CLIMATE CHANGE AND ENVIRONMENTAL IMPACTS REPORT 2014/15

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OUR STEWARDSHIP

Illovo's commitment to improve environmental management processes is underpinned by continuous improvement in the management of direct environmental impacts across its value chain. Being mindful of the role that we play in relation to the sustainable development of the regions in which we operate and our strong interdependence with the local communities and natural environments in those areas, our management of the environment is guided by the commitment to minimising any negative impacts that we may have on the environment, or which may contribute to climate change.

Guided by the United Nations Global Compact Principles ("UN Global Compact"), our environmental strategy supports a precautionary approach to environmental challenges, focuses on initiatives to promote greater environmental responsibility and encourages the use of environmentally friendly technologies.

To achieve these objectives, our operations are required:

- to continuously improve their sustainability-linked environmental practices, to conserve raw materials, reduce greenhouse gas emissions and energy intensity, entrench climate change mitigation and adaptation strategies, promote responsible manufacturing and undertake sustainable agriculture practices;

- to introduce environmentally-friendly initiatives such as responsible waste disposal programmes (thereby reducing our solid waste per ton of product produced), maximise the reuse of the by-products of our manufacturing processes, optimise our water footprint per ton of cane produced and implement our water risk management and monitoring strategy;

- to create wider environmental stakeholder awareness and improve responsiveness to key environmental-related performance indicators, including threats brought about by climate change;

- to undertake rigorous assurance and external audits, not only to address legal liability, but also to ensure the implementation of a precautionary approach in relation to the management of environmental impact;

- to leverage improved environmental performance in our supply chain (eg, quantifying and monitoring greenhouse gas emissions from third-party transporters), managing environmental impacts and focus on weather-related supply chain disruptions.

Our environmental reporting, which is guided by the Socially Responsible Index of the JSE Limited ("SRI Index") and the Global Reporting Initiative's G3 Guidelines ("GRI"), is structured to reflect the inputs, outputs and impact the organisation has on the environment. Materials, energy and water represent three inputs used by all of our operations. These inputs result in outputs feeding into the environment, which are reported under the headings of emissions, effluent and waste. We also report on land and biodiversity as inputs as these are viewed as natural resources.

We also respond publicly to the CDP water and climate change reporting requirements.

In line with the GRI reporting requirements, aspects which are material to our businesses have been determined and their materiality is based on their impact or potential impact, the risks they pose or opportunities they present, as well as factors which influence assessments of the organisation by stakeholders. Relevant laws and regulations which are applicable to our operations and stakeholders are also considered to be material.

In order to streamline challenges linked to monitoring and reporting of sustainability related indicators, Illovo has implemented a data management and reporting solution which will enhance the group's sustainability data reporting function (Report 360). Through increased training, reporting frequency and the continuation of both internal and external assurance, we aim to improve on data accuracy and reliability, as well as alleviate the problems associated with non-standardised reporting methods throughout the group. The system provides a common interface for reporting, approval, analysis and auditing of data, and as a result is expected to improve the way our operations collect and collate their site-specific environmental and climate change data. The system will also streamline group quarterly and annual reporting, by providing one access point for all data, while simplifying group-level monitoring of each site's reporting.

Environmental management at our operations is presently implemented in accordance with ISO 14001 in Swaziland and two sites in South Africa and in accordance with the NOSA Integrated Five Star management system at all of the remaining sites. We are working to align our sustainability-linked environmental and social management processes to "PAS 99", a Publicly Available Specification for integrating common management systems through a group-wide project known as Project Totus. This will ensure that our processes are consistent with internationally-recognised frameworks and certification programmes to demonstrate sustained compliance, guidance and policy-direction both internally and externally. We aim to conduct the first PAS 99 assurance process during the current 2015/16 reporting period.

Illovo understands the need to create increased value by improving the extent of our control of environmental risks introduced by contractors and suppliers into its operations. We continue to improve on environmental and social risk related specifications and implement assurance processes for key suppliers, thereby ensuring they comply with environmental and social standards similar to our own.

In respect of the UN Global Compact and with reference to the Rio Declaration on Environment and Development, Illovo's precautionary approach is that when considering new business ventures and expansions, comprehensive due diligence and environmental impact assessments are undertaken to ensure that potential negative environmental impacts are identified and mitigated. Our operations continuously identify and where appropriate, implement technical and financially-feasible pollution prevention principles and techniques. Where avoidance is not possible, our goal is to minimise adverse, social and environmental impacts.

The Sezela River lagoon, adjacent to our Sezela sugar and downstream manufacturing complex in KwaZulu-Natal, South Africa, is continuously monitored is to minimise adverse, social and environmental impacts.

In a further example of our progress towards sustainable agriculture, the World Wildlife Fund, in partnership with the Noodsberg Cane Growers' Association and supported by our own Noodsberg sugar factory and refinery, was instrumental in the development of a Sustainable Sugar Cane Farm Management system for growers, termed SUSFARMS®. This concept is based on three fundamental environmental principles for sustainable sugar cane production - natural assets are conserved, critical ecosystems are maintained and agricultural resources are used sustainably, all in conjunction with social and economic drivers. Performance relative to the principles is judged according to verifiers, resulting in a creditable certification system for implementation at other sites. The South African Sugarcane Research institute (SASRI) continues to enhance the SUSFARMS® model. Through our membership of the South African sugar industry, we contribute to the pursuit and practice of the SUSFARMS® ideology in this country.

