

NIGERIAN CONTENT DEVELOPMENT AND MONITORING BOARD



Research & Development Roadmap



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Research & Development Roadmap



Nigerian Content Development and Monitoring Board Research and Development Road Map

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1 Introduction

NCDMB developed a 10 year strategic roadmap to define focus areas in the implementation of R&D provisions in the Nigerian Oil and Gas Industry Content Development (NOGICD) Act of 2010...



Context

The Federal Government of Nigeria (FGN) established the Nigerian Content Development and Monitoring Board ("Board" or "NCDMB") through the Nigerian Oil and Gas Industry Content Development (NOGICD) Act of 2010 to "develop the capacity of the local supply chain for effective and efficient service delivery to the oil and gas industry without compromising standards".

In pursuit of this mandate, the Board identified Research and Development ("R&D") as a key enabler and seeks to enhance the state of R&D in- country towards increasing local content participation within the Nigerian oil and gas industry. It is in light of this that PwC was engaged to assist with the development of a 10-year detailed plan on Research and Development.

Purpose

The purpose of this document is to:

Illustrate the current state of R&D in the Nigerian Oil and Gas Industry and its impact on local content;

Enunciate the vision, goal and objectives of NCDMB and other industry stakeholders for R&D, in relation to the Oil and Gas industry;

Articulate a programme for the systematic improvement of the state of R&D and innovation in Nigeria, and consequently increased local content in the Nigerian Oil and Gas industry;

Create a framework for the upscaling and commercialization of R&D in the Nigerian oil and gas sector by NCDMB and other stakeholders

Outline a framework for the implementation of strategic initiatives by NCDMB

Scope

The document therefore:

provides an overview of the current situation within the Nigerian Oil and Gas R&D landscape and how this compares with other jurisdictions;

communicates desired state of R&D for the Nigerian Oil and Gas landscape; proposes initiatives for achieving the desired state and identifies parties responsible

for driving the initiatives; and

provides strategy execution timelines



2 History and current state of oil & gas related R&D in Nigeria.

Nigeria is the largest economy in Africa, with the Oil and Gas sector contributing about 9% of GDP



GDP of Select African **Countries** (2017)1 Nigeria South Africa Egypt Algeria Morocca Sudan Angola Ethiopia Kenya Tanzania Macroeconomic data GDP (USD bn) 2017 estimate 460

GDP annual growth rate (%) Q3 2018 Inflation rate 2018 Average 460 1.18% 12.10%



Nigeria remains the largest economy in Africa, growing by 0.83% YoY in 2017 and 1.93% real GDP growth in 2018

In Q2 2017, Nigeria's economy returned to positive growth after successive declines for five quarters.

This recovery was supported by a 1.6% growth in the oil sector and a 0.45% growth in the non-oil sector.

Production to Reserves ratios for Nigeria were observed to be substantially lower than some oil rich countries...





In 2017, Nigeria's production to reserves ratio was 4% (5% in 2007)markedly different from 25%,21% and 19% for Norway, Brazil and Angola respectively.

The slump in production to reserves ratio is closely linked to factors bordering on limited Research and Development including the following:

Lower investment in production or production-enhancing technologies

Inefficiency in local production attributable to use of obsolete technology on existing fields

Low access to new technology to explore new fields due to high technology acquisition cost



B History and Current State of Oil and Gas related R&D in Nigeria

Research and Development as a deliberate venture has a history dating back to 1940 but autonomous research institutions didn't exist until the early '70s





R&D efforts in the industry are mostly focused on the upstream sector with minimal impact across the value chain





Industry stakeholders generally assess the impact of current R&D efforts as "Low", on all fronts



Research and Development as a deliberate venture has a history dating back to 1940 but autonomous research institutions didn't exist until the early '70s





Key Issues in R&D in Nigeria¹⁴



Oil and gas R&D stakeholders have identified collaboration, infrastructure, capability, legal/commercial framework and funding as the key factors that drive research within the industry

Collaboration was identified as the most significant challenge - as there is a gap between the local R&D centers, the industry players and regulators. Most research work conducted by local research centers are not driven by industry needs and often not applicable for industry use.

