



Making modern life possible

Aluminium makes modern life possible. It is used in a multitude of applications ranging from skyscrapers to transportation systems and smartphones to aerospace. In 2017, Emirates Global Aluminium was the world's biggest producer of 'premium aluminium', accounting for approximately four per cent of global supply.

EGA is also the largest industrial company in the United Arab Emirates outside oil and gas, and a significant investor in the Republic of Guinea. It is not just our products that make modern life possible but also our contribution to economic diversification, our innovation and business leadership and the opportunities we create for our employees, customers, suppliers and the communities in which we operate.

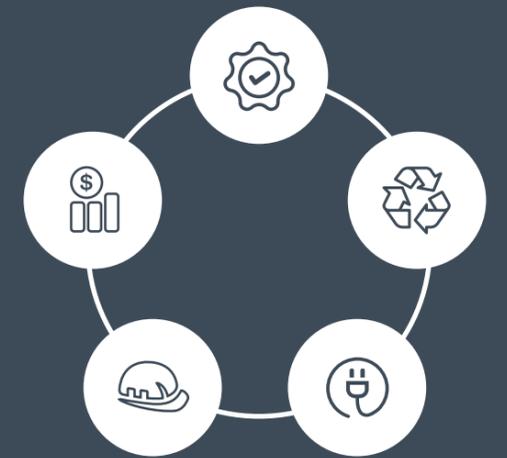
Truly modern life depends on the adoption of, and adherence to, high standards of environmental and social responsibility. In this respect, our aim is to be recognised as a leader in the mining and metals industry.



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01



Introduction



Introduction

About this report

Welcome to Emirates Global Aluminium's first sustainability report. While we focus on our performance from 1 January to 31 December 2017, we also include data for 2014 - 2016 to illustrate trends since our formation in 2014 from the merger of Dubai Aluminium and Emirates Aluminium.

The report covers EGA's sustainability performance associated with the:

- Production of aluminium from EGA's facilities
- Construction of a new alumina refinery in the UAE
- Construction of a new bauxite mine and associated export facilities in Guinea

This report has been prepared in accordance with:

- The Global Reporting Initiative Standards: Core option¹
- The Global Reporting Initiative mining and metal sector supplement²

In support of EGA's aspiration to seek certification to the Aluminium Stewardship Initiative (ASI)³, this report also includes certain disclosure requirements associated with the ASI Performance Standards.

Independent external provider, KPMG, has performed limited assurance over information disclosed in this report (please refer to the assurance statement at the back of this report).

Our report covers the five areas that we consider vital to a successful and sustainable business:



Quality products



Economic diversification and industrialisation



Environmental and social responsibility



Creating opportunity for people



Technology and innovation

For any questions or further information about this report, please contact: sustainability@ega.ae.

¹ Global Reporting Initiative (GRI) provides the sustainability reporting guidelines, which enable organisations to report publicly about their impact on the economy, environment and society.

² GRI provides sector guidance for all reporting organisations in the mining and metals sector.

³ The ASI Performance Standard defines environmental, social and governance principles and criteria, with the aim to address sustainability issues in the aluminium value chain.





Chief Executive Officer's statement

I am pleased to present Emirates Global Aluminium's first sustainability report since our company was formed through the merger of Dubai Aluminium and Emirates Aluminium in 2014.

At EGA we aim to apply the principles of sustainability across our business, focusing not just on our economic but also our social and environmental performance. We recognise that our role must extend beyond simple compliance and keeping up with our peers. Working with our customers, regulators, shareholders and stakeholders we intend to be an innovator and a leader in sustainability.

Safety is the first priority for everyone at EGA. Zero harm to our staff, contractors and neighbours is the only acceptable target.

2017 was our best year so far for accident and injury prevention in the UAE. Our safety performance was superior to industry benchmarks, with only one Lost Time Injury recorded.

In 2017, we made further progress in using our own in-house developed technology to improve the efficiency of our operations. We implemented a AED 1.1 billion (USD 300 million) project to replace older production lines in the UAE with our technology enabling us to produce more metal, whilst reducing operating costs, energy consumption and emissions. All our 2,777 reduction cells now use EGA technology.

EGA adopts the reduce-reuse-recycle philosophy to minimise waste generation and has an on-going aim of zero process waste to landfill. We have made particular progress finding economic uses for Spent Pot Lining (SPL), one of our principal waste streams. We recycled more SPL than we generated in 2017, beginning to reduce stockpiles generated in previous years.

In 2017, we worked closely with the UAE Ministry of Climate Change and Environment, on a project to reduce our Nitrogen Oxides (NO_x) emissions. We were able to exceed our target, achieving a 16 per cent reduction in NO_x emissions - the equivalent of removing 450,000 cars from UAE roads.

EGA's partnerships with community groups continued in 2017. In the UAE we ran 21 separate community engagements with an emphasis on youth education. In total 1,436 staff volunteered their time for these projects.

In 2017, Guinea Alumina Corporation continued to make contributions to encourage local community development including the provision of health centres, schools, irrigation systems, and adult literacy programmes and provision of safe drinking water, in addition to supporting agricultural development.

Last year, EGA was the first Middle East headquartered company to apply to join the Aluminium Stewardship Initiative (ASI). ASI brings the world's leading mining and metals companies together with the household-name aluminium customers to set global standards for governance, environmental and social responsibility.

In 2018, we intend to develop further our corporate sustainability strategy and prepare our certification to ASI standards, making progress in fulfilling our aspiration to be recognised amongst the world's leading metals and mining companies in meeting our environmental and social responsibilities.

Abdulla Kalban
Managing Director & CEO

2017 key achievements

QUALITY PRODUCTS



AED 2.6 million tonnes

record production of cast metal, exceeding 2016's 2.5 million tonnes



82% value-added products

making EGA the world's biggest 'premium aluminium' producer



350+ customers in total

in more than 60 countries worldwide



Green building materials

EGA products that can contribute to achieving LEED credits

ECONOMIC DIVERSIFICATION AND INDUSTRIALISATION



AED 3.3 billion net income

(equivalent to USD 900 million) 59% increase from 2016



About 10% of EGA's production

supplied to 26 UAE companies engaged in manufacturing products with EGA's metal



AED 2.9 billion is spent in UAE supply chain

(equivalent to USD 800 million) (62 per cent of total spend excluding raw materials)



41 contracts awarded

to local companies in Guinea

CREATING OPPORTUNITY FOR PEOPLE



7,200+ employed

directly in the UAE and over 230 in Guinea Alumina Corporation at end 2017



10,000+ contractors engaged

in construction in the UAE and more than 3,000 in Guinea at end 2017



100 graduate trainees

enrolled in 18-month programme



180 scholarship students

studying in the UAE and abroad

TECHNOLOGY AND INNOVATION



Two gold awards received

from the Dubai Quality Group through the 'Tamayaz' programme



↑ 38% employee suggestions

compared to 2016



All 2,777 reduction cells

now using EGA technology



AED 40 million of audited savings

(equivalent to USD 11 million) from employee improvement suggestions

ENVIRONMENTAL AND SOCIAL RESPONSIBILITY



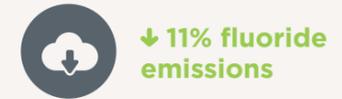
↓ 16% nitrogen oxide (NO_x) emissions

from our power plants in the UAE (when compared with normal running conditions)



↓ 65% perfluorocarbons (PFC) emissions

compared with 2016



↓ 11% fluoride emissions

compared with 2016



36% lower carbon emissions

per tonne of aluminium from aluminium produced when compared with the global industry benchmark



More SPL recycled

than generated



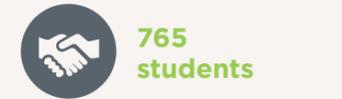
21 programmes

supporting local communities in the UAE



1,436 volunteers from EGA

participated in community improvement projects in the UAE



765 students

benefitted from EGA's partnership with UAE youth education organisations



1,400+ adults benefitted

from the adult literacy programme and financial aid in Guinea



175+ local communities

provided with medical training in Guinea



Zero fatalities

in any controlled operation



↓ 60% lower injury frequency rate

when compared global industry benchmark for aluminium production



↓ 24% injury frequency rate

for GAC employees compared with 2016 in Guinea



↑ 85% HSE training

compared to 2016 in Guinea

EGA's role in the value chain

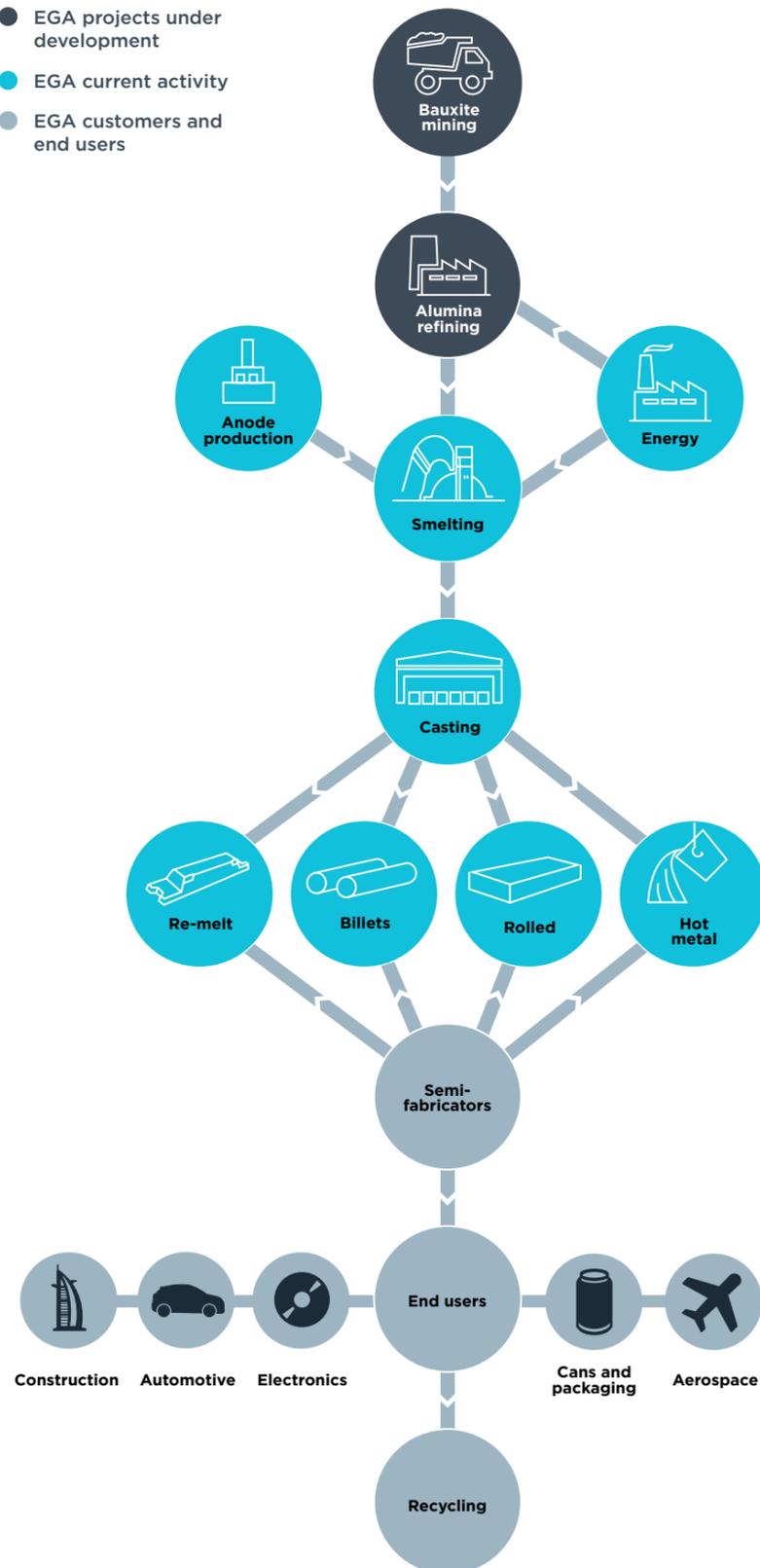
Emirates Global Aluminium currently operates in the midstream of the aluminium value chain. We have two smelters in the UAE, each with its own captive power plant, carbon anode production facilities, and casthouses.

Most of our customers are semi-fabricators that make parts for end-users in industries including construction, automotive, packaging and electronics.

EGA is in the process of developing upstream, through the construction of an aluminium refinery in the UAE, and through a bauxite mining project in Guinea. Throughout our operations, we aim to minimise our environmental impact, improve health and safety performance and enhance community engagement. In our core business of aluminium smelting, we aim to drive technological development.

EGA value chain

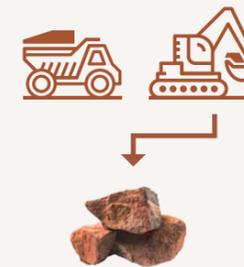
- EGA projects under development
- EGA current activity
- EGA customers and end users



How aluminium is made

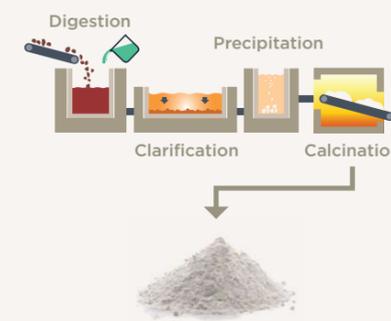
Step 1 Bauxite mining

The aluminium production process starts with the mining of bauxite ore. Layers of bauxite are typically found near the surface, so it is generally extracted through open cast mining. Around 90% of the world's bauxite resources are in tropical and sub-tropical regions.



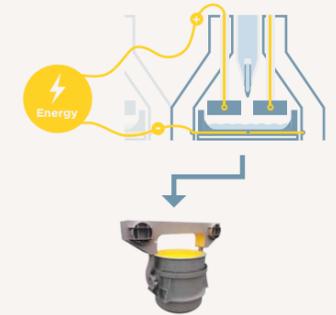
Step 2 Alumina refining

Bauxite is refined into alumina using the Bayer process. Two to three tonnes of bauxite are required to produce one tonne of alumina. In the digestion stage, hot caustic soda is added to the bauxite to dissolve the aluminium-bearing minerals in the bauxite. Clarification separates bauxite solids from the pregnant liquor via sedimentations. In the precipitation stage, aluminium crystals are recovered from the liquor by crystallisation. Calcination is a roasting process to remove remaining water.



Step 3 Alumina smelting

Alumina is smelted into aluminium using the Hall-Heroult process. It takes two tonnes of alumina to produce one tonne of aluminium. Alumina is poured into special reduction cells called pots with an electrolytic bath of molten salt called cryolite at temperatures of around 960°C. An electrical current is then projected into the mixture at 400 kA or above. This current breaks the bond between the aluminium and oxygen atoms in alumina resulting in liquid aluminium settling at the bottom of the reduction cell.



Step 4 Casting

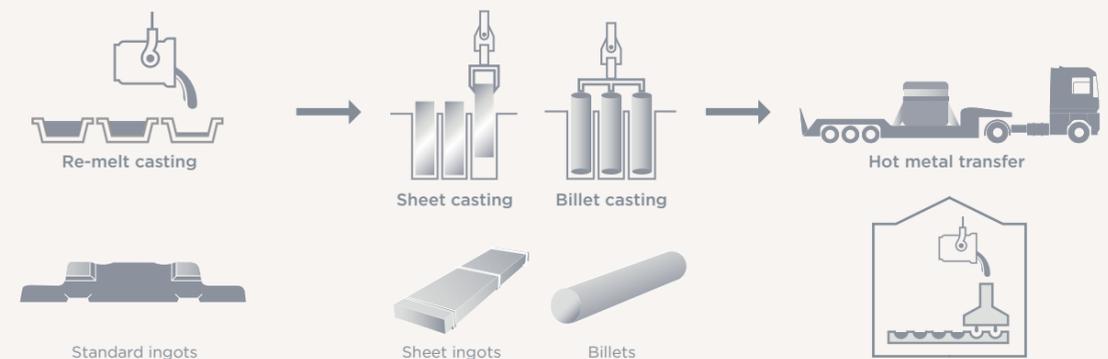
Aluminium is then transferred to the cast house, where it is made into products using several different methods. Alloys are added in many of our products, according to customer specifications, before the solidification stage.

In re-melt casting liquid aluminium, at a temperature over 700°C, is poured into moulds. The moulds are cooled and the aluminium solidified before being packed and shipped to the customer.

In Sheet Ingot casting cast aluminium slabs are either: heated and passed through a sequence of rollers until either the required plate thickness is obtained or until the metal is thin enough for cold rolling, or cut into plates.

In Billet casting cast aluminium billets are heated and either: forced through a steel die by the extrusion process producing profiles, or forged producing different products such as wheels and automotive parts.

EGA also supplies molten metal to nearby customers. Receiving aluminium in molten form eliminates the need to use high energy to re-melt it before use. We transfer molten metal by truck in preheated 14.5 tonne crucibles which can keep the metal liquid for up to 18 hours at temperatures of around 780 C°.



About Emirates Global Aluminium

GRI 102-45

Corporate profile

Emirates Global Aluminium was the world's largest 'premium aluminium' producer in 2017 and is the biggest industrial company in the UAE, outside oil and gas. We directly employ over 7,200 people in the UAE and over 230 in Guinea. We supply more than 350 customers in over 60 countries.

EGA was formed in 2014 through the merger of Emirates Aluminium and Dubai Aluminium but our history dates back to the 1970s, when Dubai Aluminium was founded. We are owned equally by Mubadala Investment Company of Abu Dhabi and Investment Corporation of Dubai.

EGA operates two aluminium smelters - one in Abu Dhabi and one in Dubai. We are also developing an alumina refinery in the UAE and a bauxite mine with associated export facilities in Guinea.

Our annual aluminium production in 2017 was 2.6 million tonnes - a record for us.

Geographical footprint map

● EGA operations ● EGA regional subsidiaries



Al Taweelah



EGA's Al Taweelah site is located in Khalifa Industrial Zone Abu Dhabi. It includes an aluminium smelter, a casthouse, a plant that manufactures carbon anodes and the head office. We also have a desalination plant that meets our water needs and a power plant to generate electricity. This consists of nine gas turbines and four steam turbines with a generation capacity of 3,100 megawatts.

Al Taweelah alumina refinery

We currently import all the alumina we need. The new refinery should supply 40 per cent of our alumina requirements.

Once fully operational, the refinery is expected to contribute around AED 1 billion (USD 270 million) per year to the UAE economy, and to create 600 permanent jobs.

Jebel Ali



EGA's Jebel Ali site is located near Jebel Ali port in Dubai. Construction began in 1976 and production began in 1979. The site has been expanded eight times.

Our facilities at Jebel Ali also include a power plant with 23 gas turbines and seven steam turbines with a total generating capacity of 2,350 megawatts. Our desalination plant at Jebel Ali meets our own water needs and supplies external water customers. We have a carbon anode manufacturing facility, an office and residential buildings at Jebel Ali.

Guinea Alumina Corporation (GAC)



EGA wholly owns GAC, our bauxite mining project, located in Guinea. GAC directly employs over 230 people and we expect the construction workforce for our mining project to reach 4,000 at peak. Bauxite mining is a further diversification upstream for our business operations and the first bauxite exports are expected during the second half of 2019, creating a new revenue stream for EGA. Once our mine starts commercial production, we will supply high-quality bauxite.

Currently GAC directly employs over 230 people. However, we expect the construction workforce to reach 4,000 at peak.

GAC's concession is in the Boké region of northwestern Guinea, close to other mines. We are building rail spurs at the mine and at Kamsar port that will connect us to existing railway lines. At the port, we are building rail unloading facilities and an export pier.

Our vision, mission and values

At EGA, our vision is to provide the global economy with sustainable material of the highest quality.

Our vision is underpinned by a three-part mission statement:

- We help shape the future by delivering high performance aluminium to our customers, for use in a range of cutting-edge applications
- We operate with a deep commitment to sustainability and to the well-being and development of our people
- We focus on innovation, performance and profitability, and provide support for a broader aluminium cluster, ensuring a lasting contribution to the UAE and global economies

In addition, we have identified three core values that underpin our vision:

1. Protect

- Safety first and always
- Act with integrity, transparency and fairness to safeguard our business
- Protect the environment wherever we operate

2. Provide

- Ensure rewarding career and development opportunities for all our people
- Sustain relationships with our customers, suppliers, and partners built on mutual trust
- Contribute meaningfully to the communities in which we operate

3. Perform

- Promote a performance-based work culture where individuals are empowered through ownership, accountability and team support
- Excel in operations through continuous improvement and innovation
- Grow profitably across the globe

Memberships

- Aluminium Stewardship Initiative
- Gulf Aluminium Council
- International Aluminium Institute

Our governance

Our long-term success is dependant on a robust corporate governance framework. Accordingly, we have developed a comprehensive corporate governance framework which is modelled on international best practice. This framework sets out the:

- Responsibilities of the Board and individual Directors
- Terms of reference for each of the company's Board Committees
- Appropriate delegation of authority to Management

Board of Directors

EGA's Board of Directors has 10 board members including our Chairman, Vice Chairman, and Managing Director & Chief Executive Officer, and two alternate Directors. The Board provides strategic direction and management supervision and ensures adequate controls are in place to achieve our vision and create long-term value for stakeholders.

Executive Committee

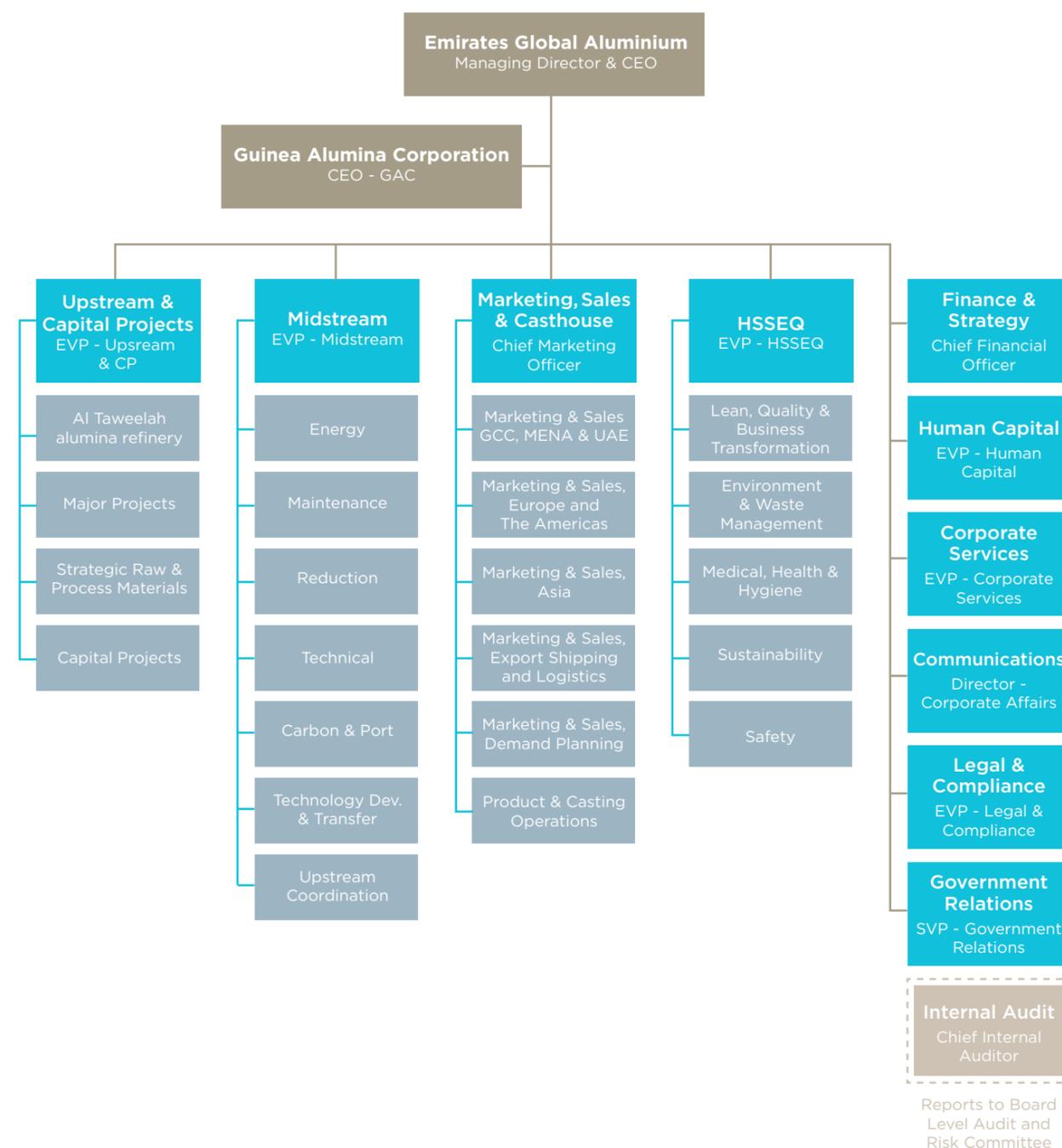
EGA's Executive Committee consists of 11 members, many of whom have extensive operational experience and have witnessed the growth of EGA over several decades. Seven of our Executive Committee members originally joined EGA as graduates. This committee is responsible for decision-making on economic, environmental and social aspects of the business. The committee is made up of the following:

- Managing Director & CEO
- Executive Vice President, Health, Safety, Sustainability, Environment and Quality (HSSEQ) and Business Transformation
- Chief Financial Officer
- Chief Marketing Officer
- Executive Vice President, General Counsel and Company Secretary
- Executive Vice President, Human Capital
- Executive Vice President, Midstream Operations
- Executive Vice President, Upstream Operations
- Executive Vice President, Corporate Services
- Senior Vice President, Government Relations
- Director, Corporate Affairs

EGA organisational structure

EGA has 10 departments under the Managing Director & CEO. Our in-house Sustainability team is part of the HSSEQ department.

