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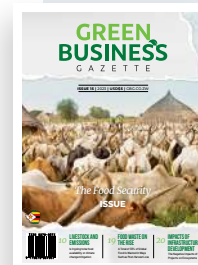
GREEN BUSINESS GAZETTE

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ON THE COVER



Livestock
Production
or Emission
Reduction

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INDUSTRIAL ENERGY EFFICIENCY – THE NEW CURRENCY

■ Tawanda Collins Muzamwese

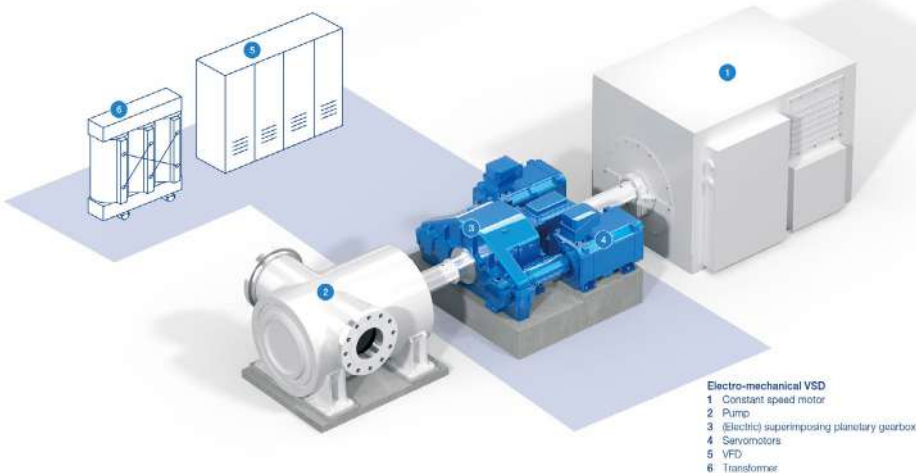
Industries consume large amounts of energy to support production processes. Typical processes include the production of cement, production of clinker, iron, and steel manufacturing among others. The energy needed to operate and run equipment can be quite high.

Several problems have been noted in various industries such as improper sizing of equipment remains a thorn in the flesh. Employees leaving equipment unattended and switched on for the rest of the night, is a mind-boggling situation.

A typical wasteful behaviour is a scenario where employees clean themselves using compressed air. This is despite the fact that energy is a major cost driver.

Innovative organisations are already deploying Variable Speed Drives (VSDs), Programmable Logic Controllers (PLCs) for greater process control and automation. The usage of LED lights, motion sensors, and other energy-efficient devices is also on the rise.

For industrial energy efficiency to happen, there is a need for improved awareness, technology transfer, and availability of reliable financing instruments.



The top management of the organisation needs to show a high level of awareness and commitment to ensure that energy efficiency is mainstreamed in the organisation's strategy. Energy is becoming a key strategic issue and a license to operate.

DECARBONISATION OF ELECTRICITY GENERATION IN ZIMBABWE IN THE WAKE OF WIND ENERGY

■ Calvin Manika



The transition from fossil fuels to renewable energy sources is only one aspect of the future of energy. It calls for the decarbonisation of the entire economy. Clean energy is only one aspect of the energy transformation. Decarbonisation refers to the goal of lowering or eliminating harmful greenhouse gas (GHG) emissions produced by companies and individuals, which are acknowledged to be significant contributors to climate change.

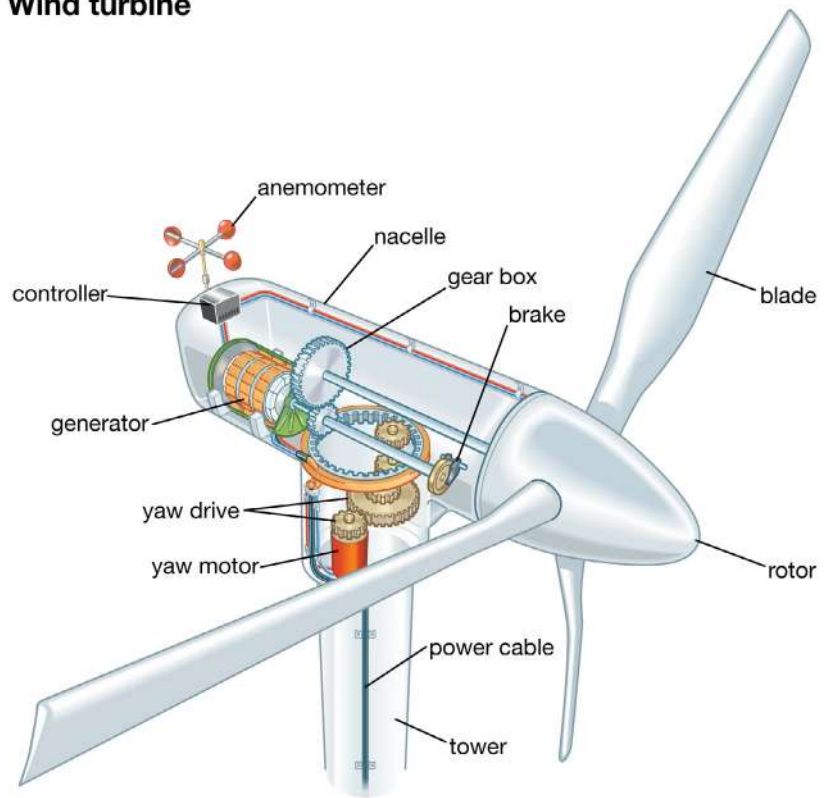
The decarbonisation of the electricity generation mix, away from a fossil-fuel generation like coal and gas, is a pillar in the energy transition. Instead, energy derived from renewable sources, will be a key component of future energy systems.

Costs of technologies like solar photovoltaic (PV) and wind energy have been successfully brought down by policies that stimulate the commercialization of renewable sources of electricity. To achieve decarbonisation goals, however, the deployment scale will need to be increased. By 2030, hydro, wind, solar PV, and bioenergy, would collectively produce up to 40% of the world's electricity, according to the IEA World Energy Outlook 2020.

Reports say the energy transition will be significantly influenced by wind, both onshore and offshore. Based on current policies and pipelines, the Global Wind Energy Council (GWEC) in its 2021 Global Wind Report predicts that 469 GW of new onshore and offshore wind power will be added over the next five years.

Due to falling technology prices, offshore wind development has quickened and project sizes have grown. Inspiring examples at the global level include the Dogger Bank wind farm in the UK, which is being developed by SSE Renewables and Equinor and will have a total installed capacity of 3.6 GW.

Wind turbine



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However, there is a lot of room for innovation, especially in the advancement of floating offshore wind technology. Since the market is still in its infancy stage, there are many possibilities for collaboration and consolidation. Zimbabwe can tap into such technologies and develop the wind energy sector through collaborations.

The major weather pattern is affected by the movement of air masses across the southern portion of the African continent. Due to Zimbabwe's location on the subtropical high-pressure system, which extends southeast trade winds, the prevailing wind direction is easterly.





The winds only have a northerly component across a third of the country, therefore throughout the year, they can be either north-easterly, northerly, or north-westerly.

Scientific data and analysis obtained by the Intergovernmental Panel on Climate Change (IPCC) highlight the necessity for decarbonisation. The goal of the UN Framework Convention on Climate Change, which went into effect in 1994, is to stabilize GHG concentrations at a scale that prevents human-led interference with the climate system.

However, climate change and the need to decarbonise have only become a major issue after the Paris Agreement was signed in 2015 at COP21. As a result of the commitments under the Paris Agreement and the threat posed by climate change in general, many governments are working with businesses to provide funding for the development of new technologies pilot projects, and the regulatory framework to incentivize decarbonisation efforts in all sectors.

It will be crucial to electrify utilizing low-carbon and

renewable electricity sources in order to decarbonize not just electricity utilization but also the transportation, heating, and cooling industries. Research shows that the electricity demand will increase by nearly 50% in just 20 years due to the switch from fossil fuels to electricity in these sectors and the necessity of enhancing access to energy in rising nations.

Over 75% of the 2.6 billion people worldwide who currently lack access to technologies and safe, clean fuels to use in their homes live in sub-Saharan Africa, according to UNDP. Additionally, to further exacerbate the already precarious position, African nations must deal with rising oil and food prices brought on by the slow recovery from the COVID-19 pandemic and the effects of the current war in Ukraine.

“At UNDP, we think that keeping an eye on the long term should be our guiding principle in this. Decarbonisation is without a doubt the future engine of any energy system, in my opinion. The shift to clean energy will happen even more quickly and exponentially in five years than it may have from 2015 to 2020,”

said Achim Steiner, UNDP Administrator.

Africa and the international community were urged to concentrate on both long-term solutions that would lead to sustainability and short-term solutions that will increase access to clean energy. This was done by highlighting the importance of decarbonisation and the switch from dirty fuels to renewable energy sources.

Dr. Daniel Schroth, the African Development Bank’s director of renewable energy and energy efficiency, emphasized that Africa’s enormous untapped energy resources and the pressing need to give hundreds of millions of Africans access to electricity constitute a market for investments worth billions of dollars.

“The private sector should increase its investments in renewable energy in Africa since there is huge potential in the continent’s energy sector and the return on investment is equally high,” said Schroth.

To determine Zimbabwe’s viability as an energy resource, wind statistics and climatic elements were analysed.

