National Council

REPORT OF THE NATIONAL COUNCIL STANDING COMMITTEE ON AGRICULTURE, ENVIRONMENT AND NATURAL RESOURCES ON THE OVERSIGHT VISIT TO INVESTIGATE THE STATUS OF NAMIBIA'S MARINE AND INLAND FISHING RESOURCES AND ASSESS THE ROLL OUT OF GREEN HYDROGEN PROJECTS IN THE //KHARAS AND ERONGO REGIONS FROM 10TH TO 21ST SEPTEMBER, 2024

October 2024

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ABBREVIATIONS

AIS	Automatic Identification System
DBSA	Development Bank of Southern Africa
EEZ	Exclusive Economic Zone
EIB	European Investment Bank
EPL	Exclusive Prospecting License
FMC	Fisheries Management Centre
HPP2	Harambee Prosperity Plan II
IUU	Illegal, Unreported and Unregulated
LAC	Automotive Location Communicator
LWDC	Lüderitz Water Development Company
MCS	Monitoring, Control and Surveillance
MFMR	Ministry of Fisheries and Marine Resources
NIPDB	Namibia Investment Promotion and Development
NUST	Namibian University of Science and Technology
O&L	Ohlthaver & List
RFP	Request for proposal
SASSCAL	Southern Africa Science Service Center for Climate Change and Adaptive Land Management
TAC	Total Allowable Catch
UNAM	University of Namibia
VMS	Vessel Monitoring System

1. Background and Introduction

Namibia has abundant natural resources, including a rich marine eco-system as well as solar and wind energy which has attracted a lot of interest and investment both locally and internationally. A lot has been uncovered about the more common resources such as uranium, gold and our marine reserves, however, the emerging sector of green hydrogen is not widely understood by many. This is partly due to the complexities and technicalities involved in the production and marketing of green hydrogen products.

This, coupled with the concern of the country's marine resources in light of reported illegal, unregulated and unreported fishing activities both in land and onshore, resulted in the Committee's undertaking of a two-fold oversight visit, to one; assess the status of green hydrogen projects and secondly, investigate the status of Namibia's marine resources and further to that, determine measures in place that safeguard and protect these marine resources through engagements with the Ministry of Fisheries and Marine Resources (MFMR). It is against this background the Committee identified Green Hydrogen and Marine Resources as subjects for the its oversight programme for the 2024/2025 Financial year. The Committee recognises the financial constraints that often limit oversight activities. On this premise, the Committee found it prudent to conduct a two-part oversight mission under one period, in order to address the two equally important matters under the Committee's ambit.

Prior to this oversight, the Committee held stakeholder engagements from the 17th to the 20th of June 2024 with both the Green Hydrogen Commissioner as well as Senior officials from the Ministry of Fisheries and Marine Resources to gain a wider understanding and appreciation of the concepts. The Committee then undertook the oversight to investigate and validate information obtained from the engagements as well as assess the conditions on the ground. The Committee met officials from the MFMR offices in Walvis Bay and Luderitz, including site visits to the harbour. In addition, the same was done with the officials of Green Hydrogen Projects in the //Kharas and Erongo Regions, after which site inspections concluded the meetings.

This report is two-part. The first section of the report will cover the investigation into the status of Namibia's marine and inland water resources. Secondly, it will delve into the assessment of the green hydrogen projects.

2. Objectives

The objective of the oversight activity was to enquire into the status of the country's marine and inland fisheries resources and secondly, assess the roll out green hydrogen projects in the country and report back to the National Council as guided by the following Terms of Reference:

With respect to the Management of Namibia's Marine Resources, assess the;

1. Monitoring and surveillance of Namibia's marine resources;
2. Status of illegal, unreported and undetermined Fishing;
3. Human resource capacity of Ministry of Fisheries and Marine Resources;
4. Challenges in the management of marine resources

With respect to the roll-out of Green Hydrogen Projects, investigate;

1. Targets of Green Hydrogen Strategy;
2. Long and Short-Term benefits of Green Hydrogen;
3. Sustainable Production of Green Hydrogen for Renewable Energy;
4. Economic Benefits of Green Hydrogen;
5. Limitations/Constraints pertaining to skills gap, funding, legal frameworks and infrastructure

3. Composition of the Standing Committee

The oversight visit was undertaken by the following Members of the Committee and Secretariat:

COMMITTEE MEMBERS

Hon. Melania Ndjago	Chairperson
Hon. Elder Filipe	Vice-Chairperson
Hon. Paulus Mbangu	Member
Hon. Joram Kennedy	Member
Hon. Richard Gaoseb	Member
Hon. Nicodemus Motinga	Member
Hon. Willem Labuschagne	Member

SECRETARIAT

Ms. Pamela Mate	Chief Parliamentary Clerk
Ms. Elizabeth Andreas	Parliamentary Clerk
Mr. Immanuel Kooper	Deputy Director: Research and Information Services

4. Methodology

This report encompasses information obtained during the Committee's stakeholder engagement held from the 17th to the 20th of June 2024 with officials from the Ministry of Fisheries and Marine Resources, Green Hydrogen Commission, the Electricity Control Board, the Ministry of Mines and Energy. It further contains information obtained from meetings with Ministry of Fisheries and Marine Resources Officials in the Kharas and Erongo regions, as well as officials of Green Hydrogen projects in the aforementioned regions. Finally, it includes evidence from site inspections related to same from the 12th to the 20th of September 2024.

5. SECTION 1: Assessment of Marine Resources

5.1 Overview of the Ministry of Fisheries and Marine Resources

The Ministry of Fisheries and Marine Resources (MFMR) is mandated to sustainably manage the living aquatic resources and promote the aquaculture sector. The Namibian fishing sector is an important industry as it contributes immensely to the Gross Domestic Product (GDP) of the country. In the 2022/2023 and 2023/2024 financial year, the sector accounted for 4,2 percent and 4,6 percent respectively of the overall GDP. Furthermore, the sector improves domestic food supplies and security, and play a major role in eco-tourism. It is also the second largest foreign currency earner after mining, with earnings also collected from levies.

The fishing industry employs a significant number of people. In Namibia, around 16 000 people are employed in various roles, including those working on board fishing vessels, in processing factories, and in related support services.

There are three state owned enterprises under MFMR namely: Namibia Maritime and Fisheries Institution, Fisheries Observer Agency and the Namibia Fish Consumption Promotion Trust.

The following are the local primary policy and regulatory instruments or frameworks of MFMR to enforce law on marine resources:

a) The Marine Resources Act 2000 (Act No. 27 of 2000);

b) The Marine Resources Regulations (Government Notice No. 241, Regulations relating to the exploitation of Marine Resources, 2001)

c) Namibia's Marine Resources Policy: Towards Responsible Development and Management of the Marine Resources Sector (August 2004); and

d) The White Paper on the Responsible Management of the Inland Fisheries of Namibia (1995);

e) Inland Fisheries Resources Act (No. 1 of 2003);

f) Aquaculture Policy;

g) Aquaculture Act 2002 (Act No.18 of 2002), and

h) Aquaculture Regulation on Licensing.

The Ministry has various aspects of fisheries management and aquaculture programs aimed at promoting sustainable fisheries and aquaculture. These programs typically include:

a) Survey and stocks assessment

This involves collecting data on fish populations to understand their size, distribution and health.

b) Monitoring, control and surveillance

MCS system are essential for enforcing fisheries regulations and ensuring compliance. They help to prevent illegal, unreported and unregulated (IUU) fishing.

c) Policy and economic advice

This includes providing guidance on fisheries policies and economic strategies to ensure sustainable and profitable fisheries.

d) Promotion of aquaculture and inland fisheries

This focuses on developing and supporting aquaculture (fish farming) and inland fisheries to increase fish production and reduce pressure on wild fish stocks.

e) Coordination and support services

These services ensure that all stakeholders, including government, fishermen and conservationist, work together effectively to manage fisheries resources.