EGA organisational structure



Our sustainability approach

As one of the biggest industrial companies in the UAE we believe we have a responsibility to be a sustainability leader and an influencer in support of 'UAE Vision 2021' and the United Nation's Sustainable Development Goals⁴.

Accordingly, the principles of sustainability are embedded in everything we do and are a core part of our mission statement: "We operate with a deep commitment to sustainability and to the well-being and development of our people". Our sustainability performance is managed by a dedicated Sustainability team which is part of the Health, Safety, Sustainability, Environment and Quality (HSSEQ) department.

In 2017, we became the first Middle East headquartered company to apply to join the Aluminium Stewardship Initiative (ASI)⁵ and have subsequently been aligning our sustainability strategy and core business practices with the ASI Performance Standards.

The aims of the ASI Performance Standards are to:

- Enable the aluminium industry to demonstrate responsibility and provide independent and credible assurance of performance
- Reinforce and promote consumer and stakeholder confidence in aluminium products
- Reduce reputational risks concerning aluminium and aluminium industry players
- Address the need by downstream industrial users and consumers for responsible aluminium sourcing

The sustainability performance of our construction projects is being ensured through the adoption of international best practice. Both the alumina refinery in the UAE and the mine development in Guinea are being managed in accordance with the requirements of the International Finance Corporation's (IFC) Environmental and Social Performance Standards. This requires that we can appropriately identify and manage any issues associated with:

- Environmental and social risk identification and impact assessment
- Labour and working conditions
- Resource efficiency and pollution prevention
- Community health, safety, and security
- Land acquisition and resettlement
- Biodiversity conservation and sustainable management of living natural resources
- Indigenous peoples
- Cultural heritage



In today's heavily industrialised world, sustainability is a core deliverable. We have learned from our founding fathers that we should take only what we need from our surroundings, that every citizen is equal and that we have a duty to provide for the needs of future generations. »

Salman Abdulla
Executive Vice President, HSSEQ and Business Transformation



As one of the world's largest aluminium producers, we acknowledge the role we must play in leading the field in our sustainability efforts. We are proud of our achievements particularly in environmental management and community involvement. We have made progress in 2017, aligning our approach with the Aluminium Stewardship Initiative and intend to seek certification for our facilities in the UAE in the near future. »

Steven Bater
Sustainability Manager

⁴ The 17 Sustainable Development Goals – part of a wider 2030 Agenda for Sustainable Development – build on the Millennium Development Goals.

⁵ For more information, please refer to the EGA website: <https://www.ega.ae/en/responsibility/>.

Engaging with our stakeholders

GRI 102-40, GRI 102-42, GRI 102-43

Engagement with our stakeholders is vital for our sustainable development and we proactively identify and engage stakeholders through a variety of means:

- Our technical specialists regularly engage with their counterparts in government authorities, industry associations and educational institutions
- Our Marketing & Sales team works closely with existing and potential customers
- Our Corporate Social Responsibility team regularly meets with local communities and interest groups
- Our Communications team issues press releases, participates in exhibitions and conferences, and engages on social media

We also regularly share performance and audit reports with government authorities and lenders.

We monitor the satisfaction of our customers and employees through surveys and on-going interaction.

Our suppliers are required to comply with our tendering process which includes environmental and social requirements. We evaluate their performance on a regular basis.

We engage with our industry peers, such as other smelter aluminium organisations through the Gulf Aluminium Council and the International Aluminium Institute.

Further information on how we engage with our key stakeholder groups and their interests is presented in more detail throughout this report.



As a major industrial company EGA plays an important role in the societies in which we operate. Engaging with our stakeholders directly and through mass communications is both an opportunity for us to seek the many types of support we need from society and an obligation for EGA as a responsible company. »

Simon Buerk
Director, Corporate Affairs

Stakeholder groups



Our material topics

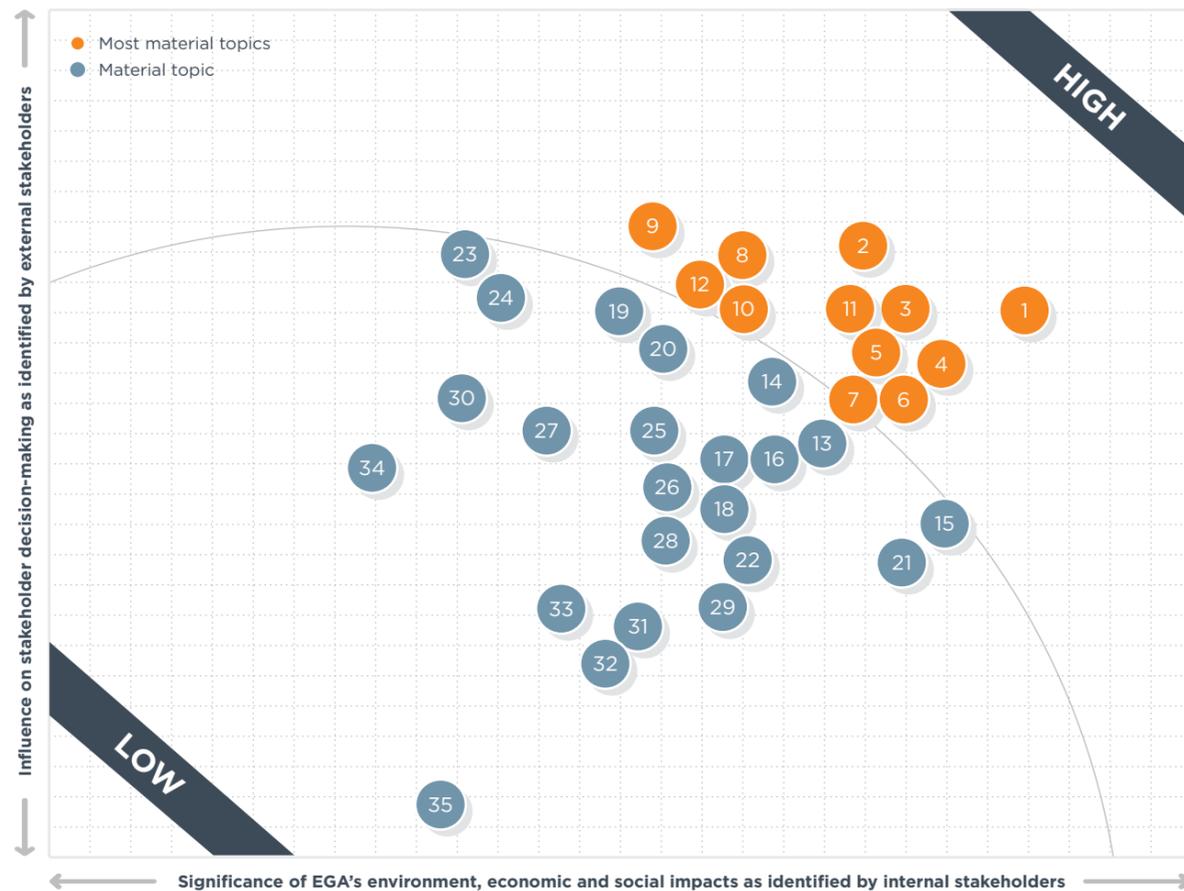
GRI 102-44, GRI 102-46, GRI 102-47

As part of the reporting process, we conducted an assessment of those topics considered most material by our employees and by external stakeholders including customers, suppliers, non-governmental organisations, lenders' auditor and regulatory authorities. Material topics are those that reflect an organisation's potential significant economic, environmental and social impacts and that substantively influence the assessment and decisions of stakeholders⁶.

Employee input was collected during a workshop attended by department representatives. External stakeholder input was collected by interview.

The results of the assessment are shown below. We address each of the issues in this report.

Materiality matrix



Rank	Material topics	Material issues	Concerned stakeholders	Reporting boundary ¹	Page reference
1	Occupational health & safety (OH&S)	OH&S performance, campaign and training	Employees, communities and contractors	A	52-59
2	Environmental compliance	Regulatory compliance	Communities, contractors and government	B	48-49
3	Energy	Energy consumption and intensity	Government and communities	B	37-38
4	Emissions	Emissions and their intensity for GHG, PFC, fluoride, NO _x and SO _x	Government and communities	B	38-41
5	Emergency preparedness	Emergency management procedures and plans	Employees, communities and contractors	A	52, 57
6	Non-discrimination	Code of Conduct and incident reporting	Employees, communities and contractors	A	66
7	Materials stewardship	Life cycle assessment	Suppliers and customers	B	49
8	Training and education	Technical, graduate and leadership training	Employees, communities and contractors	A	76
9	Supplier environmental assessment	Supplier pre-qualification process	Suppliers, contractors and customers	A	32
10	Innovation	Suggestion scheme and innovation awards	Employees and customers	B	86-90
11	Local communities	Grievance mechanism, volunteering and education	Employees, communities and universities	A	60-63
12	Effluents and waste	Generation and disposal of hazardous and non-hazardous wastes	Employees, communities, contractors and government	B	42-47
13	Economic performance	Economic value generated and distributed	Employees, customers, contractors and government	A	30-31
14	Resettlement	Resettlement planning and implementation	Communities	C	60
15	Socioeconomic compliance	Code of Conduct and compliance performance	Employees, communities, contractors and government	A	64-66
16	Diversity and equal opportunity	Employee diversity and local employment	Employees and communities	A	71-72
17	Supplier social assessment	Supplier pre-qualification process	Suppliers, contractors and customers	A	32
18	Employment	Employee numbers, diversity, retention and Emiratisation	Employees and communities	A	70-74
19	Customer health and safety	Product standards and customer feedback reporting	Employees, customers, contractors and government	B	26
20	Anti-corruption	Anti-corruption risk assessment, reporting and training	Employees, customers, communities, contractors and government	A	64-66
21	Market presence	Nationals in senior management	Employees and communities	B	75
22	Marketing and labelling	Customer feedback reporting	Employees, customers, contractors and government	B	26-27
23	Procurement practices	Local procurement	Employees, suppliers and contractors	A	32-33
24	Water	Water production, withdrawal and discharge	Employees, communities and government	B	42-43
25	Materials	Raw materials	Suppliers and customers	B	49
26	Indirect economic impacts	Local employment and procurement	Employees, communities, suppliers, contractors and government	A	31
27	Biodiversity	Ecological impacts and species conservation	Employees, communities and government	A	50-51
28	Labour/management relations	Notice period	Employees	B	73 (in footnote)
29	Human rights assessment	Human rights impact assessments and residential camps	Employees, communities, suppliers, contractors and government	A	65
30	Closure planning	Mine closure and rehabilitation plan	Communities and government	C	60
31	Child labour	Supply chain compliance and human rights	Employees, communities, contractors and government	A	65
32	Security practices	Security personnel training	Employees, communities, contractors and government	C	65
33	Forced labour	Supply chain compliance and human rights	Employees, communities, contractors and government	A	65
34	Anti-competitive behaviour	Compliance on anti-competitive behaviour	Employees, customers, contractors and government	A	66
35	Freedom of association and collective bargaining	Employee labour unions and national trade unions	Employees and government	C	70

⁶ As defined by the Global Reporting Initiative Standards, available on the website: <https://www.globalreporting.org/standards/>.

Note: 1. For the reporting boundary, 'A' covers all EGA activities (i.e. constructions and operations); 'B' covers EGA's operational activities only (i.e. excludes GAC and Al Taweelah alumina refinery); and 'C' covers GAC activities only.

02



Quality products

Aluminium makes modern life possible



Quality products

Our products and customers

We supply aluminium that is used in construction, automobiles and other transport systems, packaging, aviation and electronics. Lightweight, durable and recyclable, aluminium products can help reduce fuel use, energy costs and carbon emissions in comparison with alternatives such as steel. As economies grow and living standards rise, the demand for aluminium will increase.

Our portfolio comprises high quality aluminium products in four forms:

- **Billets:** EGA's billets are used in various applications including construction (windows and door frames), transportation, engineering, consumer durables, automotive and forging
- **Rolled products:** EGA's rolled products such as sheet ingots are used primarily in the packaging industry (including foil) and for lithographic printing plates. They are also suitable for automotive applications.
- **Re-melt products:** Our high purity re-melt products are used for electronics and aerospace applications. We are also one of the largest suppliers of foundry alloys for the automotive industry.
- **Liquid metal:** EGA uses sealed trucks to supply molten liquid metal to nearby customers in Khalifa Industrial Zone Abu Dhabi. This significantly reduces their energy use as none is required for re-melting.

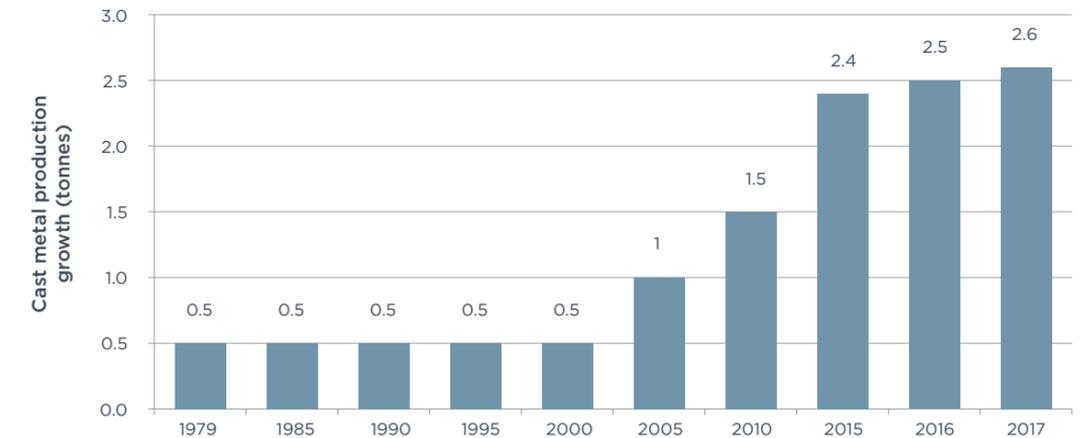
In 2017, 82 per cent of our products were value added. Our range includes more than 330 different products made to customer specifications and we have a total of 20 casting stations at our smelters. This gives us significant flexibility to tailor products to our customers' requirements.

In 2017, the average purity of EGA's aluminium was 99.91 per cent. High purity aluminium is vital for specialist aviation and electronics applications and our Jebel Ali smelter can produce aluminium with an exceptionally high purity of 99.96 per cent.

In 2017, we produced 2.6 million tonnes of cast metal - the highest total production in our history.



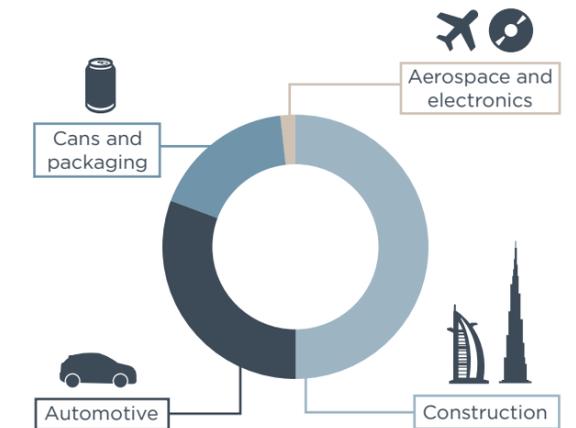
Figure 1: Cast metal production growth



EGA supplies aluminium to more than 350 customers in over 60 countries. Our key markets are Asia, the Middle East and North Africa, Europe and the Americas. We sell about 10 per cent of our production in the UAE. EGA products are used in many industries including:

- **Construction:** extrusion profiles, scaffolding and window frames
- **Automotive:** engine parts and wheels
- **Cans and packaging:** food and beverage cans and food packaging
- **Aerospace and electronics:** microchips, processors, mobile phones, aircraft structures and fittings, dye casting and spaceship components

Figure 2: The industries we serve



Meeting international standards

EGA faces the challenge of meeting or exceeding customers' expectations across different industries, as product requirements and specifications change. Significantly, EGA is increasingly being required to deliver products that comply with specific green building certification and construction codes.

EGA products can help achieve green building certifications under the US Green Building Council's Leadership in the Energy and Environmental Design (LEED) rating system. In 2017, an independent agency certified EGA products as building materials that can contribute to achieving LEED credits.

Our products also comply with the European Union's Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and Restriction of Hazardous Substances (ROHS) standards. We also supply our customers with Material Safety Data Sheets that provide details on the specific chemical composition associated with each of our products. We do not source any materials that may benefit armed groups or conflict in the Democratic Republic of Congo.

In 2018, EGA's casting operations and related support functions will undergo certification to the latest, more stringent version, of the International Standards Organisation Technical Specification (ISO/TS) 16949:2009, known as the International Automotive Task Force (IATF) 16949:2016. Certification will allow us to ensure the supply of quality products to automotive customers worldwide.

In 2017, we successfully upgraded our ISO 14001 certification to the latest 2015 standard. In addition, by the end of 2018, our Al Taweelah and Jebel Ali sites will upgrade their OHSAS 18001 certification to the latest ISO 45001:2018.



In 2017 we were the world's leading 'premium aluminium' producer, delivering to our customers exactly what they need to manufacture their own products which make modern life possible worldwide. Our focus on 'premium aluminium' means we are a global leader in maximising the value of our aluminium production.

Walid Al Attar
Chief Marketing Officer

Customer satisfaction

EGA has been reliably supplying aluminium products for almost 40 years, and our world-class expertise and market insights help our customers make the right product choice and achieve a competitive advantage in their own markets. We regularly send technical experts to assist our customers with advice on improving the efficiency of their manufacturing processes.

We also implement a rigorous procedure to ensure the quality and safety of our products. We take customer feedback seriously and implement action where appropriate. In 2017, we received no notices of non-compliance with regulations or voluntary codes concerning product health and safety, labelling, product information or marketing communications.

Customer feedback survey

In our latest annual customer satisfaction survey conducted in 2017, we achieved an overall 93 per cent satisfaction rating for our products and services.

In terms of product quality alone, we scored a 95 per cent satisfaction rating with customers, with 43 per cent being extremely satisfied.

Figure 3: EGA customer feedback result

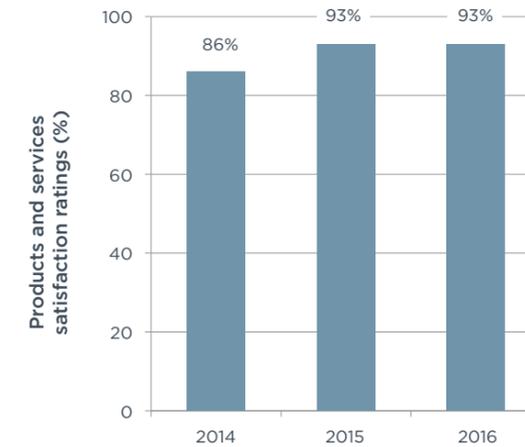
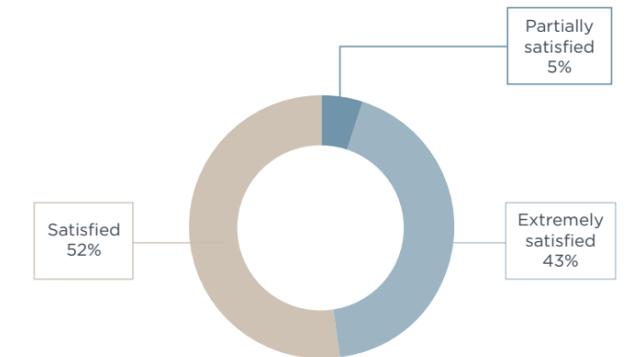


Figure 4: Overall, how satisfied are you with the quality of EGA's products?



03



Economic diversification and industrialisation

Contributing to a modern, diversified economy



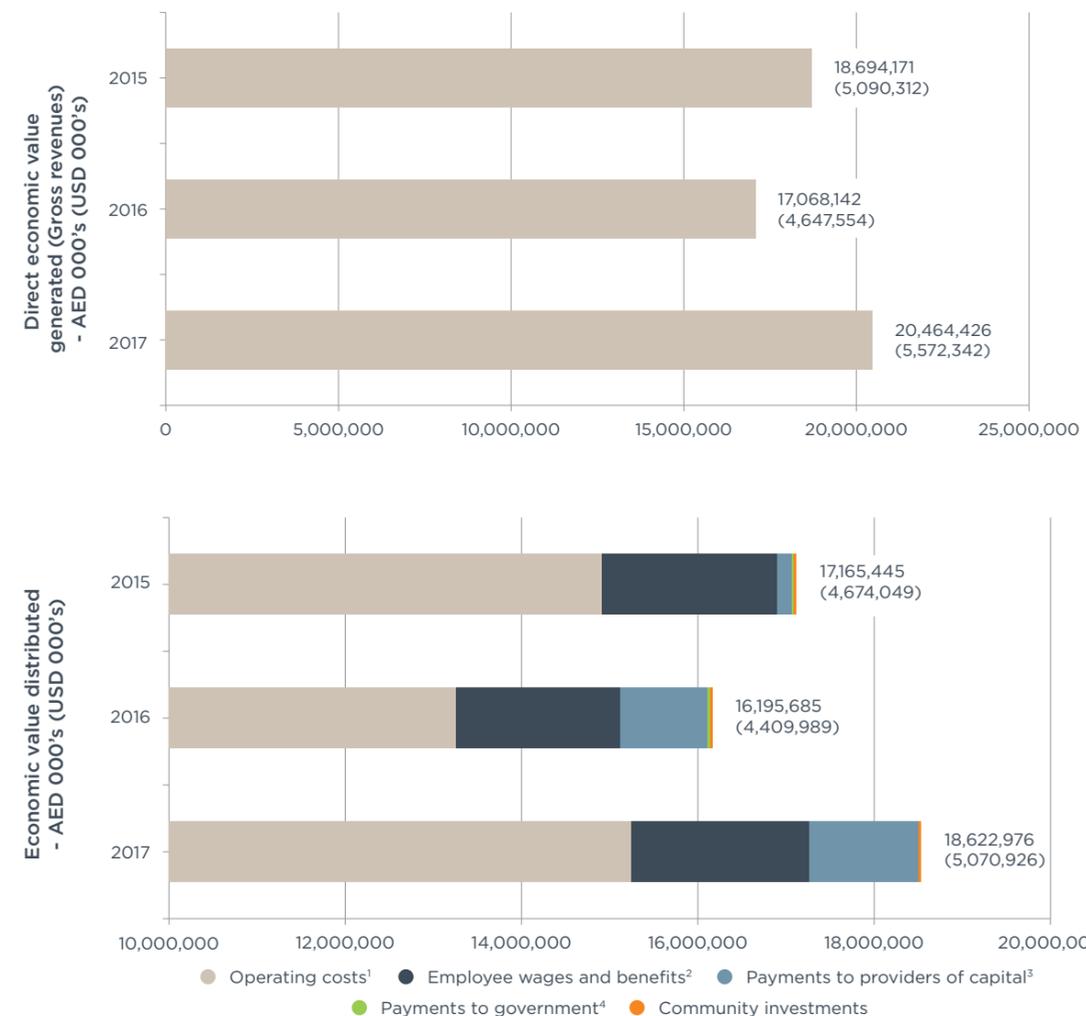
Economic diversification and industrialisation

Our economic contributions

Despite challenges facing the aluminium industry including volatile aluminium prices, strong competition and demand for innovative products, Emirates Global Aluminium has a solid record of financial performance.