While some local research centers are assessed to be in a fair state, industry players do not rely on them for their R&D needs as the local centers do not have the infrastructure required for carrying out industry-applicable research. Of interest is lack of facilities for field testing of research findings, which impacts progression to product acceptance and deployment. This is a major requirement to avoid risk of potential field losses in the event of failure from using an untested product of Research.

Activities across the oil and gas value chain (1/2)



Source: World Bank: Local Content Policies in the oil and gas sector (2013)

R&D need areas in the oil and gas value chain (2/2)



Services	Exploration Develo	pment	Production	Oil & Gas Treatment LNG	& Transport & Storage	Refining	Petrochem	Primary Distribution
Subsea Equipment	Wellhead, Sub-surface Sat Meters, Seperators, Risers	ety Valves s, Umbilica	s,Compressors, Ils					
Downhole Equipment	Casing, hardware, Comple tools, wireline Logging Too	etion Equip ols, Perfor	oment, Drilling ating Systems					
Tubular Goods	Drill Pipe, Casing, Tubi	ng, Manif	olds					
Rigs, Plat- forms & FPSP	Land Rigs, Offshore Fabı Rig Equipment, Unit Maı	rication, Ve nufaturing	essels Conversior	ns Steel Struct Topsides	ure, Production		Steel Structures	
Rotating Equipment				Compresso	or, Blowers, Turbine	s & Pumps		
Static Equipment		Surfac Exhan	e Equipment, Co ges	lumns &	Transport pipes, Tanks	Columns & Reactors, V	Exchanges (e.g essels	
Pipes, Valves & Fittings				Pipes, \	/alves & Fittings			
Electrical Equipment		Trans	formers & Switcl	hboards, Drive I	Motors, Cables			
Instrumen- tation & cont	rol Sub surface Sensors, (e.g Seperators, Multi	Surface Pr Phase Flo	oduction Monito wmeters	oring Contro	l System & Valves,	Instruments a	nd Analysers	
Fluids & Chemicals	Drilling & Completion Ch	Fluids, Up emicals	stream specialty		Catalyst and ac	ldictive		
Other materials		Со	rrosion protectio	n, Insulation, Co	oating & Painting			



Immediate R&D need areas in Nigeria Oil & Gas industry

Key R&D Needs of Industry Players¹⁸















- Implementation of local content policy is fast becoming a norm for oil producing countries especially developing nations.
- Brazil, Malaysia, Indonesia, Kazakhstan, Angola and Trinidad and Tobago are some of the countries that have instituted local content policy to drive in-country value creation and retention, in their oil and gas industry. Brazil and Malaysia have developed vibrant R&D ecosystems as enablers for their local content objectives.

Saudi Arabia is reputed as a leading Oil producer, however they are yet to enact a local
 content policy for their Oil and Gas industry although several R&D initiatives aimed at enhancing local technology, developing their oil industry and stimulating economic growth are currently being implemented.

Norway is one of the largest exporters of natural gas in the world, supplying about 25%20 of Europe's gas demand. In managing its oil resources for economic growth, Norway also has implemented notable R&D initiatives aimed at developing their oil and gas industry and stimulating value creation.

In Malaysia, R&D funding is tied to field operations and both the government and private sector fund R&D activities in the country



Malaysia is one of the oil producing countries that have implemented a local content policy in the oil and gas sector. Malaysia's employment and educational policies aim to foster the creation of local capabilities that can be transferred to other sectors. This includes the development of skills that are common to all sectors, as well as the creation and support of cluster developments with other industries that have a natural synergy with the petroleum sector.

In Malaysia, companies are subject to a research contribution calculated on production. Training expenses are cost recoverable for the purpose of calculating the production shares, and the research contribution is tax deductible, which means that part of the cost is financed by the government through the fiscal regime.

