

REINVIGORATING RENEWABLE ENERGY TECHNOLOGY IN NIGERIA VIA THE INSTRUMENTALITY OF A BOLSTERED INTELLECTUAL PROPERTY RIGHTS REGIME

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Abstract

The transition to renewable energy is critical to addressing Nigeria's persistent electricity deficit, promoting sustainable development, and achieving climate change commitments. Intellectual property rights (IPRs) play a significant role in encouraging innovation and facilitating technology transfer; however, the extent to which Nigeria's existing IPR framework supports the development and diffusion of renewable energy technologies remains contested. This article critically examines the role of intellectual property rights protection in advancing renewable energy technologies in Nigeria. Using a doctrinal legal research methodology, the study analyses Nigeria's intellectual property regime, particularly the Patents and Designs Act, the Copyright Act 2022, relevant international instruments, including the TRIPS Agreement and the Paris Agreement, as well as judicial authorities, policy documents, and scholarly works. The study finds that while an effective IPR system has the potential to stimulate domestic innovation, attract foreign investment, and promote technology transfer, Nigeria's outdated legislative framework, weak institutional capacity, inadequate enforcement mechanisms, regulatory fragmentation, limited financing, and underutilization of the flexibilities of TRIPS significantly undermine these

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objectives. The article concludes that intellectual property rights can serve as an important catalyst for renewable energy development only when supported by comprehensive legal and institutional reforms. It recommends the modernization of Nigeria's patent legislation, stronger enforcement of intellectual property rights, among others.

Keywords: Intellectual Property Rights, Renewable Energy, Technology Transfer, Patents and Designs Act, TRIPS Agreement, Climate Change

1.0 INTRODUCTION

Despite being one of the largest oil producers in Africa, Nigeria continues to record some of the lowest rates of electricity access on the continent. According to the International Energy Agency, over 80 million Nigerians lacked access to electricity as of 2022, making the country one of the most energy-deprived nations in the world.¹ This paradox of resource abundance alongside pervasive energy poverty has prompted growing scholarly and policy interest in the potential of renewable energy technologies, particularly solar, wind, and small hydro, to address the access deficit.²

The development and deployment of renewable energy technologies are intrinsically connected to intellectual property rights (IPR). Patents, trade secrets, trademarks, and copyright govern the ownership, commercialization, and transfer of the innovations that underpin clean energy solutions.³ At the international level, the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) establishes minimum standards of IPR protection that all World Trade Organization members, including Nigeria, are obligated

¹International Energy Agency, *Nigeria Energy Outlook* (IEA 2022) 12.

²Biodun Adewale, 'Energy Poverty and Access Deficit in Nigeria: A Policy Analysis' (2020) 14(2) *Journal of Energy Policy Research*, 47.

³David Ockwell and Rob Byrne, *Sustainable Energy for All: Innovation, Technology and Pro-Poor Green Transformations* (Routledge 2016) 78.

to observe.⁴ The Paris Agreement further recognizes technology transfer as a central mechanism for enabling developing countries to meet their climate commitments.⁵

The question of whether strong IPR protection promotes or inhibits the development of renewable energy technologies in developing economies is deeply contested. On one view, robust IPR frameworks stimulate domestic innovation and attract foreign direct investment. On another, they entrench the technological dominance of developed nations and restrict access to critical clean energy innovations.⁶ This article critically examines this tension within the Nigerian context. It assesses the domestic IPR legal framework, analyses how current rules shape technology transfer, and evaluates the structural barriers that prevent IPR from functioning as an effective catalyst for renewable energy development. The article concludes with targeted reform recommendations.

2. THE INTELLECTUAL PROPERTY RIGHTS FRAMEWORK IN NIGERIA

Nigeria's intellectual property legal architecture is principally governed by the Patents and Designs Act,⁷ the Trademarks Act,⁸ and the Copyright Act 2022.⁹ The Patents and Designs Act is the most directly relevant to renewable energy, as it governs the protection of novel inventions and industrial designs. A patent confers on the holder

⁴Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) (adopted 15 April 1994, entered into force 1 January 1995) 1869 UNTS 299.

⁵Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) UNTS No 54113, art 10.

⁶Chukwuemeka Obioma, 'Intellectual Property Rights and Clean Technology Transfer to Developing Countries: The Nigerian Paradox' (2021) 9(1) *African Journal of International and Comparative Law*, 36.

⁷Patents and Designs Act, Cap P2 Laws of the Federation of Nigeria 2004.

⁸Trademarks Act, Cap T13 Laws of the Federation of Nigeria 2004.