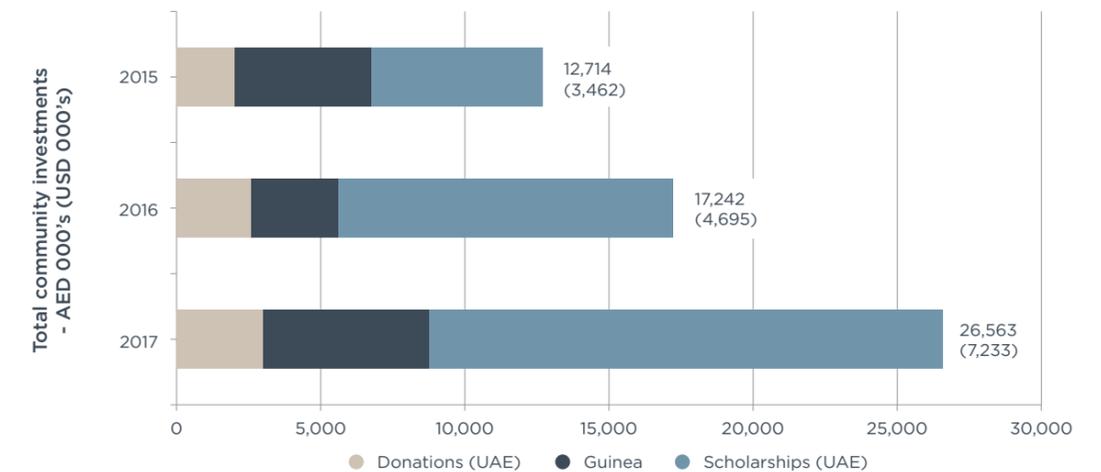
In 2017, we reported a net income of AED 3.3 billion (USD 900 million), a 59 per cent increase over 2016. We distributed AED 2 billion (USD 546 million) to our shareholders in 2017, a 61 per cent increase over 2016.

Figure 5: Direct economic value generated and distributed



Note:
 1. Operating costs include costs of goods sold, sales and distribution costs, general and administrative expenses.
 2. Employee wages and benefits include the total staff costs for EGA employees and staff directly contracted by EGA.
 3. Payments to providers of capital are the payments made to the EGA shareholders.
 4. Payments to government are tax expenses/returns. Negative numbers reflect a tax return.

Figure 6: Breakdown of community investments



Our impact

EGA has developed since the 1970s to become the largest industrial company in the UAE outside oil and gas.

One in every 25 tonnes of primary aluminium produced worldwide is made by EGA and through this we make a substantial contribution to the economic diversification goals of 'UAE Vision 2021'. EGA's aluminium is the biggest 'made-in-the UAE' export by value, after oil and gas.

After oil and gas, our aluminium is the UAE's biggest 'made-in-UAE' export. The local UAE market accounts for around 10 per cent of our sales and some 26 companies make products in the UAE using our aluminium. This supports growth in related industries and forms part of our contribution to the national economy.

We employ over 7,200 people in the UAE and at end 2017 over 10,000 people worked on our sites as contractors. Their spending in the local economy further contributes to economic development.

Investment in plant and machinery and spending for our ongoing operational needs benefits the UAE economy and has contributed to the development of local industries ranging from construction to catering.

In Guinea, we create economic opportunity through direct employment and through the use of local suppliers. The development of a competitive and effective local supply chain is vital for our business and for the economic growth of the Boké region. We are working with local entrepreneurs and the Government to build the capacity we need. We are realistic about the scale of this task as local capacity constraints mean that the Guinean mining sector has always relied upon imported materials, equipment and expertise. However, we prioritise the local sourcing of goods and services wherever possible, thus creating opportunity for people living in the areas immediately surrounding our operations.

Our supply chain

We expect our suppliers to commit to similarly high standards of social and environmental responsibility as our own. Our supply chain code of conduct sets out our commitments and what we expect of our suppliers with regards to human rights, workplace integrity, ethical business practices, community involvement, environmental protection, health and safety, anti-bribery and corruption and worker welfare.

Since 2016, as part of our prequalification process, we have required suppliers to provide a declaration confirming that they will adhere to EGA's code of conduct, including meeting our values and principles associated with business integrity, environmental protection and human rights. We have also approached all of our suppliers that were qualified prior to 2016 to request that they make the same declaration. In 2017, more than 60 per cent of our active suppliers had made this commitment to further EGA's values and principles. We also undertake regular audits and inspections of our supply chain partners to ensure our expectations are being met. In addition, as part of our prequalification process, we screen suppliers according to level of existing environmental and social commitment as well as past performance.

Local procurement

As a local business and in line with 'UAE Vision 2021', EGA supports the national economy by using local suppliers wherever possible. The nature of our business makes this a challenge due to the limited number of countries that supply some of the raw materials we require. Despite this, in 2017 we spent a total of AED 2.9 billion (USD 800 million) on local suppliers⁸ (excluding raw materials, this was 62 per cent of total spend). The local spend consistently exceeded half of our total spend.

The GAC project development cost is estimated at approximately AED 5.1 billion (USD 1.4 billion) for the development of a 12 million tonnes per year greenfield bauxite mine and associated rail, port and marine infrastructure.

To enable local businesses to tender more effectively for contracts in Guinea, we have developed a specialist training program to assist these companies in achieving the quality and integrity standards we require. During 2017, we awarded 41 contracts to local companies. Since 2014, we have trained over 500 young people in skills that directly support our construction and mining activities and we have financed 40 micro-projects including small start-up businesses.

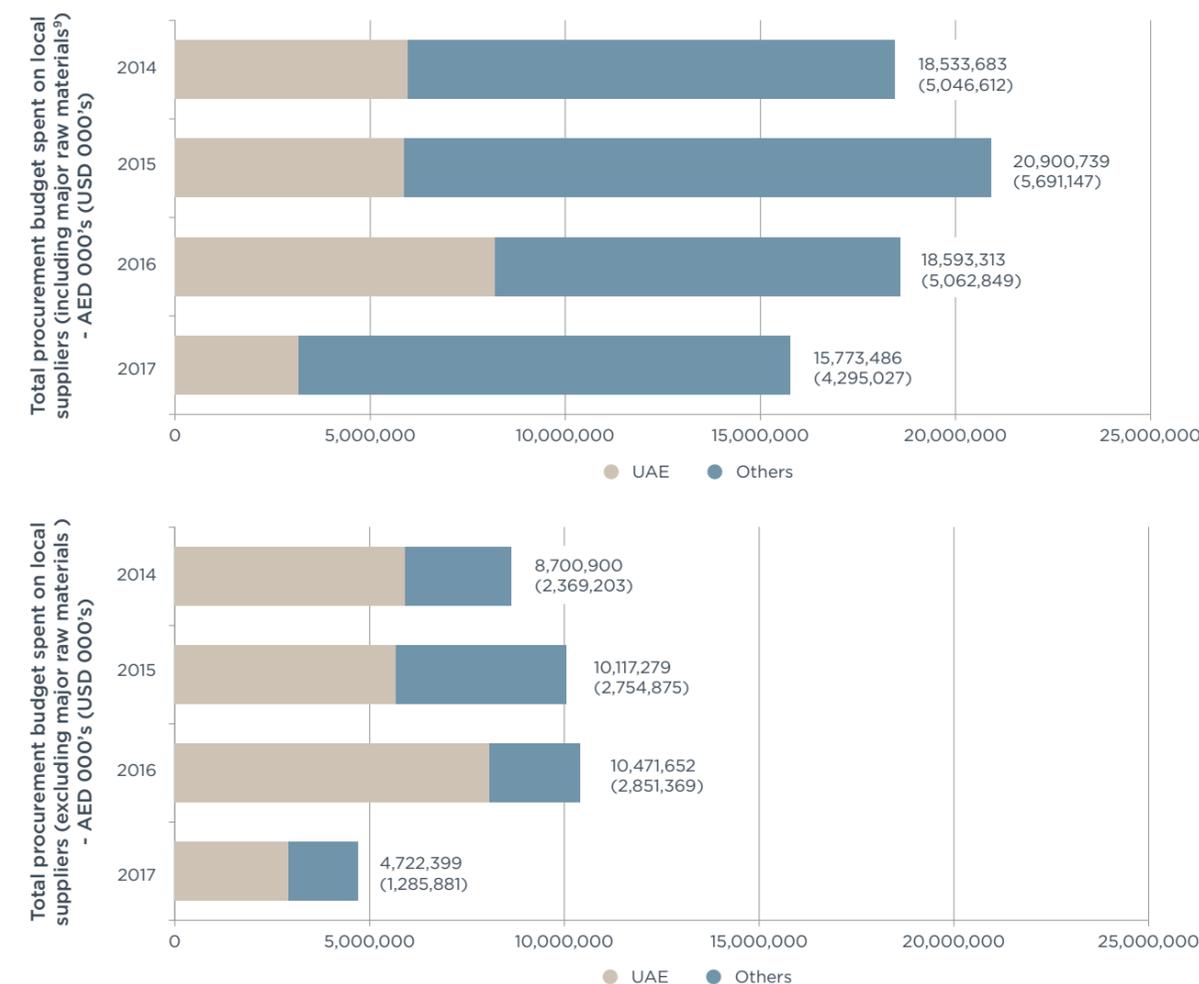
CASE STUDY

Green procurement

The Dubai Supreme Council of Energy (DSCE)⁷ formed a Green Public Procurement (GPP) Committee in 2015 to implement green procurement criteria among member entities. EGA was tasked with developing the general guidelines for GPP, which are now rolled out to all DSCE member entities with the intention of delivering widespread savings and supporting the leadership objectives of the Government of Dubai. These guidelines contribute to the energy and water efficiency strategies of the city of Dubai and to global emission reduction targets in line with international conventions such as the Paris Climate Agreement.

EGA's Managing Director & CEO is a member of Dubai Supreme Council of Energy.

Figure 7: Local procurement in the UAE



Note: Budget spent variation is largely due to the phasing of construction projects including the Al Taweelah alumina refinery.



EGA has been a partner for the past 16 years and has supported us in developing better programmes and more innovative solutions. Benefitting from EGA's expertise has raised our credibility and proficiency and opened up new opportunities in international markets for us.

Palani Kumarasamy
Plant and Commercial Manager
Al Jaber Iron & Steel Foundry
(Local supplier)



At EGA, reliability and responsibility are key components of our procurement decisions and practices. We recognise that environmental, social and governance performance is integral to an effective, efficient and sustainable supply chain.

Ahmad Almulla
Executive Vice President,
Corporate Services

⁷ The Dubai Supreme Council of Energy is the governing body tasked with developing the Dubai Integrated Energy Strategy 2030, planning and coordinating with concerned authorities and energy bodies to secure a sustainable supply of energy sources while employing a balanced approach to protecting the environment.

⁸ Any companies registered and operating in the UAE are reported as local suppliers. This local spend figure excludes natural gas.

⁹ Raw materials do not include natural gas which is purchased from ADNOC.

04



Environmental and social responsibility

Modern life is only possible when companies are responsible



Environmental and social responsibility

Environmental stewardship

Emirates Global Aluminium aspires to be measured amongst the world's leading metals and mining companies in meeting its environmental and social responsibilities. Our industry is energy intensive and has the potential to result in significant environmental impacts if appropriate controls are not in place. In line with the 'UAE Vision 2021' goal to build a 'green economy for sustainable development'¹⁰, we remain committed to continuously assess the impact of our operations and improve environmental awareness among employees and other stakeholders.

The UAE ratified the Paris Climate Agreement in 2016¹¹ and has made a national commitment, in 'UAE Vision 2021', to reduce greenhouse gas (GHG) emissions. EGA is committed to addressing global climate change actions and supporting the achievement of the UAE's national objectives. Furthermore, our environmental initiatives support the United Nations' Sustainable Development Goals in addressing issues such as clean water, clean energy, responsible production, climate action and marine and land ecology. Our main contributions to environmental sustainability are the improvements we have made to our core industrial processes. From 2010 to 2016, we invested almost AED 3.3 billion (USD 891 million) in environmental technologies and facilities¹² that enable us to reduce and manage our emissions and waste.

¹⁰ For more information, please refer to the UAE Government website at <https://www.government.ae/en/about-the-uae/economy/green-economy-for-sustainable-development>.
¹¹ For more information, please refer to the UAE government website: <https://government.ae/en/about-the-uae/leaving-no-one-behind/13climateaction>.
¹² The projects invested in facilities such as gas treatment centre, seawater facilities, fume treatment centre, cooling tower and waste management facilities.
¹³ The Social and Environmental Impact Assessment and Social and Environmental Management Plan have been validated by a group of lenders, including the International Finance Corporation (IFC) and the Africa Development Bank. For more information, please refer to the IFC project information portal for GAC at <https://disclosures.ifc.org/#/projectDetail/ESRS/24374>.

In the UAE, all our smelting and casting operations are managed through an Environmental Management System developed by our in-house specialist environmental team. The environmental team oversees necessary controls, monitoring plans, audits and opportunities for improvement to minimise any potential adverse impact to the environment. In 2017, we upgraded our Environmental Management System, which was previously ISO 14001:2004 certified, to meet the requirements of the most up-to-date international standard and subsequently received certification against ISO 14001:2015.



To protect is one of our core values and by doing things right we are protecting ourselves, our colleagues, our environment and our reputation. Complying with GAC's policies will not only maintain our reputation as a respectable company but will also contribute to raise the standards we see around us.

Paulo Castellari
Chief Executive Officer (GAC)

All potential environmental and social impacts associated with both the construction and operational phases of our project in Guinea have been identified through a detailed Social and Environmental Impact Assessment prepared in accordance with international performance standards¹³ and the laws of Guinea.

Our activities are managed through a Social and Environmental Management Plan that stipulates monitoring and compliance commitments and obligations. The Social and Environmental Management Plan is also complimented by a series of specific management plans for biodiversity, erosion and sediment control, groundwater and surface water, rehabilitation and reforestation, dredging and waste disposal, air quality, and noise and vibration control.

All potential construction-related impacts for the Al Taweelah alumina refinery and the GAC project are managed through the site-specific Construction Environmental Management Plans developed in accordance with local regulations and applicable international standards.



As project leader I believe that a project is considered successful only when it aims at creating a sustainable development. In my capacity, I am committed to ensure that every negative environmental, economic and social impacts of any project under my custody are technically mitigated and then controlled until the project is delivered.

Yousuf Bastaki
Project Director (GAC)

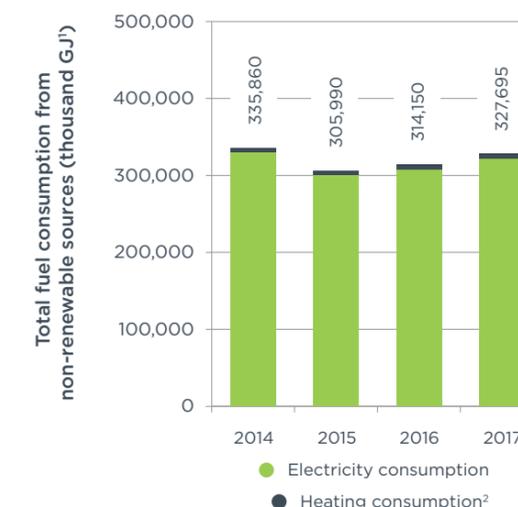
Energy consumption

Since aluminium smelting is energy intensive, producing more aluminium with less energy is crucial to EGA from both a commercial and environmental perspective and is a principal goal of our in-house development of technology. Electricity for our operations is supplied from our own natural gas-fired power plants at both Jebel Ali and Al Taweelah.

At EGA we have an in-house team of experts dedicated to finding new and innovative means of improving our environmental and energy efficiencies. Our on-going Energy Optimisation Project at Jebel Ali has so far significantly reduced GHG, fluoride and energy consumption associated with aluminium production, all from the use of our own technology (For more details see Section 6: Technology and Innovation of this report).

Note that our energy consumption increased in 2017 compared to 2016, due to the increase in output production.

Figure 8: Energy consumption at EGA in the UAE

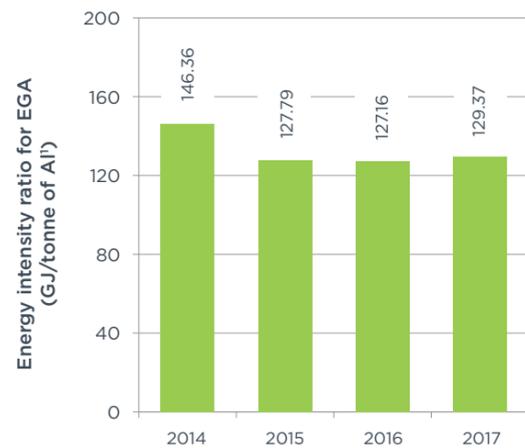


Note:
 1. Gigajoule (GJ). Standard energy conversion calculations are used. Reporting boundary includes EGA operations in Al Taweelah and Jebel Ali smelters.
 2. Heating consumption is associated with industry process for anode production in baking plant.

In addition, in 2014, we installed solar panels at our residential area in Jebel Ali, providing a renewable energy source for the residents. These solar panels generate a maximum output of 90 kilowatts. From 2014 to 2017, the associated carbon savings were approximately 287 tonnes of CO₂.

Energy optimisation has always been a focus for EGA as natural gas for power generation is one of our biggest costs. However, in 2017, we recorded a net energy intensity increase due to the forced shutdown of a steam turbine for maintenance. This outage occurred from January to May 2017 at Jebel Ali, hindering the net recordable energy efficiency for five months.

Figure 9: Energy intensity at EGA in the UAE



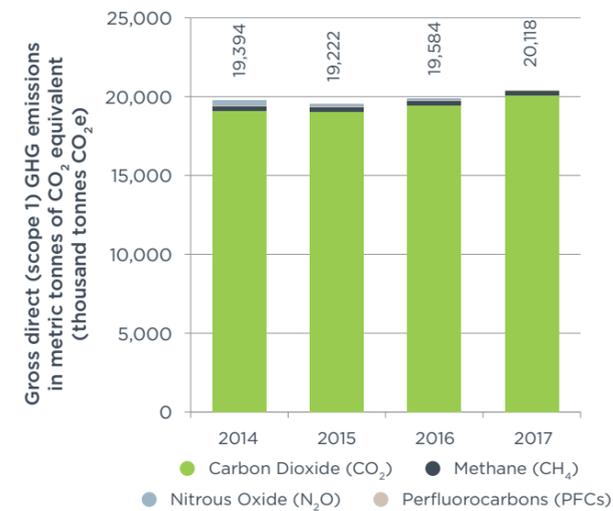
Note: 1. Gigajoule per tonne of aluminium (GJ/T Al). The ratio uses energy consumption within EGA in the UAE. Types of energy included in the reductions are electricity and heating. The metric used as the denominator to calculate the GHG emissions intensity ratio is the amount of hot metal produced for the respective year (in metric tonnes).

Greenhouse gas emissions

Gross increases in our direct greenhouse gas (GHG) emissions are predominantly associated with increases in aluminium production.

¹⁴ International Aluminium Institute (IAI) was referenced as the global industry benchmark.

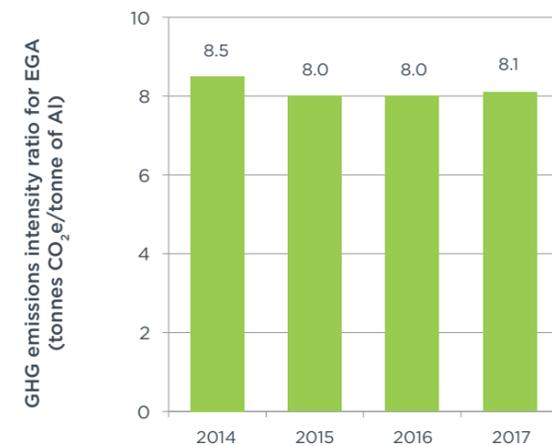
Figure 10: Direct (scope 1) GHG emissions in the UAE



Note: Base year for the calculation is 2014. Gross Warming Potential (GWP) for CO₂, CH₄, and N₂O are based on Intergovernmental Panel on Climate Change (IPCC) 2nd assessment report, 1996. Standards used for estimation are GHG Protocol (revised edition) developed by WRI and WBCSD, the IAI addendum developed for the aluminium sector by the International Aluminium Institute (IAI, 2006) and the IPCC Guidelines.

In 2017, our total direct GHG emissions produced per tonne of aluminium, including power generation and desalination, was 8.1 tonnes CO₂ equivalent per tonne of aluminium. This is approximately 36 per cent below the estimated global average of 12.7 tonnes CO₂ equivalent per tonne of aluminium¹⁴.

Figure 11: GHG emissions intensity in the UAE



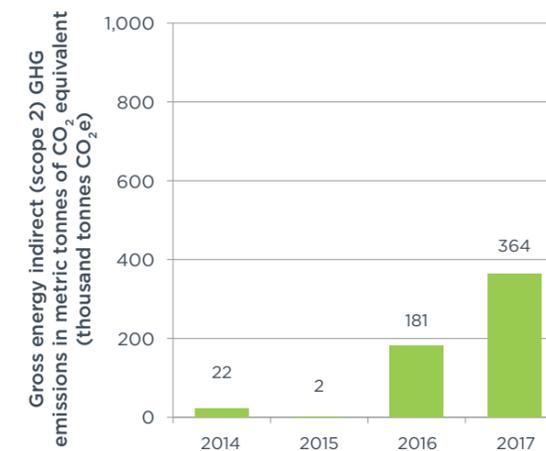
Note: GHG emissions included in the intensity ratio is direct (scope 1) and indirect (scope 2). The metric used as the denominator to calculate the GHG emissions intensity ratio is the amount of hot metal produced for the respective year (in metric tonnes).

¹⁴ International Aluminium Institute (IAI) was referenced as the global industry benchmark.

We generate all of our electricity requirements from our natural gas-fired power plants at Jebel Ali and Al Taweelah. However, we do have energy exchange agreements with energy authorities whereby we mutually exchange energy with the grid. These agreements are on a net zero exchange basis, meaning the same amount of energy supplied to the grid is returned to EGA within an agreed period. At Jebel Ali, the net zero exchange is achieved on a daily basis, whereas at Al Taweelah the net zero exchange is achieved on an annual basis, whereby Al Taweelah supplies to the grid at time of peak periods and then the grid returns energy to Al Taweelah at periods of reduced demand. Despite the net zero exchange of electricity, GHG emission factors associated with energy from the grid are different to the GHG emission factors associated with EGA's power plants.

Variations in our reported indirect GHG emissions are a consequence of the total amount of energy exchanged and the different GHG emissions factor applicable to energy sourced from the grid.

Figure 12: Indirect (scope 2) GHG emissions in the UAE



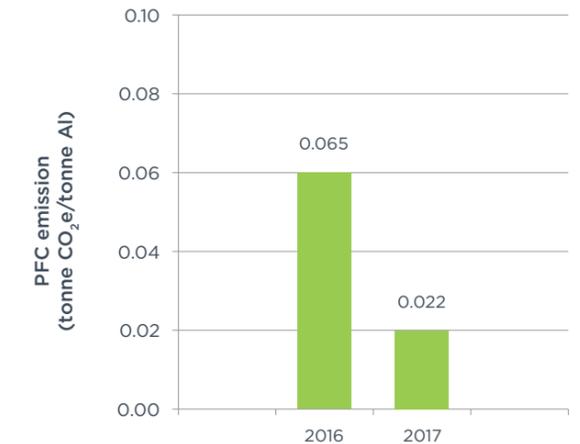
Note: Source of the emission factors and standards used for the calculation are grid specific.

¹⁵ International Aluminium Institute (IAI) was referenced as the global industry benchmark.

Perfluorocarbons (PFCs) are a group of potent GHGs generated from the aluminium smelting process. In 2017, PFC emissions from our smelters reached their lowest-ever levels with a 65 per cent reduction compared to 2016. This reduction was achieved through new smelting technology installed at Jebel Ali and through the implementation of an anode effects minimisation program which led to improvement of the pot feeding logic and control systems across our smelters.

In 2016, the global industry average for PFC emissions of CO₂ equivalent per tonne of aluminium was 380 kilograms¹⁵. In comparison, in 2017, EGA's total PFC emissions were 22 kilograms of CO₂ equivalent per tonne of aluminium. At our newer Al Taweelah smelter, the emissions were just seven kilograms of CO₂ equivalent per tonne of aluminium.