TECHNOLOGY, RESEARCH AND DEVELOPMENT

Illovo's future sustainability objectives are underpinned by technology, research and development. Our climate change mitigation indicators are directed at promoting energy efficiency initiatives and advancing the use of clean technology where appropriate.

In order to optimise the return from our existing installed capacity, we have well established in-house resources which provide technical expertise in agriculture, sugar production and downstream product manufacture at all operations. A centralised core of expertise exists to ensure technical standards are optimised and maintained for both existing equipment and new agricultural and factory installations and to keep abreast of technical innovations. This in-house function is also involved in investigating opportunities to expand our operations and in the planning and implementation of approved projects.

We continue the collaboration between our technical services function and AB Sugar with regard to the application of new technology, energy efficiency improvements and process performance optimisation. Our Continuous Improvement (CI) initiatives focus on enhancing productivity and reducing cost of production at all our operations, with emphasis on benchmarking and optimising operational performance across the group.

We continue to benefit from research and development undertaken by the South African Sugar Milling Research Institute and SASRI. These organisations are funded by the member sugar companies, including Illovo, which are represented on the respective boards of these institutes.

Illovo has a dedicated team which pursues opportunities for the development and commercialisation of downstream products and new applications. In this regard, we collaborate with both local and international research organisations and outsource certain work as appropriate.

Illovo produces a number of products utilising bagasse and biomass generated from its operations and exports excess electrical energy into the national grid from certain of its operations. In addition to sugar, syrup, ethanol and lactulose, the downstream plant at Sezela uses the bagasse from its manufacturing operations to produce furfural – a common agricultural by-product resulting from sugar cane milling – and its many derivatives, including environmentally-friendly agricultural chemicals to control nematode infestation of agricultural food crops and turf.

During the year under review, Illovo spent R11.7 million on research into new technologies and product development-related interventions (R13.4 million during the previous financial year).

BIODIVERSITY

We operate over vast tracts of land, some of which are situated in close proximity to areas of potential ecosystem sensitivity. The protection of biodiversity is addressed formally in new projects through environmental impact assessments (EIAs) and in existing agricultural operations through managing farming activities according to the field conservation guidelines advocated by SASRI and the SUSFARMS® initiatives, so as to ensure sustainable agricultural production, with limited negative impacts on the environment. During the year under review, the increased area developed for the cultivation of sugar cane did not results in any impacts on aspects of biodiversity within the footprint of our current operations.

Illovo's focus on SUSFARMS® ensures that we continuously manage the threats of degradation of freshwater resources adjacent to our operations and river buffer areas, preventing biodiversity loss, soil erosion, land degradation, as well as managing sugarcane burning and greenhouse gas emissions. During the year under review, Illovo's agricultural operations in South Africa undertook the SUSFARMS® V2 "Progress Tracker" self- audit, with the majority of farms achieving high scores for both legal and social compliance. Challenges regarding the environmental viability were mainly in relation to the control of noxious invader weeds and the formulation of land use plans. The adoption of SASRI derived Better Management Practices (BMP's) is also well entrenched on the majority of our farms.

Our operations in Tanzania and Mozambique undertook SUSFARMS® V2 self-audits utilising the "Progress Tracker". However, due to the differing legal requirements in those countries, a custom-built SUSFARMS® model will be required for our operations outside South Africa.

SUSFARMS® V3 audit criteria from the "Progress Tracker" have been included into Project Totus, which will be used during audits at all operations during the 2015/16 season.

Illovo continues its endeavours to preserve and manage the areas surrounding its operations which have high biodiversity conservation status. We are mindful of our potential impacts on these areas and support a number of initiatives to preserve ecosystem integrity and protect biodiversity. These include:

- management of 1 825 ha of the Mhlosinga Nature Reserve at Ubombo in Swaziland;
- management of 400 ha of Nyala Park and impact on outfall areas of high conservation importance such as Lake Malawi and the Elephant Marsh in Malawi;
- continued support of 49 000 ha of the Mwananchingwala Conservation Area adjacent to the Nakambala estate in Zambia;
- continued support of conservation projects to protect 1 597 ha of the Magombero Forest adjacent to the Kilombero estate in Tanzania;
- on-going support of the Malawian Government Re-forestation Initiative in Shire Valley; and
- on-going surveys for invader species and the implementation of an eradication plan to protect riverine vegetation adjacent to steep forested areas not under cane at Sezela in South Africa.

A number of our operations are located near to resources of conservation importance such as the Selous National Park in Tanzania and the Incomati Estuary in Mozambique and our risk management process aims to ensure that our operations do not negatively impact these surrounding natural environments and communities. During the year under review, no events of significant biodiversity impacts were reported by any of our operations as a result of our activities, products and services in these protected areas and areas of high biodiversity value outside protected areas which are adjacent to our operations.

We have identified further improvements in our biodiversity management strategy and have implemented a risks and impacts identification process as part of Project Totus. We engage with external experts with appropriate regional experience to assist in the development of mitigation systems to verify the implementation of biodiversity plans at each of our operations. The biodiversity strategy and action plan will in future include other aspects such as the revision of previous studies, new biodiversity monitoring studies for species of special concern (as identified in the International Union for the Conservation of Nature (IUCN) Red and national conservation species lists) and seeking wilderness value qualification for our nature reserves and other protected areas adjacent to our operations.

