

Embryonic Forms of Private Environmental Governance in Northeast Asia

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Abstract

This article provides empirical evidence of the emergence of new private governance forms through three case studies: transboundary air pollution, green supply chain, and energy transition in Northeast Asia. This article also refers to private governance theories discussed in the context of global environmental governance. Consistent with the private authority theory, entrepreneurs with vast expertise and capacity to provide useful information and practices have emerged. They allow stakeholders to cooperate in regional environmental sustainability under the conditions of weak or no focal institutions and heterogeneous state preferences. This observation is consistent with the global trend of environmental governance, which is shifting from regulatory-based to goal-setting governance. As global partnership theory suggests, hybrid forms of private governance, including various local- to global-level public-private partnerships, emerge across the cases. However, these forms of governance are still in the embryonic stage, where their functions of private authority are not fully developed. These insights challenge the predominant view on the limited roles of nonstate actors in building regional environmental governance in Northeast Asia as discussed in the existing literature.

Keywords Environmental cooperation, environmental governance, nonstate actors, Northeast Asia, private authority, private governance

Introduction

How does transboundary cooperation develop for increasing environmental sustainability risks in East Asia? In responding to the common environmental sustainability risks, each country developed a series of public policies (Terao & Otsuka, 2007) and bi- and multilateral cooperation in the region and beyond (Mori, 2013a). On one hand, formal regional institutions for environmental cooperation across the countries go back about 20 years to the 1990s when the United Nations (UN) Conference on the Environment and Development was

held at Rio de Janeiro. Since this event, a series of regional environmental institutions in addition to bilateral agreements were developed in East Asia and beyond, such as Eco Asia that began in 1991; the Northeast Asian Conference on Environmental Cooperation (NEAC), 1992; Northeast Asian Subregional Programme of Environmental Cooperation (NEASPEC), 1993; the North-West Pacific Action Plan (NOWPAP), 1994; the Acid Deposition Monitoring Network in East Asia (EANET), 1998; the Tripartite Environment Ministers Meeting (TEMM), 1999; the Joint Research Project on Long-Range Transboundary Air Pollutants in Northeast Asia (LTP), 2000; the ASEAN+3 Environment Ministers Meeting, 2002; and the East Asia Summit Environment Ministers Meeting (EAS EMM), 2007 (Otsuka 2018; Matsuoka 2013; Matsuoka 2014).

It is important to state that member countries had regular opportunities to exchange knowledge, information, and policies regarding transboundary issues, as well as dialogue about any common domestic issues, through these platforms. So far, however, regional environmental governance in East Asia has been criticized as weak and ineffective compared to that in Europe and North America (Matsuoka, 2013; Matsuoka, 2014; Mori, 2013b). Indeed, state-run formal regional institutions overlap, without effective coordination or synergy, and remain non-binding due to the absence of any region-specific multilateral treaty to tackle environmental issues (Takahashi, 2017). Moreover, non-negligible factors often impede the identification of cooperative solutions to the risks commonly faced in this region, including national security tensions between countries and the rivalry between regional institutions in Japan and South Korea (Elliott, 2017; Komori, 2010; Reimann, 2014).

However, various nonstate actors, such as nongovernmental organizations (NGOs) (also known as civil society organizations), researchers, and volunteers continue to contribute to education, advocacy, and research on these issues, both within countries and between countries in the region. There is little information about how many transboundary networks

have been organized by nonstate actors in the region. It is assumed that transnational civil society (TCS) networks (that is, transboundary networks organized by NGOs) in Asia are ‘steadily increasing’ based partly on the evidence that the number of NGO networks within Asia has increased to over 10,000 networks as of 2010 (Igarashi, 2013, pp. 272-274). Although there are no statistics regarding exactly how many TCS networks are working on issues of environmental sustainability in East Asia, some of the transboundary networks led by NGOs and researchers independent of the government have been discussed in the literature. They include: Atmosphere Action Network for East Asia (AANE) organized by environmental NGOs from Japan, South Korea, China, Taiwan, Hong Kong, Mongolia, and the Russia Far East; East Asia Environmental Citizen Council (EAECC) organized by environmental NGOs from Japan, China and South Korea; Asia-Pacific NGO Environmental Council (APNEC) organized a Japanese NGO, Japan Environmental Council (JEC) to hold ad hoc international meetings by environmental NGOs and researchers in Asia and so on. Those are expected to form a bottom-up ‘environmental community’ at the regional level (Igarashi, 2018, pp. 248-267; Teranishi & EAEIC, 2006).

In East Asia, however, there are not many active empirical studies on this emerging research field. This is because the role of nonstate actors seems to be limited due to the tradition of strong state sovereignty in the region in comparison to that in Western countries (Pekkanen, Ravenhill, and Foot, 2014). The autonomy of scholars at the track-two dialogue closely interacted with policy makers is often called into question, under the risk of ‘the trap of nationalism, state sovereignty, and nonintervention’ (Acharya, 2011), and epistemic communities formed by independent scholars are fragmented and weak in the region (Takahashi, 2017; Yarime & Li, 2018). Moreover, it has been argued that the Chinese state is intolerant of social movements (Otsuka 2009, 2018). In addition to these regional political disadvantages, it has been indicated that there is a shortage of financial resources as well as

personnel with professional skills in the area of NGOs (Komori, 2010). Overall, nonstate actors have been viewed as weak stakeholders in regional environmental governance, especially in Northeast Asia as a sub-region of East Asia, compared to the dominant, state-led policy networks that regulate governance in the region (Yoshimatsu, 2010). In sum, the role of nonstate actors in East Asia has been considered to be insignificant in terms of regional environmental governance.

Nevertheless, the recent development of transboundary cooperative activities by nonstate actors, including NGOs, independent research institutes, and businesses, in the region should not be overlooked. More focus should be accorded to the recent development of cooperative networks by nonstate actors to explore their potential, as well as their deficiencies, in terms of regional environmental governance. This is one frontier in transboundary environmental governance studies of this region. Elliott stated that ‘[t]he regional multilateral terrain has certainly become more complex, inhabited by a variety of environmental initiatives, programmes, projects, dialogues, declarations and visions’ and, therefore, ‘[t]o some extent, an early preference for vertical and intergovernmental arrangements has been supplemented by institutions and networks that reflect horizontal and transnational approaches’ in East Asia (2017, p. 2).

This article examines the recent emergence of new forms of private environmental governance in East Asia, with a particular focus on three prominent cases in its sub-region, Northeast Asia. First, Asia Pacific Clean Air Partnership (APCAP) with new institutional building initiated by scientists on transboundary air pollution has launched under the UN Environment in 2015. APCAP consists of science panel which will help to create a scientific community for atmospheric science and joint forum which will assist policy makers in setting targets to improve air quality in the region. Second, in the field of transboundary supply chains, a Chinese research type NGO is directly pushing multilateral brand companies to

make local companies working at their supply chains in China meet national emission standards by information disclosure via website and social networking service without any governmental initiative. Third, a Japanese research type of NGO with scholars is involved in research and advocacy for energy transition from fossil fuels as well as nuclear power to natural renewable energy in the region.

