

2023 APEC Climate Symposium and Asia Pacific Climate Services Workshop Joint Conference

Enhancing Energy Security in a Changing Climate
for a Resilient Future in APEC

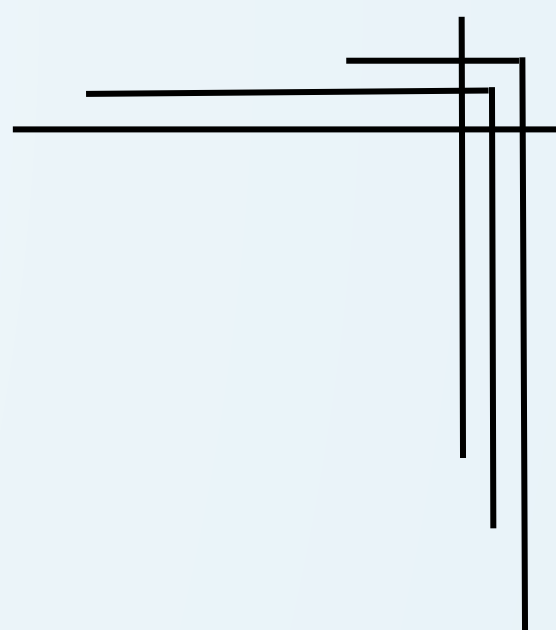
October 17-20, 2023 | Hybrid (Online / Offline)

Venue:
**International Conference Hall,
Central Weather Administration,
Taipei**

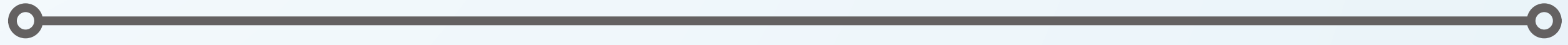


Program
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Contents



Overview.....	02
Organizers.....	03
Agenda.....	06
Warm-up Session.....	10
Keynote Session.....	22
Session I.....	25
Session II.....	32
Session III.....	39
Session IV.....	51
Panel Discussion.....	58

Overview

2023 APEC Climate Symposium and Asia Pacific Climate Services Workshop Joint Conference

Enhancing Energy Security in a Changing Climate for a Resilient Future in APEC

Background

As global temperature continuously increases causing changing climate and unprecedented extreme events, it puts the energy sector at great risk from directly affecting physical damages of current and future energy infrastructure, which all bringing a great energy insecurity.

Also, the world including APEC region is heading towards less and less dependency on traditional energy system based on fossil fuels and more on renewable energy to achieve 2030 Agenda for Sustainable Development and the Paris Agreement on climate change to reduce greenhouse gas emission. As the renewable energy system (e.g. hydro power, wind power, etc.) greatly depends on the weather and climate, changing climate conditions and severe disasters will put energy security at immense risks, especially in the APEC region where natural disasters occur more frequently and severely.

In this regard, information on extreme events and climate is required to ensure the resilience of energy systems to climate-related shocks and to inform measures to increase energy efficiency. Equipping the APEC community with the capacity and ability to understand the changing climate and predict the conditions is vital to the successful race to the climate adaptation in the energy sector, and to the successful transition to renewable energy and enhancing energy security. This will ultimately contribute the successful transition to renewable energy, and ultimately to achieve a net-zero target by 2050.



Organizers

APEC Climate Center (APCC)



APEC Climate Center (APCC) is an APEC-endorsed center established in 2005 during the 13th APEC Economic Leaders' Meeting. The mission of APCC is to enhance the socio-economic well-being of member economies by utilizing up-to-date scientific knowledge, applying innovative climate prediction techniques, and promoting application of climate information through various programs for capacity building and reducing climate risks in the region. Since its establishment, APCC has played an important role in the region in providing climate information products and services based on a multi-model ensemble prediction system, which has 15 participating institutes worldwide to provide their individual model data.

Central Weather Administration (CWA)

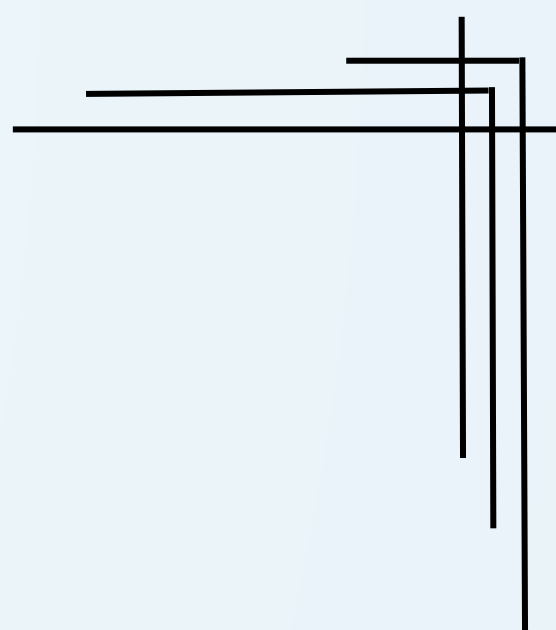


The Central Weather Administration (CWA) functions as the central governmental institution for meteorological research and forecasting in Chinese Taipei. Situated in Taipei, with a network of observatory stations and radar systems spanning across the island, CWA is tasked with overseeing meteorological, seismological, marine, and astronomical activities. It delivers a wide range of meteorological information and services to government agencies and the general public.