The MFMR management system employs a rights-based approach which includes several key tools. These measures and efforts are designed to ensure the sustainability of marine resources while supporting the livelihoods of those dependent on fishing, namely:

a) Determining Total Allowable Catch (TAC)

This involves setting a limit on the quantity of fish that can be caught within a specific period to ensure sustainable fishing practices. This is determined through work done on the Mirabilis Research vessel and at the research station in Swakopmund.

b) Granting of fishing rights (right of exploitation)

Fishing rights are allocated to individuals or companies, giving them the legal authority to exploit certain fish stocks.

c) Granting of quotas

Quotas are assigned to right holders, specifying the quantity of fish they are allowed to catch.

d) Effort control/limitation

It is managed through the licensing of vessels, controlling the number and capacity of fishing vessels to prevent overfishing.

5.2 Committee Engagement with Ministry of Fisheries and Marine Resources

Prior to the oversight visit, the Committee held an engagement with officials from the Ministry of Fisheries and Marine Resources to gain a wider understanding of the sector and to share the Committee's intention to conduct an oversight, including its aims and objectives.

The delegation of the Ministry was led by the Executive Director and her team of senior officials. The MFMR informed the Committee that they have in place a Directorate of Resource Management which is responsible for specific activities such as conducting scientific surveys for marine species and the marine environment, evaluate data from commercial fishing operations for scientific purposes, modelling and stock assessment and promote regional and international cooperation. The Ministry also noted that they instituted a dynamic Monitoring, Control and Surveillance (MCS) program with the purpose to ensure compliance with fisheries legislations. All fisheries related legislations were enacted within about a decade thereafter,

amongst others, the Marine Resources Act of 2000 (Act 27 of 2000) which was enacted with associated regulations was formalized in subsequent year. Additionally, the Ministry also ratified a number of international conventions and agreements that are relevant to fisheries governance and are in line with global practices and standards.

5.2.1 International Conventions and Agreement

Namibia is party to a number of international conventions and regional fisheries organizations that enhance the legal enforcement and extend the ministry's jurisdiction. The Ministry has signed Memoranda of Understanding with neighbouring South Africa and Angola that address co-management and protection of shared living aquatic resources in common areas or water bodies and with other countries further afield. One of such is the SADC Monitoring Control and Surveillance Coordination Centre (MCSCC) which came into force on the 8th of April 2023. The Ministry further stated that they continuously deliberate to harmonize laws and practices in shared jurisdictions.

In order to ensure that the resources are protected, the Ministry enforces compliance with national, regional and international fisheries legislation of fishing activities. They also collaborate with regional and international partners on combating, deterring and eliminating illegal, unreported and unregulated (IUU) fishing. The Ministry further conducts regional and national joint patrols, provide advice on conservation measures and monitor the offloading of fish and fish products at all landing side. In 2023, a joint patrol operation was undertaken with participation from representatives of the Republic of Angola and local stakeholders. They also conduct inspection at sea as well as conduct coastal and inland patrols.

5.2.2 Protection of the Exclusive Economic Zone

Namibia, like many countries of the world, have a contiguous zone with respect to the sea. The contiguous zone, or Exclusive Economic Zone (EEZ), is an area of sea contiguous to and extending seaward of the territorial sea, in which the coastal State may exercise the control necessary to prevent and punish infringements of its customs, fiscal, immigration, and sanitary laws within its territory or territorial sea.

In addition to the legislative and institutional arrangements in place, the Ministry complements the MCS program with operational systems that enhances efficiency of its enforcement. There

is a Fisheries Monitoring Centre (FMC) housed in Walvis Bay that operates 24 hours a day, particularly when patrol vessels are at sea to ensure efficient communication and coordination of patrol operations. The centre also hosts the Vessel Monitoring System (VMS) which enables the tracking of all licensed vessels within the EEZ and beyond in real time. In line with the Vessel Monitoring Regulation (2014), all Namibian flagged and licensed fishing vessels must be installed with an Automatic Location Communicator (ALC) which is registered in accordance with the provision of the regulations. Vessels are required to ensure that ALCs on board are functional at all times and transmit geo-tracked information every two hours to the FMC. The VMS was upgraded in 2020 to incorporate modules for Automatic Identification System (AIS) and Radar Imagery, for identification of vessels that switch off their AISs in order to enable the Ministry to identify any vessels entering Namibian EEZ. Thus, all licensed vessels have a functional VMS on board, which is a minimum requirement to curb illegal and unreported fishing activities. The system can also monitor the location of fishing vessels through an Automotive Location Communicator (ALC), after which it analyses and presents the information to the VMS Operation Room in Walvis Bay where it is processed by the surveillance and enforcement personnel for further action. VMS is also used to find vessels and ships in distress. If a ship is carrying an ALC, the last reported position may be used to narrow the search and it saves valuable time.

The MFMR takes a comprehensive approach to protect its EEZ through a combination of sea and air surveillance which is aimed to effectively manage and protect its marine resources. The sea surveillance includes two fisheries patrol vessels, named after liberation icons, Anna Kakurukaze Mungunda, Nathaniel Maxuilili. The patrol vessels are staffed with law enforcement officers who monitor and enforce regulations at sea. The air surveillance includes two fisheries patrol aircrafts that are used for aerial surveillance by providing a broader view of the EEZ and helping to detect illegal activities. Although there have been reports of illegal, unreported an unregulated fishing, officials from the MFMR claim that the monitoring and control surveillance in Namibia is perceived as a success story. They further informed the Committee that IUU is reported to have reduced over the years due to the interventions of the Ministry. However, media reports indicate that the Namibian fishing industry suffers extreme losses annually due to illegal, illicit, unreported, and unregulated fishing practices estimated to be to the tune of N$1.5 billion.

The Ministry is cooperating with other Namibian governmental and regulatory bodies related to maritime and legal affairs in an effort to curb the IUU fishing. These are the Fisheries

Observer's Agency (FOA), Namibian Navy, Namibian Police (Water Wing), Department of Maritime Affairs (DMA), Customs and Exercise, Immigration, Ministry of Justice (MOJ), Office of the Attorney General (AG) and the Office of the Prosecutor General (PG). When a fishing vessels goes out to catch fish, it often goes with or has fisheries observers from the FOA on board. The observers are professionally trained biological technicians who gather data on what is caught and what is discarded by commercial fishing vessels. They also help ensure compliance with fishing and safety regulations and monitor by-catch of protected species. These fisheries observers play a role in sustaining fisheries management by collecting data that is used to assess fish populations, set fishing quotas and inform management decisions. Their presence helps maintain the balance between fishing activities and marine conservation. There are also inland and coastal patrol and inspection that involves various activities to ensure safety, compliance with regulations and environmental protection. These patrols and inspections are crucial for maintaining safe and secure waterways.

Before a vessel leaves the port for fishing, officials do clearance and inspect whether the vessel is fit. When the vessel comes back, it reports 48 hours before it docks in which time fishing inspectors are deployed at the harbour to oversee the landing of fish brought to the harbour. They make sure that every fish landed is recorded and necessary payments are made. When fishing, log sheets are used to record the time they put the net in and when they it pull it out, how much fish was caught and at which area, the Ministry then verifies this data. If it's not the targeted fish species, one needs to pay a fee to the Ministry. The Ministry also oversees regulations related to bycatch. If vessels exceed bycatch limits or fail to comply with bycatch reduction measures, they pay fees or face penalties. Furthermore, the Ministry does not allow vessels to land at the port if it catches fish illegally. Chief amongst these, the MFMR must ensure a functional Vessel Monitoring System (VMS), Fisheries Management Centre (FMC) and Operational Centre, and collect and provide accurate fishing landings information.

