Skills partnership	INS, ONEFOP	From month –36 (mid-2027), annually	Survey published; indicators reported

Source: Cameroon Steel proposals. Timing aligns with the illustrative training timeline in Figure 9.2; calendar dates assume first heat at the start of the second half of 2030 (Table 9.2).

FINDING

The first three actions, a skills partnership, a training fund with clear rules and a fiscal incentive for apprenticeships, are the enablers of the other nine. They can be put in place within a year, and they determine whether the rest happen in time for the first heat.

10.6 Costs, risks and sequencing

The costs of the programme lie mainly in people and time rather than in buildings: stipends for apprentices and trainees, the time of tutors and trainers, placements abroad, vendor training, simulators and a test centre. Some of these costs belong in the plant's capital budget (vendor training, simulators, initial placements), some in its

operating budget (tutors, continuing training), and some in public or cluster budgets (curricula, trainer upskilling, the test centre, outreach). A clear split, agreed at the outset, prevents each party from waiting for another to pay.

Three risks deserve explicit management.

- **Training ahead of a delayed project.** If construction slips, trained people may wait without work. The waves that start after financial close should be tied to firm project milestones. The earlier ones, the partnership, graduate recruitment and the first apprenticeship intake, start before financial close in 2028; they are funded at risk by Cameroon Steel and the cluster fund, kept small and focused on skills used across the cluster, and their trainees are kept occupied in partner plants, construction and commissioning until the works needs them.
- **Quality of providers.** Results-based payments, independent assessment and published outcomes are the best protection against training that looks good on paper but does not produce competent workers.
- **Capture and dispersion of funds.** A cluster training fund must have transparent rules, independent audit and representation of employers and workers in its governance, so that resources go to the training that the zone needs.

Sequencing follows the critical path of the plant. The partnership, the fund and the incentive come first, because they make the rest possible; curricula, the dual apprenticeship and the graduate programme follow within a year; vendor training and simulators follow equipment contracts; and the indicators are published annually from the start, so that progress can be checked by everyone with an interest in it.

10.7 What each party can do now

The State can convene the partnership, open a lawful route to night work for women by ratifying the 1990 Protocol to ILO Convention No. 89, direct a share of the foreign-worker visa levy to industrial training in the zones where foreign workers are employed, and give apprenticeships a fiscal incentive in the next Finance Law. **KPIZ** can make skills and supplier development part of its zone offer, with a common safety passport and supplier portal for all tenants. **Schools and training centres** can open steelmaking and maintenance tracks with industry teachers and placements. **Equipment suppliers** can treat training as a contract deliverable and transfer their teaching capability to Cameroonian instructors. **Cameroon Steel** proposes to anchor the partnership as the first heavy-industry employer of the zone's steel cluster, to open its training programmes to the cluster where practical, and to report its workforce indicators publicly once operations begin.

The return on this effort extends beyond one plant. Each melter, electrician, welder and supervisor trained for steel adds to the industrial capability that Cameroon's development strategy seeks [S41], and that the Kribi zone needs to attract the next investor. Skills built ahead of the furnace are the most durable part of an industrial project: they remain in the country whatever happens to the market for steel.

CHAPTER 11

WHAT WE DO NOT YET KNOW, AND HOW IT WILL BE RESOLVED

This paper relies on published statistics, legal texts, institutional sources and Cameroon Steel's public planning figures. Several questions that matter for a skills plan cannot yet be answered from public evidence. Some concern Cameroon's labour market and education system; some concern the legal framework; and some concern the project itself, whose engineering and staffing will be refined as it advances. This chapter lists the main gaps, explains why each matters and proposes how and by whom it can be closed. None of them changes the paper's central conclusion, that training must start well before operations, but several will change the numbers in the workforce plan and the design of the training programmes.

11.1 Labour-market and education data

The national labour statistics used in this paper are recent and of good quality at national and regional level, but they do not describe the local labour market around Kribi, nor the capacity of individual training programmes. The latest census count published for Kribi dates from 2005 [S62], and the port's growth since 2011 makes it a poor guide to today's population. Nationally, the fourth general census (RGPH4) closed its field count in October 2026 with about 22.7 million residents, about 24% below the World Bank's estimate [S19][S14]; until final results are published, national cohorts and the local labour pool remain uncertain, and this paper shows both values for the cohort reaching working age (Chapter 2). Enrolment and graduate numbers by programme are not published systematically for the engineering schools, institutes of technology and vocational centres described in Chapter 3; the latest internationally reported breakdown of tertiary graduates by field dates from 2010, and the latest share of vocational streams in secondary education from 2016 [S16]. Two measures of young people outside work and education diverge widely: the ILO's harmonised estimate of 23.2% for 2021 [S14] and the national survey's sustainable-development indicator of 3.6% for the same year [S12], reflecting different definitions that should be reconciled before either is used to set targets.

EVIDENCE GAP

A local labour-market and skills survey of the Kribi area, and programme-level enrolment and graduate data for the main technical institutions, are the two data sets most needed to refine the workforce plan. Both can be produced within a year by the proposed skills partnership with the National Institute of Statistics and the national employment observatory.

11.2 Legal and regulatory questions

Three legal questions bear directly on the recommendations. First, article 82 of the 1992 Labour Code prohibits night work by women in industry with limited exceptions [S33]; whether this provision has been amended, how it is applied today to continuous-process plants, and which ministerial order sets the work prohibited to women under article 83 could not be verified for this paper. Second, the route the State chooses under ILO Convention No. 89 matters as much as the Code. Ratification statuses were confirmed in the ILO's NORMLEX database on 10 October 2026: Convention No. 89 (ratified in 1970) and the Occupational Safety and Health Convention, 1981 (No. 155, ratified on 1 October 2021) are in force for Cameroon; the 1990 Protocol to Convention No. 89, the Night Work Convention, 1990 (No. 171), the Violence and Harassment Convention, 2019 (No. 190) and the Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187) have not been ratified [S73][S74]. Whether the State intends to ratify the Protocol, or to use the 2031 to 2032 window to denounce Convention No. 89, is not known [S69]. Third, the implementing texts of Ordinance No. 2025/002, in particular how the local-skills and local-hiring programmes required by its article 6 will be assessed and monitored, were not yet available [S36].

11.3 Certification and training capacity

No body testing and certifying welders to ISO 9606-1 on a regular basis in Cameroon was identified for this paper, and the presence of an Authorised Nominated Body of the International Institute of Welding in Cameroon or the CEMAC region was not confirmed [S59][S60]. Similarly, no Cameroonian provider of steelmaking or casting simulator training was identified. These gaps define the scope of the proposed test centre and simulator procurement, and should be confirmed with MINEFOP, the national standards agency and international certification bodies.

11.4 Project-specific figures

The workforce figures for Cameroon Steel's works are planning values from its public reference configuration [S11]. The family totals for the first phase are planned; the allocation within families (Table 9.1), the times to competence (Figure 5.2), the localisation path by family (Figure 9.3) and the local-sourcing objectives by category (Figure 6.1) are illustrative. They will be replaced by values from detailed engineering, the equipment suppliers' staffing recommendations and the make-or-buy decisions for maintenance and services. The construction peak is an assumption based on benchmarks and will be revised once contracting packages are defined.