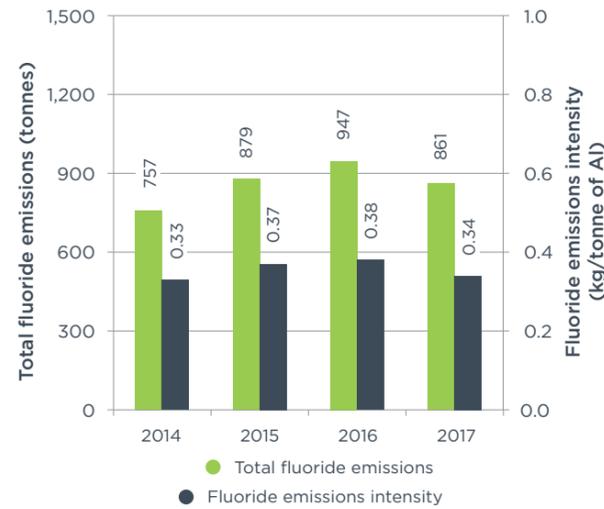
Figure 13: PFC emissions in the UAE



Air quality

Fluoride emissions are produced in the aluminium smelting process. Our fluoride emissions have been below the global industry average since 2014¹⁶.

Figure 14: Fluoride emissions in the UAE

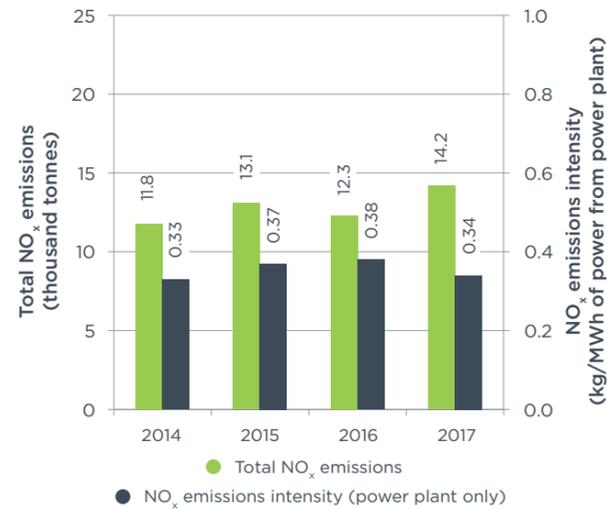


Note: Emissions are calculated from the combination of periodic sampling and estimates.

The Jebel Ali site has a vegetated buffer zone around its perimeter comprised of fluoride-tolerant plant species, chosen for their height, ability to absorb dust and tolerance of the UAE's harsh climate. The main objectives of this green belt are to establish an ecosystem around the site that will help to maintain air quality and establish a natural habitat for wild plants and animals. We hire international experts to conduct regular vegetation surveys, in order to monitor and report on the impact of fluoride emissions from our operations associated with any impacts to plant health. Any recommendations offered by the experts are developed into an action plan and subsequently acted upon.

Nitrogen Oxides (NO_x) are produced mainly from the combustion of natural gas at our power plants. Variations in NO_x emissions are influenced by increases in aluminium production, maintenance requirements and efficiency measures.

Figure 15: NO_x emissions in the UAE



Note: Emissions are calculated from periodic sampling.

In late 2016 and early 2017, EGA participated in the first 'UAE Government Accelerators programme', with a 100-day project to reduce NO_x emissions to contribute to the achievement of the 'UAE Vision 2021' to improve our air quality. We partnered with the Ministry of Climate Change & Environment to reduce EGA's power plant NO_x emissions by 10 per cent within 100 days. By the end of the project in February 2017, we achieved a 16 per cent NO_x reduction (on full year running hours) from the operation of our power plants, which is equivalent to removing 450,000 cars from the UAE roads. Our project comprised the following three initiatives:

- Implementing efficiency improvements at both our UAE sites by optimising power operations and maintenance programmes
- Retrofitting one gas turbine combustion system with a water injection skid
- Improving and sustaining the energy exchange between our Al Taweelah plant and the Abu Dhabi grid, promoting energy efficiency and making a CO₂ equivalent saving of 70,562 tonnes

Sulphur Oxides (SO_x) are mainly emitted from the electrolytic process and anode production. Variations in SO_x emissions are influenced by the sulphur percentage content in raw materials used to manufacture anodes required during the electrolytic process.

Figure 16: SO_x emissions in the UAE



Note: Emissions are calculated from periodic sampling.



¹⁶ The mean prebake fluoride emissions intensity in 2016 was 0.65 kilogram per tonne of aluminium as per IAI. For more details, refer to the IAI statistics: <http://www.world-aluminium.org/statistics/fluoride-emissions/>.

Water

In the UAE, we use seawater for all water needs. Our desalination plant at Al Taweelah produces 3.75 million gallons (approximately 17,000 m³) of water per day using the reverse osmosis process. Our Jebel Ali plant produces 30 million gallons (136,000 m³) of both potable and distilled water per day using the multi-stage flash distillation process. We use much of this water ourselves, supplying the excess to customers.

We also use seawater for cooling purposes associated with power generation and for the extraction of SO₂ from smelting emissions. Over 95 per cent of all the water we withdraw is returned to the sea. Both its temperature and salinity are closely monitored before releasing it back into the ocean so as to minimise any impact on the marine environment.

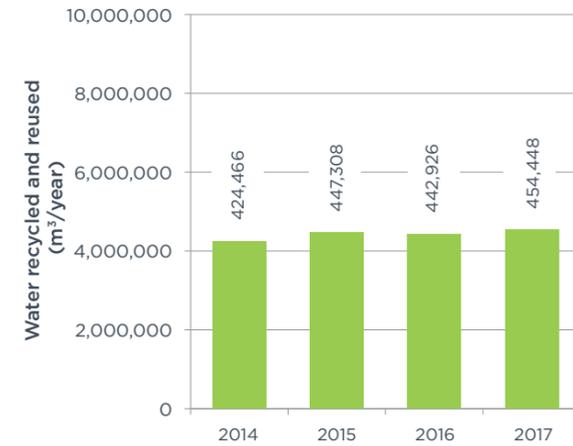
Figure 17: Water withdrawal and discharge in the UAE



Note: 1. Flow meter is used for the calculation. Water withdrawn from the sea is used not only for aluminium production but also for potable water production in Jebel Ali.

We also treat sewage wastewater and waste oily water. We are able to meet our landscaping irrigation demands from use of this water.

Figure 18: Water recycled and reused in the UAE¹

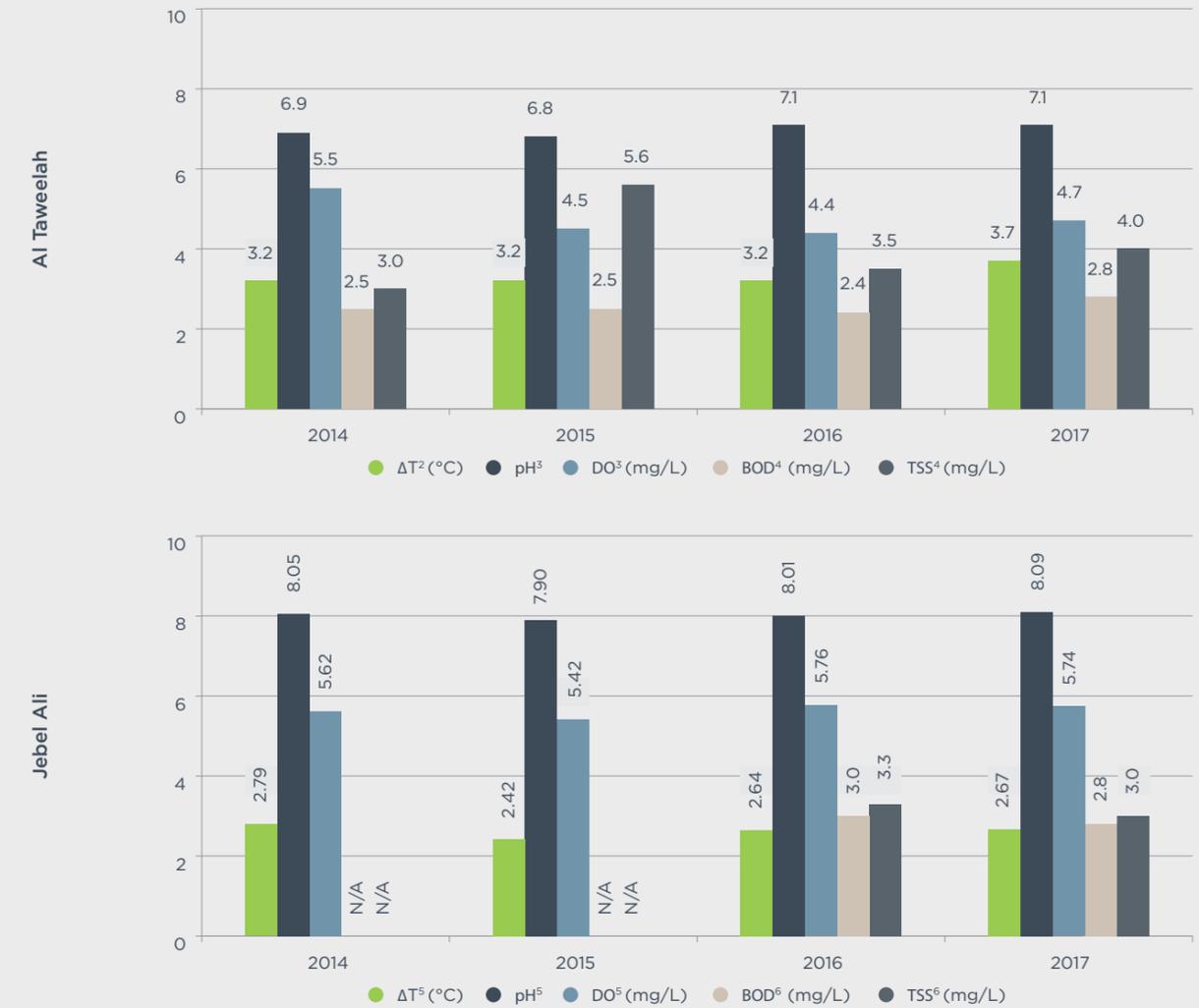


Note: 1. Water recycled and reused was 0.03 per cent of the total water withdrawal for 2014 - 2017.

We monitor daily online results and undertake regular laboratory of water sample analysis at Al Taweelah and Jebel Ali to ensure protection against adverse environmental impacts and confirm our discharge meets compliance obligation limits. Associated reports are submitted to the local authorities.

Results from 2014 to 2017 confirm that EGA is predominantly compliant with standards set by the local authorities. In the instance of identified minor exceedances of monitoring parameters, these are immediately investigated and necessary corrective actions undertaken¹⁷. Our monitoring activities have identified no significant environmental impacts associated with the water discharges from our UAE sites.

Figure 19: Water discharge by quality at EGA sites in the UAE¹



Note:

- The monitoring parameters include temperature, pH, Dissolved Oxygen (DO), Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD).
- ΔT is daily average temperature difference between the intake and effluent measured at our boundary limit.
- pH and DO are from continuous online monitoring data from seawater discharge pipe, located within our Al Taweelah site.
- BOD and TSS are from weekly grab sample lab analysis results from seawater discharge pipe, located within our Al Taweelah site.
- ΔT, pH and DO data are provided from the online monitoring system. ΔT is the difference between temperatures T1 at 1,500 metre and T2 at 300 metre from the shore of our Jebel Ali site. pH and DO data are taken at 300 metre from the shore.
- BOD and TSS data are provided from the manual sampling carried out at four discharge points as mandated by Dubai Municipality. No measurement was conducted in 2014 and 2015 for waste water discharge to marine at the discharge point due to access restrictions.

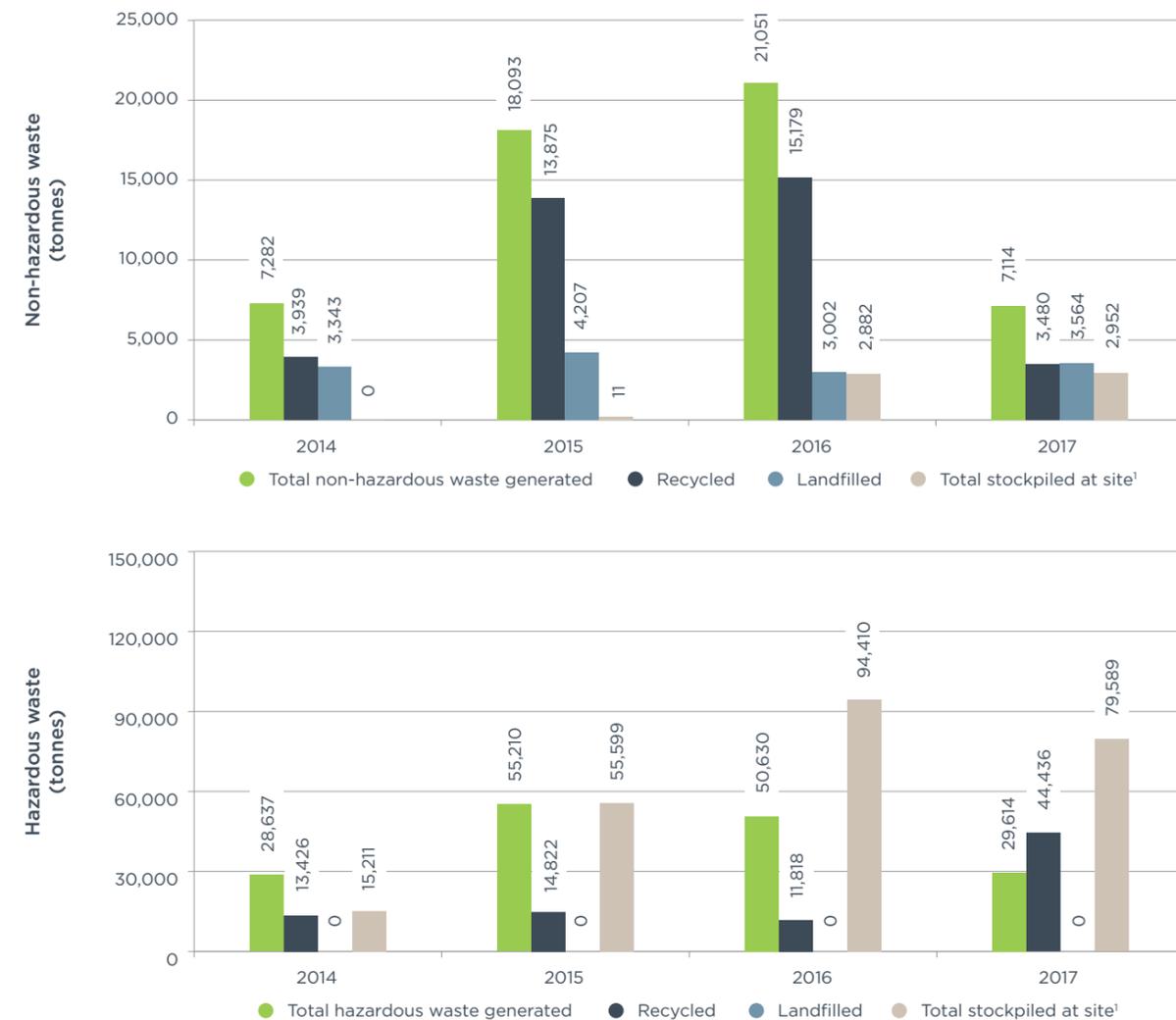
¹⁷ Compliance reviews are conducted in monthly bases and not the annualised (annual average) as in the graph.

Waste generation and disposal

We have adopted a reduce-reuse-recycle philosophy to minimise waste generation. Our aim is to send zero process waste to landfill.

For our Al Taweelah site, variation in hazardous waste generation is due to intermittent SPL generation. Removal of the lining of electrolytic cells is not a continuous process but is phased according to the age of the cell. Consequently, waste generation figures vary significantly between years. In 2015 and 2016, higher amounts of SPL (hazardous) and associated collector bars¹⁸ (non-hazardous) were generated.

Figure 20: Waste by type and disposal method in Al Taweelah



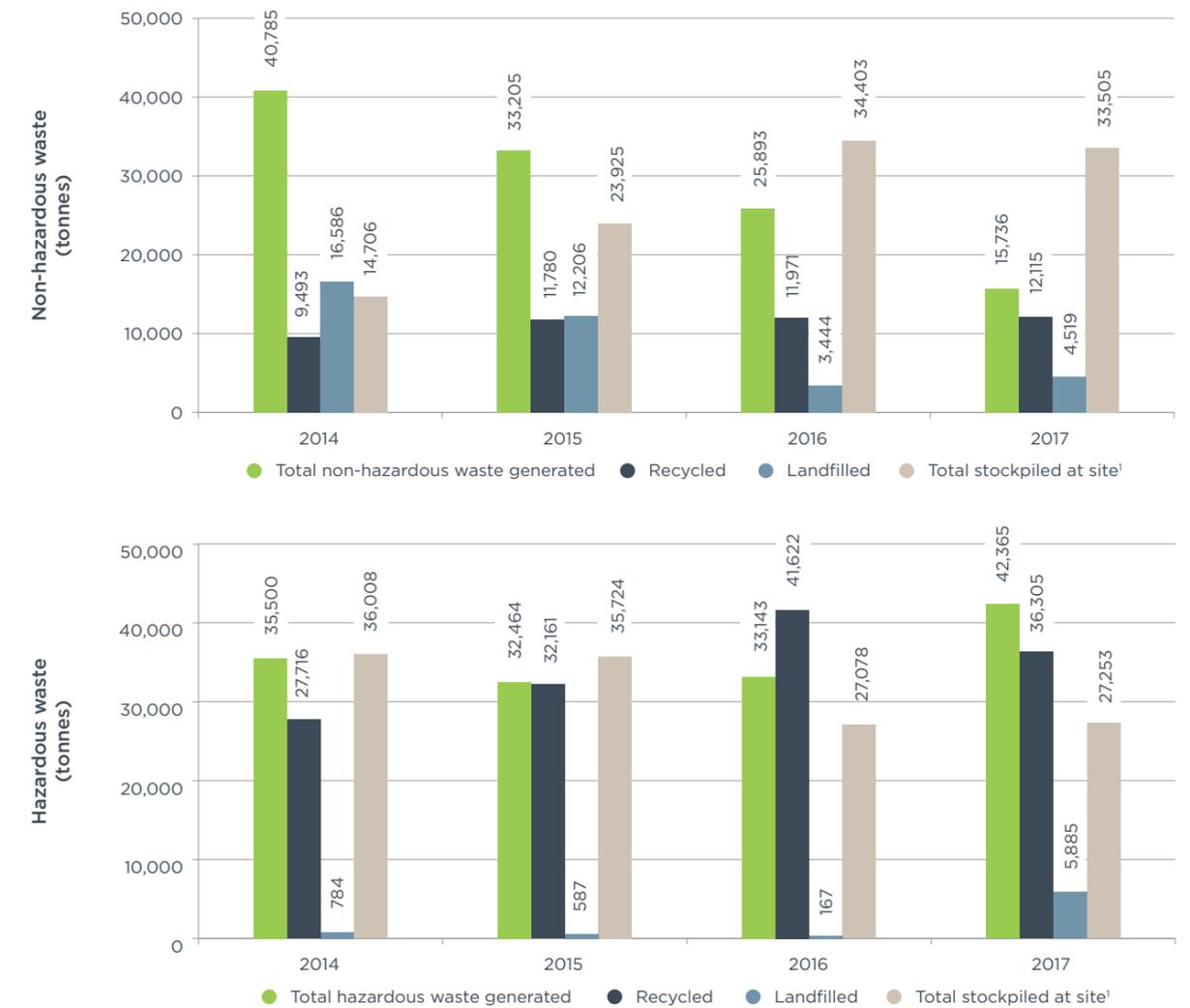
Note: 1. Values are cumulative. Non-hazardous wastes stockpiled on-site in Al Taweelah are a consequence of pending recycling plans and awaiting removal by supplier.

¹⁸ Collector bars are the steel part of the pot-lining. The carbon and refractory parts make SPL.

For Jebel Ali, rodding process waste¹⁹ was reclassified from non-hazardous to hazardous by the environmental regulator in Dubai in 2017. This is reflected in the reduction of non-hazardous waste and increase in hazardous waste generated for that year.

Non-hazardous waste landfilled reduced in 2016 as various process wastes were reclassified from non-hazardous to hazardous by the environmental regulator. This is reflected in the increase in hazardous waste landfilled in 2017.

Figure 21: Waste by type and disposal method in Jebel Ali



Note: 1. Values are cumulative. Stockpiled non-hazardous wastes are often associated with restrictions placed by the environmental regulator for the associated waste stream.

¹⁹ Rodding waste is the waste generated at the carbon rodding plant during the production of anodes. It contains carbon mixed with steel, iron and bath material.

Hazardous waste

Hazardous waste is waste that has the potential to adversely effect human health and/or the environment if not appropriately managed. The aluminium industry produces a range of hazardous waste materials. In terms of volume, the main hazardous waste streams associated with the smelting process include:

- Spent Pot Lining (SPL): after several years of operation, the lining of the electrolytic cells must be removed and replaced
- Dross: a mass of impurities that floats to the top of the molten aluminium and is subsequently removed
- Carbon dust: a by-product from the manufacture of anodes required for the electrolytic process

EGA is working to find uses for these materials, so that they can be converted from waste into feedstock for other industries.

SPL is potentially a hazardous material due to its reactive content and it requires careful handling during storage and transportation. Historically, we have stockpiled much of our SPL on-site whilst we researched opportunities for recycling this material. Thanks to successful partnerships we have developed with cement companies and support from environmental agencies in the UAE, we now process our SPL and provide it as an alternative raw material for the manufacture of cement.

During a summit entitled 'Towards a Cleaner Production', the UAE Minister for Climate Change and Environment recognised EGA and five UAE cement companies for their pioneering work re-using industrial waste from aluminium smelters in cement manufacturing. Not only does this collaboration reduce potential impacts associated with waste management in the aluminium industry, but it also reduces environmental impacts associated with raw material extraction for the cement industry.

Aluminium dross is potentially hazardous as it can release flammable and noxious gas when it comes in contact with water. In 2017, all of our dross was sent to specialised recycling centres in the UAE which recover aluminium from the dross producing a salt slag by-product.

Historically, we have disposed of this salt slag by-product in landfill. However, in 2016 we began to stockpile it and we now have an agreement pursuant to which another company will build a zero waste dross processing plant next to our Al Taweelah smelter. The plant is expected to be operational in 2019 and will enable us to recycle all of the salt slag by-product.

Carbon dust poses a health risk associated with inhalation. At Jebel Ali, the majority of carbon dust is used by a nearby cement plant as an alternative fuel. At Al Taweelah, a carbon dust recycling trial was initiated in 2017 as part of the development of a long-term recycling plan.

Once our Al Taweelah alumina refinery becomes operational, bauxite residue will be generated as a waste by-product. Our research and development team is currently working on identifying potential uses and recycling solutions for this waste (see Section 6: Technology and Innovation section for this case study), in the meantime, we are preparing a dedicated storage site to ensure adequate containment of this material in line with current world-class best practice.

All our hazardous waste is transported to licensed recycling facilities or landfill in the UAE in accordance with regulatory requirements.



EGA is working with other UAE industries to develop circular economy opportunities to help achieve the highest waste recycling and lowest waste landfilling among comparable smelters. We are proud of the solutions we have identified to enable us to recycle more SPL than we generated in 2017, a milestone in the management of one of our principal waste streams.]

Mohammad Al Jawi
Senior Manager
Environment & Waste Management

CASE STUDY

SPL entering the Circular Economy

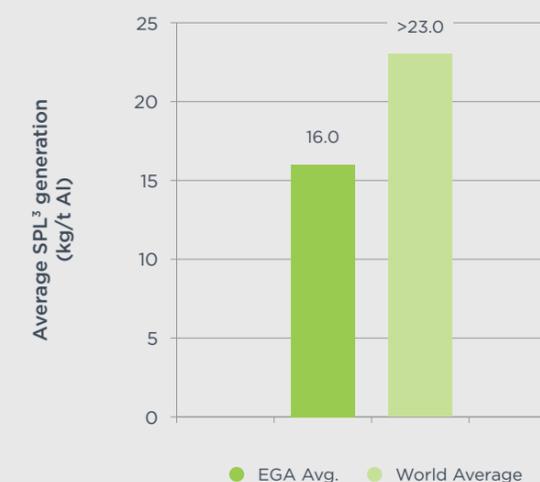
In 2017, we recycled more SPL than we generated. We recycled a total of 43,463 metric tons of SPL, a record for EGA.