INPUTS

Water

Water, which is a vital raw material for all of our operations, is sourced directly from rain, sustainable, secure and legally compliant water resources such as rivers, lakes, dams and indirectly from municipal service providers. Water consumption volumes are measured using a variety of site-specific methods to ensure on-going compliance with water use licenses, and is reported internally on a daily basis.

The Kafue River in Zambia provides a secure and sustainable source of irrigation water for our cane fields, and those of our outgrowers

Rain water consumption is measured as/when rain occurs solely to allow process engineers to continuously monitor water consumption requirements, and for the forecasting of yields. However, this data is not used for the calculation of reported water consumption data, as this does not affect water use licenses.

At most sites, water consumption is calculated via abstraction pump clock hour registers, using flow rates and time of operation to determine how much water is drawn from primary sources (ie, rivers, lakes and dams). Where possible, mechanical flow meters have been installed on incoming pipes and distribution pipes to allow for the determination of a water mass balance. This not only allows for accurate reporting of all water consumption, but also assists with ensuring that water is not lost between abstraction and use points via hard to locate leaks.

At sites where pump clock hour registers and/or flow meters are unavailable, partial flumes, portable ultra-sonic flow meters, current meters and functioning v-notches.

At all relevant sites, flow meters are calibrated annually and piezometers or infra-red sensors are used to measure flows through flumes and v-notches.

Water discharge volumes and methods also vary by site, but are monitored to ensure compliance with relevant national statutes (eg, discharge qualities and quantities). As part of our overall water management strategy, water management models have been customised to improve water efficiency opportunities in an effort to reduce water consumption and maximise the recycling of water in our secondary processes.

Total water abstraction across all operations

	2014/15			2013/14			2012/13		
Tons Sugar produced	**1 759 760**			**1 830 356**			**1 746 078**		
Source	**Megalitres consumed**	**%**	**Ml per ton of sugar**	**Megalitres consumed**	**%**	**Ml per ton of sugar**	**Megalitres consumed**	**%**	**Ml per ton of sugar**
Surface (rivers)	**953 455**	**95.89**	0.5418	942 695	99.78	0.5150	866 369	99.67	0.4962
Ground (borehole)	***39 867**	**4.01**	0.0227	980	0.09	0.0005	1 330	0.15	0.0008
Municipal	**1 032**	**0.10**	0.0006	1 248	0.13	0.0007	1 582	0.18	0.0009
Total	**994 354**	100	**0.5651**	**944 923**	**100**	**0.5163**	**869 281**	**100**	**0.4978**

**The increase in groundwater supplement used is a result of inadequate water released from the hydropower unit in the Rufiji river basin in Tanzania.*

Total water abstracted per ton of sugar produced has increased in the current reporting period to 994 354 megalitres or 0.565 megalitres per ton of sugar produced (2014: 0.516 megalitres per ton of sugar produced) predominantly due to the lower than normal rainfall at the various agricultural sites.

Illovo recognises that water is a global resource that requires local management. Ensuring access to a reliable supply of water is a critical strategic priority for the group to meet both its business needs and those of the surrounding communities, in a sustainable manner. We operate in the following water basins which are exposed to varying degrees of water risk that could impact negatively on our businesses, ie:-

- Pongola – Mzimkhulu basin in South Africa
- Zambezi water basin in Malawi and Zambia
- Rufiji water basin in Tanzania
- Incomati water basin in Mozambique
- Maputo water basin in Swaziland

In 2011, we engaged WSP Environmental and Energy, an international environmental and sustainability consultancy, to assist us with improved systems for the quantification of our total water consumption, to assess water-related risks and to develop a strategy guiding water governance, management, monitoring and reporting. Following a group-wide water foot-printing exercise, these specialists assisted with developing the group's water footprint and water management strategies which monitors consumption, risks, opportunities and strategic management requirements, which are aligned to the group's Water Footprint Assessment Manual (2011).

As part of the water management strategy we aim to reduce the loss of sugar production to inadequate irrigation efficiency to less than 2% of budgeted sugar production. The following are mitigation and adaptation strategies implemented during the reporting year:

- Continuing irrigation upgrades is in progress at irrigated estates, with the more efficient drip irrigation installed in Swaziland;
- Soil water probes were phased in at Ubombo and Nchalo;
- Surface irrigation simulation and optimisation programmes were initiated in Tanzania, Zambia, Malawi and Swaziland to optimise flood irrigation; and
- Remote Cane Management system (eLeaf) is being tested in Malawi.

Throughout our operations, our outgrowers benefit from investments in new technology, including interaction with research groups such as SASRI, in order to manage this risk. In Zambia, where water scarcity is of particular concern, Illovo has funded the development of water conveyance infrastructure to service vulnerable outgrowers, thereby helping to ensure sustainable sugar cane supply.

As water availability declines and increases in water demand unfold, we expect increased competition for this scarce resource. As a means of understanding and managing the risks associated with this issue, all of our operations are represented within the local catchment forums to assist with monitoring

consumption by all users and to ensure we remain informed of any potential future changes to legislation regarding water usage.

The success of our operations is also intrinsically linked to climate changes in precipitation patterns; the frequencies of extreme weather events, including droughts and temperature and radiation variables which have the potential to impact our businesses, resulting in lower yields and leading to the inability of our factories to fully utilise capacity. Current controls in place to mitigate against adverse weather conditions include:

- development of agriculture infrastructure including drainage systems, dykes and canals;
- irrigation systems in place at most non-South African operations;
- use of weather forecasting tools and early warning systems for flooding;
- continually evaluating and selecting drought tolerant cane varieties.

