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# Assessing governance of strategic planning for sustainable energy transitions: a sociotechnical approach for grid-based renewable energy development in Nigeria.

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# **Assessing governance of strategic planning for sustainable energy transitions - A sociotechnical approach for grid-based renewable energy development in Nigeria.**

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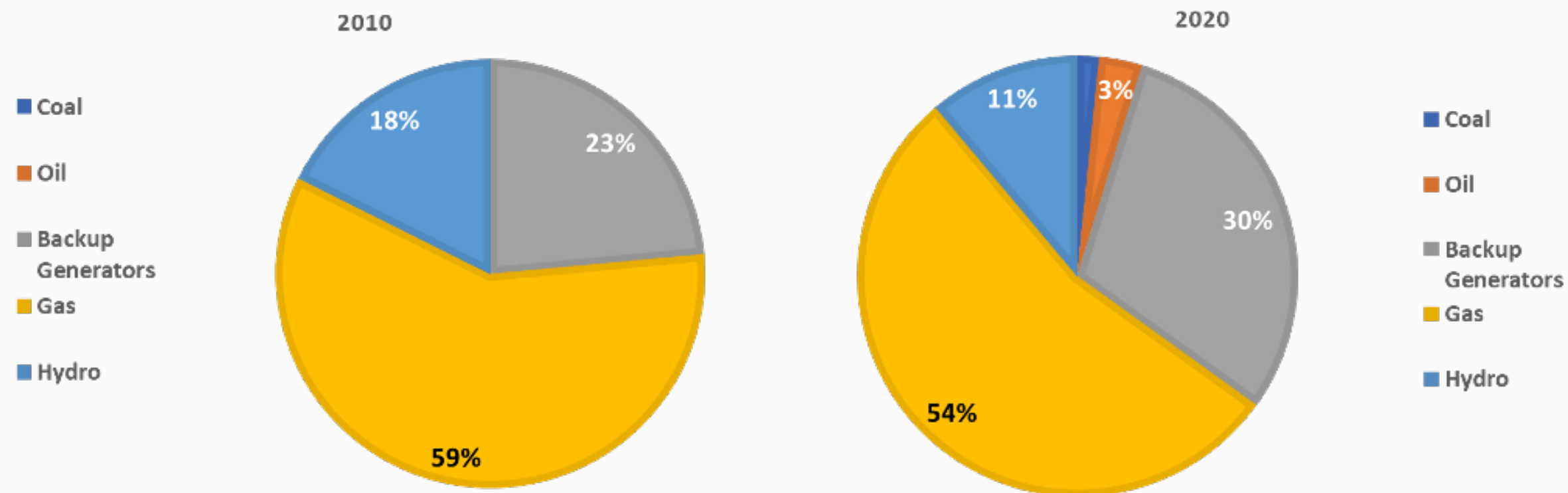
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# Background

- Nigeria is committed to reducing Greenhouse Gas Emissions and reaching net zero by 2060 based on the climate pledge to the Paris agreement and COP26.
- Nigeria was the world's 17th largest emitter of GHG in 2015.
- Africa's largest oil producer and the world's ninth-largest exporter.
- The population is about 206 million; projected to double by 2050 and overtake china to become the world's most populous country by the end of the century.



SOURCES: IEA 2020



# Background contd...

85  
MILLION

Nigerians are without access to electricity (IEA 2020)

4K  
MW

Electricity supply in 2019 (IEA 2020)

35%

Urban area has no access (residential and industrial) (IEA 2020)

6K  
MW

Electricity demand in 2019 (IEA 2020)

X2

Nigeria's population is projected to double by 2050 and energy demand increase (Cookson C 2019)

75%

Industrial areas off-grid (IEA 2020)

- Nigeria has the largest energy access deficit in the world with 43% i.e 85 million without access to electricity (world bank 2021).
- Electricity challenges have had devastating economic implications with an annual loss of \$26.2bn which is about 2% of the country's GDP (World Bank 2020b).
- Renewable energy sources (off-grid and grid-based) has been identified as a remedy to address energy poverty and climate change issues, boost economic and sustainable development.







