Energy transitions: The role of institutions and market structures

By Roula Inglesi-Lotz

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Many studies indicate that the root causes of climate change are mostly human activities. The 2021 Intergovernmental Panel on Climate Change (IPCC) report warns that many of these climate changes are already irreversible. But there's still hope. The message of the IPCC report is crystal clear: we have to raise the ambition level of mitigation.

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This means that drastic changes are needed to mitigate environmental degradation. These are radical structural changes that will accelerate the fight against climate change. It's clear from the IPCC report that time is not on humanity's side.

When policymakers discuss and promote the just energy transition, they do so within each country's institutional characteristics. The just energy transition refers to the move from fossil fuels to cleaner alternatives with the minimum negative consequences for society and the economy.

Economies with better quality institutions do better in managing the transition. This is because these institutions can, among other things, encourage innovation and efficient allocation of resources.

The question that I pose here is how institutional quality and market structures influence the energy transitions, within all the interactions in the economic and ecological systems.

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The International Renewable Energy Agency defines energy transition as:

> *a pathway toward transformation of the global energy sector from fossil-based to zero-carbon by the second half of this century.*

Measuring the progress of clean energy transition is not an easy task. The complexities of the phenomenon are considerable.

Our research paper shows that the choice of a renewable energy indicator might alter the results when examining the impact on carbon emissions. In turn this might impact policy suggestions.

The *Fostering Effective Energy Transition 2021* report shows that 92 out of 115 countries increased their energy transition index over the last decade. But only 13 showed consistent improvement over the period. This was defined as consistently above average performance improvements on the index. These include Denmark, Finland and the UK, which owe their improvements to:

> *a stable regulatory environment, diversified energy mix and cost-reflective energy pricing.*

Countries with rising energy demand registered the largest gains. These included China, India and sub-Saharan African nations. But their energy transition index scores remain low in absolute terms.

What matters

A recent literature review shows there is a plethora of determinants of renewable energy adoption globally. There is no consensus on the quantitative factors and their magnitude. But there is agreement on the following:

- Support policies and programmes as well as international commitments and agreements have positive effect. An example is the Kyoto Protocol.
- Lobbying pressure from traditional and pre-existing energy sources has a negative effect.
- The development and expansion of a local financial sector, and the quality of institutions, have a mostly positive influence.

In addition, the International Renewable Energy Agency notes that the energy transition to renewable energies will be enabled by information technology, smart technology, policy frameworks and market instruments.

Therefore, it is technology and institutional and market conditions that stand out. Some of my research has already made some contribution to understanding how innovation and technology in its various aspects and outcomes interact with the natural environment and energy.

The concept of institutions is widely used in the literature. But it's a multi-faceted one. It is less understood as it lacks tangibility. However, economist Douglas North has given a comprehensive but still straightforward definition:

> *… the formal and informal rules of the game and their enforcement characteristics.*

Then there's the quality of institutions. Economist Allard Bruinshoofd says institutional quality consists of the following dimensions:

- Voice and accountability. This captures the extent to which a country's citizens can select and challenge its government, thus limiting executive power.
- Political stability and absence of violence. The lower the probability of political instability or politically-motivated violence, the more a country's citizens are incentivised to invest in their own prosperous future.
- Government effectiveness. This refers to capturing the quality of public services and the degree of its independence from political pressures. In turn this fosters a benign context for private investment.
- Regulatory quality. This refers to the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. This lays down uniform rules of economic engagement.
- Rule of law. This captures particularly the quality of contract enforcement, property rights, the police, and the courts (that is, the enforcement of the rules of society).
- Control of corruption. The stronger the controls on corruption, the more economic success as a function of effort and competence, rather than connections and bribery.
- Ease of doing business. This captures a multitude of aspects that determine the extent to which the regulatory environment is conducive to business operations.

Policymakers internationally are in pursuit of sustainable solutions for the environmental crisis. The value of good governance should be seen as the first and main tool for achieving climate change mitigation. Part of the literature considers the energy transition's regulatory context, stressing the need for public intervention to promote renewable energy use.

Research has found that renewable energy projects, like any other investment, benefit from general political stability, sound regulatory frameworks, effective governance and secure property rights.

In addition, investment in renewable energy projects can be held back by complex and lengthy bureaucratic procedures and corruption.

Designing an appropriate market structure for a country plays a major role in the performance of the energy sector. It affects decisions and policy implementation on prices, efficiency, supply and innovation. Governance mechanisms play a direct role in market structures, influencing investment decisions. Bad market structure designs and policy decisions may increase the costs of the sector unnecessarily. They can also impact negatively on the welfare of consumers.

The South African economy is no exception. It also faces the challenge of balancing economic growth and minimising environmental degradation.

Conclusion

In general, energy transitions have focused on energy technologies, in particular their use in combination to minimise costs. Social foundations and human behaviours are also important components for the future sustainability of the planet. Within this, the rules of the game (institutions) can set ours – and future – generations up for success or failure.

This article is drawn from the author's inaugural lecture, International energy transitions and the role of institutions and market structures, at the University of Pretoria on 31 August 2021.

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