Chung-Hua Institution for Economic Research (CIER)



Chung-Hua Institution for Economic Research (CIER) is a government-funded think tank in Taiwan which holds distinguished international recognition. Since its establishment in 1981, CIER has provided economic and industry-related research and policy recommendations to the government. As an independent policy research organization, it represents the country while actively engaging with international institutions to improve global and local economic affairs. In 2018, CIER was ranked 140th out of 6,000 global think tanks in the TTCSP Global Go to Think Tank Index Reports. In the last decade, the CSTPE team of CIER has worked together with CWA for the benefit assessment and economic evaluation of climate services.



International Climate Development Institute (ICDI)



International Climate Development Institute (ICDI) is a non-profit organization which concerns the right of development under climate change impacts. By providing its professional knowledge and skills on climate governance, this think tank engages in planning and implementing of national climate policy with the public-private partnership (PPP) approach; supporting local communities and vulnerable groups on capacity building to achieve climate-resilient and sustainable lives.

Taiwan Climate Services Partnership (TCSP)



Taiwan Climate Services Partnership (TCSP), officially established in August 2021, is a non-profit organization dedicated to creating a better environment for climate services and promoting the meteorological industry in Taiwan. In 2020, led by CWA, together with six non-profit organizations, TCSP was initiated with the callings of the society and the industry promotion policy of MOTC. With its core values of meteorological science, climate change research, and climate service development, TCSP strives to foster stronger collaboration between the public and private sectors, raise public awareness of climate services, and enhance a potential domestic weather service market, as well as a network for the supply and demand stakeholders of the domestic weather service market.

Organizing Committee



APEC Climate Center (APCC)

Dr. Kyung-Won Park

Research Fellow, Prediction Research Department

Ms. Sangwon Moon

Head, External Affairs Department

Ms. Suhee Han

Project Manager, External Affairs Department

Ms. Yeuteum Na

Project Manager, External Affairs Department



**Central Weather Administration
(CWA)**

Dr. Jing-Shan Hong

Director, Marine Meteorology and Climate Division

Ms. Meng-Shih Chen

Senior Technical Specialist, Marine Meteorology and Climate Division

Dr. Wei-Peng Huang

Section Chief, Marine Meteorology and Climate Division



**Chung-Hua Institution for
Economic Research (CIER)**

Dr. Hen-I Lin

Director, the CSTPE Center & the Japan Center

Dr. Jen-Hong Hsu

Research Analyst, CSTPE Center

Dr. Yu-Chieh Chang

Post-Doctoral Research Associate, CSTPE Center

Ms. Yu-Ling Chu

Assistant Associate, CSTPE Center



**International Climate
Development Institute (ICDI)**

Mr. Kung-Yueh Camyale Chao

Executive Director



**Taiwan Climate Services
Partnership (TCSP)**

Dr. Hong-Yang Tseng

Secretary General

Agenda

10/17 (Tue) Day 1

14:00	Welcome Remark	<ul style="list-style-type: none"> • Chin-Tzu Fong (Deputy Administrator, Central Weather Administration, Chinese Taipei)
14:00-16:30	Warm-up Session Partnership and Development of Climate Services in the Asia Pacific Region	
	<p>Moderator:</p> <ul style="list-style-type: none"> • Jing-Shan Hong (Director, Marine Meteorology and Climate Division, Central Weather Administration, Chinese Taipei) <p>Speakers:</p> <ul style="list-style-type: none"> • <i>Strategic Planning of the Climate Services in Central Weather Administration in Chinese Taipei</i> Jing-Shan Hong (Director, Marine Meteorology and Climate Division, Central Weather Administration, Chinese Taipei) • <i>The Current State of the Meteorological Industries and Legislation Activities in Korea</i> Seung Jun Oh (Chairman, Korea Meteorological Industry Association, Korea) • <i>Promoting the Use of Meteorological Data and its Use Cases in Japan</i> Takashi Michikata (Associate Professor, Interfaculty Initiative in Information Studies, the University of Tokyo, Japan) • <i>Economic Evaluation for Climate Services and the Development of Promoting Weather Industry and Public Private Partnerships in Taiwan</i> Hen-I Lin (Director, the CSTPE Center and Japan Center, Chung-Hua Institution for Economic Research, Chinese Taipei) 	
18:00-20:00	Ice - break Dinner (Invited Only)	