Climate Change Responses

Our agricultural operations have been negatively affected by drought and frost conditions in South Africa, dry conditions in Mozambique, Swaziland and Zambia, heavy rains and flooding in Southern Malawi and Mozambique and increased pest activity especially Aphid and Thrips in Mozambique, Swaziland, Zambia and Southern Malawi, which occurred as a result of a prolonged dry season. As a result, focus has been placed on increasing the resilience of our dry land operations to drought and increasing inter-annual and annual rainfall variability. Mechanisms to achieve this include the development and cultivation of resilient cane varieties and soil management techniques aimed at water conservation. As an adaptation strategy, Illovo Sugar continues to cultivate varieties that are only bred through the conventional breeding process and to mitigate the risk of the spread of pests and diseases by having a variety policy which does not allow for more than 30% of the area under cane to consist of one variety type.

Illovo also provides essential water services to a number of communities situated near or within our estates.

INPUTS

Energy and other materials inputs

The input materials used in the group's production processes are relevant to the extent that they impact on the conservation of the global resource base and are the focus of our efforts to reduce resource intensity and the management of our total operational costs. Where practical, we use input materials that promote environmental responsibility. Factory by-products, in the form of filter cake, vinasse and boiler ash are applied to cane fields as natural fertilisers, while herbicides, pesticides and fungicides are applied at an average rate of less than 1 litre per annum for every seven tons of cane grown. The use of our by-products as nutrient supplements decreases the group's reliance on organic fertilisers, thereby resulting in decreased costs, resource intensity and greenhouse gas (GHG) emissions.

In the sugar production process, steam is generated using bagasse, which is the renewable fibrous residue that remains after the extraction of juice from the crushed stalks of sugar cane. This steam is used to provide the process heating requirements of the sugar production process, and then to generate renewable electricity through co-generation. The electricity is primarily used within the sugar manufacturing process, to power milling, refining and packaging processes, with excess exported to provide electricity for irrigation of the agricultural estates, other downstream processes and national electricity grids.

In certain operations, the energy derived from bagasse is not sufficient to provide all energy requirements of the production processes and supplementary fuel is required. Supplementary fuels include biomass and wood/woodchips, which are renewable and coal, which is non-renewable.

During the year under review, Illovo's operations utilised approximately 4.4 million tons of bagasse and 143 000 tons of biomass (including woodchips), all used to generate 32 302 982 GJ of energy, or 90% of the Group's total energy consumption. This equates to 18.36 GJ of energy per ton of sugar produced, derived from renewable energy sources, compared to 18.78 GJ of energy of sugar produced in the previous reporting period.

The largest use of non-renewable energy across Illovo occurs at our four sugar mills, as well as two ethanol distilleries in South Africa, and our Ubombo mill in Swaziland. During the year under review, these manufacturing operations collectively consumed 55 811 tons of coal, resulting in an equivalent energy intensity of 0.032 tons of coal per ton of sugar produced.

Various chemicals are used in both sugar and downstream processing, with the biggest quantities being:

- 0.662 million litres of sulphuric acid;
- 7.057 million litres of hydrochloric acid;
- 0.497 million litres of phosphoric acid; and
- 5.266 million litres of flocculent (Seperan – LT27 and Magnafloc – R300).

The process chemicals are issued from stock and process consumption is maintained within process dosage protocols.

Associated with the above, Illovo used 0.522 million litres of oils and lubricants which represents 0.321 litres of oils and lubricants during the reporting period.

Recycled input materials in our operations are limited to toner cartridges and copper chrome catalyst. The latter is sent to the manufacturer, BASF in Germany, which returns the processed material to our downstream plant for reuse. A total 7 tons of copper chromate catalyst was recycled during the reporting period.

Illovo is actively working to reduce the volume of materials it procures and considers reusable material where appropriate. This focus has led to the use of recyclable packaging material and the procurement of reusable and recyclable bulk polypropylene bags. A total of 11 643 tons of recyclable packaging

material or 0.0066 tons of recyclable packaging per ton of sugar produced (2014: 0.0047 tons of recyclable packaging ton sugar produced) of packaging material was used during the 2014/15 season, representing a 40.4% increase in packaging per ton of sugar produced. This increase is attributed to a new packing plant operating in Eston, which has shifted packaging from bulk supply to consumer volumes, and also includes increased sugar packed at Nakambala, Kilombero, Noodsberg and Umzimkulu.

Energy efficiency remains important to Illovo, given the growing demand for and increasing cost of energy and the corresponding impact on the environment, together with that of the risk of power outages from national grids. We are also aligning our business to play an increasingly significant role in global GHG mitigation and are working to decrease our consumption of non-renewable energy and increase our generation of renewable energy in the form of electricity. In the short term, we are focused on improving the energy efficiency of our production processes. This includes employing better management systems, improving our staff awareness and investing in new technologies.

During the year under review, our Ubombo mill in Swaziland, with its integrated co-generation facility, exported a total of 47.8 GWh of generated electricity to the Swaziland national grid, an increase from 44.8 GWh exported during the previous season.

The most substantial business decisions, which are directly influenced by climate change considerations, include driving research and development initiatives in co-generation, investigating the renewable energy market, increasing the resilience of our operations to the changing climate and increasing our use of renewable energy.