# Research Problem



- The REMP targeted renewable energy accounting for 30% of the planned 30 GW generation by 2030 i.e., available electricity. Energy access will increase from 65% (2016) to 75% (2020) and 90% (2030). However major milestones have been missed with projections looking unattainable for the 2030 target (NREEEP, VISION 20:2020, REMP, VISION 30:30:30).
- While the off-grid segment has had notable success, there is no new RE technology incorporated into the National grid.
- There are impressive body of research on renewable energy in Nigeria. However, various research has assessed more generally renewable energy development in Nigeria (Abubakar et al., 2015, Osu 2017) while others have researched off-grid RE development such as community renewable energy (Butu et al., 2017) and rural electrification (Ujumadu, 2018).
- Literature has looked at this issue specifically to the grid from technical, financial, and economic viewpoints (Edomah et al 2017, Ujumadu 2018, Adeniyi 2019, Gungah 2019, Ovwigho et al 2020, Nwozor 2021). However, there is a dearth in recent literature on grid-based renewable energy and no research yet found focused on the governance and planning process of renewable energy in the Nigerian grid-based electricity sector.
- Given the huge cost to the economy, we really want to understand the difficulties of actualising grid RE strategies and assess the governance and planning process (actors involvement and RE instruments).

**Definition in this context- Governance, energy planning and transition**



# AIM

This research aims to assess the renewable energy planning process and governance for the implementation of grid-based renewable energy strategies in Nigeria; to identify barriers, enablers and drivers for transitions.

## Objectives

- To investigate the barriers of the grid-based renewable energy strategies implementation in Nigeria.
- To investigate the enablers of the grid-based renewable energy strategies implementation in Nigeria.
- To investigate the drivers of the grid-based renewable energy strategies implementation in Nigeria.
- To assess and understand the renewable energy planning process and governance.



# Theoretical Framework

## Transition Studies

Transition theory has gained significant popularity in energy and sustainability studies, and it emphasises the need for radical change to achieve technology innovation as it requires changes in an entire structure of societal (sub)system (institutions, values, culture and technologies) which involves the coevolution of its elements at various levels and scales (Rotmans and Loorbach, 2009).

Transition in the energy sphere differs from conventional transition because of the inherent complexities.

## Transition Management Theory

Transition management is a governance approach that aims to facilitate and accelerate sustainability transitions through a participatory process of visioning, learning and experimenting (Rotmans and Loorbach 2009).

## Multi-Level Perspective

The multi-level perspective (MLP) is a prominent transition framework. The MLP posits that transitions come about through interaction of processes within and among three analytical levels: niches, socio-technical regimes and a socio-technical landscape (Geels 2002).

## Unique Contribution

- It contributes to the operationalisation of TMF and MLP in developing countries as most application are in developed economies mostly in Europe.
- It also applies to a country whose existing institutions are not advanced, inefficient with accountability challenges.
- It contributes to the type of transition management required at the four other stages of transition, especially the acceleration stage.



# Methodology



Research Philosophy - Interpretivism



Research Approach - Inductive



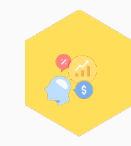
Research Strategy - Case study



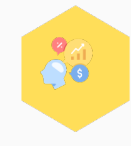
Methodological Choice - Mono method - Qualitative



Data collection - 31 Semi-structured interviews  
(conducted between April and Dec 2021).



