

# Transboundary Cooperative Governance Toward Energy Transition in East Asia



## A Review of Historical Development and Future Perspective

**Kenji Otsuka**

**Abstract** The last decade has witnessed several events that had a serious impact on people's attitudes toward environmental sustainability regionally and globally. This chapter depicts how transboundary cooperative initiatives by states and nonstate actors tackle transboundary air pollution and climate change in East Asia. It also examines the opportunities and challenges we face in the very recent landscape shift toward carbon neutrality and the deepening concerns for climate emergencies. Multilateral cooperative institutions in East Asia have focused on the monitoring of air pollutants and information sharing of related policies and measures among member countries. It should also be noted that there are some transboundary coalitions of independent scholars and research-type NGOs in Northeast Asia who conduct joint research on the decarbonization of energy systems and disseminate up-to-date knowledge and information on decentralized nature-based renewable energy. For further development of transboundary cooperation in East Asia, opportunities exist as an increasing potential for multilateral policy dialogue beyond the borders and broadening partnerships for local and transboundary coalitions with global alliances on the one hand; and challenges in just and safe transition, decarbonization of overseas financing, and seeking energy resilience on the other.

**Keywords** Energy transition · Carbon neutrality · Climate emergence · Environmental governance · Cooperative governance · Nonstate actors · East Asia · Northeast Asia

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K. Otsuka (✉)  
Institute of Developing Economies (IDE-JETRO), Chiba, Japan  
e-mail: [Kenji\\_Otsuka@ide.go.jp](mailto:Kenji_Otsuka@ide.go.jp)

## 1 Introduction

Since the last century, the people of East Asia have experienced rapid economic growth alongside regional economic integration, while facing common human security risks in terms of environmental sustainability. It should be noted that there were several events—both regional and global—in the last decade, which had a serious impact on people’s attitudes toward environmental sustainability for a cleaner and safer energy system in the region. They include the frequent occurrence of toxic smog in many cities in China in the 2010s, the Fukushima-Daiichi nuclear power plant accident in Japan in 2011, 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. Although the first two cases occurred within their respective countries, they caused serious concerns for the neighboring countries and were considered as transboundary environmental problems in the region.

In response to the common environmental sustainability risks, each country has developed a series of public policies (Terao & Otsuka, 2007), and bilateral and multilateral cooperation in the region and beyond (Mori, 2013a). However, it has been criticized that transboundary cooperative institutions for sustainable development in East Asia are weaker than those in the West because they are non-binding, overlapping without any synergy, and closed to civil society (Elliott, 2017; Komori, 2010; Matsuoka, 2014; Mori, 2013b; Reimann, 2014; Takahashi, 2017). In addition to these shortcomings in the regional institutions, there has been persistent and strong exercise of sovereignty by nation states, asymmetries in geography (upwind-downwind), economic development, political divides (liberal democracy vs. communist), and continuous tensions surrounding national security based on historical legacies from World War II and the Cold War (Cross-strait relations, the Korean peninsula, and the East China Sea) in the region (Pekkanen et al., 2014). Although these institutional and structural factors seem relentless so far, both opportunities and challenges could be found for the further development of transboundary cooperative governance under the changing landscape of energy and environment issues.

This chapter explores how transboundary cooperative governance has developed under increasing energy and environmental security concerns in East Asia and the types of opportunities and challenges that are found in the further development of transboundary cooperation on energy transition among four major economies in the region, namely, Japan, China, South Korea, and Taiwan, under the recent landscape shift toward carbon neutrality and the deepening concerns for climate emergencies.<sup>1</sup>

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<sup>1</sup>The second through fifth sections are based on Otsuka (2018) and Otsuka and Cheng (2020).

