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Navigating a trilemma: Energy security, equity, and sustainability in the Philippines' low-carbon transition

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ABSTRACT

Nearly a decade after the Philippines began promoting renewable energy through legislation, the country has seen gains and encountered roadblocks in its transition to low carbon. This paper examines the Philippines' experience in attempting to escape conditions of lock-in and path dependency on fossil fuels, and attempting a governed transition to low-carbon energy sources. The Philippines is a developing country with substantial economic growth aspirations, yet it is among the most vulnerable to climate change, so it has great interest in mitigating global carbon emissions. Yet, the country itself is heavily dependent on imported coal for its energy needs. In the context of its existing regulatory and techno-institutional landscape, the authors examine the Philippine experience in governing its energy transition. The paper discusses challenges in balancing the trilemma of energy security, equity, and sustainability. It then identifies some priorities for the Philippines as it attempts to move away from fossil fuel dependency and accelerate its transition towards low-carbon energy. The authors consider developments beyond the energy sector, particularly the early entry-into-force of the Paris Agreement, as a tool to favor the trilemma's sustainability pillar. The Philippine case may provide lessons for other developing countries undergoing their own transitions.

1. Introduction

Scholars like Sovacool, Kern and Rogge posit that future energy transitions can take place much faster than past ones, which were largely left to market forces and, consequently, dependent on the pace of technological innovations [1–3]. 'Historical' [2] or 'emergent' [3] transitions were generally driven by opportunities for economic gain. In contrast, future transitions could be driven by global problems that need addressing, like climate change and resource scarcity [2,3]. To meet these challenges, countries envision an energy future, then enact policies and legislation to realize that vision. This way, countries try to govern their transitions. A country's active management of energy transition through laws, policies, and incentives that shape markets helps accelerate the pace of these transitions [2,4]. This paper examines the Philippines' experience in attempting to govern its energy transition to accommodate low-carbon sources in its energy mix. Specifically, the paper tackles questions that have spurred intense debates in various policy fora within the Philippine energy sector: "What key challenges does the Philippines, a rapidly growing nation, face as it attempts to transition to a low-carbon future? What low-hanging opportunities and policy levers can decision makers prioritize to minimize impediments to reaching the country's energy security and equity goals, as it plans its low-carbon transition?"

This section sets the context and provides a background on the Philippines; Section 2 describes the research method; Section 3 lays down the Philippine regulatory framework for energy and discusses the techno-institutional complex and path dependencies that policymakers must contend with in formulating transition policies; Section 4 discusses challenges the Philippines has encountered in prioritizing the energy trilemma's sustainability pillar and shifting its energy landscape to accommodate renewables; Section 5 discusses opportunities for the future of Philippine energy policy and identifies key priorities in managing the transition; and Section 6 provides a brief conclusion.

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1.1. The Philippines

The Philippines is an archipelago of 7,641 islands in the Western Pacific [5], with a population of 100.98 million as of August 2015 [6]. Its population grows at an average of 1.85% annually [7], higher than the world average of 1.182% [8]. It is currently a lower middle-income country [9,10]; however, it has been one of the fastest growing economies in Asia [11,12]. Over the past six years, the Philippine economy grew by an average of 6.2%, with growth expected to continue at 6.5–7.5% in 2017 [13]. The Asian Development Bank expects the Philippines to graduate into an upper middle-income country by 2020 [14].

To support the growing population and economy, the Philippine Department of Energy (DOE) anticipates the need for a total installed capacity addition of 43,765 megawatts (MW) by 2040, with 24,385 MW for Luzon, 9180 MW for Visayas, and 10,200 MW for Mindanao [15]. As of June 2016, the Philippines' installed capacity was 20,055 MW, of which 33.99% was from renewable energy, 33.24% was from coal, 18.8% was from oil, and 14.32% was from natural gas. However, gross generation figures show that coal generated 46%; renewable energy, 24%; natural gas, 24%; and oil, 6% [16]. In governing its energy transition, the Philippines aims to increase the share of renewables in its energy mix.