10/18 (Wed) Day 2

8:30-9:00	Registration	
9:00-9:10	Opening Remarks	<ul style="list-style-type: none"> • Do Shick Shin (Executive Director, APEC Climate Center, Korea) • Chia-Ping Cheng (Administrator, Central Weather Administration, Chinese Taipei)
	Group Photo	
9:10-9:50	<p style="text-align: center;">Keynote Session</p> <p style="text-align: center;">Challenges and Opportunities of Climate Service to Promote the Energy Transition for 2050 Net-zero Target</p>	
	<p>Moderator:</p> <ul style="list-style-type: none"> • George Tai-Jen Chen (President, Taiwan Climate Services Partnership, Chinese Taipei) <p>Keynote Speaker:</p> <ul style="list-style-type: none"> • <i>Challenges of Climate Service for Carbon Neutral Society in Japan</i> Noboru Koshizuka (President, Weather Business Consortium / Professor, The University of Tokyo, Japan) 	
9:50-10:05	Q&A	
10:05-11:05	<p style="text-align: center;">Session I</p> <p style="text-align: center;">Enhancing Energy Security Using Climate Information</p>	
	<p>Moderator:</p> <ul style="list-style-type: none"> • Kung-Yueh Camyale Chao (Executive Director, International Climate Development Institute, Chinese Taipei) <p>Speakers:</p> <ul style="list-style-type: none"> • <i>Climate Services for the Energy</i> Albert Soret (Earth System Services Group Leader, Barcelona Supercomputing Center, EU) • <i>Changes in Solar and Wind Power Generation Potentials over South Korea under Global Warming</i> Seontae Kim (Research Fellow, Climate Analysis Team, APEC Climate Center, Korea) • <i>Assessment of Climate Change on South Korea's Electricity Consumption with Uncertainty</i> Hyun-Gyu Kim (Research Associate, Korea Adaptation Center for Climate Change, Korea Environment Institute, Korea) 	
11:05-11:20	Q&A	

11:20-12:20	Session II Renewable and Clean Energy to Adapt Climate Change
	<p>Moderator :</p> <ul style="list-style-type: none"> • Takashi Michikata (Associate Professor, Interfaculty Initiative in Information Studies, the University of Tokyo, Japan) <p>Speakers :</p> <ul style="list-style-type: none"> • <i>Current and Future of Floating Photovoltaic Technology</i> Changsub Won (Chief Technology Officer, Scotra, Korea) • <i>Contribution in Offshore Wind-Energy</i> Sam Hwang (Executive Vice President, SK Ocean Plant, Korea) • <i>Meteorological Information Application Service in Green Energy</i> Jen-Hsin Teng (Researcher, Marine Meteorology and Climate Division, Central Weather Administration, Chinese Taipei)
12:20-12:30	Q&A
12:30-14:00	Lunch Break
14:00-16:30	Session III Climate Services for Energy (Big Data/ Open Data Platform, AI applications)
	<p>Moderator :</p> <ul style="list-style-type: none"> • Yuan-Lung Lo (Professor, National Taipei University of Technology, Chinese Taipei) <p>Speakers :</p> <ul style="list-style-type: none"> • <i>Climate Service Platform for Energy Application: Corporate Climate Risk or Opportunities?</i> Shih-Yun Kuo (Assistant Research Specialist, Research Center for Environmental Changes (RCEC), Academia Sinica, Chinese Taipei) • <i>An Experiment on Precise and Secure Calculation on GHG Emission</i> Takashi Michikata (Associate Professor, Interfaculty Initiative in Information Studies, the University of Tokyo, Japan) • <i>Operation of Weather and Climate Big Data Platform and Its Application of Energy Section in Korea</i> Cheol-Han Bang (Director, Weather & Climate Big Data Center, Industrial Growth Department, Korea Meteorological Institute, Korea) • <i>Challenges for Climate Change Risk Reduction with Cutting-Edge Technologies in Weather and Climate Services</i> Shoichi Tateno (Team Leader, Public Private Partnership & Sustainability, Weathernews Inc. Global Center, Japan) • <i>Introduction of JWA's Services for the Energy Sectors and Power Demand Forecast Using AI</i> Muneo Matsukawa (Advisor, Environment and Energy Department, Japan Weather Association, Japan)
18:00-20:30	Event Dinner Banquet @ CIER (invited only)