11.5 Summary of evidence gaps

Table 11.1 Evidence gaps, why they matter and how they will be resolved

Gap	Why it matters	How it will be resolved	Who	When
Population and labour pool of Kribi and its surroundings	Sizes local recruitment, housing and services	Local labour-market and skills survey	Skills partnership with INS and ONEFOP	Within 12 months
Final results of the 2026 census (RGPH4), national and for Kribi	The provisional count of 22.7 million is about 24% below the World Bank estimate behind the cohorts and labour force used here	Replace WDI-based figures with final RGPH4 results	BUCREP; Cameroon Steel for this paper	On publication

Gap	Why it matters	How it will be resolved	Who	When
Enrolment and graduates by programme at key institutions	Sizes training places to buy or create	Data requests to institutions; annual reporting	MINESUP, MINEFOP, institutions	Within 12 months
Tertiary graduates by field (latest 2010) and vocational secondary share (latest 2016)	Indicates the national pipeline in technical fields	Updated reporting to UNESCO and national yearbooks	MINESUP, MINESEC	Ongoing
Divergent measures of young people not in employment, education or training	Affects targeting of youth programmes	Reconcile ILO and national definitions	INS, ILO	Within 12 months
Application of Labour Code arts. 82 and 83, and the State's route under ILO Convention No. 89 (1990 Protocol, or denunciation window 2031 to 2032)	Determines women's access to shift roles	Formal position of the Ministry of Labour and Social Security after consulting the social partners	Ministry of Labour, employers, unions	Before operator recruitment (2029)
Implementing texts of Ordinance No. 2025/002	Defines how skills and local-hiring programmes are assessed	Follow publication; engage the investment promotion agency	Cameroon Steel	As published
Welding certification and simulator training capacity in Cameroon	Scopes the test centre and simulator procurement	Survey of certification bodies and providers	Skills partnership	Within 12 months
Detailed staffing by role and area for Phase 1	Replaces illustrative allocations	Detailed engineering and supplier recommendations	Cameroon Steel	With detailed engineering
Wage benchmarks for industrial technicians in Cameroon	Informs retention and competitiveness	Salary survey with employers of the zone	Skills partnership	Within 12 months
Use of the foreign-worker visa levy revenue after 2023	Determines financing available for training	Publication by the Ministry	MINEFOP, Ministry of Finance	Next budget cycle
Capability of Cameroonian suppliers for steel-plant services	Sizes the supplier-development programme	Supplier census and capability audits	KPIZ and employers	Before major contracts
Occupational injury statistics by sector	Benchmarks safety performance nationally	Publication of insurance data by sector	National social insurance fund, Ministry of Labour	Ongoing

Source: Cameroon Steel analysis of the evidence used in this paper.

11.6 How this paper will be updated

This is a first edition. Cameroon Steel intends to update it as the evidence gaps above are closed and as the project's engineering advances, and to publish the workforce indicators listed in Chapter 9 once operations begin. Corrections and additional sources are welcome; they will be acknowledged in later editions. Figures labelled planned, indicative, assumed or illustrative should be read as such; figures labelled sourced can be checked against the sources listed in Annex C.

ANNEX A

METHOD, ASSUMPTIONS AND DERIVED FIGURES

This annex explains how the figures in this paper were obtained: which sources were used and how they were read, which values were derived by Cameroon Steel, which are planning assumptions, and how the assessments in Chapters 4 and 6 were made. Every chart is reproducible from the data files published with the web edition of this paper.

A.1 Sources and status labels

Sources were read in their original language and form wherever possible: national statistical reports (INS) and legal texts were read in full or in the relevant articles; international statistics were taken from the World Bank's World Development Indicators application programming interface (API), which republishes ILO modelled estimates, UNESCO education statistics and World Bank Enterprise Survey indicators, on the version updated on 8 October 2026; company and institutional facts were taken from their own websites and reports. No encyclopaedia entry is cited: institutional facts come from the institutions' own pages or from reputable secondary sources, ILO conventions and their ratification by Cameroon from the ILO's NORMLEX database, and city locations from OpenStreetMap.

Each figure and table carries one of four status labels:

- **Sourced:** the value was read in the cited source.
- **Derived:** Cameroon Steel arithmetic on sourced inputs, as set out below.
- **Assumed:** a planning assumption or a Cameroon Steel assessment, with its range or scoring rules stated.
- **Illustrative:** a scenario, an allocation or an objective, not a forecast or a commitment.

Cameroon Steel's project figures come from its reference configuration RC-1 (planning estimate), edition 10 October 2026 (RC-1.1) [S11]. RC-1 is not published as a separate document; the figures this paper uses are set out in this annex and in Annex D. They are labelled planned (first-phase jobs and mix, indirect jobs), indicative (full-works direct jobs, phase capacities), assumed (construction peak) or objective (localisation).

A.2 Derived figures

Young people reaching working age. The World Bank's population estimates for 2025 give 1,830,617 boys and 1,809,995 girls aged 10 to 14, a total of 3,640,612 [S14]. Dividing by five gives about 728,000 people reaching the age of 15 in each of the next five years. Scaled to the provisional 2026 census field count of 22.7 million [S19], against the World Bank's 2025 estimate of 29.9 million [S14], the cohort becomes $728,122 \times 22.7 / 29.9 \approx 553,000$, about 550,000 in the text; the scaling assumes that the census changes the level of the population but not its age structure. The population aged 15 to 24 is the sum of the four five-year cohorts aged 15 to 19 and 20 to 24 by sex: $1,619,293 + 1,612,191 + 1,359,638 + 1,359,719 = 5,950,841$ [S14].

Direct jobs per million tonnes. Direct jobs divided by capacity in million tonnes, or, for the European Union, by average annual output: Nucor Lexington, 200 jobs for 430,000 tons, read as US short tons and converted at 0.907 t per short ton to 0.390 Mt, giving 513 [S03]; CMC Berkeley County, 230 jobs for 500,000 tons (US short tons, the unit that the company's annual report defines [S82]), converted in the same way to 0.454 Mt, giving

507 [S04]; EU steel industry, 298,000 jobs in 2024 for an average output of 146 Mt a year, 2,041 [S02]; Prometal plants 4 and 5, 1,000 for about 0.36 Mt, 2,778 [S07]; Devki, 2,500 for 0.5 Mt, 5,000 [S05]; Cameroon Steel, 500 for 0.3 Mt (Phase 1, planned), 1,667, and 1,100 (900 to 1,300) for 1.0 Mt (full works, indicative) [S11]. Capacity and job definitions differ between sources; the ratios indicate orders of magnitude.

Distances. Great-circle distances from Kribi town centre to the centres of the other cities, using the place locations published by OpenStreetMap [S75] rounded to about 0.01 degree, then rounded to the nearest kilometre; the precision is about ± 2 km. Locations are city-level only; no site boundaries are used.

Localisation totals. The total direct-workforce objectives in Figure 9.3 are weighted by the planned Phase 1 mix (operators 300, technicians 100, engineers 50, administration 50): first year $0.6 \times 85 + 0.2 \times 70 + 0.1 \times 50 + 0.1 \times 70 = 77\%$; fifth year $0.6 \times 95 + 0.2 \times 90 + 0.1 \times 70 + 0.1 \times 90 = 91\%$, within the planning range of 85 to 95% around the 90% objective [S11].

Other ratios. The fall in worldsteel's lost-time injury frequency rate from 0.85 (2022) to 0.72 (2024) is 15.3% [S51]. The ratio of men's to women's work-related mortality in the ILO estimates, 51.4 to 17.2 per 100,000, is 3.0 [S54].

A.3 Assessment of skills gaps (Figure 4.1)

Each occupational family was scored on four dimensions, from 1 (small gap) to 4 (critical gap), by Cameroon Steel's project team:

- **Experienced supply in Cameroon:** 1 if experienced workers are widely available in Cameroonian industry; 2 if available but in demand; 3 if a small pool exists, mostly employed; 4 if almost no experienced workers exist in the country.
- **Training capacity in Cameroon:** 1 if programmes exist with industrial practice; 2 if programmes exist but need upgrading; 3 if only related programmes exist; 4 if no relevant programme exists.
- **Recognised certification:** 1 if national or international certificates are routinely used; 2 if certificates exist but are not widely held; 3 if certificates exist abroad but are not applied in Cameroon; 4 if no certification exists for the role.
- **Time to competence:** 1 for less than a year; 2 for one to two years; 3 for two to four years; 4 for more than four years from the start of initial training, or for roles that require extensive experience.

The scores draw on the evidence in Chapters 2 to 5 and should be read as priorities for action, not as measurements. They will be revisited with training partners.

