

RENEWABLE ENERGY AND CLIMATE COOPERATION: A CASE FOR SWEDEN AND JAPAN

Stockholm, November 25-26, 2021



Webinar Report



A Word of Thanks

First and foremost, ISDP acknowledges the generous support of its partner KIIP in making this project possible.

A special thanks goes to the distinguished experts who participated in the symposium as presenters, discussants, and chairs. These experts came from institutions across the world, including Uppsala University, Swedish Bioenergy Association, Stockholm Environment Institute, Luleå University of Technology, Malardén University, University of Adelaide, University of Lund, Gemini Strategy Group, Belt and Road Initiative Sri Lanka, Observer Research Foundation's Centre for Resources Management, Manipal Academy of Higher Education, and Strategika Group Asia Pacific.

We would also like to express our profound appreciation and gratitude to Dr. Niklas Swanstrom, Director of ISDP, and Mr. Nobuyuki Hiraizumi, President of KIIP, for their generous support.

This report was compiled by Elin Bergner, Charlotte Poirier, Viola Pulkkinen, Peter Adolfsson, Atmaja Gohain Baruah, Mrityika Guha Sarkar, and Mahima Duggal.

Executive Summary

- International cooperation on renewable energy risks being subsumed under broader strategic rivalries where the United States (US) and China will compete for power to shape the new order. Renewable energy and climate policies will be determined by industrial policies and economic strategies difficult to delink from broader great power politics.
- EU Indo-Pacific strategy specifically mentions climate goals, and new frameworks and groups in the region provide opportunities for the EU to deepen its engagement. Two key issues for the EU are promoting resilient energy systems within the diverse region and ensuring a just transition to renewables in the region.
- Solar energy is a largely underused resource although it represents the biggest resource of energy for the earth. Some suggestions:
 - ♦ Countries in the Middle East, the world's most water-stressed region, could harness solar energy based on solar irradiance.
 - ♦ The commercialization of solar energy is a way to reduce fossil fuels usage and work toward a green transition. For example, the lithium-ion (Li-ion) battery industry, used to store the electricity generated by solar panels, has made great strides in the past 10 years with costs coming down with each passing year, which will increase the use of solar energy.
 - ♦ Agrivoltaics combines the use of photovoltaic (PV) applications with farming, where essentially PV modules can be tailored for crop production. With agrivoltaics, we can reduce conflicts on land-use and produce both electricity and food in the same land.
- Wind power development is on an upswing – from rejection on the basis of subjective views to an increase in the number of turbines – partly due to Sweden's commitment to the EU Renewable Energy and Climate Policies. Issues that wind power projects face today are more and more related to “green versus green” conflicts.
- Although the mining industry has a negative environmental impact, the world needs to mine increasingly greater amounts of minerals to support a green transition – resulting in a mining paradox. Some

suggestions: Going forward, mines across the world must double their productions while reducing their emissions, water usage, and waste. The preferred method is to mine deeper and more complex ore. The truly environmentally degrading section of the mining process, namely the reprocessing, must utilize green energy and new technology to minimize emissions and waste.

- Green steel as a renewable energy has the potential to lead the way for the green transition. Sweden is a precursor in green steel production because it has the only major iron ore mine in Europe, access to fossil free, low-cost electricity already, competence in steel production, and a unique framework of industrial cooperation.
- Sweden is an experienced actor in the field of replacing fossil fuels with biofuels via policy instruments (like carbon tax) to promote biofuels. Such tools combine reducing emissions with long-term economic development and prosperity. However, often environmental laws are tailored for local interests while sustainable development requires a systematic perspective.
- The EU Green Deal, an ambitious road map on how states can comprehensively transition to a green and sustainable society, marks Europe as a leader in the climate action domain and offers a potential framework that may be effectively adapted as international standard.
- Based on the experiences of their member states, the EU has developed a community energy model that can suitably and effectively adapted for Japan. This process will require introducing strong reforms and regulations that can help establish a coherent structure and concrete action plan for the Japanese energy community.
- The private sector has a crucial role to play in the green transition, and in order to push forward the use of renewable energy, more intergovernmental cooperation must be supplemented with a public-private partnership. While many companies have now started to take the recommendation of the Task Force on Climate-related Financial Disclosures seriously, this is still at a very nascent stage, and physical risks, transition risks, and geopolitical tensions still play a great role.

- Good political preconditions, knowledge creation, market creation, institutional capacity, and social acceptance are key enablers of a framework on what is needed to encourage energy intense sectors to make greener decisions. Infrastructure developments and fairness must be taken into account.
- Climate change has emerged as a threat multiplier that can trigger conflict leading to gross climate insecurity. Greater Sweden-Japan cooperation (and Asia-Europe cooperation) to address these issues – in key areas like security risks in the Arctic Circle and dealing with Russia’s expansionism amidst climate change-induced upheavals – is therefore imperative.
- Sweden has largely been successful in expanding the use of renewable energy due to certain drivers like a low population density, flexible infrastructural development, and dominance of major forest industries and forests. However, there are future policy challenges: industrial decarbonization and competitiveness; transformation of the electricity system and electrification; and the sustainability of bioenergy.
- There is a significant gap between the state of renewability Japan is at right now and the target it is hoping to achieve. To achieve this target, the use of renewable energy is essential, particularly in harmony with the local community as well as nature. These should be achieved through strengthened and effective public participation, along with greater encouragement for local initiatives.
- Cooperation of renewable energy should focus on coordination among like-minded countries to reduce dependencies and vulnerabilities, and on the three Cs: critical materials, critical technologies, and critical supply chains

Inaugural Session Opening Remarks

By Ms. Mahima Duggal, Dr. Niklas Swanström, and President Nobuyuki Hiraizumi

Ms. Mahima Duggal opened the symposium with introductory remarks presenting the objectives of the event. Ms. Duggal highlighted the need for international cooperation to take action against the transboundary issue that climate change poses, in the lines of the COP26 summit in Glasgow where world leaders met to discuss climate action goals for the coming years. She outlined the focus of the ISDP-KIIP study on renewable energies such as solar, wind, nuclear, and geothermal power, which are a crucial component of sustainable development and for the green transition.

Ms. Duggal noted the agenda of the symposium to tackle the potential areas of collaboration between Japan and Sweden, which are both frontrunners in this field and could benefit from exchanging



ideas and technologies, in six sessions on November 25 and 26, 2021. The first three sessions focused on renewable energy and the need for international cooperation; the state of renewable energy in Sweden; and renewable energy cooperation, green growth, and the private sector, chaired respectively by Dr. Lars Vargö, Mr. Tatsuo Shikata, and Professor Maria Pettersson.

Ms. Duggal expressed her sincere thanks to Dr. Niklas

Swanström, Director of ISDP, and President Nobuyuki Hiraizumi of KIIP for their support in organizing this event. She was also grateful to all the speakers from across the world for participating in this productive and engaging discussion.

Dr. Niklas Swanström elaborated on the aim of this symposium, part of a larger project between KIIP and ISDP, to initiate a dialogue on climate change: The symposium, held shortly after COP26, is a platform for generating practical and ground-level understanding between countries, especially in Asia and Europe. A partnership between Japan and Sweden could lead this Euro-Asian cooperation with experts exchanging knowledge on the imminent environmental security concerns.



Moreover, he emphasized that cooperation through research could foster long-term policy impact within the international community, and that the experts participating in this symposium were setting an example.

He stated that renewable energies used in different sectors are a vital component in the transition to green economy, sustainable development, and poverty eradication; developing these technologies is therefore crucial for universal energy access, energy security, and curbing the impact of climate change. It was also pointed out that Sweden, as the eight-ranking nation on the global environmental policy index, and Japan, a leader in the field in Asia, need to cooperate.

He noted that the speakers participating in the two-day symposium on renewables aimed to propose concrete measures, ideas, and insights for a long-term partnership in climate change action, sus-

tainable transition, and low carbon environment goals.

Notably, Dr. Swanstrom thanked Mr. Nobuyuki Hiraizumi, for making the ISDP-KIIP collaboration possible.

President Nobuyuki Hiraizumi expressed his gratitude to ISDP for hosting this symposium on Renewable



Energy and Climate Cooperation, and gave a presentation on the Kajima Institute of International Peace:

KIIP was established in 1966 by Dr. Morinosuke Kajima, President Hiraizumi's

grandfather, to foster dialogue and research on peace policies during a period of great turmoil across the world: the Cold War, the Vietnam War and the US occupation of Okinawa. In 1982, Mr. Wataru Hiraizumi was elected chairman, followed by his son, Mr. Nobuyuki Hiraizumi, in 2015.

Mr. Hiraizumi also pointed out that Japan was lagging behind in climate change policies but predicted that Japan is on the verge of a sudden change in its approach, in particular due to the establishment of the International Sustainability Standards Report in 2021. With the establishment of the International Sustainability Standards Board on November 3, 2021, Japan will institute more changes apropos climate action, notably within a decade.

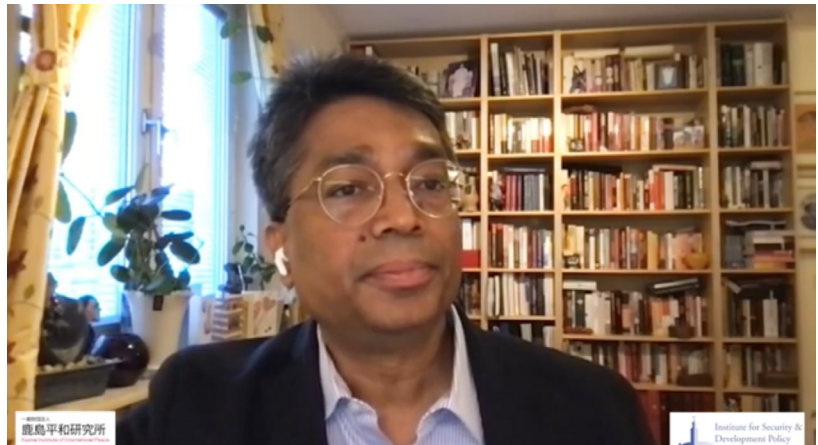
Finally, Mr. Hiraizumi concluded that Japan was not a creator of civilization, nor a rule setter; rather it was excellent at adapting to changing environments.

Keynote Speech: Hydropower - Renewable Energy with a Cost

By Dr. Ashok Swain

Dr. Ashok Swain gave an overview of the potential benefits and challenges of hydropower as a source of renewable energy to combat climate change, elaborating on the cruciality of energy for human well-being. Indeed, as highlighted in international fora, energy provision is a critical element of increased socioeconomic development. The international community needs to increase energy access in order to eradicate poverty, improve health, and provide basic needs to all. There is a correlation between an adequate supply of energy and socioeconomic development. Currently, one billion people on earth lack access to electricity, and three billion people rely on fossil fuels. With the population growth, the increasing energy demand presents new challenges in a sector dominated by fossil fuels. In the light of climate change, access to electricity must be economically and socially sustainable to face these new challenges, and thus the focus on renewable energy resources.

Hydropower is potentially the only renewable energy that can be used on a larger scale



and thus should be promoted as a stimulus for renewable energies. Hydropower presents many advantages highlighted in Dr. Swain's presentation: it produces larger electrical outputs, can effectively store energy, and is less climate dependent or unpredictable. Hydropower should be given priority for the sake of national energy security, and as a driving force for sustainable development and climate change mitigation. In the last 20 years hydropower generation increased almost by 70 percent and is estimated to increase an additional 50 percent in the next two decades; in addition, more than 500 gigawatts hydropower projects are being constructed or planned, but to limit global warming below 2 degrees increase, hydropower

production should reach 800 gigawatts by 2050.