⁹Copyright Act 2022, s 1.

exclusive rights to exploit an invention for twenty years, subject to conditions of novelty, inventive step, and industrial applicability.

However, the Nigerian IPR framework has attracted sustained criticism for its fragmented and archaic character. Scholars have noted that the Patents and Designs Act has not undergone substantive reform since its enactment in 1970, leaving it ill-equipped to address the complexities of modern technology sectors, including renewable energy.¹⁰ The institutional infrastructure supporting IPR protection is similarly underdeveloped. The Commercial Law Development Unit and the Nigerian Copyright Commission operate with limited resources and coordination, while the Federal High Court, which retains exclusive jurisdiction over patent disputes, is burdened with caseloads that impede timely adjudication.

Nigeria is a member of the African Regional Intellectual Property Organization (ARIPO) and the African Intellectual Property Organization (OAPI), as well as a signatory to the TRIPS Agreement through its WTO membership. These international commitments impose minimum standards but also offer flexibilities, including compulsory licensing and parallel importation, which are relevant to technology access. Despite their potential, these flexibilities remain underutilized in Nigeria, partly due to legislative inertia and partly due to inadequate awareness among policymakers.¹¹

¹⁰Nnamdi Ezejiofor, 'Reforming Intellectual Property Law in Nigeria: Gaps, Challenges and the Need for Legislative Overhaul' (2019) 31(3) *Nigerian Journal of Legal Studies*, 115.

¹¹World Intellectual Property Organization, *WIPO Green: The Marketplace for Sustainable Technology* (WIPO 2023) 5.

3. INTELLECTUAL PROPERTY RIGHTS AND TECHNOLOGY TRANSFER: A CRITICAL ANALYSIS

The relationship between IPR protection and the transfer of renewable energy technologies to developing countries is among the most contentious issues in the intersection of trade law, environmental policy, and development economics. Proponents of strong IPR protection argue that patents provide the assurance necessary to incentivize technology owners to license their innovations to developing country firms, thereby facilitating transfer.¹² Critics, however, contend that patent monopolies inflate the cost of licensing, generate exclusionary patent thickets, and ultimately restrict access to technologies that are urgently needed to address climate change.¹³

Maskus argued that the empirical relationship between IPR protection and technology transfer is non-linear: too little protection discourages transfer by exposing innovators to imitation risk, while too much protection drives up licensing costs to prohibitive levels.¹⁴ This insight is particularly relevant in the Nigerian context, where the formal IPR framework offers nominal protection but lacks effective enforcement, creating precisely the uncertainty that deters both domestic innovation and inward technology transfer.

Correa similarly observed that the patenting strategies of multinational corporations frequently do not correspond to genuine innovation activity in developing countries but rather constitute a form of

¹²Chidi Oguamanam, 'Bridging the Innovation Divide: Intellectual Property and Technology Transfer in Sub-Saharan Africa' (2018) 26(4) *Journal of African Law*, 214.

¹³Obinna Nwosu and Emeka Dike, 'Patent Thickets and the Renewable Energy Sector in Africa: Barriers or Incentives?' (2020) 12(1) *African Journal of Science, Technology, Innovation and Development*, 91.

¹⁴Keith Maskus, *Private Rights and Public Problems: The Global Economics of Intellectual Property in the 21st Century* (Peterson Institute for International Economics 2012) 145.

strategic exclusion, designed to foreclose competition in export markets.¹⁵ In the renewable energy sector, this dynamic is evident in the concentration of solar panel and wind turbine patents among a small number of firms based in China, Germany, and the United States. Nigerian firms seeking to enter these markets face significant entry barriers, not necessarily because the underlying technologies are inherently inaccessible, but because the IP landscape effectively channels market access through multinational gatekeepers.

Domestic licensing arrangements have emerged as one mechanism through which technology transfer has occurred in Nigeria. Several foreign solar energy companies have entered licensing agreements with Nigerian counterparts, particularly in the off-grid solar market. However, the terms of such arrangements are frequently criticized as commercially extractive, with royalty rates and know-how restrictions limiting the genuine developmental benefit.¹⁶ The absence of mandatory technology transfer requirements or local content benchmarks in Nigerian IPR law compounds this problem.

4. STRUCTURAL BARRIERS TO IPR-DRIVEN RENEWABLE ENERGY DEVELOPMENT

Beyond the technical operation of IPR rules, a range of structural barriers constrains the ability of Nigeria to leverage intellectual property frameworks for renewable energy development. These barriers operate at the legislative, institutional, infrastructural, and financial levels.

¹⁵Carlos Correa, 'Intellectual Property Rights and the Transfer of Technology to Developing Countries' (2014) 33 *World Patent Information*, 385.