5.3.3 Illegal, unreported and unregulated fishing

Illegal, unreported and unregulated fishing (IUU) remains one of the greatest global threats to marine resources due to its ability to undermine national and regional efforts to manage fisheries sustainably and conserve biodiversity. IUU fishing takes advantage of compromised administrations and exploits weak management systems, particularly where lack of capacity and resources for effective monitoring, control and surveillance (MCS) are limited. The system

can be resource demanding and this has been the factor why many countries globally have failed to protect and responsibly manage their aquatic resources.

IUU fishing occurs in all types and dimension of fisheries, both at sea and inland. Fisheries resources available for local markets are removed by IUU fishing, which can lead to the collapse of national fisheries with valuable contribution to the country's economy and negatively affect the wellbeing of its people. Fish products derived from IUU outcompete legitimate products in trade markets and suppress national supply. Therefore, IUU fishing threatens livelihoods, exacerbates poverty, destabilizes the industry and should not be taken lightly.

The MFMR is continuously trying to improve the effectiveness and efficiency of its Monitoring Control and Surveillance (MCS) programme. Since June 2005, the Ministry enacted that all fishing vessels of 20m length and more, licensed in Namibia be equipped with Automatic Location Communicators (LACs) and to report their position, direction and speed of the vessels to the Ministry's Vessels Monitoring System (VMS) to enable the Ministry to know what each vessel was doing at the particular time. This is particularly useful in the enforcement of Fishing Area Restrictions. Should a vessel cross a restricted area an alarm is triggered that can be used to check the activity of the particular vessel at that time, be it transiting, drifting or fishing and appropriate action is then taken. Should the ALC be switched off, the Ministry is able to detect it and contact vessel to verify and, if it is a mechanical problem, the vessel is ordered to return to harbour and repair its device. Initially, vessels were required to transmit their position details on four (4) hours' intervals, however the Ministry reduced the transmission intervals to two (2) hourly in 2019 and one (1) hour in 2022. Currently the Ministry is satisfied with one (1) hourly interval but will keep monitoring the situation and will improve if it's needed.

Sea patrol by vessels and an AIS to identify foreign vessels approaching or entering in the EEZ can direct the nearest patrol craft to investigate. The Ministry dedicates 30 to 50 percent of the on and over the sea patrols to the border area with Angola, where reports of foreign vessels illegally intruding to fish into Namibia's EEZ are often reported.

The Ministry however recognizes that they alone cannot address IUU fishing with the resources at its disposal. It is a challenge that cuts across various sectors, with multiple stakeholders mandated to different Ministries. Other state agencies such the Ministry of Home Affairs, Immigrations, Safety and Security (Immigrations and Nampol), Ministry of Finance and Public Enterprise (Customs and Excise), Ministry of Environment, Forestry and Tourism, Ministry of

Justice (Office of the Prosecutor General) and Ministry of Defence and Veterans Affairs have responsibilities that directly or indirectly relates to fisheries. The Ministry conducts some fisheries patrols jointly with the Navy and Nampol officials, however, improvement in these collaborations will lead to more success and further reduce IUU fishing.

5.3 Meeting with MFMR Officials at Luderitz and Walvis Bay

Following the briefing with Senior Officials from the Ministry of Fisheries and Marine Resources, the Committee met with officials stationed on the ground at the towns of Luderitz and Walvis Bay. The meetings were followed by site inspections of the harbour and the patrol vessels used in the monitoring and surveillance of Namibian waters. The officials highlighted the preventive and mitigating measures employed by the Ministry to safeguard the EEZ.

Officials from the MFMR the Committee engaged stated that the Daniel Maxuilili and Rosa Kakurukaze Mungunda patrol vessels are well maintained and meet national and international standards. For inland preservation, the Ministry acquired some small boats, one in Zambezi and one in Rundu to manage and control inland fishing.

5.4 Challenges

Notwithstanding the preventive and mitigating measures in place, the officials of the Ministry informed the Committee that the monitoring and surveillance of the country's marine and inland fisheries has not been without challenges despite the international agreements in place, as well as the technological interventions employed by the Ministry to safeguard and sustainably manage the marine and inland fisheries of the country.

5.4.1 Human Resources

The officials identified inadequate human resources and high staff turnover as a major challenge at the Ministry. The Officials informed the Committee that they employ a staff complement of about 174 fisheries inspectors and navigations officers at various offices in towns including Arandis, Walvis Bay, Lüderitz and Windhoek. There are currently about 143 staff on the establishment at the MFMR in Walvis Bay, these includes fisheries inspectors in the Directorate of Operation which oversees monitoring, control and surveillance. To successfully run the Ministry, the officials expressed that this figure needs to double to ensure that all facets of monitoring, control, surveillance are covered.

They claim the structure is filled, but more positions need to open up on the structure to meet the ever increasing demands of the fishing sector. In total, about only 123 staff are sea-going, this excludes the staff of Fisheries Observer Agency (FOA). They are complimented with approximately 140 Fisheries Observers employed by the FOA. Another limitation is that FOA staff are only allowed on fishing vessels longer than 20 meters to ensure that they meet the stipulated requirements relating to basic amenities for observers. Fisheries Inspectors are mandated to enforce legislation, while Fisheries Observers are deployed on fishing vessels to monitor day to day activities. The MFMR officials at the Luderitz office informed the Committee that there are 50 staff stationed at the regional office, however, 20 more positions still need to be filled but these positions are frozen.

Further to this, the more experienced staff who have been with the Ministry for a longer period are nearing retirement and many others have left, either for greener pastures or on retirement. A knowledge management system is thus needed to retain organizational memory and retain skills and experience.

5.4.2 Infrastructure

The Ministry officials in their engagement with the Committee prior to the oversight visit stated that they acquired various crafts used as deployment platforms for MCS enforcement across the vastness of its jurisdictional range. Crafts include the two aforementioned patrol vessels (Nathaniel Maxulili and Anna Kakurukaze Mungunda), the two fisheries patrol aircrafts and about 15 vehicles. The Committee however uncovered that equipment used in surveillance is old and needs to be updated. This includes the vehicles that do patrols for both inland and at sea. Officials stated that the patrol vehicles are not even able to catch up with more modern cars during their patrols when suspected perpetrators flee. At the time of the oversight, the Committee learned that all patrol vehicles of the MFMR at Walvis Bay were not operational. This has resulted in the poor visibility of fishing inspectors, most especially along inland waterways at the coastline. As a result, illegal fishing flourishes in places such as the Fish River, where a large number of fish is said to be carried out, sometimes as far north as the Angolan market with little to no detection. Officials say during this time, bags of mussels and other marine resources are collected along the beach at places along the Henties Bay road as they know that there will be no inspectors coming. To add to this, there are limited offices countrywide to help curb illegal fishing. Officials claim the MFMR is more focused on safeguarding the marine resources and not much resources are availed to inland fisheries.

Resources are thus more concentrated at sea than on inland resources, the Committee uncovered.

In response to questions on the effectiveness of the Vessel Monitoring System (VMS) in curbing illegal fishing, MFMR officials expressed that although useful, the VMS is detectable even by illegal vessels, and as such, is not as preventive as it ought to be. The VMS system is also only for Namibian vessels with the necessary VMS tools on board. However, for other vessels, the Fishing Monitoring Centre can detect when their Automatic Identification System (AIS) are on, otherwise they cannot be tracked. To address this, the MFMR say they are hoping to acquire drones and other state of the art equipment to patrol the vast seas and reinforce the existing measures in place. They also indicated the need for new vehicles in their budget and are hopeful to be exempted from the ongoing moratorium on the procurement of new vehicles for government agencies.

MFMR officials further stated that of the two research vessels, Anichab Research Vessel, stationed at Luderitz and Mirabilis Research Vessel, stationed at Walvis Bay experience break downs from time to time and are not always fully operational. Hence, they are not always able to go out to sea to conduct research if and when necessary.