Our operations continue to explore increased use of renewable energy where possible, thereby reducing their dependency on fossil fuels. Approval has been granted for an energy efficiency project at the Sezela site in South Africa, which will have the impact of reducing the site's reliance on coal by 12 000 tons per annum and will also reduce the site's electrical demand from the national Eskom grid by 21 GWh (approximately 75% reduction in the total demand of electricity imported during the season). The project is expected to be completed in time for the start of the 2016/17 crushing season.

The Zambia refinery expansion, which is expected to be commissioned in 2016/17, has similarly been accompanied by numerous energy efficiency initiatives and the expanded factory is forecast to continue to meet its own energy requirements without the need for supplementary fuel (eg, coal or woodchips).

Our energy strategy is generally site-dependent and for sites where we burn supplementary fuel (ie, fuels other than bagasse), our ultimate energy reduction target is to eliminate the use of supplementary fuel altogether. Reducing energy consumption beyond this point would result in excess bagasse residue

being stored and result in additional handling costs. During the year under review, in excess of 90% of all energy consumed by Illovo's operations was sourced from renewable resources, replacing fossil fuel alternatives.

Total Energy Consumption by category: GJ

	2014/15	2013 /14	2012 /13
Non-renewable energy used during the year	**3 467 287**	3 619 147	4 287 423
Renewable energy used during the year	**32 302 982**	34 381 016	36 689 874

Imported electricity was overstated at Nchalo (Malawi) in 2013/14 and has since been adjusted from 149 GWh to 67.9 GWh.

Consumption of energy types across Illovo operations: %*

	Bagasse	Coal	Electricity	Synthesis Gas	Biomass and Wood	Other Fuels
2014/15	**84.5**	**4.3**	**2.6**	**1.7**	**5.7**	**1.2**
2013/14	84.4	4.5	2.4	1.5	5.9	1.2*
2012/13	84.3	4.5	2.9	0.2	5.2	2.9

** Synthesis gas use replaced imported steam.*

Direct Energy consumption by primary energy source: GJ

Energy Source - GJ	2014/15	GJ/ton sugar 2014/15	2013/14	GJ/ton sugar 2013/14	2012/13	GJ per ton sugar 2012/13
Synthesis Gas	**591 909**	**0.34**	577 590	0.32	101 028	0.06
Diesel	**336 051**	**0.19**	355 504	0.19	543 871	0.31
Petrol	**55 961**	**0.03**	52 529	0.03	97 511	0.06
Coal	**1 534 803**	**0.87**	1 708 424	0.93	1 850 142	1.06
Heavy Fuel Oil	**11 236**	**0.01**	9 647	0.01	12 766	0.01
Liquid Petroleum Gas	**38**	**0.00**	200	0.00	6 306	0.00
Renewable - Bagasse	**30 227 273**	**17.18**	32 086 838	17.53	34 526 604	19.77
Renewable - Biomass	**388 010**	**0.22**	404 241	0.22	498 526	0.29
Renewable – Wood	**1 653 221**	**0.94**	1 855 437	1.01	1 630 245	0.93

Indirect energy in the form of electricity is produced outside of Illovo's operations and is consumed for Illovo's interim electricity needs (ie, during periods when bagasse is not burned to generate electricity).

Total indirect energy consumption by primary source in gigajoules (GJ)

Energy Source - GJ	2014/15	GJ/ ton sugar 2014/15	2013/14	GJ/ton sugar 2013/14	2012/13	GJ/ton sugar 2012/13
Imported Electricity	**936 674**	**0.58**	911 415*	0.50	1 180 436	0.68
Imported Steam	**-**		-		493 487**	0.28

* *Imported electricity was overstated at Nchalo Malawi in 2013/14 Integrated Annual Report and has since been adjusted from 149 GWh to 67.9 GWh as a result of a data capturing error.*

** *Synthesis gas replaces imported steam in 2012/13 and no imported steam was consumed from 2013/14 onwards.*

Investing in renewable energy

Various by-products of the sugar manufacturing process present the industry with the opportunity of generating the bulk of its energy requirements. A world-wide trend has seen sugar mills reaching a point where they have generated surplus green energy to be exported, creating significant ecological and economic benefits.

Co-generation

During the year under review, our Ubombo mill in Swaziland, with its integrated co-generation facility, exported a total of 47.8 GWh to the Swaziland national grid, an increase from 44.8 GWh exported during the previous season. It is anticipated that the site will export 52 GWh to the national grid over a 48-week period in 2015/16.

The sale of this clean renewable energy directly enables the Swaziland Electricity Company (SEC) to reduce its Scope 1 emissions and consequently, its customers' Scope 2 emissions. Based on the Swaziland grid emissions factor published by the UNEP Risø Centre (National Global Environmental Facility for Swaziland – 0.683 tCO_2 per MWh), the sale of this electricity enabled SEC to avoid 32 627 tCO_2e in 2014/15 (previous year 31 077 tCO_2e).

Smaller scale electricity export was achieved at the Eston Mill in South Africa, which exported 4.5 GWh into the South African electricity grid and the Maragra mill in Mozambique which exported 2.3 GWh into the Mozambican electric grid. These exports enabled Eskom in South Africa and EDM in Mozambique to avoid Scope 1 emissions of 4 200 tCO_2e and 1 700 tCO_2e respectively, directly as a result the sale of this renewable electricity. At Dwangwa in Malawi, the operation continues to export steam to an external organisation which would otherwise have had to generate steam using coal.

