October 2024

Bridging the Climate Finance Gap: Designing a Legal Framework for Carbon Market in Nigeria

Ibidolapo Olufade
Western University

Supervisor: Professor Martin Petrin and Professor Sara Ghebremusse
University of Western Ontario

Abstract

Nigeria suffers a climate finance gap of approximately USD 20.5 billion per annum. To close this gap, this project recommends that Nigeria explores the carbon market, specifically, the design of a cap-and-trade program. Against this backdrop, this project examines the California cap-and-trade program from a comparative transplant standpoint and it identified critical design lessons for Nigeria.

A refrain so quietly insistent in the project is that the success of a carbon market rests on a sound legal framework owing to the fact that carbon markets are polycentric in nature, requiring actors and many moving parts that can only be held togther by sound regulations. This also comports with the experience of California in designing and operationalizing its cap-and-trade program.

While this project recognizes the potential impact of a carbon market in mobilizing climate finance it restates that market mechanisms thrive when used in concert with other measures.

Keywords: *Cap-and-Trade, Carbon Markets, Carbon Pricing, Climate Finance, Climate Policy.*

Acknowledgments

I am grateful to my supervisors — Prof. Martin Petrin and Prof. Sara Ghebremusse — whose guidance, support, and prodigious insight helped translate this work from an amorphous idea in my head into a beautiful intellectual product. Their brilliance and perception shine through this work.

I recognize the debt of gratitude I owe to God, the *fons et origo* of who I am and yet to be. Indeed, there is a spirit in man, and the inspiration of the Almighty giveth them understanding. Thank you, Lord.

Section 1

1. Introduction

As of the time of writing, over 110 million people in sub-Saharan Africa have directly experienced the devastating consequences of weather, climate, and water-related hazards, resulting in economic losses exceeding USD 8.5 billion.[1] These figures represent more than mere statistics; they are a stark reminder of the harsh realities faced by communities in the region.

The 2022 Intergovernmental Panel on Climate Change (IPCC)[2] Report[3] has confirmed that the impacts of climate change are unevenly distributed. Nigeria's economy, which is heavily reliant on the environment and natural resources, makes the country extremely vulnerable to the effects of climate change.[4] Nigeria is in fact confronted with the dual problems of desertification in the north, and sea level rise in the south, demonstrating the diversity of adaptation needs and regional variations in vulnerabilities.[5]

Nigeria's challenge is seeking ways to guarantee that future growth adheres to a low-emission development path in order to avoid carbon lock-in (a situation where high-carbon technologies, practices, and infrastructures become entrenched in society,

---

[1] World Meteorological Organization, *State of the Climate in Africa 2022* (Geneva: World Meteorological Organization, 2023), online: World Meteorological Organization https://library.wmo.int/doc_num.php?explnum_id=11211.

[2] The Intergovernmental Panel on Climate Change is an intergovernmental body of the United Nations. The IPCC was created to provide policymakers with regular scientific assessments on climate change, its implications and potential future risks.

[3] IPCC, *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. H.-O. Pörtner et al. (Cambridge, UK & New York, NY, USA: Cambridge University Press, 2022), online: Cambridge University Press doi:10.1017/9781009325844.

[4] Department of Climate Change, Federal Ministry of Environment, Nigeria, *2050 Long-Term Vision for Nigeria (LTV-2050) - Towards the Development of Nigeria's Long-Term Low Emissions Development Strategy (LT-LEDS)* (2021).

[5] Nigeria's First Nationally Determined Contribution - 2021 Update submitted to the Secretariat of the UNFCCC

making it difficult to transition to low-carbon alternatives) as the nation continues to industrialize and urbanize.[6] Indeed, Nigeria is set to become the third most populous country in the world by 2050, with emissions likely to grow exponentially under a business-as-usual (BAU) scenario.[7]

Due to the impacts of climate change, the economic cost of climate change without adaptation could be between 6 percent and 9 percent of Nigeria's Gross Domestic Product (GDP) by 2050, that is between USD 100 billion and USD 450 billion.[8] The 2023 IPCC Report[9] has stressed that addressing these climate-related challenges will require a substantial financial commitment to adequately respond to the necessary mitigation and adaptation measures.

Indeed, the estimated cumulative financing needs for Nigeria to respond adequately to climate change and implement its Nationally Determined Contributions (NDCs) are estimated at about USD 247.3 billion over 2020-2030[10] with lower and upper bounds of USD 231.8 billion and USD 262.7 billion, respectively. This figure is for mitigation (USD 177 billion) and loss and damage (estimated at USD 70.3 billion).

Thus, there is a need for Nigeria to explore alternative mechanisms to raise funds to support adaptation and mitigation initiatives. Against this backdrop, this project aims to analyze the innovative role of the carbon market in mobilizing climate finance for

---

[6] Nigeria, *Nigeria Energy Transition Plan - Nigeria's Pathway to Achieve Carbon Neutrality by 2060* (online: Nigeria Energy Transition, 2021) https://energytransition.gov.ng/.
[7] Climate Policy Initiative, *Landscape of Climate Finance in Nigeria* (2022).
[8] African Development Bank Group, *Country Focus Report 2022, Nigeria: Supporting Climate Resilience and a Just Energy Transition* (October 2022).
[9] IPCC, *Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. Core Writing Team, H. Lee & J. Romero (Geneva: IPCC, 2023), 1-34, online: IPCC doi:10.59327/IPCC/AR6-9789291691647.001.
[10] Nigeria, *Nigeria's First Nationally Determined Contribution - 2021 Update* (2022), online: UNFCCC https://unfccc.int/sites/default/files/NDC/2022-06/NDC_File%20Amended%20_11222.pdf.

Nigeria's climate transformation initiative by drawing lessons from the California carbon market regime. Specifically, the goal of this paper is to design a legal framework for a carbon market in Nigeria through the comparative analyses of the *California Global Warming Solutions Act* of 2006, commonly known as *Assembly Bill 32 (AB 32)*.

The Californian carbon market, is useful for Nigeria as it recognizes the complementary nature of the compliance and offset market (the compliance market establishes a carbon price by laws or regulations which control the supply of allowances that are then distributed by national, or regional regimes, whereas, the offset market is voluntary, companies and individuals carry out projects in sectors not covered by the carbon market and obtain offset credits from the government in exchange for reducing or removing atmospheric greenhouse gas emissions generated by their projects) which is not permitted under the European Union Emissions Trading System (EU-ETS), another potential market Nigeria could model. As it stands, policy makers in Nigeria have shown keen interest about the use of the compliance and voluntary (offset) framework.[11] What is more, the Californian cap-and-trade Program has generated USD 22.25 billion in 10 years. In 2022, it generated USD 4.03 billion — a figure that does not include revenue from auctioning of consigned allowances which is an additional USB 2 billion. This is according to 2023 Annual Report - Cap and Trade Auction Proceeds.[12]

---

[11] *Regulatory Guidance on Nigeria's Carbon Market Approach* published by the National Council on Climate Change. Accessed (https://natccc.gov.ng/publications/NCCC%20Regulatory%20Guidance%20on%20Nigeria%E2%80%99s%20Carbon%20Market%20Approach.pdf)

[12] California Air Resources Board (CARB), *Annual Report 2023*, online: CARB https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/cci_annual_report_2023.pdf.

Quite importantly, electricity generation is one of the sectors covered by the Californian program. This is especially useful for Nigeria as the energy sector is the highest emitter (accounting for 60% of Nigeria's total emissions), renewable energy finance is estimated to make up the bulk of Nigeria's investment needs.[13]

The similarity in political and legal systems also makes the comparison apt. The United States political and legal systems which are based on the federal and common law systems are similar to Nigeria's.

The substantive work of this paper proceeds in five parts. The first part analyzes the climate finance landscape in Nigeria. This includes the disquisition of the challenges and limitations in climate finance allocation, and the role of legal and regulatory frameworks in carbon market. The second part provides an overview of California's carbon market, with a focus on the cap-and-trade program. The third part offers a comparative analysis of the legal, regulatory and policy framework of California's carbon market while drawing useful lessons therefrom that may be applied in Nigeria. The fourth part discusses the challenges, and considerations for a cap-and-trade program in Nigeria while offering recommendations on how to set up a similar program in Nigeria, while the fifth and final part concludes the project.

1.1. Understanding the Climate Finance Landscape in Nigeria

Public finance — funds from multilateral and bilateral development financial institutions, and the Nigerian government —[14] dominates Nigeria's climate finance

[13] Nigeria, Nigeria Energy Transition Plan - Nigeria's Pathway to Achieve Carbon Neutrality by 2060 (online: Nigeria Energy Transition, 2021) https://energytransition.gov.ng/.
[14] Climate Policy Initiative, *Landscape of Climate Finance in Nigeri*a (2022)

flows, with most of the resources channelled towards the energy sector.[15] Cumulative total climate finance inflows to Nigeria had amounted to about USD 2 billion for 2019 and 2020, out of which USD 1.6 billion (77.9 percent) had been from public sources and USD 0.4 billion (22.1 percent) in private climate financing.[16]

In November 2021, the Nigerian President signed the *Climate Change Act* 2021 (CCA) into law. The CCA provides a legal framework for mainstreaming climate change actions, carbon budgeting, mobilizing of finance, and other resources required for achieving the goal of net-zero carbon emissions in Nigeria by 2050 – 2070.[17] While on paper, the CCA has the potential to close the finance gap, key aspects of the Act have remained unoperationalized like the development and implementation of emission trading.

A number of climate policy plans and initiatives were already in place before the CCA, such as the Pioneer Status Incentives, which offer two years of corporate income tax relief for all investments related to climate change, and Zero Import Tariffs applied to infrastructure-related projects that facilitate the acquisition and installation of NDC-aligned investments.[18] Recently, the Nigerian Sovereign Investment Authority (NSIA), which oversees the country's sovereign wealth fund, pledged to fund initiatives that facilitate the reduction of greenhouse gas emissions as well as the avoidance or sequestration of carbon.[19]

---

[15] African Development Bank Group, *Country Focus Report 2023, Nigeria: Mobilizing Private Sector Financing for Climate and Green Growth* (October 2022).
[16] *Supra*
[17] *Climate Change Act*, 2021, s 1.
[18] List of Pioneer Industries and Products Approved by the Federal Executive Council, S. I. No. 24 of 2017
[19] Onyinye Nwachukwu, "NSIA, Vitol to Commit $50m to Climate Solutions in Nigeria" (2022) BusinessDay, online: BusinessDay https://businessday.ng/news/article/nsia-vitol-to-commit-50m-to-climate-solutions-in-nigeria/.

Despite the foregoing, the total climate financing gap required by Nigeria is USD 20.5 billion per annum, required for investment in renewable energy, smart agriculture, sustainable transport, water and waste management solutions.[20]

1.2. Challenges and Limitations in Climate Finance Allocation

The challenges of climate finance mobilization in Nigeria are structural, economic and regulatory.[21] Owing to the inadequacy of public sector financing for climate change in Nigeria, there has been a clamour for private sector financing.[22] However, there is currently a lack of strong regulatory and governance framework in Nigeria that would address the risks associated with sustainable investing when it comes to mobilizing private sector financing for climate change and green growth.[23]

Moreover, Nigeria has an underdeveloped domestic green bond market. Despite a few notable issuances, the market for green bonds remains limited, particularly for non-sovereign and corporate bonds.[24] Thus far, between 2017 and 2021 only about USD 165.1 million in climate finance was mobilised through green bonds.[25] A lack of financial incentive for example, tax incentive for corporate issuers has been identified as one of the major militating factors against the growth of the green bond market in Nigeria.[26] Green bond issuers often face initial costs and administrative hurdles associated with aligning with the Green Bond Principles. Thus, with incentives not

---

[20] African Development Bank Group, *Country Focus Report 2023, Nigeria: Mobilizing Private Sector Financing for Climate and Green Growth* (October 2022).
[21] Nigeria, *National Climate Change Policy for Nigeria 2021-2030* (2021).
[22] Climate Policy Initiative, *Landscape of Climate Finance in Nigeria* (2022).
[23] The African Development Bank Group, *Private Sector Financing For Climate Action And Green Growth In Africa*
[24] Otali, M., & Monye, C., "*Implementation of Green Finance as a Catalyst for Green Infrastructure Development in Nigeria*."
[25] Climate Policy Initiative, *Landscape of Climate Finance in Nigeria* (2022).
[26] African Development Bank, "*Challenges and Opportunities for Private Sector Involvement in NDC Implementation and Green Investment"* (2020), online: www.afdb.org/sites/default/files/2020/06/24/factsheet_nigeria_en.pdf

being designed in a way that aims to boost investments and stimulate market growth for both the supply and demand sides of the green bond market, the result has been a small market.[27]

Perhaps, more important, and being the focus of this paper, is the fact that the CCA has not been operationalized yet since its passage in 2021, particularly in terms of establishing a market for, and putting a price on, carbon. This has the potential to force private actors to price climate externalities into their business models. Designing the regulatory and legal framework needed for a carbon market will be a key step in this regard. One of the reasons for this lack of operationalization is the absence of political will. The government has not met the initial deadlines set in the CCA. Under the Act, the pilot Action Plan and first carbon budget should be published by November 2022; however, the Director General of the National Council on Climate Change (NCCC), who is expected to drive implementation of the Act, was only appointed in July 2022, and former President Buhari only approved the NCCC's work plan in February 2023.[28]

1.3. The Role of Carbon Market in Stimulating Climate Finance

Environmental economists have steadfastly supported carbon pricing as the cornerstone of climate policy for the past two decades.[29] The term 'carbon pricing' refers to an instrument aimed at reducing carbon emissions, by capturing the external costs of Greenhouse Gas (GHG) emissions and passing them back to the emitters.[30] Carbon pricing also creates a price signal that reduces, or regulates, GHG emissions

---

[27] State of the Market Report, *The Nigerian Green Bond Market Development Program* (November 2019).
[28] A. Ailemen, "*Buhari approves work plan for climate change counci*l," *Business Day* (2023).
[29] Joseph E. Aldy et al., "*Designing Climate Mitigation Policy*" (2010) 48 *J Econ Lit* 903.
[30] World Bank, *State and Trends of Carbon Pricing 2022* (Washington, DC: World Bank, 2022), online: World Bank http://hdl.handle.net/10986/37455.

and at the same time provides a strong financial case for shifting investments away from high-emission fossil-fuels based technology towards cleaner technology.[31] Both the debate and scholarly research of carbon pricing have been largely focused on its prospects for mitigating emissions and combating climate change. A long line of economists[32] generally agree that carbon pricing of one form or another provides significant advantages over other policy tools.

Markets, it is argued, are efficient allocators of resources. It is argued that the introduction of market-based mechanisms, like carbon pricing (e.g., carbon taxes or compliance carbon market), forces businesses and individuals to internalize the true cost of carbon emissions into their decision-making. This incentivizes them to invest in cleaner technologies, find the most economical ways to cut emissions, and implement more sustainable practices. Furthermore, carbon pricing mechanisms can generate revenue that can be reinvested in climate mitigation and adaptation efforts, such as funding renewable energy projects, supporting research and development of clean technologies, and assisting communities affected by climate change.[33]

The carbon market, as a carbon pricing mechanism, has emerged as a key driver of climate finance and the green transition.[34] What is currently termed the "carbon market" is, in reality, a diverse set of systems that are regulated in different jurisdictions for trading greenhouse gas pollution rights. These rights — called allowances or permits — are the commodity that is globally traded and give the bearer

---

[31] *Supra*
[32] A. Lans Bovenberg & Lawrence H. Goulder, "*Optimal Environmental Taxation in the Presence of Other Taxes: General-Equilibrium Analyses*" (1996) 86:4 *Am Econ Rev* 985; Lawrence H. Goulder, "*Environmental Taxation and the Double Dividend: A Reader's Guide*" (1995) 2:2 *Int'l Tax & Pub Fin* 157.; Don Fullerton, "*Environmental Levies and Distortionary Taxation: Comment*" (1997) 87:1 *Am Econ Rev 245*.
[33] King C. T. Duho & Bonou Senan Charlie Carine, "*Climate Finance and Carbon Pricing in the Context of Africa's Continental Free Trade Area*" (10 February 2021), online: OSF https://osf.io/h3jdq.
[34] G7 Climate, Energy and Environment Ministers' Communiqué, 27 May 2022

the right to emit an equivalent amount of CO2 emissions. A carbon market functions as mandatory (compliance) schemes or voluntary programs.[35]

The Cap-and-Trade schemes (also known as emissions trading schemes (ETS)) fall into the first category, with participants identified by governments based on carbon intensity, sector or size. Under these schemes, a limit (cap) is set on the total amount of certain greenhouse gases that can be emitted by companies covered by the scheme — effectively setting a carbon budget.[36] The cap is reduced over time so that the total permitted emissions fall. Within the cap, companies buy or receive emissions permits (or allowances) which they can trade with one another as needed.[37]

Currently, about 46 national jurisdictions and 35 cities, states, and regions — representing almost a quarter of global greenhouse gas (GHG) emissions — are putting a price on carbon as a central component of their efforts to reduce emissions and place their growth trajectory on a more sustainable footing.[38] An increasing number of these jurisdictions are approaching carbon pricing through the design and implementation of cap-and-trade Programs or ETSs.[39] Thus, by aligning profits with low-emission investment and innovation, a uniform price on carbon can channel capital flows for Nigeria's climate action. Revenues could be used for a wide range of programs including climate infrastructure investment, research and development, and climate mitigation among others.

---

[35] M. Arnoldus, Roger Bymolt, & D. Guinan, "*Demystifying Carbon Markets: A Guide to Developing Carbon Credit Projects*" (2011) *European Journal of Operational Research (EJOR)*.
[36] Lawrence H. Goulder and Andrew R. Schein, "*Carbon Taxes Versus Cap-and-Trade: A Critical Review*" (2013) 4:3 *Climate Change Economics* 1–28, online: JSTOR http://www.jstor.org/stable/climchanecon.4.3.02.
[37] Chios Carmody, "*WCI Cap-and-Trade: Overview and Cap*," in *A Guide to Emissions Trading under the Western Climate Initiative*, Centre for International Governance Innovation, 2019, pp. 47–71, online: JSTOR http://www.jstor.org/stable/resrep24954.8.
[38] ICAP, *Emissions Trading Worldwide: Status Report 2023* (Berlin: International Carbon Action Partnership, 2023).
[39] Supra

Quite interestingly, 83 percent of Nationlly Determined Contributions (NDC)[40] state the intent to make use of market mechanisms to reduce greenhouse gas emissions. Article 6 of the *Paris Agreement* establishes that parties may elect to cooperate with other countries to achieve mitigation goals by trading emissions credits or offsets. Furthermore, data covering 142 nations over a 20-year period revealed that the 43 countries that had implemented a national or sub-national carbon price by the end of the study period saw average annual growth rate of CO2 emissions from fuel combustion decrease by about 2 percentage points relative to those without.[41]

1.4. The Constraint Against a Nigerian Carbon Market Regime

The path to building a vibrant and robust carbon market in Nigeria is replete with a number of challenges ranging from technical to economic and, most important of all, regulatory. However, the focus of this section will be on legal and regulatory constraint as the successes of carbon markets the world over have always turned on this.[42] This is so as carbon markets are intricate systems of governance. They entail artificially created markets for goods — emission allowances or credits — that are created by policy.[43] Furthermore, interactions with other legal fields, like trade, financial market regulation, and environmental law, are also crucial. Because of these

---

[40] "Understanding NDCs: Paris Agreement Climate Pledges," *World Resources Institute*, accessed April 29, 2024, https://www.wri.org/insights/understanding-ndcs-paris-agreement-climate-pledges.
When the Paris Agreement was adopted in 2015, countries agreed to return periodically to make a new round of climate commitments, known as nationally determined contributions, or NDCs.