Many petroleum companies and international contractors have established training courses, either in-house or in collaboration with local training institutions. But Petronas has been leading the effort to develop a skilled and competitive local workforce. In addition to providing sponsorship to Malaysian students wishing to pursue tertiary education in country or overseas, the NOC has established four educational and training institutions, and an e-learning platform

Key Features of Malaysia's R&D policy

Funding

Every production sharing contractor is subject to an annual research contribution equivalent to 0.5 percent of the sum of cost oil and the contractor's share of profit oil. The research contribution is tax deductible, and it goes towards funding local research and development.

Infrastructure

Every production sharing contractor is subject to an annual research contribution equivalent to 0.5 percent of the sum of cost oil and the contractor's share of profit oil. The research contribution is tax deductible, and it goes towards funding local research and development.

Capability

Every production sharing contractor is subject to an annual research contribution equivalent to 0.5 percent of the sum of cost oil and the contractor's share of profit oil. The research contribution is tax deductible, and it goes towards funding local research and development.

Brazil prioritised commercial and legal framework, funding and capability to drive R&D in Oil & Gas Industry



Brazil's Agência Nacional do Petróleo, Gás Natural e Biocombustíveis (ANP), known in English as the National Agency on Petroleum, Natural Gas and Biofuels is the federal agency in charge of regulating Brazil's oil sector. The mandate of the ANP also covers Research, Development and Innovation and a law was enacted in 1997 mandating a research, development and innovation (RD & I) investment clause to be contained in contracts for the exploration, development and production of oil and natural gas, aimed towards stimulating research and adoption of new technologies for the sector.

These investments in R&D to be made by concessionaires vary depending on the nature of the contracts including a "Special Participation" being the equivalent of 1% of the gross revenue from the production of oil, natural gas and other hydrocarbons collected for fields based on concession contracts with high productivity or profitability. In a similar vein, 1% of Gross revenues applies to the 2nd and 3rd Production Sharing Rounds contracts while 1.5% of gross revenues apply to those within the 1st Production Sharing Round contract and those classified onerous assignment agreements.

A percentage of government revenue is earmarked to the Ministry of Science and Technology to finance programs to support scientific research and technological development applied in the oil industry

In 2014, the government set an ambitious program to invest \$10billion in R&D over a ten (10) year period.

Key Features of Brazil's Local content/ R&D drive

50% of the amounts generated are invested in RD & I projects that are Uses of executed by the Oil Company itself with affiliates within Brazil. The other funds 50% is used to fund research by ANP accredited local research institutes or universities The use of funds and the accreditation of institutions are governed by regulation. R&D clauses included in all concession agreement which includes tax Commercial incentives for R&D efforts e.g. full depreciation of R&D assets in year of & Legal acquisition Framework A national science and technology program (CT petro) was initiated to Capability enhance capacity building towards increasing number and quality of

enhance capacity building towards increasing number and quality of industry professionals. The programme is funded from oil and gas royalties, authorized investment for this program is 57 million euros (\$65m)

Funding for R&D in Norway consists of joint contribution by industry players and Government managed by the Research Council



In 2001, the Ministry of Petroleum and Energy established the Oil and Gas in the 21st Century (OG 21) strategy to address challenges associated with efficient and responsible petroleum operations. OG21 was conceived by oil companies, universities, research institutions, the supplier industry and authorities as a joint national technology strategy for oil and gas

Advanced R&D has contributed ~44% to total production, which was achieved through initiatives aimed at driving local content development. They included optimizing new and existing fields, and improving research, development and implementation of new technologies