¹⁶Yewande Ogunwale, 'Foreign Direct Investment, Technology Licensing and Renewable Energy Development in Nigeria' (2022) 18(2) *Nigerian Journal of Renewable Energy*, 64.

At the legislative level, the absence of a comprehensive energy innovation policy that integrates IPR considerations is a significant gap. The National Renewable Energy and Energy Efficiency Policy and the Renewable Energy Master Plan provide useful policy orientation¹⁷ but neither document articulates a coherent strategy for using IPR tools, such as patent pooling, open licensing, or compulsory licensing, to accelerate technology diffusion. This stands in contrast to jurisdictions such as India, which has explicitly incorporated IPR flexibilities into its renewable energy policy architecture.

The Nigerian electricity regulatory environment adds further complexity. The Nigerian Electricity Regulatory Commission has responsibility for setting feed-in tariffs and licensing renewable energy generators¹⁸ but has limited engagement with the IP dimensions of energy innovation. Regulatory fragmentation between NERC, the Ministry of Power, and the Ministry of Justice means that no single agency is positioned to coordinate a strategic approach to IPR and renewable energy.¹⁹

At the institutional level, the weakness of Nigerian universities and research institutes as generators of energy innovation is a serious structural problem. Most renewable energy research in Nigeria is conducted within international collaborations rather than emerging from domestic innovation ecosystems.²⁰ The country does not yet have a fully operational national patent database, which limits the ability of

¹⁷National Renewable Energy and Energy Efficiency Policy (NREEEP) 2015.

¹⁸See Nigerian Electricity Regulatory Commission, *Renewable Energy Feed-in Tariff Regulation* (NERC 2015).

¹⁹Seun Adenle, 'Assessment of Solar Energy Technology and Application Opportunities in Nigeria' (2016) 75 *Renewable and Sustainable Energy Reviews*, 1168.

²⁰Adaeze Nwachukwu, 'Institutional Barriers to Renewable Energy Investment in Nigeria: A Critical Review' (2021) 16(4) *Energy for Sustainable Development*, 47.

firms and researchers to conduct prior art searches and identify licensing opportunities. This information asymmetry further disadvantages domestic actors in negotiations with foreign technology owners.

Financing presents an equally acute barrier. Patent licensing, research and development, and technology acquisition all require substantial capital investment. Nigeria lacks a dedicated green technology investment fund or a patent-backed financing mechanism that would enable domestic firms to commercialize renewable energy innovations. The commercial banking sector remains risk-averse towards clean energy projects, and venture capital for energy technology start-ups is nascent.²¹ These conditions mean that even where the legal conditions for licensing are favorable, the financial ecosystem does not support the exploitation of those opportunities.

Enforcement of intellectual property rights in Nigeria is widely acknowledged as inadequate. The courts are slow, expert witnesses in patent matters are scarce, and counterfeiting of branded solar products, including counterfeit solar panels and inverters, is a significant problem that undermines market confidence.²² Paradoxically, weak enforcement not only fails to protect domestic innovators; it also deters foreign firms from licensing their technologies in Nigeria for fear that their IP will be appropriated without recourse.²³

²¹Tade Aina, 'Innovation Systems and Intellectual Property Rights in Sub-Saharan Africa: The Role of the State' (2019) 22(1) *African Development Review*, 60.

²²Emeka Chianu, 'Intellectual Property Enforcement in Nigeria: The Courts, the Challenges and the Way Forward' (2018) 30(2) *Nigerian Current Law Review*, 83.

²³Obioma (n 6) 40.

5. COMPULSORY LICENSING AND TRIPS FLEXIBILITIES AS POLICY TOOLS

One of the most debated mechanisms for addressing the tension between IPR protection and technology access in developing countries is compulsory licensing. Under Article 31 of the TRIPS Agreement, member states may authorize the use of a patented invention without the consent of the right holder in defined circumstances, including national emergency and public non-commercial use.²⁴ The Doha Declaration on TRIPS and Public Health, adopted in 2001, confirmed that TRIPS flexibilities should be interpreted to protect public health and promote access to medicines.²⁵ Scholars have argued that analogous reasoning should be extended to climate-critical technologies.²⁶

The Nigerian Patents and Designs Act makes provision for compulsory licensing after a patent has been in force for three years without adequate working in Nigeria.²⁷ However, there is no recorded instance of this provision being invoked in the renewable energy sector. The legal conditions for grant are cumbersome, the process untested, and the political will to use such a measure against foreign technology owners has been conspicuously absent. This represents a significant underutilization of a legitimate and internationally recognized policy tool.