[41] Richard Best, Peter J. Burke, and Frank Jotzo, "*Carbon Pricing Efficacy: Cross-Country Evidence*," *Environ Resource Econ* 77 (2020): 69–94, doi:10.1007/s10640-020-00436-x.

[42] Betz, R., Michaelowa, A., Castro, P., et al., *The Carbon Market Challenge: Preventing Abuse Through Effective Governance* (Cambridge University Press, 2022).

[43] Ahonen, H.-M., Kessler, J., Michaelowa, A., Espelage, A., & Hoch, S. (2022). Governance of Fragmented Compliance And Voluntary Carbon Markets Under The Paris Agreement. *Politics and Governance*, 10(1), 235–245.

factors, carbon markets are by their very nature polycentric, involving several, frequently overlapping sources of authority.[44]

The development of a legal framework and the identification of all entities regulated by the system have always been considered *sine qua non* for effective compliance in the carbon market.[45] Typically, the legal framework in the compliance carbon market consists of the market's legal foundation, which includes the original mandate that authorized its establishment and the legal operationalization of important design parameters.[46] Formal legislation will typically be used to enact all of these, along with subsidiary regulations and guidelines to implement the ETS or cap-and-trade program.[47]

Summary

From the foregoing, it is lucid that robust rules and regulations are *sine qua non* for the design of a carbon market. These regulations help to mitigate potential abuses and broader risks to environmental integrity and economic efficiency that may emerge in the design and implementation of carbon markets and the related trading activities. It is this realization that informs the next section which will be a disquisition of California's carbon market including the legal and regulatory framework that underpins it.

---

[44] Jordan, A., Huitema, D., van Asselt, H., & Forster, J. "Governing climate change: The promise and limits of polycentric governance." In A. Jordan, D. Huitema, H. van Asselt, & J. Forster (Eds.), *Governing Climate Change: Polycentricity in Action?* (Cambridge University Press, 2018), 359–383.

[45] ICAP, *Emissions Trading Worldwide: Status Report 2022* (Berlin: International Carbon Action Partnership, 2022).

[46] These are provided for broadly in Parts 5 and 6 of *California Global Warming Solutions Act* of 2006

[47] ICAP, *Emissions Trading Worldwide: Status Report 2022* (Berlin: International Carbon Action Partnership, 2022).

Section 2

2. An Overview of California's Carbon Market

The California cap-and-trade program is an impressive feat of regulatory engineering.[48] The program covers a wide range of industries and greenhouse gases (GHGs), including carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O),[49] making it the first comprehensive cap-and-trade program implemented in the United States. With the passage of *Assembly Bill 32 (AB 32)*, popularly known as *the California Global Warming Solutions Act of 2006*, which created the legislative framework guiding the state's actions in lowering GHG emissions, California took the lead in addressing GHG emissions in the United States.[50]

By virtue of the Act, the California Air Resources Board (CARB) was tasked with developing implementing regulations and it conducted a multi-year scoping exercise that identified a cap-and-trade program as one of the strategies the state could use to reduce GHG emissions. The state's cap-and-trade program began in 2012, with compliance obligations beginning in 2013.[51]

In 2016, the California State Legislature passed *Assembly Bill 398*, also known as *AB 398*, which mandated a 40% reduction in GHG emissions below 1990 levels by 2030. The legislature once again entrusted CARB with developing the necessary

---

[48] Patrick M. Bigger, "*Environmental Governance in the Carbon Economy: Regulating Greenhouse Gas Emissions in California's cap-and-trade program*" (2015) Theses and Dissertations--Geography, online: https://uknowledge.uky.edu/geography_etds/32.
[49] S. 95810 CCR
[50] California Health and Safety Code, (27 September 2006), ch 488
[51] Chios Carmody, "*North America and the WCI*" (2019), online: https://doi.org/resrep24954.7.

implementing regulations to extend *AB 32*.[52] In 2018, Executive Order *B-55-18* set the further target of achieving statewide carbon neutrality by 2045.[53]

Following the enactment of *AB 32*, three additional Californian laws (i.e., *Assembly Bill 1532, Senate Bill 535, and Senate Bill 1018*) were passed in 2012 to establish the Greenhouse Gas Reduction Fund to invest the proceeds from Californian emission trading auctions in Programs under *AB 1532*.[54] For clarity, auctions are the process by which a regulatory body sells emissions allowances to companies. These allowances permit companies to emit a specified amount of a pollutant.

AB 1532 requires that the auction revenue be spent for environmental purposes, with an emphasis on improving air quality. While *SB 535* requires that at least 25 percent of the revenue be spent on programs that benefit disadvantaged communities, which tend to suffer disproportionately from air pollution. The California Environmental Protection Agency identifies disadvantaged communities for investment opportunities, while the state's Department of Finance oversees the expenditures of this revenue to mitigate direct health impacts of climate change.

A cursory look at these regulations reveals that they are an assembly of elements that work together to achieve a common goal. The goal is to lower greenhouse gas emissions while simultaneously offering opportunity to get the needed finance for climate mitigation and adaptation goals. However, the framework that regulates the mechanics of the cap-and-trade program end-to-end is the *Regulation for the*

---

[52] *Ibid*

[53] Cal Exec Order B-55-18 to Achieve Carbon Neutrality (10 September 2018), online: https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf.

[54] California Air Resource Board (CARB), *Cap-and-Trade Auction Proceeds* (2024), online: https://ww2.arb.ca.gov/sites/default/files/2020-09/proceeds_summary.pdf (accessed 20 May 2024).

California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms which enacts the provisions of the Scoping Plan.[55] Consequently, I will explain the regulation by undertaking a narrative description of all the actions and actors that have defined roles in making the program functional. Some of these are cap-setting; use of auction proceeds; offsets; monitoring, reporting, and verification.

The current form of the Regulation[56] begins with a statement of purpose,[57] which is of great importance for the regimes of value at work in the creation of Cap-and-Trade. The statement goes:

"*The purpose of the regulation, is to reduce emissions of greenhouse gases associated with entities identified in this article through the establishment, administration, and enforcement of the California Greenhouse Gas cap-and-trade program by applying an aggregate greenhouse gas allowance budget on covered entities and providing a trading mechanism for compliance instruments*."[58]

It bears noting at the outset that the cap is the portion of the regulation that is intended to do the environmental work of emissions reductions, while the trade aspect seeks to generate climate finance, and so from the very outset the environmental and the economic are co-constituted.

Before going too deeply into this section, it is germane to understand what a cap-and-trade is. The cap-and-trade program, defined simply, is an emission trading system that sets a gradually declining cap on greenhouse gas emissions and allows trading of

---

[55] title 17, CCR, sections 95801-96022
[56] *Supra*. Note 7
[57] 17 Cal Code Regs § 95801.
[58] *Ibid*

credits within that cap.[59] In doing so, it creates a firm upper limit on emissions allowable by covered sources and gives regulated parties discretion in how to comply.[60] Here is a simple breakdown of the definition:

- Cap: The government sets a limit (cap) on the total amount of a certain pollutant, like carbon dioxide, that can be emitted.
- Allowances: The total allowed emissions are divided into permits (allowances), each allowing the holder to emit a specific amount of the pollutant.
- Distribution: Companies get these allowances either for free or through auctions.
- Trade: Companies that need to emit more than their allowances permit can buy extra allowances from those who emit less and have spare allowances.

As stated, covered entities can purchase allowances from an auction, trade such allowances, or use offsets (subject to regulatory limits). Entities can also bank allowances to be used in the future.[61] For purposes of the program "greenhouse gases" are defined as carbon dioxide, methane, nitrogen trifluoride, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons, perfluorocarbons, and other fluorinated gases.[62]

2.1. Institutional Arrangement and Program Design

California has created an enabling institutional framework to carry out the *AB 32* and the associated cap-and-trade program. Under this framework, CARB, the state agency in charge of regulating air quality, was given, by law, the primary responsibility for developing and implementing the state's overall climate change Program.[63] *AB 32* also

---

[59] Chios Carmody, "*WCI Cap-and-Trade: OVERVIEW AND CAP*" (2019), online: https://doi.org/resrep24954.8.
[60] Covered sources and parties are discussed in section 2.1.2
[61] Bo Shen et al, "*California's cap-and-trade Program and Insights for China's Pilot Schemes*" (2014) 25:3/4 *Energy & Environment* 551–575, online: JSTOR http://www.jstor.org/stable/43735276.
[62] 17 Cal. Code Regs. § 95802(a) (West) (definition of "Greenhouse Gas"); 17 Cal. Code Regs. § 95810 (West).
[63] See chapter 2 of *AB 32 (*17 CCR)

required CARB to develop “scoping plans” that lay out California’s strategy for meeting its climate-related goals.[64]

This scoping plan outlines the methods and measures that will be implemented to meet specific emission reduction targets over a set period. The scoping plan was required to be updated every five years.[65] CARB designed and implemented a series of regulations on the Scoping Plan in collaboration with other state agencies such as the California Energy Commission (in charge of energy policy and planning), the California Public Utilities Commission (the regulator of the state's investor-owned utilities), air districts, municipalities, and stakeholders in the business community and civil society.[66]

As part of the institutional arrangement, an independent Market Advisory Committee was formed to safeguard the Californian cap-and-trade program and prevent market manipulation. CARB also formed a Market Surveillance Committee, an independent market oversight body comprised of experts in economics, trading, and commodity markets, to assist with market monitoring and surveillance efforts.

In developing a cap-and-trade program, the regulating authority considers a number of design elements. Each design decision affects other aspects of the program. In the case of the California cap-and-trade program, I will be discussing the key elements and other matters complementary to it below.

a. Covered entities and the emissions cap

---

[64] Section 38561 of *AB 32 (*17 CCR)

[65] Alex Wang, Daniel Carpenter-Gold & Andria So, "*Key Governance Issues in California's Carbon cap-and-trade program*" (1 May 2022), online: SSRN https://ssrn.com/abstract=4119861.

[66] Bo Shen, Fei Dai, Lynn Price & Hongyou Lu, "*California's cap-and-trade Program and Insights for China's Pilot Schemes*" (2014) 25:3 *Energy & Environment* 551–575, online: https://doi.org/10.1177/0958305X14543830.

The total amount of allowable greenhouse gas emissions by all covered entities is capped annually by CARB. Then, it generates tradable allowances in the amount of the cap, which are given away for free, sold at auction, or traded with other organizations. Based on the 100-year global warming potentials included in CARB's *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions* (MRR), one allowance is equivalent to one metric ton of carbon dioxide equivalent emissions.[67]

In determining the covered entities, CARB conducted an extensive inventory of GHG emissions in California to identify major sources and sectors contributing to the state's overall emissions. This inventory included sectors such as: electricity generation, industrial facilities, refineries, natural gas suppliers, transportation fuels, commercial and residential fuel combustion. Currently, the California cap-and-trade program covers 400 facilities and emissions from the power, industrial, transport, and buildings sectors. On the whole, the program covers 80% of the state's GHG emissions.[68]

Obligation with the program is based on compliance periods to give the entities involved sufficient time and flexibility to comply with the Program. Put simply, a compliance period in a cap-and-trade program is a specified duration during which regulated entities must meet their obligations to account for their GHG emissions. During this period, entities must monitor their emissions, acquire sufficient allowances to cover those emissions, and surrender those allowances to the regulatory authority by a certain deadline.

---

[67] 17 Cal. Code Regs. § 95802(a) (West) (definition of "Carbon Dioxide Equivalent"); Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, 17 Cal. Code Regs. § 95102(a) (West) (definitions of "Carbon dioxide equivalent" and "Global warming potential").

[68] California Air Resources Board (CARB), *Overview of Emissions Trading Program 2015* (accessed 20 May 2024), online: https://ww2.arb.ca.gov/sites/default/files/Cap-and-Trade/guidance/cap_trade_overview.pdf.

b. Allocation: Allocation to address emissions leakage

Leakage risk refers to the potential for emissions reductions within a regulated region to be offset by increases in emissions outside that region. Leakage can occur when businesses or activities subject to emissions caps move their operations to areas with less stringent or no emissions regulations, or when the production and associated emissions are shifted to unregulated regions. CARB carried out its leakage analysis in the very first rulemaking package in 2010.[69]

For large industrial facilities, allowances were initially provided free of charge.[70] There will be a progressive decrease in the amount of free allowances and an increase in the amount up for auction. Allowances that are freely distributed are primarily given to industries that are at risk of leaving California.[71] CARB has developed a leakage risk analysis methodology and classified covered entities into three groups by leakage risk: high risk sectors include resource extraction, paper mills, and chemical and cement production; medium risk businesses include food processing and processing of petroleum products; and low risk sectors include pharmaceuticals and aircraft manufacturing.[72] Assistance to industries is provided in the form of free allowances based on risk classification with high-risk sectors receiving a larger share of the free allowances for longer period than the low-risk sectors.[73]

---

[69] *Supra* note 17

[70] Shen, B., Dai, F., Price, L., & Lu, H. (2014). "*California's cap-and-trade Program and Insights for China's Pilot Schemes*." *Energy & Environment*, 25(3), 551-575. doi:43735276

[71] Carmody, C. (2019). *WCI Cap-and-Trade: Overview and Cap*. Retrieved from https://doi.org/resrep24954.8

[72] California Air Resources Board (CARB), *Cap and Trade Regulation Initial Statement of Reasons (ISOR), Appendix B: Leakage Risk Analysis for New and Modified Sectors, 2013* (Retrieved 20 May 2024), online: http://www.arb.ca.gov/regact/2013/capandtrade13/capandtrade13isorappb.pdf.

[73] *Ibid*

c. Auction

Auctioning allowances is the key part of the California cap-and-trade Program. The auction is administered by the CARB and takes place every quarter with the first one occurring in November 2012. The quarterly events are conducted through an online auction platform managed by the *Western Climate Initiative WCI, Inc*. With market participants submitting their bids following a sealed-bid, single-round, uniform-price (lowest winning bid) format. Beyond the auction market, trading of allowances can occur in the secondary market outside of the California cap-and-trade Program. Transactions in the secondary market are also subject to the requirements set forth in sections *95920 and 95921 of the Californian Cap-and-Trade regulation*.

Auction participants are not limited to covered entities. Everyone who has registered with CARB can participate in the auctions. Reserve allowances can, however, only be purchased by covered entities.

d. Auction Proceeds

At present, more than two-thirds of the allowances budgeted for a given year in the cap-and-trade program are sold at auction.[74] These auctions, which generate billions of dollars a year,[75] are a source of climate finance for California and used to execute a diverse range of environmental and social projects. These revenues come from the allowances sold directly by the state and deposited in the Greenhouse Gas Reduction Fund, which funds various climate-related projects; and proceeds from consignment auctions, where freely allocated allowances to investor-owned utilities are sold at

[74] This figure changes from year to year, depending on the number of allowances freely allocated and other factors. For 2023, about 70% were sold at auction. See *Auction Notices and Reports*, CARB (last visited May. 17, 2024), https://ww2.arb.ca.gov/sites/default/files/2024-02/nc-feb_2024_summary_results_report.pdf; 17 Cal. Code Regs. § 95841,

[75] CARB, *Summary of Proceeds to California and Consigning Entities* (updated in Feb. 2024), https://ww2.arb.ca.gov/sites/default/files/2024-02/nc-feb_2024_summary_results_report.pdf

auction and revenues are required by law to be used for the benefit of utility customers. As of early 2022, about $19.2 billion in cap-and-trade auction proceeds had gone to the fund, and as of November 2021 about $10.5 billion had been used in implemented projects.[76]

2.1.1. Offsets

The Offset Program is an important cost-containment element within the broader cap-and-trade program. Thus, apart from submitting allowances, covered entities can satisfy a small percentage of their compliance obligation by funding emissions-reduction or carbon-sequestration projects. Offsets are meant to help with cost-containment (i.e., by identifying lower cost emissions reductions), to achieve reductions in non-covered sectors, and to promote climate diplomacy with other states/regions. Pursuant to *AB 32*, these projects must be real, quantifiable, permanent, verifiable, enforceable, and additional to what is required by law and to what would otherwise occur in a conservative business-as-usual scenario.[77] An offset that is "real" would result in actual carbon emissions reductions without inaccurate reporting or leakage of emissions to another area, product, or process in lieu of actual reductions. An offset that is "permanent" would create long-term emission reductions, even with unintentional reversals from events such as wildfires. And an offset that is "additional" would reduce carbon beyond would otherwise occur without the offset.

---

[76] Cal. Climate Investments, *Annual Report To The Legislature On California Climate Investments Using Cap-and-Trade Auction Proceeds*, (Apr. 2023), https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/cci_annual_report_2023.pdf.There are several stages between auction proceeds being paid into the fund and projects being implemented: the state legislature must appropriate or authorize use of the funds, the relevant agency must allocate those funds to programs, the specific recipients of the funds must be selected, the funds must be awarded to individual projects, and, finally, the projects themselves must begin creating benefits before the state considers the funding to be implemented. There is therefore a substantial lag between funds that are received by the GGRF and funds that are implemented in projects.

[77] Each of these terms is defined in 17 Cal. Code Regs. § 95802(a).

CARB has created a series of rules governing the use of the offset mechanism. First, in each compliance period an entity is allowed to use approved offset credits to satisfy up to 8% of its total compliance obligation. Second, there are currently six approved types of compliance offset projects including Forest Projects, Urban Forest Projects, Livestock Projects, and Ozone Depleting Substances Projects, Rice Cultivation Projects and Mine Methane Capture Projects.[78] Third, under the current protocols, no offset projects outside of the U.S, Canada, or Mexico can qualify for offset credits. Fourth, CARB has created Offset Project Registries to facilitate the listing, reporting, and verification of compliance offset projects. Finally, offset credits must be independently verified by the CARB-accredited offset verification bodies and offset verifiers and all associated modelling, monitoring, sampling, or testing procedures must be conducted in a manner consistent with the Compliance Offset Protocols.[79]

2.1.2. Monitoring, Reporting and Verification

California's cap-and-trade program uses a pre-existing system for monitoring, reporting, and verification (MRV) of GHG emissions. The regulatory system used by California, called the *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (MRR)*, applies to all large sources of GHG emissions in California, but was specially adapted to cap-and trade when the latter regulation was developed.[80]

---

[78] See generally *Compliance Offset Program*, CARB (last visited Oct. 25, 2023), https://ww2.arb.ca.gov/our-work/programs/complianceoffset-program (linking to offset protocols). Of these protocols, the U.S. Forest Projects protocol is responsible for the majority of offset credits.