- 38,844 tonnes were used by UAE cement plants as an alternative raw material and fuel source
- 4,619 tonnes were shipped to a recycling facility in the UK (our first overseas export under the Basel Convention). This volume represented 5.73 per cent of the total hazardous waste transported for recycling.

In 2018, we aim to clear the remaining SPL open stockpile of approximately 17,500 tonnes and from then on, maintain zero open storage. This fulfils our updated five-year SPL management strategy with its vision to convert SPL from an unwanted waste material into a valuable feedstock for use in other UAE industries.

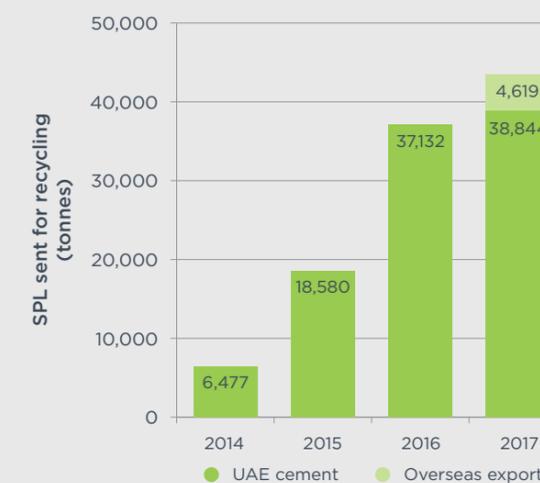


Figure 22: Average SPL generation



Note: World average derived from IAI 2015 Life Cycle Inventory.

Figure 23: SPL sent for recycling



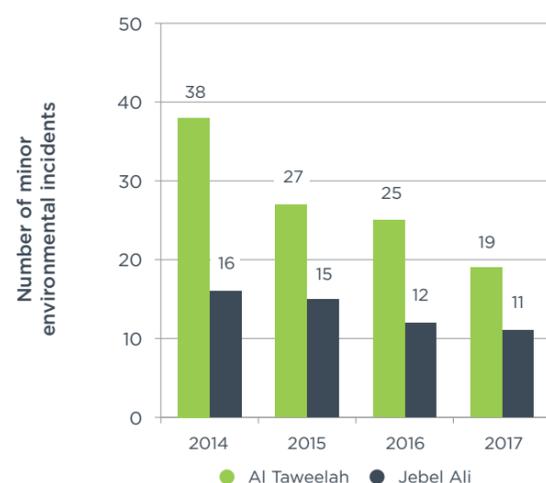
Note: The volume of hazardous waste transported to the UK is the actual weight that was determined by weighbridge.

Environmental incidents and our response

All environmental incidents are reported to the local authorities and investigated to prevent re-occurrence.

Since 2014, we have experienced a number of minor environmental incidents. These were easily rectified and did not result in any long term adverse impact.

Figure 24: Minor environmental incidents



Since 2014, we have had two significant environmental incidents; both pipeline diesel leaks. The first occurred in April 2015 near the power plant at Al Taweelah (approximately 100 m³), and the second in December 2016 behind the cooling towers at Al Taweelah (approximately 900 m³). Both leaks resulted in the contamination of soil and groundwater but were restricted to the area within the boundary of EGA's site. Our investigations identified that in both instances leaks were caused by corroded underground pipelines.

Based on a detailed site assessment conducted by third party consultants, we implemented a pump and treat remediation system to treat contaminated groundwater and excavate contaminated soil. Details of both investigations and remediation activities were reported to the regulatory authority in Abu Dhabi.

In response to these incidents, we replaced all potential defective underground diesel pipelines with above-ground pipelines. This work is 95 per cent complete and we expect full completion by mid-2018.

Notice of violations

In 2016, EGA received a notice of violation from the environmental regulator, Dubai Municipality, regarding NO_x emissions from our power plant at Jebel Ali. This was attributed to older gas turbines that had been installed prior to the implementation of relevant emission regulations in the Emirate of Dubai²⁰. Subsequently, EGA presented an action plan to the environmental regulator that includes the replacement of old gas turbines over a six year period from 2017 to 2023. Annual forecasted emissions were presented to Dubai Municipality showing a gradual decrease to reach full compliance by 2023. EGA has received no notice of violation leading to sanctions.

Grievances

In 2017, we received one grievance complaint associated with our operations in the UAE. Al Rahba municipality, which is near our Al Taweelah site, identified that tankers had been illegally discharging wastewater near the Khalifa port area. EGA conducted a full investigation and confirmed that all our contractors were using a registered waste service provider for the collection and disposal of wastewater. However, not all contractors could verify the use of GPS tracking systems or were able to verify the preparation of waste manifests at the point of disposal. EGA recommended that the waste disposal facility supply confirmation of receipt of wastewater from registered waste service providers. In addition, we reiterated to our contractors our expectations for responsible operations. Subsequently, no further grievances related to wastewater have been raised.

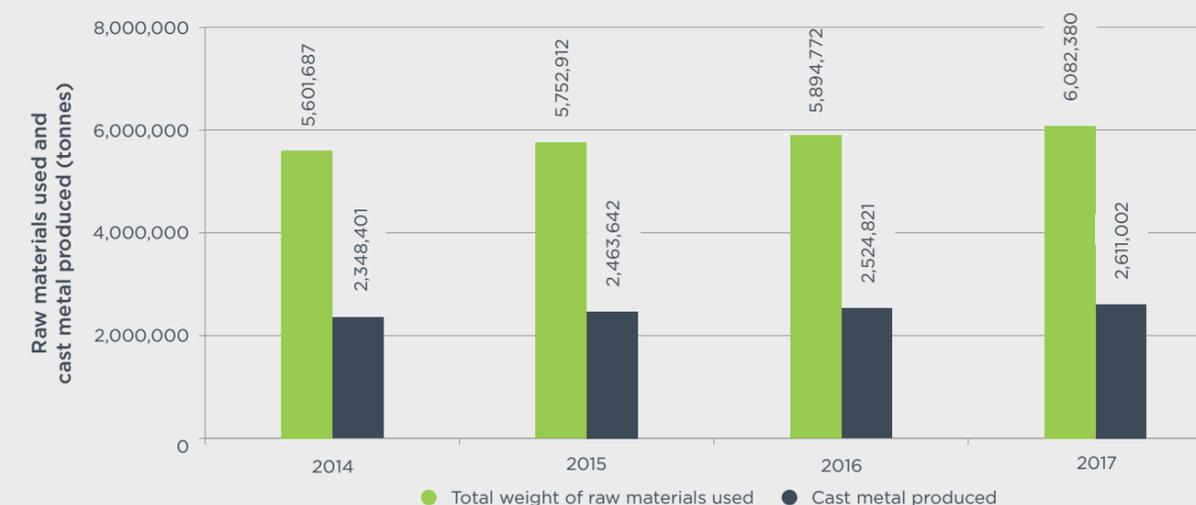
Materials stewardship

As part of the ISO 14001 environmental management system upgrade process in 2017, we considered the broader potential impacts of our products from a life cycle²¹ perspective. This included a review of potential for environmental impacts from the sourcing of materials within our supply chain.

The quality demands associated with the end use of much of our metal, for example in the automotive industry in which safety standards are stringent, prevent us from using any secondary sources of aluminium, limiting our opportunity for incorporating recycled content. However, we have targets for recycling 100 per cent of our process scrap and aluminium recovered from dross as these are both sources where we have control over associated metal purity and content.

The increase in raw materials used to produce the EGA's products corresponds to the increase in aluminium production.

Figure 25: Raw materials used in the UAE



²⁰ Cabinet Decree (12) of 2006 – Regarding Regulation Concerning Protection of Air from Pollution.

²¹ Life cycle is defined as consecutive and interlinked stages of a product (or service) system, from raw material acquisition or generation from natural resources to final disposal, as per ISO 14001:2015.

Biodiversity

EGA implements initiatives across all of our sites in order to protect biodiversity and local natural habitats.

We are all dependent on healthy, functioning ecosystems. Biodiversity plays a vital role in maintaining these ecosystems both now and for future generations.

Our facility at Al Taweelah is situated approximately two kilometres from the nationally protected marine area of Ras Ghanada, whilst our Jebel Ali site is approximately seven kilometres from the Jebel Ali Wildlife Sanctuary. Both of these sites contain important clusters of coral, mangrove and seagrass supporting species of national and international conservation significance.

- Coral reefs provide spawning areas for various marine fauna, including commercially important fish species

- Mangrove forests protect coastlines, aid nutrient recycling and support coastal fisheries
- Seagrass meadows are important nursery areas for many fish and the main food source for dugong and green turtles

Cooling water discharge associated with our power plants at Jebel Ali and Al Taweelah has the potential to adversely affect the marine environment. As such, we have online seawater monitoring systems at both sites and we regularly monitor site effluents utilising independent technical expertise to ensure that our operations have the least possible impact on the environment. Ecological monitoring studies have confirmed that our facilities at Jebel Ali and Al Taweelah are having no detrimental effect on Ras Ghanada or the Jebel Ali Wildlife Sanctuary²².



²² Reference: Ecological Assessment, Annual Report 2016, Project No. DUBAL.001, dated March 2017.

Under EGA's Environmental Management System, any site expansion plans or operational changes undergo thorough environmental reviews to ensure that our environmental impact is minimised and that we comply with applicable environmental regulations. In 2013, prior to starting the construction of our alumina refinery at Al Taweelah, an environmental impact assessment revealed an established population of Egyptian spiny-tailed lizards (listed as 'vulnerable' on the IUCN Red List) in the proposed bauxite residue storage area. We carried out a translocation programme and 19 Egyptian Spiny-Tailed Lizards were moved to Sir Baniyas Island, a nature reserve located off the coast which is owned by Tourism Development & Investment Company.

In Guinea, we have developed a Biodiversity Management Plan, in accordance with international performance standards. We aim to achieve no net loss to biodiversity. We have hired a biodiversity specialist to oversee the implementation of the monitoring and mitigation measures in this plan.

West African Chimpanzees, which are considered 'critically endangered' on the IUCN Red List, live on our mine concession in Guinea. We have arranged, with the support of the Guinean government, to fund the establishment of a site to protect chimpanzees in the newly declared Moyon-Bafing National Park²³. This will enhance the protection of an existing but threatened chimpanzee population and avoid predicted future losses of chimpanzees due to clearance of habitat.

Our mine concession, rail corridor and port areas partially intersect with critical habitats such as forests and mangroves. In order to avoid, minimise and compensate for any impacts, our Biodiversity Management Plan has identified key programmes which GAC is in the process of implementing. We have reforested more than 60 hectares of mangroves at two island villages and 10 hectares of forest near the new resettlement village in the mine concession.

²³ For more information, please refer to the IFC project information portal for GAC at <https://disclosures.ifc.org/#/projectDetail/ESRS/24374>.

CASE STUDY

Protection of turtles

Two species of turtles on the International Union for the Conservation of Nature (IUCN) Red List are found in UAE waters - Green Turtles which are classified as 'endangered' and Hawksbill Turtles which are classified as 'critically endangered'.

At Al Taweelah, we began observing hatchlings of Hawksbill Turtles in 2010. Consequently, we now prepare the beach for nesting season each year, including installing nets to ensure that hatchlings head towards the sea. We have used cameras to track nesting patterns at Al Taweelah for the past two years, and also conduct daily inspections during nesting season to remove debris that have washed onshore. We collect an estimated 10 tonnes of debris each year through daily removals during nesting season an annual beach clean-ups. Our monitoring has confirmed the successful hatching of several hundred turtles over the last seven years at Al Taweelah.

At Jebel Ali, we intake seawater for our desalination and power plants, which can result in the accidental trapping of turtles in our water chambers. Since 2011, we have developed comprehensive guidelines for conducting daily site inspections and rescuing trapped turtles. To date, we have rescued 22 green turtles, all of which were successfully returned to the sea. Any sick or injured turtles are taken to a rehabilitation unit at Madinat Jumeirah for care and are released back to the sea after their recovery.

Our employees' safety and health

There are numerous potential hazards associated with the production of aluminium including exposure to high voltage electricity, electromagnetic fields and hazardous substances, heat stress from working near hot reduction cells, and moving heavy equipment.

Safety is the first priority for everyone at EGA, no matter their role in the organisation. Zero harm to our staff, contractors and neighbours is the only acceptable target. We gather data to identify key hazards on our sites and systematically eliminate them from our operations. Our Executive Safety Committee meets quarterly to set strategic direction, goals and action plans, discuss safety performance data, monitor progress, identify gaps and cascade health and safety updates.

We believe safety processes and procedures alone are not enough. We work hard to instil a culture of safety throughout our organisation, from the top management to the shop floor. Management takes on the responsibility of shaping and helping to create a culture where people care about their safety and that of everyone around them. We nurture this culture by regularly conducting training, auditing and safety campaigns.



EGA has also established a dedicated Crisis & Business Continuity Management department. We have developed comprehensive plans, policies and procedures for responding to emergencies and crises and ensuring the continuity of our business.

EGA is a member of the Environment, Health and Safety committees at both the International Aluminium Institute and the Gulf Aluminium Council.

We are certified to Occupational Health and Safety Management System (OHSAS) 18001, and at Al Taweelah we are certified by Occupational Safety and Health Abu Dhabi (OSHAD). We provide safety training to our employees and contractors and conduct regular internal safety audits to ensure compliance.

During 2017, GAC increased its visible leadership showing more involvement by senior management in day-to-day site activities while promoting the goal of zero harm.

'Life Saving Rules'

We launched our 'Life Saving Rules' programme in 2016 to improve understanding amongst our staff, contractors and visitors of the critical safety hazards on our sites. The nine rules cover: permit to work, energy isolation, working at height, lifting and rigging, working in a confined space, barricades and safeguards, hazardous substances and molten metal, mobile phone safety and being fit for work. EGA's 'Life Saving Rules' have been incorporated into our induction training. We also introduced a mandatory e-learning module on the 'Life Saving Rules' for all employees in 2017, and conduct refreshers on the rules in toolbox talks.

We conducted an employee survey to measure the levels of communication, comprehension, implementation and compliance of the programme. This survey confirmed that the 'Life Saving Rules' programme had been well received throughout EGA with 91 per cent of respondents knowing all the nine rules. The outcomes of the survey were further confirmed through an internal audit exercise, which showed high levels of compliance with the 'Life Saving Rules'.

In Guinea, we developed a separate version of the 'Life Saving Rules' in 2017. The GAC 'Life Saving Rules' include the safety hazard of blasting in mine operations, which is not present in the UAE.

EGA Life Saving Rules

Getting to work

- Check:
- ✓ Are you fit for work?
 - ✓ Drive safely to arrive safe



Take charge of your health, including hydration to be fit for work at all times



Never use your mobile phone while driving

Before starting work

- Check:
- ✓ Know about hazards
 - ✓ Isolate danger
 - ✓ Prepare all permits



Know how, before working with hazardous substances and molten metal



Never work on live equipment, unless trained to do so



Always read, understand and adhere to Permit to Work requirements

While at work

- Check:
- ✓ Respect of safe guards
 - ✓ Safe work at height
 - ✓ Note safe lifting practices
 - ✓ Enough oxygen?



Use appropriate fall arrest equipment for work at height above 1.8m



Follow safe lifting operations and never walk under suspended loads



Never remove or work without appropriate barricades and safeguards



Never enter a confined space without authorisation and prior gas testing

Contractor management

All EGA contractors are required to comply with EGA's health and safety processes and procedures. We conduct regular inspections and training to ensure that our contractors meet our standards. We also conduct quarterly audits of the labour accommodation that they provide.



With EGA's support, the alumina refinery construction project has implemented a robust HSE programme which has resulted in very positive outcomes. Of particular note is the visible leadership from EGA senior management on sustainability initiatives such as the recent native tree planting on site.

Debbie Brown
BPJV Environmental,
Safety & Health Manager,
Al Taweelah alumina refinery



EGA has set high standards and targets for health and safety performance and supported us at all times in achieving those targets. They have also promoted a proactive approach as evidenced by weekly walkabouts to identify problems early and address them before they lead to incidents. This results in fostering a positive environment whereby safety observations and lessons learned are used to facilitate.

Werner Pienaar
Hatch - Project Health & Safety
Al Taweelah alumina refinery
Power & Steam Integration Project

Our safety performance

We experienced an increase in safety incidents in 2014 and 2015, following the merger of Dubai Aluminium and Emirates Aluminium to form EGA. The merger presented challenges such as managing an increased number of people and adapting to new systems. There were two fatalities on EGA sites in the period covered by this report, one in 2015 and the other in 2016.

In 2017, we recorded our lowest rates ever for incidents in the UAE:

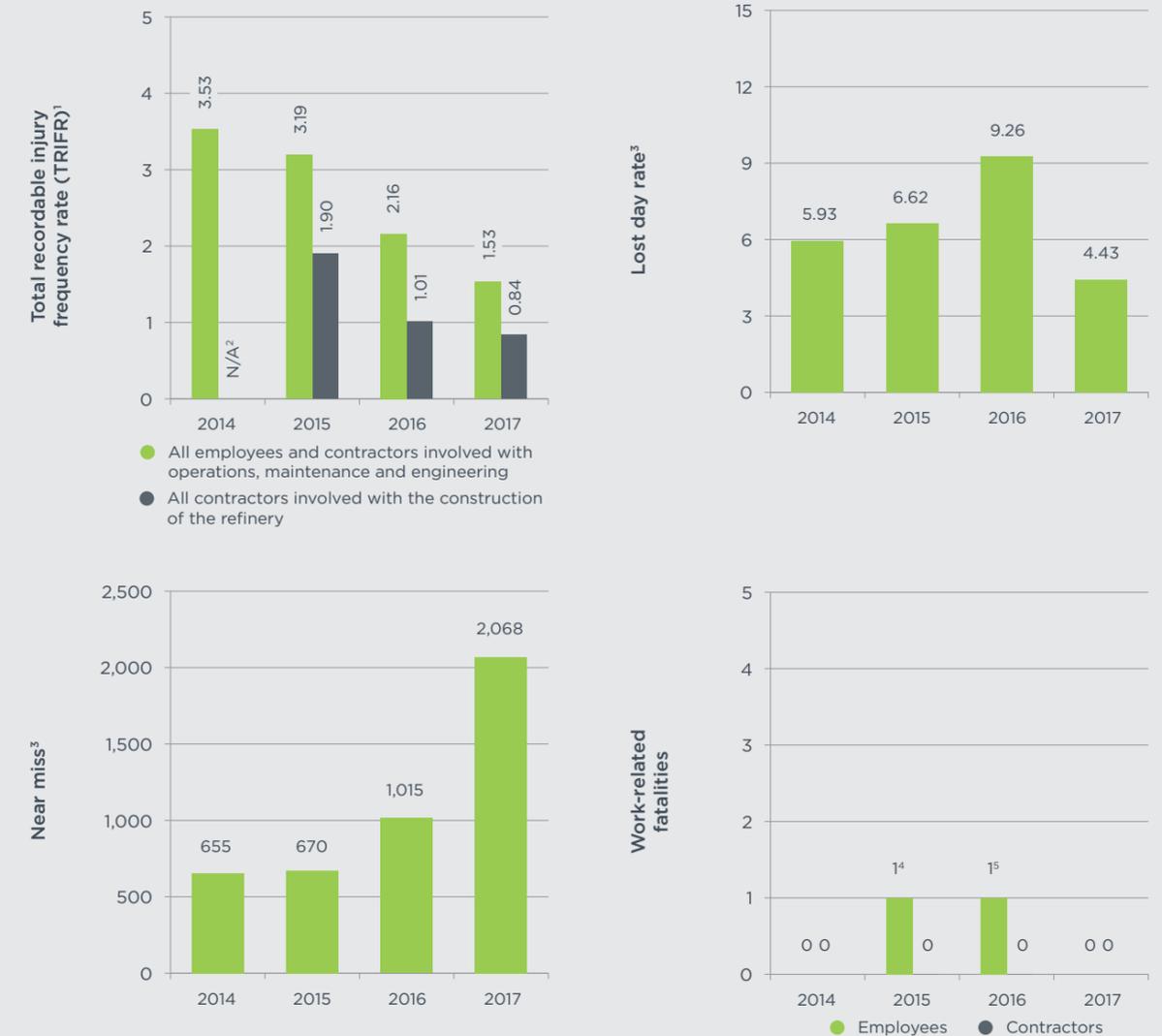
- Zero fatalities in any controlled operations
- Total Recordable Injury Frequency Rate of 1.53 per million hours worked compared to 2.16 per million hours worked in 2016 (60 per cent below the global industry benchmark²⁴)
- Lost Time Injury Frequency Rate of 0.04 per million hours worked compared to 0.28 per million hours worked in 2016
- 15 people 'Unfit for duty' compared with 20 in 2016

We credit this improvement in safety data performance to the introduction of our 'Safety Excellence Transformation Programme', our new safety rules and the enhanced roles and responsibilities of our safety representatives.

In 2017, near miss reporting increased by 95 per cent, with 172 near misses reported on average each month compared to 88 in 2016. This increase was the result of internal campaigns to improve near miss reporting as the best way to predict and enable action to prevent safety incidents.

In 2017, there was one major injury (loss of a finger) and one Lost Time Injury (a leg fracture). After receiving medical treatment and recovering from their injuries, both employees returned to work in their previous positions.

Figure 26: Safety performance in the UAE⁶



Note:

1. TRFIR is calculated per million workhours. For recordable injury rates, type of injury include fatalities, lost time injury, restricted work injury and illness, medical treatment injury and illness. Heat related illness is included in the injury rates.
2. The primary construction activities of Al Taweelah alumina refinery project commenced only at the start of 2015.
3. Lost day rate and near miss include all employees and contractors involved with operations, maintenance and engineering.
4. One male fatality in 2015 was associated with the brownfield project (indirectly supervised contractor).
5. One male fatality in 2016 was at Al Taweelah (directly supervised contractor).
6. We do not have any female injuries recorded for 2014 to 2017.

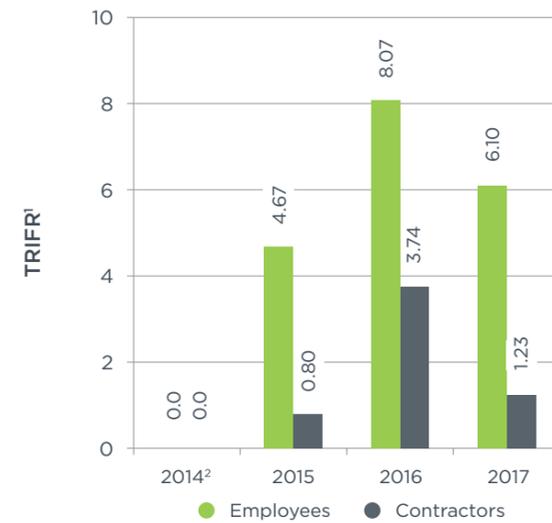
²⁴ International Aluminium Institute (IAI) was referenced as the global industry benchmark.

We conduct internal, independent investigations after any serious incident to identify the cause and steps we could take to reduce the risk of recurrence. Lessons learned are shared across our workforce. We categorise types of work by risk rating and we ensure that all workers are fit for the particular roles to which they are allocated. We also coordinate with contractors in detail and reflect worst case scenarios in our risk assessments.

EGA has residential facilities in Jebel Ali that accommodate over 2,000 people. Our safety team conducts regular audits and inspections to ensure their safety and wellbeing. In 2016 we extended the scope of our safety statistics to include any injuries or incidents in the residential area. In response to an unexpected number of such incidents recorded in 2016, we increased the number of inspections and conducted a series of safety engagement workshops. As a consequence, in 2017 the number of injuries in the residential area decreased by 70 per cent.

In Guinea, we recorded a high number of incidents in 2016. In response, we increased the number of health and safety audits and HSE training across our GAC project. As a result, the Total Recordable Injury Frequency Rate for GAC employees decreased by 24 per cent in 2017 compared to the previous year. For contractors, the Total Recordable Injury Frequency Rate was down by 67 per cent.

Figure 27: Safety performance in Guinea



Note:

1. TRIFR is calculated per million workhours. For recordable injury rates, types of injury include fatalities, lost time injuries, restricted work injuries and medical treatment injuries. TRIFR data in GAC does not have a breakdown by gender.
2. Based on the data collected, zero injuries were experienced by GAC direct employees and contractors during the year of 2014.