Dr. Swain also presented the cost of hydropower, more precisely the cost of dams and storage reserves. Dams are colossal constructions that cause inundation of forests and pollution because of cement, steel, and rocks used and often impact indigenous rights. In Sweden, 80 percent of the large hydropower dams are located in the Sapmi lands inhabited by indigenous people. An estimated 80 million people were displaced by construction of dams worldwide – 20 million in India alone – while only 2 million people received compensation. Moreover, for developing countries, construction of dams is too costly and takes too long; it can also create conflicts

between different groups. The international community must build dams suitably and sustainably to minimize environmental and social costs while maximizing benefits. The World Commission on Dams has listed five core values for

building dams: sustainability, equity, efficiency, participation in decision-making, and accountability.

To conclude, Dr. Swain emphasized the need to develop renewable energies to keep the planet safe. Hydropower

is an important component of the green transition to move away from fossil fuels; however, it does not come free of cost. The international community should, therefore, work toward minimizing cost while maximizing benefits.

Session I: Renewable Energy and the Need for International Cooperation

In Session I, three distinguished guests gave talks on the different aspects of renewable energy and the need for international cooperation: Mr. Jeremy Maxie; Professor Dhanasree Jayram; and Mr. Ashis Basu. The panel discussion included Mr. Yasiru Ranaraja as the discussant. The session was chaired by Ambassador Lars Vargö.

Geopolitics of Renewable Energy and Transatlantic Relations

By Jeremy Maxie

Mr. Jeremy Maxie started by emphasizing that the international liberal order is evolving, shifting from a unipolar to a multipolar order. The key question is what kind of multipolar order it will develop into, and where we currently are in such a transition. Mr. Maxie highlighted that we should expect disruption and non-linear transformation of the global order in the next 20-30 years – a relevant time line for global energy transformation and climate mitigation.

Although there are multiple scenarios of how the international order might develop, Mr. Maxie stressed that we should not equate multipolarity with multilateralism, or the interdependence and globalization developments that characterized the previous decades, but rather expect an increase and intensification of systemic and structural competition.

In the long term, the creative destruction of the current order is likely to produce a redistribution of wealth and power between and within countries. This will be characterized by increased great power rivalry, revisionist



state behavior, nationalist and populist response to globalization, and increased economic nationalism and illiberalism in certain democracies. Furthermore, the rise of emerging and disruptive technologies, the COVID-19 pandemic, and climate change are hastening this process. Mr. Maxie emphasized that the current order is not sacrosanct, and in the face of a transformation, key architects and stakeholders might decide to improvise a new order rather than maintain the international liberal order as we know it today. Importantly, this provides the structural context in which future renewable energy and climate cooperation can occur.

Next, Mr. Maxie talked about the US-China strategic

rivalry, characterizing it as systemic in nature, global in scale, and likely to be protracted in duration. China is a revisionist power that seeks to establish a hegemony and hierarchy in Asia, wherein the role of the US is peripheral and regional states are deferential and accommodating. In contrast, the US is assumed to be a status quo power that seeks to maintain its global position through domestic strengthening and a counterbalancing coalition against China, perceiving Beijing as a systemic rival and pacing threat.

Beyond regional competition in the Indo-Pacific, Mr. Maxie highlighted the struggle for the commanding heights of the global economy and global governance, which includes

institutions, laws, norms, leadership, and legitimacy. The key questions are: Who will write the rules of the new international order? Which system will shape and dominate the emerging global order, possibly restructuring global capitalism? Will it be democratic capitalism or authoritarian state capitalism?

Mr. Maxie emphasized that future transatlantic and trilateral cooperation on renewable energy and climate change risks being subsumed into a broader strategic rivalry for wealth, power, influence, legitimacy, and global leadership.

He then moved onto discussing the prospect of the fourth industrial revolution and its resultant transformation in energy, tech, and war. This revolution could be defined by a fusion of technologies blurring the lines between physical, digital, and biological spheres at an unprecedented speed and scope. Mr. Maxie also introduced “three Cs” along which renewable energy transition, technological revolution, and transformation of war might intersect: critical materials, critical technology, and critical supply chains. These sit at the commanding heights of the global economy, with many of them having dual-use application. This means that renewable energy and climate policies will entail not just climate mitigation and

environmental sustainability, but also industrial policies and geo-economic strategies, which are difficult to compartmentalize and delink from broader strategic rivalry and great power politics.

In this context, China's revisionist behavior and economic coercion along with the pandemic have exposed previously overlooked dependencies, vulnerabilities, and risks in global supply chains. Mr. Maxie noted that China has a leading or dominant position across several renewable energy value chains, including in rare earth minerals, lithium-ion batteries, solar and wind power, and electric vehicles. China also seeks a similar position in several emerging and disruptive technologies, such as artificial intelligence (AI), autonomous systems, quantum computing, and biotechnology. Many of these critical materials and advanced technologies have dual-use applications and are widely perceived by most states as vital to their national security and defense, as well as their economic security and competitiveness.

Mr. Maxie concluded with recommendations for the future: Trilateral and transatlantic cooperation ought to focus on the three Cs and coordination among like-minded states to reduce strategic dependencies and vulnerabilities, manage risk

and uncertainty, and promote collaborative research and development efforts with the private sector. Furthermore, the best way to achieve this might be through flexible and adaptive networks via ad hoc and overlapping bilateral and mini-lateral arrangements, rather than broad multilateral approaches such as the Group of Twenty (G20) or COP framework. This would also involve a selective and partial decoupling and a restructuring to build secure, resilient, and trusted supply chains, as well as revitalized industrial bases and innovative technology ecosystems among allies and partners.

The challenge will be to align such industrial policies and geo-economic strategies in the long term and ensure policy continuity. From the top-down, global shifts in relative power, great power rivalry, and revisionist state behavior will drive transatlantic, trilateral, and like-minded cooperation and coordination. From the bottom-up, nationalism and populism on the left and right in response to globalization along with state-level concerns over economic security, sovereignty, and autonomy will limit the scope and duration of what is politically possible. Therefore, Mr. Maxie argued, the greatest challenge will be preventing a fragmentation of global economy and the emergence of regional or bounded orders.

The European Union's Climate Cooperation with the Indo-Pacific and the Geopolitics of Renewable Energy

By Dr. Ashok Swain

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The European Union's Climate Cooperation with the Indo-Pacific and the Geopolitics of Renewable Energy

By Prof. Dhanasree Jayram

Professor Jayram started by noting that regional organizations such as the EU have increasingly engaged with the geopolitical construct of the “Indo-Pacific,” with the EU releasing its official strategy in September 2021. EU’s climate cooperation with countries, regional organizations, and other frameworks in the Indo-Pacific region became especially important after the launch of China’s Belt and Road Initiative (BRI) in 2013, as multiple alternatives to the BRI were proposed in the subsequent years. These include Japan and India’s Asia-Africa Growth Corridor initiative, Japan’s Free and Open Indo-Pacific concept, the US Indo-Pacific strategy, and India’s Security and Growth for All in the Region. Professor Jayram contextualized the need to consider what this cooperation between the EU and the region means for renewable energy and climate change.

The EU’s Indo-Pacific strategy clearly mentions sustainable development goals, achievement of the goals in the Paris Agreement,



and conventional goals of biodiversity. It also mentions deepening engagements with various partner countries in the region and regional organizations such as the Association of Southeast Asian Nations (ASEAN). The new Quadrilateral Security Dialogue (Quad) framework has also formed a working group on climate change, aimed at promoting mitigation and adaptation measures in the region. Although constellations are new and their results still uncertain, they provide opportunities for the EU to deepen its engagement for climate change in the region in line with its strategy.

Professor Jayram also discussed the seven priority

areas for EU action outlined in the strategy: sustainable and inclusive prosperity, green transition, ocean governance, digital governance and partnerships, connectivity, security and defense, and human security. Notably, all these areas have direct and indirect connections with renewable energy. Ocean and digital governance is linked to renewable energy, and there has been constant debate within the defense sector on how the military can reduce its carbon footprint. The discussions on renewable energy transition critically need to be linked to both traditional and human security, to further understand the interconnection with socioeconomic impact, such

as on livelihoods, food, and water. Professor Jayram, therefore, emphasized a more holistic perspective on issues related to renewable energy.

Beyond the priority areas, the EU strategy focuses on achieving resilient and diversified value supply chains, as well as implementing environmental due diligence. This is consequential for the possible restructuring of supply chains across the Indo-Pacific, to ensure compliance with environmental regulations. Notably, a key issue is promoting resilience of energy systems in countries with various vulnerabilities and development requirements. A consideration of the diversity of the Indo-Pacific region, where countries have varied development levels, climate vulnerabilities, and socioeconomic context, needs to be imbedded in the approach toward energy transition.

Professor Jayram argued that the resilience concept, therefore, needs to be integrated into the EU's climate cooperation in the Indo-Pacific, including in all multilateral and mini-lateral frameworks currently being established, as well as within preexisting bilateral relations. Recently, green alliances and partnerships have increased in importance, as COP26 showcased the many networks already existing. The EU needs to find a way to strengthen and capitalize on such existing partnerships –

the EU formed its first Green Alliance partnership with Japan in 2021.

Another important aspect is how to achieve a just transition toward renewable energy, as there are many coal-dependent countries and communities. Professor Jayram emphasized that the discussion, therefore, needs to take into account both traditional and critical geopolitical perspectives. The EU has already to some extent started engaging with regional organizations in this way by, for example, providing ASEAN with more financial means focused on just transitions. Another area where the EU has scope and even preexisting engagements is educational and research cooperation related to climate change, such as the Horizon Europe and Horizon 2020 initiatives.

Next, Professor Jayram discussed the future challenges and issues facing the EU in the region. She highlighted the importance of understanding the implications of transformation, for example, by taking into account the locking effects of current energy systems, where a large number of labor forces are dependent on the fossil fuel sector. It is also necessary to consider land-use change that might result from energy transition policies, as there already exist land-use conflicts where land has been diverted toward renewable energy project. Therefore, a just

energy transition aspect will have to also include workforce, land, and water issues, as well as other issues critical to the success of the transition itself. This relates to the question of having a decentralized or diffused grid, or having one large super grid. A lot of research is being conducted on creating regional grid communities. Although these are considered to be more stable than decentralized systems and have been touted as a solution to ensure energy security and self-reliance, Professor Jayram noted that such grids are highly vulnerable to cyberattacks, and there is a need to consider how to take such challenges on board.

Professor Jayram concluded by discussing the prospect of geopolitical conflict over renewable energy. China's dominance in the crucial mineral sector has previously been touted as a problem, with instances of Beijing banning various exports to Japan after geopolitical conflicts. This has driven countries to diversify their supply chains, which is arguably very important for renewable transition. Professor Jayram summarized by noting that the EU's policy toward the Indo-Pacific needs to be guided by local conflicts and a deeper understanding of various issues, where we will have to wait and see how the recent multilateral settings and frameworks operate on a grander scale.

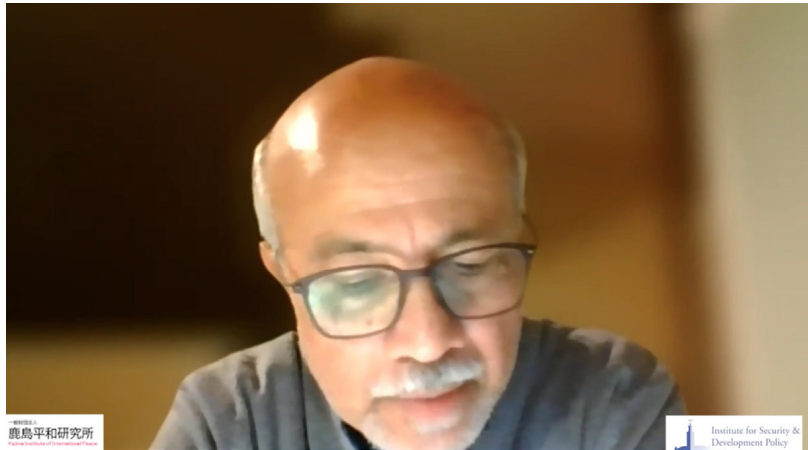
How to Use Renewable Energy? A Cross-Continental Experience

By Ashis Basu

Mr. Ashis Basu gave a brief overview of the commercialization of solar energy. As climate change is reaching crisis proportions, it is incumbent upon all of us to find ways to mitigate the harmful effects. Harnessing the power of the sun to generate electricity for a multitude of applications – such as powering homes, factories, small appliances, parking meters, and signage – is a way to reduce fossil fuels with renewable energy resources.