What kind of roles might these nonstate actors play in building transboundary cooperative networks under this complex geopolitical context? This prompts a series of questions: how these initiatives led by nonstate actors emerge under the complex regional context; how they differ from existing intergovernmental regional institutions; what types of governance do they form, and what function do they serve in terms of transboundary regional governance. To explore these questions, this article uses the concept of *entrepreneurs* as an analytical lens through which to simultaneously view *private governance theories* analytically and investigate case-specific contextual factors. Private governance theories originate in global environmental politics wherein discussions about the role of nonstate actors can be found.

Before discussing the analytical framework in the next section, it must be clarified that this article focuses on Northeast Asia as a sub-region of East Asia, while this article also generally references East Asia and the Asia-Pacific as broader regional contexts. Within Northeast Asia, this article focuses specifically on four countries (including three nations and one geopolitical area); namely, Japan, China, South Korea, and Taiwan. Although Mongolia and Far East Russia could have been included in Northeast Asia generally, we rarely address them because, in terms of this article's discussion, there is little relevant activity in these areas.

The next section introduces an analytical framework on entrepreneurs to private governance theories discussed in global environmental politics, with a particular focus on

private authority and its *hybrid form*, which have been discussed as a new form of governance arising under the transformative influence of global environmental governance. The subsequent section identifies nonstate actors as entrepreneurs while examining the development of inter- and semi-governmental institutions through an analysis of three cases: (1) transboundary air pollution; (2) the green supply chain; and (3) energy transition. Subsequently, the following section discusses the forms they take and how they function as private governors across the cases as well as in each case. Finally, the last section summarizes its findings as well as addresses the remaining tasks for further investigation.

This article argues that entrepreneurial private governance is emerging under the transformation of global environmental governance in Northeast Asia and that this emerging form of governance functions as a private authority while building broad partnerships with both public and private actors. It is also revealed that nonstate actors identified as entrepreneurs in the examined cases are amidst the process of organizing an embryonic form of private governance. These insights challenge the predominant view on nonstate actors' insignificant role in building regional environmental governance in Northeast Asia as discussed in the existing literature.

Private environmental governance: An analytical framework

This section explains the analytical framework in this article using private governance theories. First, the concept of *entrepreneurs* is introduced to analytically examine the roles of nonstate actors in building new forms of regional environmental governance. Second, this section refers to the *private authority* concept discussed in the context of global environmental politics and the factors that influence its emergence, such as demand and supply, focal institutions, and state preferences. Third, this section introduces the *hybrid forms of private governance* based on global partnership discussions to analyze private

authority forms and functions in the cases, particularly in the partnership development's embryonic stage. This article utilizes this analytical framework to examine the emergence of private environmental governance in Northeast Asia as the embryonic forms of entrepreneurial private authority.

Theories of private governance

Various nonstate actors such as epistemic communities, NGOs, and businesses have attracted scholarly attention in the area of global and transboundary environmental governance (Abbot *et al.*, 2016; Andonova, 2010; Andonova, 2017; Downie, 2017; Green, 2014; Haas, 1992; Pattberg, 2007; Raustiala, 1997). A variety of forms of governance by nonstate actors can be found, such as 'private (environmental) governance' (Falkner, 2003; Pattberg, 2007) including 'public-private partnerships' (PPP) (Andonova, 2010, 2017), 'private transnational regulatory organizations' (PTROs) (Abbott, *et al.*, 2016), 'private authority' (Green, 2014), and 'transnational private regulation' (Bartley, 2018). It should be noted that in using the private governance perspective, this article does not intend to argue about the 'retreat of the state,' or 'privatization of international governance', rather, it discusses the changing role of states as well as the emerging role of nonstate actors in the increasing complexity of governance arrangements (Sørensen, 2004; Green, 2014, p. 9, p. 163; Andonova, 2017, p. 194).

Entrepreneurs

Entrepreneurs are risk-takers, innovators, and reformers when it comes to governance matters in problem-solving (Andonova, 2017; Mintrom, 1997). This article focuses on nonstate actors as innovators, reformers, and risk-takers because they dare to initiate novel activities—that initiate new forms of regional governance, who could be considered to

function beyond the state as *entrepreneurial private governors*. These private governors could include ‘nongovernmental organizations (NGOs), private firms, multinational corporations, associations, foundations, transnational advocacy networks’ (Green, 2014, p. 29), and other nonstate actors including scientists who form a transboundary epistemic community (Haas, 1992).

Recently, the role of such private governors has been increasing under the transformation of global environmental politics, especially after the 2030 Agenda for Sustainable Development, adopted by UN member states, and the Paris Agreement, adopted at the Conference of the Parties (COP) 21 of the United Nations Framework Convention on Climate Change (UNFCCC) in 2015. Environmental governance scholars call today’s new brand of governance ‘governance through goals’ or ‘goal-setting governance’ (Kanie & Biermann, 2017; Sachs, 2015; Young, 2017), which is characterized by the setting of a common goal to prompt stakeholders to voluntarily change their behavior to fulfill the objective of creating a sustainable society. This method of governance arrangement is in sharp contrast to more traditional means of regulatory governance, such as those represented by the Kyoto Protocol, which was adopted at the COP 3 of the UNFCCC in 1997. This recent transformation in global environmental governance suggests that new, more entrepreneurial forms of private governance by nonstate actors in the region and beyond might currently be emerging.

Private authority

Regarding this new form of governance initiated by nonstate actors as part of a recent trend in global environmental governance, *private authority* (Green, 2014), and *governance entrepreneurs* (Andonova, 2017) have been proposed in the literature as specific forms of

private governance driven by entrepreneurship. This article explores these types of private governance in two ways.

Firstly, this paper examines whether and how private entrepreneurial governors form a kind of *authority* in the three designated case studies. Although ‘private authority is but one among many institutional arrangements to address cooperation problems,’ private authority, more specifically, *entrepreneurial private authority* not delegated by public authority but initiated by nonstate actors, has been proliferating since the 1990’s in the domain of global environmental issues. Entrepreneurial private authorities create rules that function as transnational civil regulations not only for the purpose of defining and issuing standards and certifications, but also to provide principles and guidelines for the establishment of best practices in any number of domains. Examples include sustainable forestry, fishery, and agricultural practices, various efforts to promote climate change mitigation, and more general activities to encourage cooperative social responsibility for environmental sustainability (Green, 2014, pp. 78-103).

The theory of private authority argues that such authority will emerge when a supply of authoritative expertise exists and there is a demand by states or other actors for its benefits such as reduced transaction costs, enhanced credibility of commitment, first-mover advantage, or improved reputation (Green, 2014, p. 39-47). It is also argued that *entrepreneurial authority* (its counter typology is ‘delegated authority’) emerges if there is a weak *focal institution* (or no institution at all) and heterogeneous *preferences of states* (Green, 2014, p. 47, 53) exist. In Northeast Asia, as the previous section argued, there are overlapping and non-legal binding intergovernmental institutions managing environmental sustainability issues as well as leadership rivalries between countries in the region. In this sense, the above hypothesis regarding the emergence of entrepreneurial private authority is worth examining in the context of this region.