This analysis revealed that geography and vegetation complexes would also be taken into account because they contribute to the overall evaluation. The data being analysed has been steadily gathered through time and is 15–50 years old.

In Zimbabwe, there are quite a few wind energy conversion systems (WECS). These have a variety of uses. Experts say they were put in place without having a thorough understanding of how the wind blows in the places where they will be employed. The scant examples available demonstrate that despite competition from other power-generating technologies, wind energy systems have persevered over time.

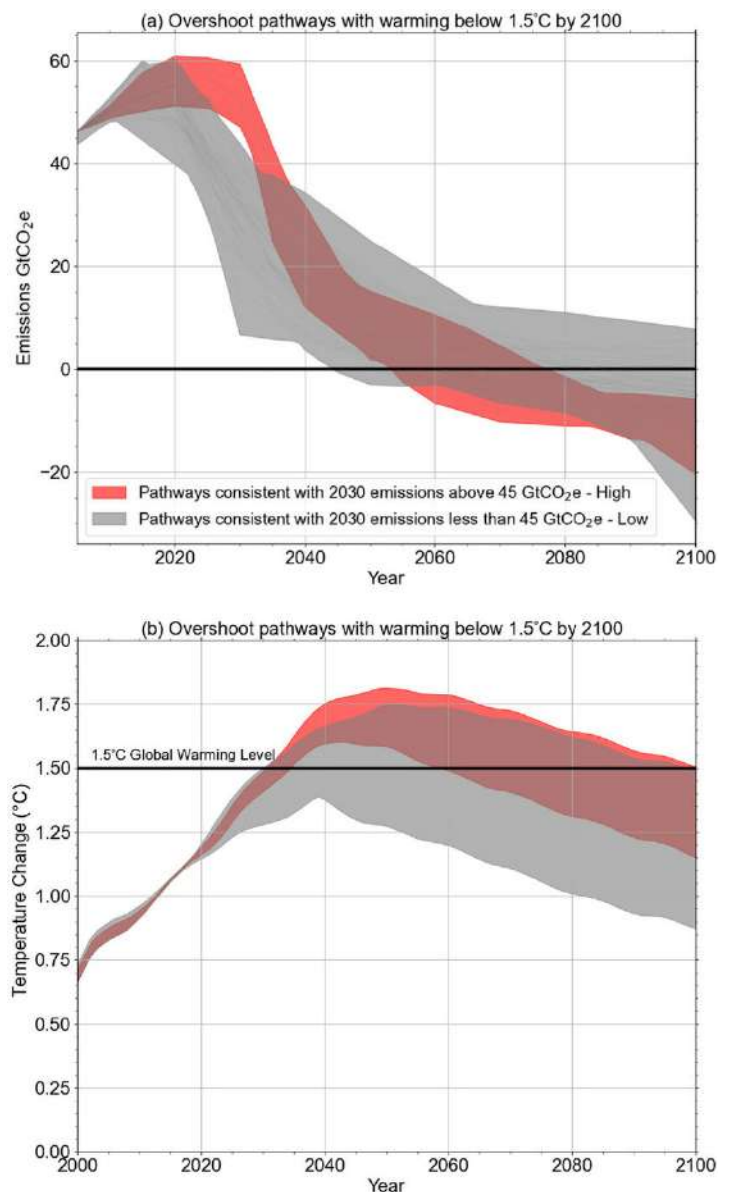
Manufacturers and users of WECS will be able to optimize designs and usage thanks to the analysis of wind data. This may also make it possible for WECS to be used and distributed more widely. The wind energy conversion systems can be used for industrial, domestic, or agricultural operations; they can be connected to existing grid networks or run independently with storage facilities.

WHAT THE CBAM MEANS FOR AFRICAN COUNTRIES AND LEDCS?

■ Wadzanai Diana Manyame

Businesses have been slowly responding to the global outcry to manage climate change by reducing greenhouse gas emissions in their operations. In 2015, parties to the United Nations Framework Convention on Climate Change agreed to accelerate and intensify their actions towards climate change management by setting a global target that all parties to the UNFCCC and nations in the world should work to meet. The goal is to keep the global temperature increase below 2 degrees Celsius above preindustrial levels and to pursue the temperature rise limit further to 1.5 degrees Celsius. Countries that ratified the Paris Agreement put forward their commitments and ambitions which spell out how they are going to work towards emission reduction and contribute to the global goal of reducing global temperature increase, hence climate change. These are commonly known as Nationally Determined Contributions. Parties are required to regularly report on their emission reduction efforts and implementation status though it is not legally binding. After every 5 years parties are encouraged to revise their Nationally Determined Contributions and improve or rather upscale the climate action.

Parties have set different emission reduction targets for example Zimbabwe initially pledged to reduce its emissions by 33% in energy-related emissions per capita compared to Business as Usual by 2030 but upgraded its ambition to 40% emission reduction in economy-wide greenhouse gas emissions per capita compared to Business as Usual by 2030. The European Union however has set higher ambitions and is working towards being the first climate-neutral continent by



NATIONALLY DETERMINED CONTRIBUTIONS

are SELF DETERMINED CLIMATE PLANS

from each country participating in the Paris Agreement (PA)

PARIS AGREEMENT OBJECTIVES

01 TEMPERATURE GOAL

Keep a global temperature rise this century well below 1.5 to 2 degrees Celsius (above pre-industrial levels).

02 RESILIENCE

Increase the ability to adapt to the adverse impacts of climate change.

03 FINANCIAL FLOW

Work towards making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

WHAT DO NDCs ENTAIL?

Each member country from the PA determines their contributions in the context of their national priorities, circumstances and capabilities.

CO₂ ↓ MITIGATION

NDCs allow countries to outline actions parties can take to reduce GHG emissions.

MITIGATION SECTORS AND ACTIONS

Parties can choose different sectors, such as transportation, waste management, energy efficiency, or forestry, for their climate actions.

TARGETS

In most cases mitigation actions are expressed as targets that define the measurement goal a country has chosen to track the effectiveness of their climate actions.

ADAPTATION

A key component in sustainable development, in many cases NDCs dovetail the mitigation strategies with resiliency measures to ensure we are equipped for the shifting climate.

ADAPTATION SECTORS AND ACTIONS

Policies, frameworks, investments and technology that is needed to minimize the impact of potential floods, changes in precipitation, droughts, rising temperatures, rising sea levels, etc.

FINANCE/SUPPORT

This can include financial plans or requests for funding, technology transfer, etc. necessary for either Mitigation or Adaptation actions outlined in each country's NDC.

SUBMISSIONS Process

Most countries have submitted their first NDC and will either submit a new one or update their NDC by 2020. As of 2020, NDCs will be reviewed and updated continuously in an ongoing 5-year process.

Global AMBITION

Each successive NDC must represent a progression beyond the Party's then current NDC and reflect its highest possible ambition. Hence, participation in NDCs sets the course for continuous expansion of climate mitigation and adaptation efforts at a global scale.



United Nations
Framework Convention on
Climate Change

2050. It has set a target to cut emissions by at least 55% below 1990 levels by 2030. Stringent policies and measures are being set within the European Union and this includes policies such as the European Green Deal. To prevent the drawback of efforts being made within the European Union a mechanism has been devised to prevent what is being termed carbon leakage, the Carbon Border Adjustment Mechanism.

Carbon leakage is a situation where companies or business shift production from countries with stringent climate policies to countries with less stringent climate policies to export the products back into the country where these would have been initially shifted and other countries. This process increases the number of emissions being released into the atmosphere only in a different geographical setting hence going against the global mandate to reduce greenhouse gas emissions and combat climate change.

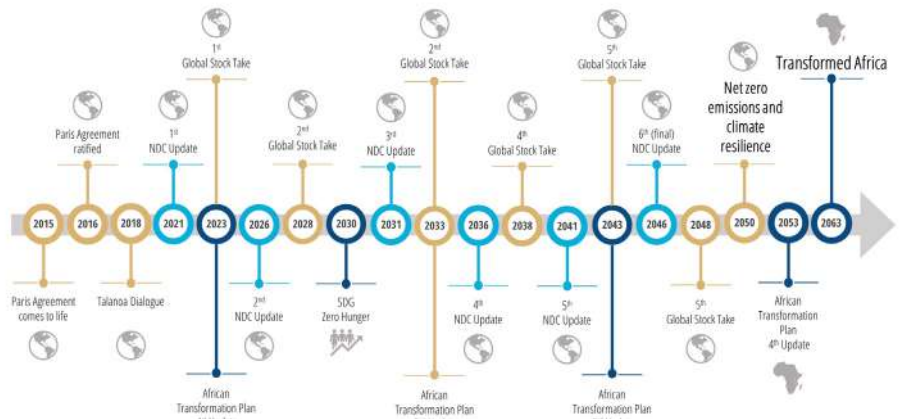
The Carbon Border Adjustment Mechanism has been devised and approved by the European Union Commission to manage carbon leakage. The Carbon Border Adjustment Mechanism is a carbon tariff to be paid on carbon- to be imported into the European Union. The CBAM will first apply to selected carbon-intensive products and as the years go by more products will be included. The currently listed products which are considered to be carbon intensive and could contribute immensely to carbon leakage are aluminum, hydrogen, iron and steel, fertilizer, cement, and electricity. Any company willing to export the listed products into Europe will have to have a

CBAM certificate which is acquired after purchase using the carbon price equivalent to what would have been paid if the produce would have been made within the European Union. The mechanism mirrors the Emission Trading System in the sense that the system involves the purchase of certificates by importers where the price of the certificate will be calculated using the weekly average auction price of EU ETS allowances expressed in €/tonne of CO₂ emitted. The CBAM will begin with a transitional phase which get into effect on the 1st of October 2023. During this phase, companies will report their emissions with no financial adjustment to pay till the end of 2025. As of 2026 going forward the whole system will be up and running and there will be no exceptions.