Key Features of Norway's Local content/ R&D drive

Funding	Funds are managed by Research Council of Norway (RCN) and disbursed through: Petromaks II – aimed at promoting long-term competence-building; through education and international collaborations (with the research entities in North America, Russia and Brazil) -budget of NOK 270m (\$31.6m), >120 active projects Demo 2000 - budget of NOK 70m (\$8.2m) in 2018, for testing of new technologies - 70 projects ongoing
Infra- structure	In 2013, high-quality research and knowledge centers were established under "Petrosenter" Centers for research-based innovations receive up to 8 years funding, and Centers of Excellence receive funds for up to 10 years R&D infrastructure financing initiatives launched in 2009 with annual budget of NOK740m (86.4m) Memberships in prominent laboratories and international research organisations in Europe where Norwegian researchers can take part in research groups, carry out short and long-term research stays, and use the infrastructure for their own research activities
Collaboration	Frequent roundtable discussions to identify critical technology issues and agree on resolution strategies Norway also collaborates with other countries in North America as well as Russia, India, Japan, China, South Africa and Brazil such as Norwegian- Russian relationships in the Barents Sea
Legal Framework	Licensing agreement with foreign companies includes integration of Norwegian institutes in their R&D activities for knowledge transfer

R&D is one of the key drivers for promoting local content in Saudi Arabia as it includes improving quality of data, human resource, oil recovery and drilling efficiency



Saudi Arabia's R&D mission is to build an R&D infrastructure with qualified professionals: Drafting technology policies, procedures and activating cooperation and collaboration Localization and development of oil and Natural Gas E & P technologies While the vision is to achieve the technical competence to find and produce every drop of oil and natural gas resources in the Kingdom's territories.

Key Feature	s of Norway's Local content/ R&D drive
Funding	Options being considered include: Allocating part of foreign investments taxes in oil and gas industry to national R&D Commercialization of research output Private grants and donations Contributions from companies that could benefit from R&D output
Infra- structure	Governmental allocation King Abdulaziz City for Science and Technology (KACST) promotes research partnerships with international leading research and industrial institutions and universities around the world KACST has established several joint centers of excellence, distributed throughout the world, in collaboration with big research institutions and universities in the field of scientific and applied research
Collaboration	Government enacted laws to ensure easy access to technical data for R&D, intellectual property protection rights and Industry support of local R&D activities through funding and providing access to information
Legal Framework	Government initiatives to enhance collaboration include: Conducting joint research projects Exchange programs in the industry Establishing periodic meetings, workshops and conferences Utilizing the presence and interest of international oil companies and laboratories in the region to establish an internal and external R&D alliance through which funds and profits are shared



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The role of NCDMB in R&D within the Nigerian Oil and Gas industry



Lessons from the study countries highlight six common themes for driving research and development in the Nigerian oil and gas sector

Funding

Funding R&D sustainably requires commitments from Government and industry stakeholders

While industry stakeholders are mandated to contribute to R&D, the government also gives incentives to stimulate local investments in R&D and preference for conducting R&D locally

Legal Framework

Most countries that have implemented local content policy have R&D enshrined in their local content laws. In some countries annual targets on R&D and local capability development are set by the government through regulations. Petroleum sharing and licensing agreements usually have R&D clauses that mandate the funding of R&D and conducting R&D in local research institutes. In some countries, the use



Capabilities

Infrastructure

Driving R&D effectively involves the close collaboration of industry, academia and governments (triple helix).

Most countries employ a market-oriented approach to R&D through which research projects are originated from industry common problems and the industry, academia and government work together to find solutions to problems

To bridge skills gap in industry and academia, joint trainings and knowledge exchange sessions are conducted by both parties.

Secondment programmes are organised to expose researchers to practical industry experience and provide a platform for industry experts to share knowledge with researchers and students.

Governments establish local research centres, learning institutions and training centers often in close collaboration with leading foreign universities and/or industry. Industry players fund the establishment of specialized research centres and programs in local academic institutions NCDMB was established through the Nigerian Oil and Gas Industry Content Development Act of 2010, to increase local participation in the Oil and Gas industry...