10/19 (Thu) Day 3

8:30-9:00	Registration
9:00-10:00	Session IV Best Practices or Policy Efforts to Enhance Energy Security
	<p>Moderator:</p> <ul style="list-style-type: none"> • Kyungwon Park (Research Fellow, APEC Climate Center, Korea) <p>Speakers:</p> <ul style="list-style-type: none"> • <i>Renewable Energy as a key to Energy Security – a case study of Chinese Taipei</i> Raoul Kubitschek (Board Member, Taiwan Renewable Energy Alliance / Managing Director, NIRAS Taiwan Ltd., Chinese Taipei) • <i>Bolstering APEC Oil and Gas Security Now and During the Energy Transition</i> Christopher Doleman (Senior Researcher, Asia Pacific Energy Research Centre, Japan) • <i>Climate Change and the Intensification of Meteorological Phenomena - Approach to Stationary Linear Mesoscale Convective Systems Forecasting</i> Noritake Nishide (Specially appointed professor, Tohoku University / Executive Advisor, Fujitsu Limited, Japan)
10:00-10:15	Q&A
10:15-12:15	Panel Discussion Policy Recommendations and Discussion on Energy System Transition and Energy Security in the Context of Climate Change Adaptation – What is our Challenges and Opportunities?
	<p>Moderator:</p> <ul style="list-style-type: none"> • Simon Wang (Professor, Utah State University, USA) <p>Panelists:</p> <ul style="list-style-type: none"> • Saurabh Trivedi (Research Analyst, Institute for Energy Economics and Financial Analysis, Australia) • Tae-Hwan Yoon (CEO, Root Energy, Korea) • Christopher Doleman (Senior Researcher, Asia Pacific Energy Research Centre, Japan) • Wan-Ling Tseng (Project Assistant Professor, International Degree Program in Climate Change and Sustainable Development, National Taiwan University, Chinese Taipei) • Suhyun You (Principal Researcher, Ecosian, Korea)
12:15-12:30	Closing Remarks
	<ul style="list-style-type: none"> • Do Shick Shin (Executive Director, APEC Climate Center, Korea) • Chia-Ping, Cheng (Administrator, Central Weather Administration, Chinese Taipei)



2023 APEC Climate Symposium and Asia Pacific Climate Services Workshop Joint Conference

Day 1 : 10/17 (Tue)

Warm-up Session

Partnership and Development of Climate Services
in the Asia Pacific Region



Honorable Guest



Chin-Tzu Fong

Deputy Administrator
Central Weather Administration
Chinese Taipei

Education

Ph.D. Atmospheric Sciences, National Taiwan University, Taiwan
M.S. Atmospheric Sciences, National Taiwan University, Taiwan
B.S. Atmospheric Sciences, National Taiwan University, Taiwan

Work Experience

Deputy Director-General, Central Weather Bureau
Deputy Director, Weather Forecast Center, Central Weather Bureau
Deputy Director, Meteorological Information Center, Central Weather Bureau



Jing-Shan Hong

Director

Marine Meteorology and Climate Division

Central Weather Administration

Chinese Taipei

Speech Title

Strategic Planning of the Climate Services in Central Weather Administration in Chinese Taipei

Abstract

The Central Weather Bureau was elevated to sub-ministerial status and rebranded as the Central Weather Administration (CWA) on September 15, 2023. Following this upgrade, promoting climate services and the development of the meteorological industry has become one of its primary missions. When looking at various countries around the world, meteorological agencies are generally responsible for weather and short-term climate forecasting, while climate change-related activities often involve collaboration with affiliated research centers. In Chinese Taipei, the CWA is primarily responsible for climate data management, and forecasting of weather to seasonal scale, with a focus on supporting disaster reduction and cross-domain applications. Furthermore, a so-called TCCIP (Taiwan Climate Change Projection Information and Adaptation Knowledge Platform) project focuses on climate risk identification, impact assessment, and adaptation strategies in different climate scenarios. Building upon the current framework, the CWA will enhance its forecasting capabilities for interannual and decadal-scale climate systems, with a particular focus on assessing the risks associated with extreme climate events. It will also align with the temporal scope of climate change under the TCCIP project and collaborate with the meteorological industry to facilitate seamless climate services. This collaborative effort will support domestic climate adaptation and greenhouse gas (GHG) reduction initiatives, in alignment with the policy goal of achieving net-zero emissions by 2050 in Chinese Taipei.



Biography

Dr. Jing-Shan Hong is now the Director of the Marine Meteorology and Climate Division (MCD), Central Weather Administration (CWA). He is in charge of the business development of the global climate model systems, the short-term climate forecast, the CWA observatory observation data management, and the cross-domain cooperation/service for renewable energy, water resources, agriculture, etc. In addition, the observation, prediction, and services for marine meteorology are also the major missions of MCD.



Seung Jun Oh

Chairman

Korea Meteorological Industry Association
Korea

Speech Title

The Current State of the Meteorological Industries and Legislation Activities in Korea

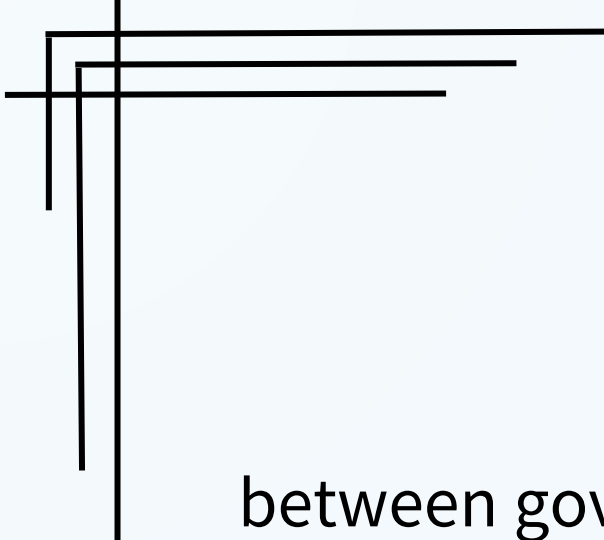
Abstract

The World Economic Forum (WEF) held in Davos, Switzerland in 2023 selected food crises and energy supply shortages due to extreme weather events, failure to respond to climate change, and environmental problems as global risks, highlighting their urgency and seriousness. Accordingly, the international community is currently prioritizing the introduction of low-carbon, green growth policies and ESG (Environmental, Social, Governance) management for sustainable development, and the research and development of C-Tech (Climate Technology), a weather and climate technology.