African countries and Less Economically Developed Countries are the most vulnerable to climate change as they lack adequate resilience mechanisms and adaptive capacity. They are lagging in terms of development and are still thriving to earn a sit amongst the economically developed bracket Trade is a key aspect to economic development and the introduction of such mechanisms is worrying if it is going to impact African countries and Less Economically Developed Nations. Europe is a very important export market for Africa, where 26% of Africa's exports of fertilizer, 16% of iron and steel, 12% of aluminum, and 12% of cement are made to Europe and these have contributed significantly to the Gross Domestic Product of the African countries and LEDCs. Having to pay extra fees to export goods can present a major downside where lesser profits will be realized and a strain experienced on the export market.

The industrial decarbonisation process has not been a walk in the park for these nations. A lot of financial support is needed to ensure the greening of the African economy. As the different countries are thriving to boost their economies, a lot of carbon-intensive processes are being relied on and most recently Zimbabwe has been rejoicing about the Hwange 7 and 8 thermal power generation projects which will increase 600MW to the grid. This on its shows how African countries and Less Economically Developed Countries still need carbon-intensive processes to develop, but with the new dawn of things and the realization of the effects of climate change could have second thought has to be given to this, thereby putting an extra burden on the already struggling nations as they now have to work to maintain their clientele and at the same time ensure a low carbon pathway. The question however is, 'With what funds?'

GLOBAL CLIMATE AGENDA · NDC UPDATES · HUMAN DEVELOPMENT AGENDA



A plea was made to exempt African countries and Less Economically Developed Countries but the EU decided against this and the European Parliament called for the EU to offer to avail financial support for the countries needing support to implement less carbon-intensive systems within their industries. In light of this, African countries and Less Economically Developed countries need to seriously consider industrial decarbonisation

It is also important to highlight the need and necessity to improve skills and capacity to conduct greenhouse gas accounting and measurements for reporting purposes during the export process. A default measure of emissions will be used for exporters who will fail to produce their emissions when exporting. According to the African Climate Foundation and the London School of Economics and Political Science (2023), African countries could consider developing their carbon monitoring systems, and potentially regional carbon markets, to better prepare for the EU CBAM.

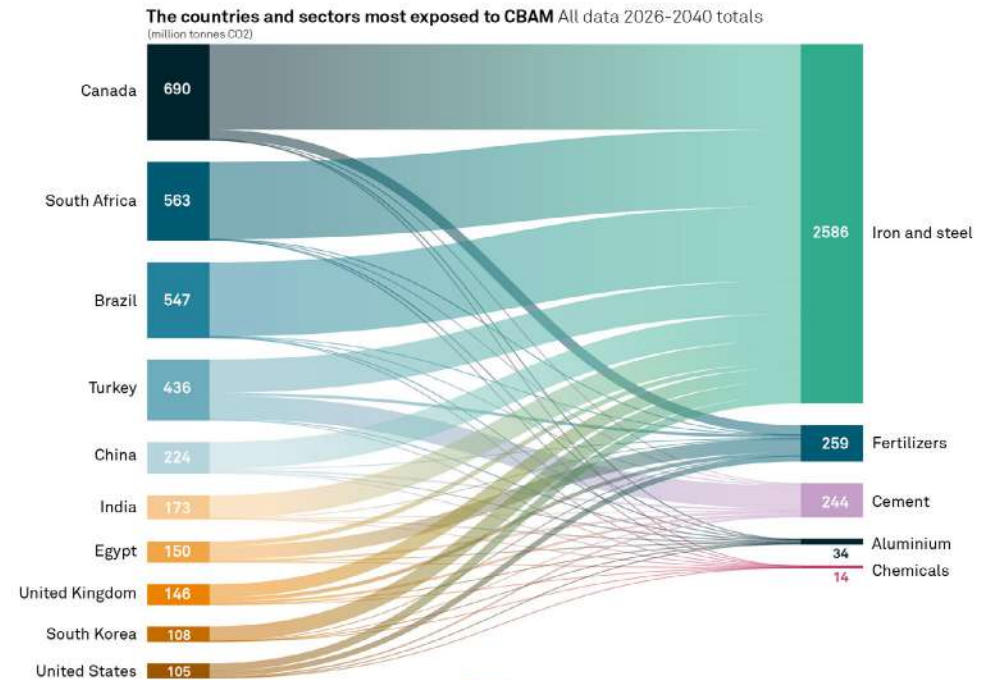


There is a lot of talk and debates around the CBAM and what it will do to the African Economy as well as that of Less Economically Developed Countries. The discourse is mainly centered on the negative impacts this system might have and therefore African countries and those in Less Economically Developed Countries, have to craft policies that support green growth and development as well as capacity building in terms of climate finance and all related phenomena so that business is better prepared for such programmes. Companies should therefore be thinking about sustainable strategies that will impact them positively and limit the effect of policies such as CBAM on their businesses.

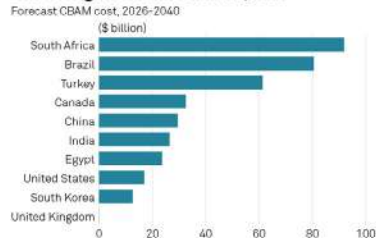


Developing economies hit hardest by EU's carbon border tax

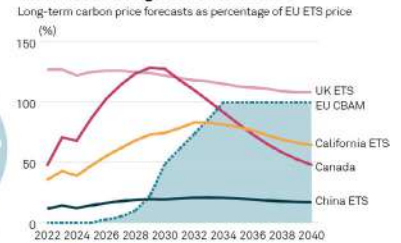
The EU's Carbon Border Adjustment Mechanism is set to have far-reaching impacts on world trade and the wider energy transition. Phasing in from 2026, CBAM will levy a carbon tax on imports of selected energy intensive materials and products into the EU, removing the gap between the EU's ETS carbon price and the export country of origin's carbon price. Analysis by S&P Global Commodity Insights shows Canada, Brazil, South Africa and Turkey will be most exposed to the mechanism, with iron and steel by far the biggest sector targeted.



South Africa, Brazil, Turkey at most risk due to high iron and steel exports



Only UK to avoid CBAM charge after 100% obligations from 2034

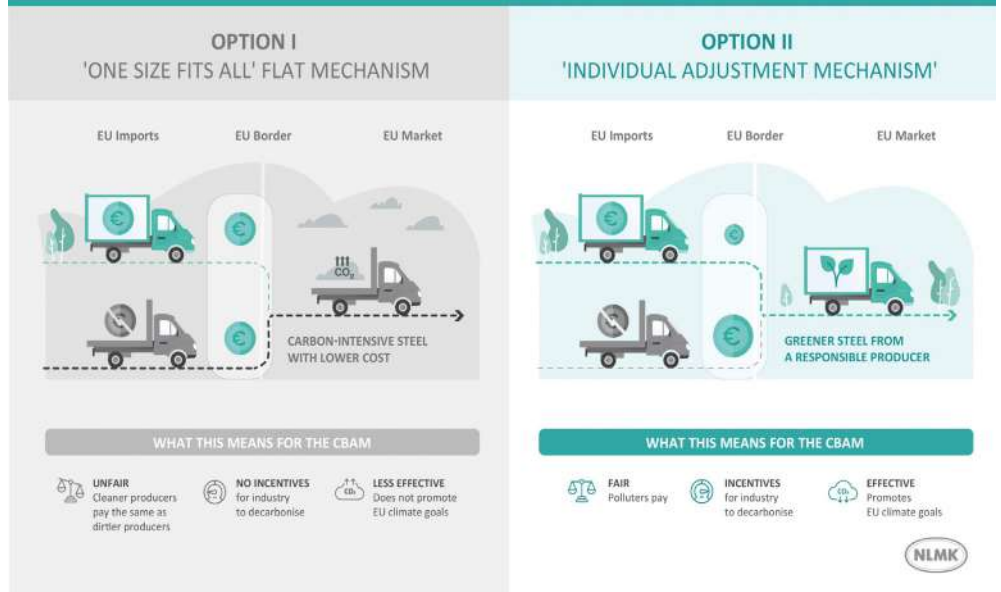


S&P Global
Commodity Insights

Source: S&P Global Commodity Insights, Global Trade Atlas
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Developed by Eklavya Gupta, designed by Nick Coles