06

Overview

In a bid to boost local participation in the oil and gas industry, the Nigerian Content Development of the Nigerian National Petroleum Corporation (NNPC) facilitated a process that led to the release of 21 presidential directives on local content in the oil and gas industry in 2005

Subsequently, the Nigerian Oil and Gas Industry Content Development (NOGICD) Act was signed into law on 22nd April 2010 which led to the establishment of the Nigerian Content Development and Monitoring Board (NCDMB)

The NCDMB was established to significantly improve the development and utilization of local capacities for the industrialization of Nigeria, driven by the oil and gas sector NCDMB activities is designed to include oversight on R&D activities in the oil and gas industry as provided in Sections 36-39 of the NOGICD Act

Essentially, the role of NCDMB is to deepen R&D capabilities and enforce domiciliation of research activities within Research Centres in Nigeria

Local content implementation has significantly improved the execution capacity of the local supply chain as well as improved the oil and gas industry business practices in the country Nonetheless, there is still the need for further enhancement to enable Nigeria maximise the full potentials inherent in the NOGICD Act

It is expected that the NCDMB 10 Year R&D Roadmap will drive this anticipated growth

Drivers of the NOGICD Act of 2010

The NOGICD Act is designed to increase the level of participation of Nigerians and Nigerian companies in the country's oil and gas industry





Attract investments to the Nigeria oil and gas sector



Review	To increase participation of Nigerians in the oil and gas industry, the NCDMB is tasked with reviewing, assessing and approving Nigerian Content plans developed by the operators, including Operators 3-5 years R&D plans.
Regulate	The NCDMB is charged with developing guidelines and minimum content levels for project related activities across the oil and gas value chain. The guidelines and regulations include R&D
Engage	The Board is required to engage in targeted capacity building interventions that would deepen indigenous capabilities especially in human capital development, infrastructure & facilities, manufactured materials & local supplier development
Establish	The Board is mandated to establish, maintain and operate the NOGIC JQS in conjunction with industry stakeholders. Additionally, the Board would establish a virtual platform to facilitate the transactions required for efficient delivery of goods and services in the oil and gas industry
Monitor	The NCDMB has a mandate of monitoring operators and service providers. Key compliance issues include in-country cumulative spend, employment creation & sources of goods, services and materials utilized on projects, compliance with domiciliation of R&D projects in Nigeria etc.
Award	The Board is also responsible for awarding Certificate of Authorization for projects that complies with Nigerian content provisions. Hence, contract would not be based solely on the lowest bidder principle where an indigenous company has capacity to execute the contract
Research	The board shall be responsible for conducting studies, research, investigations, workshops and organize conference., trainings targeted at improving local content in the oil and gas sector.







NCDMB's overall aspiration to grow Nigerian content to 70% by 2027 underscores the need for a vibrant Oil and Gas sector-related R&D...

Overall Aspiration

"To be the catalyst for the industrialization of the Nigerian Oil and Gas Value Chain and linkage sectors

Strategic Outcomes (Goal)

To increase local content level in the oil and gas industry from 26% to 70% by 2027 To double the value domiciled in the Nigerian Oil and Gas industry by 2027

Strategic Pillars

Technical Capability	Compliance &	Enabling Business	Organization	Sectorial & Regional
Development	Enforcement	Environment	Capability	Market Linkage
Extend and deepen in-country technical capability in the oil and gas industry, including R&D capabilities	Ensure Nigerian Content implementation is enhanced through the mobilization of appropriate tools, policies and frameworks across the entire value	Facilitate a commercially viable business environment that encourages increased sector investment	Build effective internal structures in terms of people, skills, processes and systems to support the Board's operations	Increase the oil and gas industry contribution to the National GDP and facilitate access of Nigerian-made goods and services to regional markets

Enablers

Funding



Collaboration & Stakeholder Engagement



Research & Statistics



NCDMB R&D mandate is well defined in the NOGICD Act...

The scope of the NCDMB's R&D role include:

Foster development of R&D capabilities in Nigeria including infrastructure, facilities, equipment, personnel and processes

Approve and monitor implementation of R&D plans by Operating Companies Develop and implement a framework that will facilitate commercialisation of Research Incentivize investment in R&D by the local supply chain, to drive development of home grown technology

Ensure investment in R&D is tailored towards tackling end to end industry challenges

NCDMB's R&D Strategic Objectives

NCDMB's R&D Objectives are set out to give the Board a clear understanding of mutual benefits, responsibilities and expectations across the R&D value chain

To provide the procedure for the implementation of the R&D provisions in the NOGICD Act	To create a linkage between the Oil and Gas industry, research institutions and academic
To enforce utilization of Nigerian facilities and intellectual resources in finding research solutions to industry problems	To create culture for funding R&D on sustainable basis

NCDMB Research and Development Contimuum

Industry Challenge/ Basic Research Needs	Applied Research	Prototype Development	Commercialization	Industry Application
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The NCDMB R&D framework is anchored on seven policy thrusts......