Case Study

At Illovo's Maragra mill in Mozambique, a 4MW turbo-alternator was reinstated and came on-line in June 2014. The unit offset electricity previously imported from the national grid for the estate's agricultural activities and enabled the export of renewable electricity to the national grid. The impact of the reinstated unit was to increase the quantity of power produced per ton of cane from 23.8 kWh per ton in 2013 to 36.2 kWh per ton in 2014. This led to a reduction in electricity imported from the national power utility of 4.6 GWh and also resulted in 2.3 GWh being exported to the Mozambican national grid. Therefore, the impact of this project resulted in a reduction in Scope 2 GHG emissions of 4 200 tons of CO_2e and avoided emissions of 1,700 tons of CO_2e.

OUTPUTS

GHG and Air Emissions

Our greenhouse gas inventory is compiled following the *Greenhouse Gas Protocol – Corporate Accounting and Reporting Standard (Revised Edition)* ("GHG Protocol") and *The Greenhouse Gas Protocol Agricultural Guidance: Interpreting the Corporate Accounting and Reporting Standard for the Agricultural Sector* which provides standards and guidance for companies and other organisations preparing a GHG emissions inventory (see www.ghgprotocol.org for details).

Emission factors are representative values, relating the quantity of an emission with an activity associated with the release of that emission. Country-specific emission factors have been applied where available, otherwise accepted international proxy emission factors have been adopted from reputable sources such as the Intergovernmental Panel on Climate Change (IPCC), UK Department for Environment or US Energy Information Administration. The electricity grid emission factors applied to our areas of operation vary significantly as a result of the GHG emission intensity of the electricity generation technologies utilised by the countries within which we operate.

The primary air pollutants which are managed by Illovo include Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (NO_2) and Sulphur hexafluoride (SF_6). GHG emissions are the result of burning various fuels throughout both agricultural and industrial processes. Hydroflurocarbons (HFCs), primarily used as refrigerants, are quantified but not reported as they are not material. Perfluorocarbons (PFCs) are not applicable to our operations.

Our GHG emissions are reported in terms of Scope 1, 2 and 3, as defined in the GHG Protocol:

- Scope 1 are direct GHG emissions as a result of fuel combustion, process and fugitive emissions;
- Scope 2 are indirect GHG emissions from purchased electricity; and
- Scope 3 are indirect GHG emissions of third party service providers (eg, transporters of raw materials and other Illovo production inputs).

The group's primary source of energy is from the use of bagasse, wood/woodchips and biomass which substantially decreases Scope 1 emissions at Illovo's operations in comparison to the use of fossil fuel sources. By 2017/18, the South African operations aim to reduce its Scope 1 emissions from coal combustion by 25% from the 2010/11 base line of 109 171 tCO_2e (tons of carbon dioxide equivalents). In an effort to reduce overall coal consumption and improve energy efficiencies within business units, a broad-scale Performance Optimisation Plan (POP) has been implemented at an operational level. Together with the planned increased substitution of coal with renewable sources of energy, such as bagasse, biomass and woodchips, we anticipate that there will still be a substantial reduction going forward in the consumption of coal and purchased electricity which is expected to reduce Scope 1 and 2 emissions.

As previously reported, Illovo set a group Scope 1 and Scope 2 GHG emissions reduction target (energy only) of 10.7% in absolute terms by 2020/21, relative to the 2010/11 base year figure of 478 681 tCO_2e. Based on current measurement, Illovo has already exceeded this target, resulting in a 24.6% reduction relative to the base year figure.

Illovo has a further risk tolerance target of 20% reduction for Scope 1 energy consumption emissions per ton of sugar produced relative to base year 2010/11 emission levels by 2018. This is equivalent to a sugar production intensity of 0.113 tCO_2e per ton of sugar produced. Illovo achieved 0.137 tCO_2e energy consumption emissions per ton of sugar produced in the reporting period.

Case Study

Noodsberg Energy Efficiency and GHG improvement project

Three energy initiatives to reduce GHG emissions were implemented at the Noodsberg sugar mill during the reporting year. These included the upgrade of a boiler from an Eisner furnace to a dump grate, the implementation of a dedicated woodchip feed to two boilers and the implementation of a raw sugar vapour melter in the back-end refinery. These projects were implemented to reduce the quantity of steam used by the factory, to improve the efficiency of fuel conversion to steam and to enable the factory to use additional quantities of renewable fuel instead of fossil fuel. Unfortunately, a reduction in the amount of cane crushed by the mill of 9.6% which resulted in a reduction in the bagasse available for the sugar production and refining process, coupled with the increased refined sugar output of 3.7%, relative to the 2013/14 financial year, resulted in the impact of these projects being diluted. Reduced cane throughput results in reduced bagasse fuel production and consequently additional supplementary fuel was required to produce the increased quantity of refined sugar. Despite these impacts, the GHG emissions per ton of refined sugar produced by the mill decreased from 158kg CO_2e per ton to 150kg CO_2e per ton.

Certain of our agricultural operations have adopted “green cane harvesting”, where practical, which decreases agricultural emissions caused by the burning of sugar cane prior to harvesting. During “green cane harvesting”, green biomass is stripped off the cane, either mechanically or by hand, as an alternative to the traditional practice of burning. The trash removed from the cane is either left infield to render back into the soil, potentially improving soil moisture retention, nutrient levels and carbon sequestration, or used as a renewable boiler fuel. Green cane harvesting operations are currently being undertaken at Illovo’s Malawi, Swaziland and South African operations.