The presentation focused on large-scale generation of electricity using solar energy. Solar parks are being set up in many countries around the world: China has the greatest concentration of solar parks, but the largest is the Bhadla Solar Park in India producing 2,245 MW. One of the best ways to advocate for solar energy is to compare the most water-stressed countries with their solar potential since power generation from solar PV power plants requires minimal water use. Countries in the Middle East are the most water-stressed countries that could harness solar energy based on solar irradiance.

The electricity generated by the solar panels has to be



stored for use later. The most common means of storage has been lead acid batteries, which are being replaced by Li-ion batteries – ranging from standard automotive batteries to units built within 40 ft shipping containers used by large utility companies. The Li-ion battery industry has made great strides in the past 10 years; costs are coming down with each passing year, which will increase the use of solar energy. The recently concluded COP26 in Glasgow has for the first time stated that the use of coal for generating electricity must be phased down. This will boost the use of alternative renewable energy from various sources like solar, wind, green hydrogen, and li-ion batteries. The cost of solar panels and PV cells has

come down substantially. The only limitation for large-scale conversion is the availability of land and batteries. Notably, India has an airport powered by solar energy.

Sweden and Japan are both leaders in the use of renewable energy. Sweden is one of the world's leading countries in the transition to renewable energy; it plans to operate in all sectors with 100 percent renewable energy power generation by 2040 and reduce greenhouse gas (GHG) emissions to zero by 2045. In Japan, solar power has become an important national priority since the country's shift in policies toward renewable energy after the Fukushima Daiichi nuclear disaster in 2011. By the end of 2017, cumulative capacity reached 50 GW, the world's second-

largest solar PV-installed capacity behind China. Overall installed capacity in 2016 was estimated to be sufficient to supply almost 5 percent of the nation's annual electricity demand.

In order to push forward the use of renewable energy, a public-private partnership is needed. The private sector has a crucial role to play in the green transition; however, it must be further incentivized to participate in a meaningful

transition toward renewable energy. Regarding the land usage concern, there are solutions, like in China where solar panels were installed on a mountain.

Mr. Ashis Basu concluded by highlighting the necessity for more intergovernmental cooperation. Indeed, there are frameworks like the COP26, which can enable international cooperation on climate change, but they are often criticized for greenwashing. Smaller coun-

tries at COP26 complained that richer countries did not fulfill their promise of releasing US\$100 billion to help them cope with climate change. He added that the use of solar energy is growing across the world, but countries that are still currently using fossil fuels for electricity generation may take years to switch to renewables. Nonetheless, climate activism and new government regulations are the need of the hour.

Panel Discussion

Discussant: Yasiru Ranaraja

In the panel discussion, Mr. Yasiru Ranaraja, the discussant, raised the importance of the guiding principle of Common But Differentiated Responsibilities (CBDR). Mr. Ranaraja noted that the CBDR was instrumental in bringing countries together to discuss climate change within the ambit of the United Nations' Intergovernmental Panel on Climate Change (UN IPCC), but the principle has been re-interpreted since the Kyoto Protocol, with two different branches in the Paris Agreement. The first branch focuses on common responsibility, evident by the transboundary threat of climate change; the second on differentiated responsibility, as countries are not equally affected by the climate crisis, and taking historical emissions into account, around 80 percent of global GHGs in the atmosphere today were emitted during the industrial revolution era of the 1800s.

Mr. Ranaraja emphasized the large gap between developed and developing countries such as across Asia, where



the states have struggled to develop basic infrastructure. Many countries have therefore turned to non-official funding partners through bilateral agreements with, for example, China – infrastructure funding through China's BRI has played a significant role in the African continent – and India. Mr. Ranaraja noted a failure by countries to properly communicate within the CBDR principle and that most developing countries show a lack in commitment toward funding a green transition.

Finally, he highlighted the need to re-engage the global climate regime with the CBDR principle to enable meaningful

progress. As developing countries such as India, China, and Indonesia will enhance their infrastructure development in the next 20-30 years, their emissions will likely peak during the same period. It will therefore be up to the G7 or G20 countries to come up with a workable framework to tackle climate change; ultimately, a majority of global emissions are caused by such major economic powers, and an effective solution may need to be driven by such groupings, rather than the current approach of Nationally Determined Contributions (NDCs) that engages too many countries and lacks ambition to meet 2050 targets.

Session II: The State of Renewable Energy in Sweden

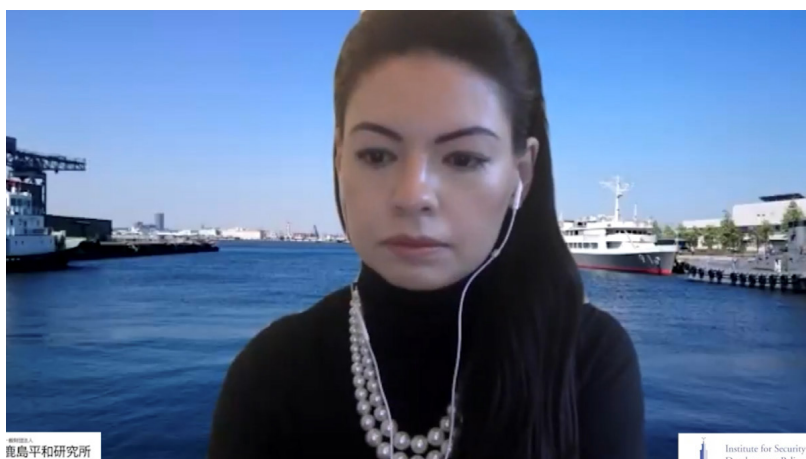
In Session II, three distinguished guests gave talks on the state of renewable energy in Sweden: Dr. Cecilia Higa from the Swedish Bioenergy Association (SveBio), Professor Maria Petterson from the Luleå University of Technology, and Dr. Bengt Stridh from Mälardalen University. The panel discussion included the discussant Lydia Powell from the ORF Centre for Resources Management. The session was chaired by Mr. Tatsuo Shikata from the Kajima Institute of International Peace, Tokyo & Company Fellow, Mitsui & Co., Ltd.

Leading the Path toward a Fossil-free Society through Biofuel Policies in Sweden

By Dr. Cecilia Higa

Dr. Cecilia Higa discussed biofuels as a path toward a fossil-free society in Sweden. The idea of replacing fossil fuels with biofuels has been long established in Sweden: the search for alternative fuels, in particular for the transportation sector, began five decades ago. This was in part due to the high and volatile prices of oil, the uncertainty of supplies, and uncertainties related to reliance on supply from politically unstable regions. Furthermore, the rising awareness of environmental damages played a significant role.

Biofuels play an important role to reach the emission reduction goals. By increasing the use of biofuels, several climate benefits can be reached too. Some of these benefits are increased energy security, technological development toward circular bioeconomy, decreased GHG emissions, and creation of jobs. Such benefits



have also motivated Sweden to develop biofuel policies and targets for renewable energy.

Sweden has several policy instruments promoting biofuels – one central instrument being the Swedish carbon tax. The tax was adopted in 1991, and it has become a cornerstone of Swedish climate policy because it is administratively easy to implement and easy to calculate. Additionally, it does not increase taxation in general and makes decreasing fossil fuels and increasing renewable energy more profitable by

supporting the “Polluter Pays” principle.

Dr. Higa concluded by noting that Sweden is a recognized global leader in decarbonization efforts. The Swedish carbon tax in particular shows that reducing emissions can be combined with long-term economic development and prosperity. Public opinion and low administrative costs are seen as priorities, and a progressive approach to taxation efforts, for example, gives households and businesses time to adapt.

Legal Preconditions for Wind Power Development in Sweden: Issues of Land-use, Opposing Interests and Potential Goal Conflicts

By Prof. Maria Pettersson

Professor Maria Pettersson described the rules that form the basis for the examination and assessment of permits for environmentally hazardous activities such as wind power installations. The role of environmental laws in the context of wind power development is not necessarily to prohibit or restrict activities, but rather to ensure that the activities are conducted with as few negative impacts on human health and the environment as possible. In this approach, environmental laws function in many ways as a risk management instrument that aims to ensure that the risks for human health and the environment posed by different industrial activities are minimized. Additionally, the laws aim to protect a large number of interests, public as well as private, and to promote sustainable development.

A central issue with environmental laws is that the application in many cases has to be tailored for local interests and based on local impact. Yet, sustainable development



requires a more systemic perspective where national, and even global aspects, are taken into consideration. This is evident in particular with issues regarding land-use, where guidelines for the use of land and water areas are guided by the precautionary principle and follow national interests. But these guidelines tend to generally be quite vague and difficult to apply.

Professor Petterson highlighted a few trends in Swedish case law regarding wind power development. At the end of the 1990s, wind power projects were frequently rejected based on landscape values and views. From 2005

onwards, more projects were granted permits. This was at large due to Sweden's commitment to EU renewable energy and climate policies. Since then, the initial resistance about landscape and the fairly subjective views have changed to more positive views about wind power projects. Simultaneously, both the size and number of wind turbines have grown.

There are five main environmental requirements for wind power projects: (1) Choice of location, which means that the operator has to choose a location that is best for the environment, causing the least harm to human health and the

environment; (2) precaution and the use of best possible technique; (3) environmental law principles (e.g., the burden of proof of compliance with environmental requirements rests on the operator); (4) cost-benefit assessment (e.g., the Swedish environmental code relies heavily on principles such as the precautionary principle, which means that precautions can be required

even when scientific evidence is lacking to avoid risks of irreversible damage to the environment); and finally (5) case law.

Today, issues related to wind power projects are to a great extent include land-use and “green versus green” conflicts. Environmental considerations are gaining more and more legal attention where issues such as wind

power and biodiversity can be set against species protection, green minerals, and biomass. This represents essentially a new playing field, where green interests stand against other green interests – something that perhaps presents a need for environmental legislation reforms. This is to enable, or at least not obstruct, green industrial development in the foreseeable future.

Can Agrivoltaics Solve the Solar Energy and Farming Conflict?

By Dr. Bengt Stridh

Dr. Bengt Stridh talked about the new and innovative field of agrivoltaics, which combines solar energy with agriculture. Solar energy is the biggest resource on earth; and yet it represents less than one percent of the total energy consumed by the world today. This is largely due to costs and not supply, as sunlight is a renewable resource. The solar effect was discovered about 180 years ago and it was first applied in 1958 in space. Since then, research and development studies have taken a great leap forward, where solar energy can be used to much higher efficiency with a much lower cost.

PV applications in Sweden started with off-grid applications, for example, in lighthouses and energy phones in the late 1970s. During the past 20 years, buildings with PV applications, larger solar parks, and buildings integrated with PV modules have been introduced. Solar panels today also come in different colors, which might increase their desirability.

The use of PV increased



globally during the 2000s: 3.7 percent of the world's electricity generation is covered by PV, and countries such as Germany are particularly successful cases – solar energy accounts for about 10 percent of the electricity generated in Germany. In comparison, only 0.7 percent of electricity consumption in Sweden is covered with PV applications, although the solar radiance in northern Germany is at the same level as in southern Sweden. Germany, however, started subsidizing feeding tariffs for solar energy in the early years, which ensured that there was already a market in 2004 itself.