[79] California Air Resources Board (CARB), *Compliance Offset Program* (2013), online: http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm (accessed on 20th May 2024).

[80] See *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions*, 17 Cal. Code Regs. Art. 2 [hereinafter MRR]. For a brief summary of the history of the MRR, see CARB, *Proposed Amendments to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions* 1-2 (2018), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2018/ghg2018/isor.pdf. For previous versions of, and supporting documents for, the MRR, see *Mandatory Greenhouse Gas Reporting Regulation*, CARB, https://ww2.arb.ca.gov/mrr-regulation

The MRR applies to essentially all facilities that emit greenhouse gases with a global-warming potential of 10,000 MTCO2e or more in a year.[81] In addition, facilities in certain industries are covered even if their emissions are less than 10,000 MTCO2e per year: continuously operated generators; refineries; manufacturers of cement, lime, or nitric acid; and facilities with CO2 sequestration or injection.[82] A separate set of monitoring requirements apply to oil and gas production, transmission, and storage.[83] These sectors must monitor several additional types of emissions that are particular to their work, including: equipment leaks, vents, flares, emissions from produced water, and emissions from blowdowns prior to servicing equipment.[84]

Facilities subject to the MRR are required to report their emissions annually to CARB. These reports must include information about the facility itself, such as location and ownership, and the total amount of electricity or heat imported to or exported from the facility.[85] All reports must be made through the *California Electronic Greenhouse Gas Reporting Tool* (Cal e-GGRT).

In terms of verification, facility reports must be verified by a CARB-accredited third-party service with the necessary expertise.[86] Covered entities must switch verifiers at least once every six years, and may not use the previous verifier for at least three years after switching.[87] The verifier must then submit its verification report to an independent reviewer, who must agree with the verification results.[88] Both the head of

---

[81] *See generally* MRR § 95101.
[82] MRR § 95101(a)(1)(A).
[83] See generally MRR §§ 95150-95158.
[84] The specific emission sources that must be monitored vary by sector and process. See MRR §§ 95152(b)-(j), 95153, 95154(a).
[85] MRR § 95104(a)-(d); 40 C.F.R. § 98.3.
[86] MRR § 95103(f); see also generally MRR §§ 95132-95133 (accreditation and conflict-of-interest requirements). For more detail on accreditation requirements, see MRR § 95132.
[87] MRR § 95130(2)-(3).
[88] MRR § 95131(c)(2).

the verification team and the lead reviewer must certify that they have completed the required review under penalty of perjury.[89]

CARB oversees the verification process. If the reporting entity refuses to correct errors raised by the verification team, CARB adjudicates the dispute, and, if it agrees that the verification team is correct, determines the amount of emissions the reporting entity is responsible for.[90] Likewise, CARB may refuse a verification report and assign verification to a new verifier if it finds conflicts of interest or errors. CARB also brings enforcement actions when it discovers errors in measurement or calculation that are not corrected in the verification process.

Market monitoring is an essential aspect of the California cap-and-trade program, aimed at ensuring the efficient functioning and integrity of the emissions trading market. The CARB oversees market monitoring activities to detect and prevent any potential market manipulation, fraud, or other irregularities that could undermine the effectiveness of the program.

Since secondary market trading is an integral part of the cap-and-trade program, offering flexibility and liquidity for covered entities to manage their compliance obligations is vital. To ensure this occurs, transactions occurring outside of the official auctions, including trades on secondary markets such as exchanges or over-the-counter markets, are monitored. This secondary market consists of trades in 1) current and future vintage allowances, 2) current and future GHG offsets, and 3) contracts to deliver valid allowances and offsets in the future (termed "futures contracts"). Allowances, offset credits, and financial derivatives are traded in the secondary

[89] MRR § 95131(c)(3)(D).
[90] MRR § 95131(c)(4)-(5).

market on the Intercontinental Exchange (ICE), CME group, and Nodal Exchange platforms. Any company qualified to access these platforms can trade directly or through a future commission merchant. Companies can also trade directly over the counter but must have a CITSS account to take delivery of compliance instruments. This market is seen as an indicator of overall carbon market health and is helpful in understanding price and liquidity trends.[91]

California has taken several measures to monitor covered entities' compliance with the cap-and-trade regulations as well as the activities in the California cap-and-trade Program. To safeguard the successful operation of the Program, CARB has been actively working with the Federal Commodity Futures Trading Commission (CFTC) on a comprehensive market surveillance Program, which monitors the daily activities of large traders, key price relationships, and relevant supply and demand factors. CARB also works with other Federal agencies such as the Federal Trade Commission (FTC), Federal Bureau of Investigation (FBI), and Department of Justice (DoJ) to ensure internet security and market rules compliance.

2.1.3. Enforcement

CARB considers enforcing of MRR requirements to be an integral means of maintaining the cap-and-trade program's integrity. It pursues enforcement actions even against violations that it believes were the result of error or misunderstanding. CARB also posts each of its completed enforcement actions on its public website, which may increase the deterrent effect of its enforcement actions.[92] CARB has

---

[91] *Carbon Market California - A Comprehensive Analysis of the Golden State's cap-and-trade program. Year One: 2012-2013*. The complete report is available online at edf.org/california-cap-and-trade-updates.

[92] *See MRR Enforcement Activities, CARB*, https://ww2.arb.ca.gov/our-work/programs/enforcement-policy-reports/enforcement-case-settlements (last visited 20th May, 2024)

brought 33 enforcement actions since 2013, with an average of $157,330 in penalties.[93] The first year of MRR violations were mostly either for reporting late or for failing to satisfy the independent verifier. These were more numerous but tended to yield lower settlements.[94] In more recent years, enforcement for late reporting and verification-related issues has mostly disappeared (possibly due to increased compliance), leaving larger but less frequent enforcement actions for reporting errors.[95]

2.1.4. Price Management

A carbon price is a monetary cost put on the emission of carbon dioxide into the atmosphere. Regulators must ensure that the market price is not unduly high or low: too high a price may retard growth and innovation, whereas too low a price may discourage the attainment of climate change goals. Price ceilings and price floors are containment mechanisms intended to limit prices within an emissions trading system, thereby stabilizing the market.[96] A price ceiling "[limits] the risk that carbon prices exceed acceptable levels if constraining emission turns out to be more expensive than expected."[97] Price ceilings also provide greater cost certainty to emitters.

A price floor sets a price below which carbon permits cannot be sold (a minimum selling price). A price floor also provides greater certainty and ensures that prices will not collapse to near zero. This price floor should also reflect the full costs imposed on society by carbon pollution. Overall, a combined system of price ceilings and price floors can reduce the risk and price volatility in carbon markets, which has been a

[93] See *Ibid.53* CARB has settled, rather than litigated, all of its enforcement actions.
[94] There were 35 settlements completed in 2013-23, with an average penalty of about $76,000. Data from *ibid. 53*
[95] There were 12 settlements completed in 2015-2020, with an average penalty of about $300,000. Data from *ibid. 53*
[96] Carmody, C., "*WCI Cap-and-Trade: Overview and Cap*" (2019) online: https://doi.org/resrep24954.8.
[97] Peter John Wood & Frank Jotzo, "*Price Floors for Emissions Trading*" (2011) 39:3 *Energy Policy* 1746 at 1747

point of concern in other Cap-and-Trade markets, specifically the EU Emissions Trading System.[98]

In California, recent amendments to section 38562 of *the California Health and Safety Code* required the state to have a price ceiling from January 1, 2021, to December 31, 2030.[99] The price ceiling will be the equivalent of the selling price for allowances in the allowance price containment reserve (APCR) and any additional allowances that are sold by CARB when the APCR is exhausted. California's 2018 current auction reserve floor price was US$14.53.

2.2. The California-Québec Carbon Market Linkage

A feature of the California's Carbon Market that has faced serious constitutional challenges especially during the Donald Trump presidency, has been the linkage with Québec. Though very much the product of state and provincial legislation, the cap-and-trade programs of California and Québec operate under guidelines of the Western Climate Initiative (WCI)[100], a voluntary subnational intergovernmental organization initiated in 2007.[101] By setting targets and timetables on emission reductions, the WCI bears many similarities to the European Union's Emissions Trading System. However, the key difference is that the WCI is a non-binding voluntary agreement designed by participating jurisdictions for their mutual benefit.

---

[98] Wood & Jotzo, *supra* note 58
[99] *California Health and Safety Code*, s 38562
[100] The WCI is a group of American states and Canadian provinces that have decided to adopt a common approach toward addressing climate change, in particular by developing and implementing a North American system for capping and trading GHG emission allowances.
[101] Purdon, M., Houle, D., & Lachapelle, E. (2014). *The Political Economy of California and Québec's cap-and-trade programs*.

The collective objective of members of the WCI at inception was to eventually put in place an interjurisdictional market-based program to reach agreed upon emission reduction targets.[102] Ultimately, most WCI members, except California and Québec, did not fully implement linked cap-and-trade programs.[103] From the WCI and its foundational design work came North America's first cross-border subnational cap-and-trade linkage: the California and Québec Linkage. Neither California nor Québec are obligated to establish a cap-and-trade program—each has done so voluntarily because of the expected advantages of cooperation while the non-binding nature of the WCI allows jurisdictions to maintain their autonomy.

The linkage between California and Québec is an important one in the carbon market governance of California. Firstly, the linkage created the largest carbon market in North America and the first to be designed and managed by sub-national governments in different countries. Secondly, as a result of the linkage, entities now trade compliance instruments across jurisdictions, which expands market opportunities for regulated entities and others.

In recent years, policy makers have begun to embrace the necessity of linking carbon markets especially because of its potential for reducing leakage. Furthermore, Article 6 of the *Paris Agreement* has also brought to the fore the place of international collaboration in climate finance especially in the form of cross-border transfer of mitigation outcomes. The gist of Article 6 is that it addresses cooperative approaches to reducing greenhouse gas emissions and promoting sustainable development while

---

[102] See *WCI, Design for the WCI Regional Program* (2010), http://www.westernclimateinitiative.org/the-wci-cap-and-trade-program/programdesign.

[103] WCI, *Design Recommendations for the WCI Regional Cap and Trade Program* (2008), http://www.westernclimateinitiative.org/the-wcicap-and-trade-program/design-recommendations.

also outlining mechanisms for voluntary cooperation between countries in achieving their climate goals (Nationally Determined Contributions, or NDCs).

The linkage between the California and Québec carbon markets is a product of regulations, guidance, government officials, and a formal agreement working in concert. At the center of the linkage is the "*Agreement Between the California Air Resources Board [CARB] and the Gouvernement du Québec Concerning the Harmonization and Integration of cap-and-trade programs for Reducing Greenhouse Gas Emissions*" (Linking Agreement).[104]

The Linking Agreement essentially codifies collaboration between Québec and California. The document comprises 20 articles spread across three chapters: General Provisions, Harmonization and Integration Process, and Operation of the Agreement.[105] The legal framework around the Linking Agreement is reciprocal in nature, made up of a set of statutes, regulations, and guidance put in place by each jurisdiction in recent years. Aspects of these legal frameworks build on the earlier work of the Western Climate Initiative (WCI) and were refined by Québec and California in the lead-up to linking (and to some extent since) to ensure harmonized systems.

From the California side, the regulatory framework for the linkage was set by *AB 32* by requiring CARB to "consult with other governments to facilitate the development

---

[104] Agreement Between the California Air Resources Board and the Gouvernement du Québec Concerning the Harmonization and Integration of Capand-Trade Programs for Reducing Greenhouse Gas Emissions, CA-QC (2013), available at http://www.arb.ca.gov/cc/capandtrade/linkage/ca_Québec_linking_agreement_english.pdf [hereinafter Linking Agreement]. The Linking Agreement fulfilled the direction in CARB Resolution 13-7 to document the coordination process in a written agreement. See http://www.arb.ca.gov/cc/capandtrade/linkage/resolution13-7.pdf, at 9.

[105] Linking Agreement, *supra* note 101.

of integrated and cost-effective regional, national and international greenhouse gas reduction programs." CARB has exercised this authority with fervor, putting in place the *Air Resources Board Cap-and-Trade Regulations*[106] — the comprehensive set of rules for creation and operation of California's Cap-and-Trade regime,[107] including linkage to other systems like Québec's.

Harmonization was essential to the linkage between California and Québec. Thus, it was important for the linkage to identify elements that must be harmonized in linking in contrast to those that may be harmonized in such a scheme. Thus, it was noted that "some elements of a multi-jurisdictional cap program…must be the same between implementing jurisdictions; these include certain elements of measurement and reporting of emissions, the schedule for distributing allowances to covered entities or facilities, compliance and reconciliation periods, the use of banking and/or borrowing, the acceptance of offsets and allowances from other trading programs, and compliance and enforcement."[108]

The specific approach to harmonization and linking pursued by the two jurisdictions involved the identification of three specific categories of measures:[109]

- Those provisions that, for the full linking to occur, had to be identical. For example, the provisions regarding the joint auction of allowances and the purchase and holding limits that protect against market manipulation. In addition, since allowances are only created in electronic form, all transfers of allowances

---

[106] §§95800-96023, available at http://www.arb.ca.gov/cc/capandtrade/ capandtrade/unofficial_c&t_012015.pdf.
[107] See *Summary of California's Cap-and-Trade*, Ctr. for Climate & Energy Solutions, http://www.c2es.org/us-states-regions, http://www.c2es.org/ us-states-regions/action/california/cap-trade-regulation
[108] WCI, *Design Recommendations for the WCI Regional cap-and-trade program* (13 March 2009), online: <www.environnement.gouv.qc.ca/changements/carbone/documents-WCI/modele-recommande-WCI-en.pdf> [WCI, Design Recommendations].
[109] *Ibid*

between systems had to take place within a common registry and the rules governing such transfers had to be identical.[110]

- Those provisions that, for the full linking to occur, had to produce similar outcomes but did not need to be identical. For example, the provisions regarding measuring, reporting and verification (MRV) that are needed to make sure that a ton of GHG emitted and verified in a partner jurisdiction equals a ton of GHG emitted and verified everywhere within the partnership.[111]
- Those provisions that could still be different from one another without impacting the linking process. For instance, California's regulation contains provisions recognizing GHG emission reductions from a voluntary offset program that had started several years before its cap-and-trade program became operational, while Québec's regulation includes provisions recognizing GHG mitigation efforts made voluntarily by industry prior to the implementation of its cap-and-trade program.[112]

Although the cross-border sub-national linkage between California and Québec offers advantages on different fronts, like the prevention of carbon leakage, and deepening of the carbon market, etc., such advantages offered no shield from constitutional scrutiny, notwithstanding, the intricate regulatory engineering that underpins the linkage. Section 3 of this paper looks at the constitutional challenges that the California cap-and-trade program has had to surmount.

---

[110] *Ibid*
[111] *Ibid*
[112] *Ibid*

Summary

This section is intended as a deep-dive description of the regulatory framework that underpins the California cap-and-trade program and its linkage with Québec. It should be noted that the suite of policies implemented in California to create its carbon market landscape goes beyond the cap-and-trade program and is vast – the creation of California's *Low Carbon Fuel Standard* for refined petroleum products is every bit as involved, convoluted, and controversial as the creation of cap-and-trade, if not more so.[113] The other major planks of California's climate strategy, like the *Renewable Portfolio Standard* for cleaner energy generation, have substantial impacts on the polluting geography of California and the overall costs of emissions reductions mandated by the state. These two are outside of the scope of this project.

While this section, nor this project, is a template by which to design a cap-and-trade program for Nigeria, the matters touched upon above are foundational program design and regulatory matters that Nigeria cannot afford to get wrong in designing its own program and when it decides to link with West African neighbours. Thus, this section and the entirety of the project shines the needed light that will guide the steps of regulators and policy makers alike.

[113] Bigger, Patrick M., "*Environmental Governance in the Carbon Economy: Regulating Greenhouse Gas Emissions in California's Cap-and-Trade Program*" (2015). Theses and Dissertations--Geography. 32. https://uknowledge.uky.edu/geography_etds/32

Section 3

3. Legal and Constitutional Challenges to the California Carbon Market and Comparative Lessons for Nigeria

In the previous section, this project had taken a trenchant look at some of the mechanics and the many moving parts of California's cap-and-trade program. This exposes us to the intricate inter-relationships between different institutions and systems that make up the California carbon market. This section will consider constitutional, legal and institutional lessons for Nigeria — a common law, and federal country like the United States — in designing a legal framework for a carbon market.

In view of the fact that both the federal government and states in Nigeria enjoy concurrent legislative powers to address environmental matters, and by extension climate change, this section will briefly consider challenges that a sub-national entity may face if it decides to design a cap-and-trade program.The institutional challenges of the program in Nigeria are considered in section 4 of this project. Thus, the task of this section is a comparative legal analysis, not a like-for-like comparison, as Nigeria does not have a carbon market, but an analysis that may be useful for a transplant.

3.1. What are Legal Transplants?

According to Alan Watson — a Scottish legal historian who is credited with coining the term "legal transplants — legal transplant is "the moving of a rule or a system of law from one country to another, or from one people to another."[114] For Watson, the

[114] WATSON argues that the legal transplants phenomena have been common since the earlier recorded history and offers some examples. Alan Watson, *Legal Transplants* (Edinburgh: Scottish Academic Press Ltd, 1974) at 21.

object of legal transplants is — "rules, not just statutory rules — institutions, legal concepts and structures that are borrowed, not the spirit of the legal system."[115] The reasons for the transplantation of certain laws include: (i) authority, (ii) prestige and imposition, (iii) chance and necessity, (iv) expected efficacy of the law, and (v) political, economic and reputational incentives from the countries and third parties.[116]

In the case of the California cap-and-trade program, prestige, necessity, expected efficacy of the law, and economic and reputational incentives weigh in favour of the program and its use case in Nigeria.

A consideration of the constitutional challenges California faced is apt for this transplantation analysis. In recent times, there has been a move in Nigeria towards what is called "true federalism" — a wresting of power from the center to the federating units. Power, a sub-sector of the energy industry in Nigeria, and one of the largest carbon emitting sectors is now being concurrently overseen by both the federal government and the federating units. This is further compounded by the fact that the authority to oversee climate and environmental matters are not clearly vested in either the federal government or federating units. It is possible, that a court strikes down the CCA and its associated ETS plans. Thus, the factors that made the constitutional challenges in California possible are increasingly present in Nigeria.