Hybrid forms of private governance

Secondly, as a way of exploring governance types, this article also examines the *hybrid form of governance* that might be initiated by nonstate actors in the process of building partnerships with international organizations (IOs) and governmental organs. As Green analyzes in her empirical study on climate change mitigation practices, entrepreneurial private authority is not working independently but is empowered by public actors like the United States (US) Environmental Protection Agency (EPA) (2014, pp. 132-162). This hybrid organizational form that exists between public and private actors is also discussed in the context of PPPs, which ‘are voluntary agreements’ between public actors (*e.g.*, IOs, states, sub-state organizations, etc.) and nonstate actors (*e.g.*, NGOs, firms, foundations, etc.) (Andonova, 2017, p. 2). This article assumes that entrepreneurial private governance in Northeast Asia takes a hybrid form with partnerships between public and private actors and that their forms vary in different cases as suggested by the study on global partnerships.

This article also assumes that hybrid forms of private governance are emerging but that they are still in an *embryonic* stage because the development of such forms of authority is very recent in the region of Northeast Asia. In terms of institutional change, the lifecycle of global partnerships as governance entrepreneurs is instructive of this theory. It is assumed that there are three stages of development: the experimental adoption of (partnership) initiatives; the diffusion of (partnership) practices; and (reverse) institutionalization (Andonova, 2017, pp. 57-61). At the embryonic stage, the governance form could be ‘experimental’ (Andonova, 2017, p. 58). It could be initiated by entrepreneurial actors in a web of existing institutions or within IOs. Taking the United Nations Environment Programme (UNEP)’s partnerships as an example, they were initiated by ‘expert groups within UNEP departments that worked out partnership arrangements with the private sector

or with societal and expert organizations around programs or projects they were putting in place' (Andonova, 2017, p. 112). When they evolve to the extent that 'a specific partnership initiative is implemented and diffused by expanding participation beyond the core group of entrepreneurs and by replication across states, institutions, and contexts' (Andronova, 2017, p. 59), they are able to move out of the embryonic stage of experimentation to the stage of partnership diffusion. Although the theory of governance entrepreneurs focuses on partnerships between IOs and other public and private actors, this insight regarding their stages of development is useful for exploring the emergence of a hybrid form of private governance in the embryonic stage.

In sum, this article examines the emergence of private environmental governance in Northeast Asia through two presumptions: (1) Entrepreneurs with authoritative expertise to provide cooperative benefits to stakeholders in terms of regional environmental sustainability under the conditions of weak (or no) focal institutions and heterogeneous state preferences have emerged in Northeast Asia. (2) Hybrid forms of private governance, including various public-private partnerships, are emerging in this region. However, they are still in the embryonic stage, where their private authoritative functions are limited. The following sections discuss three cases; namely, transboundary air pollution, green supply chain, and energy transition, to test these presumptions.

Case studies: Emergence of private entrepreneurs in environmental governance development

Transboundary air pollution

Northeast Asia has been facing serious air pollution problems as a result of the regions recent rapid economic growth. Therefore, in the 1970s and 1980s, research institutes in each country

conducted numerous studies of acid rain issues. This was the starting point for promoting regional cooperation on transboundary air pollution issues in East Asia. In Japan, increasing public concern about air pollution in China, which featured the largest amount of sulfur dioxide (SO₂) emissions in the region, forced the government to cooperate with China through official development assistance (ODA) and other joint projects to ensure air quality improvement during the 1990s. In 1993, the Ministry of Environment in Japan organized the first round of expert meetings on acid rain issues, with a special focus on building a monitoring network across countries in the region, including China, Indonesia, South Korea, Malaysia, Mongolia, the Philippines, Singapore, Russia, Thailand, and some IOs in the Toyama Prefecture. After several rounds of expert meetings and negotiations between these countries, the first round of intergovernmental meetings of the Acid Deposition Monitoring Network in East Asia (EANET) was held in Yokohama City with the generous support of the Japanese government in 1998. This inaugurated a tentative operation by nine countries including Vietnam, but China was just an observer at that time. China participated in the second round of intergovernmental meetings as a member country in the year 2000. At the second round of meetings in 2000, it was decided that the EANET secretariat should be headquartered at the Regional Center for Asia and the Pacific, which was jointly established by the UNEP and the Asian Institute of Technology (<http://www.rrcap.ait.asia/>). The network center was established in Niigata, Japan, which is now called the Asia Center for Air Pollution Research (ACAP). There are 13 member countries in EANET including Cambodia, Laos, and Myanmar (Suzuki, 2009, pp. 77-80; Takahashi, 2017, pp. 238-273).

Over a decade, EANET has contributed to the data monitoring about the deposition of acid pollutants in rain and snow, as well as capacity-building of monitoring, and analysis in developing countries in the region. Especially for China, Japan provided technical assistance to train staff in EANET cities through the Japan-China Friendship Center for Environmental

Protection. Through a series of monitoring and analysis exercises, acid rain was observed in some cities but no critical damage to the ecosystem by acid rain was observed in the region (Suzuki, 2009, pp. 77-83).

Meanwhile, South Korea is also positive about leading a cooperative project on transboundary air pollution in the region, because it suffers directly from the air pollutants generated in China without the benefit of a sea between the two countries, like with China and Japan. In 2000, the Joint Research Project on Long-Range Transboundary Air Pollutants in Northeast Asia (LTP) was launched as a joint research project between South Korea, Japan, and China under the initiative of the South Korean government. The main objectives of the project included contributing to foundational research on LTP; improving the scientific understanding of LTP, and providing science-based information to policymakers in Northeast Asia. Since 2000, the LTP project has monitored transboundary pollutants, including acid rain pollutants, as well as atmospheric particulate matter less than 2.5 micrometers (PM_{2.5}), and modeled the spatial distribution of pollutants across member countries. Although the three countries—Japan, China, and South Korea—are members of both EANET and the LTP project, the scope and methodologies of the LTP project are wider than those of EANET, which focuses only on acid rain pollutants (Lyu, 2017).

The Tripartite Environment Ministers Meeting (TEMM) is the highest-level intergovernmental platform launched jointly by Japan, China, and South Korea in 1999 for the purpose of sharing policies and experience with various environmental issues such as air pollution, dust and sandstorms, biodiversity, chemical management, industrial accidents, waste management, climate change, fresh water and the marine environment, and others. Air pollution mitigation has been a high priority on the TEMM agenda for two decades. Recently, each country has targeted acid pollutants as well as ozone, volatile organic compounds, and

PM_{2.5} for monitoring and research as well as for information sharing of analysis technology (Chu, 2018).

In terms of the focal institutions confronting this issue, TEMM is the highest-level intergovernmental institution among the three major countries in the region. It should be noted, however, that no treaty on transboundary air pollution—such as the Convention on Long-Range Transboundary Air Pollution, which was established in 1979 by the UN Economic Commission for Europe—exists in East Asia (Akimoto, 2018).