C-Tech, meteorological technology, is becoming an essential element not only in the safety of citizens from disasters, but also in all social fields such as aviation, road traffic, agriculture, marine, forestry, leisure, health, and energy. As the value of meteorological big data is increasing in management activities and policy establishment, the meteorological industry that produces stable meteorological data, manages the quality of collected data, and develops consulting and software based on this is also becoming important.

In Korea, the meteorological business operator system with private participation has been implemented since 1997, and the meteorological industry began in earnest with the enactment of the Meteorological Industry Promotion Act in 2009.

The Korea Meteorological Industry Association (KMIA) is comprised of members from meteorological industry, and it has the mission to foster the public private partnership (PPP)



between government and meteorological service providers in Korea, The introduction of KMIA and the current state of Korean Meteorological Industry will be presented including a few successful cases from the private sectors and the relevant legislation activities in Korea.

Biography

Seung Jun Oh is the founder and CEO of the SELab, Inc (Space Environment Laboratory, Inc.), and he has now served as the Chairman of Korea Meteorological Industry Association (KMIA) since 2022. He had been appointed the member of APEC Business Advisory Council (ABAC) from 2013 to 2018.



Takashi Michikata

Associate Professor
Interfaculty Initiative in Information Studies
The University of Tokyo
Japan

Speech Title

Promoting the Use of Meteorological Data and its Use Cases in Japan

Abstract

Biography

Takashi Michikata has strong qualifications on information and communication technology (ICT) with over 20 years of experiences in public sectors, an international organization, a research institution, and an academic sector. He received his master's degree from the University of Tokyo as well as master's degree of public policy and management from Carnegie Mellon University. He has worked at many ICT related organizations including the national government of Japan, an international organization, and a research institution. In his current role as Associate Professor at The University of Tokyo, Takashi Michikata works on many research projects of smart cities, machine learning, and green energy as researcher and gives series of lectures of information technology and its policies as educator.

Speaker of Warm-up Session



Hen-I Lin

Director

Chung-Hua Institution for Economic Research
Chinese Taipei

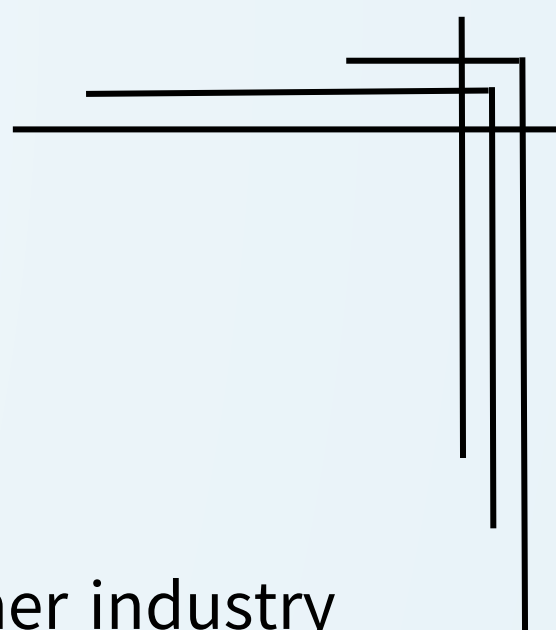
Speech Title

Economic Evaluation for Climate Services and the Development of Promoting Weather Industry and Public-Private-Partnership in Taiwan

Abstract

The increasing frequency of extreme weather events has had significant impacts on both people's lives and business operations. How to apply climate information to respond weather risks and climate change has become a topic worthy of discussion. The application of various technological innovations and services derived from big data analysis has led to the expanding use of meteorological information. However, the benefit of meteorological information not only comes from the advanced technologies and accurate observations, but also depends on how end users and decision makers apply the meteorological information to improve their daily lives or business decisions. To reveal the economic benefits and the importance of the meteorological information, this presentation discusses our utilization of economic methodologies for evaluating meteorological information applications across various sectors such as agriculture, forestry, tourism, transportation, and the household sector. It also includes the estimates of the corresponding socio-economic value.

Moreover, the weather industry in Taiwan is still in its early stages of development. To promote the weather industry in Taiwan and encourage the participation of public sectors, academia, and private industries in climate services, the Central Weather Administration (CWA) invited six non-profit organizations in 2020 to initiate and establish the Taiwan Climate Services Partnership (TCSP), which was officially founded in 2021. This presentation will also provide an overview of current TCSP development,



with our current research findings regarding the current status of the weather industry in Taiwan, the establishment and composition of TCSP, as well as recent activities aimed at promoting the domestic weather industry and building Public Private Partnerships in Taiwan.