3.2. The California Cap-and Trade Program and the United States Constitution

The Constitution is the main instrument in the United States that establishes the division of powers between the federal and state governments. Any authority not

---

[115] Alan Watson, *Legal Transplants and European Private Law*, Ius Commune Lectures on European Private Law, 2 (electronic version), Dutch Institute of Comparative Law.
[116] R. Sacco, "*Legal Formants: A Dynamic Approach to Comparative Law (II)*" (1991) 39 Am J Comp L 398.

specifically granted to Congress is reserved to the states by the Tenth Amendment.[117] At the same time, as environmental awareness gradually increased throughout American history, both federal and state governments have regulated various facets of environmental protection.[118]

Without a doubt, California, like every other state in the United States, has the right to protect its environment by legislating environmental issues like climate change.[119] What has come to be known as the "quasi-sovereign" interest in protecting the land of the state or commonwealth was perhaps most notably observed in *Tennessee Copper*,[120] which served to solidify the state's role in environmental protection:[121] "[The state] has the last word as to whether its mountains shall be stripped of their forests and its inhabitants shall breathe pure air."[122]

Despite the foregoing, CARB was forced to defend the California cap-and-trade program against lawsuits, which sought to undermine various aspects of the Program, using different legal arguments. Since implementation, a barrage of litigation has invoked the dormant Commerce Clause and the Supremacy Clause of the U.S. Constitution to challenge the legal viability of the program. California was also accused of taking *ultra vires* administrative actions not allowed under state law or the U.S. Constitution and illegally discriminating against interstate commerce. Some of these challenges are examined below.

---

[117] Roger W Findley & Daniel A Farber, *Cases and Materials on Environmental Law*, 4th ed (St Paul, Minn: West Group, 1985) at 169ff.
[118] Carmody, C, *North America and the WCI* (2019), online: https://doi.org/resrep24954.7.
[119] See *Alden v. Maine*, 527 U.S. 706, 713–14 (1999)
[120] *Georgia v. Tennessee Copper Co*., 206 U.S. 230, 327 (1907).
[121] Robert V Percival, *The Frictions of Federalism: The Rise and Fall of the Federal Common Law of Interstate Nuisance* (University of Maryland, Public Law Research Paper No 2003-02, 2003), online: SSRN https://ssrn.com/abstract=452922 or http://dx.doi.org/10.2139/ssrn.452922 (discussing the quasi-sovereign interest doctrine and dogma).
[122] *Tennessee Copper Co*., 206 U.S. at 237.

3.2.1. *California Chamber of Commerce v. State Air Resources Board* [123]

In 2012, the California Chamber of Commerce (the Chamber) challenged the market-based nature of the Program.[124] The Chamber based the suit on two central issues but only one is relevant for the purpose of this project: the Chamber challenged whether the revenue generated by auctioning allowances constituted a tax, which would make the validity of the Program subject to the two-thirds supermajority vote requirement of California's *Proposition 13*.[125] The relevance of this issue to Nigeria stems from the fact that there is a persuasive authority that can help clear a possible misapprehension that a cap-and-trade program is akin to a tax. Secondly, the power to levy a tax is shared between the federal government and federating units in Nigeria, with the federal government taxing authority only limited to matters on the exclusive list. Lastly, there is no framework for a carbon tax in Nigeria yet. A finding that a cap-and-trade program is a tax in Nigeria without a clear statutory and legislative framework will lead to the invalidation of the program by the courts.

The trial court in California ruled in favor of the Board and upheld the Program in 2013. The court held that the auction system more closely resembled a regulatory fee than a tax, so it was not subject to the *Proposition 13* requirements.[126] California's Third District Court of Appeal affirmed the trial court's decision in 2017.[127] The court explained the two "hallmarks" of a tax: It must be compulsory, and it must lack any specific benefit to the payor.[128] Regarding the first factor, the court reasoned that the auction was not compulsory because covered entities have the option of not taking part in the auction by voluntarily reducing their greenhouse gas emissions to the level

[123] *Cal. Chamber of Commerce v. State Air Res. Bd*., 10 Cal. App. 5th 604, 649 (2017)
[124] *Ibid*
[125] *Ibid* at 614
[126] *Ibid*
[127] *Ibid*
[128] *Ibid.* at 639

of their free allowance.[129] Regarding the second factor, the court reasoned that the ability to pollute in excess of free emissions allowances provides a direct benefit to those regulated by emissions caps.[130] The court emphasized that the ability to emit is not a right but rather a privilege conferred by the purchase of emissions allowances. As the emissions auction met neither criterion, the court held that it was not a tax and therefore did not violate *Proposition 13*.[131] Later in 2017, the California Supreme Court declined to review this appellate court decision—a key victory for the Board and the Program.

3.2.2. The Cap-and-Trade and the Dormant Commerce Clause Challenge

The Commerce Clause of the United States Constitution provides that "Congress shall have [the p]ower . . . [t]o regulate Commerce . . . among the several States."[132] The Commerce Clause gives Congress affirmative authority over state regulation of interstate commerce without explicitly limiting state authority to do so. Nonetheless, the Supreme Court has long construed it to entail this kind of restriction.[133] This limitation, referred to as the dormant commerce clause has been interpreted broadly[134] but does not prohibit all state regulation of interstate commerce.[135] In the absence of federal preemption, states have historically been free to use their police authority, which includes controlling GHG emissions and air quality,[136] to "promot[e] the health and welfare" of their citizens.[137]

---

[129] *Ibid.* at 642
[130] *Ibid*
[131] *Ibid* at 650
[132] U.S. CONST. art. 1, § 8, cl. 3.
[133] *United Haulers Ass'n v. Oneida-Herkimer Solid Waste Mgmt.* Auth., 550 U.S. 330, 337 (2007); see also *H.P. Hood & Sons Inc. v. DuMond*, 336 U.S. 525, 531 (1949).
[134] *Philadelphia v. New Jersey*, 437 U.S. 617, 622 (1978)
[135] *Hunt v. Wash. Apple Adver. Comm'n*, 432 U.S. 333, 349–50 (1977); *Huron Portland Cement Co. v. City of Detroit*, 360 U.S. 440, 442–43 (1960).
[136] *Massachusetts v. EPA*, 549 U.S. 497, 519–20 (2007) (states can use their police power to reduce in-state GHG emissions unless there is an independent limitation on their ability to do so).
[137] *Huron*, 360 U.S. at 442–43.

It was opined that the cap-and-trade program does not offend the dormant commerce clause and can escape a challenge owing to the fact that the program does not have a discriminatory purpose.[138] Stated differently, the program does not aim to prioritize intrastate trade over interstate trade. The goal is to implement the cap-and-trade program in a way that is as equitable as possible for both in-state and out-of-state businesses.[139] It has been argued that stopping leakage does not require discrimination against interstate commerce, as equal treatment alone is enough. If leakage does happen, it is likely due to out-of-state businesses exploiting reduced compliance obligations.[140]

Although the cap-and-trade program has not yet been challenged under the dormant commerce clause, the Low Carbon Fuel Standard (LCFS) program under the same law — *Assembly Bill 32 ("A.B. 32")* — which birthed the cap-and-trade program was challenged under the dormant commerce clause. It should be noted that the LCFS is distinct from the cap-and-trade program. The goal of LCFS is to reduce carbon intensity (CI) of fuels through regulations requiring providers of gasoline and diesel fuels to calculate the CI of each fuel component, report such calculations to CARB, and make reductions to meet the CI standards.[141]

In *Rocky Mountain Farmers Union v Goldstene,*[142] the plaintiffs in Rocky Mountain argued that their ethanol products are chemically identical to comparable ethanol products manufactured in California. Yet CARB assigned the Midwestern low carbon

---

[138] Thomas Alcorn, *The Constitutionality of California's cap-and-trade program and Recommendations for Design of Future State Programs*, 3 Mich. J. Env't. & Admin. L. 87 (2013). Available at: https://repository.law.umich.edu/mjeal/vol3/iss1/3
[139] *Ibid*
[140] *Ibid*
[141] See generally CAL. AIR RES. BD., FINAL REGULATION ORDER (undated), available at http:// www.arb.ca.gov/fuels/lcfs/CleanFinalRegOrderI12612.pdf and http://penna.cc/EWZ5-RQ5Q
[142] 843 F. Supp. 2d at 1081.

fuel a higher CI value, which made it ultimately cost-disadvantaged and less desirable to California consumers. The plaintiffs contended that California fuel consumers seeking to meet emissions obligations will seek in-state fuels with lower CI values at a premium, which would inflate the cost of in-state fuels at the expense of out-of-state producers.[143]

In 2013, the Ninth Circuit declared the constitutionality of the California LCFS.[144] the majority decision states that it is not unconstitutional for a state to impose a regulation whose effect is only for out-of-state commerce to purchase additional credits and pay additional fees: "*California may regulate with reference to local harms, structuring its internal markets to set incentives for firms to produce less harmful products for sale in California*."[145] The court reiterated that a state environmental purpose to reduce GHGs emitted in the state is sufficient to impose regulation and costs on interstate commerce entering the state.[146]

3.3. The California-Québec Linkage and its Constitutional Validity in the United States

It is apt that attention is turned to the constitutional furore generated by virtue of the carbon market linkage between California and Québec. Analyzing how constitutional challenges are addressed in the context of carbon markets can establish legal precedents that may influence future international climate agreements and domestic environmental laws in Nigeria and beyond.

---

[143] *Ibid* at 1087
[144] *Rocky Mountain Farmers Union v. Corey*, 730 F.3d 1070, 1107 (9th Cir. 2013), petition for cert. filed, 2014 WL 1154199 (U.S. Mar. 20, 2014) (No. 13-1148).
[145] *Ibid* at 1104
[146] *Rocky Mountain Farmers Union*, 730 F.3d at 1106-08.

As federalist nations, Canada and the United States both impose constitutional limits on what provinces and states can and cannot do. Such rules affect the subnational governments' activities not only within national borders, but also across international borders, thus having implications in the cross-border carbon-market context. Constraints imposed by the U.S. Constitution on crossborder carbon market linkages stem from the general premise that foreign relations and interstate affairs are the exclusive domain of the federal government.[147]

Constitutional anchors for this federal power are found in the express provisions of the Treaty Clause[148] and the Compact Clause,[149] as well as through the Supremacy Clause.[150] The Treaty Clause is a provision in the United States Constitution that outlines the process by which the federal government can enter into treaties with foreign nations. While the Compact Clause restricts the ability of individual states to enter into agreements or compacts with other states or foreign powers without the approval of Congress. The purpose of this clause is to ensure that states do not independently enter into agreements that could affect the federal balance of power, interfere with federal authority, or undermine national unity.

In 2019, the U.S. Department of Justice (DoJ) filed a lawsuit in the U.S. District Court for the Central District of California challenging the constitutionality of California's linkage of its cap-and-trade program to a similar program operated by Québec.[151] The U.S. DOJ challenged the California-Québec linkage on four distinct constitutional grounds, alleging that California's actions to link its cap-and-trade program to

[147] Erwin Chemerinsky, *Constitutional Law: Principles and Policies* 367, 402 (3d ed. 2006) (citing *United States v. Curtiss-Wright Corp*., 299 U.S. 304 (1936)).
[148] U.S. Const. art. 1, §10, cl. 1.
[149] *Ibid*. cl. 3.
[150] *Ibid.* §1, cl. 2.
[151] *United States v. California*, 444 F. Supp. 3d 1181 (E.D. Cal. 2020)

Québec's program violated the U.S. Constitution's Treaty Clause, Interstate Compact Clause, the Foreign Affairs Doctrine, and the Foreign Commerce Clause.[152]

Specifically, the filed complaint of the DoJ states that the agreement between California and Québec, linking the two carbon markets, is unlawful and goes beyond the State's competences. For the DOJ, the cap-and-trade linkage undermines the Federal State, "which must be able to speak with one voice in the area of U.S. foreign policy"[153] and is the only one who can enter into or approve agreements with foreign powers under the Treaty Clause, the Compact Clause, and Foreign Commerce Clause of the US Constitution and the Foreign Affairs Doctrine.[154]

The federal district court for the Eastern District of California ruled that an agreement between California and Québec concerning the linking of their greenhouse gas cap-and-trade programs did not violate either the Treaty Clause or the Compact Clause of the U.S. Constitution.[155] Regarding the Treaty Clause, the court in his ruling, stated that the agreement between California and Québec cannot be considered as a Treaty as it is not an "alliance for peace or war", not an "agreement for mutual government", and does not represent a "loss of sovereignty".[156] The court stated "the agreement explicitly recognizes that Québec and California adopted their own greenhouse gas emissions reduction targets, their own regulation on greenhouse gas emissions reporting programs and their own regulation(s) on their cap-and-trade programs."[157]

---

[152] *Ibid*
[153] *Ibid*
[154] *United States of America v. State of California et al., Case 2:19-cv-02142-WBS-EFB (E.D. CA. 10/23/2019).*
[155] *United States v. California*, No. 2:19-cv-02142 WBS EFB (E.D. Cal. Jul. 16, 2020)
[156] *Ibid*
[157] *Ibid*

The court reasoned that the schemes have different scopes, environmental ambition levels and can be operated, modified, and revoked by each party independently (i.e. without each other's agreement). The linkage agreement cannot be considered as a Treaty for General Commercial Privilege either, because of its very limited and targeted content. If it were recognised by the Court as a Treaty, it would have been automatically illegal as only the Federal level can enter into agreements with foreign countries through Treaties.[158]

Regarding the Compact Clause, the court noted that the Supreme Court had limited the clause's bar on compacts between a state and another state or foreign power to "agreements that encroach upon federal sovereignty."[159] In this case, the court found that the California-Québec agreement did not contain indicia of a compact because (1) it "does not require reciprocal action to take effect"; (2) "does not impose a regional limitation"; (3) does not adopt a joint organization or body that exercises regulatory authority: WCI Inc is an operational body in charge of technical and administrative support; and (4) does not include an "enforceable prohibition on unilateral modification or termination." The court also concluded that the agreement did not increase California's power so that it encroached on U.S. supremacy. The court reasoned that the agreement is "well within California's police powers to enact legislation to regulate greenhouse gas emissions and air pollution."[160] In addition, it rejected the argument that the *Clean Air Act*'s explicit authorization of agreements and compacts between states implicitly precludes agreements between states and foreign powers.[161]

---

[158] *Ibid*
[159] *Ibid*
[160] *Ibid*
[161] *Ibid*

On the Foreign Affairs Doctrine, state actions may be preempted if they either (1) conflict with or pose an obstacle to a federal treaty, statute, or policy (this is called "conflict preemption") or (2) if the action falls outside the realm of "traditional state responsibilities" and also intrudes on the power of the federal government to craft foreign policy (this is called "field preemption"). The District Court rejected federal claims under both prongs of this test.[162]

The United States argued that California's actions to link its greenhouse gas emissions program to that of Québec created an obstacle to the implementation of both the Global Climate Protection Act of 1987 (GCPA) and the United Nations Framework Convention on Climate Change of 1992 (UNFCCC), of which the United States is a party. The United States also argued that California's program is inconsistent with President Trump's withdrawal from the Paris Agreement of 2015 (which the Court refers to as the "Paris Accord").

The Court first found that the GCPA was primarily an "appropriations rider" and that it is made up of mostly "platitudes," therefore California's program could not create an obstacle to its implementation. The Court then found that California's program was "entirely consistent" with the objectives of the UNFCCC and therefore was not in conflict with that treaty.[163]

The United States also attempted to argue that California's program was inconsistent with the Trump Administration's intent to withdraw from the Paris Accord because the linkage assisted Canada in fulfilling its commitments under the Paris Accord. The

---

[162] *Ibid*
[163] *United States v. California, No. 2:19-cv-02142 WBS EFB (E.D. Cal. Jul. 16, 2020)*

Court initially noted that while the Trump Administration has given notice of its intent to withdraw from the Paris Accord, the earliest that such a withdrawal could take place under the terms of the Accord would be in November 2020, therefore the United States is still a party to the agreement. California and Québec, as subnational entities, are not themselves parties to the Paris Accord.[164] As a result, the Court concluded there is no conflict between the California-Québec agreement and the Administration's intent to withdraw from the Paris Accord.

The Court further found that there were no other Federal treaties, statutes, or official policies rejecting the type of cross-border mitigation strategy employed by the California program and that the Trump Administration's claim that it intends to negotiate a "better deal" on international climate change measures—at some undefined point in the future—was not sufficient to constitute such a policy. Consequently, the Court held that California's linkage of its cap-and-trade program to Québec does not conflict with Federal law or policy and is not preempted.[165]

The Court likewise rejected federal claims that the California-Québec agreement intrudes into a field preempted by the federal government.[166] The Court observed that California's program exceeds the traditional scope of state responsibilities because it explicitly attempts to encourage other countries to take action to reduce greenhouse gas emissions, rather than only seeking to impact emissions taking place within the state.[167] Nonetheless, the Court held that California's program did not intrude upon the power of the federal government to engage in foreign affairs, because the program

---

[164] *Ibid*
[165] *Ibid*
[166] *United States v. California*, No. 2:19-cv-02142 WBS EFB (E.D. Cal. Jul. 16, 2020)
[167] *Ibid*

is not in conflict with any existing treaty, statute, or official policy. The Court noted that a future treaty, statute, or policy may preempt California's program, but held that the United States' "fears" of such future intrusion are merely speculative. There was no decision on the Foreign Commerce Clause Claim as the United States sought dismissal of the same. The U.S. opined that the claim was largely duplicative of the Foreign Affairs Doctrine claim.[168]

3.4. Constitutional and Legal Lessons for Nigeria in Designing a Cap and Trade Program

Unlike the United States, the Nigerian federal government has put in place — at least on paper — a country-wide legal and regulatory framework on climate change by virtue of the 2021 *Climate Change Act (CCA)*. Does this mean that the constitutional hurdles that California had to face as a federating unit or state may not arise in the case of the Nigerian federal government? This question is addressed shortly.

Furthermore, the choice of an emissions trading system as a policy option to combat climate change is clearly stated in the CCA, unlike the position in California with *AB 32* which did not specify an emissions trading system but left the decision of the appropriate policy to the CARB. As a matter of fact, CARB's scoping plan for selecting the cap-and-trade in California was challenged by a group representing lower income state citizens in *Association of Irritated Residents v. California Air Resources Board.*[169] In that case, the court issued a writ of mandate enjoining CARB from any further cap-and-trade rulemaking until it complied with the California Environmental Quality Act (CEQA) by analyzing alternatives to cap-and-trade and

[168] *United States v. California, United States District Court, Eastern District of California, Case No. 2:19-cv-02142-WBS-EFB; United States Court of Appeals, Ninth Circuit, Case No. 20-16789.*
[169] *Ass'n of Irritated Residents v. Cal. Air. Res. Bd., 206 Cal. App. 4th 1487, 1487 (2012).*

considered relevant public comments.[170] This delayed the program implementation for approximately a year until 2013. When re-promulgated a year later in 2012 with a more robust consideration of alternatives, CARB's Climate Change Scoping Plan and choice of the previous cap-and-trade option was upheld by a state court.[171]

In spite of the foregoing, a decision to design a cap-and-trade program by the Nigerian federal government may draw constitutional scrutiny based on two issues: firstly, the constitutionality of the CCA itself, which forms the legislative basis for a cap-and-trade program; and, if the first issue survives constitutional scrutiny, the legality of the federal government designing a country-wide program.