5.4.3 Financial Constraints

Another critical factor that hampers the proper patrol on Namibian waters according to officials of the MFMR is the cost related to the operation of the patrol vessels. From Walvis Bay the patrol vessel goes down to the orange river mouth, then back up to the boarder of Namibia and Angola to the Kunene river mouth before going back again to Walvis Bay. The Committee was informed that the cost for patrolling the sea are extremely high, ranging from between N$ 500 000 to N$ 800 000 per patrol. This figure varies depending on the number of days and nature of operation. A majority of the costs go towards fuel, other costs including overtime, food and daily subsistence allowance push this figure even higher. Ideally, a patrol vessel needs at least 144 days, excluding unforeseen circumstances, out of the 365 days a year at sea for effective surveillance. Similarly, once a quarter is recommended for effective surveillance. However, Namibia's patrol vessels only take about 88 days at sea due to the high costs related to the activity. Conversely, if given new information, such as IUU fishing, the vessels are out at sea for longer periods then the 88 days. The MFMR is often unable to carry this cost alone and they informed the Committee that all stakeholders should pull together, particularly the Ministry of Defence, Ministry of Works and Transport, Ministry of Home Affairs and

Immigration and even Nampol, as the work carried out by the Ministry overlaps with those of other Ministries and agencies.

Of the two aircrafts under the Ministry's ownership, only one is fully operational. This is due to a faulty maritime radar, which has rendered the limping aircraft unfit for sea patrol. The Cesna 406 was manufactured in 1985 and was procured in 1993 from France. Currently, the aircraft cannot be used for sea patrol as it cannot be tracked. The Committee learned that the company that manufactured the aircraft has since closed, and procuring the maritime radar from other suppliers in the market today would cost an estimated N$ 23 million. Patrol aircrafts are able to land anywhere along the beach, making it easier to carry out arrests more swiftly. However, due to financial constraints, this has not happened.

The Committee further found that a vessel may take up to a day or more to reach an illegal vessel. By helicopter, it could be between an hour and half to two hours. With Navy and law enforcement officers on board, arrests can be carried out immediately. Thus, the MFMR officials underscored to the Committee the need to acquire an aircraft for this purpose. Additionally, they also highlighted the need for a navy base to be built at the Kunene River mouth, as Walvis Bay is too far to carry surveillance from. However, financial constraints will not allow this.

5.4.4 Mining and Exploration

Marine Biologists at the MFMR Office in Luderitz informed the Committee that oil and diamond mining activities negatively impact marine resources. The equipment used for exploration of oil and other minerals, when it comes in contact at high impact with either the ocean floor or other substances in the sea, interferes with the frequencies used by marine animals to communicate. This seismic activity causes whales and dolphins to pick up these waves and mixed signals, ending up swimming to the wrong side of the ocean and into shallow water where they get stuck and are unable to swim back in the deep sea. This is what often results in the beaching or stranding of whales and dolphins as they get washed out on the beach.

The Ministry stressed the importance of recognizing that living resources are renewable and if managed properly, could sustain the economy for generations to come. Therefore, they suggest that before Namibia expands marine mining activities, it is essential that its impact on the living marine resources and ecosystem from such activities are understood and that proper mitigation measures and regulations are in place.

5.4.5 Transboundary Relations and Cooperation

In the SADC region, Namibia is part of the Benguela Current Convention (BCC), a multi-sectoral inter-governmental organisation established by the Republics of Angola, Namibia and South Africa to promote a coordinated approach to long-term conservation, protection, rehabilitation, enhancement, and sustainable use of the Benguela Current Large Marine Ecosystem. Also referred to as the Benguela Current Commission, the body is the first in the world to be based on the Large Marine Ecosystem (LME) approach to ocean governance and is mainly responsible for managing the resources of the Benguela area.

Law enforcement committees of the three countries meet to harmonize their marine resources. However, a lot more still needs to be done. For example, at the time of the oversight, it was closed season for lobsters harvesting in Namibia. In October, the catch for hake was also closed, as was the case with bream, a species of freshwater fish more commonly found in the Chobe, Kavango, Linyati and Zambezi rivers. However, neighbouring countries do not take similar approaches, so fish depletes in those waters and migration to Namibian waters is affected. Sardine moratorium is also currently underway. Agreements thus need to be harmonized between states and matters such as closed season need to be revised. A closing season for fish species in one country must be applicable and bilateral to other countries within the convention, in order to help resources to recover, as fish know no boundary. Important to this point is that currently, Namibia reduced the quota of pilchards from 90 000 tonnes to zero currently due to unsustainable fishing. However, other countries within the region continue to catch and this has depleted the stock of pilchards significantly, almost to zero in Namibian waters.

5.4.6 Operational

The Committee was informed that in other countries, coast guard measures have a lot more government Ministries, Agencies and Organizations involved compared to Namibia, where a majority of the costs with respect to patrolling are carried by the MFMR alone. This has proven to be a burden to the Ministry as their budget is unable to meet the demands of the industry. The officials informed the Committee that currently, the responsibility of oil spills and tracking of missing vessels is he responsibility of the MFMR. This reduces operations and output as vessels cannot be there all the time. The sector thus does not have what it needs to function optimally. In terms of collaboration, the Navy and Namibian Police do however go on patrol vessels.

The Committee further learned that the MFMR Rundu Office had been closed, another indicator of the resource challenges facing the Ministry, further negatively impacting the protection of inland water resources. Although mostly overlooked, IUU is also prevalent on inland fisheries. There is almost no surveillance there at all, and over the years, the situation has worsened. This negatively impacts the livelihoods of the communities living along the rivers.

5.4.7 Other

Climate change has resulted in ocean warming which has negatively affected fish population. An increase in the sea's surface temperature has resulted in decreasing oxygen levels and now threatens marine life.

There is also a challenge with pollution, particularly plastic pollution, and officials are calling for the total ban of plastic in order to safeguard the ocean. Furthermore, oil leaks and spills also pose a threat to marine resources. Another threat that was raised is the increased marine traffic that interfere with dolphins and whales, as they use sound waves to communicate. These excessive sound and movement from boats, ships, tankers and vessels interfere with their communication.

Another major concern is the issue around the Orange river. MFMR officials claim that there is exploitation of resources at the Orange River and the matter needs to be addresses as a matter of urgency. Additionally, Namibians living along the Orange river have no say over that shared natural resource. Often, when they are fishing, they are told to leave as the river does not belong to them. This has become an issue of concern for the Ministry, as they are fearful of the future of the river and its resources. The MFMR also does very little oversight there due to limited resources.

Research indicates that there are 1.6 million seals in Namibian territory. This population is increasing and doing well despite the ongoing culling. The Committee was informed that the increasing number of seals poses a threat to fish stocks and thus, seals must be harvested in moderation, as they also deplete fish resources. They further claimed that seals are culled in the same way that fish are caught and it is all part of the sustainable management of natural resources. The challenge however, is the lack of value addition in the industry for products such a leather shoes and other merchandise.

White collar crime and corruption in the fisheries sector was also highlighted as a possible contributor to illegal fishing during the Committee's undertaking. Those involved and who benefit the most are believed to sit very high and investigating the cases takes ages to conclude. The sector deals with the matter by employing various mitigating measures, including literacy sessions with the Anti-Corruption Commission (ACC) and other more internal measures that aim to sensitize and discipline employees on corrupt practices. Furthermore, the FOA directive of 2020 prohibits observers from receiving any catch while gifts exceeding N$500 must be declared.