) Focus on market driven research

Tailor R&D spend to projects that address industry needs

) Establish world class R&D Centres of Excellence

Establish and operate world class R&D centres of excellence with standard infrastructure as the bedrock for undertaking quality research in Nigeria

[/]Establish R&D Council

Inaugurate Nigerian content R&D council comprising industry stakeholder groups, to advice the Board on R&D delivery strategy

) Provide sustainable funding to support R&D

Create \$50 Million R&D fund to support NCDMB R&D interventions

[/] Develop stakeholder collaboration matrix for R&D

5

Develop seamless and beneficial interface between end users of products of Research and Research community

6 Provide enablers for commercialization of research breakthrough

Support acquisition of intellectual property rights, protype development, field trials, business feasibility studies and other enablers that demonstrate commercial viability of product viability

Facilitate acceptance & utilization of research products by end users

Facilitate product certification, acceptability and assimilation by end users of products of Research in the industry ...which were reinforced by 8 distinct success pillars co-created by a cross-section of key industry stakeholders





Core Values: Integrity, Creativity, Team Spirit, Patriotism, Professionalism and Passion

this.firstName=firstName; this.lastName=lastName;

public Long getId(){ return id;

public void setId(Long id) this.id=id;



The 8 success pillars are very relevant in improving the state of R&D in the Nigerian Oil and Gas industry...

Success Pillar	Relative Level of Importance	Goals
1 Funding		Attract sustained funding for R&D, innovation and entrepreneurship in the Nigerian O&G industry
2 Infrastructure		Establish and operate functional centers for R&D delivery in the Nigerian Oil & Gas industry
3 Capability	$H \not \longrightarrow L$	Develop R&D related skills, knowledge and structure for entrepreneurship, as well as job and wealth creation
4 Commercial Framework		Translate oil and gas research results into products and services that will be deployed for economic growth
5 Collaboration	H L	Create an environment for seamless interaction and interface across oil and gas industry R&D stakeholders
6 Governance		Effect an inclusive, transparent, solution and demand driven R&D governance structure to drive R&D delivery
7 Legal Framework		Guide and protect the evolution & domiciliation of a vibrant R&D value chain in the Nigerian O&G industry
8 Enforcement	$\mathbf{H} {\longrightarrow} \mathbf{L}$	Ensure stakeholders' compliance with approved R&D regulations







The Strategic Initiatives were founded on four guiding principles



Develop R&D culture in local supply chain The roadmap seeks to inculcate R&D culture in the local supply chain, to enhance home grown technology development thereby reducing reliance on foreign technology

Adopt global benchmark models to deepen R&D delivery in Nigeria It is recognized that some countries have made significant progress in respect to R&D, especially within the Oil and Gas industry. The initiatives articulated comprise model initiatives balanced against the peculiarities of the Nigerian environment.

Collaborate for effectiveness

NCDMB will seek to rely on the support of relevant organisations and institutions in the execution of the initiatives contained in the strategic roadmap

Create viable and sustainable funding for R&D

Funding research and development is not a one-off activity; therefore, it cannot be funded by grants and donations alone. An eco-system that harnesses funding from multiple sources needs to be established to facilitate and sustain research and development

Measures, Targets and Initiatives have been outlined for each objective defined across the 8 success pillars (1/8)