A.4 Planning assumptions

Table A.1 Main planning assumptions and their ranges

Assumption	Central value	Range	Basis	Status
Phase 1 capacity	0.3 Mtpa nameplate	Expected sustained output 270,000 to 300,000 t a year	Cameroon Steel reference configuration, RC-1.1 [S11]	Planned
Phase 1 schedule	First heat in the second half of 2030	Hearings Q3 2028; environmental certificate Q4 2028; financing 2028; works from Q1 2029; ramp-up 2031	RC-1.1 [S11]	Target
Later phases	Phase 2 (sections) 2032 to 2034	Phase 3 after 2034	RC-1.1 [S11]	Indicative

Assumption	Central value	Range	Basis	Status
Phase 1 direct jobs	500	450 to 550	Cameroon Steel reference configuration [S11]	Planned
Phase 1 mix (operators, technicians, engineers, administration)	300, 100, 50, 50	Shares may shift by 5 points with automation choices	Cameroon Steel reference configuration [S11]	Planned
Phase 1 indirect jobs	1,000	800 to 1,500	Cameroon Steel reference configuration [S11]	Planned
Full works direct jobs (about 1 Mtpa)	1,100	900 to 1,300	Cameroon Steel reference configuration [S11]	Indicative
Phase 1 construction peak	800 workers	600 to 1,000	Mini-mill construction benchmarks, e.g. [S03]; [S11]	Assumed
Duration of construction per phase	24 months	18 to 30 months	Industry practice for EAF mini-mills	Assumed
Cameroonian share of operating workforce by year 5	90%	85 to 95%	Cameroon Steel objective [S11]	Objective
Time to competence by role	See Figure 5.2	See Figure 5.2	Durations of Cameroonian diplomas plus typical in-plant training	Assumed
Start of training before first steel	30 to 36 months for engineers; 18 to 30 for the melt-shop, caster and maintenance cadres (with the engineers, 240 of 500 posts); 6 to 18 for the other 260 posts	Varies by role	Times to competence and commissioning sequence	Illustrative
Calendar of the training timeline	Month 0 = start of the second half of 2030	A later first heat moves every date by the same interval	First heat on the RC-1.1 schedule [S11]	Assumed
Women's share of direct workforce by year 5	15%	Not set	Cameroon Steel objective, above worldsteel average of 11.4% [S51]	Objective
Local-sourcing objectives by category	See Figure 6.1	See Figure 6.1	Cameroon Steel assessment of local supply	Illustrative

Source: as listed.

A.5 Times to competence (Figure 5.2)

Each bar has three segments: initial qualification (months of schooling or training before recruitment: 3 months for crane and production operators, 6 for welders, melters and casters recruited with a technical diploma, 24 for technicians from an IUT, 60 for engineers and for supervisors who start as engineers or progress from operator roles), the minimum time of in-plant training to independent work, and the typical maximum. The values reflect

the durations of Cameroonian diplomas (CQP, DUT and BTS of two to three years, engineering degree of five years) and typical in-plant training in EAF long-products works. For shift managers, the in-plant segment represents years of progressive experience rather than formal training.

A.6 Local-sourcing objectives (Figure 6.1)

For each procurement category, Cameroon Steel estimated the share of spend that could be placed with Cameroonian-registered suppliers in the first year of operation, given the current supplier base, and in the fifth year, assuming a supplier-development programme of the kind described in Chapter 6. The objectives assume that metallic charge, energy, graphite electrodes and ferro-alloys remain largely imported in the medium term, and that services, site works and maintenance can be largely local. They are objectives for planning and dialogue, not commitments.

A.7 Charts and data files

All charts were drawn with the house chart style of Cameroon Steel's document engine. The data behind each chart, map and diagram is published as a JSON file with the web edition of this paper, with its source identifiers and status, and the plotted values are printed in Annex D. The map in Figure 3.1 uses Natural Earth administrative boundaries, which are in the public domain, and shows city-level locations only.

ANNEX B

GLOSSARY AND ABBREVIATIONS

This glossary explains the technical terms, diplomas, institutions and abbreviations used in this paper. French terms are given where they are the usual names in Cameroon.

Term	Meaning
Alternance (formation par alternance)	Work-linked training that alternates periods in a school or centre and in an enterprise, provided for by Law No. 2018/010
Apprenticeship (apprentissage)	Training under a written contract in which an employer or master craftsperson undertakes to train an apprentice in a trade
Billet	Semi-finished steel of square section cast in the melt shop and rolled into bar or rod; a merchant billet is sold to another rolling mill
BTS	Brevet de technicien supérieur: two-year higher technician diploma
BUCREP	Bureau central des recensements et des études de population: Cameroon's census bureau
CAP	Certificat d'aptitude professionnelle: vocational certificate for skilled trades
CEMAC	Economic and Monetary Community of Central Africa (Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon)
CFP d'excellence	Centre de formation professionnelle d'excellence: public vocational training centres of excellence in Douala, Limbe and Sangmélima
CFPS	Centre de formation professionnelle sectoriel: sectoral vocational training centre managed with employers
Continuous caster	Machine that solidifies liquid steel in water-cooled moulds into continuous strands cut into billets
CQP	Certificat de qualification professionnelle: certificate of professional qualification
Direct jobs	Jobs on the payroll of the steel company itself
DRI and HBI	Direct-reduced iron: iron ore from which oxygen has been removed with gas, without melting. Hot-briquetted iron is DRI compacted for shipping
Dual system	Training model, common in Germany, in which apprentices learn mainly in a company and partly in a vocational school
DUT	Diplôme universitaire de technologie: two-year diploma awarded by university institutes of technology
EAF	Electric arc furnace: furnace that melts scrap and DRI with an electric arc between graphite electrodes and the charge
EESI3	Third survey on employment and the informal sector, conducted by the INS in 2021
ENSET	École normale supérieure d'enseignement technique: school training teachers for technical education
ENSPY, ENSPD	Écoles nationales supérieures polytechniques of Yaoundé and Douala: public engineering schools
FCFA	CFA franc of Central Africa, pegged at 655.957 per euro
Global underemployment	INS measure combining unemployment, visible underemployment (involuntarily short hours) and invisible underemployment (earnings below the minimum hourly wage)
HSE	Health, safety and environment
ILO	International Labour Organization
Indirect jobs	Jobs in firms that supply goods and services to the steel company
INS	Institut national de la statistique, Cameroon's national statistics institute
ISO 45001	International standard for occupational health and safety management systems

Term	Meaning
ISO 9606-1	International standard for the qualification testing of welders in fusion welding of steels
ISTD	Institut supérieur de technologie de Douala, formerly the University of Douala's institute of technology
IUT	Institut universitaire de technologie: university institute of technology
KPIZ	Kribi Port Industrial Zone S.A., the company created in 2026 to develop the industrial zone of the Port of Kribi
Ladle furnace	Station where liquid steel in a ladle is reheated and its chemistry adjusted before casting
Local content	Activities that develop local capacities, use local human and material resources, transfer technology and subcontract to local firms, creating measurable value in the local economy
Lockout and tagout	Safety procedure that isolates and locks energy sources before maintenance, with a tag identifying the person responsible
LTIFR	Lost-time injury frequency rate: lost-time injuries (including fatalities) per million hours worked
MINEFOP	Ministère de l'emploi et de la formation professionnelle (employment and vocational training)
MINESEC, MINESUP	Ministries of secondary and higher education
MINMIDT	Ministère des mines, de l'industrie et du développement technologique
Mtpa	Million tonnes per annum
Nameplate capacity	The design output of a plant; sustained output is usually somewhat lower
NEET	Young people not in employment, education or training
NORMLEX	The ILO's information system on international labour standards and their ratification by each country
OEM	Original equipment manufacturer: the supplier of a major item of plant
ONEFOP	Observatoire national de l'emploi et de la formation professionnelle
Permit to work	Written authorisation for a hazardous task, specifying the hazards, controls and people responsible
Phase 1, 2, 3	The successive investments by which Cameroon Steel's works would reach 1 Mtpa: melt shop and bar and rod mill; second melt line and sections mill; heavier sections and melt capacity
PLC	Programmable logic controller: industrial computer that controls machines and processes
RC-1.1	Edition of 10 October 2026 of Cameroon Steel's reference configuration RC-1, a planning estimate
Rebar and wire rod	Ribbed reinforcing bar for concrete, and hot-rolled rod in coils used for wire, mesh and fasteners
RGPH4	Fourth general population and housing census of Cameroon, whose field count closed in October 2026
Rolling mill	Line of stands that reduces reheated billets to bars, rods or sections
SMIG	Salaire minimum interprofessionnel garanti: national minimum wage
SND30	Stratégie nationale de développement 2020 to 2030, Cameroon's national development strategy
Supplier development	Structured support that helps local firms meet a buyer's safety, quality and technical requirements
VAE	Validation des acquis de l'expérience: validation of skills acquired through experience

Source: Cameroon Steel; definitions of local content after Law No. 2023/014 [S35], of global underemployment after INS [S12] and of LTIFR after worldsteel [S51].