## 2 Development of Regional Environmental Governance in East Asia

Even before building multilateral environmental cooperation in East Asia, efforts have been made to promote bilateral cooperation between Japan and China. In 1979, Japan began to provide official development aid (ODA) to China. Before the termination of the new Yen Loan Program to China in 2008, Japan had been a top donor to China in terms of bilateral economic cooperation in the world. In 2007, just 1 year before terminating the said program, the amount of ODA from Japan to China was \$435.66 million USD, which was 32.6% of the total amount of ODAs given to China. Germany was China's second largest donor in 2007, providing \$289.28 USD in aid, comprising 21.6% of the total aid given to the country.<sup>2</sup>

It is also noted that Japanese ODA to China started to focus on environmental issues from the 1990s in response to the mounting environmental problems in the country and their potential impact on Japan. According to data from 2000 to 2007 on countries in the Development Assistance Committee (DAC), Japan had been a top donor for China in terms of the contract-based amount of environmental ODA that accounted for about 40%–60% of the DAC countries (Takehara, 2014, pp. 424–425). China watched Japan grappling with environmental issues such as pollution and disease, and learned from the country's efforts to improve technology and regulations (Qu, 1997, pp. 9–13; Wang, 1999, p. 180). Furthermore, Japan's bureaucratic culture originated in ancient China. While the two countries have different political systems today, the governments can communicate more easily because they share some bureaucratic practices.<sup>3</sup> Moreover, Japan was visited not only by governmental officials, but also Chinese scholars and researchers in the field of environmental sciences and technologies to share mutual interests and exchange information and results with their Japanese counterparts (Bianweihui, 1994, pp. 226–337). China has enjoyed a beneficial relationship with Japan, learning from Japanese environmental protection experiences, and benefiting from a large amount of financial aid. In 2018, however, both the governments agreed to terminate all the ODA projects, including technical assistance and grant aid, after several years, when China's GDP overtook that of Japan.

Formal regional institutions for environmental cooperation across countries go back about 20 years to the 1990s when the UN Conference on the Environment and Development was held in Rio de Janeiro. Since this event, a series of regional environmental institutions, in addition to bilateral agreements, have been developed in East Asia and beyond, such as Eco Asia, which began in 1991; the Northeast Asian Conference on Environmental Cooperation (NEAC), 1992; the Northeast

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<sup>2</sup>Ministry of Foreign Affairs of Japan, "Date book of ODA 2010," [http://www.mofa.go.jp/mofaj/gaiko/oda/shiryo/kuni/10\\_databook/index.html#1](http://www.mofa.go.jp/mofaj/gaiko/oda/shiryo/kuni/10_databook/index.html#1).

<sup>3</sup>Such stories were recounted by many Chinese counterparts in several joint research projects. It is also true, however, that there are a few gaps between us and them in terms of political sensitivities in some issues.

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 (Matsuoka, 2013, 2014; Otsuka, 2018). Further, in terms of energy and environmental issues, the Asia-Pacific Economic Cooperation (APEC) launched in 1989 is an important international organization that has been discussing sustainable development as a cross-cutting issue among member economies since 1997.<sup>4</sup>

Meanwhile, 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 and between countries 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, as of 2010 (Igarashi, 2013, pp. 272–274). Although there are no statistics regarding the number of TCS networks working on issues of environmental sustainability in East Asia, some transboundary networks led by NGOs and researchers independent of the government have been observed and reported (Teranishi & East Asia Environmental Information Center (EAEIC), 2006; Igarashi, 2013, pp. 248–267). Moreover, the recent emergence of new forms of private environmental governance initiated by nonstate actors in East Asia should be examined (Otsuka & Cheng, 2020). The Asia Pacific Clean Air Partnership (APCAP)<sup>5</sup> with the new institutional building, initiated by scientists on transboundary air pollution, was launched under the UN Environment in 2015 and consists of a science panel that will help create a scientific community for atmospheric science and a joint forum, which will assist policymakers in setting targets to improve air quality in the region. Several research-type NGOs in Northeast Asia organize various activities including research, information disclosure, and advocacy on environment and energy issues in the region, including the Institute of Public and Environmental Affairs (IPE),<sup>6</sup> the East Asia Climate Network (EACN), and the research group on Energy Transition and Democracy in East Asia (ETDEA). In particular, the last two groups focus on energy transition in Northeast Asia and will be described in detail later in this chapter.

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<sup>4</sup><https://www.apec.org/Groups/Other-Groups/Sustainable-Development>.

