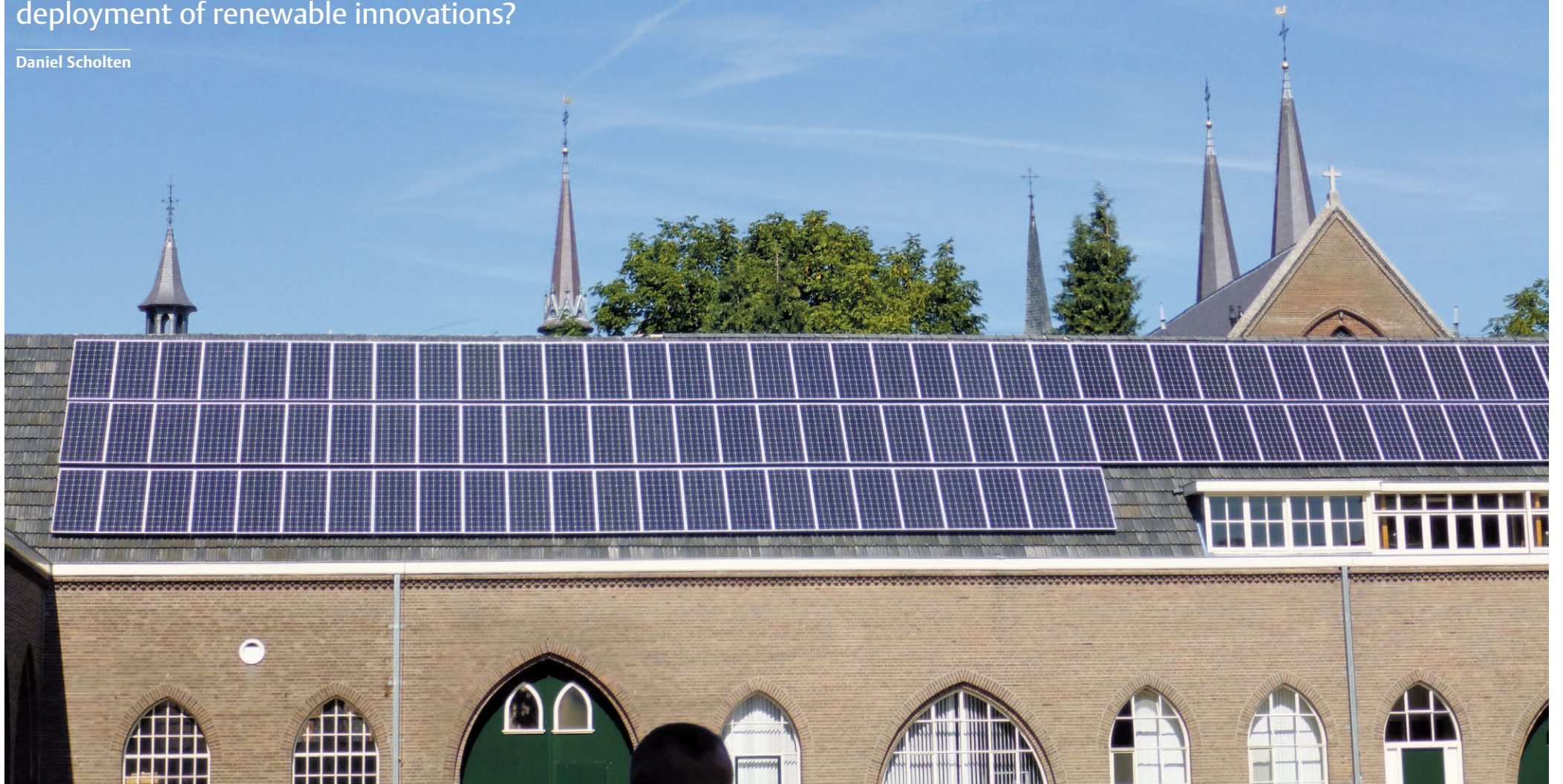


The governance perspectives behind renewables

Increasing fossil fuel scarcity and deteriorating environmental conditions call for a transition towards the use of sustainable energy sources. Policy makers of various countries, however, respond very differently when it comes to the development and deployment of renewable energy technologies. Whereas some countries leave the creation and diffusion of renewables to market forces and private actors, governments of other countries take a strong leading role in technical innovation. As a result of these differences, countries experience rather divergent processes of renewable development and deployment, also reaping different results. Hence we arrive at an intriguing question: what are the consequences of different energy transition governance perspectives on the development and deployment of renewable innovations?