ANNEX C

SOURCES

Every source cited in this paper with an [S-id] marker is listed below with its title, publisher, date and address. Web pages were accessed between 1 and 10 October 2026. No encyclopaedia entry is cited. Cameroon Steel's planning figures [S11] are the reference values of RC-1.1, explained in Annex A.

Table C.1 Sources cited in this paper

ID	Title	Publisher	Date	Address
S01	Economic and social impact of the global steel industry (infographic)	World Steel Association and Oxford Economics	May 2019	https://worldsteel.org/wp-content/uploads/Steel-social-and-economic-impact.pdf
S02	European Steel in Figures 2025	EUROFER	Jun 2025	https://www.eurofer.eu/assets/publications/brochures-booklets-and-factsheets/european-steel-in-figures-2025/EUROFER_European-Steel-in-Figures-2025.pdf
S03	Nucor to build new rebar micro mill in North Carolina	Nucor Corporation	7 Apr 2022	https://nucor.com/news-release/nucor-to-build-new-rebar-micro-mill-in-north-carolina-122541
S04	Rebar manufacturing facility coming to Eastern Panhandle	West Virginia Public Broadcasting	8 Dec 2022	https://wvpublic.org/story/economy/rebar-manufacturing-facility-coming-to-eastern-panhandle/
S05	Devki opens Sh50bn steel plant in Kwale	Capital FM Kenya	20 Nov 2022	https://capitalfm.africa/devki-opens-sh50bn-steel-plant-in-kwale/
S06	Tosyali Algérie: mise en service du complexe des tôles d'acier plat (2,5 Mt)	Algérie Eco	28 Nov 2024	https://algerie-eco.com/2024/11/28/tosyali-algerie-mise-en-service-du-complexe-des-toles-dacier-plat-dune-capacite-de-25-millions-de-tonnes/
S07	Prometal inaugure deux usines évaluées à 57 milliards F	Journal du Cameroun	19 Jan 2024	https://fr.journalducameroun.com/prometal-inaugure-deux-usines-evaluees-a-57-milliards-f-ce-jour-a-douala/
S08	Production: les acteurs en présence	Cameroon Tribune	11 May 2026	https://cameroon-tribune.cm/article.html/76600/fr.html/details_2
S09	Kribi: le Premier ministre, chef du gouvernement est là	Cameroon Tribune	30 Dec 2024	https://cameroon-tribune.cm/article.html/68499/fr.html/details_2
S10	Industrialisation: la voie royale de l'émergence	Cameroon Tribune	2 Jan 2025	https://cameroon-tribune.cm/article.html/68558/fr.html/details_2
S11	Cameroon Steel reference configuration RC-1 (planning estimate), edition 10 October 2026 (RC-1.1)	Cameroon Steel	10 Oct 2026	Planning figures, not commitments; not published as a separate document; the figures used are set out in this paper (Annex A and Annex D)
S12	Troisième enquête sur l'emploi et le secteur informel (EESI3), phase 1: enquête emploi, rapport principal (2021 data; Tables 2.9, 3.7, 3.24 and 4.1 are cited)	Institut national de la statistique (INS), Cameroon	Nov 2023 (file of Jul 2025)	https://ins-cameroun.cm/wp-content/uploads/2025/07/EESI3_Rapport-principal_Emploi_VF.pdf
S13	EESI3 Phase 1: Employment Survey, main report (key indicators page)	INS, Cameroon	1 Nov 2023	https://ins-cameroun.cm/en/?p=17601
S14	World Development Indicators, Cameroon: population by age, labour force, ILO modelled labour indicators, Human Capital Index	World Bank	upd. 8 Oct 2026	https://api.worldbank.org/v2/country/CMR/indicator/SL.UEM.TOTL.ZS?format=json

ID	Title	Publisher	Date	Address
S15	Enterprise Surveys indicator: firms offering formal training (% of firms), Cameroon and Sub-Saharan Africa	World Bank	upd. 8 Oct 2026	https://api.worldbank.org/v2/country/CMR/indicator/IC.FRM.TRNG.ZS?format=json
S16	Education indicators (UNESCO Institute for Statistics) via World Development Indicators: enrolment, vocational share, graduates by field, attainment, spending	World Bank and UNESCO UIS	upd. 8 Oct 2026	https://api.worldbank.org/v2/country/CMR/indicator/SE.SEC.ENRL.VO.ZS?format=json
S17	Retombées: plus de 197 000 emplois créés en 2025	Cameroon Tribune	8 May 2026	https://www.cameroon-tribune.cm/article.html/76537/en.html/details_2
S18	École nationale supérieure polytechnique de Yaoundé: presentation (created in 1971), departments and 2026 to 2027 entrance competition (Meyomessala annex)	ENSPY	acc. 10 Oct 2026	https://polytechnique.cm/
S19	Cameroon: bouclage du 4e RGPH, 22,7 millions d'habitants recensés (provisional field count)	Journal du Cameroun	5 Oct 2026	https://fr.journalducameroun.com/cameroon-bouclage-du-4e-rgph-227-millions-dhabitants-recenses-en-mode-digital/
S20	Université de Douala: schools and institutes	Université de Douala	acc. 10 Oct 2026	https://www.univ-douala.cm/
S21	Institut supérieur de technologie de Douala (ISTD): departments and key figures	ISTD, Université de Douala	acc. 10 Oct 2026	https://www.iut-dla.cm/
S22	Établissements; Institut universitaire de technologie (identification sheet)	Université de Ngaoundéré	acc. 10 Oct 2026	https://www.univ-ndere.cm/fr/etablissements/
S23	Cameroon: les nouveaux responsables de l'université d'Ebolowa prennent fonctions	Journal du Cameroun	23 Jul 2024	https://fr.journalducameroun.com/cameroon-les-nouveaux-responsables-de-luniversite-debolowa-prennent-fonctions/
S24	Cameroon inaugurates 3 excellence training centres of FCFA 24 billion built by South Korea	Business in Cameroon	20 Dec 2016	https://www.businessincameroon.com/cooperation/2012-6783-cameroon-inaugurates-3-excellence-training-centres-of-fcfa-24-billion-built-by-south-korea
S25	Former des ouvriers et techniciens qualifiés dans des métiers porteurs (project page)	Agence française de développement	acc. 10 Oct 2026	https://www.afd.fr/fr/projets/former-des-ouvriers-et-techniciens-qualifies-dans-des-metiers-porteurs
S26	Loi n° 2018/010 du 11 juillet 2018 régissant la formation professionnelle au Cameroun (text)	Republic of Cameroon (reproduced by Cameroon24)	11 Jul 2018	https://cameroun24.net/article/46391-loi-n2018-010-du-11-juillet-2018-regissant-la-formation-professionnelle-au-cameroon.html
S27	Decree No. 2020/2592/PM of 9 June 2020 to lay down procedures for the establishment, organisation and functioning of vocational training and learning centres	Prime Minister's Office, Cameroon	9 Jun 2020	https://spm.gov.cm/site/sites/default/files/decret_ndeg_2020_2592_en.pdf
S28	Centres de formation professionnelle: 2 694 formateurs exercent sans diplôme au Cameroun	EcoMatin	30 Jan 2026	https://ecomatin.net/centres-de-formation-professionnelle-2-694-formateurs-exercent-sans-diplome-au-cameroon
S29	Cameroon: vers la création d'un fonds national pour financer la formation professionnelle	EcoMatin	10 Dec 2024	https://ecomatin.net/cameroon-vers-la-creation-dun-fonds-national-pour-financer-la-formation-professionnelle
S30	« Ces recettes vont assurer le financement de la formation professionnelle »	Cameroon Tribune	25 Jan 2024	https://cameroon-tribune.cm/article.html/62720/fr.html/details_2
S31	Cameroon: en 2023, l'État n'a collecté que 5 milliards de recettes auprès des travailleurs étrangers	EcoMatin	26 Jan 2024	https://ecomatin.net/cameroon-en-2023-letat-na-collecte-que-5-milliards-de-recettes-aupres-des-travailleurs-etrangers
S32	Republic of Cameroon: Corporate, Other taxes	PwC Worldwide Tax Summaries	reviewed 14 Aug 2026	https://taxsummaries.pwc.com/republic-of-cameroon/corporate/other-taxes
S33	Loi n° 92/007 du 14 août 1992 portant Code du travail	Republic of Cameroon (FAOLEX copy)	14 Aug 1992	https://faolex.fao.org/docs/pdf/cmr198304.pdf