On the legality of the CCA, the constitutional question will be whether the federal government of Nigeria has the authority to enact the CCA to bind the entirety of the country. The Constitution of the Federal Republic of Nigeria 1999 ("the Constitution") divides legislative powers between two main tiers of government: the federal government and the government of a state.[172] Generally, legislative powers are divided between these tiers of government in the manner prescribed in the Exclusive Legislative List and the Concurrent Legislative List contained in the Second Schedule of the Constitution. Items on the Exclusive Legislative List can only be legislated on by the federal legislature. Items on the Concurrent List can be legislated on by both the federal and state legislatures, with the caveat that federal legislation shall override state legislation where there is a conflict between them.[173]

---

[170] *Ibid*

[171] *Citizens Climate Lobby v. Cal. Air Res. Bd.*, No. CGC-12-519554, 2013 WL 861396, at *2 (Cal. Super. Ct. Jan. 25, 2013).

[172] See generally section 4 of the Constitution. The legislative powers of the federal government are vested in the National Assembly, whilst the legislative powers of a state are vested in the House of Assembly of that state.

[173] Section 4(5) of the Constitution. See: *Military Governor of Ondo State & Anor v. Victor Adegoke Adewumo (1988) 6 SCNJ 151*; *Olaleye-Ote vs. Babalola (2012) 14 NWLR (Pt.1279) 574*.

There are cases where a subject matter is neither contained in the Exclusive Legislative List nor in the Concurrent Legislative List. In such cases, the courts would look first at whether the subject matter can be deemed incidental or supplementary to any of the items contained in the Exclusive Legislative List. If yes, then the National Assembly would have exclusive legislative power to legislate on that subject matter as if it were contained in the Exclusive Legislative List.[174] If the answer is no, then the subject matter would be deemed residual. That is, it falls within the residue of the legislative powers of the states.[175] On residual matters, each state is entitled to legislate for itself, without Federal interference.[176]

A thorough review of the exclusive and concurrent legislative lists shows that there is no mention of environmental protection and/or climate change therein. Thus, it may not be out of order to declare that the federal government cannot enact the CCA as environmental and climate change issues are residual powers left for the various states. However, the analysis does not end there. Section 20 of the Constitution provides that "the *State* shall protect and improve the environment and safeguard the water, air and land, forest and wild life of Nigeria." Interestingly, section 318 of the constitution defines "State" thus: "*when used otherwise than in relation to one of the component parts of the Federation, includes government*." *Government* is defined to include the "*Government of the Federation, or of any state, or of a local government council or any person who exercises power of authority on its behalf*." Consequently, both the federal government and state government can make laws and policies on

---

[174] Item 68 of the Exclusive Legislative List. See also *A.G. of Ogun State v. Aberuagba (1985) NWLR (Pt.3) 395; A.G. of the Federation v The A.G. of Lagos State16 NWLR (Pt 1380) 249; Nigerian Soft Drinks v AG Lagos State (1987) 2 NWLR (pt. 57) 444*.

[175] *UAC of Nigeria Plc & Ors. v. A-G of Lagos State & Ors. (2010) LPELR-5038(CA); A.- G., Lagos State v. A.-G., Federation (2003) 12 NWLR (Pt. 833); Balonwu v. Obi (2007) 5 NWLR (Pt. 1028) 488.*

[176] Section 4(7) of the Constitution; *AG Abia State & 2 ors v. AG Federation & ors (2006) 16 NWLR (pt. 1005) 265; A-G Abia State & 2 ors v. A-G Federation & ors (2002) 6 NWLR (pt. 764) 542*.

environmental issues including climate change. Thus, the CCA may escape constitutional scrutiny if it ever comes to that.

If indeed, the CCA is a law validly made under the federal government powers as opined by this author, the next issue is whether a nation-wide cap-and-trade program under the CCA can be designed by the federal government. This issue is relevant as carbon markets are polycentric by nature. That is, they cut across different areas like (environmental law, securities regulation, trade, and contracts) and they interact with various institutions. Some of these institutions and areas of law may be under the legislative competence of state governments.

I contend that the federal government can design a cap-and-trade program that is country-wide especially under the peace, order and good government powers of the federal government under section 4 of the Constitution. This is especially so given the national concern of climate change and the fact that some states may not have the impetus to drive climate mitigation and adaptation efforts within their domains. Thus, the failure of one state to cooperate would carry with it adverse consequences for the residents of other states and the country at large.

However, on the off chance, that a court strikes down the CCA and its associated ETS plans, such that only states in Nigeria can validly regulate climate change, there is thus, a lot that states in Nigeria who may want to design a carbon market can learn from the constitutional challenges that the California's cap-and-trade program has had to face.

The primary lesson for a state is that there must be an explicit or implicit legislative basis for an emissions trading system or cap-and-trade program. Where there is an implicit legislative basis, the body or agency responsible for climate change/finance must first analyze alternatives to cap-and-trade and consider relevant public comments.[177] This way a Nigerian state may escape the type of suit which challenged California's cap-and-trade program as seen in *Association of Irritated Residents v. California Air Resources Board.*[178]

An issue worth distilling, and that might pose a serious challenge in the unlikely event that a state plans a cap-and-trade program is the doctrine of covering the field[179] given the federal government's enactment of the CCA. This will arise if a court rules that climate change issues may be concurrently addressed by the federal government and state governments. This doctrine is similar to the United States' *preemption clause*. While it may be argued that California was able to escape constitutional challenges because there is no similar federally mandated program, the case cannot be said of Nigeria which has a federal statute in the CCA. However, a convincing argument that may be put forward by a state is that the CCA only provides a legislative basis for a cap-and-trade program, however, there is no such program yet or any regulation emanating from the CCA implementing such program.

At best, the CCA, whilst it remains unoperationalized may be regarded as a "statement of wish" that cannot be regarded as covering the field, and thus able to prevent a state from actually developing a cap-and-trade program. Again, the decision

---

[177] *Ibid*

[178] *Ass'n of Irritated Residents v. Cal. Air. Res. Bd., 206 Cal. App. 4th 1487, 1487 (2012).*

[179] The said doctrine of covering the field would come to the effect, that where identical legislations exist on the same subject matter, validly passed by the legislative powers of the National Assembly and the State House of Assembly. When and where such situation arises, the appropriate step to take would be to invalidate the identical law passed by the State House of Assembly on the ground that the National House has covered the whole field

in *California v. United States* is persuasive in this respect, where the court found that the *United States' Global Climate Protection Act of 1987* ("GCPA") was primarily an "appropriations rider" and that it is made up of mostly "platitudes," therefore California's program could not create an obstacle to its implementation.[180]

3.5. An Assessment of California's Cap-and-Trade Program

Opponents of California's cap-and-trade program are primarily concerned about what they consider are the system's meager results in terms of reducing emissions over the previous eleven years.[181] However, data from the CARB reveals that sources covered by cap and trade reduced their climate pollution by approximately 10,567,000 metric tons of CO2 equivalent, or 3.6%.[182] Reductions were however most prominent in the electricity imports sector, which declined by 12.4% or approximately 2,434,000 metric tons of CO2e. Nonetheless, critiques acknowledge that the program has generated significant income for climate and environmental projects, contributed to the establishment of a thorough system for monitoring, reporting, and recording GHG emissions, and helped guarantee that an economy-wide price signal is in place.[183]

This sub-section endeavors to encapsulate the current debates surrounding the effectiveness of California's program. While there are strong opinions and differences on some of the points covered below, this project recognizes that these differences exist and does not aim to reach a definitive conclusion on them here. In addition to pointing out the kinds of issues that have come up in the design and execution of

---

[180] *United States v. California*, No. 2:19-cv-02142 WBS EFB (E.D. Cal. Jul. 16, 2020)
[181] Wang, Alex and Carpenter-Gold, Daniel and Shen, Siyi and So, Andria, *Emissions Trading in California: Lessons for China* (June 17, 2022). Available at SSRN: https://ssrn.com/abstract=4139727 or http://dx.doi.org/10.2139/ssrn.4139727
[182] Carb 2023 (/https://ww2.arb.ca.gov/sites/default/files/classic/cc/reporting/ghg-rep/reported-data/2022mrrfaqs.pdf)
[183] *Ibid*

California's cap-and-trade, this project makes the case that Nigeria ought to give these issues serious thought when designing its own system.

3.5.1. GHG Emissions Reduction and the Role of the Cap-and-Trade Program in this Success.

The portfolio of climate policies implemented under *AB 32*[184] has had a substantial impact on California's carbon emissions: California met its goal of reducing emissions by about 15% compared to a "business as usual" scenario,[185] and researchers have found that the suite of *AB 32* policies have been effective in reducing emissions.[186]

It is not clear, however, how much of this reduction is due solely to the driving force of the cap-and-trade program, as opposed to the other policies begun at around the same time. The California Legislative Analyst's Office (LAO) attempted to review the efficacy of the program in 2020, but was unable to find any relevant empirical research. However, in its 2024 report, it did find, "the program is not currently well-positioned to ensure the state meets its 2030 target. Cap-and-Trade allows banking of allowances from earlier years, which could hinder the state's ability to rely on the program to achieve its overall emissions reductions goals under the current program cap."[187]

---

[184] A summary of the major elements of this portfolio is maintained by the Center for Law, Energy & the Environment at University of California, Berkeley School of Law. *California Climate Policy Dashboard*, Berkeley L. https://www.law.berkeley.edu/research/clee/research/climate/ climate-policy-dashboard/.

[185] See, e.g., *Latest State Greenhouse Gas Inventory Shows Emissions Continue to Drop Below 2020 Target*, CARB (2021), https://ww2.arb.ca.gov/news/lateststate-greenhouse-gas-inventory-shows-emissions-continue-drop-below-2020-target.

[186] See, e.g., Geoff Martin & Eri Saikawa, *Effectiveness of State Climate And Energy Policies in Reducing Power-Sector CO2 Emissions*, 7 Nature Climate Change 912 (2017), https://www.nature.com/articles/s41558-017-0001-0.pdf?origin=ppub.

[187] LAO, *The cap-and-trade program: Issues for Legislative Consideration* (2024), https://lao.ca.gov/handouts/resources/2024/Cap-and-Trade-Issues-021324.pdf

Other policies, such as California's renewable portfolio standard, are thought to have been a "significant driver" of emissions reductions. The state enacted its renewable portfolio standard in 2002, requiring the power sector to use renewable power for 20% of its retail sales by 2017.[188] This dynamic is consistent with the idea of the cap-and-trade program as a "backstop" to the rest of the AB 32 policies.[189] If California did not successfully lower greenhouse gas emissions enough to reach its goal, the cost of allowances might have increased enough to encourage industries to lower emissions. However, because emissions decreased rapidly across the state, the number of credits available remained high compared to the demand, so prices remained close to the minimum price.[190]

While the above may be true in terms of GHG emissions reduction, it should be borne in mind that the carbon market has never been put forward as the single or best solution to the climate change problem. However, it is seen as the best way to get the needed finance for climate mitigation and adaptation. This is more so in the case of Nigeria where the challenge is not solely emissions as it were. In 2022, Nigeria contributed 0.79% of the world's total GHG,[191] and even when adjusted on a per-capita basis, Nigeria's contribution was 1.79%, lower than the global average of 6.50%.[192] In spite of these relatively modest numbers, Nigeria is considerably impacted by climate change, a testament to the fact that it does not matter where the

---

[188] SB 1078, 2001-2002 Leg. (Cal. 2002).
[189] See, e.g., *Elec. Power Rsch. Inst., Exploring the Interaction Between California's Greenhouse Gas Emissions cap-and-trade program and Complementary Emissions Reduction Policies* 1–7 (2013) ("The cap-and-trade program incorporates a fixed emissions cap which serves as a backstop for" other climate policies.). CARB's own analyses have avoided the term, but generally refer to the program as a means of ensuring that climate targets are met, rather than a standalone program. E.g., CARB, First Update to the Climate Change Scoping Plan, at ES4 (2014) (ETS "will ensure that California remains on track to continually reduce emissions and meet the 2020 limit.")
[190] *Supra.* note 1
[191] "Share of global greenhouse gas emissions" accessed at (https://ourworldindata.org/grapher/share-global-ghg-emissions)
[192] *The Carbon Brief Profile: Nigeria* (2023) accessed at (https://www.carbonbrief.org/the-carbon-brief-profile-nigeria/)

emissions are being produced, impacts may be felt thousands of miles away. Thus, the challenge for Nigeria is broadly about climate mitigation and adaptation which are all predicated on finance. What is more, the LAO asserts that cap-and-trade can be a cost-effective way to achieve GHG goals including financing.[193]

3.5.2. The Cap-and-Trade and Surplus of Allowances

Perhaps the most common critique of the program is that it suffers from excessive allowances that have in turn kept allowance prices low.[194] Several observers consider the Program to have been oversupplied with allowances through 2016.[195] More recent empirical data is hard to obtain, but the LAO document previously cited[196] provides reason to suspect that there was still oversupply. According to the LAO, the CARB intends to decrease the supply of allowances to reflect a new emissions trajectory.[197]

However, prices have spiked over the last several auctions, and the current-auction settlement price is, as of May 2024, at a record high of $37.02.[198] It is too early to tell whether the latest auctions are an anomaly or the beginning of a trend, but the early surpluses and availability of banking may continue to drag down prices and may threaten California's 2030 targets.[199]

---

[193] *Supra*. Note 6

[194] See, e.g., Chris Busch, *Oversupply Grows in the Western Climate Initiative Carbon Market* (2017), https://energyinnovation.org/wp-content/uploads/2018/02/WCI-oversupply-grows-February-update.pdf; Danny Cullenward & Andy Coghlan, *Structural Oversupply and Credibility in California's Carbon Market*, 29(5) Elec. J. 7 (2016); LAO, *Cap-and-Trade Extension: Issues for Legislative Oversight* 8–9 (2017).

[195] *Ibid*.; see also Env't Comm'r Ont., *Ontario's Climate Act: From Plan to Progress* – Appendix G: Technical Aspects of Oversupply in the WCI Market 2–4 (2018), https://www.auditor.on.ca/en/content/reporttopics/envother/env17_other/From-Plan-to-Progress-Appendix-G.pdf.

[196] *Supra.* Note 6

[197] *Supra.* Note 6

[198] CARB, *Summary of California-Québec Joint Auction Settlement Prices and Results* (May 2024).

[199] LAO, *Cap-and-Trade Extension: Issues for Legislative Oversight* (2017), https://lao.ca.gov/Publications/Report/3719. Importantly, this does not necessarily mean that more GHGs could be emitted over the course of the program than were allowed for, just that emissions that were budgeted for earlier years may be released in later years. But this nuance does not matter for California's targets, since they are expressed in terms of an annual rate.

One reason for oversupply is the low initial ambition of the program. Although important, the reduction that the GHG ETS was meant to deliver by 2020 was relatively modest: 23 MMTCO2 e/year, or about 4.5% of the annual emissions in the "business as usual" projection for 2020.[200] As described above, substantial emissions reductions, likely from other regulatory programs, led to substantial surpluses of allowances within the system.

This problem is compounded by the banking provisions of the program. The generous banking provisions allowed entities to bank nearly 10 MMTCO2 e in 2021. For all but a few of the highest emitters, this is equivalent to or greater than the allowances for the entire compliance period.[201] As a result, even though the program's ambition was raised slightly starting in 2021, the previous surplus might have an impact on the program's future effectiveness. Most remarkably, the LAO has estimated that excess allowances may cause California to significantly miss its annual emissions target in 2030.[202]

Historically, CARB has offered responses to criticisms of allowance oversupply. In a February 2022 document, CARB had argued that existing cap-and-trade design is appropriate for meeting California's 2030 GHG target.[203] This follows on CARB's 2018 analysis, which found that "the currently established caps … would support a steadily increasing carbon price signal to prompt the needed actions to reduce GHG

---

[200] CARB, *First Update to the Climate Change Scoping Plan: Building on the Framework* 93 (2014).
[201] In the 2015-2017 compliance period, only 13 entities, 4% of all entities, had more than 10 MMTCO2 e in emissions. The mean entity emissions for the period were about 3.2 MMTCO2 e, and, because most entities are small emitters, the median was only about 0.2 MMTCO2 e. See CARB, *2015-2017 Compliance Report* (2020), https://www.arb.ca.gov/cc/capandtrade/2015-2017compliancereport.xlsx.
[202] LAO, *The cap-and-trade program: Issues for Legislative Consideration* (2024), https://lao.ca.gov/handouts/resources/2024/Cap-and-Trade-Issues-021324.pdf
[203] See CARB, *BR 18-51 Cap-and-Trade Allowance Report (2022).* https://ww2.arb.ca.gov/sites/default/files/cap-and-trade/Allowance%20Report_Reso18_51.pdf (response produced at the direction of the Board).

emissions," and "no changes to allowance supply or banking rules were required at the time."[204] CARB had been required to report to the California legislature at the end of 2023 "giving a status of the allowance supply with any suggestions on legislative changes to ensure the number of allowances is appropriate to help the state achieve its 2030 target."[205]

3.5.3. Stringency of Offset Rules

A California emitting facility may satisfy a small portion of its compliance requirement under the cap-and-trade program by using offsets from GHG reduction or elimination in other projects. The state's offset program aims to reduce expenses in non-covered sectors, contribute to cost containment, and provide a platform for climate diplomacy with other states and regions.

Offsets are designed to theoretically decrease global greenhouse gas emissions by the same amount as direct mitigation measures at a facility. However, there is uncertainty in whether offset protocols truly achieve this goal. For example, one scholar has argued that the protocol for non-urban forestry offset projects, which account for the vast majority of offset credits generated thus far[206] assumes that all the carbon sequestration from a 100-year project occurs immediately.[207] She further argues that this allows covered facilities to trade reductions far in the future, which are less valuable, for allowances in the present; that the future emissions reductions are

---

[204] *Ibid*
[205] *Ibid*
[206] *CARB, ARB Offset Credit Issuance Table (2024)*, https://ww2.arb.ca.gov/resources/documents/arb-offset-credit-issuance-table
[207] Barbara Haya, *Policy Brief: The California Air Resources Board's US Forest Offset Protocol Underestimates Leakage 1* (May 7, 2019), https://gspp.berkeley.edu/assets/uploads/research/pdf/Policy_Brief-US_Forest_Projects-Leakage-Haya_4.pdf. For CARB's response to Haya's critiques regarding antileakage measures and the temporal mismatch issue, see *CARB, US Forest Offset Projects 19–24* (May 30, 2019), https://ww2.arb.ca.gov/sites/default/files/ cap-and-trade/offsets/overview.pdf (stating that the Haya brief "misrepresents how leakage is accounted for in the Protocol").

uncertain because of variability in the effectiveness of sequestering carbon in forests as they age; and that the leakage rate is likely higher than the protocol allows.[208]

Offsets also present additional concerns. When offsets are from outside of California, residents do not experience the additional benefits of reducing greenhouse gas emissions, such as decreased air pollution.[209] Even in-state offsets can reduce public health co-benefits, for example, where non-urban forestry projects take the place of industrial emissions reductions in urban areas. Offsets can also exacerbate allowance oversupply as they are direct substitutes for allowances in the Program.