Daniel Scholten



UNFORTUNATELY, ANSWERING THIS QUESTION is not as simple as it seems. Challenges to establishing 'causality', and performing 'comparisons', hinder generalizations about the relationship between governance perspectives and renewable innovation processes. Regarding 'causality', it is not easy to prove the influence of energy institutions on energy outcomes. Frequently, a myriad of national peculiarities and particular circumstances may just as well account for the described outcomes. Regarding 'comparison', it is difficult to relate the diverse experiences of countries' energy governance efforts frequently depicted in in-depth case studies. The diversity of approaches used and actors and factors taken on board as explanatory variables tend to create highly context-specific accounts that hinder cross-country comparisons.

In light of these challenges, my contribution to this Focus section of *The Newsletter* proposes a possible means to study, in a comparative manner, the relationship between energy transition governance perspectives and renewable innovation processes of countries. Key in the effort is to develop definitions and classifications of governance perspectives and innovation processes that allow establishing valuable insights on their relationship, distinguish the meaningful differences among them, that are applicable to any country (allowing for many countries to be compared), and that may structure further research in this area. The hope is that, if many cases were investigated, certain patterns between governance perspectives and innovation processes may be found, indicating at least a degree of correlation, and perhaps even causality if the amount of cases allows particular circumstances of individual cases to be ruled out. Please allow me to briefly introduce here the main classifications I have in mind.

Energy transition governance perspectives

Energy transition governance perspectives represent the way countries pursue the development and deployment of renewables energy technologies. They embody the key assumptions, values and beliefs behind the 'proper way of doing things' concerning energy policy, reflect the distribution of power and responsibilities that shape energy

policy making and implementation, and are expressed in countries' particular formal and informal energy institutions and policy instruments. Generally, energy transition governance perspectives are differentiated along a public-private divide, between market forces and central coordination, more or less government intervention in the market, and between the nature of the actors involved (public or private) and their interaction (cooperative or competitive).¹

A convenient differentiation of perspectives has been presented by Hisschemöller et al. In their 2006 article they ask the question "What governs a transition to hydrogen?", and distinguish between four governance paradigms based on whether major actors in the governance of an energy transition to hydrogen collaborate or compete in either a public or market setting.² In the so-called 'governance by corporate business'-paradigm, the private sector has the knowledge and ability to develop and diffuse renewable technologies. In the 'governance by policy networking'-paradigm, the state helps private actors to jointly realize the public interest through formation and maintenance of policy networks. In the 'governance by challenge'-paradigm governments address rules, regulations, and privileges that stand in the way of innovations and interfere in markets to improve fair competition. Finally, in the 'governance by government'-paradigm, the government is expected to lead the development and diffusion of renewable technologies, albeit with support of private actors and society, in the name of safeguarding the public interest. Of course, these four categories represent ideal-types that help structure a debate on the effect of governance perspectives on renewable innovation processes. They are not meant to exclude the possibility of intermediary or other categories.

In this light, we might consider, for example, China as moving from 'governance by government' to a 'governance by challenge' perspective over the last decades (as part of its economic reforms), especially noting the principal-agent structure that seems to characterize the relationship between the State Energy Commission (which drafts strategies and makes decisions) and the State Energy Administration

(which oversees implementation) on the one hand, and state-owned enterprises (which possess expertise, manpower, finances, and considerable political influence) on the other.

The Netherlands, by contrast, balances between the 'governance as challenge' and 'governance as networking' perspectives. On the one hand, the Ministry of Economic Affairs, Agriculture and Innovation (in charge of energy policy), adheres to the credo 'the market where possible, the government where needed', leading to a regulatory approach wherein the energy chamber of the Dutch regulator NMa keeps an eye on market functioning and the introduction of renewables with regard to the EU's 20-20-20 targets. On the other hand, the new transition management framework seems to be centered upon the typical Dutch polder-model, with its transition platforms where businessmen, policy makers, and academics regularly gather to discuss the promotion of renewable energy technologies.

Renewable innovation processes

Renewable innovation processes refer to the development of renewable energy technologies and their deployment in the market place. To classify their nature, the literature on industrial life-cycles, wherein the growth of a technology from its emergence to its maturity in the market place is discussed, and theories on technological change and trajectories, which allow distinguishing variations in this process, provide good starting points. Accordingly, several aspects of innovation processes may be distinguished.

First, innovations may be radical or incremental in nature, i.e., renewable energy technologies may be complementary to existing energy technologies, which they optimize, or contain fundamentally new technologies that replace the existing dominant design. Second, innovations are continuously starting, breaking through, and optimized. The question is when technologies are intended for use or become usable: the short, medium, or long term? Third, the speed with which a new technology diffuses in the market place may be slow, normal, or fast. Fourth, innovations seldom come alone and develop in isolation. Usually, many compete for their use.

Above:
Solar panels added
to existing buildings
in the Netherlands.
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courtesy Creative
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Hence, how many renewable technologies is a country pursuing; does it have a narrow or broad focus? Fifth, what decides the success and direction of renewable innovations; is it market competition (consumer demand) or deliberate choice by powerful actors (politicians and industry incumbents)? Finally, the dominant actors in the innovation process may be vested interests or newcomers, public or private institutes and firms.