ID	Title	Publisher	Date	Address
S34	Décret n° 2023/00338/PM du 21 mars 2023 (salaire minimum interprofessionnel garanti)	Prime Minister's Office (FAOLEX copy)	21 Mar 2023	https://faolex.fao.org/docs/pdf/cmr217528.pdf
S35	Loi n° 2023/014 du 19 décembre 2023 portant Code minier	Republic of Cameroon (FAOLEX copy)	19 Dec 2023	https://faolex.fao.org/docs/pdf/cmr223180.pdf
S36	Ordonnance n° 2025/002 du 18 juillet 2025 fixant les incitations à l'investissement en République du Cameroun (certified copy)	Presidency of the Republic (copy published by LEGECAM)	18 Jul 2025	https://legecam.cm/wp-content/uploads/2025/08/ordonnance_n_2025_002_du_18_07_2025.pdf
S37	Cameroun: l'Agence de promotion des investissements lance la sensibilisation autour de l'ordonnance de 2025	Droit Médias Finance	13 May 2026	https://droitmediasfinance.com/index.php/actualites/droit-ohada-affaires/1260-cameroun-lagence-de-promotion-des-investissements-lance-la-sensibilisation-autour-de-lordonnance-de-2025-portant-promotion-des-investissements
S38	Zone industrialo-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-industrialo-portuaire-de-kribi-kpiz-jusqu-a-8-points-de-croissance-et-150-000-emplois-attendus-sur-15-ans
S39	Cameroon launches \$860m Kribi industrial zone to process raw materials locally	Ecofin Agency	27 Feb 2026	https://www.ecofinagency.com/news/2702-53326-cameroon-launches-860m-kribi-industrial-zone-to-process-raw-materials-locally
S40	Innovations douanières de la Loi de finances 2025	Ministry of Finance, Directorate General of Customs	Jan 2025	https://minfi.gov.cm/wp-content/uploads/2025/01/EXPOSE_DGD_LF_2025.pdf
S41	Stratégie nationale de développement 2020 to 2030 (SND30)	Republic of Cameroon, MINEPAT (FAOLEX copy)	2020	https://faolex.fao.org/docs/pdf/cmr211554.pdf
S42	Annual Report and Accounts 2025	Dangote Cement Plc	Jun 2026	https://cement.dangote.com/wp-content/uploads/2026/06/Dangote-Cememt-Plc-2025-Annual-Report.pdf
S43	Tata Steel's SNTI celebrates century of skilling industrious workforce (press release)	Tata Steel	1 Nov 2021	https://www.tatasteel.com/newsroom/press-releases/india/2021/tata-steel-s-snti-celebrates-century-of-skilling-industrious-workforce/
S44	Diverse workforce (careers)	Tata Steel	acc. 10 Oct 2026	https://www.tatasteel.com/careers/culture-at-tata-steel/diverse-workforce/
S45	Tata Steel introduces first batch of women fire fighter trainees (The Avenue Mail)	Tata Steel newsroom	9 Sep 2023	https://www.tatasteel.com/media/newsroom/in-the-news/2023/tata-steel-introduces-first-batch-of-women-fire-fighter-trainees/
S46	Mastercard Foundation Scholars Program at UM6P (575 scholars over ten years)	Université Mohammed VI Polytechnique (UM6P)	acc. 10 Oct 2026	https://um6p.ma/en/mastercard-foundation-scholars-program-um6p
S47	OCP SA, UM6P Project (project summary: ownership, Benguerir campus, enrolment)	Multilateral Investment Guarantee Agency (MIGA), World Bank Group	2021	https://miga.org/project/ocp-sa-um6p-project
S48	Vocational training (theme page and press release of 12 April 2023 on new apprenticeship contracts in 2022)	Federal Statistical Office of Germany (Destatis)	acc. 10 Oct 2026	https://www.destatis.de/EN/Themes/Society-Environment/Education-Research-Culture/Vocational-Training/_node.html
S49	The Training Market 2025 (publication summary)	Federal Institute for Vocational Education and Training (BIBB)	acc. 10 Oct 2026	https://www.bibb.de/en/index.php
S50	steeluniversity: learning for the steel industry (simulations, courses, safety videos)	World Steel Association	acc. 10 Oct 2026	https://steeluniversity.org/

ID	Title	Publisher	Date	Address
S51	Sustainability indicators (2025 report; 2022 to 2024 data)	World Steel Association	acc. 10 Oct 2026	https://worldsteel.org/wider-sustainability/sustainability-indicators/
S52	Safety and health in the steel industry: Data report 2025	World Steel Association	2025	https://worldsteel.org/media/publications/safety-and-health-in-the-steel-industry-data-report-2025/
S53	Safety and health (principles, policy paper, fundamentals)	World Steel Association	acc. 10 Oct 2026	https://worldsteel.org/safety-and-health/
S54	Nearly 3 million people die of work-related accidents and diseases	International Labour Organization	26 Nov 2023	https://www.ilo.org/resource/news/nearly-3-million-people-die-work-related-accidents-and-diseases
S55	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
S56	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
S57	Performance Standard 2: Labor and Working Conditions	International Finance Corporation	1 Jan 2012	https://www.ifc.org/content/dam/ifc/doc/2010/2012-ifc-performance-standard-2-en.pdf
S58	ISO 45001:2018, Occupational health and safety management systems: requirements with guidance for use	International Organization for Standardization	Mar 2018	https://www.iso.org/standard/63787.html
S59	ISO 9606-1:2012, Qualification testing of welders: fusion welding, Part 1: Steels	International Organization for Standardization	2012	https://www.iso.org/standard/54936.html
S60	IIW history	International Institute of Welding (IIW)	acc. 10 Oct 2026	https://iiwelding.org/about-iiw/iiw-history/
S61	Enquête démographique et de santé du Cameroun 2018 (EDSC-V), final report FR360	INS and ICF (DHS Program)	2020	https://dhsprogram.com/pubs/pdf/FR360/FR360.pdf
S62	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
S63	2024 Investment Climate Statements: Cameroon	US Department of State	2024	https://www.state.gov/reports/2024-investment-climate-statements/cameroon/
S64	Cameroon reviews metals industry to address supply and energy constraints	Business in Cameroon	29 Apr 2026	https://www.businessincameroon.com/public-management/2904-16094-cameroon-reviews-metals-industry-to-address-supply-and-energy-constraints
S65	Verzeichnis der anerkannten Ausbildungsberufe 2026 (directory of the 324 recognised training occupations)	Federal Institute for Vocational Education and Training (BIBB)	2026	https://www.bibb.de/dienst/publikationen/de/21008
S66	Cameroun: Complexe moderne de sidérurgie de Kribi, le PM Joseph Dion Ngute effectue la pose de la première pierre	Camer.be	5 Jan 2025	https://www.camer.be/87795/12:1/cameroun-complexe-moderne-de-siderurgie-de-kribi-le-pm-joseph-dion-ngute-effectue-la-pose-de-la-premiere-pi-cameroon.html
S67	Cameroon rejects fresh push to revise rebar standard	Business in Cameroon	26 Jan 2026	https://www.businessincameroon.com/construction/2601-15657-cameroon-rejects-fresh-push-to-revise-rebar-standard
S68	Cameroun: le gouvernement rejette une demande de révision de la norme du fer à béton	EcoMatin	5 Feb 2026	https://ecomatin.net/cameroun-le-gouvernement-rejette-une-demande-de-revision-de-la-norme-du-fer-a-beton