The Doha Declaration model has demonstrated its value in public health, where Brazil, India, and South Africa have successfully used compulsory licensing to secure access to antiretroviral medicines at

²⁴TRIPS Agreement, art 27.

²⁵Doha Declaration on the TRIPS Agreement and Public Health (WT/MIN (01)/DEC/2, 20 November 2001) para 4.

²⁶Peter Yu, 'The TRIPS Enforcement Dispute' (2011) 89 *Nebraska Law Review*, 1057.

²⁷Patent and Designs Act 2004, s 58.

affordable prices. The question of whether this model can be transposed to renewable energy technologies is analytically complex. Unlike pharmaceutical products, where a single molecule may be protected by a manageable number of patents, renewable energy technologies are frequently subject to overlapping patent claims across components, manufacturing processes, and software systems. This layered IP structure makes compulsory licensing a less tractable solution for energy technology access than for pharmaceuticals.²⁸

An alternative approach gaining attention is the establishment of patent pools for climate technologies, modelled on the Medicines Patent Pool. Under such an arrangement, technology owners voluntarily deposit patents into a shared pool, from which licensees in developing countries may obtain access at reduced or zero royalty rates. The WIPO GREEN initiative provides an existing platform for matchmaking between technology owners and users in developing countries. Nigeria has not yet developed a domestic strategy for engaging with these initiatives, and this represents a policy opportunity that warrants urgent attention.

6. CRITICAL REFORM RECOMMENDATIONS

The foregoing analysis reveals a fundamental misalignment between Nigeria's IPR framework and the imperatives of renewable energy development. Addressing this misalignment requires reform across at least four dimensions: legislative modernization, institutional coordination, innovative policy tools, and international engagement.

First, the Patents and Designs Act requires urgent and comprehensive reform. A modern patents statute should include explicit provisions on green technology patent examination, with incentives for early

²⁸Yu (n 26) 1065.

disclosure of climate-relevant innovations, streamlined procedures for compulsory licensing in the public interest, and mandatory local working requirements that compel patent holders to actively exploit their patents in Nigeria or face licenses of right. Legislative reform should be accompanied by capacity building within the judiciary and among patent examination staff at the Commercial Law Development Unit.

Second, a dedicated renewable energy innovation policy is needed that explicitly integrates IPR considerations. Such a policy should designate lead agencies for IP strategy in the energy sector, set targets for domestic patent filings in renewable technologies, and create incentives for public research institutions to commercialize their innovations. The policy should also establish a green technology financing facility, potentially modelled on the Green Climate Fund, to provide concessional capital for domestic firms acquiring or commercializing energy patents.

Third, Nigeria should develop a proactive strategy for engaging with international IPR flexibilities. This requires training lawyers and policymakers in TRIPS-compliant mechanisms for technology access, designating a competent authority to oversee compulsory licensing applications, and participating actively in multilateral forums, including WIPO and the WTO TRIPS Council, to advocate for an expanded interpretation of TRIPS flexibilities in the context of climate technology.

Fourth, the regulatory architecture for foreign investment in renewable energy should incorporate technology transfer conditionalities. Investment promotion agreements should require technology licensors to invest in domestic training, knowledge transfer, and joint research arrangements as a condition of market access. This approach, which is

consistent with Nigeria's obligations under international investment law, would help convert foreign IP into genuine developmental benefit rather than mere revenue extraction.

7. CONCLUSION

This article has argued that intellectual property rights protection plays a deeply ambiguous role in the development of renewable energy technologies in Nigeria. The formal IPR framework, rooted in decades-old legislation and supported by weak institutions, neither sufficiently incentivizes domestic innovation nor adequately facilitates inward technology transfer. The structural barriers of inadequate financing, regulatory fragmentation, enforcement weakness, and information asymmetry further compound the challenge.

The international dimension is equally fraught. TRIPS obligations create floor requirements that constrain domestic policy space, while the flexibilities they offer remain largely untapped. Patent concentration among a small number of developed-country firms continues to shape the terms on which renewable energy technologies reach Nigeria, frequently to the disadvantage of local actors.

Yet the conclusion of this analysis is not that IPR protection is inherently antagonistic to Nigeria's renewable energy ambitions. Rather, it is that the existing framework fails to channel IP in a direction that serves national development objectives. Strategic legislative reform, institutional strengthening, deliberate engagement with international flexibilities, and technology transfer conditionalities in investment policy offer a plausible pathway to a different outcome. Nigeria's renewable energy future will not be built on IP protection alone, but it cannot be built without it.