AB 398 attempts to address these concerns by limiting the use and location of offset projects. It reduced the cap on offsets from 8% to 4% of an entity's total compliance obligation through 2025, though it will raise that cap to 6% in 2026 through 2030.[210] It also required that no more than one half of a firm's quantitative usage limit may be sourced from projects that do not provide direct environmental benefits in the state. This is defined in the regulation as a project that improves air or water quality in California, and CARB has interpreted this to include any project that is located within California, as well as outside projects that reduce GHG emissions or have another environmental benefit to the state.[211]

---

[208] *Ibid.* Dr. Haya recommends crediting projects with the actual amount of sequestration achieved each year, rather than granting all sequestration credits immediately, which would result in an 82% decrease in the offset credits issued under the protocol.

[209] See, e.g., Lara Cushing et al., *Carbon trading, Co-Pollutants, and Environmental Equity: Evidence from California's cap-and-trade program* (2011–2015), PLOS Med. (July 10, 2018), https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002604; Robert Sanders, *California's Cap-and-Trade air Quality Benefits Go Mostly out of State*, Berkeley News (July 10, 2018), https://news.berkeley.edu/2018/07/10/californias-cap-and-trade-air-quality-benefitsgo-mostly-out-of-state/.

[210] *Cap-and-Trade Regulations, 17 C.C.R. § 95854.*

[211] *Ibid.* § 95989(a).

This section does not pretend to examine all the challenges with the California cap-and-trade program. However, the challenges highlighted above are those that may potentially rear their ugly heads in implementing a similar program in Nigeria. That being said, a separate sub-section is dedicated specifically to three peculiar challenges against a homegrown cap-and-trade program in Nigeria. Before then a quick review of the lessons learned from California is apposite.

3.6. Lessons Learned

Without a doubt, emissions trading systems have produced benefits. They have helped to build monitoring capacity and firm awareness of carbon emissions. Where auctions are involved, as the case in California, they have generated substantial revenue that can be used to support environmental and social programs and build political support for environmental policies. For example, in recent years, the cap-and-trade auctions have raised between $3 billion and $4.7 billion annually for California.[212] This is good news for Nigeria.

To correctly place carbon pricing within a more comprehensive regulatory framework for climate change, however, the conversation surrounding carbon pricing—in whatever form it takes—needs to be more forthright about its limitations and the real benefits realized thus far. The following lessons have been learned from California's cap-and-trade program:

Firstly, a useful lesson is that command-and-control measures should not be jettisoned, and policy makers in Nigeria should not put all their eggs in the basket of cap-and-

[212] *Supra*. Note 6

trade. This is particularly so, as it has been argued that the theoretical administrative simplicity of emissions trading systems also may not carry over to all regulatory systems, particularly those in the developing world where capacity issues are commonplace.[213] Establishing an effective carbon market depends on technical expertise to create emissions inventories; monitoring, reporting, and verification systems; and robust market monitoring and regulatory enforcement capacity (this matters will be discussed further under constraints and recommendations for Nigeria). Undoubtedly, with less capacity it will be easier *ab initio* to implement traditional command-and-control measures in many parts of the world.

What is more, it is clear from the experience of California that market mechanisms thrive when used in concert with other measures. It ought to be designed and implemented as a "backstop" to the larger issue of climate change. Its main goals should be to raise carbon prices in the event that other regulatory measures fail, generate income to finance GHG-reduction initiatives, and apply some downward pressure on emissions—just like they do in California.[214]

Secondly, in order to gain political support and promote awareness and participation with a novel regulatory approach, regulators frequently launch cap-and-trade programs with comparatively loose allowance budgets. This laxity is made worse by generous banking regulations which leads to allowance surpluses. Later on, it may prove politically challenging to reduce allowance surpluses and tighten environmental regulation. In California, initial overallocation and generous banking rules have kept

---

[213] Wang, Alex and Carpenter-Gold, Daniel and So, Andria, *Key Governance Issues in California's Carbon Cap-and-Trade System* (May 1, 2022). Available at SSRN: https://ssrn.com/abstract=4119861 or http://dx.doi.org/10.2139/ssrn.4119861

[214] *Supra*. Note 8

allowance prices low.[215] And the negotiations to extend the cap-and-trade program from 2020 to 2030 resulted in compromises (such as the expansion of leakage protections for industrial facilities, and preemption of local regulation) that arguably limit the environmental ambition of the program.

Thirdly, carbon markets are not exempt from the phenomenon of regulatory capture, where regulated industries use political influence and resource mobilization to control their regulators. This presents unique challenges for Nigeria given its less than savoury reputation for corruption, which is discussed further in the next section. Cap-and-trade programs can connect all entities in a market, making the success of the entire program dependent on the influence of the most powerful sector. This can be observed in the California experience in two ways: first, free allocations were given to industrial manufacturing on the complex concept of "leakage risk," but later, that concept was dropped and free allocations were maximized for all industries. What is more, free allocations also reduce funds available to the GGRF.

Lastly, the use of offsets in California has sparked heated discussions about whether these projects actually and quantitatively reduce emissions in a way that is verifiable, permanent, enforceable, and goes above and beyond what is mandated by law and what would happen in a conservative business-as-usual scenario. Simultaneously, California boasts some of the most extensive offset regulations globally, which include adhering to particular “Compliance Offset Protocols” that are issued by CARB. The California experience is instructive for highlighting debates over offset quality, and possible responses to issues raised.

---

[215] LAO, *The cap-and-trade program: Issues for Legislative Consideration* (2024), https://lao.ca.gov/handouts/resources/2024/Cap-and-Trade-Issues-021324.pdf

Summary

Given the similarity in structure between Nigeria and the United States, from a purely legal perspective, there may not be the need to reinvent the wheel. As Justice Louis Brandeis rightly opined: "*Denial of the right to experiment may be fraught with serious consequences to the nation. It is one of the happy incidents of the federal system that a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country."*[216]

In this case, California has been a battle ground and laboratory for the myriad constitutional challenges that may arise as a consequence of designing a cap-and-trade program while being a part of a federal structure, and the lessons are not just for other states in the United States but also hold useful lessons extraterritorially. It is only prudent for Nigeria and its federating units to learn from the California experience and transplant useful ideas in designing and administering a similar program and even for dispute resolution in a constitutional challenge.

---

[216] *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting); see also *Gonzales v. Raich, 545 U.S. 1, 42 (2005)* (O'Connor, J., joined by Rehnquist, C.J., & Thomas, J., dissenting) ("One o_x001D_ffederalism's chief virtues, of course, is that it promotes innovation by allowing for the possibility that 'a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.'" (quoting Liebmann, 285 U.S. at 311)).

Section 4

4. The Task of Designing a cap-and-trade program for Nigeria: Challenges and Recommendations

How can Nigeria design a cap-and-trade program? What are the challenges Nigeria needs to surmount on its way to developing its own program? What recommendations can guide Nigeria in this task given its local context, and the critical design, implementation and operational lessons and insights that have been gleaned from California? This section seeks to answer these questions in crafting a robust Cap-and-Trade design for Nigeria. That being said, the first task of this section is to assess the institutional challenges that might militate against the design and administration of a cap-and-trade program in Nigeria.

4.1. Institutional Challenges Against a Homegrown Cap-and-Trade Program in Nigeria

Designing a cap-and-trade program anywhere in the world is an uphill task and fraught with challenges. It took the European Union 5 years from when a green paper was presented on the design of an ETS to an actual launch in 2005. Even at that, the period from 2005 to 2007 was a 3-year pilot of 'learning by doing'.[217] The California cap-and-trade program took 6 years from when *AB 32* was passed in 2006 to launch in late 2012. Flowing from the foregoing, I will look at three peculiar challenges that must be addressed before there can be a homegrown cap-and-trade program in Nigeria.

---

[217] *Development of EU ETS (2005-2020)* Accessed (https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/development-eu-ets-2005-2020_en)

4.1.1. Greenhouse Gas Inventory Challenge

A national GHG inventory is a comprehensive listing, by source of annual GHG emissions. National inventories include greenhouse gas emissions and removals taking place within national territory and offshore areas over which the country has jurisdiction. A GHG inventory report would typically cover all the relevant gases and source categories of the gases.

A good inventory is very important to a cap-and-trade program because it is from the inventory that a decision will be made about which sectors to include, and where to apply the obligation to hold allowances (e.g., at the fuel distributor or the emission source).[218] It is thus important that one key area to focus on for the pilot phase of a cap-and-trade program in Nigeria should be getting GHG inventory right. This is so as it is from the inventory that a decision will be made about the aggregate cap. In addition, emissions inventory is sometimes used to project future emissions. Inventory preparation has proven to be a challenge for Nigeria, as there is so much uncertainty in the process which is due to lax monitoring, reporting and verification of GHG emissions especially in sectors outside of oil and gas.[219]

To solve this challenge, there should be a legislative framework for greenhouse gas reporting in Nigeria. Regulation should require reporting of GHG emissions at the facility level and then roll up to the corporate level. Companies should state GHG emission source categories such as from stationary combustion mobile construction, process emission, and fugitive emissions. Where emissions primarily emanate from

---

[218] US EPA, *Tools of the Trade: A Guide to Designing and Operating a Cap and Trade Program for Pollution Control* (2003)

[219] *Assessment of Carbon Pricing Initiatives in Nigeria* (2023) - /https://unfccc.int/sites/default/files/resource/Carbon%20Pricing%20Assessment%20in%20Nigeria.pdf

the forestry sector, farmers and other forest-dependent professions should be mandated to report their activity-based emissions. This would involve training in the reporting guidelines of the IPCC.

Lastly, beyond regulation is also the need for technical proficiency. Assessors who work for the government or a regulated entity should be trained and/or retrained on inventory standards and where possible, consultants may be brought in where local capacity is currently lacking.

4.1.2. Monitoring and Enforcement Challenge

This challenge is closely intertwined with the earlier challenge discussed. While a cap-and-trade program achieves two broad goals, which are financing and GHG reductions, one should always remember that the primary goal of any tradable permit scheme is to control pollution, albeit through cost effective means. This goal can only be achieved if the environmental goals of the program are strictly adhered to. This can only be done through an effective enforcement regime: however, Nigeria has a weak environmental enforcement capacity. For instance, a news report from *Nairametrics* in December 2023 stated that Nigeria had an unpaid gas flare penalty of $828.8 million.[220] This suggested that a considerable amount of gas was flared during the specified period without corresponding payments as mandated by law, posing significant challenges to the country's zero emissions initiative.

Enforcement of emissions trading generally involves four steps: detecting violation,

---

[220] "*Nigeria has unpaid gas royalty of $559.8 million, unpaid gas flare penalty of $828.8 million – NEITI*" (https://nairametrics.com/2023/11/14/nigeria-has-unpaid-gas-royalty-of-559-8-million-unpaid-gas-flare-penalty-of-828-8-million-neiti/)

notifying the source, negotiating a compliance schedule, and applying sanctions for noncompliance when appropriate.[221] Detecting violation involves determining that a plant is in compliance when it commences operation, and during continuous normal operation.[222] Normally, a single set of tests, conducted at installation, will suffice to determine that a source is initially in compliance, but it is inherently harder to verify continuous compliance. Several means are used to detect violations, including self-certification by sources,[223] on-site inspections, and direct monitoring of pollutant flows. Thus, the ability to measure emissions by participating facilities is very important in a cap-and-trade program.

Measuring compliance can be difficult for some GHGs. Carbon dioxide is easier to monitor because of the close link between the carbon content of fuel and the amount of carbon dioxide emissions. Thus, monitoring the flow of fuels could substitute for monitoring emissions.[224] One way of dealing with unreliable emissions monitoring would be to limit trading to GHG sources that can be readily and accurately monitored.[225] For gases that are difficult to monitor, such as methane, emission factors may be developed.[226]

Determining compliance in cap-and-trade involves comparing actual emissions with authorized emissions. If actual emissions are estimated imperfectly, the environmental goal of the program is diminished. The two known options for showing compliance are through modelling and monitoring. However, modelling does not guarantee

---

[221] T.H. Tietenberg, *Emissions Trading: Principles and Practice* (Washington, D.C.: RFF Press, 2006) at 165-166.
[222] *Ibid* at 166
[223] Self- certification means self- reporting by the polluting source as to whether it is in compliance. Ibid.
[224] *Ibid* at 169.
[225] Tom Tietenberg et al., *International Rules for Greenhouse Gas Emissions Trading, Defining the Principles, Modalities, Rules and Guidelines for Verification, Reporting and Accountability*, United Nations Conference on Trade and Development Secretariat, 1 at 27, online: <http://www.unctad.org/en/docs/pogdsgfsbm6.en.pdf>
[226] *Ibid*

continuous compliance because it is an estimate accomplished before the fact.[227] Technology could help solve this monitoring concern; for instance, asking facilities to install and pay for a Continuous Emissions Monitor (CEM). A CEM would make it easier to verify continuous compliance.[228] A CEM would also transfer the monitoring burden to polluters, especially in a terrain where the environmental enforcement capacity is weak.

Another way of dealing with monitoring concerns which may be perfect for a cap-and-trade program is to use permits in some markets and to combine permits and standards in others.[229] As part of compliance, facilities or firms must show that monitored emissions match allowances. The allowance monitoring system should be sufficiently harmonized with the emissions monitoring system to allow matches between the two to be easily obtained. A registry is needed to ensure this. The registry is an automated database that keeps track of all permits and changes to the permits either through transfer or use.

Given the above, one matter that Nigeria must address at the pilot phase of its program is to ensure that the authority that has the mandate for designing the program publishes a guidance document for monitoring and reporting that includes methods for different emissions sources, including combustion, industrial processes, and

---

[227] Emission Summary and Dispersion Modelling Reports, online: <http://www.ene.gov.on.ca/environment/en/industry/standards/industrial_air_emissions/air_pollution/STD PROD_078056> When a facility makes an application for a certificate of approval to install, operate, or modify any device that emits contaminants into the air, it has to prepare what is called an Emission Summary Dispersing Modelling Report (ESDM) summarizing all air emissions from a facility and assessing their impacts against the regulator standards and guidelines. Though this report is regularly updated, it does not guarantee accurate monitoring

[228] The CEM is the gold standard for source monitoring. It is attached to a smoke stack and records all the emissions from the stack. See: Blackman and Harrington, *Use of Economic Incentives in Developing Countries: Lessons from International Experience with Industrial Air Pollution* (Resources For the Future May 1999) 1 at 2, online: <http://www.rff.org/rff/Documents/RFF-DP-99-39.pdf>.

[229] Pablo Montero, "*Pollution Markets with Imperfectly Observed Emissions*" (2005) 36 Rand 645 at 657

electricity consumption. However, given that the pilot phase will be Nigeria's first introduction to a cap-and-trade program monitoring and reporting may only be demanded from the energy sector given its reputation as the higest polluting sector in Nigeria.

Finally, a suggestion on enforcement will be that the pilot phase should be designed to pose no economic impact on regulated entities; however, non-compliant entities should lose the opportunity to bank unused allowances into subsequent compliance periods within the pilot and will receive fewer allowances in the first allocation of the operational phase of the cap-and-trade program (two fewer allowances for each non-delivered allowance during the pilot). Sanctions should be expected to be implemented in the operational phase of the program.

4.1.3. Corruption

An institutional constraint for Nigeria is corruption. For a cap-and-trade program to succeed, the regulator must be corruption-free; the participants in the program must have confidence in the regulator. A carbon market will thrive in an environment where rule of law is respected and enforcement is consistent, impartial, transparent, and independent of political considerations.

The issue of corruption also closely ties to the phenomenon of regulatory capture which has been reported even in the United States. It has been argued that emissions markets create particular problems of capture. One of the most important is that, by tying together all entities in a given market, an ETS makes the ambition of the whole

program subject to the most influential sector.[230] It has also been argued that in both the RECLAIM (the Regional Clean Air Incentives Market (RECLAIM) program for conventional air pollutants in southern California, begun in 1993 and now being retired) and the GHG ETS cases, industry-friendly decisions have weakened the program. In RECLAIM, the overallocation that pervaded the program was likely due to the influence of refinery owners.[231]

Participating firms or facilities should clearly understand from the onset how the program works, and how regulating authorities will measure and enforce compliance. Interest in a trading program will diminish significantly if firms believe that rules are unfair, arbitrary, or unpredictable.

The role of the agencies charged with driving the program, is crucial because it is the ministry or agency that will monitor and enforce the program locally. While corruption is a global vice, it appears more predominant in Nigeria. On Transparency International's 2023 Corruption Perceptions Index, Nigeria scored 25 on a scale from 0 ("highly corrupt") to 100 ("very clean"). When ranked by score, Nigeria ranked 145th among the 180 countries in the Index.[232]

This perception can erode the confidence of participants in the process: it can, however, be remedied if public participation in the program is allowed. Public inputs on what the emissions cap should be and public access to data on trades, violations

---

[230] Wang, Alex and Carpenter-Gold, Daniel and Shen, Siyi and So, Andria, *Emissions Trading in California: Lessons for China* (June 17, 2022). Available at SSRN: https://ssrn.com/abstract=4139727 or http://dx.doi.org/10.2139/ssrn.4139727

[231] *Supra*

[232] Transparency International Corruption Perceptions Index 2023. Available at https://www.transparency.org/en/cpi/2023

and actual emissions will enhance the credibility of the program.[233] Evaluation of compliance by rights groups should be factored into the implementation design. Rights groups can exert a lot of pressure on companies that want to dilute the emissions goal and on impartial regulators.

Beyond the three critical challenges identified above and the solutions proferred, designing a Nigerian cap-and-trade program will also benefit from other broad recommendations. Some of these recommendations have been instrumental to the successes of similar programs, however the second and third recommendations which are detailed in the sub-section hereunder take into account Nigeria's particular local context.

4.2. Recommendations for Designing a Nigerian Cap-and-Trade program

"*Power is the by-product of understanding*."