ID	Title	Publisher	Date	Address
S69	Night Work (Women) Convention (Revised), 1948 (No. 89): text and key information (interim status; may be denounced 27 Feb 2031 to 27 Feb 2032)	International Labour Organization (ILO), NORMLEX	acc. 10 Oct 2026	https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_COD E:C089
S70	Night Work Convention, 1990 (No. 171): text and key information	ILO, NORMLEX	acc. 10 Oct 2026	https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_COD E:C171
S71	Violence and Harassment Convention, 2019 (No. 190): text and key information (in force 25 Jun 2021)	ILO, NORMLEX	acc. 10 Oct 2026	https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_COD E:C190
S72	Protocol of 1990 to the Night Work (Women) Convention (Revised), 1948	ILO, NORMLEX	acc. 10 Oct 2026	https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_COD E:P089
S73	Ratifications for Cameroon (51 conventions; No. 89 ratified 25 May 1970 and No. 155 ratified 1 Oct 2021, both in force)	ILO, NORMLEX	acc. 10 Oct 2026	https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:103038
S74	Up-to-date Conventions and Protocols not ratified by Cameroon (including Nos. 167, 171, 174, 187 and 190 and the Protocol of 1990 to No. 89)	ILO, NORMLEX	acc. 10 Oct 2026	https://normlex.ilo.org/dyn/nrmlx_en/f?p=1000:11210:0::NO:11210:P11210_COUNTRY_ID:103038
S75	OpenStreetMap place data for the ten cities of Figure 3.1, retrieved through the Nominatim geocoder (Open Database Licence)	OpenStreetMap contributors	acc. 10 Oct 2026	https://nominatim.openstreetmap.org/
S76	UN Comtrade public API: Cameroon (reporter 120), imports of HS 7207 (semi-finished iron and steel, including billets), 2023	United Nations Statistics Division	acc. 10 Oct 2026	https://comtradeapi.un.org/public/v1/preview/C/A/HS?reporterCode=120&period=2023&partnerCode=0&flowCode=M&cmdCode=7207
S77	Université d'Ebolowa: le PCA et le recteur en fonction	Cameroon Tribune	8 Aug 2022	https://cameroon-tribune.cm/article.html/50294/fr.html/details_2
S78	Become an IIW authorised body (Authorised Nominated Bodies and Approved Training Bodies)	International Institute of Welding (IIW)	acc. 10 Oct 2026	https://iiwelding.org/become-an-iiw-authorised-body/
S79	Le programme de bourses de la Fondation Mastercard accélère son impact avec trois nouveaux partenariats en Afrique	Mastercard Foundation	Jan 2025	https://mastercardfdn.org/fr/articles/le-programme-de-bourses-de-la-fondation-mastercard-accelere-son-impact-avec-trois-nouveaux-partenariats-en-afrique/
S80	Cameroon: le Mindef lance les travaux de construction d'un Centre de secours de sapeurs-pompiers à Douala	Journal du Cameroun	21 Feb 2024	https://fr.journalducameroun.com/cameroun-le-mindef-lance-les-travaux-de-construction-dun-centre-de-secours-de-sapeurs-pompiers-a-douala/
S81	Why women are leaving the mining industry and what mining companies can do about it (H. Ellix, K. Farmer, L. Kowalik et al.; survey of more than 1,000 mining employees in 52 countries)	McKinsey & Company, Metals & Mining Practice	Sep 2021	https://www.mckinsey.com/industries/metals-and-mining/our-insights/why-women-are-leaving-the-mining-industry-and-what-mining-companies-can-do-about-it
S82	Annual report on Form 10-K for the fiscal year ended 31 August 2025 ("Any reference in this Annual Report to a ton refers to the U.S. short ton, a unit of weight equal to 2,000 pounds")	Commercial Metals Company (US Securities and Exchange Commission, EDGAR)	Fiscal year 2025 (accessed 11 Oct 2026)	https://www.sec.gov/Archives/edgar/data/22444/000002244425000138/cmc-20250831.htm

Source: Cameroon Steel compilation. Addresses as accessed; some documents may move after publication.

ANNEX D

DATA TABLES BEHIND THE FIGURES

This annex prints the values plotted in each chart and map of the paper, so that readers can check them, reuse them and cite them without reading values off a graphic. The tables are generated directly from the data files published with the web edition, so they cannot drift from the charts. Each table gives the unit, the status of the values (sourced, derived, assumed or illustrative, as defined in Annex A) and the source. Where the source table contains columns that help to interpret a chart, they are added and identified as such. Diagrams that carry no quantitative data (Figures 1.1, 4.2, 5.1, 6.2, 8.3 and 10.1) are summarised in the last section.

D.1 Figure ES.1: workforce by phase

Central planning values and ranges for the construction peak and the operating workforce of a phased EAF works at Kribi. The status of each value is shown; none is a commitment.

Table D.1 Values plotted in Figure ES.1: indicative workforce by phase (people)

Phase and workforce	Central value	Low	High	Status
Construction peak, Phase 1	800	600	1,000	assumed
Operations, Phase 1 (0.3 Mtpa nameplate), direct	500	450	550	planned
Operations, Phase 1, indirect	1,000	800	1,500	planned
Operations, full works (1 Mtpa), direct	1,100	900	1,300	indicative

Source: Cameroon Steel reference configuration RC-1 (planning estimate), edition 10 October 2026 (RC-1.1) [S11].

D.2 Figure 1.2: direct jobs per million tonnes

Direct employment divided by annual capacity (plants) or, for the EU, 2024 employment divided by average annual output. The ratio is Cameroon Steel arithmetic on the published job and capacity figures; definitions of jobs and capacity differ between sources.

Table D.2 Values plotted in Figure 1.2: direct jobs, capacity or output, and jobs per Mt

Plant or industry	Direct jobs	Mt	Jobs per Mt	Status	Source
CMC micro mill, Berkeley County WV (US), rebar	230	0.454	507	sourced	[S04]
Nucor micro mill, Lexington NC (US), rebar	200	0.390	513	sourced	[S03]
Cameroon Steel, full works (indicative)	1,100	1.000	1,100	indicative	[S11]
Cameroon Steel, Phase 1 (planned)	500	0.300	1,667	planned	[S11]
EU steel industry (2024 jobs, average annual output)	298,000	146.000	2,041	sourced	[S02]

Plant or industry	Direct jobs	Mt	Jobs per Mt	Status	Source
Prometal plants 4 and 5, Douala	1,000	0.360	2,778	sourced	[S07]
Devki, Kwale (Kenya), ore-based	2,500	0.500	5,000	sourced	[S05]

Source: as listed; ratios derived by Cameroon Steel. Nucor (430,000 tons) and CMC (500,000 tons) capacities are read as US short tons, as CMC's annual report defines its ton [S82], and converted to 0.390 Mt and 0.454 Mt. Cameroon Steel full works shown at the central value of a 900 to 1,300 range.

D.3 Figure 2.1: young people reaching working age and new jobs

The first value is derived from the World Bank's population estimate for 2025 of people aged 10 to 14, divided by five; the second scales it to the provisional 2026 census count of 22.7 million (Annex A); the others are as reported by the national employment observatory.