As the earliest initiative by nonstate actors working on air pollution issues in Northeast Asia, the Atmosphere Action Network for East Asia (AANE) had been active before 2001 (Igarashi, 2013, 2018). In terms of international institutions to work on air pollution issues in Asia, Clean Air Asia (CAA, <https://cleanairasia.org/>) is an international non-profit international organization founded by the Asian Development Bank, the World Bank, and the US Agency for International Development (USAID) in 2001. This is a multi-stakeholder network involving national and city governments, universities, and research institutes in China, India, Indonesia, the Philippines, Vietnam, Nepal, Sri Lanka, and Pakistan. Their mission is to reduce air pollution and greenhouse gas emissions in over 1,000 Asian cities through science-based policies and programs. However, transboundary air pollution is not their target. Also, the role of nonstate actors is not clear under the initiative led by powerful multilateral institutions.

Regardless of whether they are involved or not in intergovernmental and international initiatives, scholars and researchers have been active in joint research projects in Northeast Asia, especially between Japan and China. Such joint research projects have been expected to provide a basis to nurture a science-based network on atmospheric science in the region (Akimoto, 2016).

Meanwhile, many have called for a need to build a platform for addressing the increasing seriousness of air pollution and to coordinate several intergovernmental institutions and other transboundary networks since no international treaty exists in Asia. In 2014, the UN Environment Assembly adopted Resolution 1/7 of the first assembly, which stated its purpose was ‘[s]trengthening the role of the United Environment Programme in promoting air quality.’ Following this resolution, in 2015, the Asia Pacific Clean Air Partnership (APCAP) was established under the UNEP ‘as a mechanism and platform to promote coordination and collaboration among various clean air initiatives in Asia Pacific’ (UNEP, n.d.).

APCAP consists of a science panel that will help to create a scientific community in atmospheric science and a joint forum that will assist policymakers in setting targets to improve air quality in the region. Dr. Hajime Akimoto, then-Director General of ACAP in EANET, and now a visiting scientist at the National Institute for Environmental Studies (NIES) in Japan, is one of founders of this new initiative. He explained the role of the APCAP Science Panel: ‘[i]n Asia [,] there is no international framework for the scientific discussion of air pollution to be reflected to policy makers’ so ‘[t]here is a strong need to give clear message and suggestions from scientific community to policy makers to take proper actions by a single voice’ (Akimoto, 2018). This policy recommendation was the output of a five-year joint research project on transboundary air pollution issues in Asia funded by the Japanese Ministry of the Environment (H. Akimoto, personal interview, June 2018).

As of 2018, the science panel was comprised of 12 scientists; three from China, two from Japan, two from India, and one each from Singapore, South Korea, Thailand, Nepal,

and Austria.¹ One of its Chinese members, Prof. Jiming Hao of Tsinghua University, has been designated the Chair and Dr. Akimoto has been nominated vice chair (H. Akimoto, personal interview, June 2018).

In 2019, UNEP, APCAP and the Climate and Clean Air Coalition (CCAC, <https://ccacoalition.org/>)² jointly published the first regional assessment report, *Air Pollution in Asia and the Pacific: Science-Based Solutions*, to establish a science and policy interface. This was a response to the 2017 Resolution 3/8 of the third UN Environment Assembly on ‘Preventing and reducing air pollution to improve air quality globally’ (UNEP, n.d.). The report identified a solution package with 25 cost-benefit measures for the Asia-Pacific region, with multiple benefits in terms of the World Health Organization’s (WHO’s) Air Quality Guidelines and sustainable development goals (SDGs) while assessing key pollutants in the region, including PM_{2.5}, carbon dioxide (CO₂), methane (CH₄), and Black Carbon (UNEP, APCAP, and CCAC, 2019).

It should also be noted that there were over 100 contributors from the Asia-Pacific region and beyond involved in authoring this report. According to the acknowledgment in the summary presented by UNEP, APCAP, and CCAC (2019), the report was coordinated by four co-chairs from South Korea, China, Austria, and the WHO, and was written by 96 authors. It was technically reviewed by four teams and 47 individuals from Asia as well as a number of IOs and other regions of the world.³ The writers of the report were reported to be volunteers organized by members of the Science Panel and through other bodies (H. Akimoto, personal interview, April 2019).

¹ Dr. Markus Amann, Program Director of the Air Quality and Greenhouse Gasses, International Institute for Applied Systems Analysis (IIASA) joined the panel. He is expected to advise to the panel as a European expert.

² CCAC is a global partnership supported by UNEP and established in 2012 to address short-lived climate pollutants (SLCPs).

³ Four teams as technical reviewers came from the Pollution Control Department of Thailand, the UN Environment China Office, the Ministry of Ecology and Environment of China, and the WHO.

In addition to this science-based solution report, Dr. Akimoto, as vice chair of the APCAP Science Panel, published the *Clean Air Brief 2019* to emphasize the need to co-control of PM_{2.5} and ozone in Asia (Akimoto, 2019), based on his and other relevant science-based studies in January 2019. Although the necessity of monitoring multiple pollutants has been addressed in intergovernmental efforts, there has been no consensus among intergovernmental initiatives on how to control them (Akimoto, 2018; Lyu, 2017). Thus, the APCAP Science Panel acts as an entrepreneur to innovate a transboundary science network that aims to disseminate clear messages regarding science-based solutions to transboundary air pollution problems to broader actors in the region.

The emergence of this science–policy interface should be discussed.

First, scientists have initiated this new program despite the existence of transboundary cooperation among institutions in the region. The science panel is composed of scientists in relevant fields of environmental sciences, including chemistry, modeling, health, economics, and engineering (H. Akimoto, personal interview, June 2018). The panel members were invited based on a series of joint research on environmental air studies with scholars in Asia and other regions over the past two decades, though UNEP invited them officially. Furthermore, according to Dr. Akimoto, ‘the Science Panel should consist of “real” scientists who are recognized in their academic field and should not consist of experts delegated by the government.’ He added, ‘I wish if scientists in the APCAP Science Panel should be like those in IPCC’ (H. Akimoto, personal interview, April 2019). He believes that IPCC would be one such model in which scientists conduct science-based research on climate change independent of state interest.

Based on his experience as the director general of ACAP in EANET, there are gaps among major Northeastern countries in terms of the science–policy interface in intergovernmental multilateral cooperation. Scientists have gained increasing awareness of

other transboundary air pollutants in the region, including aerosols, photochemical oxidants, and persistent organic pollutants. Thus, Japan intended to extend the scope of EANET to monitoring and modeling various pollutants. However, no consensus has been reached between the member countries due to South Korea and China's negative reactions (Takahashi, 2017, pp. 279–282; K. Suzuki, personal interview, June 2018). Moreover, Dr. Akimoto reflected on his experience in EANET, stating that most representative scientists of member countries could not always speak the scientific truth (H. Akimoto, personal interview, June 2018).

Second, science and policy in the recent case about negotiation between LTP and TEMM can have another gap. The LTP project primarily aims to 'provide science-based information to policymakers' in the region but has not succeeded thus far. China has not agreed to disclose the LTP modeling results as observed at the TEMM's meeting in 2018, whereas Japan and South Korea have already agreed ('Zhong-ri-han,' 2018).

In sum, as an entrepreneur, the APCAP Science Panel can serve comprehensive scientific solution-oriented expertise on transboundary air pollution in Asia and the Pacific region. It has also emerged under the inertia of its interface with focal institutions and its heterogeneous preferences between three major countries in Northeast Asia.