5.5 Findings

With respect to Marine Resources, the Committee made the following findings;

a) A critical factor that hampers the proper patrol on Namibian waters is the cost related to the operation of the patrol vessels, which ranges between N$ 500 000 to N$ 800 000 per patrol.
b) The MFMR carry much of the costs with respect to safeguarding the EEZ alone. They are thus unable to carry this cost alone. Thus, there is a need for a multi-sectoral approach to compliment the work of the Fisheries Ministry.
c) IUU fishing takes advantage of weak management systems, particularly where lack of capacity and resources for effective monitoring, control and surveillance (MCS) are limited. Thus, the combination of sea and air surveillance currently in place is not sufficient.
d) The Ministry dedicates 30 to 50 percent of the on and over the sea patrols to the border area with the Republic of Angola, where reports of foreign vessels illegally intruding to fish into the Namibian EEZ have been reported.
e) For inland preservation, the MFMR acquired small boats, one in Zambezi and one in Rundu to manage and control inland fishing. However, the MFMR office in Rundu is closed.
f) There is inadequate human resources and high staff turnover which poses a major challenge at the MFMR regional offices. In addition, more experienced staff who have been with the Ministry for a longer period are nearing retirement.
g) Of the two aircrafts under the Ministry's ownership, only one is fully operational. Procuring the faulty maritime radar would cost an estimated N$ 23 million. The research vessels also need upgrading as they experience periodic breakdowns.

h) Oil and diamond mining activities negatively impact marine resources. The equipment used for exploration of oil and other minerals interferes with the frequencies used by dolphins and whales to communicate, resulting in their beaching or stranding.

i) The policies, regulations and legislation of the Law enforcement committees of the Benguela Current Convention (BCC) countries are not harmonized, neither are bilateral agreements for inland fisheries. Neighbouring countries do not take similar approaches with regard to sustainable fishing, so fish depletes in those waters and migration to Namibian waters is affected.

j) IUU is more prevalent in inland fisheries but the sector is overlooked. There are not enough resources channelled to inland fisheries, which negatively impacts the protection of inland water resources.

k) The Committee uncovered that cars used in surveillance are old. At the Walvis Bay office, all vehicles for patrol were on break down. In additional, the number of cars (fifteen) is not sufficient to carry out operations country wide, hence the illegal fishing along the sea and inland.

l) Climate change has resulted in ocean warming which has negatively affected fish population. There is also a challenge with pollution, particularly plastic pollution, oil leaks and increase in marine traffic.

m) There is exploitation of resources at the Orange River. Namibians living along the Orange river have no say over the shared natural resource and are often told that the river does not belong to them so therefore, they should not fish there.

n) The seal population is doing well and is under sustainable management. The challenge however, is the lack of value addition in the industry for products such a leather shoes and other merchandise.

o) The MFMR needs more offices and officials to meet the demands of both sea and inland resources. In addition, investigators and fishing inspectors are not properly trained to investigate illegal syndicates in the fisheries sector.

5.6 Conclusion

The effective management, monitoring and surveillance of Namibia's marine resources is crucial for maintaining biodiversity, supporting fisheries and ensuring the health of marine ecosystems. Effective safeguarding requires an integrated management across all sectors to

ensure that all aspects of marine ecosystem are considered from biodiversity to human activities.

The MFMR is barely managing under an insufficient budget and workforce. A lot more still needs to be done, and this will require a multi-sector approach to compliment the work of the line Ministry. Finally, continuous research and monitoring systems are necessary to adapt to management strategies that welcome changing conditions and new scientific findings.

5.7 Recommendations

Based on the findings, the Committee hereby recommends the;

a) Ministry of Finance and Public Enterprise to increase the budget allocation to the Ministry of Fisheries and Marine Resources (MFMR) to enable them to carry out their function of monitoring and surveillance of the country's marine and inland fisheries resources;
b) The MFMR to develop multi-sectoral guidelines that will guide the operations of other state agencies whose functions directly or indirectly overlap;
c) The MFMR to prioritise the procurement of a helicopter, vehicles, drones, sufficient internet coverage and connectivity coverage along the coastline and other state of the art equipment to curb IUU;
d) The Ministry of Defence and Veterans Affairs to consider putting up a navy base close to the Kunene River mouth for maritime protection as Walvis Bay is too far to carry surveillance from;
e) The MFMR to fill all vacancies and address staff shortages within the structure in all Regional offices where monitoring, surveillance and research are undertaken. In addition, develop a knowledge management strategy that will help retain organizational knowledge;
f) The MFMR to conduct a full scale research on the impact of climate change and oil and diamond mining activities in the EEZ on marine resources;
g) The MFMR and Ministry of International Relations and Cooperation to strengthen and harmonize the policies, regulations and legislation of the Benguela Current Convention (BCC) and other transboundary agreements relating to the sharing of river resources, particularly in relation to fishing seasons;

h) The MFMR to prioritise inland fisheries sector and provide them with the necessary support and resources such as boats, vehicles and human resources to function optimally;

i) The MFMR and Ministry of Industrialization and Trade to develop and guide the value addition policy for the seal industry;

j) The MFMR to offer training to fisheries inspectors and other sea-going officials with respect to monitoring and surveillance.

6. SECTION 2: Assessment of Green Hydrogen Projects

6.1 Overview of Namibia's Green Hydrogen Strategy

The Namibian government showed interest in the prospects of green hydrogen projects after it launched the second Harambee Prosperity Plan II (HPP2), with a focus on developing the green and blue economy. Namibia's Hydrogen Strategy states that green hydrogen could play a role in decarbonising the mining sector, for example through green hydrogen fuelled heavy-duty mining vehicles. It also notes pilot opportunities to use green hydrogen for green ammonia for fertiliser production and other uses. Domestic demand for hydrogen could increase in the future as Namibia industrialises and increases its domestic capacity to use hydrogen in green products such as fertilizer and steel.

Namibia's Hydrogen Strategy plans to export hydrogen to Europe, China, Japan, and South Korea in the form of ammonia, green hydrogen-based hot briquetted iron, methanol, and e-kerosene. However, it is imperative that the country develops the necessary technical and industrial workforce to meet this demand. The production of green hydrogen in Namibia is also important for decarbonisation, energy security, and industrial development in the Southern African Development Community (SADC). Furthermore, the ambitious hydrogen strategy sets out to boost regional green hydrogen value chains and cooperation through green transport corridors and shared infrastructure. Namibia could potentially export excess renewable energy or export green hydrogen to countries in the region. Being a net exporter of energy and hydrogen derivates could lead an economic boost.

The strategy further sets a production target of 10 to 15 million tonnes (Mt) hydrogen per year by 2050 which equates to 5 to 8% of the expected international trade volume. To put it into context, producing 15 Mt of green hydrogen would require 750 terra-watt hours per year (TWh/year) in renewable energy generation. In 2020, Namibia's domestic renewable energy generation was 1.33 TWh, this demonstrates the amount of resources still needed to meet this target. To achieve the 2050 target, Namibia must accelerate renewable installations capacity in the years ahead.

The strategy highlights that renewable power installations can free up additional capacities for domestic use, further reducing the cost of electricity. Most of the green hydrogen projects the Committee visited do not produce or plan to produce hydrogen with energy from the national

grid. However, Clean Energy Solutions Namibia requires an additional 100 megawatts from Erongo Red and Nampower for its operations. This informs the Committee that the energy demands from the production of hydrogen could strain Namibia's supply of renewable energy and may not address the high cost of energy in the more foreseeable future.

6.2 Green Hydrogen and Namibia's Energy Demands

Namibia has some of the world's highest potential for solar and wind generation. However, it currently imports over 60% of its energy from neighbouring countries. According to cost-projections, Namibia can theoretically produce some of most cost competitive green hydrogen globally. While the country is endowed with significant solar and wind resources, it is today highly dependent on energy imports and drought-vulnerable hydropower. Green hydrogen production presents an opportunity to enhance domestic energy security and build domestic industry for products such as ammonia, which may be used to fertilize local green schemes and further reduce poverty and address food insecurity. Ammonia is produced from Hydrogen and nitrogen. Surplus production could be exported, thereby decreasing import dependence. Enhanced solar and wind capacity could also increase domestic electricity generation. This could help Namibia to meet its decarbonisation targets.