THE EU CARBON BORDER ADJUSTMENT MECHANISM: CHOOSING A MODEL FOR FAIRNESS



ENERGY POVERTY - A DOUBLE-EDGED SWORD

■ Tawanda Collins Muzamwese

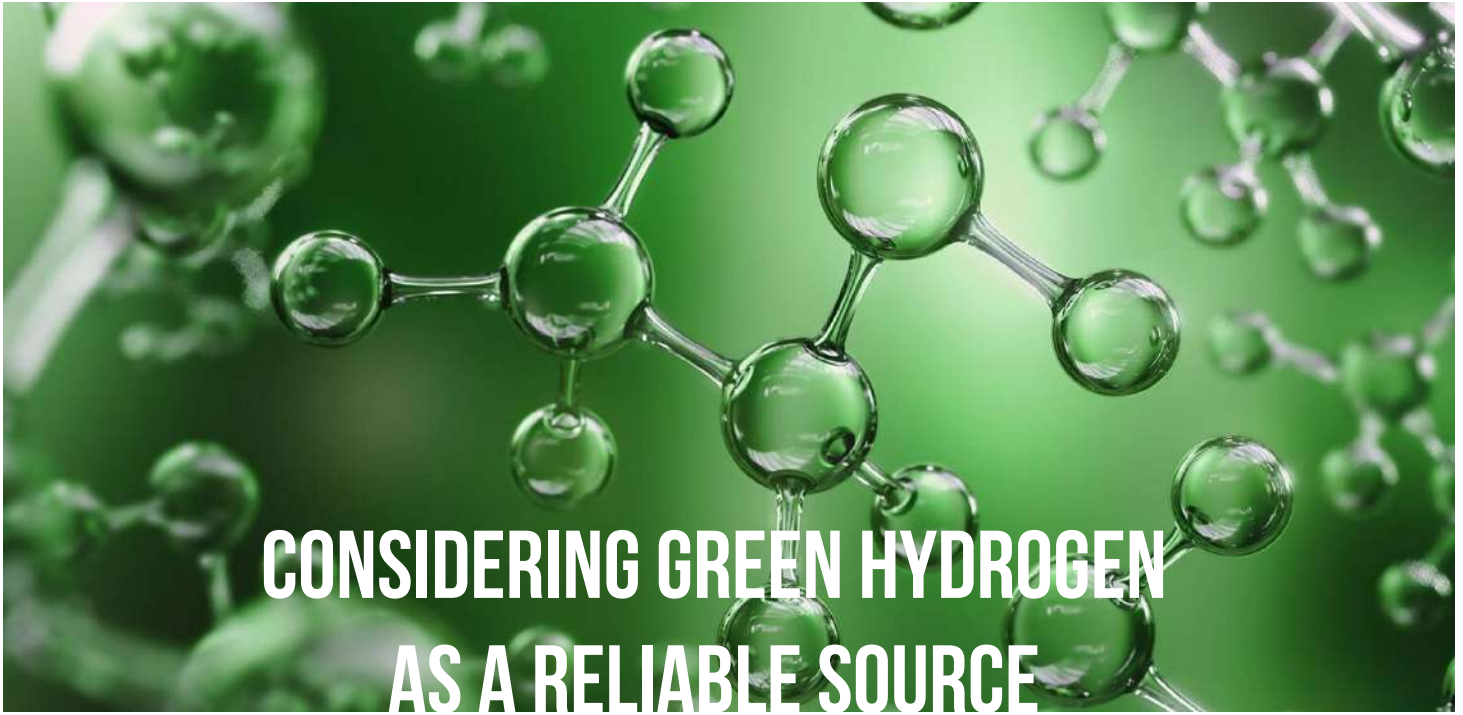
Energy poverty is a term that has become so popular describing the deprivation of energy to millions of people around the world. It is the lack of access to energy services. This phenomenon is popular in developing countries. In addition, the majority still relies on biomass, cow dung, especially in rural communities. The advent of electricity has brought relief to both residential and commercial consumers. To add spice to the menu, renewable energy is also becoming popular.



There are several paradoxes that we need to look at before we push energy transition. Already the world is crazy about the transition to clean energy to tackle climate change. When there is energy poverty, there are limited economic opportunities to develop and implement income-generating projects.

Another nexus exists between energy and poverty. In areas where energy is available, it is possible to improve people's livelihoods and better their lives. Governments, private the sector, Civil Society, and NGOs play a very important role in taking millions of people out of energy poverty and higher up the energy ladder.

Policy incentives, regulations, economic instruments, awareness, and provision of financing for energy projects are key ingredients in ending energy poverty. The growth of the Gross Domestic Product (GDP) is linked to the ability of a country to provide energy. In the quest for the Sustainable Development Goals, there is a need to address energy poverty and take energy a key developmental priority.



OF RENEWABLE ENERGY IN ZIMBABWE

■ Wadzanai Diana Manyame

Zimbabwe, just like any other country in the world is working towards establishing renewable energy infrastructure to boost its energy supply through the production of renewable energy sources. This is in response to the global climate change agenda and the Paris Agreement commitment as well as the need to ensure there is adequate supply of electricity and energy to drive socio-economic development within the country. In 2012, the country published its Energy Policy and in 2019 the Renewable Energy Policy, which promotes sustainable energy production. The Renewable Energy Policy paves the way for the harnessing of energy from renewable sources

within the country and this has been a guide to some of the renewable energy projects that have been done in the country. The production of renewable energy is a welcome concept in

Zimbabwe as this is creating a number of opportunities for players in the energy sector and also assisting with the increase in total energy output being produced in the country.



Zimbabwe is mainly known for hydroelectric production and thermal power production but because of lack of timely preventative maintenance and upgrading of its infrastructure, challenges have been faced in the production of adequate electricity to support the citizens of Zimbabwe.

Zimbabwe's main power generation infrastructure includes one hydropower plant and four coal-fired generators with a total combined capacity of 2,240 MW, theoretically. These could indeed meet the country's demand of around 2,100 MW, but the actual achievable output being experienced is far below this

figure where the main power station in Kariba has had a total generation capacity of 1,050 MW since March 2018, and its production has even dwindled to almost 500MW in the recent years. Despite the climate change-related experiences being faced in the country, the supply and demand issue has promulgated the key actors in the energy sector to be open and explore other sources of energy that the country can harness and add to the already existing sources.

The introduction of Independent Power Producers (IPPs) has played a major role in lessening the burden on the Zimbabwe Power Company (ZPC) to produce electricity that can support everyone in Zimbabwe. Using the available sources of energy, IPPs are producing energy either for their own consumption or to top the grid for public use. Solar energy has been the most acceptable source of renewable energy in Zimbabwe, outside the hydroelectric power which is the most commonly known. The potential of wind energy is still being assessed and a relatively new source of energy, green hydrogen, is also stirring interest.

Green hydrogen as explained in the previous issue, is hydrogen energy that is produced by splitting water using a process called electrolysis. This process also produces oxygen as a byproduct which can safely be released into the atmosphere or can be collected for other uses with no negative impacts on the environment. However, to produce this hydrogen energy as green hydrogen, a renewable source of power is required to perform the electrolysis. The hydrogen energy value chain should be associated with sustainable measures only thus no negative environmental and socio-

economic impacts should be associated with its production and use for it to remain green and not adopt the other colors of hydrogen. This measure is what brings out its complexity. Green hydrogen energy production needs a primary source of renewable energy to produce it and an adequate supply of water.

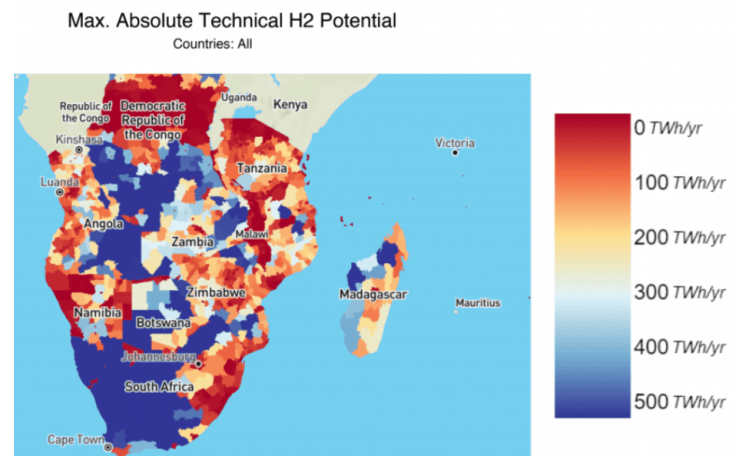
In a country where energy and water security are low, this is a questionable sector to consider and invest in as the process is power intensive. There are socioeconomic aspects to be considered which relate to the availability of water for other uses such as production and domestic use against the availability of water for energy generation; the availability of electricity to generate more electricity vis a vis the availability of electricity for manufacturing, industrial use, domestic and other uses as well as the availability of land to set up supporting renewable energy sources for primary supply in the generation of green hydrogen. Holistic calculations need to be done on the inputs against the output energy and its significance.

Sable Chemicals, a fertilizer manufacturing company in Zimbabwe used to produce green hydrogen during its fertilizer production. The company used to produce ammonia onsite from nitrogen (N₂) produced from air separation and green hydrogen (H₂) from the electrolysis of water from Sebakwe River. The electrolysis plant involved 14 electrolyzers with the capacity to produce 23.1 kg/h of green hydrogen. The electrolyzers consumed a total of 105 MW of power and this power supply was being fed from the Kariba hydropower station. Following the country's power supply challenges and high cost of

importing power, the plant was decommissioned in 2015. This in its fact raises questions as to whether it is a reliable source of energy that should be considered for a country like Zimbabwe, where the alternative primary renewable energy base has not yet been fully cemented to support the production of another source of energy outside the general industrial and domestic uses. Sable Chemicals has been said to have plans to establish a solar farm to support the production of green hydrogen again.