Agrivoltaics combines PV applications with farming. Dr. Stridh presented an example where vertical PV modules are installed in a manner that a tractor can bypass them. This improves land productivity and provides an opportunity to avoid conflicts, such as solar parks conflicts with farmlands (i.e., energy versus food production). By combining them, both food and electricity can be produced. Additionally, PV installations shade a portion of the ground and therefore could improve the soil water content; however, this could also be a potential problem for crop production, as sun exposure is limited.

Panel Discussion

Discussant: Lydia Powell

Discussant Lydia Powell inquired about how the concepts presented in Session II could be applied to relatively poor and large countries. For example, ideas that work in Sweden might not work in a country such as India, which has a much lower average in electricity and primary energy consumption compared to the rest of the world – carbon tax might not be applicable in a country such as India that does not consume much

energy. India is facing growing land-use conflicts, which have become a problem for infrastructure projects. However, in India, the conflict is less about landscape and renewable energy generation, but more about agriculture and access to land for habitation.

In response, Professor Pettersson pointed out that land is a rather scarce resource everywhere and that land conflicts, whether about individual views, indigenous

people's lands, or agricultural aspects, could be resolved through similar mechanisms. Here, legislation plays a particularly important role as it sets boundaries for how we should look upon these issues.

In response to the question about how industrialization and decarbonization can be made compatible, Dr. Stridh stated that agrivoltaics has the potential to serve both causes. It can be beneficial in particular in areas where the climate is warmer and drier and areas where there is a lot of competition for land, as the method can combine solar parks and farm lands. Furthermore, to avoid a new "green curse" with manufacturing solar panels, it is relevant to focus on aspects of water consumption and biodiversity, too, when developing these resources.



Session III: Renewable Energy Cooperation, Green Growth, and the Private Sector

In Session III, three distinguished guests gave talks on renewable energy cooperation, green growth, and the private sector: Mr. Adis Dzebo, Professor Michael Goodsite, and Professor Max Åhman. The panel discussion included the discussant Mr. Hajime Kobayashi. The session was chaired by Professor Maria Pettersson.

Climate-resilient Trade and Supply-chain Management: The Role of Public and Private Actors in Jointly Governing Transboundary Climate Risks

By Adis Dzebo

Mr. Adis Dzebo introduced the concept of TCR, which despite being increasingly acknowledged as a significant area by policy makers remains under-explored and misunderstood. Climate risks cross national borders regardless of the location or developmental level of the nations involved, yet most studies conducted so far have been niche and country-specific. This means that adaptation plans in most countries fail to address TCRs. He mentioned a project wherein Mr. Dzebo and colleagues have attempted to rectify the situation by establishing an interest in the management of natural resources across borders, stressing that both producers and consumers benefit from transboundary risk policies. There are four pathways through which TCRs take place: people, biophysical, trade, and finance. This presentation focuses mainly on the latter two aspects:

First, he showcased agricultural trade through the lens of import dependency and climate change-induced fluctuations in the percentage of crop



yield. Six different commodities were included in the study: soy, maize, sugarcane, coffee, rice, and wheat, of which all but the last are expected to see major decreases in yield over the coming years (wheat yield is instead expected to increase with higher temperatures). A country exporting such a commodity is identified as a high-risk exporter; the importer a high-risk importer. Japan, for example, will be negatively impacted by a decrease in soy crop yield in the US. However, the impact could be offset by increasing import from Canada, where climate change instead is expected to increase the yield due to its northern

location. This is important to take into consideration for future bilateral relationships between states.

Second, he showcased the effects of the severe floods in Thailand in 2011 on the global financial system and supply chain far beyond its national borders. This was because large industrial parks with high-value manufacturing were located close to the harbors for efficiency in transportation, and were badly affected by the floods. It majorly affected, in particular, the automobile and electronics industries, which were mainly Japanese. The disturbance in production at this particular location in Thailand had a no-

ticeable impact on the Japanese manufacturing production index, which led to the owners of the companies lobbying the Japanese International Cooperation Agency to invest in a flood management plan that was actually implemented.

What type of opportunities exist to manage TCRs? Dr. Dzebo and colleagues have identified five pathways through which TCRs can be governed: (1) Transnational governance, in which private actors such as private companies and non-governmental organizations (NGOs) cooperate to incentivize behavioral change through certification schemes, private finance, insurance, and public-private partnerships. (2) Development cooperation, where donor countries support the self-determined development priorities of recipient countries through development assistance, ca-

capacity building, and technology transfer. (3) International diplomacy, where sovereign states negotiate as equals and jointly agree on rules and regulations intended to benefit both parties through bilateral and multinational engagement and international agreements. (4) Global markets, in which everything is left to market forces. (5) Domestic policy, in which each country takes care of its own policy within its borders.

Dr. Dzebo noted that whereas the first three pathways have high ambition for inducing international cooperation, the last two have low ambition as they are determined by market forces and internal policy.

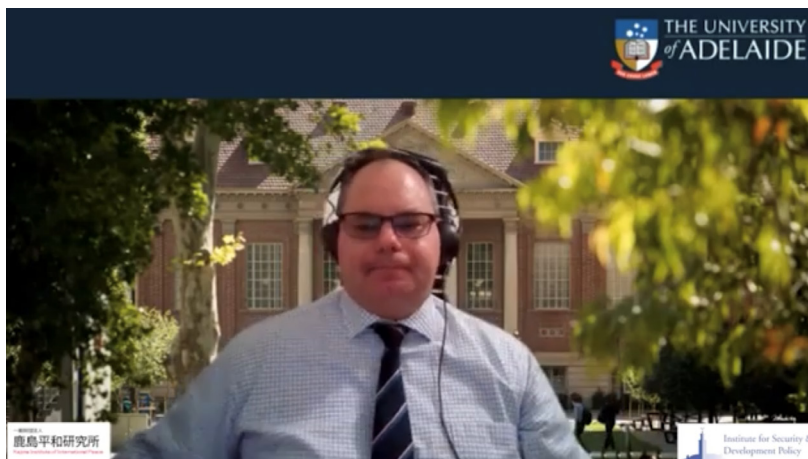
Going forward, the success of adaptation in exporting countries is of importance as continuously replacing high risk suppliers will not work in the long run in a world expe-

riencing systematic risk from climate change. Public and private actors have a shared interest in achieving climate resilience, as importers benefit when exporters can adapt. Mr. Dzebo emphasized that the international community is only as resilient as the most vulnerable among us. Yet the world can also expect to see a return of protectionism on the global scene with some countries reacting to TCRs by trying to securitize access to food, ultimately destabilizing the markets to the detriment of those who can least afford to compete. Public and private adaptation strategies need to be better aligned, and robust international structures for cooperation must be established to share systematic risks. The Paris Agreement is a starting point for change but the speed of improvements must increase rapidly.

The Role of Mining in Green Energy System and Its Negative Impact on the Environment

By Prof. Michael Goodsite

Professor Michael Goodsite has worked closely with the mining sector in Australia to develop a cooperative research center bid for industrial research set for 2022. In his presentation, he focused on the inherent paradox of mining: it has a negative impact on the environment while simultaneously being vital to the development of green energy and the fulfillment of global zero-emissions by 2050. Solar plants and wind power plants utilized in the production of green energy as well as the vehicles of transportation utilizing such energy, such as electric cars, all require much larger amounts of critical minerals than their fossil-fueled counterparts. The average need for these critical minerals has risen by 50 percent since 2010, as the shares of renewables have increased. For example, as a result of the transition away from fossil fuels, copper mining will need to be significantly increased so as to considerably enhance renewable energy production capacity; in the next 30 years, more copper will need to be mined than has been mined in



the history of humankind, to reach the stated global climate goals. The good news is that it exists – the earth is not running out of copper ore. The problem, according to the International Energy Agency, is that today's supply and investment plans for many critical minerals fall well short of what is needed to support an accelerated deployment of solar panels, wind turbines, and electric vehicles. In short, the mines are not able to meet the current demand.

For copper, in particular, but transferrable to other mineral cases too, the reasons for this are many. Professor Goodsite explained that although there are vast amounts of copper to be discovered still, the entire process (from discovery to

first production) takes on a global average around 16 years, as miners need to be extremely careful with the local environment. The copper ore grade in existing production is also declining. Another reason is financial, as miners must balance the cost of water and energy usage to reach deeply located ores while still being able to sell that ore at a competitive price. For the market, however, the fact that the demand for copper is higher than the availability is obviously profitable, as it pushes up the prices. Many mining companies have started making statements on cleaner production to shareholders that independent experts would challenge, in particular

on how they are to go about it. It is clear that new technology has to be developed for them to actually meet their goals. Global mines, including the new ones, will all have to double their productions while reducing their emissions, water usage, and waste at the same time. For mines some countries, this will prove to be easier, in particular in locations where there is water in excess; for other countries, like Australia, this will be a major issue.

Next, Professor Goodsite emphasized the need to mine copper (and other minerals) in a sustainable manner, and listed the three pillars that would help in addressing the shortage of copper: (1) Economics of sustainable copper produc-

tion, (2) mining, and (3) processing. Preliminary studies have shown that the preferred mode of production for companies and the environment would be to mine the more complex and deeper ore first, followed by mining the mineral through a different method utilizing a benign liquid that enables copper to be sucked up from the earth's interior. Slightly less preferred option would be re-mining and re-mediating, as well as recycling and reusing. This would prove difficult, considering that the majority of copper is tied up in capital assets such as buildings, meaning that these would have to be torn down for the copper to be reused. The least preferred would be exploring,

considering that this requires highly time-consuming environmental studies not in line with the set time goals of the global climate agenda.

Market forces and an understanding of risk factors will prove key to the success of sustainable mining in the future. International frameworks for reporting and accountability, which the KIIP champions as well, are likely to function as long as global shareholders and global trade mechanisms demand them. In the future, mining must be the solution, not the problem. The mining industry is often put up as being at odds with other industries, but you cannot have minerals for windmills without mining.

Green Steel from Renewables - Development and Outlook in Sweden

By Prof. Max Åhman

Steel requires an energy and emission intensive production, and 10 percent of the emissions in Sweden come from two blast furnace sites in Luleå and Oxelösund. The issue with traditional steel is the blast furnace process, which requires coke made from coal and underground carbon capture and storage that adds to the cost. Green steel, on the other hand, uses a shaft furnace process where coal is replaced by pure hydrogen melted into sponge iron to make steel. This technology requires a lot of electricity, which needs to be harnessed from green resources if the production is to be environmentally sustainable.

Sweden is a world leader in green steel production, particularly through its joint ventures between the mining, steel manufacture, and power utilities industry. In 2016, the HYBRIT project was launched as a joint venture between the utility Vattenfall, iron ore producer Luossavaara-Kiirunavaara AB (LKAB) and steel maker SSAB. The project has been funded by the EU to build a full demonstration plant providing 1.3 million tons of steel per year. This plant should



be fully integrated by 2025 and able to commercially sell steel by 2026. HYBRIT is one of the major international green steel projects, which has led the way for major steel companies to plan on using hydrogen instead of coke and banning blast furnaces. Competitors have also emerged, such as the company H2 Green Steel.

But why is Sweden a leader in green steel production? Professor Åhman explained that Sweden has the capabilities and resources, including the only major iron ore mine in Europe, access to fossil free, low-cost electricity, competence in steel production, and unique cooperation between its industries. The main driving forces come from a resource perspective, meaning the very low cost

of new renewable electricity. There is a global trend toward cheaper renewable energy and a narrative of electrifying everything. The economics of green steel are also an important factor for its diversification. Hydrogen costs more than coal; but because of rising EU prices on emissions, green steel via hydrogen direct reduction (H-DR) could become competitive.