Researchers claim that many households are on the brink of economic collapse due to this high electricity prices and this has been a cause of concern for the Committee. Against this background, the Committee, during its stakeholder engagements met the Ministry of Mines and Energy, the Green Hydrogen Commission as well as the Electricity Control Board to address the energy question, more particularly in relation to green hydrogen and by extension, renewable energy. Due to the country's significant solar and wind resources, Namibia's National Renewable Energy Strategy identifies the need to utilise the country's renewable resource potential optimally. The National Renewable Energy Strategy underscores the need to utilise its significant renewable resource potential to ensure job creation and investment opportunities. However, because the green hydrogen project is by design for export, it may not directly provide the expected relieve needed in the energy sector from the onset. It is however expected to provide the necessary jobs that will enable more households to afford energy. The Green Hydrogen Commissioner estimates that Namibia's gross domestic product (GDP) could expand by 34% in real terms by 2030, and by 50% in 2040.

However, the Committee was informed that pilot projects are under way to assess downstream incentives. One such project is at the Daures Hydroegn Project, which is currently producing fertilizers at a small scale.

6.3 Green Hydrogen Production and Namibia's Readiness

Hydrogen is the major component, together with one-part Oxygen, that makes up water, also known by its scientific name as H2O. In the he process of extracting hydrogen from water, minerals are separated from the water to obtain pure water through a process called desalination. Thereafter, an electric charge is used to split the water into hydrogen and oxygen through what is called electrolysis process. The oxygen is released back in the air while the hydrogen is what is useful for green hydrogen production. The hydrogen product is what is called green because it is a clean energy source that only emits water vapour and leaves no residue in the air, unlike coal and oil, hence the name, green hydrogen.

The interest in green hydrogen globally is due to several reasons. Those in the industry noted energy security and the need to help with decarbonization as major themes. In additional, the geo-political developments in the energy sector has seen countries look elsewhere for energy sources and fertilizers.

Namibia has received public and private investment to develop green hydrogen production. The European Investment Bank (EIB) and Namibia signed a Joint Declaration to unlock up to EUR 500 million in concessional finance to support the construction of key infrastructure needed for renewable generation and green hydrogen production. Namibia has also signed several Memorandums of Understanding (MoUs) on green hydrogen cooperation with industrialised economies including the European Commission, Germany, Belgium, and Japan. Namibia Ports Authority (Namport), also entered into partnership with the Port of Rotterdam to build infrastructure for hydrogen transportation.

A lot of investment is needed for the infrastructure needed to support a green hydrogen economy. This includes solar and wind instalments, roads, housing infrastructure and much more. Experts do warn however that government should refrain from taking on any debt to finance the sector in case hydrogen demand does not materialize or the cost of production exceeds the market price. Hyphen Green Hydrogen Energy, in collaboration with the Port of Rotterdam and Namport is working on a port masterplan to develop all the necessary infrastructure at the Port of Lüderitz. Port of Rotterdam will provide support to Hyphen and

Namport to determine the infrastructure needed in Lüderitz that will allow for the import of massive wind turbine blades and other equipment used in green hydrogen production. The Port of Rotterdam has also committed to provide financial support for this initiative.

However, Namibia's skills market is simply not able to deliver what the green hydrogen industry requires. Sectors such as logistics, transport and technical services are not able to meet the demands of the sector.

6.4 Engagement with Green Hydrogen Commissioner

Prior to undertaking the oversight activity, the Committee held an engagement with officials from the Green Hydrogen Commission to ascertain several issues ahead of going into the field. The engagement also served as a good opportunity for capacity building on green hydrogen for Members and staff serving the Committee.

The Commissioner informed the Committee that Namibia aims to produce hydrogen that could be exported globally, positioning itself as a key player in the emerging green energy market. This venture is not only expected to bring in substantial revenue but also to create jobs, drive infrastructure development, and reduce the country's carbon footprint. The Government's strategy is thus to produce green hydrogen not only to help the world decarbonize but to kick start a local green hydrogen economy, that will usher in a new transformative green and sustainable industrialization pathway for economic development.

The Committee was informed that the global demand for green hydrogen and its derivatives is expected to rise. More countries will rely on energy partnerships with countries that have more abundant renewable resources to close supply gaps at lower costs, thus providing an opportunity for countries like Namibia to draw on its wind and solar energy.

The Committee was further informed that there are green hydrogen pilots with emerging local and foreign investment in green hydrogen. To unlock such green industrialization potential, enabling infrastructure to support regional and international connectivity is required. Such infrastructure enablers include railway upgrades, port expansion and power transmission lines, amongst others. The estimated value of these public investments is USD15 billion.

6.5 Courtesy Call with Erongo Regional Governor

The Committee paid a courtesy call on the Governor of the Erongo Region, Hon. Neville Andre Itope to brief him on the purpose of the oversight and gain some insights on the status of the green hydrogen projects in his region. Hon. Itope noted that green hydrogen has the capacity to get Namibia into the industrialization phase. He however stated the need for enhanced cooperation between government, municipalities and local authorities in order to better understand and commonly resolve the issues and challenges of green hydrogen projects. The Governor further stressed the need for adherence to environmental sustainability regulations, citing the need for more environmental commissioners as well as labour commissioners to ensure that employees are well taken care of on projects in the emerging markets.

The governor further noted the importance of community participation and ownership, through traditional authorities and conservancies in green hydrogen projects that are sprawling in the Erongo Region, referencing the region as 'home of green hydrogen', due to the many pilot projects currently underway there. Hon. Itope commended the Daures Green Hydrogen Project for its 10% local community ownership. Currently, nine (9) projects have been earmarked, four (4) are running of which two (2) are in partnership with government while the remaining two are private entities. According to the governor, the town of Arandis is also keen to get on board.

Hon. Itope expressed that green hydrogen projects employ an estimated 1000 people directly and indirectly. Downstream, SMEs are also reaping the benefits through security services, transport, accommodation and catering, thus strengthening the value chain. The Governor informed the Committee that Namport has earmarked 1000 square kilometers of land for expansions to meet the need for green hydrogen exports.

The Governor underscored the importance of involving tertiary institutions and encouraging more youth to participate. He called on the youth to enter green hydrogen related fields and on government to raise the interest of youth in this emerging sector.

Hon. Itope identified a number of challenges that has been brought under his attention with respect to green hydrogen production. Firstly, land availability has proven to be a major challenge with respect to the tracks of land required to successfully run a green hydrogen project. In Erongo region, ideal tracks of land suitable for projects of this nature are not available, such as the Dorob national park, which is protected. Secondly, the issue of skills

shortage was also raised. He however reiterated that young people are keen to get involved, but more understanding, information and access is needed. He called on the Ministry of Mines and Energy to do more to raise awareness and interest in the sector.

6.6 Meeting and Site Visit to Hyphen Hydrogen Energy

Hyphen Hydrogen Energy was established to participate in the Namibian government's request for proposal that was issued in 2021. The agreement with the Namibian government was signed after negotiations where concluded in 2023. Hyphen Green Hydrogen Project is situated in //Kharas Region, in the Tsau//Khaeb National Park near Luderitz, on a 4000 square km area. Hyphen Energy are targeting a yearly production of one million tonnes of green ammonia by the year 2027, and then two million tonnes by the year 2029. Green ammonia is a critical component used in fertilizers, and given the ongoing drought, food insecurity, climate change and the unrest in Eastern Europe, it is imperative that local alternatives to fertilizers are met to meet the ever increasing demand for fertiliser both locally and in the region.