Our people are the most important aspect of our business and their safety and well-being is our number one priority. We are proud of independent benchmarking statistics that put EGA among global leaders in safety in the international aluminium industry. 📌

Ronald Otte
Safety Director



GAC is deeply committed to keeping our workplace safe because at the end of the day whether in construction or operations, front office or back office, EVERYONE should return home safely. 📌

Aissata Beavogui
General Director (GAC)

Our safety culture

We launched our 'Safety Excellence Transformation Programme' in 2017, aimed at firmly embedding our safety culture throughout the organisation. We aim to emphasise that safety is everyone's business and remove any last trace of an 'it doesn't apply to me' attitude.

As part of the 'Safety Excellence Transformation Programme', we developed a hearts and minds programme called 'Safety I Care' (see case study). 'How I Care' is the second stage of the campaign, which will be launched during 2018. This campaign will involve the tactical communication of specific safety rules, risks and challenges using predominantly visual methods including posters, presentations and safety campaigns.

In addition to our campaigns, we run safety related training which includes: safety induction for new employees, risk assessment and analysis, pot rooms electrical hazard and molten metal course, gas and atmospheric testing, hazard identification and reporting, basic occupational safety and health training, confined space awareness, working at height safety, lifting equipment and operations safety, incident investigation and reporting, and safety inspection principles.

In 2017, the number of employees receiving safety training increased at both Al Taweelah and Jebel Ali sites compared with 2016.

Figure 28: Safety training in the UAE



²⁵ For more information, please refer to the IFC project information portal for GAC at <https://disclosures.ifc.org/#/projectDetail/ESRS/24374>.

CASE STUDY

'Safety I Care' campaign

Aimed at all staff, contractors and visitors, the 'Safety I Care' campaign was launched in 2017 to deepen safety as a core value at EGA. 'Safety I Care' has so far featured more than 20 EGA employees explaining why they care about their own safety, starting with the Managing Director & CEO. Many of the participants cite a sense of responsibility to their family members, and the campaign is designed to make everyone think about why they should be responsible for themselves and the people around them. In a supplementary part of the campaign, EGA safety leaders have explained the safety initiatives on which they are working. The campaign has been delivered through posters and outdoor banners, through video, and at plant and company-wide townhalls.

Worker and community safety in GAC²⁵

In GAC, HSE training increased by 84.8 per cent in 2017 compared with 2016. One of the particular safety risks is from increased vehicular traffic around the project area. In 2017, we launched a road safety awareness campaign and trained contractors' drivers in safe driving. We also developed a Community Health and Safety Management Plan for neighbouring communities, which included alcohol and drug awareness and snake bite management. GAC is also working towards the development of an Emergency Preparedness and Response Plan.

Occupational health management

We regard occupational health management as essential to the health and happiness of our workforce. Key occupational health risks at EGA include physical hazards such as noise, vibration, heat stress and airborne contaminants (such as fluoride and coal tar pitch). We conduct medical assessments to enable the earliest possible diagnosis of any occupational health conditions. During 2017, we conducted a total of 2,681 occupational health assessments with an attendance rate of 98 per cent.

Should an employee be prevented performing from their usual role as a result of an occupational health hazard or a medical condition, they become part of EGA's rehabilitation and return to work programme where we find alternative suitable work in another role either temporarily or permanently if necessary.

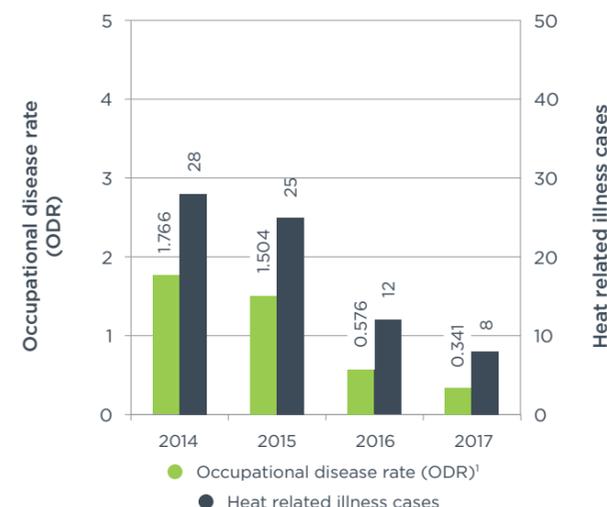
During 2017 we had eight occupational disease incidents in the UAE, all of which were heat related. The occupational disease rate decreased by 41 per cent from 0.576 in 2016 to 0.341 in 2017 and it has continuously improved each year since 2014 as we analyse the results from the previous year and implement changes. In 2017, we installed additional cooling cabins in the reduction and power plant areas and increased the number of walkabouts to inspect facilities such as water dispensers necessary for the prevention of heat related illness.



We acknowledge the vital role that employees play in the success of our organisation. Taking care of not only their health, but also their holistic well-being remains a key focus for us. 🗣️

Dr. Peter Gonsalves
Chief Medical Officer

Figure 29: Occupational disease rate in the UAE



Note: 1. Occupational disease rate is calculated per million workhours. All the occupational disease cases are heat related illness. No other type of occupational disease has been reported.

CASE STUDY

'Employee Assistance Programme'

In 2017 we launched an 'Employee Assistance Programme', which offers counselling, legal and financial advice and crisis intervention services to all our employees and their dependent family members. Provided by an external third party, the service is entirely confidential and no information is passed back to EGA. Employees and their families can reach out for short-term counselling for emotional issues such as anxiety, depression, stress, grief and relationship conflicts or seek advice from a legal or financial advisor on matters such as divorce, estate planning, wills, retirement planning, budgeting and debt.

Ensuring the well-being of our people

Fitness for work programme

In 2017, we opened a new medical centre at Al Taweelah to enhance the medical services provided to EGA employees and contractors in the areas of medical emergency response, primary health care, occupational health and health awareness. Fitness for duty of our workforce is a priority at EGA and all of our employees are regularly offered a full medical assessment as well as specific assessments on an 'as needed' basis.

Health week

Year-long health initiatives such as blood donation and medical checkups culminate in an annual Health Week which was last held in October 2017. Nearly 1,200 employees participated in the initiative which offered flu vaccinations, stress management awareness sessions, health screening, a talk on smoking and asthma, yoga sessions and an introduction to the 'Employee Assistance Programme'.

'Beat the Heat'

'Beat the Heat' is an EGA initiative to prevent the occurrence of heat related illness. It encourages employees to arrive at their stations fit for work and fully hydrated and to remain as such throughout their shifts. The number of heat related illness cases dropped by a third in 2017 in comparison to 2016 (from 12 to 8). The main causes of heat related illnesses were dehydration and the late reporting of symptoms by the effected worker. We have implemented a hydration-level monitoring programme to overcome these causes but low participation rates remain a challenge. In 2018, further awareness campaigns on how to stay hydrated will continue and mandatory participation in the hydration-monitoring programme at the beginning and middle of a shift will be included in an employee's individual performance programme.

Additionally, we have introduced an acclimatisation programme to gradually expose new employees, and those returning from annual or sick leave, to the heat. Electrolyte drinks are available on all sites and a nurse is dedicated to assist with heat related issues and monitoring in the higher risk areas, such as the potlines. During the year, we introduced cooling gloves and temperature, humidity and heart rate sensors to optimise the hydration and health of our workforce.

Taking part in community health activities

In 2017, over 250 of our UAE employees donated blood to local blood banks. In addition, nearly 800 employees participated in a walkathon for 'Unite for Diabetes' day.

In Boke, where GAC is located, the main diseases affecting the local population are malaria, diarrhea, tuberculosis, tetanus and respiratory diseases (such as asthma and bronchitis) as well as Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS).

GAC has implemented health awareness campaigns and provided basic medical training to more than 175 local communities on first aid, hygiene, malaria, HIV/AIDS, maternal health and breast cancer. On World AIDS Day in 2017, we facilitated HIV/AIDS awareness campaigns on our sites at Conakry, Kamsar and Tinguilinta, in collaboration with the Chamber of Mines of Guinea.

During the Ebola crisis, GAC supported the United Nations Children's Fund's awareness program to alleviate the spread of the disease in Guinea. We also helped the World Health Organisation to control the Ebola crisis by increasing the capacity of health care facilities in our project area. And we constructed the country's first medical centre focused on sickle cell anaemia.

Engaging with our communities

We recognise that our activities have the potential to result in both positive and adverse effects for local communities. Accordingly, we build social engagement programmes intended to result in a net positive impact for society.

In the UAE, we have a Corporate Social Responsibility (CSR) team that runs community investments, sponsorships and initiatives. In 2017, we ran 21 CSR activities.

Our GAC operations have the potential to significantly affect those who live and work in and around our mining project areas. We prepared a detailed environmental and social impact study for the project in line with IFC Performance Standards and requirements of the Guinean government. We have sought to avoid impacts on local communities whenever we can. When this is not possible, we have put plans in place to minimise and/or compensate for any adverse impacts. All land acquisition, compensation and resettlement have been managed in accordance with a documented framework (also developed in accordance with IFC Performance Standards) which is made publicly available on the IFC website.

We have more than 25 professionals supported by fieldworkers who work with potentially affected communities. We have also built schools, healthcare centres and wells, and provided medical treatment as well as developing irrigation systems for agriculture.



Engaging with our communities not only fulfils our social responsibility, it also makes good business sense. We are proud to be very active in the communities where we operate.

Khalid Buhmaid
Senior Vice President
Government Relations

Community grievance mechanism

In 2017, we published a formal community grievance procedure for our UAE operations. The procedure sets out the mechanism for receiving, documenting and addressing complaints. The procedure is published on our employee portal and our community phone number is listed on our website in English and Arabic.

In 2017, we received one grievance complaint. This was from Al Rahba municipality and concerned trucks illegally discharging wastewater near the Khalifa port area in Abu Dhabi. This grievance was investigated and addressed by our internal environmental department (refer to Section 4: Environmental Stewardship).

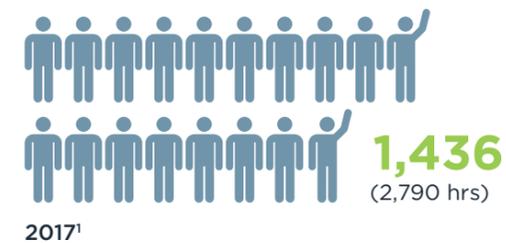
GAC established a Resettlement Committee to engage with affected communities throughout the resettlement planning and implementation process. During 2017, more than 1,500 consultations with local community members took place. We have also put in place a specific community grievance process, which is tracked by stakeholder management software. This proved particularly helpful during the resettlement process.

GAC is developing a Mine Closure and Rehabilitation Plan²⁶ which will be periodically updated in consultation with local communities and the relevant authorities. Rehabilitation of the mined areas will be completed as the mining advances on an on-going basis. The mine closure will include closure costs provisions for immediate closure and life of mine closure, and decommissioning and restoration costs.

Volunteering

At EGA, we encourage our employees to volunteer their time and expertise to benefit non-profit partner organisations, community programmes and foundations. We also participate in social development programmes and engage our employees in these activities to increase awareness and offer opportunities for direct involvement in the community. For this purpose we have created the EGA CSR club which is open to any EGA employee who would like to volunteer their time either inside or outside of working hours. The CSR club coordinates all volunteering activities and ensures a cohesive approach to volunteering activities. On joining the club, EGA employees are able to define their particular areas of interest and members of the club are encouraged to share CSR ideas and opportunities. In 2017, 1,436 volunteers from EGA participated in community improvements in the UAE.

Total number of volunteers and hours



Note: 1. The number of volunteers in 2017 includes the Clean-Up UAE campaign in which some of EGA contractors participated.



The engagement of the Corporate Social Responsibility managers along with employee volunteerism from a corporate partner enriches a project, yielding best and sustainable rewards to the benefactors. Working closely in consultation and evaluation of projects builds trust and long-term partnerships. Our working relations over the years with EGA has proven this and has been a rewarding experience.

Cherryn Kelly
General Manager
Action Care (NGO)



I began volunteering on a number of CSR programmes in 2016. I am grateful for the opportunity to volunteer and find it a rewarding experience to meet talented students from universities and to share knowledge and experience to develop and guide them to achieve future success.

Mohsen Bin Awadh
Reduction Planning & Operation Supply
(Volunteer)



Since joining EGA, I have actively taken part in the CSR club each year in whatever way possible. I think that every employee should take a walk in the shoes of the less privileged at some point. This not only gives back to the community but also helps to put your own difficulties into perspective and face workplace challenges more positively.

Jameel Usman
Officer - Inbound Logistics,
Logistics & Warehouse Management,
Corporate Services
(Volunteer)

²⁶ For more information, please refer to the IFC project information portal for GAC at <https://disclosures.ifc.org/#/projectDetail/ESRS/24374>.

Education and youth development

Education is one of the UAE government's top priorities in its drive to develop human capital and a diversified knowledge-based economy²⁷. In line with 'UAE Vision 2021' goals to ensure inclusive and quality education, at EGA our main CSR focus is on education and youth development. In 2017, three of our key initiatives focusing on youth development were our partnerships with INJAZ-UAE, American University of Sharjah and 'Engineer the Future'.

INJAZ UAE

INJAZ UAE is a member of Junior Achievement Worldwide, one of the world's largest non-profit business education organisations, reaching over 10 million students each year in 121 countries. It serves as a nexus between the business community, educators and volunteers, working together to empower young people to plan their professional futures and make smart academic and economic choices. Our partnership with INJAZ supports the government's economic goals of increasing Emirati employment in the private sector.

Under the umbrella of Junior Achievement Worldwide, the objectives of INJAZ are to:

- Increase the skills of youth and their participation in the economy
- Encourage youth to take the initiative to become entrepreneurs
- Enable youth to plan their career through a business mentoring programme
- Link youth with successful role models from the private sector
- Give UAE corporations an opportunity to shape their future workforce and support Emiratisation

EGA partners with INJAZ to support its 'Work Readiness Programme' which includes innovation camps, career success classes and job shadowing days. EGA's participation in 2017 involved hosting 20 career success classes, three innovation camps and two work-shadowing visits that benefitted a total of 765 students. 76 per cent of participants were UAE Nationals and 64 per cent of the total were female. These initiatives involve EGA volunteers acting as mentors for the students.



EGA has been a great supporter and believer in the INJAZ missions for years. This belief ensures the company's vision in empowering youth in the UAE and helping them to achieve their economic independence.]

Tamer Zumot
Acting CEO - INJAZ UAE Relations

American University of Sharjah (AUS)

Founded in 1997, the American University of Sharjah has almost 5,500 students representing 93 nationalities and is acclaimed throughout the Gulf Cooperation Council countries and the Middle East for its academic excellence and multicultural campus environment. It is an independent, non-profit, coeducational institution of higher education, which integrates broad-based liberal arts education with professional studies.

EGA supported the institutional advancement of AUS in the academic year 2016/17 and contributed to the delivery of a number of initiatives including:

- Annual careers forum offering advice and internship opportunities to more than 400 attendees
- Alumni activities attended by more than 400 past students and lecturers
- Job Search Preparatory Day helping 200 senior students in their search for the right career

'Engineer the Future'

'Engineer the Future' is a Science, Technology, Engineering and Mathematics (STEM) outreach programme for high school students that we launched in 2017. Supported by the UAE Ministry of Education, the programme is delivered in schools across the UAE. The programme aims to increase enthusiasm for STEM subjects through interactive workshops and practical projects. We aim to reach 8,000 students in grades 9-11 during the 2017/18 academic year.

By exposing students to STEM and giving them opportunities to explore STEM-related concepts, the hope is they will study these subjects further and ultimately pursue a job in a STEM field. 'UAE Vision 2021' calls for UAE students to reach world-class attainment in science and mathematics subjects. In the first three months of the programme, over 1,200 students benefitted from the programme.



'Engineer the Future' has been an enriching experience for our students and it is great to see organisations like EGA contributing to STEM education and reaching out to young students. It will inspire them to consider STEM as a career path. The workshops have been very successful in our school, with over 900 students actively participating.]

Eman Zeidan
Activity Coordinator
Dubai National School

Community engagement in Guinea

GAC has invested in community-based projects that address areas such as youth capacity building and agricultural development. These community investment projects aim to contribute to poverty reduction through equitable access to basic social services and strengthening the technical and operational capacities of our neighbouring communities.

Education programmes

At GAC, we introduced an adult literacy program and financial aid for income-generating activities which benefitted more than 1,400 adults, including 725 women. We also ran a computer literacy training program with 60 young participants.

GAC also conducted a training program on the management of compensation income for the benefit of people receiving it. The training aimed to raise awareness of financial management, in preparation for receiving what can be a substantial sum in the local context. The session was attended by 194 people in total (68 people from Kamsar and 126 from the mine concession area. More than half the attendees were women).

Our scholarship program also continued for the 2017-2018 school year. Nine girls from disadvantaged families near the concession area have been offered a scholarship to advance their grade school education. In addition, we are launching the fifth edition of the capacity building program for 50 young girls and boys. This program trains the youths on how to become professional boiler makers, electricians or mechanics.

Food security initiatives

GAC has enhanced food security in neighbouring communities through agricultural projects, as well as by training young farmers. We developed three chicken farms around our mine concession area. Farmers will be able to supply their chicken and egg produce not only to surrounding communities but also to GAC employees, thereby improving their livelihoods through income generation and job creation. We also provided support to develop watering systems using solar pumping devices. As part of these projects, we have planted over 3,000 fruit trees.

²⁷ <http://uaesdgs.ae/en/goals/quality-education>

Business integrity

EGA implements a risk-based ethics and compliance programme that reflects the specific challenges in the countries and industries in which we operate. We apply the same standards throughout our business and undertake regular risk assessments. We continue to look for ways to improve how we detect, prevent and respond to compliance issues.

We strive to conduct our business with integrity, based on our corporate values. We seek to build mutual trust with our customers, suppliers and communities by working honestly and ethically. We are developing a compliance programme that accords with global best practice.

EGA's Code of Conduct

We believe that good ethics are the foundation of good business, as unethical behaviour can severely damage the trust stakeholders place in an organisation. The standards that guide our behaviour are embodied in EGA's Code of Conduct, Our Values at Work. The code applies to everyone at EGA, and covers 24 compliance issues, including treating people with respect (prohibiting harassment, discrimination and retaliation), anti-bribery and corruption, complying with competition laws, and working with integrity with customers, partners, suppliers and governments.

Code of Conduct training is mandatory for all new joiners and delivered as part of the induction process. This training introduces EGA's ethics and compliance programme, including compliance issues, the multiple ways to report compliance concerns, and our non-retaliation policy. All employees are required to complete refresher Code of Conduct training on an annual basis. We also deliver targeted training and awareness to address risks arising in different business areas and for specific employee grades.

Anti-bribery and anti-corruption

EGA takes anti-bribery and anti-corruption compliance seriously, particularly given the high risk of corruption in some of the countries and industries in which we operate. Bribery not only undermines the rule of law and the principle of free and fair competition, but also has a corrosive and stifling effect on businesses and commerce.

Our compliance programme provides a strong and practical anti-bribery and anti-corruption framework. We have a zero approach to bribery and corruption and all forms of such, including facilitation payments, are prohibited by our Code of Conduct and policies.

Regular risk assessments are a key part of an effective compliance programme. In 2017, we conducted an anti-bribery and anti-corruption risk assessment with EGA's new office in China, and refreshed anti-bribery and anti-corruption risk assessments in Guinea and with our executives in the UAE. These on-going risk assessments allow us to focus our efforts on the business areas with the highest risks.

All new joiners receive anti-bribery and anti-corruption training as part of their induction. In 2017, the annual Code of Conduct training included a module entitled "Stand-up to Bribery and Corruption". During 2017 we also delivered targeted anti-bribery and anti-corruption training to contractors working in high-risk environments.



GAC has zero tolerance for corruption. It is with this value that we will guarantee the economic advancement of our society. »

Malick N'Diaye
Chief Financial Officer (GAC)

Supply chain compliance

EGA's values and commitment to integrity also shape the expectations we have for our suppliers. We require all suppliers to sign a supplier declaration, or provide comparable assurance that they comply with EGA's values and standards, including prohibitions on all forms of bribery and corruption and the use of child and forced labour.

We do basic due diligence on all suppliers, conducting further due diligence on those we identify as high-risk. This extends to looking beyond our direct suppliers to the companies producing the raw materials we use. In 2017, we carried out site visits to conduct compliance audits on 11 silicon and magnesium production plants throughout China, improving transparency down our supply chain.

CASE STUDY

'Your Voice'

We encourage people to speak up if they have compliance questions or concerns. 'Your Voice', our 24/7 independently operated report line, allows employees, suppliers, contractors and others to report confidentially and without any fear of retaliation, any possible violation of our Code of Conduct, policies or applicable laws. 'Your Voice' is available online, by phone and in multiple languages and it is possible to report concerns anonymously. The report line details are well publicised within EGA and also appear on the EGA website and in our supplier declaration. 'Your Voice' is, currently, the only toll-free report line in Guinea.

Human rights

Our strength lies in the talent and diversity of our people and we respect the rights and dignity of our employees and contractors. We encourage and monitor human rights through Our Code of Conduct, the 'Your Voice' report line, supplier declaration and supply chain assessments. We believe people should work because they want or need to, not because they are forced to do so. We do not employ children or use forced labour and we prohibit the use of child and forced labour in our supply chain. We promote an inclusive workplace that respects cultural differences and will not tolerate harassment or discrimination.

An independent human rights impact assessment was completed on our Guinea project in 2015²⁸. Guinea Alumina Corporation's human rights impact assessment identified security as a key issue. GAC security personnel are trained on GAC's own, EGA-based Code of Conduct. GAC's external security provider has its own training program, which includes adherence to relevant Guinea and International laws and a commitment to the UN principles concerning the use of force and arms. In addition, security contractors working on the GAC site, receive additional training on the standards set out in GAC's supplier declaration.

We regularly inspect our residential camps and those used by our contractors in the UAE and Guinea, taking remedial action if they do not meet the International Finance Corporation (IFC) based standards. There are no indigenous peoples, as defined by the benchmark IFC Performance Standards, in our project areas.

²⁸ For more information, please refer to the IFC project information portal for GAC at <https://disclosures.ifc.org/#/projectDetail/ESRS/24374>.

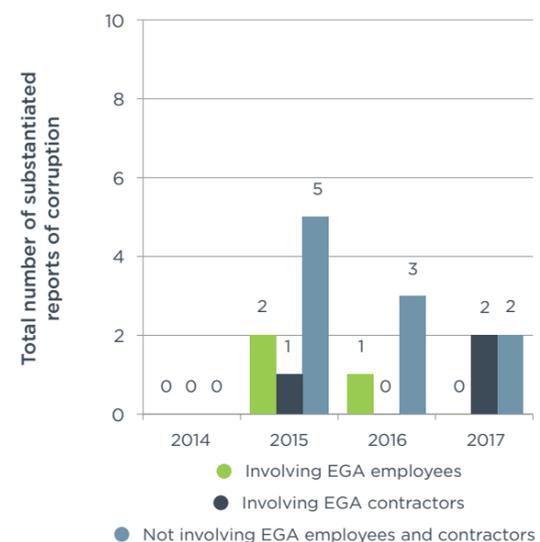
Our compliance performance

Our compliance team investigates all concerns that are reported to it directly or through the 'Your Voice' report line. In 2017, the compliance team investigated 78 reports of non-compliance; 56 per cent were substantiated and corrective action taken. EGA received no significant fines, judgments, penalties or non-monetary sanctions for non-compliance. There were no legal actions, threatened or ongoing, regarding anti-competitive behaviour and no violation of anti-competition laws.

There were 10 reported incidents of discrimination and harassment in 2017. On investigation, six cases were substantiated and remedial action taken, ranging from promoting awareness to termination of employment. In each instance, EGA's internal compliance team will follow up with any remedial action to ensure that the incident has been appropriately addressed. There were no substantiated reports of corruption involving EGA employees in 2017. There were two substantiated reports of corruption involving EGA's contractors and two substantiated reports of corruption not involving EGA's employees or contractors. None of these four corruption incidents had any material impact on the business and operations of EGA in 2017.

In addition, in 2016 EGA received a notice of violation from Dubai Municipality over NO_x emissions from the Jebel Ali power plant (see Section 4: Environmental stewardship for more details).

Figure 30: Anti-corruption



Our corporate values provide the foundation for our compliance programme. EGA's leadership is responsible for shaping our compliance culture, but ultimately all our employees are ambassadors for EGA. We all have a duty to act with integrity in everything we say and do.

Jonathan Evans
Executive Vice President,
Legal & Compliance,
General Counsel & Company Secretary

Employees that have received training on anti-corruption in the UAE and overseas offices (excluding GAC)



NOTE:

1. Anti-bribery and anti-corruption covered in annual Code of Conduct training, which subsequently became the Introduction to the Code of Conduct training delivered at induction.
2. Anti-bribery and anti-corruption included in annual Code of Conduct training so new joiners in 2017 received anti-bribery and anti-corruption training twice.