Funding					
Objectives	Measures	Targets	Initiatives	Responsible Parties	Due Dates
			 Establish Nigerian Content Research Fund (NCRF) for NCDMB funded R&D interventions – Research grants, Centers of Excellence, Endowments and Commercialization of Research 	NCDMB	2021
Create sustainable funding for R&D	Funding Mix	Multiple and viable funding sources for R&D	 Develop operating procedure for administering the NCRF- approvals, releases, monitoring, benefits plan and impact assessment 	NCDMB	2021
activities	Timely availability of funds for R&D		 3. Design framework for development of R&D plans for funding on the back of major EPC projects in the industry - LNG, Deepwater field development, Refinery projects etc. 	NCDMB	2020
			Develop pitch documents to attract ^{3.} venture capitalist to fund Research and innovation in Nigeria	NCDMB	2022
			 4. Design incentive programmes to encourage indigenous oil companies and service companies, to inculcate 5. the culture of R&D spending on an ongoing basis 	NCDMB	2022



Infrastructure							
Objectives	Measures	Targets	Initiatives	Responsible Parties	Due Dates		
Improve condition of facilities & equipment	Number of functional facilities for Oil and gas related Research	of At least one I state of the or art R&D of the six geopolitical zones	6. Design checklist for assessment of Research centers	NCDMB	2021		
			7. Conduct needs assessment on proposed R&D Centers of Excellence (COEs), to determine capability requirements	NCDMB Universities	2021		
			8. Deliver all capability requirements for NCDMB sponsored Research CoEs- equipment, governance, process, etc	NCDMB	2022		
for delivery of oil and gas research in			9. Develop detailed programme for the R&D centres of excellence	NCDMB	2022		
Nigeria			10. Facilitate the establishment of oil and gas technology hubs	NCDMB Universities	2022		
			11. Create a repository for hosting database of oil and gas sponsored Research projects, functional Research centers and	NCDMB Universities	2022		
			12. Establish centres for testing/validating research findings	NCDMB PTDF	2023		



Capabilities								
Objectives	Measures	Targets	Initiatives	Responsible Parties	Due Dates			
Maintain a steady pool of competent Nigerian Researchers	Number of Y-o-Y qualified in n Researchers worl Rese carry oil ai relat Rese	Y-o-Y increase in number of	13. Conduct annual capability assessment of CoEs adopted by NCDMB	NCDMB Universities	2023			
			14. Conduct benchmark exercise on international Research centres to identify leading practices, processes and policies that can be adopted by Nigerian oil and gas research centres	NCDMB	2021			
		world-class Researchers carrying out oil and gas	15. Set up a recognition and reward system for academics in faculties adopted by the oil and gas industry stakeholders	PTDF NCDMB NUC	2022			
		related Research	16. Develop an incentive programme for attracting top-rated Researchers in the diaspora to Nigerian Research institutions	PTDF NCDMB NUC	2022			



Commercial Framework							
Objectives	Measures	Targets	Initiatives	Responsible Parties	Due Dates		
Enhance commercial attractiveness	Commercial viability of sponsored research		17. Develop benefits plan for proceeds of Research efforts converted to products deployed for industry application	NCDMB Universities	2021		
conducted in Nigeria	Achieve	Achievent	18. Partner with Manufacturers Association of Nigeria (MAN), Institute Of Software Practitioners Of Nigeria (ISPON), Computer		2022		
Ensure Research outputs are converted	Ensure Research outputs are converted into viable products for industry use Ratio of research	least 5 patents per annum	Registration Council of Nigeria (CRCN) and other associations to create system that enables commercial production of qualified products of Research	MAN ISPON CRCN	LOLL		
products for industry use	commercialized products for industry application		19. Establish procedure for conducting field trials and other proof of concept mechanisms, to guarantee the quality of products developed from Research breakthroughs	NCDMB SON DPR NOTAP NCC	2021		