Green supply chain

Due to globalization and regional economic integration, China has become the factory to the world as well as the largest source of environmental pollution in East Asia. In China, '[i]t was observed that emissions of all pollutants increased largely' during the period between 1950 and 2015, although most pollutants have decreased in recent years (Kurokawa & Ohara, 2019, p. 14). Especially in the early 2000s, 'SO₂, NO_x, and CO₂ emissions increased keenly' in Asia, along with (and, perhaps, as a result of) the rapid economic growth in China

(Kurokawa & Ohara, 2019, p. 13). On the other hand, China's production of pollutants is largely linked with the supply chain beyond its borders. On the basis of firm data, in 2010, small- and medium-sized enterprises (MSMEs) produced 53% of China's CO₂ emissions and MSMEs induced 65% of China's CO₂ emissions through the supply chain (Meng et al., 2018). This is why the control of environmental pollution in China is a very important issue for environmental sustainability, not only for the country itself, but also for the region and beyond.

In response to the increasing burden of the environment caused by rapid economic growth and global and regional economic integration in Asia, green supply chain management has attracted not only scholarly attention, but also the attention of practical actors (Irum et al., 2018). In May of 2014 the China Council for International Cooperation on Environment and Development (CCICED) proposed building a region-wide network on the green supply chain at the High-Level Roundtable on Green Development, Asia-Pacific Economic Cooperation (APEC), in Tianjin, China. CCICED recommended the establishment of the APEC Green Supply Chain Cooperation Network based on its policy study on green supply chains launched in 2011. Since its endorsement of the APEC leaders in November 2014, the APEC Green Supply Chain Network centered in Tianjin has held annual conferences and organized training workshops for capacity-building in green supply chain management for officials, businesses, and researchers (http://www.apecgsc.org/pub/apecgsc_english/). This is a unique intergovernmental institution that promotes green supply chain development in the Asia-Pacific region. There cannot be found, however, any tangible impact on its development at the moment.

Conversely, environmental NGOs have also paid attention on industrial pollution issues along with the launch of environmental campaigns initiated by the official media. China has been developing its environmental policy since the 1970s; however, its

implementation has been problematic due to strong pro-economic development incentives by local government and business enterprises. Due to the authoritarian Communist Party regime, top-down inspections have been conducted to penalize the absence of local inaction in environmental protection while promoting a series of environmental campaigns via the official news media since the 1990s. Information disclosure was expected to improve local misconduct, and a ratings program for industrial polluters was also introduced in some provinces. This progress in enforcing environmental regulations and the information disclosure policy has created a space for environmental NGOs to play a key role in environmental pollution control (Economy, 2004; Otsuka, 2007).

Concerning the supply chain and environmental pollution issue, a Chinese NGO has invented a way for improvements in the enforcement of environmental policy by involving broader stakeholders, including businesses and the public in Northeast Asia, and other developed countries, through its website and its activities on the ground. The Institute of Public & Environmental Affairs (IPE, <http://wwwen.ipe.org.cn/>) was established in 2006 as a think tank-type environmental NGO⁴ based in Beijing that leverages a unique platform, disclosing information to urge industrial polluters to comply with environmental effluent standards in China. Using the official data published by the government, the IPE created the Water Pollution Map database and published the map on its website in 2006. It also developed the Air Pollution Map in 2008 and those maps have now been integrated into the Pollution Map, which every citizen can access via its original smartphone app (IPE staff member, personal interview, October 2016). In addition, the IPE investigated the relationships between polluters as suppliers, and multinational or domestic brand

⁴ In China, ‘NGOs’ or ‘civil society’ are considered to be several types of organizations such as: social organization, private non-profit institutions, and private foundations despite whether they are registered as ‘NGOs officially.’ IPE is one of these private non-profit institutions, and it is self-identified as an ‘environmental NGO.’ See Otsuka (2009), Wang (2013), and China Environmental Problems Research Group (2011, pp. 290-291).

corporations as buyers, through a variety of sources, and created a database about these supply chains to be integrated into the Pollution Map.

In addition, they have sent an open inquiry letter to each chief executive officer (CEO) of every branded corporation to urge them to take positive action to solving the problems caused by their suppliers. Both the inquiries and their answers are disclosed on their website. Also, the IPE organized Chinese NGOs to form a Green Choice Alliance (GCA) to conduct a third-party audit of polluters by asking the organization to update their information positively at its website. They had collected and accumulated supply chain data from 267 brand corporations and 3,627 suppliers and had conducted 1,644 audits by early 2019. Furthermore, they created the Corporation Information Transparency Index (CITI) to rate major multinational and domestic corporations by disclosing their performance to the public. They also set environmental compliance standards and stipulate the environmental responsibilities of brand corporations.

It should be noted that tangible progress in the improvement of corporate environmental sustainability performance has been accomplished. For example, at the Green Supply Chain Forum held in Beijing on October 2018, some CEOs of brand corporations enjoying their high-rank reputations as indicators were announced by IPE, and in turn, announced that they were willing to keep up with IPE's initiative. Also, one executive regional manager from Apple announced its strategy to realize 100% coverage of renewable energy (RE 100) throughout their supply chains at the forum (authors' observation at the forum, October 2018).

The database, maps, and other information disclosed at its website have invented a unique 'transparency-based platform,' driven by market incentives (Haddad, 2015) to improve and complement the weak implementation of environmental regulations by the Chinese government.

Thus, it can be said that IPE is an entrepreneur that is innovating a new type of platform to promote the establishment of the green supply chain in China and beyond—earlier than the goals set by the APEC initiative. It is noteworthy that countries outside China could not intervene directly to improve the environmental policy implementation and enforcement in the country due to its strong sovereignty.⁵ Thus, NGOs may develop their network on this issue.

With regard to the emergence of the IPE platform, the NGO can sufficiently bring relevant resources, including information, knowledge, and know-hows, to build. First, information about environmental emissions standards and performance comes from open-source disclosures via the country's environmental administration websites. Second, their strategy is similar to that of international NGOs because of its founder's consulting experiences in the US (J. Ma, personal communication, November 2009). Thus, he had the opportunity to learn the know-hows of private businesses in the global trend of environmental governance. Lastly, recent information and computer technology development, including online database building and personal smart phone applications, support their platform.

These backgrounds, such as China's weak national policy enforcement in which any country cannot directly intervene, no effort from the focal institutions to promote the green supply chain in the region at the initial time, and its founder's personal expertise and the capacity of his staff to utilize information and communication technologies, are the main drivers that formed such a platform.

⁵ This notion is a common understanding among Japanese experts who have been involved in bilateral environmental aid projects in China (the author's personal conversations with them thus far).

Energy transition

TEMM is the highest-level intergovernmental platform not only for air pollution control but also for climate change policy dialogue in terms of multilateral cooperation in Northeast Asia. Since the Kyoto Protocol was adopted at COP3 of UNFCCC in 1997, which requires major industrialized countries to reduce CO₂ emissions, climate change has come to the attention of policymakers, as well as scholars and civil societies worldwide, as an environment-energy nexus issue (Cui, 2018). In TEMM, climate change has been addressed as an important common issue for three countries since 2001. The Tripartite Joint Action Plan (TJAP) adopted at TEMM 12 in 2010 regards climate change as one of the main priority cooperation areas between the three countries (Japan, China, and South Korea) and states that ‘the three countries reaffirm their commitment to the objectives and principles of the UNFCCC and its Kyoto Protocol in particular, the principle of common but differentiated responsibilities, and will work together to promote the full and effective and sustained implementation of the UNFCCC and its Kyoto Protocol.’ Under the TJAP framework, some joint activities, such as the Tripartite Green Economic Policy Seminar in 2010, and joint research on the ‘green growth and low-carbon society’ have been organized by focal institutes in the three participating countries. However, practical progress in multilateral cooperation on climate change issues in the region cannot be found (CAECC, IGES, and KEI, 2015).