Table D.3 Values plotted in Figure 2.1 (people or jobs per year)

Series	Value	Status	Source
Reaching age 15 per year (derived: 3,640,612 aged 10-14 in 2025 / 5)	728,122	derived	[S14]
Same cohort scaled to the provisional 2026 census count (728,122 x 22.7 / 29.9, rounded)	553,000	derived	[S14][S19]
New jobs recorded 2025	197,356	sourced	[S17]
Objective	300,000	sourced	[S17]

Source: World Bank, World Development Indicators [S14]; Journal du Cameroun, 5 October 2026, provisional census count [S19]; Cameroon Tribune, 8 May 2026, reporting ONEFOP [S17].

D.4 Figure 2.2: unemployment by education and sex

ILO unemployment rate (SU1) for persons aged 14 and over in 2021, from the national employment survey. The age-group rates from the same survey are added for reference.

Table D.4 Values plotted in Figure 2.2: ILO unemployment rate by level of education and sex, 2021 (%)

Level of education	Men	Women	All
No schooling	1.8	1.5	1.6
Primary	2.2	3.3	2.7
Lower secondary	4.8	8.0	6.1
Upper secondary	6.8	14.0	9.5
Higher education	12.1	28.2	17.6

Table D.5 Additional reference: ILO unemployment rate by age group and sex, 2021 (%)

Age group	Men	Women	All
14 to 34	8.1	13.8	10.4
35 to 64	2.3	3.1	2.7
65 and over	2.0	0.0	1.1
All ages 14+	5.1	7.5	6.1

Source: INS, EESI3 Phase 1, main employment report, Table 4.1 [S12]. Status: sourced.

D.5 Figure 2.3: employment by institutional sector

Share of employed persons by institutional sector in 2021, for all workers aged 14 and over and for workers aged 14 to 34.

Table D.6 Values plotted in Figure 2.3 (% of employed persons, 2021)

Institutional sector	All workers aged 14+	Workers aged 14 to 34
Formal private	5.1	5.7
Public	8.2	6.4
Informal non-agricultural	52.0	59.2
Informal agricultural	34.7	28.6
Total	100.0	100.0

Source: INS, EESI3 Phase 1, main employment report, Table 3.7 [S12]. Status: sourced.

D.6 Figure 3.1: institutions on the map

City-level locations of the institutions shown in Figure 3.1, with the straight-line distance from Kribi town centre. No site boundaries are used.

Table D.7 Locations plotted in Figure 3.1

City	Type	Institutions shown	Distance from Kribi (km)
Kribi	Industrial-port zone	industrial-port zone (KPIZ steel cluster)	0
Douala	University school or institute	ISTD (IUT), ENSPD, ENSET; CFP d'excellence; CFPS	126 km
Limbe	Public vocational centre	CFP d'excellence	143 km
Edéa	Public vocational centre	CFPS	99 km
Yaoundé	University school or institute	ENSPY (Univ. of Yaoundé I)	206 km
Ebolowa	University school or institute	University of Ebolowa, incl. ENSET	138 km
Sangmélina	Public vocational centre	CFP d'excellence	230 km
Meyomessala	University school or institute	ENSPY annex	260 km
Ngaoundéré	University school or institute	IUT, EGCIM	635 km
Meiganga	University school or institute	EGEM (mines)	629 km

Source: institutions as cited in Chapter 3 [S18][S20][S21][S22][S23][S24][S25]; boundaries from Natural Earth (public domain); distances derived by Cameroon Steel from OpenStreetMap city locations [S75].

D.7 Figure 3.2: vocational training by region

Share of persons aged 14 and over who follow or have followed vocational training, by survey region, in 2021. Urban and rural values from the same source table are added; Douala and Yaoundé are entirely urban.

Table D.8 Values plotted in Figure 3.2 (% of persons aged 14+, 2021)

Survey region	All (plotted)	Urban	Rural
Yaoundé	43.2	43.2	n/a
Douala	40.5	40.5	n/a
Littoral (excl. Douala)	34.8	38.5	29.2
South-West	34.5	32.9	36.0
South	32.2	38.7	25.5
Centre (excl. Yaoundé)	30.9	34.2	27.6
West	27.4	32.0	21.0
North-West	21.9	29.8	15.7
East	20.9	33.2	11.3
Adamawa	14.3	18.1	9.7
Far North	8.0	14.2	4.6
North	6.4	12.0	3.1
Cameroon	25.0	32.9	13.4

Source: INS, EESI3 Phase 1, main employment report, Table 2.9 [S12]. Status: sourced.

D.8 Figure 4.1: skills-gap assessment

Scores on a four-step scale (1 small, 2 moderate, 3 large, 4 critical) by occupational family and dimension. Scoring rules are set out in Annex A. The last column is the simple average of the four scores, used only to order priorities.

Table D.9 Values plotted in Figure 4.1 (score 1 to 4)

Occupational family	Experienced supply	Training capacity	Certification	Time to competence	Average
EAF and ladle-furnace operation	4	4	4	4	4.00
Continuous casting	4	4	4	3	3.75
Rolling and roll-shop	3	3	3	3	3.00
Mechanical maintenance	2	2	3	2	2.25
Electrical, automation, instrumentation	3	2	3	3	2.75
Welding and fabrication	2	2	3	2	2.25
Metallurgy and quality lab	3	3	2	3	2.75
Crane, mobile plant and logistics	1	2	2	1	1.50
HSE and emergency response	2	2	2	2	2.00
Supervision and shift management	3	3	4	4	3.50

Source: Cameroon Steel assessment (Annex A). Status: assumed.

D.9 Figure 4.3: firms offering formal training

Share of firms offering formal training to their permanent full-time employees, from the World Bank's Enterprise Surveys.

Table D.10 Values plotted in Figure 4.3 (% of firms)

Economy and survey year	Firms offering formal training
Cameroon 2009	25.5
Cameroon 2016	37.6
Cameroon 2024	24.0
Sub-Saharan Africa (latest)	27.8

Source: World Bank, Enterprise Surveys, via the World Development Indicators API, updated 8 October 2026 [S15]. Status: sourced.

D.10 Figure 5.2: time to competence

Planning assumptions for the months from the start of initial training to independent competence, in three segments: initial qualification, minimum in-plant training, and in-plant training up to a typical maximum.

Table D.11 Values plotted in Figure 5.2 (months)

Role	Initial qualification	In-plant, minimum	In-plant, maximum	Total, minimum	Total, maximum
Crane and mobile-plant operator	3	3	9	6	12
Production operator (mill, finishing, dispatch)	3	6	12	9	15
Certified welder (ISO 9606-1 coded)	6	6	12	12	18
Mechanical maintenance technician	24	6	18	30	42
Electrical and automation technician	24	12	24	36	48
Caster operator	6	12	24	18	30
EAF and ladle-furnace operator (melter)	6	18	36	24	42
Process metallurgist	60	12	24	72	84
Shift manager	60	48	72	108	132

Source: Cameroon Steel planning assumptions (Annex A). Status: assumed.

D.11 Figure 6.1: local-sourcing objectives

Illustrative objectives for the share of each procurement category's spend placed with Cameroonian-registered suppliers in the first and fifth years of operation. They are objectives for planning and dialogue, not commitments or forecasts.

Table D.12 Values plotted in Figure 6.1 (% of category spend)

Procurement category	First year	Fifth year	Change (points)
Catering, cleaning, security	90	100	10
Road haulage and port handling	80	95	15
Civil works and building materials	85	95	10
Mechanical maintenance services	40	75	35
Electrical installation and repair	35	70	35
Machining, roll and spare-part repair	20	55	35
Lime, aggregates and slag handling	30	60	30
Industrial gases (on-site plant)	20	40	20
Refractories and refractory services	10	30	20
Ferro-alloys and graphite electrodes	0	5	5

Source: Cameroon Steel analysis (Annex A). Status: illustrative.

D.12 Figure 6.3: local procurement at Dangote Cement

Local share of total procurement as reported by Dangote Cement Plc; total and local procurement amounts are added from the same report.