Collaboration						
Measures	Targets	Initiatives	Responsible Parties	Due Dates		
Improve perception index among industry players on R&D collaboration	Achieve alignment of industry stakeholders on Research agenda and initiatives	20. Develop partnership model to foster collaboration between local and foreign Research centres on the following themes – joint research, shared services (facilities, equipment), peer review, exchange program etc	NCDMB Universities	2022		
		21. Host annual R&D roundtable to discuss industry R&D needs and set the Research agenda for the industry for each year	NCDMB	2022		
		22. Develop partnership model to foster collaboration between NCDMB & industry on establishment of Research Centres	NCDMB OPTS	2021		
		23. Host bi-annual R&D fair and conference to create interactive platform for industry, academia and Researchers on R&D delivery	NCDMB	2021		
	Measures Improve perception index among industry players on R&D collaboration	MeasuresTargetsImprove perception index among industry players on R&D collaborationAchieve alignment of industry stakeholders on Research agenda and initiatives	MeasuresTargetsInitiativesImprove perception index among industry players on R&D collaborationAchieve alignment stakeholders on Research agenda and initiatives20. Develop partnership model to foster collaboration between local and foreign Research centres on the following themes - joint research, shared services (facilities, equipment), peer review, exchange program etc21. Host annual R&D roundtable to discuss industry R&D needs and set the Research agenda for the industry for each year22. Develop partnership model to foster collaboration between NCDMB & industry on establishment of Research Centres23. Host bi-annual R&D fair and conference to create interactive platform for industry, academia and Researchers on R&D delivery	MeasuresTargetsInitiativesResponsible PartiesImprove perception index among industry players on R&D collaborationAchieve alignment of industry stakeholders on Research agenda and initiatives20. Develop partnership model to foster collaboration between local and foreign Research centres on the following themes - joint research, shared services (facilities, equipment), peer review, exchange program etcNCDMB Universities21. Host annual R&D roundtable to discuss industry R&D needs and set the Research agenda for the industry for each yearNCDMB22. Develop partnership model to foster collaboration between NCDMB & industry on establishment of Research CentresNCDMB OPTS23. Host bi-annual R&D fair and conference to create interactive platform for industry, academia and Researchers on R&D deliveryNCDMB		



Governanc	e				
Objectives	Measures	Targets	Initiatives	Responsible Parties	Due Dates
Oversee, enhance and sustain implementation of R&D initiatives	ion Level of compliance with R&D plans and	Achieve all inclusive and predictive participation by industry stakeholders in R&D delivery	24. Develop R&D regulation to guide effective oversight of the Oil and Gas industry related Research	NCDMB	2020
initiatives Regul indus stake	industry stakeholders		25. Develop framework for the monitoring and evaluation of R&D projects	NCDMB	2020
			26. Develop incentive programmes for the adoption of Research centres by Operators and Service companies		
				NCDMB	2021



Legal Framework					
Objectives	Measures	Targets	Initiatives	Responsible Parties	Due Dates
Provide legal framework to protect activities related to R&D	Level of protection given to R&D spend and breakthrough	Achieve 100% IP registration for sponsored research	27. Inaugurate Technical Advisory Board to superintend over evaluation of Research proposals for Research grants	NCDMB	2022
		Achieve 100% partnership agreements with beneficiaries of NCRF grant	28. Establish a framework for mitigating the risk of litigation in delivery of R&D projects	NCDMB	2022
			29. Establish partnership with relevant Agencies to facilitate IP rights for Research breakthrough	NCDMB NOTAP NCC	
					2021



Legal Framework					
Objectives	Measures	Targets	Initiatives	Responsible Parties	Due Dates
Enforce the implementation of all R&D provisions in the NOGICD Act and other relevant regulations	Level of compliance with R&D regulations	100% compliance Ince with R&D ations regulations	30. Create awareness among industry stakeholders to deepen their understanding on provisions of NOGICD Act and Regulations on R&D	NCDMB	2022
			31. Develop alternative dispute resolution mechanism to manage cases of infractions to R&D provisions in the NOGICD Act	NCDMB	2022
Ensure optimal utilization of local R&D findings	Level of deployment of qualified research breakthroughs	100% acceptance and deployment of qualified research breakthroughs	32. Enforce Regulations that mandate the deployment of tested and certified research breakthrough in oil and gas operations	NCDMB NOTAP SON DPR	2022

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