To aid in making such decisions and safeguarding investments in green hydrogen production, there is an initiative that has been taken in the SADC region to determine the potential of green hydrogen in the different counties within the SADC region. The Southern Africa Green Hydrogen Atlas has been worked on by a team of national, regional and international

experts. The atlas is meant to provide evidence-based information for investors and policy makers to drive green hydrogen production and use in Africa and Zimbabwe. Main issues considered include ground water availability, climate change impacts, socioeconomics and local scenario indicators, eligible lands and renewable energy potentials, possible cost of production and market. Given below is the map showing the recently published results from the study by the Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) adopted from www.esi-africa.com. It showing the green hydrogen production in terawatt hours per year. Based on the map Zimbabwe's potential is ranging from 0TWh/year to 300TWh/year with most of the areas showing a potential range of 200TWh/year to 300TWh/year.



Green Hydrogen Potential Projected Results (Adopted from www.esi-africa.com)

The potential highlighted is promising and if exploited can pave way for green hydrogen production in Zimbabwe with the right policies and strategies in place to support technical readiness, intellectual skills, market penetration and market growth. Zimbabwe which is a step ahead has already signed a Memorandum of agreement with HDF, a French company to produce 178GWh/year of green hydrogen in the Middle Sabi region.



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RURAL DEVELOPMENT AND SUSTAINABLE ENERGY IN ZIMBABWE

■ Calvin Manika

Zimbabwe's rural areas have been off the grid for decades despite the launch of the rural electrification programme. Attempts to expand the national grid continues to face enormous obstacles in rural areas. Poverty and isolation are pervasive, and supplies of fuel, spare parts, and expertise are all limited. Only 19% of individuals in rural areas have access to electricity, and frequently not reliable.

The main electricity producers are the coal-fired Hwange Coal Power Station and the hydroelectric Kariba Power Station, with 12 MW coming from IPPs. However, given the current economic crisis, it must be recognized that aside from the foreign currency utilized for imports, the nation's industrial base is no longer at the same level it once was.

Farmers are unable to process their produce,

add value, or diversify their businesses without electricity. Children struggle to learn in the dark and are isolated from contemporary technology in both schools and homes. As a result of the restricted treatment that health clinics and maternity wards can offer, women and new-borns may suffer and even pass away as a result. To lead the rural electrification effort, the Zimbabwean government created the Rural Electrification Agency (REA) around the turn of the millennium.





The Oxfam and Practical Action RuSED initiative in Zimbabwe's Ruti and Himalaya communal regions has improved health outcomes, increased access to education, encouraged commerce and enterprise, strengthened livelihoods, and improved quality of life. Through models like RuSED, green communities that are independent of the national grid can be created by supporting and sustaining energy growth in rural areas.

Solar irrigation is essential to addressing climate change and lowering greenhouse gas emissions in Zimbabwe because the country's economy is mostly agro-based and the majority of the population relies on agriculture.

Zimbabwe receives 3,000 hours of sunshine per year with an average solar irradiation of 20 MJ per square meter per day. A large possibility for solar product sales on PAYGO exists given the country's high literacy rate, more than 80% mobile penetration, and high use of mobile payment platforms. By adapting existing electric geysers, the solar water heating scheme could result in 300 MW energy savings.

Zimbabwe's estimated national electricity access is 40%, with rural areas at 19%. The primary source of energy for 68% of the population, who reside in rural areas, is firewood, according to the 2012 Census. Despite having a 2,342 MW installed capacity, which is made up of 45% hydro and 55% thermal energy, the country is unable to use its full potential because of poor access to water and fuel as well as outdated equipment. The added 600MW at Hwange stage being synchronised will be tested with time is it will effectively avert the power outages.

Zimbabwe faced growing electricity shortages as protracted droughts affect the hydropower dams in Southern Africa; nevertheless, linking private solar installations by people and businesses to the national grid could assist to close some of the gap. REA programs have been impacted by the struggling economy and a lack of essential resources in the energy sector. However, it appears that some non-governmental initiatives are utilizing the sun and water in rural areas for sustainable energy.



The inland irrigation dams in the Eastern Highlands have the potential to be developed into small hydropower plants due to the region's rainy environment and year-round flow of perennial streams and rivers.

The lives and livelihoods of poor rural people can be improved by deliberate projects that can harness the power of the sun and running water to bring electricity to remote and isolated villages in ways that are affordable and sustainable.

The RuSED program's experience thus far shows that having access to cheap, dependable power generated by the sun or by flowing water is essential for fostering business and raising production. Energy is required to increase production, yet it is insufficient on its own. For people to fully benefit from economic prospects, access to energy must be matched by other activities, most of which are not energy-related.

The quality of life for everyone benefits from having access to energy, especially for women. If implemented appropriately, access enhances communities' sense of empowerment as well as their social and psychological well-being. Energy production has been touted to have the ability to 'energize' communities.



The globe is currently experiencing an accelerated renewable energy revolution as technology develops and solar and other renewable energies become more and more compelling business opportunities. Zimbabwe, and its most isolated villages in particular, might be at the vanguard of this “green energy revolution” thanks to its enormous natural resources of sun and, in many parts, water.

The clinics in the majority of Zimbabwe’s rural communities with ongoing energy projects have also benefited from solar refrigeration. The Rural District Councils and the Rural Electrification Authority have designated these specific clinics and schools as being far from the grid and without electricity. Clinics maternity wards and computer labs are being powered across the country. Such projects remain limited but organisations working in sustainable energy hint that as funds become available, the solar systems can be expanded to power other building components.

Most of the farmers in Matabeleland North want to increase the size of the solar mini-grids they use to pump water from wells into a farm reservoir for irrigation and other uses. Farmers can sell excess energy to the government. Zimbabwe’s net metering system, which went live in 2020, enables individuals who generate renewable energy for their own use and sell any extra energy to the national grid in exchange for electricity credits that they can use when their renewable energy supply is insufficient.

However, other farmers bemoan the high cost of the equipment required to link mini-grids to the state-owned distributor, Zimbabwe



Electricity Transmission and Distribution Company (ZETDC). Farmers have found that the prices, which include the grid-tied inverter and solar power system, can reach as high as US\$8000, which is beyond the reach of many.

An expert in the energy sector Isaiah Dambudzo Nyakusendwa the Chair of the Renewable Energy Association of Zimbabwe (REAZ) says various reasons can cause renewable projects to fail to take off in Zimbabwe.

“Among the reasons why projects fail to take off in Zimbabwe include the absence of appropriate project developmental financing, lack of long-term and appropriately priced loans/equity investments as well as low skills in producing bankable projects,” said Nyakusendwa.

In response, the government has outlined several initiatives to increase power supplies, including importing more energy from nearby countries and obtaining

more electricity from Independent Power Providers (IPPs).

The development of a middle-income economy and the achievement of a 33% decrease in greenhouse gas emissions by 2030 are two of the government of Zimbabwe’s main goals. The draft renewable energy policy, with a goal of 1,000 MW by 2025, is a crucial approach for achieving these ambitious developments. All of them offer tremendous promise for Zimbabwe’s renewable energy industry.





ENERGY AND GENDER

■ Tawanda Collins Muzamwese

Sustainable Development Goal Number 7 aims to enable Clean and Affordable Energy by the year 2030. It still awaits to be seen if the world will meet this target. Nonetheless, energy has been recognised as an enabler of socio-economic development in both developing and transition countries. Without energy, countries will never grow. Furthermore, we need to look at energy from a gender dimension.

In the African context, gender roles give women the responsibility of fetching firewood in rural communities. This may also mean that there are some hours lost, which may have been devoted to education and other productive activities.

Women-owned businesses can be strengthened by providing them with proper access to energy. This calls upon those organisations responsible for providing financing and promoting technology transfer to be gender sensitive.

There is a dire need for equipment to be given to different stakeholders including both males and females, be it in the provision and issuance of renewable energy equipment.

Women can implement typical projects include solar photovoltaic, solar thermal, solar drying and biogas projects. Women can operate power plants as well and lead project management, alongside policy support in the quest for energy security.

GAPS IN LAW ENFORCEMENT ACCELERATING CLIMATE CHANGE

■ Calvin Manika

Every day buses traveling to various high-density areas line up at the bus terminals in the Harare Central Business District, Zimbabwe's capital. When COVID-19 came, the buses served as Zimbabwe's primary means of public transportation under ZUPCO on a public-private partnership basis. Unfortunately, the majority of the buses that ZUPCO was hired to provide had numerous technical issues, with abnormal smoke emissions being the primary sign of these issues.

Other people brought in their fleets during the stampede of the returning buses, increasing the urban air pollution. Before being used on the road and carrying passengers, all public utility vehicles in Zimbabwe are required by law to pass a roadworthiness inspection by the Vehicle Inspection Department (VID). Vehicles lacking a certificate of fitness (COP) must be seized by VID and fined, but buses and other vehicles drive through many cities without the necessary paperwork, speeding past law enforcement officers. Corruption on the roads is a big part of the puzzle

In an effort to reduce corruption, the Ministry of Transport and Infrastructural Development transferred senior management at the Vehicle Inspection Department (VID) in 2022. VID employees have been charged with running a bribery ring, stealing money from potential car owners looking for certificates of roadworthiness, and other issues.