<sup>5</sup><https://www.unenvironment.org/asia-and-pacific/asia-pacific-clean-air-partnership>.

<sup>6</sup><http://www.ipe.org.cn/>.

### 3 Early Cooperative Initiatives for Transboundary Air Pollution in Northeast Asia

Northeast Asia has been facing serious air pollution problems as a result of rapid regional economic growth. Therefore, in the 1970s and 1980s, research institutes in each country conducted numerous studies on 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 (SO<sub>2</sub>) emissions from the combustion of large amounts of coal in the region, forced the government to cooperate with China through ODAs and other joint projects to ensure air quality improvement during the 1990s. In 1993, the Ministry of the Environment of 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 international organizations in Toyama Prefecture. After several rounds of expert meetings and negotiations between these countries, the first round of inter-governmental meetings of the EANET was held in Yokohama City with the generous support of the Japanese government in 1998. This inaugurated a tentative cooperation 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 2000. At this round of meetings, 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 United Nations Environment Programme (UNEP) and the Asian Institute of Technology.<sup>7</sup> The network center was established in Niigata, Japan, which is now called the Asia Center for Air Pollution Research (ACAP).<sup>8</sup> The EANET has 13 member countries, including Cambodia, Laos, and Myanmar (Suzuki, 2009, pp. 77–80; Takahashi, 2017, pp. 238–273).

For over a decade, the EANET has contributed to data monitoring of the deposition of acid pollutants in rain and snow; and capacity-building, 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). The recent review on impacts on the ecosystem by acidification points out: “Although the impact of acid deposition is less clearly understood, the adverse impact on forests, inland waters, and materials has been reported in one or

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<sup>7</sup><http://www.rcap.ait.asia/>.

<sup>8</sup><https://www.acap.asia/en/>.

more countries in the East Asia regions. Therefore, continuous efforts toward impact assessment of acid deposition are necessary for the decades to come.” (TFRC, SAC, and EANET, 2015, pp. 183–184).

Meanwhile, South Korea is 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, such as in the case of China and Japan. In 2000, 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 and atmospheric particulate matter less than 2.5 micrometers (PM<sub>2.5</sub>), and modeled the spatial distribution of pollutants across member countries. Although the three countries—South Korea, Japan, and China—are members of both the EANET and the LTP project, the scope and methodologies of the latter are wider than those of the former, 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, 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<sub>2.5</sub>, for monitoring and research, and for information sharing of analysis technology (Chu, 2018). 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).

#### **4 Development of Cooperative Initiatives for Air Pollution and Climate Change**

Since the Kyoto Protocol was adopted at COP3 of the UNFCCC in 1997, which requires major industrialized countries to reduce CO<sub>2</sub> 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 the 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). It 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, 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, no practical progress in multilateral cooperation on climate change issues in the region has been made (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 COP 21 of the UNFCCC in 2015. It should be noted that China, as an emerging economy, has played an important role because of its increasing significance 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 the regulatory-based to goal-setting method (Kanie & Biermann, 2017; Sachs, 2015; Young, 2017). Moreover, a shift in China’s commitment to regional environmental governance has been observed (Otsuka, 2018). First, China pledged in its NDC to limit CO<sub>2</sub> 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 CO<sub>2</sub> emissions. Second, China has been suffering from persistent heavy smog, mainly consisting of PM<sub>2.5</sub>. Lastly, the government has decided to reduce coal usage and undertake industrial restructuring to address their over-consumption 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.<sup>9</sup> 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 the IGES and its counterparts in China and South Korea since 2016 (Liu, 2018). Thus, except for

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<sup>9</sup>[https://isap.iges.or.jp/2015/en/day1/p\\_3.html](https://isap.iges.or.jp/2015/en/day1/p_3.html).

the TEMM as the highest-level intergovernmental meeting, the platform initiated by the 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, scholars and researchers have been active in joint research projects in Northeast Asia, especially between Japan and China. Such joint research projects are expected to provide a basis for nurturing a science-based network on atmospheric science in the region (Akimoto, 2016). Meanwhile, many have called for the 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 as “[s]trengthening the role of the United Nations 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 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 the EANET, and now a visiting scientist at the National Institute for Environmental Studies (NIES) in Japan, is one of the 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 policymakers [. . .]” therefore, “[t]here is a strong need to give a clear message and suggestions from the scientific community to policymakers 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 (Akimoto, personal interview, June Akimoto, 2018).