Time Horizon - Cross-sectional



Data Analysis Technique

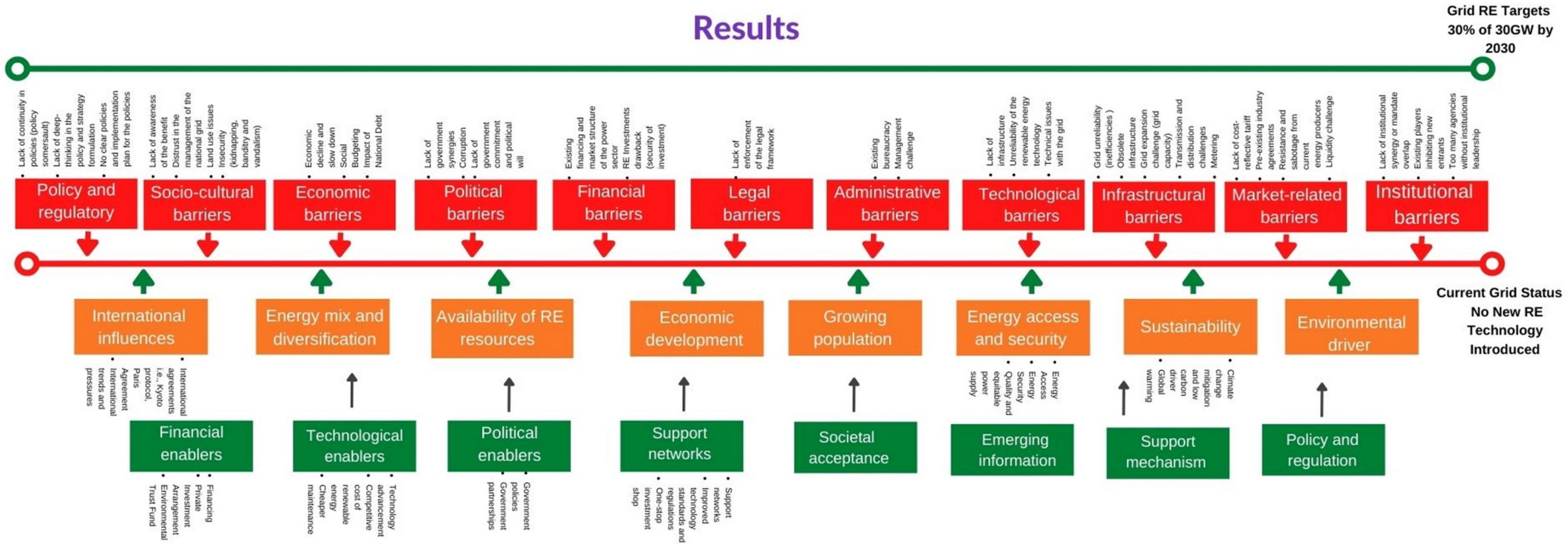
- Thematics Analysis (NVivo Software)

S/ N	Energy and Non-energy Industry Actors		Descriptions	Number of Participants	Level of Experts
1	Public Authorities	Regulatory	Nigeria Electricity Regulatory Commission (NERC)	3	Managerial
2		Policymaking	Energy Commission of Nigeria (ECN)	3	Managerial
4		Government parastatal	Department of Climate Change	1	Managerial
5			Federal Ministry of Environment	1	Managerial
6			Federal Ministry of Power (FMOP)	3	Managerial
7	Research and Development institute		Centre for Energy Conservation and Energy Efficiency (Lagos)	1	Managerial
9	Associations		Renewable Energy Association of Nigeria	1	Executive
12			Association of Power Generating Companies	1	Executive
13	Climate change Movement		Friends of the Earth in Nigeria	1	Executive
	NGO		Ecowas Centre for Renewable Energy and Energy Efficiency	1	Executive
14	Universities		Covenant University	1	Researcher
			Landmark University	1	Researcher
15	Electricity Generation companies		Kainji Power Station, Niger State	1	Senior manager
16			Egbin Thermal Power Station, Lagos	1	Senior manager
17	Electricity Distribution companies		Ikeja Electricity Distribution Company	1	Senior manager
19	Electricity Transmission Company		Transmission Company of Nigeria	1	Managerial
20	Renewable Energy Technology Funding Company		Sustainable Use of Natural Resources and Energy Finance (SUNREF)	1	Senior Executive
21			Nigeria Investment Promotion Commission	1	Senior Executive
22	Independent Researchers		Individual Researchers	2	Researcher
23	Renewable energy businesses	Solar	Nigeria Solar Capital Partners	1	Senior Executive
24		Wind	Terawatts MBH Company	1	Senior Executive