Transport and Infrastructure Development Minister Felix Mhona emphasised that his ministry will not accept corruption in any parastatals under its jurisdiction when addressing attendees in late 2022 at the ministry's strategic planning workshop in Bulawayo.

The Minister added that the effects of climate change on the ministry's activities have been detrimental, highlighting the fact that the transportation and infrastructure sector has not been exempt from the whims of climate change.

"Equally, the state of climate change in our motherland is impacted by our decisions, use of, and development of the

sector. Our daily activities and way of life depend on transportation in all its forms. It establishes the boundaries of our rural areas, cities, and towns. The issue is the ongoing carbonization of the atmosphere, which has led to an acceleration of climate change is occasionally a result of the types of ships, machinery, and cars we use," said Mhona.

Without significant enforcement action, individuals will ultimately pay for climate change and air pollution by other means. Zimbabwe has recently been hit by severe droughts that have been attributed to climate change and these have forced millions out of their homes and have left them seeking assistance and food aid.

Climate change advocates are concerned about Zimbabwe's pledge to control air pollution while allowing such a large number of vehicles to pollute the cities and contribute to the overall greenhouse gases in the atmosphere. Authorities and those working to combat climate change are being pushed to take action as a result of law enforcement officials' failure to stop the situation.

Zimbabwe is a party to the Paris Agreement, the Kyoto Protocol, and the UNFCCC. Through their Nationally Determined Contributions (NDCs), countries are required by the Paris Agreement to submit and periodically revise their targets for reducing their greenhouse gas emissions. The Paris Agreement's Article 4 Paragraph 19 mandated that nations share their mid-century low greenhouse gas emission development strategies with the UNFCCC Secretariat by 2020 to direct nations' development in the wake of climate change.

In response to this appeal, the Zimbabwean government created the 2020–2050 Long-Term Low Greenhouse Gas Emission Development Strategy (LEDS) and the corresponding Measurement, Reporting, and Verification (MRV) Framework. Subsequent NDC upgrades and changes will take into account the LEDs.

The main contributors to ozone layer depletion and subsequent climate change have been identified as greenhouse gas emissions. The transport sector, manufacturing sector, and mining sector all use machines that require fuel which in turn release gas waste as an output. Countries are having trouble changing their energy production methods as they fairly move from fossil fuels to renewable energy. Electric vehicles are slowly penetrating the Zimbabwean economy, however, there are not many of them can be seen on the streets following other challenges associated with electricity supply and affordability of the vehicles.

The major portion of the nation's GHG emissions is attributed to energy production in the electricity, transportation, manufacturing, and agriculture sectors. In 2015, emissions were about 11.9 MtCO₂e, with CO₂ accounting for more than 99% of those emissions. The emissions from the transportation sector, primarily from the use of gasoline and diesel in road vehicles, made up the second-largest portion of the total.

According to an inquiry by the Green Business Gazette, imported Japanese and United Kingdom (UK) cars are not examined for radiation and exhaust gas emissions when they enter the nation.

Sedans, commuter omnibuses, and haulage trucks are among the ex-Japanese or ex-U.K. vehicles. The average mileage of an imported reject vehicle is roughly 100 000 kilometers, and their gas and radiation emissions are not regulated.

Rejecting automobiles will make it impossible for Zimbabwe to cut harmful gas emissions under the Paris Agreement, according to climate change expert Anna Brazier. The Paris Agreement aims to compel nations to cut their gas and radiation emissions to combat climate change.

Zimbabwe held an E-Mobility Stakeholder Awareness Workshop in June 2022 with a focus on how to convert the transportation industry, which accounts for 22% of the country's greenhouse gas emissions, to a green electric future.

During the workshop, the government of Zimbabwe launched three important documents. The three documents; a National E-Mobility Roadmap, a Market Feasibility Study for Intracity E-buses in Harare, and a National E-Mobility Policy and Market Readiness Framework were the culmination of an 18-month effort with assistance from the Climate Technology Centre and Network (CTCN) and the UNEP Copenhagen Climate Centre (UNEP-CCC).

Washington Zhakata, the Director of the Department in charge of managing climate change, was represented by Munashe Mukonoweshuro, who made the opening remarks.

"We have gathered here to discuss investment prospects, technological development and transfer, entry points for climate-smart infrastructure, and how to foster an environment that would encourage the use and deployment of electric vehicles in Zimbabwe. To adapt and close the gap between transportation sector development and climate action, help from the public and commercial sectors is crucial," said Zhakata.



CATCH THEM YOUNG! — TEACH CHILDREN SUSTAINABLE LIVING



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BIOGAS POTENTIAL UNDERATED

■ Tawanda Collins Muzamwese

Organic waste is ubiquitous in many African countries. This may arise from agricultural waste, household food waste, or else from sewage waste. Anything organic can produce biogas in anaerobic conditions.



Waste is a problem to many, but to some, it is an opportunity. The advent of biogas digesters has enabled the reduction of waste as well as the potential to generate income in different parts of the world.

Biogas digesters have long been implemented as potential energy sources for cooking purposes, heating, and even power generation.

Areas, where people are conglomerates, can be good havens for biogas. Boarding schools, prisons, barracks, churches, mosques, and places of worship can be good sources of biogas. This is by and large due to the presence of feedstock from the waste generated by the people.

Specific industrial sectors such as abattoirs, fish processing, and sewage works can also be designed with a biogas component. Biogas is good because it burns with a clean flame and has low emission levels.

Addressing energy challenges requires a plethora of energy sources, in what has come to be known as an energy mix. An energy mix allows a reduced dependency on one energy source and enables a reduction in energy poverty.

It is possible to use local masons in building biogas digesters and also to minimise the cost of getting imported materials. The bulk of biogas digester material can be sourced locally.

INVESTMENT IN BIOMASS ENERGY IN ZIMBABWE

■ Calvin Manika

Recent proposals of ending or limiting coal use and the declining water levels at the Kariba Dam are evidence that climate change has affected Zimbabwe's energy sector. The same conservations also cover the subject of diverse energy sources. Biomass energy is one of those energies. Years of personal level use of biomass energy have led some supporters of clean energy to feel that it can assist the country in resolving its energy issues.

There has been a rise in desire recently in the nation to use biomass resources for energy production to a greater extent. Fuel wood, agriculture and forestry residues, animal manure, energy crops, municipal and industrial wastes, and energy crops are the main biomass materials found in Zimbabwe. In Zimbabwe, a great deal of research has been done on using biomass materials as energy sources. Anaerobic digestion, gasification, fermentation, and combustion are some examples of biomass energy conversion technologies.

For the nation, biomass represents a sizable energy resource that must be fully utilized. However, the historic practice of using solid biomass as a major source of energy is still common in Zimbabwe today. According to experts, upgrading to more advanced and contemporary biomass energy technology should be the way forward.

Coal, petroleum, solar energy, and hydropower are also included in the nation's energy mix. Modernized bioenergy systems are crucial for the creation of sustainable energy systems since it is now widely acknowledged that biomass has the potential to become one of the main primary energy sources in this century. Traditional biomass energy makes up the majority of the bioenergy used in sub-Saharan Africa.

Traditional biomass energy is referred to as the direct combustion of various types of solid biomass resources. Moving toward enhanced traditional biomass and contemporary biomass energy technology is necessary. Utilizing biomass energy nowadays means transforming it into modern fuels, primarily liquid and gaseous fuels.

In Sub-Saharan Africa, the majority of the ultimate energy supply is derived from biomass. Zimbabwe

uses roughly 280 pJ of energy annually. The source of 66% of this energy is biomass. Around 10 million people, or more than 76% of the population, rely on biomass for energy. About 85% of the nation's domestic energy needs are met by biofuels. Zimbabwe's energy usage has increased at a pace of roughly 3.5% annually.

Zimbabwe is home to a sizable livestock population. Cattle, pigs, and goats are the predominant species. Each year, the nation generates around 4 million tons of animal waste. A good substrate for biofuels is animal dung. To realize the true economic worth of Nuanetsi Ranch through biomass energy generation, Zimbabwe Bio Energy (ZBE) and the Development Trust of Zimbabwe (DTZ) formed a joint venture there. Such joint ventures and collaborations in deploying new technologies in the sectors are proving to be a success.

Along the Eastern Highlands of Zimbabwe, a substantial timber industry exists. The plantations, which cover 810 km² of pine, 240 km² of eucalyptus, and 130 km² of wattle, take up 0.02% of Zimbabwe's total land area. Residues from forestry and sawmill operations make good energy carriers.

Large quantities of sawmill wastes, which can be utilized for cogeneration, are produced by sawmills in the eastern half of the nation. Three possible projects for co-generation in Zimbabwe's Eastern Highlands have been identified by the Department of Energy under its National Biomass Strategy. The Charter Sawmill Wood Residue Power Project, Chimanimani Sawmill Wood Residue Power Project, and Nyanga Sawmill Wood Residue Project.

About 98% of Zimbabwe's biomass energy needs are met by fuelwood, which also fulfills 85% of the nation's home energy needs. The majority

of low-income households in rural and urban areas consume approximately 6 million tons of wood annually. A significant portion of the biomass that is accessible in the nation is made up of crop wastes. These by-products of harvesting and processing are these residues. Crop residues are produced in the greatest amounts by sugarcane, which accounts for 55% of the total crop residues.