As of 2018, the science panel comprised 12 scientists: three from China, two from Japan, two from India, and one each from Singapore, South Korea, Thailand, Nepal, and Austria.<sup>10</sup> One of its Chinese members, Prof. Jiming Hao of Tsinghua University, has been designated the Chair, and Dr. Akimoto has been nominated as the vice chair (Akimoto, personal interview, June Akimoto, 2018).

In 2019, the UNEP, APCAP, and the Climate and Clean Air Coalition (CCAC, <https://ccacoalition.org/>)<sup>11</sup> 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

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<sup>10</sup>Dr. Markus Amann, Program Director of the Air Quality and Greenhouse Gases, International Institute for Applied Systems Analysis (IIASA) joined the panel. He is expected to advise the panel as a European expert.

<sup>11</sup>The CCAC is a global partnership supported by the UNEP and established in 2012 to address the impacts of the short-lived climate pollutants (SLCPs) such as black carbon.



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<sub>2.5</sub>, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and black carbon (UNEP, APCAP, and CCAC, 2019).

It should also be noted that there were over 100 contributors from the Asia-Pacific region who were involved beyond authoring this report. According to the summary presented by the UNEP, APCAP, and the 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, and a number of international organizations and those from other regions of the world.<sup>12</sup> The writers of the report were reported to be volunteers organized by members of the science panel and through other bodies (Akimoto, personal interview, April Akimoto, 2019).

In addition to this science-based solution report, Dr. Akimoto, as the vice chair of the APCAP Science Panel, published the *Clean Air Brief 2019* in January 2019 to emphasize the need to co-control PM<sub>2.5</sub> and ozone in Asia (Akimoto, 2019), based on his and other relevant science-based studies. 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 together with climate change issues to the stakeholders including scholars, policymakers, and other practitioners in the region.

## 5 Emergence of Nonstate Actors’ Initiatives Toward Energy Transition

It should be noted that civil society has taken much longer to develop a network addressing climate change and energy transition in Northeast Asia. In 2010, the East Asia Climate Network (EACN) was established between NGOs in three countries and has since organized the East Asia Citizen Conference on Climate Change bi-annually (Aikawa, 2011). At the COP 24 of the UNFCCC held in Poland in December 2018, NGOs from three countries—the Rock Environment and Energy Institute (REEI, China), the Kiko Network (Japan), and the Korean Federation of Environmental Movements—jointly published a policy report, “Coal Power Sector

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<sup>12</sup>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 China, Japan, and South Korea: Current Status and the Way Forward for a Cleaner Energy System.” This report focused on issues related to coal-fired plants 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, since 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 an environmental NGO at the National Taiwan University on September 2 and 3, 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 & Chung, 2018; Suzuki, 2017), and how to build the momentum of nonstate actors’ energy transition networks.<sup>13</sup>

The research group “Energy Transition and Democracy in East Asia” (ETDEA) is a recent initiative hosted by the Institute for Sustainable Energy Policies (ISEP) with generous support by a research project in Tohoku University, a private think tank based in Tokyo that 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 of some former policymakers and advisors of the Democratic Party of Japan who were serving when the disaster occurred in 2011. In June 2019, they held a second workshop in Taipei hosted by the National Taiwan University to invite Japanese and South Korean members to discuss the 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 the bitter lessons from the severe accident that occurred in Japan in 2011, as mentioned often in their presentations and personal conversations.<sup>14</sup>

It is worth mentioning that the ETDEA acts as an entrepreneur that 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. As a network initiated by a private independent think tank NGO in Northeast Asia, the

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<sup>13</sup>My participatory observations at the forum in Taipei, September and October 2017.

<sup>14</sup>My participatory observations in the Tokyo workshop, February 2019 and the Taipei workshop, June 2019.

ETDEA group cooperated with other institutes to promote the transition from fossil fuels and nuclear power to cleaner renewable energy.