05



**Creating
opportunity
for people**

Jobs for modern lives



Creating opportunity for people

Our employees

Emirates Global Aluminium directly and indirectly creates tens of thousands of jobs both in the UAE and internationally. Today, we directly employ 7,210 in the UAE and 232 in Guinea²⁹. We have over 10,000 contractors in the UAE and more than 3,000 in Guinea. In addition, our supply chain creates further opportunities for people.

Our success is intrinsically linked to the people we employ. We aim to attract and retain top-quality candidates by being an employer of choice. As a major industrial company, we are a significant employer of professionals in Science, Technology, Engineering and Mathematics (STEM) related disciplines. Out of our 7,210 employees in the UAE, more than 1,500 are professionals in these fields. We also sponsor education and research projects in STEM subjects and deliver internal training. EGA employs over 60 nationalities in the UAE. Almost 1,200 employees are UAE Nationals.

In Guinea, one of our key business objectives is to increase the number of Guinean nationals working for us. We give hiring priority to the working population directly impacted by our project provided they have the right skill set. Education, development, training and succession programmes underpin this business objective and ensure the future leaders of our business are provided every opportunity to develop as senior professionals within Guinea Alumina Corporation. In 2017, 83 per cent of our workforce in GAC were nationals and approximately 20 per cent were considered directly impacted by our construction.

GAC employees benefit from Human Capital policies and procedures aligned with International Labour Organisation and International Finance Corporation standards. Employee labour unions and collective bargaining are permitted under the Guinean Labour code. Most of GAC's employees are members of one of the national trade unions for the mining sector. GAC has established a relationship with these unions and engages them to resolve any labour issues and to ensure adequate working conditions for our employees³⁰.



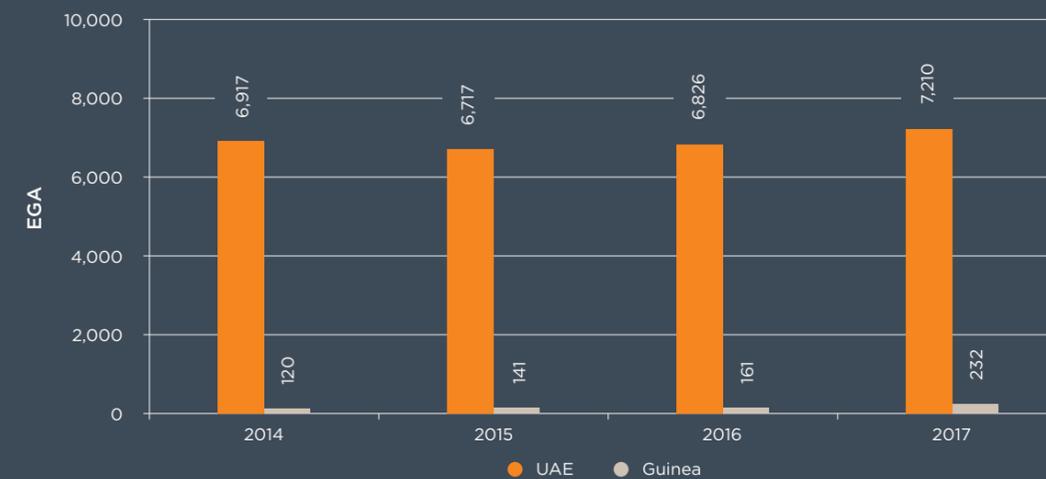
Employee welfare ranks very highly on our agenda and we invest heavily in the well-being, development and reward of all of our employees. This pays dividends in terms of employee satisfaction, loyalty and retention and underpins our goal to be an employer of choice.

Ahmed Al Shamsi
Executive Vice President
Human Capital

²⁹ Our Guinea operation is currently under construction with our PMC partner providing direct employment opportunity for around 3,200 people, as at December 2017.
³⁰ For more information, please refer to the IFC project information portal for GAC at <https://disclosures.ifc.org/#/projectDetail/ESRS/24374>.

Figure 31: Employee overview

Total number of employees by location



Total number of employees by gender

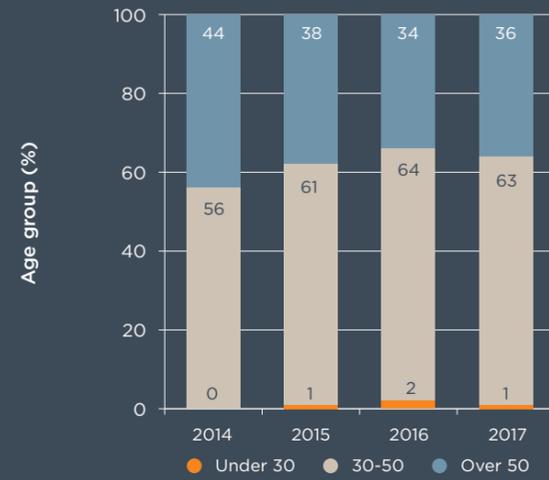


Total number of employees by nationality

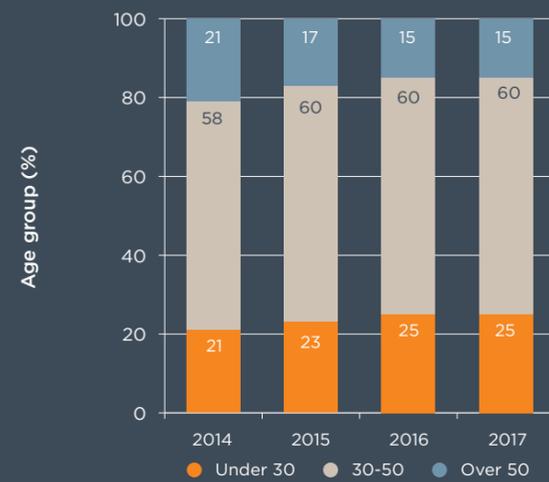
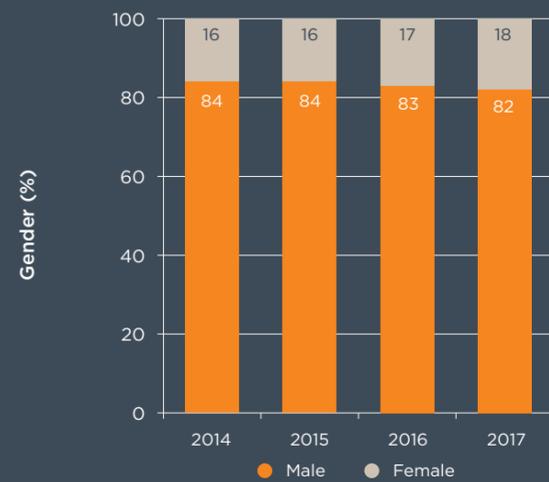


Figure 32: Employee diversity in the UAE

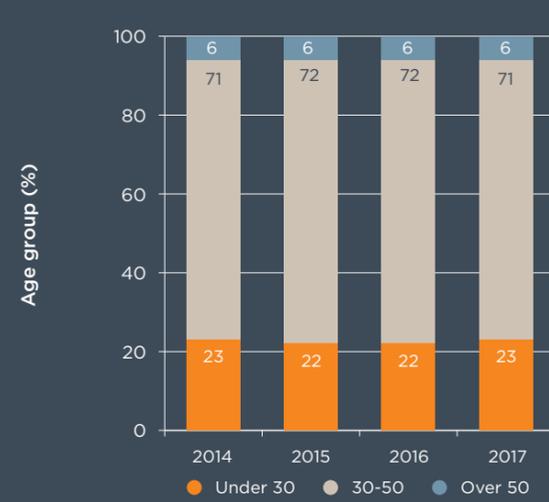
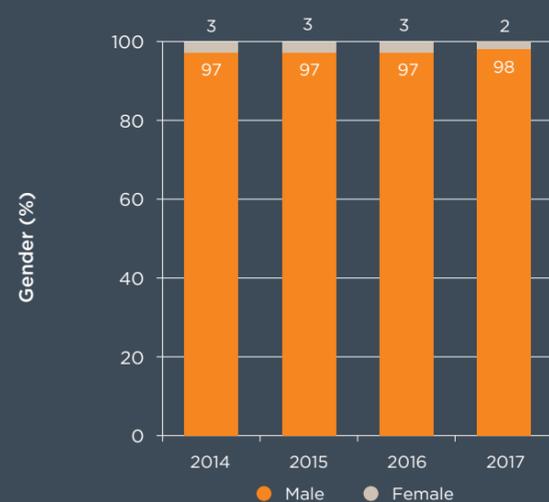
Executive and senior management



Middle management



Staff (professional and administrative)



Note: Classification of employee groups: Executive and senior management means senior management in Grades F+. Middle management means Management or Supervisory in Grades G-K. Staff means Non-supervisory in Grades L-S.

Our people's happiness and well-being

We offer numerous benefits to our employees in order to enhance their happiness and commitment to work. All our full-time employees receive life insurance, health care, disability and invalidity coverage, annual leave, parental leave (both maternity and paternity), and compassionate leave³¹. In 2017, we launched EGA's first employee handbook to simplify information on Human Capital policies, a dedicated helpline for employee queries on HR-related issues, and an 'Employee Assistance Programme'.

EGA operates parental leave policies that surpass statutory requirements. For all employees that go on parental leave, their role is kept open and support is provided as they return to work.

We run a biennial employee engagement survey called 'Mashura', the Arabic word for consultation or suggestion. This measures employee satisfaction levels and collects feedback on work related issues. In the 2016 Mashura survey, 93 per cent of EGA employees considered themselves to be sustainably engaged³². Areas for improvement highlighted by the survey were addressed through in-depth workshops at multiple levels of the organisation. These workshops enabled leaders to identify practical actions targeting noticeable improvements and, during 2017, 90 per cent of these actions were completed.

CASE STUDY

Spot awards and employee of the month awards

In response to the 2016 'Mashura' employee survey and to contribute to a performance based culture, in 2017 we introduced two new recognition programmes - spot awards and an employee of the month award.

The objective of the spot award is to provide immediate recognition for a specific action or achievement beyond what is normally expected of an employee. This includes exceptional commitment to safety, innovation, teamwork or quality. The objective of the employee of the month award is to distinguish our top performing non-supervisory employees who make a valuable contribution to the organisation and have demonstrated excellence in their field.



³¹ Contract notice periods range from 1 to 3 months depending on seniority.

³² Sustainable engagement is defined by Willis Towers Watson as "attachment to the company and willingness to give discretionary effort" (Source: "The Power of Three: Taking Engagement to New Heights". June 2016).

Figure 33: Employee retention in the UAE

Total number of new employee hires (i.e. entering employment)



Total number of employee turnover (i.e. leaving employment)



Attrition Rate



Note: 1. Attrition rate = total number of employees leaving ÷ total number of employees.

Emiratization

As part of our contribution to the 'UAE Vision 2021', we are committed to increase the number of UAE Nationals we employ and develop to become senior professionals at EGA. We employed 1,160 UAE Nationals at the end of 2017. In our Emiratization programme we prioritise 'in-focus' positions, which are all those that can feasibly be Emiratised based on the expectations and cultural requirements of the national workforce. At the end of 2017, 37.6 per cent of these positions were held by UAE Nationals, the highest ever level. We aim to Emiratised 40 per cent of in-focus³³ positions by 2020.

EGA's Emiratization Strategy is designed to attract, develop and retain UAE Nationals and our programmes provide them with clear progression pathways via structured development and training plans. We offer a scholarship programme for university students as well as trainee and graduate programmes and we engage in succession planning to identify suitable positions for talented candidates.

Our Emiratization initiatives include the following:

- Internship programme
- Summer programme
- Eadad programme (training opportunity for a fixed period)
- Scholarships for employees and students
- National trainee programme
- Graduate trainee programme

At the end of 2016, 16 per cent of all our UAE employees were UAE Nationals.

In 2017, 119 UAE Nationals held positions in executive and senior management and they represented 43 per cent of our employees in the same positions. We are also pioneering the role of UAE National women in heavy industry. In 2017, females comprised 6 per cent of our UAE workforce but more than 16 per cent³⁴ of those working at supervisory level and above.

³³ In-focus positions are the jobs that have proven to be attractive to UAE nationals.

³⁴ 16 per cent include expats and UAE nationals while 12 per cent are UAE national females only.

CASE STUDY

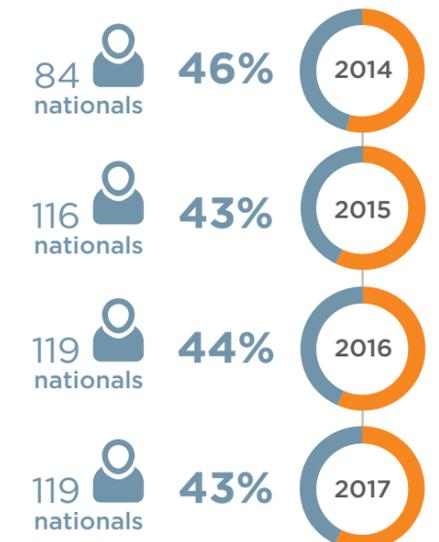
Driving Emiratization through education

At the end of 2017, EGA was sponsoring 180 UAE Nationals in their university studies, including more than 10 studying abroad. Since 2001, we have helped over 380 students obtain tertiary education.

EGA offers scholarships to students to pursue a university education in subjects relevant to EGA's current and future needs. These fields include mechanical engineering, electrical engineering, chemical engineering, industrial engineering and business. Each scholarship student also benefits from at least two periods of work experience at EGA, as well as academic guidance from EGA managers.

Existing EGA employees can also apply for scholarships to obtain additional qualifications in disciplines relevant to their jobs. Staff can study on either a part-time or full-time basis and at local or international universities.

UAE nationals in top management in the UAE



Our people training and development

We focus on attracting the most capable people and offering them the opportunity for continuous career development. EGA's Executive Committee is an example of this approach. Seven members of our Executive Committee, including EGA's Managing Director & Chief Executive Officer, originally joined the business as fresh graduates. Five of these leaders studied STEM subjects, reflecting our broader focus on these disciplines as a company engaged in heavy industry.

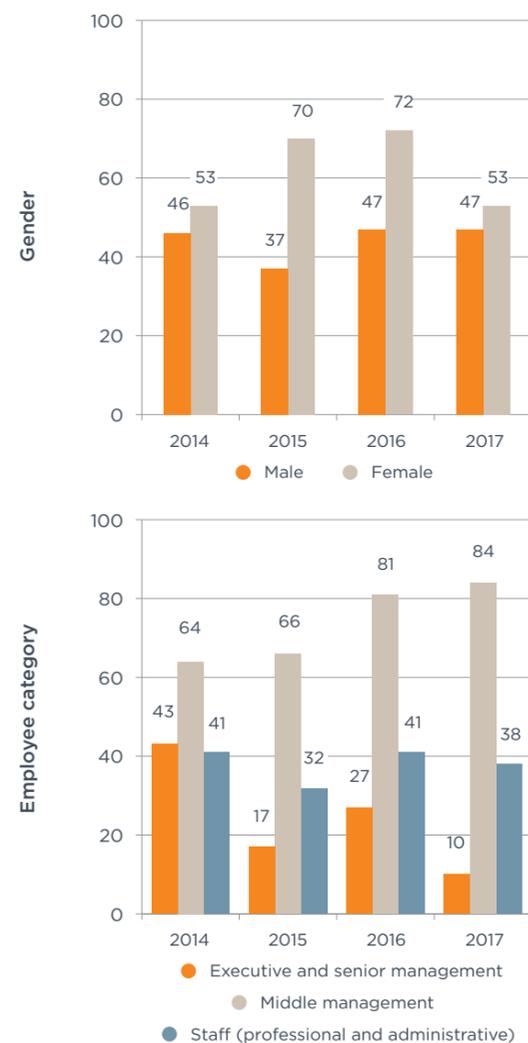
With a focus on both management training and technical skills, every year thousands of employees benefit from our training. Our in-house management training qualifications are accredited by the Institute of Leadership and Management³⁵, and as a result, we can issue our employees with globally recognised vocational qualifications.

In Guinea, we provide training and development opportunities for our own employees and for those of our contractors and subcontractors. In 2017, we conducted a six-week leadership and team management training programme aimed at developing the skills of local talent. GAC is progressively training 200 Guinean nationals to prepare them for roles with GAC.

EGA Technical Training Institute

Established in 1988, the EGA Technical Training Institute provides training for people working in our operations. We are licenced by the Knowledge and Human Development Authority to offer accredited courses to UAE Nationals. Our National Trainee Apprenticeship Schemes help young UAE Nationals pursuing careers in technical roles and cover subjects such as maintenance, instrumentation maintenance, electrical maintenance, mechanical maintenance, laboratory work, power operations, desalination and smelting.

Figure 34: Training hours in the UAE



³⁵ ILM is the UK's leading provider of leadership, coaching and management qualifications and training and a part of the City & Guilds Group.



06



Technology and innovation

Contributing to a modern knowledge-based economy



Technology and innovation

Technology development

For over 25 years, Emirates Global Aluminium has focused on technological innovation, improving the efficiency of our smelting process and operations. Our research and development work also indirectly supports the achievement of the 'UAE Vision 2021' goals of creating a knowledge-based economy and the 'National Innovation Strategy', which was launched in October 2014 and aims to make the UAE one of the most innovative nations in the world³⁶.

Our research and development focuses on increasing production efficiency, reducing our environmental footprint and reducing the amount of energy consumed during our aluminium smelting process. We have developed and used in-house technology in every smelter expansion since the 1990s, including the construction of our Al Taweelah smelter. In addition, we have retrofitted our older production lines with our own technology to improve their efficiency. All 2,777 reduction cells at EGA now use EGA technology.

In 2016, we became the first UAE industrial company to license our process technology to another company internationally³⁷. Aluminium Bahrain was the first company to select EGA's in-house developed technology to use at its new potline, in a commercial agreement after a competitive tender process.

Our reduction cell technology and advanced reduction cell control system enable us to achieve low greenhouse gas (GHG) emissions from our smelting operations.



EGA is committed to the direction set by the country's leaders of becoming a technology and innovation hub. Our talented workforce made up of highly qualified and competent UAE Nationals and Expats work hand in hand to put EGA and UAE on the international map by offering best-in-class smelting technologies. »

Dr. Ali Alzarouni
Executive Vice President,
Midstream Operations



At EGA, we are driven by technology. Our pursuit of class-leading technological excellence allows us to be efficient and competitive among the world's leading aluminium producers. »

Abdalla Alzarooni
Vice President of Technology
Development and Transfer,
Midstream

Our technology³⁸

The aluminium smelting process requires large amounts of electricity. Our technological challenge is to increase the productivity of the reduction cell, reduce the amount of energy consumed per tonne of aluminium produced, reduce environmental impact and minimise capital and operational costs.

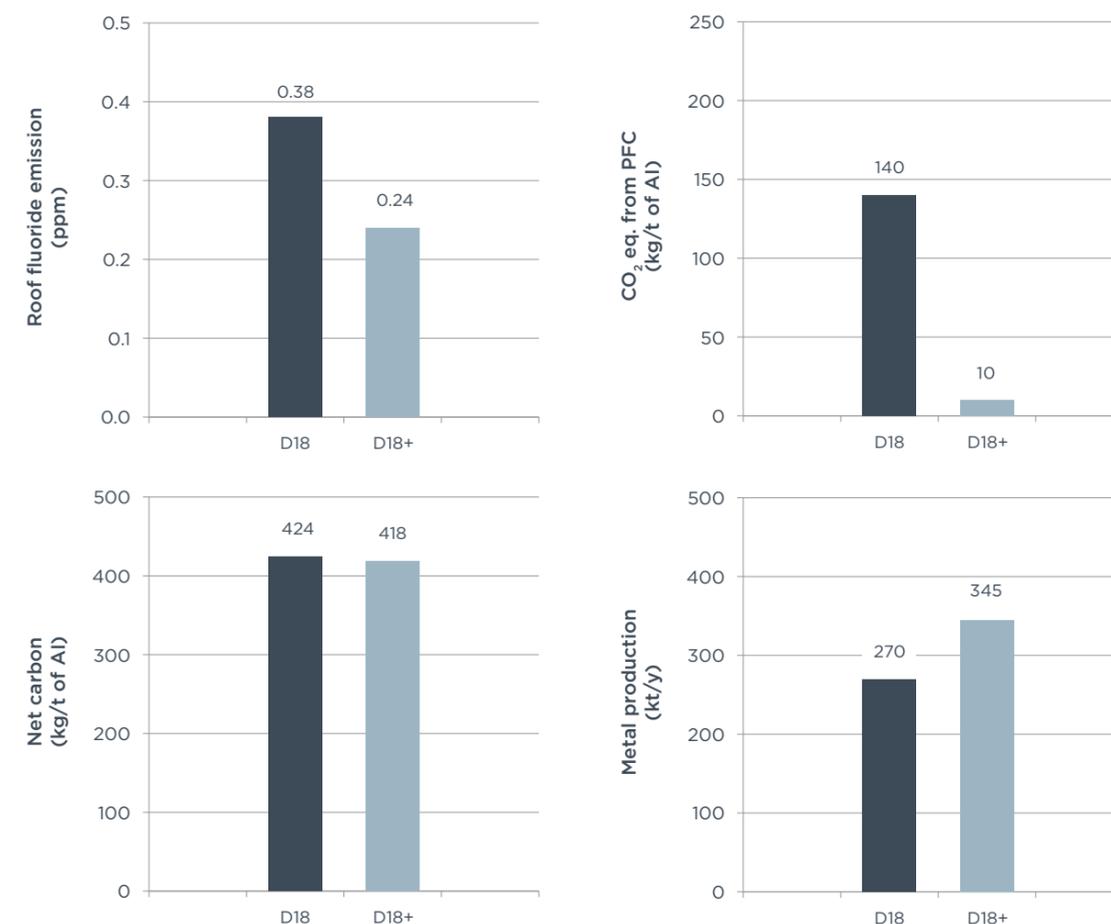
Our latest technologies drive efficiency and reduce impact on the environment by offering substantially reduced energy consumption. With seven reduction technologies running across 10 potlines in the UAE, our technologies are designed, modelled, tested and optimised in-house.

In Jebel Ali, EGA has retrofitted its original D18 potlines with the newly developed D18+ cell technology which will increase our hot metal

production by 47 thousand tonnes per year, while reducing the energy consumption by 1 kilowatt hour per kg of aluminium (kWh/kg Al); a significant reduction in environmental footprint.

DX+ Ultra cell technology has been selected for the smelter expansion project of a major aluminium producer in Bahrain. Steady pot operation has proven that DX+ Ultra technology is a high productivity and low energy technology.