Besides these intergovernmental platforms, scholarly issue-specific and research-oriented dialogue has been active in the region since the Paris Agreement was discussed and adopted at the COP 21 of UNFCCC in 2015. It should be noted that China as an emerging economy has played an important role, due to its increasing capacity in the Paris Agreement, which requires all developed and developing countries to submit nationally determined contributions (NDCs), including mitigations of and adaptations to climate change (Cheng, 2014). This is a visible shift in the method of global environmental governance from

regulatory-based to goal-setting. Moreover, a shift in China's commitment to regional environmental governance is observed (Otsuka, 2018). First, China pledged in its NDC to limit CO₂ emissions around 2030; the reason being the increasing pressure from developed countries to show its commitment to environmental sustainability and its growing economic and technological capacity as the world's largest source of CO₂ emissions. Second, China has been suffering from persistent heavy smog mainly consisting of PM_{2.5}. Lastly, the government has decided to reduce coal usage and undertake industrial restructuring to address their overproduction of coal, which has been criticized by developed countries.

One prominent example is a series of climate change-related dialogues among scholars and other stakeholders organized by the Institute of Global Environmental Strategies (IGES), a semi-governmental environmental think tank established with the support of the Ministry of the Environment in Japan. At its annual conference, The International Forum for Sustainable Asia and the Pacific (ISAP)—a two-day forum to discuss various aspects of sustainable development in Asia and the Pacific involving officials, scholars, businesses, and other stakeholders in the region—held dialogue sessions between experts from Japan, China, and South Korea focusing on climate change in 2015 and 2017. At the first session in 2015, the launch of the Japan-China-South Korea Tripartite Climate Policy Research Forum was announced as an effort to promote joint research activities on 'science-based climate policies' by core institutions in each country (https://isap.iges.or.jp/2015/en/day1/p_3.html). The session at ISAP 2017 focused on carbon pricing in China, South Korea, and Japan. In addition to the ISAP sessions, the Tripartite Carbon Pricing Forum has been held annually by IGES and its counterparts in China and South Korea since 2016 (Liu, 2018). Thus, except for TEMM as the highest-level intergovernmental meeting, the platform initiated by IGES plays an important role in the sharing of knowledge and information about climate change mitigation among the three major countries in the region.

In addition to these focal institutions to address energy transition, TEMM as a multilateral, cooperative initiative by governments on one side, IGES as a semi-governmental research institute in addressing energy transition on the other side, transboundary coalitions between NGOs in Northeast Asia can also be found in the field of energy transition in response not only to climate change and the increasing seriousness of smog in China but also the astonishing event of Fukushima-Daiichi nuclear power plant accident in 2011. Their development beyond sectoral settings in intergovernmental and semi-governmental cooperation on climate change and air pollution issues can be observed.

Meanwhile, civil society has taken much longer to develop a network addressing climate change, as well as energy transition, in Northeast Asia. In 2010, the East Asia Climate Network was established between NGOs in three countries and has since organized the East Asia Citizen Conference on Climate Change bi-annually in three countries (Aikawa, 2011). At the COP 24 of UNFCCC held in Poland, on December 2018, NGOs from three countries, the Rock Environment and Energy Institute (REEL, China), the Kiko Network (Japan), and the Korean Federation of Environmental Movements jointly published a policy report, 'Coal Power Sector in China, Japan, and South Korea: Current Status and the Way Forward for a Cleaner Energy System.' This report focused on coal-fired plant issues in these countries, advocating that governments and businesses take action to ensure a transition to cleaner energy in the region (Lin et al., 2018).

Moreover, after the accident at the Fukushima Dai-ichi Nuclear Power Plant of Tokyo Electric Power Company Holdings in 2011, several forums on energy transition have been held in this region specifically focusing on denuclearization and a shift toward renewable energy. The 2017 Asia Democracy Forum was organized by the Democratic Progressive Party of Taiwan and the Taiwan Environmental Protection Union as environmental NGO at the National Taiwan University, on September 2nd and 3rd, 2017. 'Environment, Energy and

Sustainable Development’ was the main theme under the rising momentum for denuclearization in Taiwan, and experts on renewable energy policy from Japan and South Korea were invited. In addition, a symposium on energy transition was held at the National Taiwan University just before the 6th International Symposium on Environmental Sociology in East Asia on October 18, 2017. Experts from Japan and South Korea were invited to discuss the ‘Fukushima Effect’ (Kim and Chung, 2018; Suzuki, 2017), and how to build the momentum of nonstate actors’ energy transition networks (authors’ participatory observations at the forum in Taipei, September and October 2017).

The research group ‘Energy Transition and Democracy in East Asia’(ETDEA) is a recent initiative hosted by the Institute for Sustainable Energy Policies (ISEP)—a private think tank based in Tokyo—one of whom was invited to the Asia Democracy Forum in Taipei to organize researchers and scholars from Japan, South Korea, and Taiwan. In February 2019, they held the first workshop in Tokyo to discuss the experiences of policy success and failure at and after the Fukushima nuclear power plant accident with members from Japan, South Korea, and Taiwan and some former Democratic Party of Japan policymakers and advisors who were serving when the disaster occurred in 2011. In June 2019, they held the second workshop in Taipei hosted by the National Taiwan University to invite Japanese and South Korean members to discuss progress and challenges of energy transition in each country. The members of this network have a clear mission to promote renewable and decentralized energy not only in each country, but also in Northeast Asia, while sharing the urgent need to mitigate climate change and air pollution as well as bitter lessons from the severe accident that occurred in Japan in 2011, as mentioned often in their presentations and personal conversations (authors’ participatory observations in the Tokyo workshop, February 2019 and the Taipei workshop, June 2019).

Therefore, ETDEA acts as an entrepreneur who aims to reform energy policy in a more renewable and decentralized way in each country, as well as in the region that has been politically sensitive in terms of energy security. The emergence of ETDEA similar to that of an entrepreneur can be analyzed as follows.

First, the ISEP, an initiator of the ETDEA group, has provided the concept of energy democracy at its website: ‘Energy Democracy is... to think about the meaning of the structural energy transition from centralized to decentralized societal system’ (<http://www.energy-democracy.jp/>). Moreover, ISEP has vast expertise and sufficient capacity to advocate renewable energy and provide technical guidance to those who intend to introduce renewable energy (<https://www.isep.or.jp/>). ISEP established the Community Power Initiative in Japan in 2013 and reformed it into the National Association of Community Powers in 2014. As the secretariat of the association, ISEP has organized the national network to involve more than 50 local community power businesses that can produce renewable energy using local natural resources and provide consultation to and certification of production of renewable energy; power sources include solar, wind, and biomass among others (<http://communitypower.jp/about>).