1.2. Climate vulnerability

As an archipelago in the Western Pacific Ocean, the Philippines lies within the typhoon belt and the Pacific ring of fire [10,19]. It is especially vulnerable to extreme weather events such as typhoons, floods, and rising sea levels [20,21]. The Global Climate Risk Index 2017 ranks the Philippines as the world's fifth most affected by extreme weather events and other natural hazards like earthquakes [22], even while global average temperature increase is still at +1 °C above pre-industrial levels. In the last decade, for example, record-breaking tropical cyclones like Super-typhoon Haiyan have devastated the country, resulting in substantial losses of life and property and affecting the country's productivity [19]. Moreover, the Intergovernmental Panel on Climate Change (IPCC) predicts that more intense and more frequent precipitation events will result from an increase in global mean surface temperature, especially in the tropics [23]. Thus, the Philippines cannot afford to ignore climate change despite its substantial economic growth aspirations. It must include climate considerations in developing its national energy and economic development policy agenda [24].

However, as Silveira and Johnson suggest, "[t]he global transition to an environmentally sustainable economy will require radical re-organization in the structure of energy systems [25]." Since energy production and consumption are substantial sources of greenhouse gases, contributing about 65% of global emissions [26], energy policy changes are critical to achieving environmental sustainability. "Energy is at the heart of the problem and so must be integral to the solutions [27]." In light of these, the Philippines has been attempting to transition its energy system to low carbon. This paper studies the Philippine experience in this effort.

2. Methods

Mixed methods were used to gather data for this study. Data was collected from both written and oral sources using archival research, desktop reviews, key informant interviews, expert workshops, and a multi-stakeholder policy dialogue.

The research team conducted an extensive literature review on energy policy and governance and held key informant interviews, supplemented by archival data collection of official government records, throughout a six-month research period, from May to October 2016. Desk-based research was conducted on the current regulatory framework for energy, supplemented by validation interviews with selected high-level officials involved in national policy planning and implementation. The team conducted a total of 28 interviews with key officials from fourteen national government offices, three international organizations with development cooperation projects in the Philippines, and two development specialists with expertise on the Philippines, *viz* (Table 1).

Table 1
Research Participants.

National government offices	
1. DOE Office of the Undersecretary	2
2. DOE Energy Policy and Planning Bureau	2
3. DOE Electric Power Industry Management Bureau	2
4. DOE Renewable Energy Management Bureau	1
5. National Renewable Energy Board	1
6. Energy Regulatory Commission	2
7. Climate Change Commission	4
8. Senate	2
9. House of Representatives	2
10. Office of the President	1
11. Department of Transport	1
12. Department of Environment and Natural Resources (DENR) Office of the Undersecretary	1
13. DENR Environmental Management Bureau	1
14. DENR Climate Change Office	1
International organizations	3
Development specialists	2

Research participants were identified by selecting government agencies involved in the formulation, planning, and implementation of energy and climate policies at the national level. Thereafter, a snowball method was employed, with the research team interviewing specialists and other resource persons recommended by research participants.

Most of the persons contacted agreed to be interviewed, and the interviews were completed over four months. The interviews employed an initial, semi-structured portion involving a series of relatively standard questions about current energy and climate policies and those that were being discussed or planned, followed by an unstructured, open-ended segment where research participants were invited to speak freely about the challenges they encountered in energy and climate policy planning and implementation in general, and in handling energy transition in particular.

Findings from the study were presented and extensively validated in expert workshops on September 5 and 6, 2016, attended by representatives from the private sector (representing both fossil fuels and renewables), from government/regulatory agencies, and from aid agencies involved in the formulation of climate change mitigation plans for the Philippines (*e.g.*, USAID-Building Low Emission Alternatives to Develop Economic Resilience and Sustainability (B-LEADERS) Project). This was capped by a high-level multi-stakeholder policy dialogue with representatives from the legislative and executive departments, the private sector, civil society organizations, and the academe. Inputs gathered from the expert workshops and policy dialogue were incorporated into this study.

In addition, the paper also relies on appropriate scientific literature, data provided by relevant government agencies, results of studies commissioned by government agencies and international organizations, information provided by industry association reports, and data from veteran negotiators for the Philippines in the international climate negotiations.

3. Regulatory and techno-institutional landscapes

Regulatory and techno-institutional landscapes can result in path-dependency or lock-in. This means that the extant architecturally-linked systems of laws, technologies, and institutions that allow energy to be produced, and transported to consumers seamlessly, create "systemic market and policy barriers to alternatives [28]: 818." In other