Focusing on these aspects, we may note some interesting differences between China and the Netherlands. China sees the introduction of renewables as the construction of a renewable energy industry required next to its fossil fuel industry to meet its ever growing energy demand. It tends to import existing renewable energy technologies to mass-produce them for immediate domestic use and exports. Overall, then, China focuses on technologies already further down their life-cycle, i.e., on short term product diffusion of immediately usable technologies.³ In general, we may also note that the diffusion of renewable energy has been very rapid and large-scale by any standard and that this holds for almost all renewables, be they solar, wind, hydro, etc. To achieve an energy transition, the Chinese government sets concrete targets regarding renewables for state-owned energy companies to pursue. However, energy companies enjoy considerable organizational and operational independence from policy making when deciding how to meet these targets.

By contrast, the Dutch have been considering the energy transition as an ongoing long-term evolutionary process in which fossil fuels are being replaced by renewable energy sources. In principle, both existing technologies and more radical innovations enjoy an equal focus and all options are on the table; in practice, special attention goes to meeting the EU 20-20-20 targets,⁴ focusing efforts on medium term deployment, while the rate of introduction of renewables so far has been slow (compared to the EU member states and China).⁵ The government's pro-market attitude, the lack of a clear overall vision for renewables and unified policy towards them, its attempt to increase private participation

The cases of China and the Netherlands show how pressing circumstances may override the impact of governance perspectives on innovation processes.

for purposes of burden sharing, and the technical and practical expertise of energy companies, weakens government leadership and puts vested incumbents in oil and gas in the driving seat for achieving the energy transition.

A promising proposal?

The point of departure was that a country's choice of governance perspective influences the development and deployment of renewable innovations. Yet are we now, after classifying governance perspectives and innovation processes, able to meaningfully compare countries and will a large scale cross-country study shed light on their relationship? Such matters are explored in more detail in the edited volume where the proposed definitions and classifications are further operationalized and illustrated at the hand of more in-depth examples from China and the Netherlands.⁶

If we were to make a long story short, however, it seems that the means for comparison are established, despite some operational issues, but that the issue of causality remains to be seen. The definitions and classifications do appear to grab the key elements of governance perspectives and innovation processes, accentuate meaningful differences among them, be applicable to any country, and provide valuable insights on their relationship. However, there are some operational issues to be resolved. For example, establishing the governance perspective of a country may be difficult due to the often very complex arrangements of public and private actors in the energy sector. Next, the innovation process classifications are rather black and white. There may be too little room for nuance. Finally, establishing generalizations remains difficult. The cases of China and the Netherlands show how pressing circumstances may override the impact of governance perspectives on innovation processes. In China, for example, the combination of energy scarcity, environmental pollution, and rapidly increasing energy demand has undoubtedly shaped its renewable energy development and diffusion pattern to a great extent. The Dutch, by contrast, have willingly increased their renewable goals beyond that posed by the EU for the 20-20-20 targets. The innovation process is thus more likely the direct result of the governance perspective.

Below: Windfarm, Ningxia Province, Northern China. Photos reproduced courtesy Creative Commons/Flickr.

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Notes

- 1 Prominent actors are government policy makers (ministries), regulating institutions, (renewable) energy producers and suppliers, infrastructure companies and operators, metering and service providers, R&D facilities, energy research institutes, universities, NGOs, interest groups, and consumer organizations.
- 2 Please note that "none of the paradigms reject government intervention, but [that] each paradigm reveals an institutional bias in that it articulates opportunities for collaboration and competition in a particular way, thereby creating a context for policies, regulations, and instruments, which may at first glimpse look identical but are given a specific meaning by their institutional context" – Hisschemöller, M., R. Bode, & N. van de Kerkhof. 2006. "What governs the transition to a sustainable hydrogen economy? Articulating the relationship between technologies and political institutions", *Energy Policy*, 34 (11): 1227–35, p.1234
- 3 While this may bring immediate benefits in terms of increasing renewable energy use, the risk is that of early movers: to be stuck with less efficient technologies in the long run.
- 4 Please note that the Dutch goal for 20% renewable share by 2020 goes beyond the proposed national target of 14% of renewables in total energy consumption set under the overall EU 20-20-20 targets.
- 5 The share of renewables in total energy supply in 2007 stood at only 2.8% while this was already an increase of 85% since 2000. It needs to be kept in mind though that the Netherlands lacks traditional hydropower, which so often makes up the bulk of countries' renewables.
- 6 Amineh, M.P. & Yang Guang. 2012. *Secure Oil and Alternative Energy: The Geopolitics of Energy Paths of China and the European Union*. Leiden-Boston-London: Brill Academic Publishers.