Professor Åhman further highlighted that good political preconditions are a key enabler to develop frameworks that encourage energy intense sectors to make greener decisions. Industrial transformation will come through the directionality of the political targets toward zero emission goals:

- Knowledge creation, like

in Sweden and Japan, to invest in research and development.

- Market creation to develop niche markets for green steel with private sector investments and political support.
- Institutional capacity along with international coherence to align policies with climate change.
- Social acceptance – introducing a new technology means getting rid of the old ones, such as shaft furnace versus blast furnace.

To develop green steel production, society must undergo a speedy renewable electricity transition, and relocate the most energy intensive part of the steel value chain to places where there is potential for cheap electricity (Middle East, Australia, Scandinavia). For example, Japan has a large competitive steel industry, but maybe, it should import the most energy intensive parts of production, like iron or sponge iron, from Australia. Green steel via H-DR and renewable energy would be a dominating factor in the future. The market needs to be reset toward green steel; progres-

sive businesses, too, want that but they need encouragement through governmental policies. The consumers also need to be made aware on what is actually green steel.

Finally, Professor Max Åhman highlighted the challenges associated with green steel. The speed necessitated in the transition is an issue where simply unleashing market forces is not a good way for ensuring a fair and just transformation. Moreover, infrastructure such as hydrogen pipelines power grid requires major development, which will be a slow process.

Panel Discussion

Discussant: Hajime Kobayashi

The discussant Mr. Hajime Kobayashi urged Professor Åhman to expand on how the investors involved in the Swedish green steel business built the institutional capacity over the past 10 years. Professor Åhman explained that institutional capacity in this context largely revolved around the acts of the local government

how feasible it was to envision the Swedish north as a potential future source for substantial green steel production, especially in the context of growing land-use conflicts. Maria Pettersson concurred that coming to an agreement with the local people about land-use will indeed be an important challenge for the

where production faces water and electricity shortages as well as insufficient infrastructure investment. Professor Goodsite clarified that multinational mining companies access finance from investors around the world, so instead of being a question of certain national priorities, it is rather a question of sustainable mining not being prioritized enough anywhere in the world. He suggested that efforts should be put into developing capacity pilot studies for mining and processing of other fuel sources like hydrogen, as well as new models for low-energy usage.

Finally, the audience asked Mr. Dzebo about the kind of institutional capacities that exist in the Global South for developing sustainable practices in coffee production, like better water and disease management for climate-resilient trade management. Mr. Dzebo stated that there are a lot of capabilities, both locally and internationally driven. The main issue, however, is that introducing sustainable practices tends to lower the yield, which in turn lowers the income. This can be detrimental to small-holder farmers in particular, especially those who are already facing yield failure due to TCRs.



agencies and their awareness of deep reduction and how to regulate and support it. He highlighted how they initially only knew about energy efficiency in relation to the heavy industries and next to nothing about deep reduction. He also stressed that as both Vattenfall and LKAB are partially government owned, they were able to leverage the growing governmental awareness and support with their own private finances to initiate the projects.

Mr. Adis Dzebo inquired

future, but also emphasized that the development will take place, quoting the massive finances put into the projects (an estimated 1,000 billion SEK). Another challenge will be the continuation of green energy supply, as Sweden cannot develop hydropower and will have to search for alternatives going forward.

The audience queried Professor Goodsite if sustainable mining was likely to be prioritized in countries such as Peru and Zambia

Session IV: Climate Action & Cooperation

Session IV began with Dr. Jagannath Panda speaking on the importance of taking concrete climate action and having a cooperative agenda not just between countries but also continents. COP26, which took place in Glasgow from November 1 to 12, 2021, was a display of such a commitment. A total of 197 countries, 12,000 NGOs, and 38,000-40,000 participants registered, showing the importance of the event. Professor Sandra Cassotta, therefore, kick-started the session by reflecting on the summit.

Reflections on COP26

By Prof. Sandra Cassotta

Professor Sandra Cassotta recognized that there is no climate change treatment therapy that takes into consideration global inequality, and so there were a lot of expectations associated with the COP26 climate summit. Before the summit, the idea was to broaden climate solutions, increase the funds to vulnerable countries, and convince the most reluctant ones to accelerate decarbonization. The common goal of limiting the temperature of the planet to 1.5°C by the end of the century compared to preindustrial period remains, but to do this, harmful GHG emissions have to be reduced to 50 percent by 2030 and reach zero emissions by 2050.

Considering this reality, also reflected in the scientific documents produced by the IPCC, and the extreme projections contained therein, she suggested that a more apt title for COP26 would have been “Two Weeks to Save the Planet.” Key hindrances that continue to impede cooperation and progress on climate change include the enormous economic interests of different actors and states dependent on fossil fuels, companies, banks, inequalities, lack of capacity building, lack of technology, and lack of knowledge. These issues, alongside several



other assessments, put the expectations from COP26 to save the planet in two weeks in perspective.

According to Professor Cassotta, the EU Green Deal that is developing a transition from fossil fuel to green energy is of immense significance in this context. It is a strategy – or rather, a rough map – to transform the environment, climate, and society. The climate pact includes policies and targets addressing areas like preserving Europe’s natural capital; developing sustainable transport; achieving climate neutrality, as well as clean and affordable energy; financing the transition to sustainability; transitioning to a circular economy, a zero pollution Europe, and a sustainable food system via a farm-to-fork strategy; transforming agriculture and rural areas; moving toward a modernized and simplified

Common Agricultural Policy (CAP); and enabling a just transition where no one is left behind.

However, despite the introduction of this plan in Europe, when it comes to coordinating the road map with COP26 and adapting it to international standards, is it really realistic? Professor Cassotta argued that even though people are now trying to link post-pandemic economic recovery to the climate crisis, the economy is still very much based and dependent on fossil fuels. Therefore, the whole industrial system must be reconverted, and it is not a coincidence that one of the goals at COP26 was to allocate US\$100 billion to help weaker economies transition from fossil fuel to clean energies. That is a real challenge.

Professor Cassotta also drew attention to one of the positive aspects achieved in

COP26: the completion of the Paris rulebook, which provides details on how the Paris Agreement pledges can be met. However, several of the issues have yet to be agreed upon over the past six years. Nonetheless, this progress also kept alive the objective of containing global temperatures to below 1.5°C (compared to pre-industrial levels), which was by no means a given. And while this may be a low bar, it will still require all countries to keep their commitments and enhance their respective NDCs. For instance, all countries will need to update their decarbonization pledges by 2022 to cut carbon dioxide (CO₂) emissions by 45 percent by 2030. Unfortunately, COP26 did not provide for any shared

road map on how these goals will be realized.

One particular issue that did not receive the needed level of attention is loss and damage: COP26 was expected to put forward concrete commitments with a dedicated fund and compensation mechanisms, but the agenda has been postponed to next year.

Professor Cassotta also discussed the need to phase-down (gradual reduction), rather than phase-out (total elimination), carbon. It is the first time that “phase-down” of carbon has been used in global environmental agreements. It is the result of an agreement reached at the last minute between India, China, and the US, which forced all other states into an “either” or “not” Choice

wherein they had to either accept the new version of the deal or forgo a deal entirely.

Professor Cassotta concluded by arguing how COP26 was neither a positive achievement nor a fiasco: it was a medium achievement event. The text of the agreement is a “diplomatic compromise” (like its predecessor, the Paris Agreement) and the problems unresolved in the Paris Agreement still remain. From a legal point of view, a positive aspect is that the rules of implementation and compliance are clearer, and thanks to this clarity, it will be possible to observe more easily who is doing what in the coming years and to individualize those who cheat on their NDCs.

Community Energy in the 2050: Energy Transition of the EU and Japan

By Prof. Marciej M. Sokolowski

Professor Marciej M. Sokolowski's presentation centered on the ability of the energy community to help in the transition of energy in the EU and Japan under COP26. The traditional energy sector is changing from a centralized conventional generation system to a modern energy-based decentralized generation system with a bottom-up approach. However, it has its own problems of membership, duration, taxation, licensing, and so on. In this regard, the EU has a more solid action plan, which can be utilized by other countries like Japan.

Japan has its own community-owned structures as well – formed by local leaders like the Miyama Smart Energy, Hokkaido Green Fund, and Japan Green Fund. Japanese NGOs and civil societies are also very efficient in establishing renewable energy installations. These energy communities that are already part of the current Japanese energy sector are called enekomi by Professor Sokolowski. They are powered by renewables with an important role played by PVs, and reflect a growing wave of prosumer movements in Japan.



However, in comparison to Europe, they do not have a coherent structure and do not reflect concrete action plans.

Professor Sokolowski emphasized on how any further development of enekomi requires an appropriate regulatory framework. Japan, which wants to promote the concept of a sustainable regional community inter-nationally, must focus on a more preferential approach to enekomi. Based on the experience of the member states, the EU has managed to establish a model that could be implemented in Japan after a suitable adaptation. This applies in particular to the solutions offered to energy communities in Europe with respect to membership, non-discriminatory treatment, barriers, support schemes, as

well as grid connection and management.

Japan has already adopted various innovations for decarbonization at different levels for stakeholders, consumers, and local governments. Japan already involves citizens for promoting cooperation between private and public, and it has done well in making local communities more self-reliant. Such sharing of knowledge, networks, and interactions has led to a building of sustainable regional “carbon neutral communities” in both agricultural and urban sectors. These types of structures could be a good investment when it comes to the demography of Japan's elderly society as well. Moreover, as these structures are already in place, following the EU model could further improvement

by facilitating installations – a win-win situation.

Professor Sokolowski also emphasized on voluntary membership – nobody should be forced to join or leave an energy community. Japan already has a cooperation where several local authorities own and operate entities for various public services like water supply or sewage. Such an association has a corporate legal status and is also stipulated as a type of union. In the light of the development of such associations, Professor Sokolowski recommended that the Japanese government should work on the “Energy Community Strategy” offering a description of tools, which could be offered to energy communities in Japan. He also drew comparison between the systems of the EU and Japan.

The EU law stipulates

specific goals for energy communities’ activities. These are environmental, economic, or social community benefits to its members, shareholders, and local citizens. Japan could also propose solutions promoting activities that address environmental, economic, and local community benefits. The generation of profits should be seen as auxiliary.

What is also interesting is the disaster prevention structure, which does not exist in Europe. These structures are very useful and can be found all over Japan. They are based on local distribution and local electricity generation through PV installation. However, to ensure non-discriminatory treatment to all, Professor Sokolowski emphasized on allowing all to enter the market and compete – having regulations with respect to energy. He

proposed the establishment of registers, which list the entities as ex post or ex ante. The Japan Fair Trade Commission could be used as a reference. There should be a support scheme, too, for energy grid operators and small renewable installations that can help participation in the energy community.

Professor Sokolowski concluded by highlighting that a possibility exists for the Japanese energy community to redevelop – as open as possible with a strong regulatory approach, which takes into account environmental issues while also not eliminating profit making. Both Sweden’s and Japan’s community energy initiatives can then directly engage with consumers and facilitate the use of new technology and consumption patterns in a more integrated and sustainable manner.

Climate Security and Japan-Sweden Cooperation

By Prof. Takashi Sekiyama

Professor Takashi Sekiyama acknowledged that climate security is an ambiguous concept but is important to protect countries and societies from the conflicts and riots caused by climate change. Discussing what Asia and Europe can do to cooperate is essential. The issues facing both regions are difficult, but it cannot be denied that climate change is a threat multiplier – it may not pose a direct threat but intersects with other factors to cause multiple effects, ranging from health problems to economic and social inequalities.