It has been investigated whether cogeneration in Zimbabwe's sugar sector is a possibility. The results pointed to technological advancements that could be made to boost process and energy efficiency. These are based on comparisons with cutting-edge technology used in Mauritius for the cogeneration of bagasse energy. By constructing two plants with a combined capacity of 105 MW, which would generate roughly 517 GWh of clean bagasse energy, the capacity at the two sugar estates could be raised to 210 MW.

Biomass can be used to create modern, convenient, clean energy sources. There are well-established conversion processes for using biomass to produce heat, power, and fuels, and these processes are backed by ongoing research and development. The primary types of conversion processes include physical, thermochemical, and biological ones. One of today's most outstanding biomass energy technologies is the production of biodiesel and bioethanol.

Modern biomass energy technologies are now in various stages of



development, testing, demonstration, and commercialization. The gasification process has been around for over a century. The technology of anaerobic digestion is established. It is well-established to generate electricity using boiler-

steam turbine systems and biomass combustion. On the other hand, it has been proven that biomass can be burned alongside coal, and biomass-based cogeneration technology is well-established in the agro-industry.





CLIMATE LITERACY IN THE MEDIA SECTOR

■ Wadzanai Diana Manyame

Climate change is a fairly new concept that has been initially denied but due to the occurrence of certain events across the globe, the perception around climate change is changing. People are starting to find interest in it and are working towards understanding its dynamics and how it interacts with the environment, the people, and businesses. Attention is being drawn to climate change and the world is changing in trying to manage its recent impacts and mitigate its possible future impacts. The dialogue around climate change and actions being taken is solely dependent on the discourse around the phenomenon, and these are mostly driven by the different media houses to the different media platforms we use to access information. This alone shows the power of information and most importantly the power of those who have the capability and rights to spread the information around the world. It is a rather worrying aspect when one wonders whether those communicating the message are fully educated and aware of the message that they are communicating as this might have implications on how the message is packaged and how the reader is going to receive it and actions thereafter.

In this modern-day information travels very fast, in a matter of seconds something that would have happened in the United States of America will be already making headlines in South Africa. The media platform has grown and through technology, access to information has been made easy. In light of this, it is very important to recognise the role that the media sector is playing in the spread of information. The way people perceive phenomena and things happening around them is fully dependent on the information that they are fed and this is mainly being done through the different media platforms. The way climate change is and will be perceived and the way engagements will be done are all depended on the type of information that would have been reported about climate change. It is therefore imperative that people in the media sector have a full understanding of climate change and the dynamics around it to communicate the right message and paint a correct and clear picture to the general public.

According to UNESCO media and climate literacy is a prerequisite for stimulating climate change engagements. Data and information about climate change are always changing as

there are ongoing studies on the subject and new findings are being made regularly. Through its complexity, several dimensions are being used to understand this concept and also apply it to each region's context. Since the world is not a uniform place, general weather and natural climatic conditions differ in the different regions across the globe and effects being felt in each region are different though all related to the changing climate. Therefore, information should be true to the context and should apply to the region in which the reporting is being done. The vulnerability of countries and regions are mainly depended on geographical characteristics and mostly importantly adaptive capacity. All these are concepts that media sector personnel should be well equipped with as they craft stories and make headlines on climate change because awareness-raising, policy-making, and other interventions against climate change cannot be performed outside of the information and media circles.

Fully understanding the need to have reliable information being communicated around the world, Konrad Adenauer Stiftung (KAS) conducted a study to determine how climate change is perceived in the media fraternity within the Sub-Saharan African Region.

The study mainly focused on climate change reporting within the region of interest, knowledge levels of journalists on climate change, key drivers and incentives of their reporting on climate change, and challenges being faced in their different media houses. 200 journalists from seven countries were involved in the study and this was done to give a holistic view of the situation around the region. A book entitled, 'Media Perceptions of Climate Change in Sub-Saharan Africa.' was launched on the 18th of May 2023 in Harare, Zimbabwe in the presence of the German Ambassador to Zimbabwe, a representative from the Ministry of Information, Publicity and Broadcasting Services, Zimbabwean journalists, KAS representatives from the Regional office in Kenya and climate change experts in Zimbabwe.

Findings in the book showed that there is basic knowledge of climate change amongst the journalists reporting on climate change in Sub-Saharan Africa, where journalists know that the climate is changing and this could be attributed to human activities. Low levels of literacy were noted when it came to some basic concepts of climate change such as mitigation and adaptation, where some journalists could not differentiate between the two. The journalists were aware of the most common climate change-related processes and programs such as the Conference of Parties (COP) meetings and the Kyoto Protocol but were not aware of the African Common Position (ACP) which is something these journalists should be well knowledgeable about and following to communicate to the public of the negotiations taking place in favour of Africa within the climate change space.



The reporting levels were not satisfactory. 4 countries were reported to have published less than 50 stories in 4 years and most of the articles were event related mostly addressing and reporting on climate emergencies and climate events such as Cyclone Idai and the Conference of Parties (COP) meetings. Critical analysis and investigative journalism are not being practiced in this sphere of reporting most probably because of the lack of adequate knowledge and understanding of the different concepts to fully present a case and critique it hence the stories lack depth and breadth in terms of climate change advocacy. A substantial percentage understood the role that media plays in communicating climate change phenomenon and advocating for policy change and action towards climate mitigation and adaptation.

A bias was also identified when it came to the main reason why some journalists though not knowledgeable or interested in climate change still reported on it. The study brought out that most journalists would cover climate change stories and report upon incentives from NGOs, who would in turn tell them what to cover and how to report the news in their favour.

Incentives on offer include support to travel internationally to cover stories, training, and financial support. Now because the journalists is not well equipped with the information on climate change, they cannot argue on what they would have been asked to report on and also because they do not want to lose the support, they are left with no choice but to abide by what the NGO would have told them to do.

Key challenges highlighted were the availability of resources to support coverage of climate change stories which brings fewer returns, as well as poor access to sources and climate-related information. Despite being interested in the subject most journalists studied journalism and still need to be educated on climate science, climate finance, climate governance, climate reporting, and several dynamics that are coming up around climate change and most of them are not capable of supporting themselves to undertake these studies. The media houses are also not allocating funds for this to happen. Those that are active in the media spaces and are quite knowledgeable about climate change-related phenomena hold

onto the information and do not invite those in the media sector to be trained and have them correctly disseminate information. They select what should be communicated and who should communicate it and this has created a major gap within the media sector when it comes to climate literacy and reporting.

The unfortunate bit is that, as explained earlier human activity is directly related to what they know meaning there is a direct correlation between knowledge, attitudes, and practices as there is an old saying that says, 'knowledge is power.' Climate literacy is a stronger predictor of climate change concern and policy support than any other variables such as demographics, experience, and values and it can largely enhance the effects of media coverage through the mediation effect.

Therefore, the right and significant actions toward climate change can only be noted when there is true, reliable, and relevant information circling the media spaces. In this digital age, the media has the power to sway the thoughts and perceptions of the world and this should be taken advantage of to bring about positive change.

72%

of Africa's young people consider climate change a major concern impacting their future



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CLIMATE CHANGE IMPACT ON INSURERS IN ZIMBABWE AMIDST INSURANCE DISCUSSIONS IN COPS

■ Calvin Manika

The 21st century has been marked by uncertainty and hazards that are constantly expanding, particularly in the areas of technology, human behaviour, and even natural events. Humanity now has serious concerns about climate change. The only topic of discussion right now is how much it will affect various economic sectors including agriculture, forestry, and the energy industry. The insurance industry is vulnerable to climate change and if climate change poses a systemic threat, the industry is not well equipped to manage it. It may be ready for some natural disasters but not the overall impact.

Zimbabwe is very susceptible to the variations brought on by climate change. Temperatures have risen by about two degrees Celsius over the past century, but yearly rainfall has dropped by 20 to 30%, reducing the amount of fresh water available. In Zimbabwe, according to statistics from ZimStats, rain-fed agriculture accounts for about 80% of total production. Shifting from

early November to late December has become the new rainy season, and there have been eleven droughts, as well as numerous cyclones and storms, in the past 20 years. Food insecurity in the nation has increased as a result.

A climate change analyst Adrienne Bolen claims that the country's extreme weather events are becoming more frequent due to climate change, leaving nearly half of the nation's population—more than 15 million people—uncertain of where they will get their next meal.

The conventional purpose of insurance is to make up for losses. The promise of insurance, to pay claims that are legally owed, must be upheld even when those claims become due for years, and sometimes decades, after the policy was issued. To do this, climate change analysts say insurers must collect enormous sums through premiums that must be withheld and prudently invested. According to Nobert Musa Phiri, a climate change researcher, this makes the insurance industry a great ally in responding to climate change but only if it sees the potential for economically insuring the risks,

"Insurers are essential in the worldwide effort to combat climate change. They pay claims when customers experience losses as a result of extreme weather; they have a sizable capacity to invest in long-term infrastructure to support adaptation and mitigation to climate change; and their risk management expertise can assist governments, businesses, and communities in building resilience," said Phiri.

According to research, the energy industry is responsible for 49% of Zimbabwe's overall greenhouse gas emissions. In 2021 Zimbabwe revised its Nationally Determined Contributions and updated its emission reduction target to 40% per capita compared to business as usual by 2020. To achieve this, His Excellency President Emmerson Mnangagwa is promoting investments in hydropower, solar power, and biomass. During his speech at the 2021 United Nations Climate Change Conference (COP26), he promised to keep protecting the varied species while pleading for financing in the future to fulfill pledges made at COP26 and help fight the effects of the country's ongoing droughts. The three key commitments made at COP26 are climate finance, community adaptation, and emission reductions.