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's and South Korea's renewable energy practices with the local participants.<sup>15</sup> The workshop had 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 (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 the local participants that this *ad hoc* open forum attracted the latter who desired to gain knowledge and up-to-date information on energy transitions achieved in neighboring countries.

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. In particular, 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 locally produce renewable energy, is a common hot topic in East Asia. This is because it is garnering increased 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 a private authority (Green, 2014) by broadening their networks regionally and domestically.

## **6 Opportunities and Challenges for Further Development of Transboundary Governance Toward Energy Transition**

### ***6.1 Landscape Shift for Climate Policy***

The Paris Agreement adopted at COP 21 of the UNFCCC came into force in 2016. It requires all parties to undertake ambitious efforts to hold the increase in the global average temperature to well below 2 °C, and to pursue efforts to limit the temperature increase by 1.5 °C above pre-industrial levels (UN, 2015). To achieve this goal, all nations need to put their best efforts into their NDCs and revise them every 5 years. The synthesis report of intentional NDCs by April 2016, however, suggests that their aggregate efforts were not enough to reduce greenhouse gas emissions to adhere to the temperature increase limit set by the agreement, rather allowing its

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<sup>15</sup>My participatory observation, June 2019.

continuous increase (UN, 2016). In addition, as of January 2021, only 50 countries have updated their NDCs (since the outbreak of the COVID-19 pandemic).<sup>16</sup> Although there is uncertainty in achieving the climate goal, it should be noted that an increasing number of countries have been setting carbon neutrality—balancing carbon emissions and sinks—as a long-term target recently. The race to net-zero emissions was launched in Western Europe<sup>17</sup> after the Paris Agreement of 2015, and has now been sparked in East Asia since China’s announcement in September 2020 (2060 as the target year), followed by Japan in October 2020 and South Korea in December 2020 (2050 as the target year in both countries).<sup>18</sup>

In addition to those national governmental commitments, the race to net-zero emissions has been spreading among various actors in the world. The Climate Ambition Alliance led by the governments of Chile and the United Kingdom together with the support from UN organizations are mobilizing a wide range of nonstate actors including business, cities, companies, investors, universities, and other organizations to join the global campaign, “Race to Zero.” There are 7877 participants registered on the website, including those from Japan (180 participants), China (120), South Korea (37), and other Asian countries.<sup>19</sup>

Besides such an ambitious shift for climate response by the state and nonstate actors, various actors across the world have shared wide concerns regarding the looming climate crises. According to the global campaign “Climate Emergency Declaration and Mobilisation In Action,” launched from a local city council in Australia in December 2016,<sup>20</sup> 1854 jurisdictions in 33 countries have declared a Climate Emergency by December 2020, most of which (1807) are local governments, but others include 32 subnational or state governments, 14 national governments, and the EU.<sup>21</sup> In East Asia, the declaration has been adopted in Japan (the National Parliament, Tokyo Metropolitan Government, Nagano Prefecture, Kanagawa Prefecture, and 42 local governments), South Korea (the National Assembly, National Association of Mayors, and Chungcheongnam-do Province), the Philippines (Bacolod City, Cebu City, and Tolosa Municipal Council), and Taiwan (New Taipei City and Taitung County).<sup>22</sup>

Recently, an increasing number of people have experienced real climate crises through frequent extreme weather events. The Global Risks Perception Survey on an extensive network of the World Economic Forum (WEF) including more than

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<sup>16</sup><https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement/nationally-determined-contributions-ndcs/NDC-submissions>.

<sup>17</sup><https://www.weforum.org/agenda/2019/07/the-growing-list-of-countries-committing-to-a-net-zero-emissions-goal/>.

<sup>18</sup><https://news.un.org/en/story/2020/12/1078612>.

<sup>19</sup><https://racetozero.unfccc.int/join-the-race/whos-in/> (Accessed on November 1, 2021).

<sup>20</sup><https://www.cedamia.org/news/four-years-of-climate-emergency-declarations/>.

<sup>21</sup><https://www.cedamia.org/news/four-years-of-climate-emergency-declarations/>.

<sup>22</sup><https://www.cedamia.org/global/>.