Professor Sekiyama focused on the impact of resource depletion, which has been a focus of discussion for long. If climate change causes a shortage of resources such as water or land, competition may occur or intensify over those resources. It can also indirectly induce political and social turmoil. It might lead to a large number of environmental immigrants, who might compete for land, job, etc. Evidence of such cases is abundant, such as in Bangladesh and Kenya. In addition, extreme weather can have a serious impact on food production, agriculture, and



fishery, leading to higher food prices in the market. People may riot and cause social instability. It will also lead to widening economic and social disparity, and thus creating a breeding ground for conflict and riots.

Professor Sekiyama highlighted that major climate security risks facing Europe and Asia would be conflicts triggered by water shortage, flooding issues, fisheries, and environmental immigrants. For example, the Himalayan water sharing project will undoubtedly create conflict between the participant countries. Over the Mekong River too, there are conflicts arising due to China's construction of dams in the upstream that affects downstream countries like Thailand and Vietnam. In Europe, there is always the issue of immigrants from the Middle East and Africa.

Southern and eastern Europe are facing decreased food production, frequent wildfires, and droughts – creating conditions for social instability, which could further act as a significant threat multiplier.

Professor Sekiyama also focused on some of the steps Sweden and Japan can take, especially in the international arena, to mitigate these risks. Firstly, they can cooperate to control security risks in the Arctic Circle, because the Arctic is warming twice as fast. Sweden is one of the eight member countries in the Arctic Council, while Japan is one of the observer countries – cooperation between the two in the council would be advantageous.

Secondly, both countries can cooperate to deal with Russia's expansionist tendencies that have only grown with climate change-induced turmoil. Professor Sekiyama predicted that global warming may result in the decline of Russia's wheat production, which might trigger Russia's expansionist behavior further. Both countries, therefore, need to come together to combine forces, as also to learn from each other.

Panel Discussion

Discussant: Mahima Duggal

As the speakers concluded their talks, the discussant, Ms. Duggal, thanked everyone for their valuable comments and rounded up the session. She noted how global cooperation has not been at its best and that efforts toward climate action have had little impact. In the absence of effective global mechanisms, Sweden and Japan can lead as examples, especially considering their economic and political weight and their contributions to the developing world to help fight climate change. India, too, is very important in this struggle, and it announced its much-awaited climate targets in COP26 pertaining to carbon neutrality and energy efficiency. A key takeaway from COP26 was that though the funding challenge may not have been resolved, but the developing countries still need to respect their climate targets; otherwise, it could aggravate issues between the North and South.

Considering this dire situation, Ms. Duggal asked Professor Cassotta if achieving “medium achievement” in COP26 is enough. Another question posed to Professor Cassotta was on the inclusion of nuclear power into the EU green taxonomy and its suitability to

achieve sustainability targets, including establishing a transition to a circular economy. On the question of whether “medium achievement” in COP26 is enough, Professor Cassotta stated that a yes or no answer was difficult because it is a very complicated issue. She did, however, confirm that the EU was working hard to come up with a robust renewable energy framework, and that it could definitely be a leader in reducing carbon emissions. Nuclear energy could be an excellent example of adaptive mitigation, even though it is not renewable and requires a good energy mix. However, it also has its own problems, especially related to terrorism and creation of nuclear waste. Therefore, the time is ripe to come up with new solutions to use and monitor nuclear and other renewables with the least amount of risk.

Professor Sekiyama was asked about the potential areas of cooperation for the EU and Sweden in Southeast Asia considering it is a climate change hotspot. Professor Sekiyama agreed that Southeast Asia is one of the most vulnerable regions for climate change. There can be partnerships at various levels – economic, social, etc.

In terms of cooperation in the region, there are many factors leading to vulnerability; but with better support especially through official development assistance (ODA), some of the vulnerability can be overcome. Japan is already the largest provider of ODA to Southeast Asia, and it can truly contribute to overcoming Southeast Asian countries’ vulnerabilities. He hoped that Sweden and other European countries would follow suit.

Finally, the question to Professor Sokolowski was about the effectiveness of Japan’s sustainable energy development when compared to developing countries, and if there is any potential for this to be established in other regions. As per Professor Sokolowski, Japan’s sustainable energy development is effective; but he was not sure if it could work in other parts of the world. This is because a strong regulatory framework that is followed strictly may not be viable across the world. Japan also has access to high technology, which might be absent in other countries. He emphasized on establishing a strong government program (strategy) first to support those types of structures for the local communities.

Session V: Role of Institutions, Climate Cooperation, and Debates in Sweden and Japan

In Session V, Professor Bengt Johansson, Mr. Merlin Linehan, and Professor Noriko Ohkubo gave talks on the role of institutions, climate cooperation, and debates in Sweden. The panel discussion included the discussant Dr. Masayuki Komatsu. The session was chaired by Dr. Svetlana Sabelfeld.

Climate Security and Japan-Sweden Cooperation

By Prof. Takashi Sekiyama

Professor Takashi Sekiyama acknowledged that climate security is an ambiguous concept but is important to protect countries and societies from the conflicts and riots caused by climate change. Discussing what Asia and Europe can do to cooperate is essential. The issues facing both regions are difficult, but it cannot be denied that climate change is a threat multiplier – it may not pose a direct threat but intersects with other factors to cause multiple effects, ranging from health problems to economic and social inequalities.

Professor Sekiyama focused on the impact of resource depletion, which has been a focus of discussion for long. If climate change causes a shortage of resources such as water or land, competition may occur or intensify over those resources. It can also indirectly induce political and social turmoil. It might lead to a large number of environmental immigrants, who might compete for land, job, etc. Evidence of such cases is abundant, such as in Bangladesh and Kenya.

In addition, extreme weather can have a serious impact on food production, agriculture, and fishery, leading to higher food prices in the market. People may riot and cause social instability. It will also lead to widening economic and social disparity, and thus creating a breeding ground for conflict and riots.

Professor Sekiyama highlighted that major climate security risks facing Europe and Asia would be conflicts triggered by water shortage, flooding issues, fisheries, and environmental immigrants. For example, the Himalayan water sharing project will undoubtedly create conflict between the participant countries. Over the Mekong River too, there are conflicts arising due to China's construction of dams in the upstream that affects downstream countries like Thailand and Vietnam. In Europe, there is always the issue of immigrants from the Middle East and Africa. Southern and eastern Europe are facing decreased food production, frequent wildfires,

and droughts – creating conditions for social instability, which could further act as a significant threat multiplier.

Professor Sekiyama also focused on some of the steps Sweden and Japan can take, especially in the international arena, to mitigate these risks. Firstly, they can cooperate to control security risks in the Arctic Circle, because the Arctic is warming twice as fast. Sweden is one of the eight member countries in the Arctic Council, while Japan is one of the observer countries – cooperation between the two in the council would be advantageous.

Secondly, both countries can cooperate to deal with Russia's expansionist tendencies that have only grown with climate change-induced turmoil. Professor Sekiyama predicted that global warming may result in the decline of Russia's wheat production, which might trigger Russia's expansionist behavior further. Both countries, therefore, need to come together to combine forces, as also to learn from each other.

Swedish Renewable Energy Policy as a Part of Swedish Climate Policy

By Prof. Bengt Johansson

Professor Bengt Johansson gave a brief background on renewable energy in Swedish climate policy, highlighting the success factors and challenges. Sweden has been largely successful in expanding the use of renewable energy, with more than half of its energy use covered by renewables. This has been possible due to certain drivers, such as Sweden being a country with a low population density with significant renewable resources, especially biomass and potential wind power. Further, Sweden has benefitted enormously because of flexible infrastructural development conducive to renewable energy. Lastly, the dominance of major forest industries and forests has enabled the presence of systems and policies contributing to renewable energy.

Notably, major policy drivers such as high climate ambitions (net-zero CO₂ emissions and a nuclear phase out) and integration with the EU have aided the Swedish government to prioritize renewable energy. The nuclear phase-out goal has been in play since the 1980s and continues to witness momentum. The integration with the EU has



been beneficial especially in terms of regulation and a common energy market, as well as a historic preference for market-based instruments, which largely underpin the carbon taxes introduced in 1991. The latest goal is to move toward net-zero mitigation from carbon mitigation, particularly as industry and energy policies for systemic change grow in importance.

Professor Brendt also discussed the residential and service sectors, which have been witnessing a significant growth in biomass used in district heating systems, as well as in electricity and bioenergy. The driver here has been mainly the carbon taxes, encouraging the sectors to focus more on renewables. The electricity sector is practically fossil free,

particularly in the hydro and nuclear areas. However, there is still a need for infrastructure investments and market reform in the electricity sector, while land-use planning still remains a main issue.

In the transportation sector, a rapid expansion of biofuels has been witnessed since 2010, mainly due to tax exemptions. A significant driver also has been the bio-supply obligation at filling stations, accompanied with emission reduction obligations for petrol and diesel through biofuel blending. There also has been expansion of electric vehicles through various support systems.

A range of policy and economic instruments such as taxes and emissions trading are critical elements of Sweden's

climate action strategy. Notably, the industries play a major role in the Swedish climate policy, which has seen an increase in the usage of biomass, in spite of industries being protected from strong policy instruments and receiving carbon tax reductions. The forest industry in particular has been a large user and provider of bioenergy.

Professor Bendt also discussed future policy challenges, such as how to juxtaposition industrial decarbonization and

competitiveness, particularly in the areas of steel, cement, and plastics. Other challenges include the transformation of the electricity system and electrification (in terms of the variability and localization of wind power and power lines) and the sustainability of bioenergy (in terms of bioeconomy versus carbon storage versus biodiversity).

Professor Bendt stated that renewable energy systems in Sweden are compatible

with a well-functioning industrialized economy and policy instruments have been pivotal for renewable energy expansion. Further, net-zero approaches need broad sectoral policies in addition to carbon pricing, while policies and measures that reduce energy and material demand are key to avoid future conflicts. Further, institutions must adapt to new systems in order to preserve energy security.

Swedish Renewable Energy Policy as a Part of Swedish Climate Policy

By Merlin Linehan

Mr. Merlin Linehan discussed the importance of regulation and cooperation in building a low carbon future. He started by noting the key trends in climate governance and highlighted how climate change was perceived as a remote phenomenon by most companies, while companies have now started to take the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) seriously.

Essentially, there are four pillars of the TCFD recommendations: strategy, analysis, governance, and matrix. Japan and the EU countries are leading the way in terms of the increase in the number of companies committed to reporting their approach to climate change using the TCFD recommendations, well ahead of the rest of the world. The companies are gaining an understanding on the potential climate risks to corporations and banks through the TCFD recommendations. These risks, many of which are related to physical risks, include floods,



droughts, water shortages, and other disasters linked to climate change. Besides, there are also financial costs incurred, where infrastructure and businesses are destroyed. At the same time, green transition carries its own risks, as government policies target carbon intensive companies, or societal changes in the trends of the eating habits of people and aviation, impact carbon intensive companies. So, though the TCFD recommendations have been successfully adopted by many companies, there are still some gaps.

This is an opportunity, particularly for banks and companies, to build a net-zero world through renewable energy. However, it is necessary that every sector of the economy changes. Here,

the TCFD can be a catalyst driving innovation, helping management, and building a narrative to look for products and services, which could decarbonize. For instance, companies in Sweden are investing in decarbonization and using hydrogen in place of coal to promote renewable energy. Further, companies could invest in and adapt to the goals of decarbonization. Companies, banks, investors, and governments should engage in dialogues about achieving these goals. The companies should be encouraged to analyze not only the climate risks they face, but also the opportunities presented by a green transition. However, this process is still in its nascent stage.

There is also a geopolitical aspect: there are countries emerging and leading in the TCFD climate change regulations, as well as pushing for net-zero emissions; while there are also laggards. There is a huge possibility of friction between these two groups, as is being seen already, and it will only get worse with time.