Figure 35: D18+ technology improvements



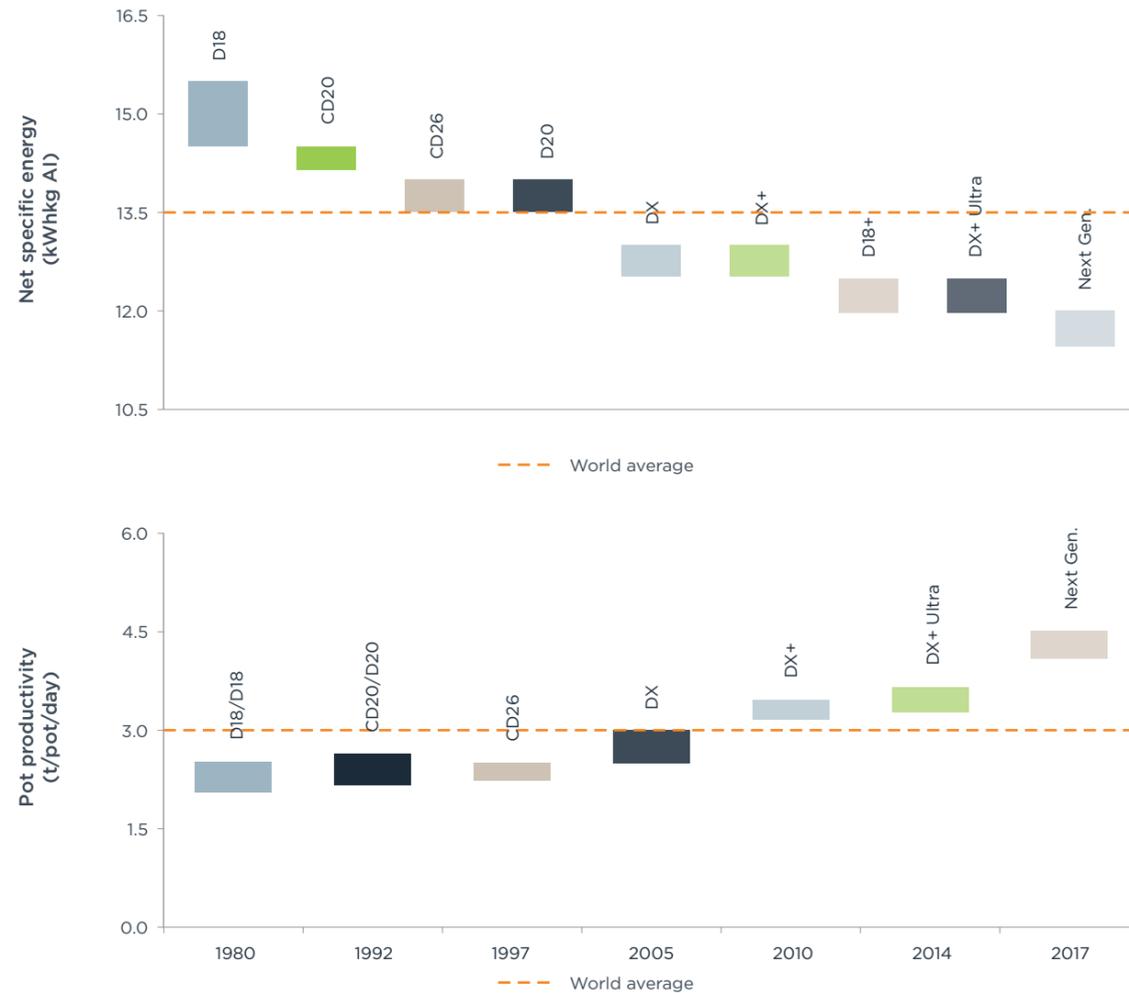
³⁶ Refer to the Official Portal of the UAE Government: <https://government.ae/en/about-the-uae/strategies-initiatives-and-awards/federal-governments-strategies-and-plans/national-innovation-strategy>.

³⁷ For more information, please refer to the EGA website: <https://www.ega.ae/en/innovation/>.

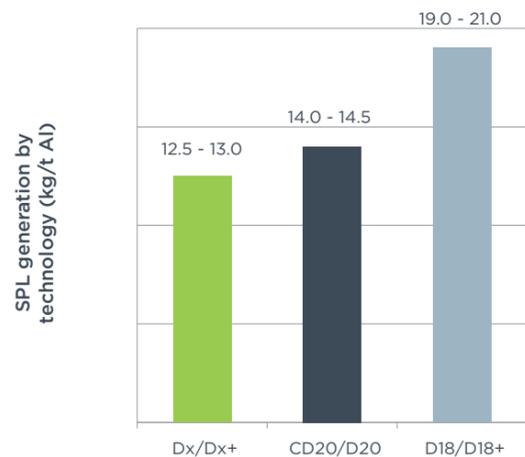
³⁸ Further information: "Implementation of D18+ Cell Technology at EGA's Jebel Ali Smelter" (D. Whitfield et al., 2017). A.P. Ratvik (ed.), Light Metals 2017, The Minerals, Metals and Materials Series, DOI 10.1007/978-3-319-51541-0_91.

"DX+ Ultra - EGA High Productivity, Low Energy Cell Technology". (A. Alzarouni et al., 2017). A.P. Ratvik (ed.), Light Metals 2017, The Minerals, Metals and Materials Series, DOI 10.1007/978-3-319-51541-0_93.

Figure 36: Improvements in productivity and energy efficiency



Note: IAI was referenced for the world average.



“Creativity and innovation never stop at EGA and the development of technology has continually improved our business performance and added value to the financial bottom line. Successfully developed and tested in-house over a number of years, our technologies such as D18+ and DX+ Ultra are one of the reasons EGA ranks amongst the leading aluminium companies in the world.”

Mahmood Abdulmalik
Senior Manager
Technology Engineering

R&D with leading universities

Our technological achievements were a result of both in-house R&D and collaboration with national and international universities. EGA's Centre of Excellence is a research centre and knowledge bank located at Al Taweelah. The centre conducts research into practical challenges in EGA operations, and proposes solutions that seek to optimise our internal processes, reduce our environmental impact and ultimately achieve cost savings for the company. EGA has partnered with a number of universities on research projects including Massachusetts Institute of Technology (MIT), Masdar Institute, American University of Sharjah, Rochester Institute and the University of New South Wales, Australia.

The main objectives of the Centre of Excellence are to:

- Work with local and international universities to carry out research activities into fields related to aluminium smelting
- Build a strong knowledge base in aluminium smelting in the UAE and across the Gulf Cooperation Council region
- Raise the appeal and gravitas of UAE universities and institutes by sponsoring research activities related to our operational activities
- Increase the technical knowledge level of our staff by sponsoring research projects as part of employees' PhD and Masters programmes

CASE STUDY

Research collaboration with MIT

Since 2015, we have hosted an annual research and development programme with students from the world-renowned MIT. Over a two-month period, graduate students from MIT join researchers from EGA to research and develop new technologies and identify innovative solutions to further improve our aluminium smelting processes. In 2017, six research projects were conducted and a total of eight postgraduates participated in this programme that leverages the talent, creativity and fresh approach of young engineers and provides them with an opportunity to gain research experience in a live and active setting. EGA is the first Middle East company to participate in this MIT programme.

“I really enjoyed the diversity of people. I also enjoyed the professionalism that I encountered throughout most of my interactions. It was an extremely well organised station. I could recognise how people were devoted to EGA and really cared. This is something I personally value in a work environment.”

Anatasia Nikolakopoulou
MIT graduate student



“The past three Practice School stations at EGA have been very successful, and we have been pleased with the variety of projects in which the students have been engaged, the level of project support at the company, and the quality of logistics and living arrangements. EGA has certainly been an excellent Practice School host, and we look forward to working with them over the next five years, continuing this strong collaboration.”

T. Alan Hatton
Ralph Landau Professor of Chemical Engineering Director, David H. Koch School of Chemical Engineering



“EGA's technology is competitive in productivity, energy efficiency, environmental performance, construction costs and cell life. Furthermore, our exceptional client support and focus on generating value for our clients complete our overall value proposition. Our successful technology transfer to Aluminium Bahrain is a great example.”

Jean Luc Faudou
Senior Manager
Technology Transfer

Bauxite residue R&D group

We have established a bauxite R&D group that is tasked with finding a responsible solution for the future management of bauxite residue from our alumina refinery. The group has created a bauxite residue roadmap that describes the challenges, processes and technologies required to achieve the goal of sustainably managing the approximately 2.5 million tonnes of residue that will be generated annually.

As part of this roadmap, EGA is working closely with several research and technology groups and institutions.

EGA has signed an agreement with the European research and technology organisation, VITO, to assess the potential for using bauxite residue in the UAE for the manufacture of large volume construction materials ranging from road base to cement and concrete, and even for refractory bricks for EGA's own aluminium smelters. EGA is also working with The University of Queensland's School of Agriculture and Food Sciences to investigate combining bauxite residue with agricultural and domestic wastes to create a soil for greening and other uses in the UAE.



Innovation from within

EGA has always focused on continuous improvement as a foundation for becoming and remaining globally competitive. Some of our innovations are derived from specific research and development activities. However, many are the result of input from employees in relation to work processes with which they are directly engaged. This is because continuous improvement is an integral part of our corporate culture. We emphasise the importance of employee's taking ownership of their work and being proactive in identifying opportunities for improvement in efficiency, sustainability and health and safety.

Our suggestion scheme and 'Tamayaz' programmes facilitate and reward innovative thinking at all levels in EGA and are an integral part of EGA's lean manufacturing approach. Lean manufacturing includes a set of principles used to achieve improvements in productivity, quality, and lead-time by eliminating waste through kaizen. Kaizen is a Japanese word that means 'change for the better' or 'good change' and central to a lean manufacturing approach is the philosophy that everyone can contribute to continuous improvement.

Suggestion scheme and 'Tamayaz' programme

Launched in 1981, our employee suggestion scheme is one of the longest running structured suggestion schemes globally and has been showcased to other companies as a benchmark. During the past 37 years, the suggestion scheme has generated hundreds of thousands of ideas from our employees, some of which have solved major bottlenecks. In 2017, employees submitted 34,420 suggestions of which 26,832 were implemented and rewarded; an increase of 38 per cent and 70 per cent, respectively. 83 per cent of our employees made at least one suggestion in 2017, compared to 75 per cent in 2016.

'Tamayaz' is the Arabic word for 'differentiate' or 'distinguish oneself'. Launched in 2016, the 'Tamayaz' programme is a team-based innovation scheme under which mid-level managers bring together their teams to identify and eliminate non value-added activities and improve process performance by understanding problems, conducting detailed analyses to find potential improvements, and implementing them. Internal Lean and Quality improvement experts provide relevant coaching to the 'Tamayaz' teams.

In 2017, AED 40 million (USD 11 million) of audited savings were generated by the suggestion scheme and 'Tamayaz' programmes. We recognise the best employee suggestions and the best 'Tamayaz' projects each month and at an annual company-wide event.



Figure 37: Suggestion scheme achievements



Innovation awards in 2017

EGA employees won three awards in 2017 at the Ideas America³⁹ competition for ideas that were originally submitted through EGA's suggestion scheme. Their winning suggestions included:

- **Safety Idea of the Year (Gold) Award:** Reduced safety risks associated with ingot transfer process
- **Green Idea of the Year (Bronze) Award:** Improving our recycling rates
- **Individual Idea of the Year (Bronze) Award:** Improved efficiencies with material screening during smelting pot startup operation

In 2017, EGA won the SEER⁴⁰ Performance Excellence Silver Award for suggestions per 100 employees and the SEER Performance Excellence Award for total dollars saved.

Through the 'Tamayaz' programme, EGA also won two gold awards from the Dubai Quality Group for continuous improvement:

- **Lean Six Sigma Category (1st Place):** Improved efficiencies in communications between the reduction unit and cast house
- **Innovation Category (1st Place):** In-house development of petroleum coke blending system - resulting in a 10 per cent reduction of quality rejection rate, 1.3 million kWh power saving and 9.45 million kg of carbon footprint reduction



“ I am very happy to receive this award, which is an excellent morale booster that will encourage me to continue doing my best work. My family is very proud of my work because this is my first award in my professional life. I would like to thank the management for taking my suggestion to an international forum. This award has motivated me to do more in my professional life. ”

Dileepan Soundararajan
Senior Technician (Gold award winner of Ideas America)



³⁹ Ideas America is a leading professional association assisting organisations in idea management. For further information: <http://www.ideas-america.org/>.

⁴⁰ SEER stands for Savings Per 100 Eligible Employees Ratio. This is calculated by taking annual net savings dollars divided by number of eligible employees.



Our innovation journey

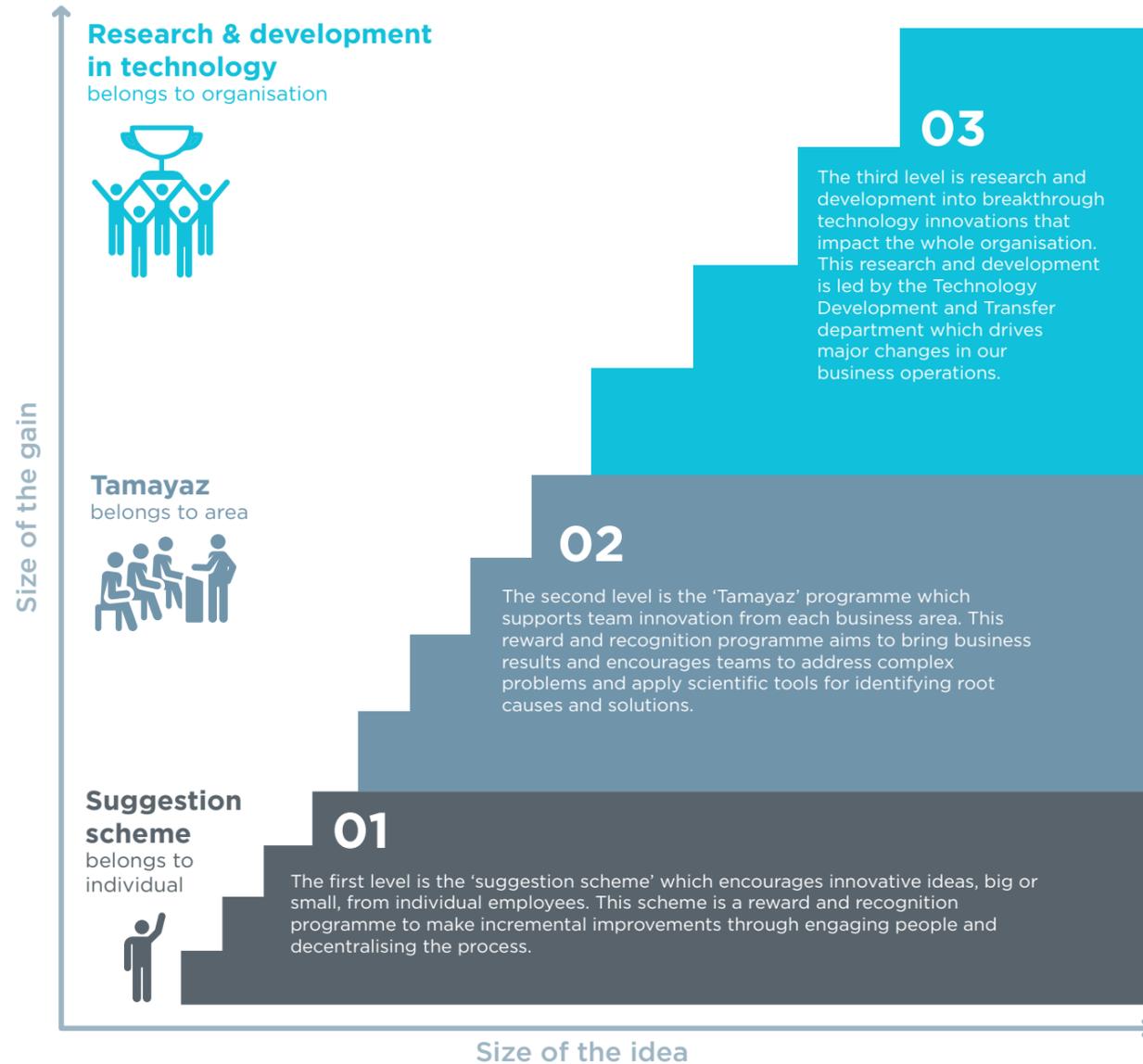
EGA developed a model to capture and implement innovative ideas from every level and department of our organisation. This 'EGA Innovation Journey' includes three levels of innovation. The higher the level, the bigger the scope of the idea and its value creation.



“Innovation is a core value at EGA and integral to our culture. Our 'EGA Innovation Journey' drives this culture and encourages innovation from every part of our business. We firmly believe that involving our employees helps to keep us at the top of our industry in terms of value-added products and responsible operations.”

Ignacio Gatell
Director of Lean Quality & Business Transformation, HSSEQ

EGA Innovation Journey



07



Appendices

External assurance



Independent Limited Assurance Report to Emirates Global Aluminium

Conclusion

Based on the evidence we obtained from the procedures performed, we are not aware of any material misstatements in the Selected Performance Areas as described below, which is prepared in accordance with GRI Standards Principles for Defining Content and Quality for the period ending 31 December 2017.

Information Subject to Assurance

The Selected Performance Areas as presented in the Emirates Global Aluminium (EGA) Sustainability Report 2017, subject to assurance, comprise the following:

Selected Performance Areas	Page no.
2017 Safety Performance Data (Limited to Injury Rate, Fatalities, and Near Miss Reporting)	11, 52-56,
2017 Occupational Health Management	58-59
2017 Energy and GHG Emissions (Limited to Total Scope 1 and 2, and Energy Consumption)	37-39
Emiratization disclosures	75
Learning and Development disclosures	57, 66
Volunteering disclosures	61-63, 76
UAE Residential Camp disclosures	15, 38, 56, 65

Criteria Used as the Basis of Reporting

The GRI Standards Principles for Defining Content and Quality ("the criteria"), as published by the Global Reporting Initiative is the criteria used as the basis of reporting and our audit work.

Basis for Conclusion

We conducted our work in accordance with International Standard on Assurance Engagements ISAE 3000 (Standard). In accordance with the Standard we have:

- used our professional judgement to plan and perform the engagement to obtain limited assurance, where, we are not aware of any material misstatements in the Selected Performance Areas, whether due to fraud or error;
- considered relevant internal controls when designing our assurance procedures, however we do not express a conclusion on their effectiveness; and
- ensured that the engagement team possess the appropriate knowledge, skills and professional competencies.

Summary of Procedures Performed

Our limited assurance conclusion is based on the evidence obtained from performing the following:

- enquiries with relevant EGA management and staff to understand EGA's process for determining material issues;
- the process for developing the Selected Performance Areas within the EGA Sustainability Report 2017

- enquiries with relevant EGA management and staff to understand the internal controls, governance structures and reporting processes for the Selected Performance Areas;
- analytical procedures over the Selected Performance Areas;
- site visits to Jebel Ali and Al Taweelah;
- walkthroughs of the Selected Performance Areas to source documentation;
- evaluating the appropriateness of the criteria with respect to the Selected Performance Areas; and
- considering that the appropriate indicators have been reported in accordance with the GRI Sustainability Reporting Standards Core level of disclosures; and
- reviewed the EGA Sustainability Report 2017 in its entirety to ensure it is consistent with our overall knowledge of EGA's sustainability approach.

How the Standard Defines Limited Assurance and Material Misstatements

The procedures performed in a limited assurance engagement vary in nature and timing, and are less extensive than those procedures performed for reasonable assurance. Consequently the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had reasonable assurance procedures been performed.

Misstatements, including omissions, are considered material if, individually or in the aggregate, they could reasonably be expected to influence relevant decisions of the Management of EGA.

Use of this Assurance Report

This report has been prepared for the Management of EGA for the purpose of providing an assurance conclusion on the Selected Performance Areas, and may not be suitable for another purpose. We disclaim any assumption of responsibility for any reliance on this report, to any person other than the Management of EGA, or for any other purpose than that for which it has been prepared.

Management's Responsibility

Management are responsible for:

- determining that the criteria are appropriate to meet their needs;
- preparing and presenting the Selected Performance Areas in accordance with the criteria; and
- establishing internal controls that enable the preparation and presentation of the Selected Performance Areas that is free from material misstatement, whether due to fraud or error.

Our Responsibility

Our responsibility is to perform a limited assurance engagement in relation to the Selected Performance Areas for the period end 31 December 2017, and to issue an assurance report that includes our conclusion.

Our Independence and Quality Control

Our work was performed in compliance with the requirements of the International Federation of Accountants (IFAC) Code of Ethics for Professional Accountants, which requires, among other requirements, that the members of the assurance team (practitioners) as well as the assurance firm (assurance provider) be independent of the assurance client, in relation to the scope of this assurance engagement, including not being involved in writing the Report. The firm applies ISQC 1 and the practitioner complies with the applicable independence and other ethical requirements of the IESBA code.

KPMG

Raajeev Batra

Partner

Abu Dhabi

22 July 2018

GRI content index

GRI Standards	Disclosure	Page number(s) and/or URL(s)	Omissions and clarifications
General Disclosures			
GRI 102: General Disclosures 2016	Organisational profile		
	102-1 Name of the organisation	Front cover	
	102-2 Activities, brands, products, and services	12-15, 24	
	102-3 Location of headquarters	14	
	102-4 Location of operations	14-15	
	102-5 Ownership and legal form	14-15	
	102-6 Markets served	25	
	102-7 Scale of the organisation	14-15, 25, 30	
	102-8 Information on employees and other workers	70-72	
	102-9 Supply chain	32-33	
	102-10 Significant changes to the organisation and its supply chain	32-33	
	102-11 Precautionary principle or approach	32, 36-37	
	102-12 External initiatives	18	
	102-13 Membership of associations	16	
	Strategy		
	102-14 Statement from senior decision-maker	9	
	Ethics and integrity		
	102-16 Values, principles, standards, and norms of behaviour	16	
	Governance		
	102-18 Governance structure	16-17	
Stakeholder engagement			
102-40 List of stakeholder groups	19		
102-41 Collective bargaining agreements	70		
102-42 Identifying and selecting stakeholders	19		
102-43 Approach to stakeholder engagement	19-20		
102-44 Key topics and concerns raised	18, 20-21		

GRI Standards	Disclosure	Page number(s) and/or URL(s)	Omissions and clarifications
Reporting practice			
	102-45 Entities included in the consolidated financial statements	14-15	
	102-46 Defining report content and topic boundaries	21	
	102-47 List of material topics	20-21	
	102-48 Restatements of information	No restatements	
	102-49 Changes in reporting	No changes	
	102-50 Reporting period	6	
	102-51 Date of most recent report	6	
	102-52 Reporting cycle	6	
	102-53 Contact point for questions regarding the report	6	
	102-54 Claims of reporting in accordance with the GRI Standards	6	
	102-55 GRI content index	96	
	102-56 External assurance	94	

Material Topics

GRI 300 Environmental Standards Series

Energy			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 37-38	
	103-2 The management approach and its components	37-38	
	103-3 Evaluation of the management approach	37-38	
GRI 302: Energy 2016	302-1 Energy consumption within the organisation	37-38	
	302-3 Energy intensity	37-38	
Emissions			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 38-41	
	103-2 The management approach and its components	38-41	
	103-3 Evaluation of the management approach	38-41	
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	38	EGA does not have any source of biogenic CO ₂ emissions. Emission values derived from operational control.
	305-2 Energy indirect (Scope 2) GHG emissions	39	Emission values derived from operational control.
	305-4 GHG emissions intensity	38	
	305-7 Nitrogen oxides (NO _x), sulphur oxides (SO _x), and other significant air emissions	40-41	

GRI Standards	Disclosure	Page number(s) and/or URL(s)	Omissions and clarifications
Effluents and Waste			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 42-47	
	103-2 The management approach and its components	42-47	
	103-3 Evaluation of the management approach	42-47	
GRI 306: Effluents and Waste 2016	306-1 Water discharge by quality and destination	42-43	
	306-2 Waste by type and disposal method	44-45	
	306-3 Significant spills	48	
	306-4 Transport of hazardous waste	47	EGA does not import hazardous waste. All waste data are collated internally by the environment and waste department.
Environmental Compliance			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 48-49	
	103-2 The management approach and its components	48-49	
	103-3 Evaluation of the management approach	48-49	
GRI 307: Environmental Compliance 2016	307-1 Non-compliance with environmental laws and regulations	48-49	
Supplier Environmental Assessment			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 32	
	103-2 The management approach and its components	32	
	103-3 Evaluation of the management approach	32	
GRI 308: Supplier Environmental Assessment 2016	308-1 New suppliers that were screened using environmental criteria	32	

GRI 400 Social Standards Series

Occupational Health and Safety			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 52-59	
	103-2 The management approach and its components	52-59	
	103-3 Evaluation of the management approach	52-59	
GRI 403: Occupational Health and Safety 2016	403-2 Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	54-56	

GRI Standards	Disclosure	Page number(s) and/or URL(s)	Omissions and clarifications
Training and Education			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 76	
	103-2 The management approach and its components	76	
	103-3 Evaluation of the management approach	76	
GRI 404: Training and Education 2016	404-1 Average hours of training per year per employee	76	
Non-discrimination			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 64-66	
	103-2 The management approach and its components	64-66	
	103-3 Evaluation of the management approach	64-66	
GRI 406: Non-discrimination 2016	406-1 Incidents of discrimination and corrective actions taken	66	
Local Communities			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 60-63	
	103-2 The management approach and its components	60-63	
	103-3 Evaluation of the management approach	60-63	
GRI 413: Local Communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	60-63	

Organisation Specific Material Topic

Innovation			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 86-89	
	103-2 The management approach and its components	86-89	
	103-3 Evaluation of the management approach	86-89	
Innovation	Innovation and employee engagement	86-90	

GRI Mining and Metal Sector Supplement 2013

Emergency Preparedness			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 52, 57	
	103-2 The management approach and its components	52, 57	
	103-3 Evaluation of the management approach	52, 57	
Emergency Preparedness	Existence of emergency plans, how they are prepared and their content	52, 57	
Materials Stewardship			
GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its boundary	21, 49	
	103-2 The management approach and its components	49	
	103-3 Evaluation of the management approach	49	
Materials Stewardship	Programs and progress relating to materials stewardship	49	



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