We continue to support various projects in our global climate change mitigation and adaptation strategy:

- We are presently engaged in an energy optimisation project at Sezela to reduce its coal consumption by an estimated 12 000 tons per annum and reduce its imported electricity by 21 GWh. This will reduce Scope 1 emissions by approximately 29 600 tCO_2e and Scope 2 emissions by approximately 19 700 tCO_2e;

- We are pursuing energy opportunities at Ubombo which will have the impact of reducing the factory’s reliance on supplementary fuel, particularly coal and woodchips.

Scope 1 + Scope 2 emissions in tCO_2e

tCO_2e	**2014/15**	2013/14	2012/13
Scope 1 (Energy)	**240 977**	250 432	247 943
Scope 1 (Other)*	**136 819**	142 983	42 702
Scope 2	**120 029**	122 439	259 857
Total	**497 825**	515 854	550 501

Note: Issues impacting on data integrity include fuel measurement which may be imprecise. Fuel delivery data is based primarily on delivery or purchasing records and not fuel meters. Boiler efficiency was not considered when determining emissions from fuel combustion.
** In 2013/14 Illovo’s Scope 1 emissions reporting was expanded to include waste and agricultural emissions.*

In 2014/15, the group produced 497 825 tCO_2e (Scope 1 and 2) GHG emissions at an intensity ratio of 0.283 tCO_2e per ton of sugar produced. This represents an increase in the intensity ratio from 0.282 tCO_2e per ton of sugar produced which was achieved in the previous year. This increase is primarily due to a reduced cane crop in South Africa during the reporting period which has necessitated the use of a greater proportion of supplementary fuel per ton of sugar produced.

As part of our efforts to monitor the environmental impact from indirect sources such as third party transport of sugar cane and finished product, we have begun to monitor their contribution to GHG emissions (Scope 3). It is estimated that 60 314 tCO_2e of GHG emissions were generated.

There were no significant environmental incidents reported from third party transportation of our products and other goods and materials. We are currently piloting a one plant fleet management utilisation software and functional real time electronic delivery and dispatch system to reduce idle time and improve fleet utilization thereby reducing GHG emissions from our own and third party fleet used in our Agriculture for land preparation and cane transport activities. A number of haulage vehicles have been removed from the fleet to-date at Nchalo factory in Malawi as a result of this initiative

Although we have not started to quantify the impact of emissions from business travel, we have invested in video-conferencing facilities across all our operations. As an intended result, this has reduced business air travel and similarly reduced resultant GHG emissions from such travel.

Illovo is also implementing a new project with the Climate Resilience Infrastructure Development Facility (CRIDF+), a UK Department for International Development (DFID) funded programme to investigate and adapt to the impacts of climate change with our outgrower communities.

Air Quality

Air quality is monitored for both point source emissions (stack emissions) and ambient air quality (fugitive emission) in line with respective country legislation. The key challenges and initiatives in relation to point source emission are:

- high particulate matter (PM_{10}) in measured stack emissions which, although in certain cases are above legal limits, are managed within permit conditions at all our operations. SOx, NOx, volatile organic compounds and other gases are not material because of the types of fuels consumed within our operations (ie, bagasse, biomass, wood/woodchips and coal);

- improvement in the boiler technology in order to increase the efficiency of the boilers and to reduce carbon monoxide at our operations in Malawi and Tanzania;

- improvement in the current incineration technology at the on-site clinics in order to reduce the risk of exposure to dioxins at our Malawi operations;

- improvement plans based on the adoption of preventive and mitigation measures, including appropriate maintenance procedures, to reduce fugitive bagasse and stack emission, ie, sulphur dioxide in South Africa and particulate matter throughout our operations.

OUTPUTS

Effluent

Illovo's management of effluent and water quality is a critical part of our water management strategy. The effluent discharged by the sugar mills in Zambia, Malawi, Tanzania and Swaziland is treated to acceptable levels in terms of chemical oxygen demand (COD), biochemical oxygen demand (BOD), total suspended solids, total dissolved solids and pH. The effluent discharged after treatment is used for irrigation and where overflow occurs into natural streams, these are managed under local effluent discharge permit conditions.

After various treatment processes at our different sites, the effluent is discharged under permit into rivers. At our Sezela operation, 580 kl of treated effluent was discharged into the sea while 490 kl from our Merebank factory was treated by the municipal wastewater facility, also under permit and strict authority oversight. No event occurred where Illovo's operations affected any water receiving body either through discharge of wastewater or runoffs.

Effluent produced

m^3	Malawi	Mozambique	South Africa	Swaziland	Tanzania	Zambia
2014/15	**28 861 352**	**5 938 130**	**2 406 054**	**49 987 039**	**54 758 890**	**76 255 722**
2013/14	48 239 215	6 089 024	2 706 726	53 395 200	57 102 409	76 162 846
2012/13	47 462 702	5 040 840	2 184 201	42 163 200	48 041 992	80 691 387

In continuing efforts to decrease discharged water and improve our grey water footprint, the Sezela sugar mill in South Africa will be conducting trials on a novel concept, which will both reduce the amount of make-up water the site requires and reduce the amount of waste water it discharges. The outcome of these trials will be used for any future plant installations of a similar nature. Our strategy is to improve our ability to divert treated discharged effluent to irrigation, or increase recycling at all our facilities.

Waste

Illovo's overall approach to waste management embraces the "duty of care" principle through the entire operational life cycle. Robust operational guidelines are aligned to legal requirements and focus on facilitating comprehensive waste inventories in order to reflect classification of waste generated by operations. Onsite waste management programmes ensure that waste which is reusable, recyclable, or which is to be disposed of, is stored in designated waste bins and/or storage facilities. All waste is quantified using weighbridge or safe disposal certificates to reconcile quantities generated.