Local Initiatives to Overcome Green vs. Green Conflicts Related to Renewables

By Prof. Noriko Okubo

Professor Noriko Okubo highlighted that there is a significant gap between the state Japan is right now and the target it is hoping to achieve. To achieve its target, the use of renewable energy is essential, particularly in harmony with the local community and nature. However, at present, its percentage of usage remains very low.

She highlighted that Japan has essentially two levels of local government, namely prefectures and municipalities. Today, the majority of the local governments, including in Kyoto and Tokyo, are seriously committed to bring down the carbon emissions to zero by 2050. These governments, importantly, include 90 percent of Japan's population. To achieve the goals set by national and local governments, the Council for National and Local Decarbonization was launched, which works for solving social local and social issues, and at the same time, contributes to decarbonization development.

However, local governments realize that there are challenges in promoting



renewables, which range from technical to financial issues to environmental conflicts between businesses and residents. These conflicts might emerge due to, for instance, mega solar farms (landscape degradation, deforestation, and increase of disaster risks); wind farms (risks of low frequency noise, landscape degradation, and adverse effects to nature); geothermal projects (risks of landscape degradation of national parks and biomass and risks over odor from facilities). The main causes of conflicts include inadequate land-use zoning, ineffective and inadequate public participation, and development by large-scale operators outside the region, not bringing benefit

to local communities. From the viewpoint of the sustainable development goals, there is a need for measures to promote renewable energy that will also lead to social and economic revitalization of the communities.

Notably, Professor Noriko focused on the ways to overcome the challenges through a new positive zoning and approval system. The new system is a result of the revision of the Act on the Promotion of Global Warming Countermeasures in 2021 and the establishment of an approval system for business plans to promote regional decarbonization. The aim has been to promote renewable energy utilization by municipalities and consensus

building, as also to achieve positive zoning by designating promotion areas of renewable energy in advance and improvement of predictability. Further, the approved system is being initiated in an effort to enhance benefits for project operators by deregulation through one-stop service for projects in the designated zone integrating the various relevant permits under the National Parks Act, Forestry Act, etc. For such projects, the Environmental Impact Assessment (EIA) procedures would be simplified. With the absence of a simplified EIA – Simplified Environmental Assessment (SEA) - procedure in Japan, it is the primary environmental impact consideration that takes care of activities of screening, scoping, and reporting. During this, there are two possibilities of public participation: during the formulation of the prefectural or municipal Action Plan and the opportunity based in Environmental Impact Assessments in projects where EIAs are mandatory. However,

there are questions regarding the opportunities for public participation, as there are none at the approval stage of a specific project, and it is not required for every applied project to conduct an EIA. For instance, small projects are not subjected to EIA.

A major role is also played by the Council for Local Action Plan, organized by a prefecture and/or municipality to promote formulation and implementation of local action plans. These councils include members from the prefecture, municipality, and relevant administrative authorities; Climate Change Action Officer; members of the Local Center to Promote and Enhance Global Warming Prevention Activities; business operators; local residents; and experts. There are, however, challenges such as lack of adequate resources and lack of substantive debate, formal or superficial. In this situation, the ordinance concerning building a sustainable society is done through the introduction of renewable energies. It guarantees locals

environmental rights to use renewable energies in harmony with the natural environment and local communities. This is especially important as renewable energy should be utilized based on consensus decision-making by communities or territorial groups; and the city should support and promote such renewable projects.

In conclusion, Professor Noriko argued that the SEA should be introduced with active zoning of the municipality. Further, public participation in Japan should be strengthened – unlike Parties of the Aarhus Convention such as Sweden, the right to public participation is not sufficiently guaranteed in Japan. Judicial control over improper public participation should be strengthened for effective public participation, which would also ensure proper functioning of the Council of Local Action Plan. And lastly, local initiatives should be encouraged and local governments should be enabled to enact ordinances in accordance with local conditions.

Panel Discussion

Discussant: Dr. Masayuki Komatsu

Dr. Masayuki Komatsu summarized the discussions of Session V. Dr. Komatsu praised Professor Johansson for enumerating the successful efforts of the Swedish government in expanding the use of renewable energy, which could serve an example or an introduction, to some extent, to Japan. Dr. Komatsu also commended Mr. Linehan for a forward-looking presentation and focusing on how we look at the accountability, transparency, and responsibility aspects of governments and corporations.

Dr. Komatsu also asked the speakers some pertinent questions: He inquired of Professor Johansson about the future updates in Swedish climate policy apropos renewable energy. Professor Johansson responded that in future we still may have to use broad economic instruments, but more important would be to look for a way for countries to reform how to manage more renewables, in terms of the rising prices, expanding infrastructure, and ability to have a market to support the goals. There are further challenges in land-use conflicts, like attaining greater land for wind farms



or using biomass, which would only increase in future. Thus, the future might not have only success stories. But the focus on infrastructure, research, etc. is very important for a 100 percent renewable system.

Further, regarding Japan's initiative toward the TCFD, Dr. Komatsu opined that Japan remains far behind Europe and the US in terms of CFDs. He asked Mr. Linehan to explain each country's acceptability to his proposal in conjecture to the Sustainable Environmental Economic Accountability (SEEA), which has been developed by the UN. In response, Mr. Linehan mentioned that countries are not applying and agreeing to all the recommendations by the TCFD, and it could take

more than five years to actually notice the benefits; however, laying a foundation does take time.

Finally, Dr. Komatsu raised an issue regarding the development of renewable energy in particular regions like the coastal areas and mountainous regions. He asked Professor Noriko to share her views about the process of developing successful renewable infrastructure against such complaints. In response, Professor Noriko agreed that if any changes are introduced, public participation should also be strengthened. However, the government rarely relies on new consultative systems; for instance, the Council for Local Action Plan, whose effectiveness is not very certain.

Concluding Panel Discussion: The Way Forward for Sweden-Japan Cooperation

To end the two-day symposium, the concluding panel discussion invited speakers to summarize their key takeaways and reflect on the way forward. Presenters were prompted to respond to the following two questions:

1. What are the specific three areas where Sweden-Japan effective cooperation can be executed moving forward? What should our priorities be to effectively respond to the climate crisis?
2. Given the scope of the ISDP-KIIP climate study project, what are the three specific areas where Japan can learn from Sweden?

Speakers' Concluding Remarks

Professor Sandra Cassotta outlined the three areas of cooperation as follows: (1) Public participation in renewable energy from a regulatory point of view is an area Japan must work on further. Transparency and public participation are very important to achieve the goals of the Paris Agreement, and therefore require greater focus. (2) Disaster risk management, too, requires greater focus; and Japan could share its extensive experience in this area. (3) Ocean and marine governance and nature-based solutions, which are exceedingly relevant in Japan, is another area of cooperation.

Furthermore, referring to the problem of public participation raised by Professor Noriko, Professor Cassotta posited that there seems to be a problem in Japan due to a lack of an established litigation system than can empower NGOs and citizens to allow reaction of efficiencies to tackle climate crisis, which is a positive bottom-up phenomenon. There might, therefore, be potential to investigate the obstacles of a climate change litigation system in Japan, especially in the light of the legal framework and cultural identity of Japan.

Professor Noriko Okubo highlighted the importance of guaranteeing the three procedural rights based on principle 10 of the Rio Declaration

in Japan and globally too – namely access to information, access to public participation, and access to justice. In Japan, there has been no public interest in relation to environment litigation; and a system is yet to be introduced, so it is very difficult for NGOs to litigate. In contrast, EU member states, including Sweden, have ratified the Aarhus Convention, which gives everyone the right to access environmental information that is held by public authorities and guarantees these procedural rights. Hence, this is a good area of cooperation. Another area is climate change adaptation, where Japan has significant experience and has developed several methods, such as nature-based solutions and green infrastructure.

Next, Professor Bengt Johansson highlighted that a key takeaway from the array of presentations is that we must look to learn from each other through increased cooperation, particularly in the institutional context. Often, policies implemented in one country cannot be straightforwardly introduced in another, but this can only happen in a very specific context and must be adequately adapted. Accordingly, we must consider why a specific solution worked in Sweden and whether the same factor would allow such success to translate to Japan, and vice ver-

sa. In other words, considering the context in which environmental policies are implemented is crucial. Furthermore, we must also consider the question of how to plan society. It is easy to just focus on the expansion of renewable energy. But how do you see this as part of a broader industrial policy or transportation policy? How do you design a transport or urban system that first mitigates the need for extensive transport or increase efficiency? We must consider these questions alongside introducing renewables as part of one, comprehensive solution. Therefore, learning to see renewables in this context, and not just as a separate field but integrated into other measures is very important. Being context-specific is very important; while we can look at other countries and their experiences, we also need to consider how it could work here, and whether one should rather focus on local traditions and institutional structures to come up with something new.

Professor Dhanasree Jayaram pointed out the following factors in regard to Japan-Sweden cooperation: (1) Equity and justice, which Japan, Sweden, and their partners need to promote on the international level. These principles are important both internationally and locally, and should be established on the

local level as well. (2) Energy transitions and how to look at them in different contexts. In other words, we need to see how energy transitions relate to technology, actors, and institutions, and how they will impact these domains as well as the systems we have put in place thus far. For example, with regard to developing countries that are so dependent on coal, we must explore solutions that ensure development cooperation is attuned to ground-level realities of climate change. That is something we need to learn from each other's experiences. (3) Climate security. We need to look at how renewable energy can provide opportunities for peacebuilding and peacekeeping. There are a lot of conflict areas and regions across the world, and resources have always been enmeshed in these conflicts. We need to see renewables as an element of peacekeeping itself. This has already been experimented in a couple of regions with decentralization and diffusion of technology, and we need to see how we can empower such processes. (4) Gender dynamics. We also need to focus on gender issues as part of the conversation on climate change. Although we have made some efforts in this regard, such as with the solar alliances looking at the gender dynamics; however, this still hasn't been institutionalized and programmed enough in development cooperation. We

must account for the gender dimensions of development justice and energy security itself, and move toward streamlining all these sectors on the multi-lateral or local levels.

Professor Takashi Sekiyama reiterated that there are various things Sweden and Japan can do by working together. In particular, Sweden and Japan are neighbor countries across the Arctic Ocean, and should come together to deal with common geopolitical risks triggered by climate change in this region. Similarly, both countries can coordinate strategies to respond to geopolitical turbulence caused by competition and conflict over scarce resources as climate change becomes a larger issue. Beyond this, a deeper conversation to identify other areas for cooperation must be a priority.

Dr. Tatsuo Shikata stated that the various presentations gave extensive insight on possible areas for further cooperation. Dr. Shikata noted that while Sweden and Japan may appear separated by a continent and on different sides of Eurasia, they are in fact neighbors in the Arctic. Therefore, there is much room for the two countries to cooperate here, especially considering the region as a key area for mitigating the climate crisis.

Mr. Merlin Lineham identified that on a sub-national level, banks and other financial institutions can cooperate

by sharing their TCFD recommendations and data. This includes exchanging new information about climate risks and how to assess them within their own portfolios, as well as ideas on how to measure climate risks, which is still a new field. Mr. Lineham added that in his personal experience, introducing such collaboration between banks is always a challenge and involves a very steep learning curve, but it can still be developed by learning from the experiences of other institutions. Further, Sweden and Japan must look to explore new opportunities for innovation and advancement of products and services that help achieve the net-zero emissions goal. In short, banks cannot just work in isolation, but must work in concert with various other institutions.

Dr. Masayuki Komatsu emphasized that Sweden and Japan must learn from each other's institutions, legal systems, and code systems. Sweden's speedy establishment of a taxation system is something Tokyo can perhaps glean insights from. While the Swedish code system is very different from that of Japan's (for instance, the Swedish local administration works closely with the people and holds immense authority – unlike Japan's decentralized system), it can nevertheless provide lessons for Japan. Referring to the Swedish electricity generation, Dr. Komatsu pointed out that Sweden has

plenty of dams for hydropower generation and is increasingly debating the merits of nuclear energy. Japan shares several similarities in this respect; it also has numerous dams and nuclear plants. While dams threaten biodiversity, migratory ranges, and the natural

beauty, nuclear energy brings with it considerations of nuclear waste and heat generation that may cause immense harm to large water bodies like rivers and oceans. Collaboration to mitigate such issues can be a point of climate cooperation between Sweden and Japan.