Table D.13 Values plotted in Figure 6.3

Year	Local share of procurement (%)	Total procurement (₦ million)	Local procurement (₦ million)
2023	72	1,108,083	793,620
2024	75	1,899,869	1,419,972
2025	82	2,087,497	1,719,166

Source: Dangote Cement Plc, Annual Report and Accounts 2025, pages 53 to 54 [S42]. Status: sourced.

D.13 Figure 7.1: women along the skills pipeline

Share of women in each group, from the latest available year for each source.

Table D.14 Values plotted in Figure 7.1 (% women)

Group	Women (%)	Source
Labour force, Cameroon, 2025	43.9	[S14]
Vocational secondary pupils, Cameroon, 2016	36.6	[S16]
Apprentices, Germany (dual system)	35.0	[S48]
Tertiary STEM graduates, Cameroon, 2023	24.6	[S16]
Workforce of worldsteel reporting members, 2024	11.4	[S51]
Workforce, Dangote Cement group, 2025	9.0	[S42]

Source: as listed. Status: sourced. The Dangote Cement value is the group total (1,110 women of 12,227 employees, excluding the transport division) [S42].

D.14 Figure 8.1: work accidents and insurance by region

Share of employed persons who reported a work accident in their main job in the previous twelve months, and share covered by insurance in their main job, by survey region, in 2021. The occupational-disease rate from the same source table is added.

Table D.15 Values plotted in Figure 8.1 (% of employed persons, 2021)

Survey region	Work accident	Insured	Occupational disease (added)
South-West	17.9	21.0	10.5
Littoral (excl. Douala)	15.9	9.3	10.0
South	15.4	6.6	15.5
Centre (excl. Yaoundé)	13.7	13.9	8.4
North-West	12.8	9.0	9.7
East	11.7	5.9	3.8
Yaoundé	8.4	23.5	7.0
North	7.8	3.8	5.3
West	7.7	10.1	8.5
Douala	6.9	20.3	5.7
Adamawa	6.0	6.5	4.1
Far North	5.1	2.8	3.0
Cameroon	9.1	11.0	6.5

Source: INS, EESI3 Phase 1, main employment report, Table 3.24 [S12]. Status: sourced.

D.15 Figure 8.2: worldsteel safety and training indicators

Lost-time injury frequency rate (lost-time injuries and fatalities per million hours worked) and training days per employee, for the steel companies reporting to the World Steel Association.

Table D.16 Values plotted in Figure 8.2

Year	LTIFR (per million hours)	Training days per employee
2022	0.85	8.22
2023	0.76	8.98
2024	0.72	6.77

Source: worldsteel, Sustainability Indicators, 2025 edition [S51]. Status: sourced. Women were 11.44% of the reporting members' workforce in 2024 [S51].

D.16 Figure 9.1: workforce by phase

Planned first-phase direct workforce by occupational family, indicative full-works workforce and assumed first-phase construction peak.

Table D.17 Values plotted in Figure 9.1 (people)

Item	Central value	Low	High	Status
Phase 1 operations: operators	300			planned
Phase 1 operations: technicians	100			planned
Phase 1 operations: engineers	50			planned
Phase 1 operations: administration and support	50			planned
Phase 1 operations: total	500	450	550	planned
Full works operations (about 1 Mtpa)	1,100	900	1,300	indicative
Phase 1 construction peak	800	600	1,000	assumed

Source: Cameroon Steel reference configuration RC-1 (planning estimate), edition 10 October 2026 (RC-1.1) [S11].

D.17 Figure 9.2: training timeline

Start and end of each activity in months relative to first steel in the first phase (negative values are before first steel), with the calendar month that follows if first heat comes at the start of the second half of 2030 on the RC-1.1 schedule; a later first heat moves every date by the same interval.

Table D.18 Values plotted in Figure 9.2 (months relative to first steel, and calendar on the RC-1.1 schedule)

Activity	Start	End	Duration (months)	Calendar start	Calendar end
Sector skills partnership signed; curricula co-design	-42	-30	12	Jan 2027	Jan 2028
Graduate engineers recruited; placements at operating plants	-36	-6	30	Jul 2027	Jan 2030
Dual apprenticeship, intake 1 (two years)	-30	-6	24	Jan 2028	Jan 2030
Upskilling of experienced technicians and welders	-24	-3	21	Jul 2028	Apr 2030
Operator recruitment and simulator training	-18	-3	15	Jan 2029	Apr 2030
Vendor (OEM) training at supplier sites and on site	-12	0	12	Jul 2029	Jul 2030
Cold commissioning with vendor specialists	-6	0	6	Jan 2030	Jul 2030
Hot commissioning and ramp-up with vendor supervision	0	12	12	Jul 2030	Jul 2031
Handover of expatriate roles to Cameroonian staff	6	36	30	Jan 2031	Jul 2033
Apprenticeship intakes 2, 3... for Phases 2 and 3	6	48	42	Jan 2031	Jul 2034

Source: Cameroon Steel proposal (Chapter 9; Annex A); first heat in the second half of 2030 from the Cameroon Steel reference configuration RC-1 (planning estimate), edition RC-1.1 [S11]. Status: illustrative.

D.18 Figure 9.3: localisation objectives

Illustrative objectives for the share of Cameroonian nationals by occupational family in the first and fifth years of operation, with the weights of the planned first-phase mix used to compute the total.

Table D.19 Values plotted in Figure 9.3 (% of headcount)

Occupational family	Weight (Phase 1 headcount)	First year	Fifth year
Operators	300	85	95
Technicians	100	70	90
Engineers	50	50	70
Administration and management	50	70	90
Total direct workforce	500	77	91

Source: Cameroon Steel planning objective of 90% (85 to 95%) Cameroonian operating workforce by year 5 [S11]; family values are illustrative objectives, not commitments.

D.19 Diagrams without quantitative data

Six figures are diagrams. Their content is summarised here so that it can be read without the graphic.

Table D.20 Content of the diagrams

Figure	Diagram	Content
Figure 1.1	Occupational map	Process areas: Raw materials yard; Melt shop (EAF); Ladle furnace; Continuous caster; Reheating and rolling mill; Finishing and dispatch. Support functions: Maintenance; Electrical and automation; Quality and metallurgy; Health, safety and environment; Logistics and administration.
Figure 4.2	Career paths	Production: Bac technique, CAP or CQP + induction > Operator (0 to 3 yrs) > Senior operator, furnace or mill (3 to 6) > Shift supervisor (6 to 10) > Area or production manager (10+). Maintenance and automation: DUT, BTS or HND (IUT, CFP d'excellence) > Maintenance technician (0 to 3) > Senior technician, PLC or hydraulics (3 to 7) > Maintenance planner or reliability lead (7 to 10) > Maintenance manager (10+). Engineering and metallurgy: Engineering degree (ENSPY, ENSPD, EGCIM) > Graduate engineer, plant rotation (0 to 2) > Process engineer or metallurgist (2 to 6) > Senior metallurgist or quality manager (6 to 12) > Plant or technical director (12+).
Figure 5.1	Dual apprenticeship cycle	Selection > School block > Plant block > Assessment > Certification, with four to six alternations over 24 months.
Figure 6.2	Supplier-development ladder	Register > Qualify > Pilot order > Coach > Approved > Regional.
Figure 8.3	Safety-culture maturity	Reactive > Compliant > Managed > Proactive > Owned.
Figure 10.1	Skills-partnership governance	Steering committee (MINEFOP, MINESUP, MINESEC, MINMIDT, KPIZ, employers, unions) over training providers, employers and funding; outputs: curricula and standards, apprenticeship places, trainer upskilling, certification, tracer studies, women's participation targets.

Source: Cameroon Steel. Status: illustrative.

CAMEROON STEEL

FROM MINERAL RESOURCE TO INDUSTRIAL VALUE

Cameroon Steel is developing a steel complex at Mboro, in the Kribi industrial-port zone, to turn Cameroonian iron into the bars, rods and sections that Central Africa builds with, and to train the Cameroonians who will make them. This paper is published for information and does not constitute an offer or a commitment.