Biography

Hen-I Lin has begun his career at CIER since 2010 after receiving his agricultural economics PhD degree from Texas A&M University. His CSTPE team has continuously worked with CWA for evaluating the economic benefits of weather information applications on various sectors, investigating the needs of users, and providing policy suggestions. In 2020, his team also helped CWA initiate a domestic weather industry promotion policy, and established a non-profit organization, TCSP, as a platform to communicate between public and private sectors. TCSP also plays a role of bridging the demand and supply sides of the potential weather service market in Taiwan.



2023 APEC Climate Symposium and Asia Pacific Climate Services Workshop Joint Conference

Day 2 : 10/18 (Wed)

Keynote Session

Challenges and Opportunities of Climate Service
to Promote the Energy Transition
for 2050 Net-zero Target

Session I

Enhancing Energy Security Using Climate Information

Session II

Renewable and Clean Energy to Adapt Climate Change

Session III

Climate Services for Energy
(Big Data/Open Data Platform, AI applications)



Honorable Guest

HONORABLE GUEST



Do Shick Shin

Executive Director
APEC Climate Center
Korea

Education

Ph.D. Atmospheric Sciences, Seoul National University(ABD)

Work Experience

Director-General, Regional Office of Meteorology of Busan and Seoul Metropolitan
Director-General, Planning and Coordination Bureau
Director-General, the Forecast Bureau, Korean Meteorological Administration



Chia-Ping Cheng

Administrator
Central Weather Administration
Chinese Taipei

Education

M.S. Atmospheric Sciences, National Taiwan University, Taiwan

Work Experience

Deputy Director-General, Central Weather Bureau
Director, Meteorological Information Center, Central Weather Bureau

Moderator of Keynote Session



George Tai-Jen Chen

President
Taiwan Climate Services Partnership
Chinese Taipei

Education

Ph.D. Atmospheric Science, State University of New York (Albany), USA

Work Experience

Distinguished Professor, National Taiwan University
Chair, Department of Atmospheric Sciences, National Taiwan University
President, Chinese Geoscience Union
Contract Research Fellow, Department of Natural Sciences and Sustainable Development, Ministry of Science and Technology
Project Director, Taiwan Area Mesoscale Experiment (TAMEX) Program

Research Interests/ Field of Expertise

Synoptic and Mesoscale Meteorology
Monsoon and the Associated Disturbances
Mei-Yu Front and the Associated Weather
Mesoscale Climatology Related to Mei-Yu Rainfall



Speaker of Keynote Session



Noboru Koshizuka

President / Professor

Weather Business Consortium / The University of Tokyo
Japan

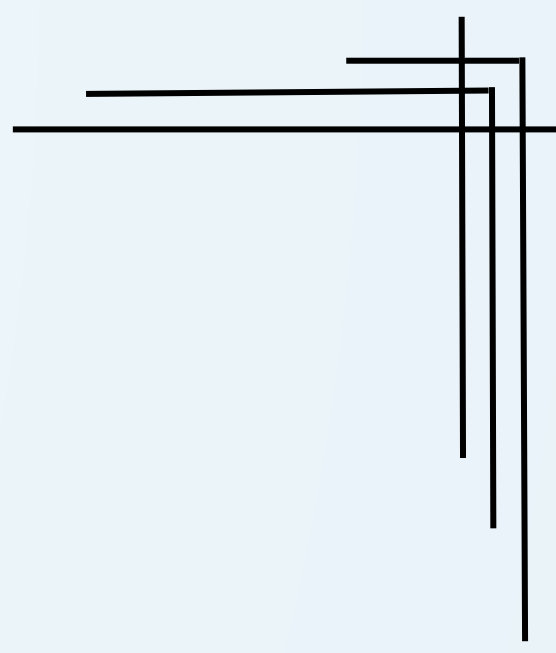
Speech Title

Challenges of Climate Service for Carbon Neutral Society in Japan

Abstract

In recent years, climate change and global warming have become extremely important events for the global environment and our society in general; the summer of 2023 was reportedly the hottest in recorded history. The world has responded enthusiastically to climate change, with the 1997 Kyoto Protocol and the subsequent 2015 Paris Agreement declaring that the nations of the world will work together to tackle the problems of climate change and global warming. In Japan, then Former Prime Minister Suga declared in 2020 that Japan would achieve a carbon-neutral, decarbonized society by 2050. The Japanese government is also very committed to addressing the issue of climate change.

In this speech, we divide global warming countermeasures into mitigation and adaptation measures, and focus especially on activities utilizing digital technology (Green x Digital). We introduce the activities of three organizations in Japan, 1) Weather X Business Consortium, 2) Green x Digital Consortium, and 3) Smart City Social Implementation Consortium, which are collaborating with industry, government, and academia, and climate services provided by these organizations.