The clearest effects of climate change on insurance relate to the provision of coverage for natural disasters. However, it is also necessary to take into account the growing significance of damages brought on by gradual phenomena, agricultural insurance for things like crop, livestock, and forest damage, as well as insurance for buildings, contents, machinery, and transport, insurance for tourism, and business interruption insurance across all industries.

According to the experience of countless insured farmers, climate change causes a wide range of legal issues. These logically result from the fact that the insurance contract has two conflicting interests. While the insurer just wants to protect itself from material increases in existing risks as a result of climate change, without necessarily withdrawing from regular coverage, the insured wants to protect themselves against any potential future exigencies.

The population may continue to grow in areas like Manicaland province where flooding is becoming more common due to climate change, which would double the losses. The economic value of the assets at risk may potentially rise under the same conditions. There are concerns about whether the insurance will pay out when a loss is caused by a combination of diverse circumstances, with climate change being one of them, even if the policy covers the effects of climate change only.

To encourage development in sustainable areas rather than vulnerable ones that might need to be abandoned in the future due to the effects of climate change, Richard Ward, a climate change researcher with work in the insurance industry, contends that micro-insurance must be made available in conjunction with the United Nations Framework Convention on Climate Change.

Local climate change advocates suggest that the Insurance and Pensions Commission (IPEC)

must create a structured and thorough framework based on climate change to encourage the creation of products that are meant to lessen the effects of climate change. Balancing these worries with equally critical issues of insurance availability and affordability will always be a regulatory problem. To promote new products that lessen the effects of climate change, there is also a need for proper coordination between policymakers and the business sector on climate change awareness.

A record number of leaders and experts from the public and commercial sectors came together at the 27th Conference of the Parties (COP27), organized by the United Nations and held in Sharm El-Sheikh in November 2022, to propose novel solutions and establish new alliances to battle climate change. The insights from the proposals discussed how climate change would affect insurance.

Loss and ruin are among the lessons learned. Loss and

damage are terms used to describe the effects of human-induced climate change, which include more frequent and extreme events, and slow-onset trends with widespread negative effects, some of which are beyond the scope of adaptation. It is significant to note that in the 2015th, Article 8 of the Paris Agreement designated comprehensive risk assessment and management, risk insurance facilities, climate risk pooling, and other insurance solutions are among the main themes for collaboration and support under the Loss and Damage programme.

For insurers, the introduction of the G7/V20 Global Shield may be the most noticeable result of COP27. These advancements build on the industry's efforts to provide insurance to the most vulnerable countries, such as those made through the Insurance Development Forum and the InsuResilience Global Partnership, and they present new chances for increased funding access and collaboration, both of which are necessary to close the protection gap in emerging and low-income economies.



GREEN BUSINESS'S GAZETTE



**SAVE
THE
PLANET**

CHEAPER NUCLEAR SOLUTIONS TO BRIDGE AFRICA'S ENERGY DEFICIT

■ Innocent Nhire

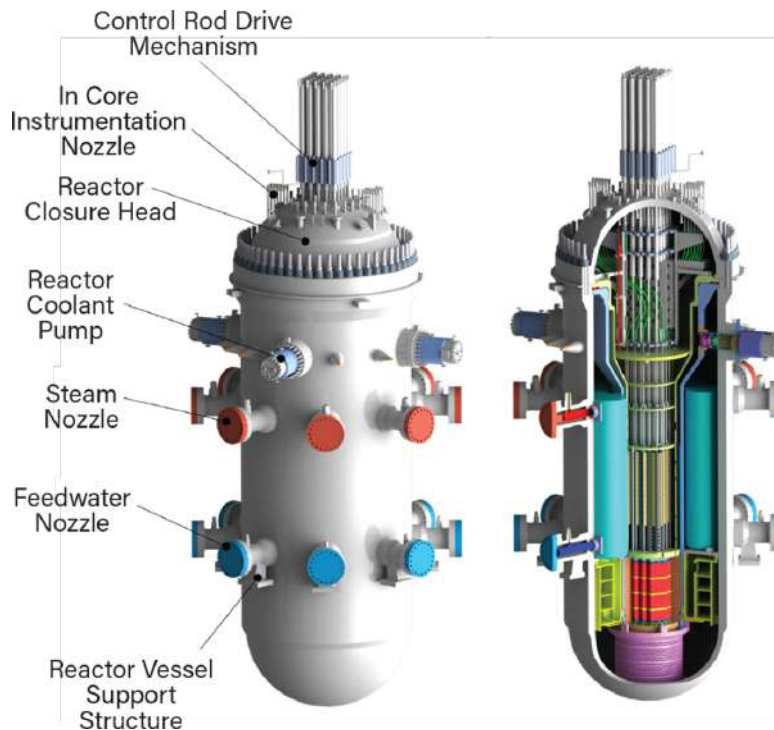
A new version of reactors provides a fresh opportunity for more African countries to take up the nuclear option! Small modular reactor (SMR) concepts are rapidly proliferating, which could alter how nuclear power is developed both in Africa and abroad.

These SMRs range from reactors small enough to fit on a pickup to ones with a power output of about 300 megawatts, or roughly one-third the size of a conventional reactor. However SMRs have not yet been put to the test, and many of the new designs are quite conceptual. However, Kirsten points out that the US will certify its first SMR design by the end of 2022, meaning the facility will be able to produce power at that time.

More power is critically needed on the continent. According to the African Development Bank, more than 640 million of the 1.4 billion people living on the continent lack access to electricity. Projections by the Institute for Security Studies are that based on current patterns, this number will increase to 657 million by 2030.

To bridge the gap, many African nations have considered developing nuclear weapons. However, aside from the 40-year-old Koeberg plant in South Africa, only Egypt has made the switch due to costs and other complications. Rosatom, the government-run nuclear company in Russia, began building its first nuclear power plant last year.

Only the United States (US), Russia, China, France, and South Korea have recent experience building and exporting conventional big nuclear power stations. But the technology for small modular reactors (SMRs) has exploded over the course of the last year or so. At least 80 new designs have surfaced.



According to them, SMRs will make nuclear power more accessible to more African nations. The reactors may potentially alter the prospects for the global and African markets for multinational nuclear power station makers.

At least 80 new compact modular reactor designs have surfaced internationally in the previous year. A few years ago, Rosatom was the industry leader in Africa and on

a global scale. About 12 African nations were investigating nuclear power in 2016. Around 18 African nations signed cooperation agreements with Rosatom on the peaceful use of nuclear energy at the Russia-Africa Sochi Summit in October 2019.

The US and France have not actively entered the market for a variety of reasons, whereas Rosatom has been aggressively marketing itself and providing finance packages, particularly to African nations. It continues to do this. Vladimir Putin, the president of Russia, stated last month at the International Parliamentary Conference in Moscow that Russia was prepared to provide 100% financing to African nations.

However, Russia can soon lose its competitive advantage. According to Kirsten and Stott, SMR technology has advanced most rapidly in the US, France, China, Canada, and the United Kingdom.

According to them, SMRs have three key benefits for Africa: reduced construction costs, quicker construction, and improved inherent and passive safety characteristics. For instance, some might be prefabricated in the country that produces them, reducing the expense of acquiring the nuclear technical expertise needed for traditional facilities.

Additionally, an SMR may be put into service in a nation with nuclear power in five years as opposed to the typical 10 to 15 years it takes to build a conventional nuclear power station. It might take more time—between five and 12 years—in a developing nation with little to no experience with nuclear power.

Small Modular Reactors have not yet been put to the test, and many of the new designs are quite conceptual. This is due in part to the relative scarcity of nuclear expertise as well as the complex legal and regulatory frameworks that must be established to satisfy safety requirements. To prevent radiation mishaps, safeguard nuclear material, and stop nuclear proliferation (the divergence of fissile material for illicit military use), these actions must be taken.

Ghana will likely produce nuclear energy in Africa after Egypt, according to Kirsten and Stott. It has operated a

nuclear research reactor for a while, gaining knowledge of technology and legal requirements. Ghana has successfully entered Phase 2 of the three-stage IAEA Milestones Approach after completing the first phase with assistance from the International Atomic Energy Agency (IAEA). This aids nations in building the domestic nuclear power infrastructure they need. Ghana could opt for an SMR with the capability of later adding modules if necessary. Kenya and Uganda could be the next nuclear-armed nations in Africa.

They also claim that there are many more in the works, however, they plan to wait to see how SMRs fare in their home nations first. Not everybody is persuaded. The claim that SMRs are a more affordable alternative is disputed by opponents of nuclear power, in addition to usual worries about radiation, proliferation, and the disposal of toxic waste.

SMRs' benefits to Africa include lower construction costs, quicker construction, and enhanced safety measures. There will be questions around the place of renewables obviously in the whole matrix. However, at best renewable energy is intermittent, it doesn't contribute to the base load of electricity. Renewables cannot provide the base load for industrialisation and efforts such as the African Continental Free Trade Area, which are all energy-intensive. Ultimately every country will have its own mix but fundamentally nuclear energy should be part of this mix. The global energy crises should accelerate African states toward deploying SMRs.





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