600 leaders from business, government, civil society, and others tells us that extreme weather has been recognized in the last 5 years as a top priority risk “likely to occur in the next 10 years” from the time of the survey (WEF, 2021). It is pointed out that recent extreme weather events observed in many parts of the world such as heat waves, heavy precipitation, droughts, and cyclones are likely influenced by human activities (IPCC, 2021, pp. 8–9). These events have not just made people feel fearful regarding the future, but have also had great impacts on the vulnerability of the existing energy system. For example, Japan has been experiencing widespread blackout accidents due to extremely intense typhoons in the Kansai area (Osaka Prefecture and surrounds) in 2018 and the Kanto area (Chiba Prefecture) in 2019. In response to the increasing natural and manmade disasters in the region, APEC member economies have been discussing “energy resilience” since 2015 and endorsed the APEC Energy Resiliency Principle in August 2020.<sup>23</sup>

## ***6.2 Opportunities for Transboundary Cooperation Toward Energy Transition***

These recent landscape transformations around climate and energy issues could provide both opportunities and challenges for further development of transboundary governance toward energy transition in East Asia. As for opportunities, first, there is the same long-term goal of carbon neutrality among three major countries in East Asia—Japan, China, and South Korea—although the target years are different (2060 for China and 2050 for Japan and South Korea). To achieve this goal, it is expected to accelerate decarbonization of energy supply and consumption, which are still dependent largely on fossil fuels, through further development of renewable energy systems. In terms of renewable energy development, the Taiwanese government is also heading in the same direction (see the relevant Chapter in this book). In this sense, decarbonization of energy sources can be an important opportunity for joint climate actions by governments, businesses, and various nonstate actors in this region. According to an analysis of transboundary economic integration and water-energy-food interdependence in this region (White et al., 2018), China is the largest exporter of water, energy, and food to Japan and South Korea. Thus, it is important to seek the interests of not only a single country, but also regional common beneficiaries toward planetary sound energy transition by mutual learning and cooperation regarding emerging integrated policies of economy, environment, and energy including “green growth,” “green new deal,” and “green recovery from COVID-19.” This may be done under an existing institution such as the TEMM or APEC or a new relevant platform built for all concerned economies. In addition to policy learning and coordination, there could be a potential to monitor and evaluate climate policy progress by monitoring air pollutants with climate impacts by

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<sup>23</sup>[http://mddb.apec.org/Documents/2020/EWG/EWG59/20\\_ewg59\\_023.pdf](http://mddb.apec.org/Documents/2020/EWG/EWG59/20_ewg59_023.pdf).

updating transboundary monitoring and scientific networks that have been developed over these decades in the region.

Second, the recent rapid landscape transformation provides an important opportunity for the various nonstate actors to introduce and disseminate new technology and policy for cleaner and safer energy systems. Especially in terms of decentralized and nature-based renewable energy systems such as solar and wind power, there could be an advantage for nonstate actors including venture businesses, research institutions, and expert-led NGOs to learn, analyze, and disseminate up-to-date knowledge and knowhow. For example, “community power” (community-based renewable energy system) and “solar sharing agriculture” (agriculture farming under the solar system) are initiated by a coalition of multi-stakeholders, including local communities, local governments, NGO/NPOs, universities, social businesses, local banks, and so forth (see the relevant Chapter in this book). As a private authority in the region, nonstate actors who can afford to act both internationally and locally could have the potential to develop and proliferate such local practices when they connect with national, regional, and global networks (Otsuka & Cheng, 2020), including the global alliance of the race to net-zero mentioned above.