Waste management is approached in terms of better on-site segregation with particular attention to avoid the mixing of hazardous and non-hazardous waste, recycling and waste disposal tracking. Our goal is to reduce hazardous and non-hazardous waste material produced per ton of sugar and the amount of waste sent to landfill by 10% year on year.

Comparative Table in tons

Tons	2014/15	2013/14	2012/13
Total Non-hazardous waste	11 676	10 283	14 901
Total Hazardous waste	1 552	1 707	2 183
Total Waste (Non-Hazardous +Hazardous)	13 228	11 990	17 084
% Waste Deemed 'Hazardous'	11.7%	14.2%	12.8%
Waste Recycled/Repurposed/Reused	5 938	4 272	2 831
% Waste sent Recycled/Repurposed/Reused	44%	35%	16%
Waste send to Landfill/Incinerated	7 286	5 083	11 027
% Waste sent to Landfill/Incinerated	55%	42%	64%

The data reported in the table above may include scrap metal, organic waste from agriculture and by-products from process which are sent for beneficial use e.g. crop fertiliser, road spreading or reused by other organisations.
For future comparability purposes it should be noted that total hazardous waste volumes are expected to significantly decrease as all operations become fully aligned to group sustainability definitions and reporting procedures.

Each operation retains appropriate waste registers including relevant records from waste services and contractors. The records detail the quantity, frequency and types of waste sent to landfill or recycled.

During the year under review, our operations collectively generated 11 676 tons of non-hazardous waste or 0.0066 tons of non-hazardous waste per ton of sugar produced which represents an increase in consumption from 0.0056 tons of non-hazardous waste per ton of sugar produced during the previous year. We further generated 1 552 tons hazardous waste or 0.001 tons of hazardous waste per ton of sugar produced versus 0.001 tons of hazardous waste per ton of sugar produced during the previous year. Hazardous waste refers to wastes which are environmentally hazardous, such as medical wastes, chemicals, asbestos, used oils, and in the case of the operations outside South Africa, includes scrap metals. Bagasse is not included in the total waste data in this report as it is reused as fuel to generate steam and electricity in our factories and is therefore reported as an input material.

The significant increase in non-hazardous waste generated during the year under review is primarily due to the need to repackage previously unsold sugar stocks, resulting in large volumes of discarded packaging materials.

Waste recycled increased to 5 938 tons, or 0.0034 tons per ton of sugar produced (2014: 0.0023 per ton of sugar produced). The balance of waste is reused, composted, incinerated or stored on site on a short term basis.

In South Africa, our waste is disposed of through accredited waste management disposal facilities. Outside South Africa our operations manage our own licenced waste disposal sites. In Swaziland and Zambia, waste such as fluorescent tubes, leaded filter paper from the laboratory, asbestos-containing waste, expired chemicals (non-medicine) and used transformer oil is transported through an accredited waste management company to South Africa for final disposal. Basel Permits are obtained from the South Africa Environmental Department through the respective country government agencies. In 2014/15, a total of 99 tons (2014: 15 tons) of hazardous waste was removed under these permits. This improvement is attributed largely to a new system implemented at our Nakambala operation to improve management of hazardous waste. All operations hold relevant waste management permits as prescribed by country legislation.

INVESTING IN ENVIRONMENTAL COMPLIANCE

In line with its applied precautionary approach to environmental management, Illovo continues to invest in environmental improvements, with the aim of introducing cost-effective measures to prevent environmental degradation and improve environmental management systems. These include the following:

- Investing in improving water and wastewater treatment infrastructure at our Noodsberg, Dwangwa, Nchalo, Nakambala and Ubombo operations;
- Implementing world class systems to facilitate improved accuracy of data reporting by implementing a sustainability reporting system;
- Implementing limited assurance processes on specific environmental KPIs by external assurance providers, KPMG, IRAS and Environmental Resource Management (ERM).

On environmental protection, Illovo spent R7.14 million (2014: R3.1 million) on waste disposal, emission treatment, management remediation and outsourced environmental specialists costs.

Environmental compliance

Illovo manages its operations in line with environmental permits issued by government agencies in the countries in which we have operations and continuously monitors for any non-compliance of permit parameters. During the period under review, no significant incidents, enforcement notices, environmental prosecutions or environmental citations were issued to any of the group's operations. No fines or penalties were imposed by any government agency.

We encourage and plan interaction and engagements with local authorities to discuss changing environmental legal requirements and solicit clarity where these may impact on our operations. During the year under review, there were 30 active engagements with the environmental authorities associated with our operations.

In the event that any environmental concerns or complaints are raised from external agencies and the communities in which we operate, these are treated with utmost importance. All entities keep a "complaints register" and any complaints are directed to Illovo's management for consideration, response and action if necessary. During the year under review, no environment-related submissions were received through our formal complaints mechanisms.

In 2014, our Zambian subsidiary received a Best Environmental Awareness Award at the Agricultural and Commercial Show of Zambia (ACSZ), which recognises an exhibitor who demonstrates best environmental sustainability practices.

ASSURANCE

Some contents of this report have been externally assured by an independent external assurance provider, Integrated Reporting and Assurance Services (IRAS), as per the scope defined within the assurance statement that appears on our website at www.illovosugar.com.