— Jacob Bronowski[234]

The phrase "power is the by-product of understanding" suggests that true power or influence is not achieved directly but rather as a result of deep comprehension and knowledge. To effectively wield power, one must first have a thorough understanding of the subject, system, or situation. This could be in various contexts such as knowledge of a particular field, insight into human behavior, or awareness of how systems operate.

---

[233] Akinwande, Gbenga, "Emissions Trading: A Policy Option for Fighting Climate Change in Africa" (2013). Electronic Thesis and Dissertation Repository. 1662.
https://ir.lib.uwo.ca/etd/1662

[234] Bronowski, Jacob (1965). *The Identity of Man*. Amherst, N.Y.: Prometheus Books.

The power granted to the Nigerian federal government by virtue of the CCA to design an ETS can only be effectively wielded through understanding, else the CCA may become a non-effective law. The task of this section is to provide recommendations that will guide policy makers in designing a cap-and-trade program that will be fit for the Nigerian purpose. These recommendations are detailed hereunder.

4.2.1. Beyond a Legal Basis: The Need for Subsidiary Legislations

It cannot be gainsaid that the CCA has established the statutory and legal basis for a cap-and-trade program in Nigeria. However, there is the need for subsidiary legislation(s) that will guide the operations of the program and the same is currently missing. While the *Assembly Bill 32 (AB 32)* enacted in California established the legal framework for California's actions to address climate change, *AB 32* had to delegate primary responsibility to CARB and required it to prepare a scoping plan, promulgate regulations (which are already extant), design a market-based emissions trading system, and develop complementary measures to effectively achieve the legally binding target. Although, as it has been noted *AB 32* is enacted at the state level, due to the failure at the US federal level to pass a climate change law. This is a major difference with Nigeria.

The creation of sound regulations is important for Nigeria to make institutional arrangements, adopt allied market-based mechanisms, and carry out enforcement to address GHG emissions. While a principal enactment like the CCA might have been solely passed by law makers who are not versed in the technicalities of climate change, the success of a cap-and-trade program requires the interdisciplinary competencies of various sectors and experts coming together to craft sound regulations that are not

influenced by the politicking of a formal legislative process. Some of these regulations include monitoring, reporting, and verification (MRV) regulations, compliance and enforcement rules, trading rules (especially for secondary market transactions), use of proceeds rules.

4.2.2. A Return to the Age of (Curial) Deference

I recall in Season 2, Episode 5 of the widely acclaimed T.V. series, *The Crown,* a journalist telling the Queen that the "age of deference" is over. This pronouncement, although aimed at the continued relevance of the British Monarchy, appears to be relevant now in the realm of administrative law, especially in light of the recent decision of the United States Supreme Court ending more than forty years of what has come to be known as the *Chevron Deference.*[235]

The success of a cap-and-trade program in Nigeria, especially in the area of enforcement, requires curial deference. By curial deference, I mean the restraint Superior Courts show when asked to interfere, by way of judicial review, with the decisions of regulatory or statutorily "independent" expert bodies. While the fact cannot be gainsaid that the Nigerian jurisprudence recognises subsidiary regulations made by regulatory bodies where the power to make such regulations is donated to the body by the principal enactment, the standard of review of decisions of these expert bodies leans towards a correctness standard rather than a reasonableness standard.[236]

Thus, in view of the expert nature of a cap-and-trade program and the complexity in administering same, it is recommended that the regulatory body for the program in

---

[235] *Loper Bright Enterprises v. Raimondo* No. 22–451, 603 U.S. __ (2024). The Court's decision was also issued in the Loper's sister case, *Relentless, Inc. v. Dep't of Commerce*, No. 22–1219.
[236] *Gov., Oyo State v. Folayan* (1995) 8 NWLR (Pt. 413) 292

Nigeria be imbued with rule-making powers, rule interpretation privileges, and a curial deference that is based on a reasonableness standard rather than correctness.

It is thus important that Nigeria avoids the chaos that will result as lower courts pass judgments individually on cap-and-trade regulations that are often quite technical and in which the judges involved may lack any expertise.

4.2.3. **Undertake Necessary Preparation**

For six years, state agencies and stakeholders in California dedicated significant effort to meticulously plan and prepare for the cap-and-trade program.[237] Their goal was to create a comprehensive, effective program that would anticipate and address any potential issues. In 2007, CARB, in response to *AB 32*, issued a regulation that mandated the largest industrial sources to report and verify their greenhouse gas emissions.[238] This crucial step provided the necessary data for the cap-and-trade program to be established on a solid foundation, enabling accurate tracking of emissions levels and facilitating future adjustments as needed.

CARB also convened an Environmental Justice Advisory Committee to assess and advise on environmental justice and other related issues, and an Economic and Technology Advancement Advisory Committee to advise on the stimulation of investment and implementation of technological advances and economic development opportunities. CARB has developed an adaptive management plan to address unanticipated impacts for both localised air quality impacts and forest impacts from the Californian cap-and-trade Program.

---

[237] SHEN, B., DAI, F., PRICE, L., & LU, H. *California'S cap-and-trade Program and Insights for China's Pilot Schemes*. Energy & Environment, 25(3), 551-575. https://doi.org/43735276

[238] *Ibid*

For Nigeria, careful preparation and years of planning are critical to prevent problems occurring, thus helping build the confidence of market participants. Two of these matters that need adequate planning and should be stress-tested at the pilot phase in Nigeria are GHG inventory, and monitoring reporting and verification of emissions. Essentially both involves working with reliable data. The EU ETS faced a similar situation, in its initial period from 2005-2007, with a lack of reliable GHG emissions data which encouraged regulated emitters to inflate their emissions.[239] The lack of careful preparation can create future problems that not only require time and funding to correct but, more importantly, erode stakeholders' confidence of the scheme itself. California's experiences in taking the necessary steps upfront to identify foreseeable problems, collect the information needed, build strong foundation of data, examine potential impacts through robust impact assessments, and make adaptive plans to address unanticipated impacts are useful examples for Nigeria.

Thus, it is recommended that Nigeria should start with pilot programs that could serve well as the learning phase in preparation for a countrywide development of a cap-and-trade program. The aim of the pilot program amongst other things should be to test system design, contribute to the NDC and other national mitigation goals, enhance the quality of emissions data, and build capacity in emissions trading, ultimately improving the design of the operational phase. This will be following in the footsteps of Mexico and Chile that have also started with pilots.

[239] M. Grubb, C. Azar, U. M. Persson, *Allowance allocation in the European emissions trading system: A commentary*. Clim. Pol. 5, 127–136 (2005).

4.2.4. **Create an Enabling Institutional Framework**

California has established the necessary institutional framework to implement its cap-and-trade program. The CARB is responsible for creating regulations and collaborating with various state agencies, businesses, and civil society stakeholders to execute the program effectively. Together with this, the CARB establishes an independent market analysis and watchdog group, whose mission is to evaluate the efficiency of the market's operation and offer the required safeguards without endangering it.

It is critical for Nigeria to establish an effective institutional framework with strong leadership that encourages greater participation of all relevant stakeholders in each stage of a trading program. To ensure that Nigeria's Cap-and-Trade market functions effectively, a robust monitoring and surveillance system through an independent body is required to understand market behaviour, oversee market activities, and identify market abuse. Thus, it is my recommendation that experts be drawn from the ministries responsible for trade, the environment, and the Securities and Exchange Commission to sit on the independent body whose mandate is to oversee market activities.

4.2.5. **Establish Reliable Funding Sources**

California has utilised an innovative approach to generating revenue to support its GHG emissions reduction target. By providing free allowances to utilities and then selling these allowances through consignment auctions, the state generates a solid revenue stream to fund Programs under *AB 32* and to minimize the increase in costs for disadvantaged communities. Instituting a Program implementation fee by CARB

allows the state to have sufficient funds to directly support its development, administration, and enforcement of *AB 32* programs.

In the case of Nigeria, utility companies may receive free emissions allowances initially to help manage costs and prevent a sudden increase in energy prices, which can burden consumers, particularly those in disadvantaged communities. Additionally, sell the free allowances through consignment auctions. The utilities could also be permitted to auction these allowances, and the proceeds can be used to fund climate and energy programs. This approach generates a consistent revenue stream while maintaining incentives for utilities to reduce emissions. Lastly, it may allocate a significant portion of the auction revenue to support programs in disadvantaged communities. This can include funding for renewable energy projects, energy efficiency improvements, and public health initiatives, ensuring that vulnerable populations benefit from the revenue helps address social equity concerns.

4.2.6. **Clearly Define Program Parameters**

The Californian cap-and-trade program, clearly defines the sources of GHG emissions as well as the parties responsible for controlling the emissions. The scheme covers entities responsible for the generation of emissions, processing of emissions, stationary combustion emissions, vented emissions as well as importers of electricity and suppliers of natural gas, distillate fuel oil and liquefied petroleum gas.[240] The emission-based rather than end-use-based point of regulation helps effectively control emissions without unnecessarily broadening the target and increasing the costs of compliance.

[240] § 95811 title 17, California Code of Regulations (CCR)

Flowing from the foregoing, Nigeria should define the sectors and sources of emissions that will be covered under the cap-and-trade program. Nigeria's NDC already establishes that the energy sector is one of the highest emitting sectors; thus, it is recommended that it should be one of the covered sectors. Secondly, focus should be on emissions at the point of generation or processing rather than end-use to ensure that the entities with the greatest control over emissions are the ones regulated, leading to more efficient and effective emissions reductions.

Thus, by setting clear boundaries, targeting the appropriate entities, focusing on emissions at the point of generation, and supporting compliance through robust MRV systems and stakeholder engagement, Nigeria can develop an effective cap-and-trade program that controls GHG emissions efficiently without imposing undue burdens on the economy.

4.2.7. Develop Effective Allocation Strategies

Industries that are at a competitive disadvantage in California's cap-and-trade program have received vital support through free allowances. This means that these industries can now compete on an even playing field against out-of-state emitters who are exempt from emissions regulations. To fund utility-managed greenhouse gas reduction programs, California has also implemented an efficient strategy that involves providing utilities with free allowances and requiring them to sell them. In addition, California has utilised a combination of product-based and energy-based methodologies to allocate allowances.

However, allocations which rely upon historical emissions resulting from an existing fossil fuel-intensive structure could generate excessive allowances that are detrimental to the healthy operation of a cap-and-trade program. The problem of over-supply of allowances is a lesson learned from the EU ETS. California is now facing a similar issue where abatement from complementary measures such as the Renewable Portfolio Standard and the Low Carbon Fuel Standard will reduce demand for allowances below the state's projections, thus bringing down auction prices. This could also become a significant issue for Nigeria if there is a heavy reliance on grandfathering.

Despite the obvious benefit of adopting the product-based intensity benchmarking that both the Californian cap-and-trade scheme and the EU ETS utilise to allocate allowances, Nigeria will need access to adequate and reliable data to do the same. This again raises the importance of a GHG inventory, which has been identified as a major challenge for Nigeria. Both California and the EU have faced great difficulties in collecting data to define relevant product categories and determine proper benchmarks.[241]

4.2.8. Design Mechanisms to Minimize Impacts and Create Flexibility

Just like in California, Nigeria should implement measures to reduce the risks to which its economy would be exposed and to provide covered entities more flexibility in complying with the regulations. First, the introduction of emissions sources into the scheme should be done gradually. California began with power generators, importers,

[241] Relevant work in California and EU can be seen at: http://www.arb.ca.gov/regact/2010/capandtrade10/candtappb.pdf and http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011D

and major industrial sources and two years later, it expanded to include distributors of transportation, natural gas, and other fuels.

The gradual implementation of the cap-and-trade program helps to minimize its impact on the economy and gives other organizations time to get ready to take part in the program. Additionally, Nigeria should take a cue from California by dividing the program into separate three-year compliance periods with a partial annual compliance obligation. This allows time and flexibility for entities covered to buffer annual variations in product output. It should be noted that in California, covered entities are allowed to purchase future allowances through advance auctions and to bank unused allowances. These measures help the businesses involved to hedge against potential risks in the forms of allowance supply shortage and/or price hike.

Although it is understandable that for a pilot initiative, Nigeria may favor a less complicated scheme that could ease implementation, giving time and flexibility. The ability to hedge potential risks could also increase the implementation success rate.

4.2.9. Build a Strong System for Enforcement

Enforcement is perhaps the most important part of a cap-and-trade program. To safeguard the success of its Program, Nigeria should take strong actions related to enforcement, which include mandatory reporting, creating a centralised market tracking system, putting in place a powerful penalty for non-compliance, and creating an independent market watchdog and oversight body. In California, CARB has been actively working with various federal law enforcement agencies to watch trading activities, internet security, and market rules compliance.

Nigeria may adopt California's approach of setting the penalty for breach at four times an entity's "excess emissions". Furthermore, accurate emission reporting is vital for the cap-and-trade program. Thus, Nigeria's penalty for misreporting should be stringent.

Summary

Despite the aforementioned institutional challenges, a cap-and-trade program can thrive in Nigeria. An assessment of the California cap-and-trade program reveals that it is not a perfect system. Thus, what Nigeria needs is not a perfect system *ab initio* but a working system. The literature on emissions trading schemes reveals that conditions must not necessarily be ripe for trading before the policy is deployed.[242]

What is more, setting up an emissions trading scheme is not a walk in the park. At least it was not so for California or the European Union. As a researcher puts it:

> The problems that are likely to be encountered in setting up a cap-and-trade system should not be minimized. Institutionally, the Member States of the European Union must be considered more prepared and capable of implementing such a system than many of the prospective participants in a global system. Yet, there was no end of difficulties in setting up the system in Europe…and most of the East European governments required more time to set up the requisite infrastructure for trading and enforcement. Poland's registry did not go on line until eighteen months after the start of the EU ETS; and Romania and Bulgaria, who became participants in the trial period in its last year, did not have everything in place in time to participate effectively in trading in 2007.[243]

If the solutions proferred to the challenges identified in this paper are followed, along with the recommendations, then Nigeria will be on its way to setting up a successful cap-and-trade program.

---

[242] Akinwande, Gbenga, "*Emissions Trading: A Policy Option for Fighting Climate Change in Africa*" (2013). Electronic Thesis and Dissertation Repository. 1662. https://ir.lib.uwo.ca/etd/1662

[243] Denny Ellerman, "*The EU Emissions Trading Scheme: A Prototype Global System?*" 1 at 5-6, online: <http://belfercenter.ksg.harvard.edu/files/Ellerman11.pdf>.

Section 5

Conclusion

As I draw the curtain on this project, I am reminded of the more than 2,000 people that have been displaced in Eti-Osa Local Government Area in southern Lagos State, due to flooding in the month of June.[244] These are not just numbers but people with dreams and aspirations. Unfortunately, this may just be the beginning of a morbid climate apocalypse if climate change mitigation and adaptation are not brought to the fore of Nigeria's sustainable development agenda.

The task of climate change mitigation and adaptation are by no means cheap, and with Nigeria servicing its external debts with 90 percent of its revenue, all hopes for public sector climate financing look bleak. Thus, this project has identified the innovative role of carbon market in mobilizing climate finance for Nigeria's climate transformation initiative. Leaning on the experience of California with its cap-and-trade program, this project finds that a well designed carbon market will bridge the climate finance gap in Nigeria. This is especially so as global carbon pricing revenues in 2023 exceeded USD 100 billion for the first time.

Through a comparative analysis of the California cap-and-trade program and Nigeria's local context, it is my finding that effective laws and regulations are important in designing a similar program in Nigeria. These regulations help to mitigate potential abuses and broader risks to environmental integrity and economic efficiency that may emerge in the design and implementation of the program. These regulations are also central to the effective governance of the program. Empirical

[244] Nigeria - *Floods and cholera outbreak* (DG ECHO Partners, NOAA CPC, media) (ECHO Daily Flash of 18 June 2024) (https://reliefweb.int/report/nigeria/nigeria-floods-and-cholera-outbreak-dg-echo-partners-noaa-cpc-media-echo-daily-flash-18-june-2024)

research has revealed that perceptions of weak governance coincide with weaker climate policies.[245] Investigating the political economy of carbon pricing — including, specifically, emissions trading — another empirical study of 167 national and 95 subnational jurisdictions identified well-governed institutions as one of two conditions for successful implementation.[246] In particular, this project finds that three governance indicators — perception of corruption, lack of technical capacity, and the absence of independent institutions — militates against a cap-and-trade program in Nigeria, and also have a bearing on the level of the carbon price in other jurisdictions. Public trust in governments has likewise been shown to correlate positively with carbon pricing levels.[247]

The foregoing informs my recommendations in this project on what Nigeria should put in place to ensure the success of a cap-and-trade program:

i. An interdisciplinary independent regulatory body with rule making powers. This will ensure the creation of a robust monitoring and surveillance system to understand market behaviour, oversee market activities, and identify market abuse. Furthermore, in view of the expert nature of a cap-and-trade program and the complexity in administering same, it is recommended that there should be a curial deference that is based on a reasonableness standard rather than correctness standard for this body's decisions.

---

[245] Rafaty, Ryan, *Perceptions of Corruption, Political Distrust, and the Weakening of Climate Policy* (May 7, 2018). Global Environmental Politics, Vol. 18, No. 3, 2018, Available at SSRN: https://ssrn.com/abstract=3175064 or http://dx.doi.org/10.2139/ssrn.3175064

[246] Sebastian Levi, Christian Flachsland, Michael Jakob; *Political Economy Determinants of Carbon Pricing*. Global Environmental Politics 2020; 20 (2): 128–156. doi: https://doi.org/10.1162/glep_a_00549

[247] Klenert, David & Mattauch, Linus & Combet, Emmanuel & Edenhofer, Ottmar & Hepburn, Cameron & Rafaty, Ryan & Stern, Nicholas. (2018). *Making carbon pricing work for citizens*. Nature Climate Change. 8. 10.1038/s41558-018-0201-2.

ii. On the issue of corruption, this project recommends that public participation in the program be allowed at the pilot phase. Public inputs on what the emissions cap should be and public access to data on trades, violations and actual emissions will enhance the credibility of the program. Evaluation of compliance by rights groups should be factored into the implementation design.

iii. On technical capacity, this project finds that the absence of a national GHG inventory is paradigmatic of this technical incapacity. Thus, this project recommends a legislative framework for greenhouse gas reporting in Nigeria, training assessors in the reporting guidelines of the IPCC and on inventory standards, and where possible, consultants should be brought in where local capacity is currently lacking.

While this project does not pretend to answer all the issues that a carbon market throws up, I believe that my position in this project comports with my intention — and hope — that the array of issues and matters raised in this project will stimulate a robust debate that will be integrated within the existing discussion about the right climate policy architecture for Nigeria and even sub-Saharan Africa. The goal of this project is to guide Nigeria in doing the hard job of designing a carbon market and by drawing on the California experience, my research fosters international collaboration and knowledge exchange, emphasizing the interconnectedness of climate challenges and the importance of shared solutions.