Second, ETDEA addresses not only climate change mitigation and air pollution control in terms of energy transition but also energy source denuclearization. This approach is partly similar to that of IGES, which addresses air pollution abatement and proposes that energy transition from fossil fuel energy to a more renewable energy should be carefully managed. However, IGES does not clearly address nuclear power plant treatment though they often address the 2011 nuclear power plant disaster in Japan. In addition, as an inter-environmental ministry between the three countries in Northeast Asia, TEMM has not addressed energy policy directly (CAECC, IGES & KEI, 2015). IGES and TEMM have not

clearly addressed energy denuclearization because energy policy is beyond the environmental ministry's jurisdiction but a national security issue (Cui, 2018).

The environment ministries of Japan and South Korea can manage climate change issues.⁶ However, China's Ministry of Environmental Protection could deal with things from a narrow perspective, whereas the National Development and Reform Commission (NDRC) had controlled this area as a jurisdictional ministry.⁷ Moreover, climate change, including in Japan, is a complex issue administered not only by the Ministry of the Environment but also by other ministries, including the Ministry of Foreign Affairs, the Ministry of Economy, Trade, and Industry (with Agency for Natural Resources and Energy), and the Ministry of Agriculture, Forestry, and Fishery. These complexities have hindered the promotion of joint climate change activities under the TEMM framework. Furthermore, IGES is funded by the Ministry of the Environment in Japan. Therefore, a private advocator can clearly raise their voice for energy denuclearization, unlike inter- and semi-governmental environmental institutions in the region, which are limited to their administrative jurisdictions.

The difference in energy transition strategies between official and semi-official networks and the private network is also due to the different combinations of member countries. Inter- and semi-governmental networks focus on climate change and air pollution issues. This strategy is primarily initiated by the Japanese, Chinese, and South Korean actors. In contrast, the private think tank networks focus on energy source denuclearization. This strategy is mainly initiated by the Japanese, South Korean, and Taiwanese actors. Heterogeneous preferences in national energy policy are also observed. Chinese government seeks to develop nuclear power plants to meet the country's economic and environmental

⁶ Personal communications with relevant experts in Japan, China, and South Korea.

⁷ Since March of 2018, the Ministry of Environmental Protection in China has been reformed as the Ministry of Ecology and Environment. This new ministry deals with climate change issues instead of the NDRC.

needs. The Japanese government also resumes nuclear power plants despite public unwillingness after the 2011 accident, while both the Taiwanese and Korean governments are slowly moving toward denuclearization.⁸ Although the Japanese and Chinese governments have similar pro-nuclear power development attitudes, their governmental attitudes toward nonstate actors differ. The Chinese government is intolerant of different voices raised against energy policy, particularly regarding its nuclear power development (the staff of The East Asia Environmental Information Center, personal interview, April 2019), whereas the Japanese government considers dissenting views.

Thus, the ETDEA has emerged as private entrepreneurs to provide energy transition related norm, information and practices. They have emerged under the absence of focal institutions, which advocate energy denuclearization and heterogeneous state preferences in energy policy among four countries in the region. These entrepreneurs also provide expertise and practical capacity on renewable energy production.

Embryonic forms of private authority involving broad actors

This section examines embryonic forms of private environmental governance in each case and across the cases as regards their various partnerships and functions as private authority. Table 1 summarizes the analysis of the three cases, including the findings in the previous section.

⁸ Presentations and discussions at the workshop that was held at the National University of Taiwan in June of 2019.

Table 1. Summary of case studies

Issues	Entrepreneurial private governors	Type of private governors (countries)	Private authority functions	Focal institutional gaps	State preferences	Actors involved in hybrid form
Transboundary air pollution	APCAP Science Panel	Scientific community (Japan, China, South Korea, etc.)	Science-based solutions	Overlapping but no coordination, non-binding	Rivalry between Japan and South Korea; no consensus for wider area of cooperation between Japan, South Korea, and China	IOs (UNEP, CCAC, IIASA), a semi-governmental institution (IGES)
Green supply chain	IPE platform	Research type NGO (China)	Pollution map, corporate performance indexes	No focal institutions at the initial time	Countries outside China cannot implement environmental regulations directly to Chinese industries	Domestic and overseas NGOs, multinational brand corporations, foreign embassy (Japan)
Energy transition	ETDEA group	Private independent think tank (Japan) and scholars (Japan, South Korea, Taiwan)	Renewable energy practices (community power)	Intergovernmental and semi-governmental networks avoid contestation on the nuclear energy development in the region	Different policies on nuclear power energy among South Korea, Taiwan, Japan, and China; Different attitudes toward anti-nuclear movement between Japan and China	Small businesses (Japan), National research institute, and local governments (Taiwan)

Source: Compiled by the authors

Table 1 shows that entrepreneurial private governance has similar trends across the cases but differ in forms and functions in each context. On the one hand, all cases emerge not as a standalone form but a hybrid form with broad partnerships between public and private actors. On the other hand, each case has different types of form and function, such as a scientific community, to provide comprehensive scientific solution (the APCAP Science Panel), NGO platform that promotes green supply chain practices (the IPE initiative), and a think tank NGO network that advocates energy transition and renewable energy practices (the ETDEA group). The details are discussed as follows.

Various forms of partnerships

In the case of the APCAP Science Panel, as an IO, UNEP is an important actor in terms of secretariat. The first assessment report could not be published by APCAP only but jointly with UNEP and CCAC as an international multi-stakeholder coalition. Moreover, this publication has been translated into Japanese by IGES, a semi-governmental institution funded by the Ministry of the Environment in Japan and ACAP, the center of EANET. The Japanese edition states that certain IGES and ACAP experts were involved in writing the report. Additionally, IGES and the International Institute for Applied Systems Analysis (IIASA: <https://iiasa.ac.at/>) followed the report to hold a symposium on scientific solution for air pollution and climate change in the region in Tokyo, 2019 (the author's observation, November 2019). Reflecting the ethos built into the name of APCAP, it functions as a regional partnership mechanism through its recent output. These facts reveal that scientists are networking not only through the APCAP Science Panel members but also through other institutions and networks, including inter- and semi-governmental organizations and international platforms. This finding indicates that various organizations and platforms contribute to the supply of broader scientists to the APCAP Science Panel initiative.

In the case of the IPE platform that promotes green supply chain, it has a broad range of partnerships with local and overseas NGOs. The East Asia Environmental Information Center (EAEIC), a Japanese NGO, has cooperated with IPE to promote GCA activities among Japanese companies, published Japanese GCA reports, and held roundtable meetings involving Japanese companies, IPE, and other Chinese NGOs between 2012 and 2014 (<http://www.eden-j.org/GCA>). The Natural Resources Defense Council is an international NGO based in the US with an office in Beijing. It cooperated with the IPE to develop and publicize CITI since 2014 (see the IPE website). In 2018, CDP, a London-based non-profit climate research institute, drafted a report with the IPE on the Supply Chain Climate Action SCTI Index (Supply Chain Climate Transparency Index). This report examines carbon footprints as regards greenhouse gas emission management of 181 information technology (IT) and textile industry brands from CITI. This report aims to ensure the Paris Agreement targets to avert global warming are achieved by involving not only foreign companies where developed countries invest but also Chinese companies (IPE & CDP, 2018). This multi-stakeholder coalition initiated by a Chinese environmental NGO has established a transparency-based platform as a new form of private governance.