The Tsau//Khaeb National Park is a protected area and concern have been raised on the protection of the national park concerning the envisaged green hydrogen production. The officials informed the Committee that there will be no harm to the environment, as hydrogen production comes at no cost to the environment. However, environmental clearance to confirm this is yet to be issued after which production will commence. Government is committed to safeguarding the environment in its hydrogen strategy through adherence to the Community-Based Natural Resource Management Programme (CBNRM) that addresses environmental concerns regarding green hydrogen.

The Hyphen officials informed the Committee that they estimate the project to create employment for about 15 000 people in the Tsau//Khaeb National Park for the construction phase and an estimated 3 000 people to get permanent jobs during the operational phase once the project is fully developed. The project plans to set up solar panels on 5000 ha of land and between 400 and 500 wind turbines.

The Namibian government entered into an agreement with Hyphen known as the Feasibility and Implementation Agreement (FIA) under the Sustainable Economic Development framework. The agreement, also referred to as the 'concession agreement, refers to the two land parcels that Hyphen was allocated for a 40-year period. However, the 40 years are not automatic, hence it is referred to as a feasibility and implementation agreement due to the

various implementation phases contained therein. The first phase of the agreement is the feasibility period, which is the current two-year period, at the end of which Hyphen is required to provide government a feasibility report. The report is expected to include the environmental and social impact assessments to demonstrate that in the two years, Hyphen has indeed done the environmental and social impact assessment and have achieved environmental clearance. The second aspect of the FIA is the social economic development framework that will entail a detailed strategy on aspects such as readiness of equipment and other supplies such as solar panels and electrolyers. On the financing aspect, which is third component of the agreement, Hyphen needs to demonstrate that they were able to raise 70% of the 10 Billion required to run the project and that the equity is in place. Government will then verify each of these aspects, before they sign off on whether it believes the project is either feasible for implementation or not.

At the time of the oversight, the two and a half feasibility study period for the Hyphen project was still ongoing. The feasibility stage is expected to conclude in the first quarter of 2026. A four-year construction phase will commence should approval be granted after which it will enter a validation phase before actual work commences. Currently, there are eleven meteorological masts (met masts) already erected by Hyphen. A met mast is a free standing measurement or meteorological tower which carries meteorological instruments, such as thermometers and instruments to measure wind speed. The project is collecting data on the climatic conditions of the area in order to determine the necessary statistics to guide their operations. By the year 2030, a complete project is expected to be established and operational. As such, no actual production have begun at the site to date.

Hyphen Energy is in partnership with Nicholas Holdings Limited and Enertrag, who, collectively hold up to 76 percent equity while the Namibian government takes up a 24 percent equity stake in the project. As per this agreement, Hyphen Green Hydrogen have access to ports, sea water and land owned by the government thus it is possible to produce green hydrogen at a very low cost in Namibia. This 24 percent equity has often come under criticism, with critics and economic commentators claiming that the stake government holds is too small. To this, Hyphen officials narrated that the 24% stake of government in Hyphen was not bought or paid for, it was given at nominal value. This stake of government is not only limited to the 24%, but also extends to royalties, taxes and other benefits the country stands to obtain from the project.

6.7 Meeting and Site Visit to Clean Energy Solutions Namibia

Clean Energy Solutions Namibia is a joint venture between the Ohlthaver and List (O&L) Group and CMB.TECH, and is further supported by the German Federal Ministry of Education and Research. The project The project aims to develop a green hydrogen production plant in the Erongo Region for green hydrogen fuel. Like Hyphen, the project is working on producing green hydrogen through a process called electrolysis which is used to split water into hydrogen and oxygen. The hydrogen which is produced will then be used as an energy source to power vehicles.

This facility includes a 10-hectare solar park and a hydrogen production facility that, once fully operational, will be a hydrogen refuelling station for vehicles. The project also has a hydrogen academy to educate and train local individuals on local hydrogen technology. The project has three ambitious phases but is currently focusing on Phase 1, which includes the hydrogen production plant, refuelling station and hydrogen academy. In Phase 2, the project is expected to commence with the extension north of the port of Walvis Bay which will be used for facilities such as ammonia terminals, storage and distribution infrastructure. In the third and final phase, the project aims to commercially produce hydrogen fuel and ammonia.

The project is in negotiations with Erongo Red and Nampower where they are seeking to be allocated allocate 100 megawatts to meet their growing energy demand and growing renewable energy initiatives in the region.

6.8 Meeting and Site Visit to HyIron Oshivela Project

Launched in November 2023, HyIron Oshivela Project is located in the Erongo Region near Arandis and is the first green iron project in the world. The project aims to use renewable energy sources like solar and wind power to produce iron with zero emissions by way of using green hydrogen to reduce iron ore in a carbon neutral process. The process for hydrogren extraction is the same as envisaged by Hyphen energy and already in use by Clean Energy Solutions Namibia, through electrolysis.

The project is an investment which is facilitated by the Namibia Investment Promotion and Development Board (NIPDB). The German Federal Ministry of Economics and Technology is

set to fund the project with more than 13 million euros over the next two (2) years. The project manager informed the Committee that the operation is worth 600 million Namibia dollars.

The project is set to produce 15 000 tonnes of iron in its pilot phase, which will put Namibia in the lead of iron production and at the centre of green technology revolution. Project Manager at HyIron indicated that if possible, they would be willing to integrate all the solar power they generate onto the national grid, but at present, this is not possible. Namibia is evaluating the potential to integrate captive installations into the grid. This is another issue that requires regulations to guide the establishment and integration of a renewable energy grid and increased energy access.

In addition, the Project Manager claims that the import tax they pay on renewable energy equipment and parts, such as electrolysers, panels, thermostats and invertors which are often replaced is very expensive. The parts are often replaced due to wear and tear of the extreme weather conditions and need constant repair and servicing, but to do so is expensive due to high taxes on such products.

6.9 Meeting and Site Visit to Daures Green Hydrogen Village

Daures Green Hydrogen Village is located in Erongo Region, near Uis in the Daures Constituency. It aims to produce green hydrogen, green ammonia and ammonia sulphate for fertilizers. According to an official of the project that met the Committee, the project has the potential to produce over 100 tonnes of green ammonia and 18 tonnes of hydrogen annually.

The project has three (3) phases, with the current phase focusing on proof of concept by way of pilot. The project is currently powered by solar panels. It has secured a grant of 220 million euros from the German Federal Ministry of Education and Research (BMBF) to implement this first phase. Construction of 12 housing units for employees, eco-lodges, evaporation ponds, electrolyzer building and two green houses are part of the current phase and were complete at the time the Committee was on the site.

There is also a research laboratory and training center that will be used for research on how to produce hydrogen and ammonia by students from the University of Namibia (UNAM) and Germany's University of Stuttgart. Other envisaged research initiatives are a nursery for research and development that will be used to plant crops for adaptation tests. Water for the

project is sourced from boreholes in the area. The construction of the nursery was near completion at the time of the oversight visit.

The Committee learned that the Daures Green Hydrogen Project has secured three (3) offtake agreements to ensure that a market for the green ammonia is secured. One of the offtake agreements are with Sabble Chemicals, a Zimbabwean ammonium nitrate fertilizer manufacture which is expected to take up about 40 000 tons of green ammonia. Another such agreement is with a Walvis Bay company that produces liquid soaps. Finally, the Rossing Uranium Mine has agreed to offtake ammonia which will likely be used for mining operations. There are ongoing consultations with various other entities aiming to enter into similar off take agreements. This will contribute to the broader adoption of green hydrogen and ammonia in various industries. It will also enhance local agricultural productivity and reduce the need for imported fertilizers.

The project has scaled down its workforce over time from the 300 employees it had during the peak of the construction phase. It is impressive that 50 percent of these employees came from the Daures Constituency while 75 percent of the employees came from the Erongo Region overall. This is a clear indication of the employment opportunities that exist within the green hydrogen sector. Significant progress has been made in the construction of the project, with 80 percent of the work already complete. The Committee was informed that the project is expected to be completed by the end of September 2024 and the first green hydrogen production is expected by the second week of October 2024. In addition, the construction of the green house is also expected to be completed by end of September 2024.