Bibliography

LEGISLATION

California Assembly Bill 1532

California Assembly Bill 398

California Global Warming Solutions Act of 2006

California Health and Safety Code, ch 488

California Senate Bill 1018 (SB 1018)

California Senate Bill 535(SB 535)

Climate Change Act, 2021

The Constitution of the Federal Republic of Nigeria, 1999

The Constitution of the United States of America, As Amended

United States' Global Climate Protection Act of 1987

SUBSIDIARY LEGISLATION

California Executive Order B-55-18

Regulation for the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms

Regulation for the Mandatory Reporting of Greenhouse Gas Emissions 17 Cal. Code Regs

JURISPRUDENCE

Cases: Nigeria

A.-G of Ogun State v. Aberuagba (1985) NWLR (Pt.3) 395

A.-G of the Federation v The A.-G of Lagos State16 NWLR (Pt 1380) 249

A-G Abia State & 2 ors v. A.-G Federation & ors (2006) 16 NWLR (pt. 1005) 265 A-

A-G Abia State & 2 ors v. A-G Federation & ors (2002) 6 NWLR (pt. 764) 542

A-G Lagos State v. A.-G., Federation (2003) 12 NWLR (Pt. 833)

Balonwu v. Obi (2007) 5 NWLR (Pt. 1028) 488

Military Governor of Ondo State & Anor v. Victor Adegoke Adewumo (1988) 6 SCNJ 151

Nigerian Soft Drinks v A.-G Lagos State (1987) 2 NWLR (pt. 57) 444

Olaleye-Ote vs. Babalola (2012) 14 NWLR (Pt.1279) 574

UAC of Nigeria Plc & Ors. v. A.-G of Lagos State & Ors. (2010) LPELR-5038(CA)

Cases: United States of America, and California

Alden v. Maine, 527 U.S. 706, 713–14 (1999)

Cal. Chamber of Commerce v. State Air Res. Bd., 10 Cal. App. 5th 604, 649 (2017)

Citizens Climate Lobby v. Cal. Air Res. Bd., No. CGC-12-519554, 2013 WL 861396, at *2 (Cal. Super. Ct. Jan. 25, 2013).

Georgia v. Tennessee Copper Co., 206 U.S. 230, 327 (1907)

H.P. Hood & Sons Inc. v. DuMond, 336 U.S. 525, 531 (1949)

Hunt v. Wash. Apple Adver. Comm'n, 432 U.S. 333, 349–50 (1977)

Huron Portland Cement Co. v. City of Detroit, 360 U.S. 440, 442–43 (1960)

Massachusetts v. EPA, 549 U.S. 497, 519–20 (2007)

Philadelphia v. New Jersey, 437 U.S. 617, 622 (1978)

Rocky Mountain Farmers Union v. Corey, 730 F.3d 1070, 1107 (9th Cir. 2013)

Tennessee Copper Co., 206 U.S. at 237

United Haulers Ass'n v. Oneida-Herkimer Solid Waste Mgmt. Auth., 550 U.S. 330, 337 (2007)

United States of America v. State of California et al., Case 2:19-cv-02142-WBS-EFB (E.D. CA. 10/23/2019)

United States v. California, 444 F. Supp. 3d 1181 (E.D. Cal. 2020)

TREATIES, AGREEMENTS AND CONVENTIONS

Agreement Between the California Air Resources Board and the Gouvernement du Québec Concerning the Harmonization and Integration of Capand-Trade Programs for Reducing Greenhouse Gas Emissions, CA-QC (2013)

The Paris Agreement 2015

United Nations Framework Convention on Climate Change of 1992 (UNFCCC)

SECONDARY MATERIALS: MONOGRAPHS

A Jordan, D. Huitema, H. van Asselt, & J. Forster (Eds.), *Governing Climate Change: Polycentricity in Action?* (Cambridge University Press, 2018)

Alan Watson, *Legal Transplants* (Edinburgh: Scottish Academic Press Ltd, 1974)

Betz, R., Michaelowa, A., Castro, P., et al., *The Carbon Market Challenge: Preventing Abuse Through Effective Governance* (Cambridge University Press, 2022)

Erwin Chemerinsky, *Constitutional Law: Principles and Policies* (3d ed. 2006)

Roger W Findley & Daniel A Farber, *Cases and Materials on Environmental Law*, 4th ed (St Paul, Minn: West Group, 1985)

T. H. Tietenberg, *Emissions Trading: Principles and Practice* (Washington, D.C.: RFF Press, 2006)

SECONDARY MATERIALS: ARTICLES

Ahonen, H.-M., Kessler, J., Michaelowa, A., Espelage, A., & Hoch, S. (2022). *Governance of Fragmented Compliance And Voluntary Carbon Markets Under The Paris Agreement. Politics and Governance*, 10(1), 235–245.

Alex Wang, Daniel Carpenter-Gold & Andria So, "*Key Governance Issues in California's Carbon cap-and-trade program*" (1 May 2022), online: SSRN <https://ssrn.com/abstract=4119861>

M. Arnoldus, Roger Bymolt, & D. Guinan, "*Demystifying Carbon Markets: A Guide to Developing Carbon Credit Projects*" (2011) European Journal of Operational Research (EJOR)

Barbara Haya, Policy Brief: *The California Air Resources Board's US Forest Offset Protocol Underestimates Leakage* 1 (May 7, 2019),

<https://gspp.berkeley.edu/assets/uploads/research/pdf/Policy_Brief-US_Forest_Projects-Leakage-Haya_4.pdf>

Bo Shen et al, "*California's cap-and-trade Program and Insights for China's Pilot Schemes*" (2014) 25:3/4 Energy & Environment 551–575, online: JSTOR <http://www.jstor.org/stable/43735276>

Chios Carmody, "*WCI Cap-and-Trade: Overview and Cap*," in A Guide to Emissions Trading under the Western Climate Initiative, Centre for International Governance Innovation, 2019 online: JSTOR <http://www.jstor.org/stable/resrep24954.8>

Denny Ellerman, "*The EU Emissions Trading Scheme: A Prototype Global System?*" 1 at 5-6, online: <http://belfercenter.ksg.harvard.edu/files/Ellerman11.pdf>

Don Fullerton, "*Environmental Levies and Distortionary Taxation: Comment*" (1997) 87:1 Am Econ Rev 245

Geoff Martin & Eri Saikawa, *Effectiveness of State Climate And Energy Policies in Reducing Power-Sector CO2 Emissions*, 7 Nature Climate Change 912 (2017), <https://www.nature.com/articles/s41558-017-0001-0.pdf?origin=ppub>

N. Grubb, C. Azar, U. M. Persson, *Allowance allocation in the European emissions trading system: A commentary*. Clim. Pol. 5, 127–136 (2005).

Joseph E. Aldy et al., "Designing Climate Mitigation Policy" (2010) 48 J Econ Lit 903

King C. T. Duho & Bonou Senan Charlie Carine, "*Climate Finance and Carbon Pricing in the Context of Africa's Continental Free Trade Area*" (10 February 2021), online: OSF <https://osf.io/h3jdq>

Klenert, David & Mattauch, Linus & Combet, Emmanuel & Edenhofer, Ottmar & Hepburn, Cameron & Rafaty, Ryan & Stern, Nicholas. (2018). *Making carbon pricing work for citizen*s. Nature Climate Change.

A. Lans Bovenberg & Lawrence H. Goulder, "*Optimal Environmental Taxation in the Presence of Other Taxes: General-Equilibrium Analyses*" (1996) 86:4 Am Econ Rev 985

Lara Cushing et al., *Carbon trading, Co-Pollutants, and Environmental Equity: Evidence from California's cap-and-trade program (2011–2015)*, PLOS Med. (July 10, 2018) <https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002604>
Lawrence H. Goulder and Andrew R. Schein, "*Carbon Taxes Versus Cap-and-Trade: A Critical Review*" (2013) 4:3 Climate Change Economics 1–28, online: JSTOR <http://www.jstor.org/stable/climchanecon.4.3.02>

Lawrence H. Goulder, "*Environmental Taxation and the Double Dividend: A Reader's Guide*" (1995) 2:2 Int'l Tax & Pub Fin 157

Otali, M., & Monye, C., "*Implementation of Green Finance as a Catalyst for Green Infrastructure Development in Nigeria*."

Pablo Montero, "*Pollution Markets with Imperfectly Observed Emissions*" (2005) 36 Rand 645 at 657

Peter John Wood & Frank Jotzo, "*Price Floors for Emissions Trading*" (2011) 39:3 Energy Policy

Purdon, M., Houle, D., & Lachapelle, E. (2014). *The Political Economy of California and Québec's cap-and-trade programs*

Rafaty, Ryan, *Perceptions of Corruption, Political Distrust, and the Weakening of Climate Policy* (May 7, 2018). Global Environmental Politics, Vol. 18, No. 3, 2018, Available at SSRN: <https://ssrn.com/abstract=3175064>

Richard Best, Peter J. Burke, and Frank Jotzo, "*Carbon Pricing Efficacy: Cross-Country Evidence*," Environ Resource Econ 77 (2020): doi:10.1007/s10640-020-00436-x

Robert Sanders, *California's Cap-and-Trade air Quality Benefits Go Mostly out of State, Berkeley News (July 10, 2018)*, <https://news.berkeley.edu/2018/07/10/californias-cap-and-trade-air-quality-benefitsgo-mostly-out-of-state/>

Robert V Percival, *The Frictions of Federalism: The Rise and Fall of the Federal Common Law of Interstate Nuisance* (University of Maryland, Public Law Research Paper No 2003-02, 2003), online: SSRN <https://ssrn.com/abstract=452922>

R. Sacco, "*Legal Formants: A Dynamic Approach to Comparative Law (II)*" (1991) 39 Am J Comp L 398

Sebastian Levi, Christian Flachsland, Michael Jakob; *Political Economy Determinants of Carbon Pricing*. Global Environmental Politics 2020; 20 (2): 128–156. doi: <https://doi.org/10.1162/glep_a_00549>

Thomas Alcorn, *The Constitutionality of California's cap-and-trade program and Recommendations for Design of Future State Programs*, 3 Mich. J. Env't. & Admin. L. 87 (2013). Available at: <https://repository.law.umich.edu/mjeal/vol3/iss1/3>

Tom Tietenberg et al., *International Rules for Greenhouse Gas Emissions Trading, Defining the Principles, Modalities, Rules and Guidelines for Verification, Reporting and Accountability*, United Nations Conference on Trade and Development Secretariat, 1 at 27, online: <http://www.unctad.org/en/docs/pogdsgfsbm6.en.pdf>

Wang, Alex and Carpenter-Gold, Daniel and Shen, Siyi and So, Andria, *Emissions Trading in California: Lessons for China* (June 17, 2022). Available at SSRN: <https://ssrn.com/abstract=4139727>

SECONDARY MATERIALS: THESIS

Akinwande, Gbenga, "*Emissions Trading: A Policy Option for Fighting Climate Change in Africa*" (2013). Electronic Thesis and Dissertation Repository. 1662. <https://ir.lib.uwo.ca/etd/1662>

Patrick M. Bigger, "*Environmental Governance in the Carbon Economy: Regulating Greenhouse Gas Emissions in California's cap-and-trade program*" (2015) Theses and Dissertations--Geography, online: <https://uknowledge.uky.edu/geography_etds/32>

SECONDARY MATERIALS: REPORTS AND DEBATES

African Development Bank Group, Country Focus Report 2022, Nigeria: *Supporting Climate Resilience and a Just Energy Transition* (October 2022).

African Development Bank Group, *Country Focus Report 2023, Nigeria: Mobilizing Private Sector Financing for Climate and Green Growth* (October 2022)

African Development Bank, "*Challenges and Opportunities for Private Sector Involvement in NDC Implementation and Green Investment*" (2020), online: <www.afdb.org/sites/default/files/2020/06/24/factsheet_nigeria_en.pdf>

Assessment of Carbon Pricing Initiatives in Nigeria (2023) - <https://unfccc.int/sites/default/files/resource/Carbon%20Pricing%20Assessment%20in%20Nigeria.pdf>

Cal. Climate Investments, *Annual Report To The Legislature On California Climate Investments Using Cap-and-Trade Auction Proceeds*, (Apr. 2023), <https://ww2.arb.ca.gov/sites/default/files/auctionproceeds/cci_annual_report_2023.pdf>

California Air Resource Board (CARB), *Cap-and-Trade Auction Proceeds (2024)*, online: <https://ww2.arb.ca.gov/sites/default/files/2020-09/proceeds_summary.pdf>

California Air Resources Board (CARB), *Annual Report 2023*, online: CARB <https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/cci_annual_report_2023.pdf>

California Air Resources Board (CARB), C*ap and Trade Regulation Initial Statement of Reasons (ISOR), Appendix B: Leakage Risk Analysis for New and Modified Sectors, 2013* (Retrieved 20 May 2024), online: <http://www.arb.ca.gov/regact/2013/capandtrade13/capandtrade13isorappb.pdf.>

California Air Resources Board (CARB), Compliance Offset Program (2013), online: <http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm> (accessed on 20th May 2024)

CARB, *ARB Offset Credit Issuance Table* (2024), <https://ww2.arb.ca.gov/resources/documents/arb-offset-credit-issuance-table>

CARB, BR 18-51 *Cap-and-Trade Allowance Report* (2022). <https://ww2.arb.ca.gov/sites/default/files/cap-and-trade/Allowance%20Report_Reso18_51.pdf>

CARB, *Summary of California-Québec Joint Auction Settlement Prices and Results* (May 2024)

CARB, *Summary of Proceeds to California and Consigning Entities* (updated in Feb. 2024), <https://ww2.arb.ca.gov/sites/default/files/2024-02/nc-feb_2024_summary_results_report.pdf>

Carbon Market California - *A Comprehensive Analysis of the Golden State's cap-and-trade program. Year One: 2012-2013*. The complete report is available online at edf.org/california-cap-and-trade-updates

Climate Policy Initiative, *Landscape of Climate Finance in Nigeria* (2022)

Department of Climate Change, Federal Ministry of Environment, Nigeria, *2050 Long-Term Vision for Nigeria (LTV-2050) - Towards the Development of Nigeria's Long-Term Low Emissions Development Strategy* (LT-LEDS) (2021)

Development of EU ETS (2005-2020) Accessed <https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/development-eu-ets-2005-2020_en>

Env't Comm'r Ont., Ontario's Climate Act: From Plan to Progress – Appendix G: Technical Aspects of Oversupply in the WCI Market 2–4 (2018), <https://www.auditor.on.ca/en/content/reporttopics/envother/env17_other/From-Plan-to-Progress-Appendix-G.pdf.>

G7 Climate, Energy and Environment Ministers' Communiqué, 27 May 2022

ICAP, *Emissions Trading Worldwide: Status Report 2023* (Berlin: International Carbon Action Partnership, 2023)

IPCC, Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, eds. H.-O. Pörtner et al. (Cambridge, UK & New York, NY, USA: Cambridge University Press, 2022), online: Cambridge University Press doi:10.1017/9781009325844

IPCC, Summary for Policymakers. In: *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. Core Writing Team, H. Lee & J. Romero (Geneva: IPCC, 2023), 1-34, online: IPCC doi:10.59327/IPCC/AR6-9789291691647.001.

LAO, *Cap-and-Trade Extension: Issues for Legislative Oversight* (2017), <https://lao.ca.gov/Publications/Report/3719>

LAO, The cap-and-trade program: Issues for Legislative Consideration (2024), <https://lao.ca.gov/handouts/resources/2024/Cap-and-Trade-Issues-021324.pdf>

LAO, *The cap-and-trade program: Issues for Legislative Consideration* (2024), <https://lao.ca.gov/handouts/resources/2024/Cap-and-Trade-Issues-021324.pdf>

MRR Enforcement Activities, CARB, <https://ww2.arb.ca.gov/our-work/programs/enforcement-policy-reports/enforcement-case-settlements> (last visited 20th May, 2024)

Nigeria, *National Climate Change Policy for Nigeria 2021-2030* (2021)

Nigeria, Nigeria Energy Transition Plan - *Nigeria's Pathway to Achieve Carbon Neutrality by 2060* (online: Nigeria Energy Transition, 2021) <https://energytransition.gov.ng/.>

Nigeria, *Nigeria's First Nationally Determined Contribution - 2021 Update* (2022), online: UNFCCC <https://unfccc.int/sites/default/files/NDC/2022-06/NDC_File%20Amended%20_11222.pdf.>

Regulatory Guidance on Nigeria's Carbon Market Approach published by the National Council on Climate Change. Accessed <https://natccc.gov.ng/publications/NCCC%20Regulatory%20Guidance%20on%20Nigeria%E2%80%99s%20Carbon%20Market%20Approach.pdf>

Share of global greenhouse gas emissions accessed at <https://ourworldindata.org/grapher/share-global-ghg-emissions>

State of the Market Report, *The Nigerian Green Bond Market Development Program* (November 2019)

The Carbon Brief Profile: Nigeria (2023) accessed at <https://www.carbonbrief.org/the-carbon-brief-profile-nigeria/>

Transparency International Corruption Perceptions Index 2023. Available at <https://www.transparency.org/en/cpi/2023>

Understanding NDCs: Paris Agreement Climate Pledges, World Resources Institute, accessed April 29, 2024, <https://www.wri.org/insights/understanding-ndcs-paris-agreement-climate-pledges>

US EPA, *Tools of the Trade: A Guide to Designing and Operating a Cap and Trade Program for Pollution Control* (2003)

World Bank, *State and Trends of Carbon Pricing 2022* (Washington, DC: World Bank, 2022), online: World Bank <http://hdl.handle.net/10986/37455>

World Meteorological Organization, *State of the Climate in Africa 2022* (Geneva: World Meteorological Organization, 2023), online: World Meteorological Organization <https://library.wmo.int/doc_num.php?explnum_id=11211>

SECONDARY MATERIALS: ONLINE SOURCES

"*Nigeria has unpaid gas royalty of $559.8 million, unpaid gas flare penalty of $828.8 million – NEITI*" <https://nairametrics.com/2023/11/14/nigeria-has-unpaid-gas-royalty-of-559-8-million-unpaid-gas-flare-penalty-of-828-8-million-neiti/>

Nigeria - Floods and cholera outbreak (DG ECHO Partners, NOAA CPC, media) (ECHO Daily Flash of 18 June 2024) <https://reliefweb.int/report/nigeria/nigeria-floods-and-cholera-outbreak-dg-echo-partners-noaa-cpc-media-echo-daily-flash-18-june-2024>

Onyinye Nwachukwu, "NSIA, Vitol to Commit $50m to Climate Solutions in Nigeria" (2022) BusinessDay, online: BusinessDay <https://businessday.ng/news/article/nsia-vitol-to-commit-50m-to-climate-solutions-in-nigeria/.>

OTHER

Bronowski, Jacob (1965). *The Identity of Man*. Amherst, N.Y.: Prometheus Books.