As a network initiated by a private independent think tank NGO in Northeast Asia, the ETDEA group cooperated with other institutes to promote the transition from fossil fuels and nuclear power to cleaner renewable energy. As mentioned earlier, ISEP has organized a local network of renewable energy producers in Japan. Additionally, in June 2019, the Industrial Technology Research Institute (ITRI), a semi-governmental research institute in Taiwan, collaborated with the members of the ETDEA group to hold a workshop in Taipei. This workshop aimed to share Japan and South Korea's renewable energy practices with local participants (authors' participatory observation, June 2019). The workshop showed a potential to attract various adherents to the private initiative as described in details below.

Emerging functions of private authority

Assessing the functions of private authority in the first case is too early because APCAP only succeeded in producing its first output in 2018. However, APCAP seems to function as a private authority that is expected to be followed by additional stakeholders in future. This observation can be seen in a series of related events around the publication in Japan as mentioned above. It should also be noted that APCAP Science Panel scientists intend to disseminate a message based on scientific analysis to policymakers, which could not be done by intergovernmental focal institutions. The first policy brief was developed by Dr. Akimoto, APCAP Science Panel Vice Chair. He aimed to not only analyze but also 'justify the need to co-control PM_{2.5} and photochemical oxidant represented by ozone (O₃)' (Akimoto, 2019). The policy is expected to function as a private authority in terms of devising a co-solution for air pollution and climate change mitigation in Asia and the Pacific. However, it will need additional time to determine how it can be followed by broader actors as solutions to the region.

In the second case, the IPE platform is important in the context of Northeast Asia's regional environmental governance due to the following reasons. First, the platform urges China's industrial polluters and their buyers worldwide to comply with national effluent standards. This simple mechanism contributes to reducing the total amount of industrial pollutants not only in the country but also in the region. Apple, DELL, Levi's, NIKE, and other multinational brands have to communicate with the IPE to monitor the reputations of their suppliers and improve their CITI evaluation. Thus, the IPE platform is viewed as an entrepreneurial private authority that delivers its environmental standards to be followed by corporations that invest in China's industries.

Panasonic was the first Japanese company accused of violating suppliers' environmental protection required by IPE. Panasonic is a leading Japanese company in the consumer electronics industry and has struggled to restore its bad reputation. This incident was caused by announcements on IPE's website and local news media through a generous consultation with the Japanese embassy based in Beijing. Consequently, the Japanese embassy secretariats have been communicating with the organization about the evaluation and reputation of Japanese companies that invest in China. Through third-party inspections organized by IPE and local environmental NGOs, Panasonic has succeeded in removing their name from the worst performer list on the IPE website.⁹

Furthermore, how this 'transparency-based platform' (Haddad, 2015) model can diffuse is interesting to see. The case of the Green Citizens' Action Alliance, a Taipei-based environmental NGO is a good example. It has developed the website *Transparency Footprint* that presents Taiwan's environmental pollution database as a digital map (thaubing.gcaa.org.tw). According to the organizational leader, they learned about IPE's website after communicating with their staff.¹⁰ This episode indicates that partnerships initiated by IPE have the potential to step into replicating and diffusing practices (Andonova, 2017, pp. 57-61).

At the last case, the ETDEA is expected to be a private authority to provide renewable energy practices as seen in the case of the workshop held jointly by ITRI in Taipei. At the workshop, there were 96 participants, including stakeholders such as the central government (4 persons), local and municipal governments (16), universities (4), academic institutes (16), private consulting companies (9), foundations (4), civil society organizations (17), politicians

⁹ From an oral report made by one of the staff of Panasonic at the symposium in November of 2009 in Tokyo (https://www.sustainability-fj.org/seminar_report/091106-2/) and a personal communication with a former secretariat of the embassy to the author.

¹⁰ Interview at Green Citizens' Action Alliance in Taipei in October 2017.

(2), media houses (1), interpreters (2), and foreign participants from Japan (8) and South Korea (2) (ITRI, 2019). It was observed through discussions between foreign experts and local participants that this *ad hoc* open forum attracted local participants who desired to gain knowledge and updated information on energy transitions achieved in neighboring countries (authors' participatory observation, June 2019).

It should be noted that the knowledge and information the ETDEA group disseminates is synthesized with the global trends followed by local governments and businesses in the region after the Paris Agreement of the UNFCCC. Especially local governments and businesses in the region are now aware of the need to develop renewable energy. 'Community power,' which is a community-based practice to produce renewable energy locally, is a common hot topic in East Asia because it is getting more and more attention from not only the relevant experts but also local governments, farmers, banks, and other businesses under the landscape transformation of the energy-environment nexus that occurred after the Paris Agreement of the UNFCCC. Thus, the ETDEA group is functioning as private authority through broadening their networks regionally as well as domestically.

Conclusion

This article has provided empirical evidence of the emergence of new forms of private governance through three case studies: transboundary air pollution, green supply chain, and energy transition in Northeast Asia. These case studies refer to private governance theories discussed in the context of global environmental governance. First, as private authority theory predicts, entrepreneurs with vast expertise and sufficient capacity to provide useful information and practices to stakeholders have emerged. They enable stakeholders to cooperate in regional environmental sustainability under the conditions of weak or no focal institutions and heterogeneous state preferences in all cases. This condition is consistent with

the global trend of environmental governance, which is shifting from regulatory-based to goal-setting governance.

Second, global partnership theory suggests that hybrid forms of private governance, including various local- to global-level public–private partnerships, are emerging across the cases. However, they are still in the embryonic stage, where their private authoritative functions are not completely developed. Entrepreneurial private governance in each case has different potentials in terms of private authoritative functions and is at slightly different stages as regards partnership development.

APCAP Science Panel provides science-based solutions for transboundary air pollution and climate change mitigation. Actors in the region are expected to follow these solutions as certain Japanese and IOs disseminate their results independent of the panel activity. In the case of the IPE platform, which promotes green supply chain, it provides original indicators to international and national brand companies to follow. Thus, tangible results of industrial pollution abatement in China are obtained, where environmental pollution in Northeast Asia is concentrated. Moreover, a Taiwanese environmental NGO has replicated this model in its website. In the case of the ETDEA group, they have vast expertise and capacity to provide current information and practical experiences on renewable and decentralized energy. This approach can potentially attract additional adherents in the region as seen in the case of the international workshop held in Taipei.

These insights challenge the predominant view on the limited roles of nonstate actors in building regional environmental governance in Northeast Asia as discussed in the literature. However, they are still at the embryonic stage of partnership development and have not yet developed their full capacity of private authoritative functions. In other words, these private entrepreneurial governors must continuously gain additional adherents from broader actors; these adherents include local to global public and private actors, unless they remain

experimental or temporary advocacy network. Further investigation of their future development and observation of more diversified cases, while focusing on the dynamics of the interaction between global, regional, and local environmental governance, are necessary.

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