Biography

Noboru Koshizuka is a Professor of Interfaculty Initiative in Information Studies, the University of Tokyo, Japan. He received the B.S., M.S. and Ph. D degrees in Information Science in 1989, 1991, and 1994 from the University of Tokyo, Japan.

Since 1990, he has been researching ubiquitous computing, IoT (Internet of Things), embedded systems, human-computer interactions, and computer networks. Currently, his main research interests are IoT, smart city, smart building, data sharing platforms, blockchain, operating systems, and computer networks. He is a director of Data Society Alliance, a chair of Weather x Business Consortium, and a member of Digital Society Initiative Council of Digital Agency.

Moderator of Session I



Kung-Yueh Camyale Chao

Executive Director
International Climate Development Institute
Chinese Taipei

Education

Ph.D. Education Policy and Management, National Taipei University of Education, Taiwan

Work Experience

Executive Director, International Climate Development Institute

Treasurer, International Forum of Meteorological Societies

Advisor and Co-Chair of Organizing Committee, SMART CITY SUMMIT & EXPO

Lecture, Soochow University

Research Interests/ Field of Expertise

Climate Change and Adaptation Policy

Smart City Governance

Climate Finance/ TCFD

SDGs



Albert Soret

Earth System Services Group Leader
Barcelona Supercomputing Center
European Union

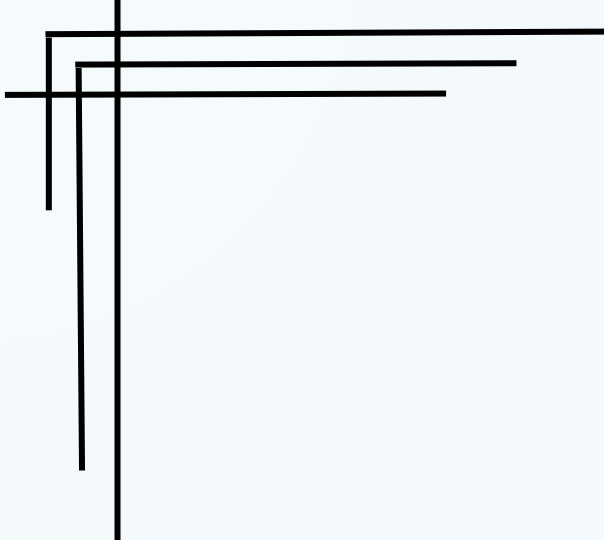
Speech Title

Climate Services for the Energy Sector

Abstract

Energy is responsible for over 70% of GHG emissions globally. Therefore, the energy transition is pivotal to achieve the Paris Agreement's goals. The European Green Deal is fostering massive development of renewable energy, especially solar and wind. At the same time, climate change, increasing climate variability and extreme events, is posing a challenge to integration of renewables into the power mix. Although ongoing research has focused on assessing the impacts of climate variability at different timescales, research gaps still need to be addressed. One noticeable gap is providing robust and homogenised information that would break down the artificial barriers coming from different observational and modelling systems and temporal and spatial scales.

The S2S4E project developed an innovative service to improve renewable energy variability management by developing new research methods exploring the frontiers of weather conditions for future weeks and months. The main output of S2S4E was a user co-designed Decision Support Tool that for the first time integrated sub-seasonal to seasonal (S2S) climate predictions with renewable energy production and electricity demand indicators. The pilot of the DST has been developed in two steps. The first step was drawn on historical case studies pointed as relevant by energy companies - e.g. periods with an unusual climate behaviour affecting the energy market. An ex-post analysis of the forecasts and their impacts on users' risk management was conducted. The impact analysis covered energy trading, production planning and maintenance.



The second step was an improvement of probabilistic S2S real-time forecasts built up into the DST. The DST was providing S2S forecast near-real time during 18 months. The performance and the usability of the system was assessed in real life decision-making processes with three different energy companies covering different regions and strategies. The evaluation served to identify the potential value of the service as well as the gaps providing inputs for improvements.

Biography

Dr Albert Soret holds a PhD in Environmental Engineering from the Polytechnic University of Catalonia (Barcelona). He is the head of the Earth System Services group at the Earth Sciences Department of the BSC and an adjunct lecturer at the Polytechnic University of Catalonia. The group hosts ~45 research engineers, physicists, social scientists, economists, communication experts, and air quality/climate researchers who bring the latest developments in Earth sciences to society. He has 15 years of experience as a researcher in Air Quality and Climate. His expertise includes atmospheric emissions, meteorological and air quality modelling, and climate services. His research facilitates technology transfer from local to national to international levels to advance sustainable development in key sectors such as urban development, infrastructure, energy, transport, health, agriculture, and water management. He is the principal investigator of the ASPECT project (EC-HE) and previously coordinated the S2S4E project (EC-H2020). He is the work package leader and principal investigator at BSC of different projects and contracts: e.g. Clim4Energy (Copernicus), VISCA (H2020) and AI4DROUGHT (ESA). He coordinates the development of the air quality forecast system for Spain and Catalonia (CALIOPE Air Quality Forecast System). His work has resulted in 52 peer-reviewed publications, five chapters in books, proceedings, and reports, and more than 80 contributions to conferences/workshops/seminars. He is the supervisor of several postdocs and five PhD students.