### ***6.3 Challenges Toward Energy Transition***

However, there are several challenges to be addressed. First, it needs to mitigate the socio-economic impacts of the rapid transition of the energy system, and secure technological and social safety during the transition. According to one scenario of renewable energy development to meet the Paris Agreement target by the mid-century, it is estimated that 3034 thousand jobs will be lost in the conventional energy sector, including nuclear power and fossil fuels; and 4257 thousand jobs will be created in transition-related sectors including renewable energy, energy efficiency, and power grids and energy flexibility from 2017 to 2050 in Japan, China, Korea,<sup>24</sup> and Mongolia (IRENA, 2020). Although it is estimated that 1223 thousand jobs will be created in these countries by 2050, securing job losses in old sectors while training personnel in new sectors is a major challenge (IRENA, 2020). In terms of human resource allocation in transition, caution should also be exercised regarding how to secure skilled personnel to manage nuclear power technology, including reactor decompression during the transition toward denuclearization. In addition to these personnel factors, conflicts with local communities should be carefully avoided while constructing a renewable energy system, especially large-scale facilities of solar power, wind power, and hydropower. These challenges encourage us to work together toward a just and safe transition regionally and globally.

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<sup>24</sup>It includes both North and South Korea.

Second, the way toward decarbonization of overseas investment by public banks in the three major countries in East Asia should be considered, although their national leaders have pledged net-zero emissions in 2020. According to Greenpeace, public banks in China, Japan, and South Korea invested 78.9 billion USD in coal and gas, while investing 9.1 billion USD in solar and wind power from 2009 to 2019. Moreover, some of the top financiers of fossil fuels globally are found in these countries (Greenpeace, 2020, p. 3). Although both public and private financiers in Japan and South Korea have announced their commitment to the decarbonization of overseas projects in 2020, it has been revealed that there is a gap between their willingness and decision, as seen in the case of a coal-fired generation project in Vietnam to be financed by the Japan Bank for International Cooperation with major Japanese private financiers, Korea Electric Power Corporation, and the Export-Import Bank of Korea.<sup>25</sup> It is time for all financiers in East Asia to shift their investment from fossil fuels to renewable energy, such as solar and wind power, which has large demands in Southeast Asia and other developing countries (Greenpeace, 2020, pp. 5–9).

Third, building a resilient energy system against frequent natural disasters should be included as an important agenda of energy transition projects in this region. Except for individual efforts in each country and the energy resilience principle adopted in APEC, joint actions and cooperation on energy resilience are lacking both regionally and globally. Major challenges toward a resilient energy system would be how to decentralize energy sources and how to control grid networks flexibly (METI, 2020). In this sense, decentralized renewable energy such as solar power has an advantage in terms of energy resilience. For example, in the case of Typhoon Faxai that struck Chiba Prefecture in 2019, 79.8% of the households that installed photovoltaic at their rooftops utilized their self-sustained operation during the blackout.<sup>26</sup> It should be noted, however, that there are no comprehensive data about the types and scales of energy system that could be resilient against natural and manmade disasters. It needs to conduct a systematic survey in each country as well as in the region and beyond.

## 7 Conclusion

This chapter depicts how regional cooperative initiatives by states and nonstate actors to tackle with transboundary air pollution and climate change. Multilateral cooperative institutions in East Asia have focused on monitoring of air pollutants or information sharing of related policy and measures among member countries. It should also be noted that there are some transboundary coalitions of independent scholars and research-type NGOs in Northeast Asia conduct joint research on the

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<sup>25</sup><https://www.kiconet.org/eng/press-release-en/2020-12-29/VA2-JBIC>.

<sup>26</sup>The sample size was 486 households in the area (<https://pps-net.org/column/79250>).

potential and challenges of decarbonization of energy systems and disseminate up-to-date knowledge and information on decentralized nature-based renewable energy under the landscape change toward cleaner and safer energy in the region. In addition, a very recent landscape shift toward carbon neutrality and the deepening concerns for climate emergencies provide both opportunities and challenges to the further development of transboundary cooperative governance toward energy transition. On the one hand, there are opportunities as an increasing potential for multilateral policy dialogue beyond the borders and broadening partnerships for local and regional coalitions with global alliances. On the other hand, there are challenges to a just and safe transition, greening overseas financing, and seeking energy resilience. In addition to these opportunities and challenges, we should consider technological, economic, and social uncertainties in deeper decarbonization, introducing new energy such as hydrogen, earth engineering, and carbon capture and storage with a long-term perspective. The first and most important thing is to move toward a better future through mutual learning and cooperation while enjoying fair competition in seeking an art of a cleaner, safer, just, and resilient energy transition locally, regionally, and globally.

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