As part of the discussion on how justice and equity among people must be a part of the climate change discourse, Dr. Komatsu emphasized that we must address issues of justice, equity, and fairness between the current and future generations too.

Discussion and Question-Answer Session

After the concluding remarks by experts, the floor was opened for questions from the audience. The first question addressed to Professors Cassotta and Jayaram was about the EU's role in engaging China to step up its climate action.

Discussing the complex geopolitical environment currently prevailing, Professor Jayaram said that at present, most initiatives introduced appear as alternatives to China's BRI, which is an extensive geo-economic and geopolitical project that runs through multiple countries across continents. To some extent, there are already efforts within the BRI to make it greener and to diversify its portfolio by not just investing in fossil fuels, but also looking into renewables and cleaner energy. Within the EU there is still division among the countries on how to approach China. While some countries want to finalize the trade and investment agreement, taking forward energy-related issues, anti-China sentiments are quite palpable in many European countries too.

However, regardless of the geopolitical flux, it should be noted that without China, there is no climate solution in the world. It is important to have China, a country that

dominates both supply chains and mineral value chains, on board for an effective response to climate change. Instead of treating new solutions (like "Build Back Better World") as alternatives to the BRI, we must focus on diversification so that we are not dependent on China's position on these issues, so that we can have other sources for procuring rare earth minerals that are critical to various sectors, including renewable energy (such as in building solar panels). At the same time, while diversification is crucial, considering the urgency of the problem, we must pursue multiple options simultaneously; engaging China is one such option.

This was evident in COP26: despite all the geopolitical wrangling between the countries, and the ongoing tensions between the great powers, the US and China came together to sign a bilateral agreement on climate change. Climate change is an issue where multilateral cooperation is the only way forward, and this makes it necessary to find a fine balance where democratic powers are not too dependent on China but are able to bring China to the table and find large-scale multilateral solutions.

Addressing the same question, Professor Cassotta

stated that a new kind of diplomacy is needed to approach China on climate action. During the early years of the COP summits, China was not very active, which was not a good sign, but this turned around rather unexpectedly. Today, our overdependence on China is the elephant in the room. Moving China toward a common position has now become vital, as it is the only way to get other smaller states to agree in order to make significant headway globally. While China has committed to carbon neutrality by 2060, this is still a long way off.

The second question, by Mr. Peter Adolfsson to Professor Bengt Johansson, concerned the future of Swedish climate policies in the aftermath of Sweden's current political turmoil, and especially post elections, which are due next year. Mr. Adolfsson inquired whether a change in the government could lead to a new direction in climate policies, whether individual parties have a strong influence on policy, and whether we should expect to see continuity on Sweden's climate policies and climate commitment.

In response, Professor Johansson said that it is difficult to forecast precisely what will happen. Nevertheless,

we should not expect to see major changes in ambitions, but the new government may reevaluate its priorities in terms of measures: for example, it may prioritize subsidies over market instruments; or it may redefine the role of nuclear energy. It is unlikely that, regardless of a change in government, Sweden would lower its ambitions. Sweden had a different government eight years ago, and although there were, of course, differences, the overall climate ambition remained the same. So, the goal to be carbon neutral by 2040 will remain in place. The recent lowering of petrol taxes is one example of different parties using different instruments to reach the same target.

Speakers' Concluding Remarks

The symposium came to an end with brief closing remarks from the ISDP Director Dr. Niklas Swanström and KIIP President Nobuyuki Hiraizumi. Dr. Swanström thanked the KIIP, President Hiraizumi, and all the staff of the ISDP and KIIP. He also expressed his gratitude to all the people who presented, shared, and participated in the discussions. Dr. Swanström noted that the topic of climate change needs more attention; and undoubtedly, further discussions between experts, including those who have participated in this event, will not just help identify challenges, but also solutions. He highlighted that the themes tackled in the symposium – including (but not limited to) engagement with China; public participation; connection between public participation and policy implementation; local adaptation, which is very important as no solution fits all; climate change in the Arctic; gender dynamics in climate action; disaster risk reduction; and ocean pollution, which is becoming an imminent threat to the survival of species – will continue to feature in and be the focus of ISDP and KIIP's

joint study on climate change. Notably, Dr. Swanström invited all the experts to participate in the upcoming meetings, consultations, and an in-person conference in Stockholm, which have already been scheduled for the coming year.

Mr. Hiraizumi listed two takeaways from the symposium: (1) Europe is taking the lead in sustainability reporting standards. The EU is working toward international sustainability standards, or accounting standards, which will come into being on January 1, 2023, and require all companies across the EU to file climate reporting. These rules will be the first of their kind in the world. It's likely that Japan will eventually follow suit. Japan went through a similar kind of transition in the 2000s when it harmonized Japanese corporate financial principles with international accounting standards. That was a tremendous ordeal, and it took Japanese companies 10 years to adjust to the new environment. Europe will be the first to experience this transition to the new sustainability standards, and Japan has much to learn

from the EU's adaptation process. (2) Japan relies heavily on imports to meet its energy requirements. The energy industry in Japan is tightly regulated by the Ministry of Economy, Trade, and Industry (METI), which exerted considerable influence under the Abe administration and continues to remain powerful under the current Kishida administration – the top ranks comprise ex-METI officials (as they did under Mr. Abe). Japan's political culture makes it exceedingly difficult to bring about changes to rules and laws. Therefore, Japan should look into other ideas such as reducing food waste in order to lower carbon emissions, or focusing on plant-based diets – a proposition discussed in the book *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming* (edited by Paul Hawken). Mr. Hiraizumi particularly agreed with the book's argument for the need of a cross-section of solutions. He asserted that Japan must explore not only renewable energies but also other potential solutions that could reduce carbon emissions.

Appendix: Symposium Program

Day 1, November 25, 2021 (Thursday)

Inaugural Session (17:00-17:25 JST/ 9:00-9:25 CET)

Welcome Note: Mahima Duggal, Associated Research Fellow at ISDP

Chair: Amb. Lars Vargö, Distinguished Fellow & Head of ISDP Stockholm Japan Center

Opening Remarks:

- Niklas Swanström, Director & Co-founder, ISDP, Stockholm
- Nobuyuki Hiraizumi, President, KIIP, Tokyo

Keynote Speech: Hydropower – Renewable Energy with a Cost

Ashok Swain, Professor and Head of Department of Peace and Conflict Research

UNESCO Chair of International Water Cooperation, Uppsala University

Session I: Renewable Energy and the Need for International Cooperation (17:25-18:25 JST/ 09:25-10:25 CET)

Chair: Amb. Lars Vargö, Distinguished Fellow & Head of ISDP Stockholm Japan Center

Presentations:

- Geopolitics of Renewable Energy and Transatlantic Relations - Jeremy Maxie, Associate, Strategika Group Asia Pacific
- The European Union's Climate Cooperation with the Indo-Pacific and the Geopolitics of Renewable Energy - Dhanasree Jayaram, Assistant Professor, Manipal Academy of Higher Education
- How to Use Renewable Energy? A Cross-Continental Experience - Ashis Basu, Corporate Executive & Climate Expert, Canada

Panel Discussion among Speakers and Discussant; Q&A with Audience

Discussant: Yasiru Ranaraja, Founding Director, Belt & Road Initiative Sri Lanka (BRISL)

Session II: The State of Renewable Energy in Sweden (18:35-19:35 JST/ 10:35-11:35 CET)

Chair: Tatsuo Shikata, Associate Researcher, Kajima Institute of International Peace, Tokyo & Company Fellow, Mitsui & Co., Ltd.

Presentations:

- Leading the Path toward a Fossil-free Society through Biofuel Policies in Sweden - Cecilia Higa, Project Manager, Swedish Bioenergy Association (Svebio)
- Legal Preconditions for Wind Power Development in Sweden: Issues of Land-use, Opposing Interests and Potential Goal Conflicts - Maria Pettersson, Chair Professor, Luleå University of Technology
- Can Agrivoltaics Solve the Solar Energy and Farming Conflict? - Bengt Stridh, Senior Lecturer, Mälardalen University

Panel Discussion among Session Speakers and Discussant

Discussant: Lydia Powell, Distinguished Fellow, ORF Centre for Resources Management

Session III: Renewable Energy Cooperation, Green Growth and the Private Sector (19:45-20:45 JST/ 11:45-12:45 CET)

Chair: Maria Pettersson, Chair Professor, Luleå University of Technology

Presentations:

- Climate-resilient Trade and Supply-chain Management: The Role of Public and Private Actors in Jointly Governing Transboundary Climate Risks - Adis Dzebo, Research Fellow, Stockholm Environment Institute
- The Role of Mining in Green Energy System and Its Negative Impact on the Environment - Michael Goodsite, Professor, University of Adelaide / Non-resident Senior Research Fellow, ISDP
- Green Steel Form Renewables – Development and Outlook in Sweden - Max Åhman, Associate Professor, University of Lund

Panel Discussion among Speakers and Discussant; Q&A with Audience

Discussant: Hajime Kobayashi, Partner, Gemini Strategy Group

Wrap-up: Mahima Duggal, Associated Research Fellow, ISDP, Stockholm

Day 2, November 26, 2021 (Friday)

Session IV: Climate Action & Cooperation (17:10-18:10 JST/ 9:10-10:10 CET)

Chair: Jagannath Panda, Associated Senior Research Fellow, ISDP, Stockholm

Welcome Note: Peter Adolfsson, Intern, ISDP Stockholm Japan Center

Presentations:

- Reflections on COP26 - Sandra Cassotta, Associate Professor in International, Environmental and Energy Law, Aalborg University, and Associated Senior Research Fellow, ISDP
- Community Energy in the 2050: Energy Transition of the EU and Japan - Marciej M. Sokolowski, Visiting Researcher, University of Tokyo / Assistant Professor, University of Warsaw
- Climate Security and Japan-Sweden Cooperation - Takashi Sekiyama, Associate Professor, Kyoto University

Panel Discussion among Speakers and Discussant; Q&A with Audience

Discussant: Mahima Duggal, Associated Research Fellow at ISDP

Session V: Role of Institutions, Climate Cooperation, and the Debates in Sweden and Japan (18:20-19:20 JST/ 10:20-11:20 CET)

Chair: Svetlana Sabelfeld, Researcher at Gothenburg Research Institute, University of Gothenburg

Presentations:

- Swedish Renewable Energy Policy as a Part of Swedish Climate Policy - Bengt Johansson, Associate Professor in Environmental and Energy Systems Studies, University of Lund
- International Cooperation, TCFD, and Corporate Governance - Merlin Linehan, Risk Manager, European Bank for Reconstruction and Development (EBRD)
- Local Initiatives to Overcome Green vs. Green Conflicts Related to Renewables – Noriko Okubo, Professor, Osaka University

Panel discussion among speakers and discussant; Q&A with audience

Discussant: Masayuki Komatsu

President, Ecosystem Research Institute / Visiting Researcher, Kajima Institute of International Peace, Tokyo, Japan

Concluding Panel Discussion: The Way Forward for Sweden-Japan Cooperation

(19:20-20:00 JST/ 11:20-12:00 CET)

Chair: Mahima Duggal, Associated Research Fellow, ISDP, Stockholm

- Final comments by speakers
- Panel discussion

Closing Remarks

- Niklas Swanström, Director & Co-Founder, ISDP
- Nobuyuki Hiraizumi, President, KIIP

Vote of Thanks: Representatives from KIIP and ISDP