# Results

## Results



# Result contd

- **Formulation of Transition Arena and group**

- International arena

*"...Sometimes, some of these targets to the same way we have our experts who go to the International Committee and make certain agreements, for things like their NDC contributions and all of that, and then they set all kinds of ambitious targets without really sitting down to see if these targets are achievable or realisable..."IR27*

- National Arena

*"... But I was fully aware, when the Ministry of power and others were doing projections They called in some experts and others..." IR03*

- **Stakeholder engagement, involvement and participation**

- Decision makers:

*"So when something is referred to from the minister to the President, then is put on the table and then that NERC can adopt it . So Ministry of power is overlooked a lot of times and Ministry of power is quite critical..." IR01*

- Value chain players

*"...have actually invited us and my company set up renewable energy, Think Tank. I am a member of that think tank, and we did a lot of extensive work..."IR01*

- **Selection of frontrunners**

*"...But I learned there are a number of companies that have been licensed to go into making renewable energy procurement for Nigeria. Okay which companies that please? Now I do not have the record, what I only know is that we have about 11 company that have already signified investment to go into renewable energy procurement in Nigeria..." IR15*

- **Transition design**

- RE target

*"Because if we are battling with taking in 4000 or 6000 megawatts, to take that 5000 megawatts in five years? Or sorry, in four years? Yeah, when we have not started doing anything. So I just hope it's not one of those visions, that we wait till the end of the year, then we extend it again. So I think that's these are the two things that should be done regulations, strict regulations would have legislative backing, and issues of enforcement, penalties, then expansion of the grid... And I'm not also sure that our vision 303030 I'm not sure we will get there..." IR13*

- Strategies

*So without sounding too cynical? I think sometimes I feel and this is a personal opinion, of course, it's not the source always, always be used in research. Sometimes I feel as if some approach we go through in deploying our strategies in the country is a bandwagon approach, there's really some kind of the thoughts pen to paper kind of research in direction of how to deploy it. IR 14*

- Renewable energy objective

*"...diversify in renewable energy. cause renewable energy is the in thing now many countries... I'm suggesting 100% ownership by the federal government and diversifying in other means of electricity, we should not not just focus on only hydro, we should have other means..." IR05*



# Conclusion

- This study demonstrates that there is a need to protect renewable energy niche innovation by providing an enabling environment for the growth and maturity of the technology.
- Socio-technical landscape pressures from electricity demand on the existing regime and the multifaceted challenges of the grid system has created opportunities for niche development. However, the strong incumbent socio-technical regime, conflicting multiple actors' interests, government's petroleum subsidies and policies, and the system's inefficiency are reinforcing the incumbent regime (technology lock-in).
- A strong societal acceptance of RE technologies
- The study also found out that there is no dedicated agency handling Grid RE just like the REA. Hence, this study proposes the establishment of an agency to beef up the niche and RE innovations with appropriate support mechanism i.e., financing established to accelerate transition and create an actionable implementation plan.
- The study shows that inhibitors to grid-based renewable energy are stronger than the drivers. Government's involvement, deficiencies in governance system and financing challenge coupled with grid infrastructure challenges and no clear implementable action plan challenges are identified as major bottlenecks for transition to renewable energy.
- The need to address energy access, enhance energy supply and meet the growing energy demand to achieve energy security has been identified as the pertinent enablers of the transition in Nigeria.
- MLP was useful in understanding the enablers and inhibitors of energy transition in Nigeria.
- The state of the transition arena is unable to exert strong pressure on the incumbent socio-technical regime to foster the transition.

## Limitation

The study focused on solar and wind technologies. It provides opportunity for assessing other forms of renewable energy contained in the NREEEP documents such as biomass and hydro technologies.

## Area of further research

Further research should focus on the dynamics of the regime in a transition pathway where incumbent regime systems are inefficient.

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Any Questions?



COMMENT

Thank you!