The project does not only focus on green energy production but also aims to support local communities through employment and sustainable development. This is evident through their employment history. The inhabitants of the Daures Constituency community are partners and have ownership of this project as ten percent of the shareholding belongs to the community represented by the Daure Daman Traditional Authority and Tsiseb Conservancy.

6.10 Findings

With respect to Green Hydrogen Production, the Committee made the following findings;

a) Namibia's green hydrogen is for international export purposes and not for local or regional markets. Green hydrogen will be exported to Europe, China, Japan, and South Korea.

b) The Committee found that the energy demands from the production of hydrogen could strain Namibia's supply of renewable energy and may not address the high cost of energy in the more foreseeable future, hence;

c) The green hydrogen sector may not directly provide the expected relieve needed in the energy sector, but will provide jobs that will enable more households to afford energy.

d) Namibia has the potential to position itself as a key player in the emerging green energy market. This venture expected to bring in substantial revenue, create jobs, drive infrastructure development, and reduce the country's carbon footprint.

e) Namibia must accelerate its renewable energy capacity in the years ahead to meet demands of the growing population. Abundant renewable power can free up additional capacities for domestic use, further reducing the cost of electricity.

f) Daures Hydroegn Project is producing fertilizers at a small scale. Green hydrogen production presents an opportunity for Namibia to enhance domestic energy security and build domestic industry for products such as ammonia, which may be used to fertilize local green schemes and further reduce poverty and address food insecurity.

g) Sectors such as logistics, transport and technical services are not able to meet the demands of green hydrogen production.

h) There is a skills shortage in the sector. A lot of investment is needed for the infrastructure required to support a green hydrogen economy. This includes solar and wind instalments, roads, housing infrastructure and much more.

i) Land availability has proven to be a major challenge with respect to the tracks of land required to successfully run a green hydrogen project.

j) Clean Energy Solutions Namibia is working on establishing Africa's first public green hydrogen refuelling station at Walvis Bay, in the Erongo Region.

k) Projects are willing to transmit all the solar power they generate onto the national grid, but at present, this is not possible. The import tax they pay on renewable energy equipment and parts, such as electrolysers, panels, thermostats and invertors which are often replaced is very expensive. The parts are often replaced due to wear and tear of the extreme weather conditions and need constant repair and servicing, but to do so is expensive due to high taxes on such products.

l) The industry needs protections. Currently, parts used in the production of green hydrogen are not prioritised against other demand sources when supply is limited. Currently, hydrogen production completes with other demand sources in the local industrial space equally.

m) Namibia lacks important regulations and legislation to regulate the green hydrogen industry. One such regulation relates to the role of local content in supply chains and incentives to promote domestic demand. Others highlighted by officials during the oversight are fiscal frameworks, legislation regulating the exclusive economic zones, regulations on infrastructure like pipelines, coordination and harmonizing of permits relating to green hydrogen as well as occupational health and safety regulations.

6.11 Conclusion

Green hydrogen is gaining significant attention as a sustainable clean energy source globally and Namibia is no exception. The Namibian government and other entities have shown interest in green hydrogen as part of its renewable energy strategy and is increasingly recognising the importance of green hydrogen. The Namibian government is working on establishing a robust regulatory framework to support the green hydrogen industry and a Bill is expectant to come before Parliament in the near future.

Green hydrogen has the potential to decarbonize various sectors including industry, transport and power generation. It can help reduce reliance on fossil fuels and lower greenhouse gas emission contributing to net zero targets. Policies and investment are being directed towards research, development and deployment to accelerate its adoption. By investing in green hydrogen, Namibia aims to create jobs, boost economic growth and contribute to global efforts to combat climate change, however, it must be well regulated to maximise benefits for Namibians.

6.12 Recommendations

Based on the findings, the Committee hereby recommends the;

a) Ministry of Mines and Energy to develop regulations that will protect Namibia's renewable energy sources and further protect consumers from the increasing energy demands that will come from the production of green hydrogen;
b) Ministry of Mines and Energy to upgrade or renew the current grid to enable the installation of renewable energy in order the abundant renewable power to be made available for domestic use, further reducing the cost of electricity and develop regulations that will guide same;
c) Ministry of Agriculture, Water and Land Reform to source locally produced fertilizers and supply government green schemes in order to reduce poverty and address food insecurity;
d) Ministry of Higher Education, Technology and Innovation, together with other stakeholders, to lead in the development of the training and skills development programme required to meet the demands of the green hydrogen sector through tailor made technical and vocational education and training programmes, placing priority in regions where the projects are situated;
e) Ministry of Industrialization and Trade to develop regulations that will support SMEs in the downstream of green hydrogen industry offering services including equipment, transport, security services, installations and repairs, amongst others;
f) Ministry of Urban and Rural Development and Ministry of Lands and Resettlement to prioritize the leasing of suitable, vacant land to green hydrogen projects;
g) Ministry of Mines and Energy to source independent and highly skilled Environmental Commissioners specialized in the field of hydrogen fuels to assess the health and safety of hydrogen fuel production and consumption, after which the report must be made a public document;
h) Ministry of Mines and Energy to provide incentives for green hydrogen fuel cell vehicles.

i) Ministry of Finance and Public Enterprise, Namibia Revenue Agency to offer tax cuts for green hydrogen projects on the import of materials and equipment for green hydrogen and renewable energy projects, such as, but not limited to electrolysers, panels, thermostats and invertors;

j) Ministry of Mines and Energy to draft legislation and regulations that will regulate the green hydrogen industry with respect to the following; local content in supply chains, incentives to promote domestic demand, fiscal frameworks, legislation regulating the exclusive economic zones, regulations on common infrastructure like pipelines, coordination and harmonizing of permits relating to green hydrogen as well as occupational health and safety regulations.

7. Adoption of Report

This report was adopted by the Standing Committee on Agriculture, Environment and Natural Resources at its meeting of 4th November 2024 in the Blue Room National Council Administration Building.

..... Date 05/11/2024

Honourable Melania Ndjago

Chairperson: Standing Committee on Agriculture, Environment and Natural Resources

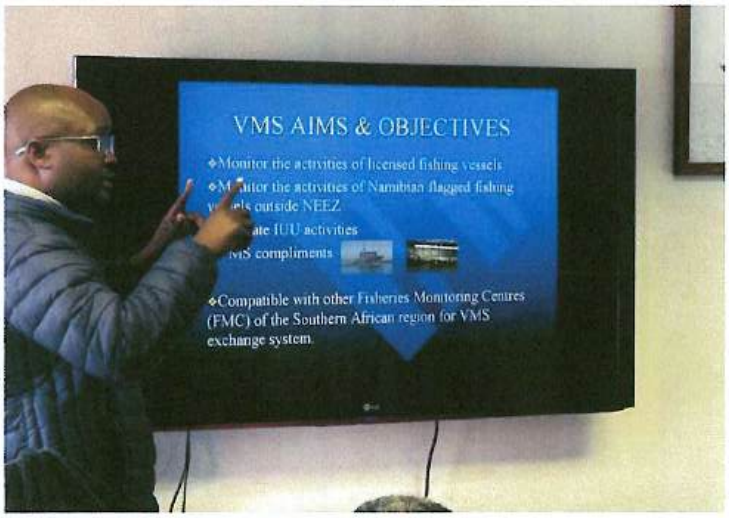
<<< Visit to the Hyphen Green Hydrogen Site in the Tsau //Khaeb National Park.

Production and storage cylinder for green ammonia >>

<<< Storage Cylinders for hydrogen

<<< Site visit of the Daniel Maxuilili Patrol Vessel

Presentation on the VMS monitoring system >>>



<Patrol Vessel Anna Kakurukaze Mungunda