Seontae Kim

Research Fellow
Climate Analysis Team
APEC Climate Center
Korea

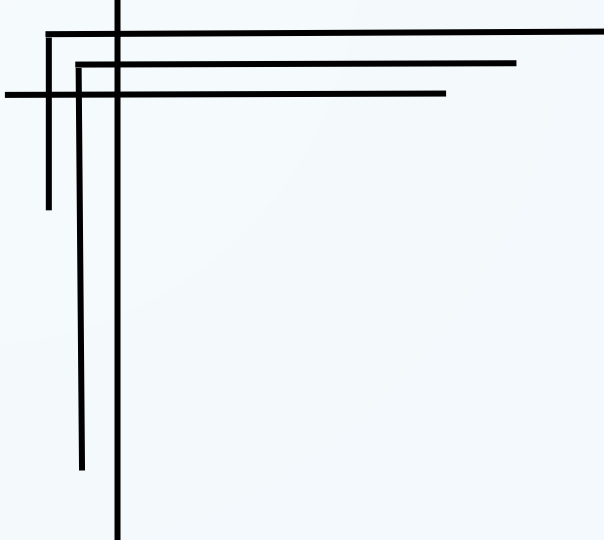
Speech Title

Changes in Solar and Wind Power Generation Potentials over South Korea under Global Warming

Abstract

Due to climate change caused by global warming, extreme climate/weather events have become intense and frequent. Efforts to reduce greenhouse gases in the atmosphere are needed to slow global warming, and an increase in the proportion of renewable energy use could be one of possible solutions. Renewable energy resources, particularly wind and solar power energy which depends on climate, can be affected by future climate change. Here we investigate the impact of the climate change on the wind and solar power generation potentials over South Korea considering ensemble projections from downscaled high-resolution bias-corrected future climate change scenario data taken from the National Institute of Meteorological Science in Korea.

Under future global warming, solar power potentials over South Korea are projected to decrease in spring (March-May) and winter (December-February) seasons relative to present climate in the late 21st century (2081-2100), particularly showing the relatively large decrease in the northern part of South Korea. The decrease tendency is more significant and larger in the high-CO₂ emission scenario (SSP5-8.5) than low-CO₂ emission scenario (SSP2-4.5). The projected decrease in solar power potential in spring is mainly due to increased air temperature by future global warming and the decrease in winter is attributable to the projected increase in the air temperature and the decrease in solar radiation at the surface. Wind power potentials which are estimated with the wind energy density is generally projected to be decreased with future global warming



in all seasons except for summer. This decrease tendency is also larger in the late 21st century of the SSP5-8.5 scenario, especially over the southern part of South Korea in winter and spring and over the northern part in fall. These results may help optimize the regional renewable energy generation system development and plans.

Biography

Dr Kim, Seon Tae received a doctorate in meteorology from the University of Hawaii at Manoa (2009). After Ph.D, he worked in the University of California, Irvine, USA and in CSIRO, Australia as a post-doctoral scholar for 5 years and conducted research on various climate variability and future climate change. After returning to Korea, he has been involved in research projects on seasonal forecast of and climate change impacts on extreme climate events in APEC Climate Center, Busan.



Hyun-Gyu Kim

Research Associate
Korea Adaptation Center for Climate Change
Korea Environment Institute
Korea

Speech Title

Assessment of Climate Change on South Korea's Electricity Consumption with Uncertainty

Abstract

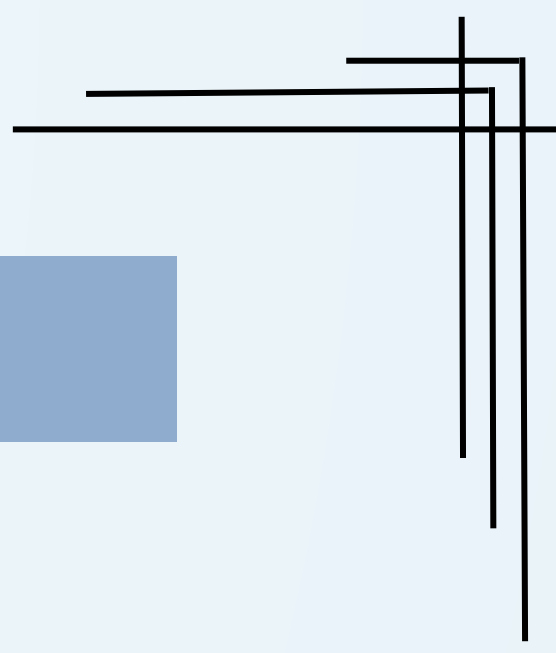
The ongoing occurrence of damage resulting from frequent abnormal temperatures and extreme weather events has raised interest in the impact of climate change. This study examines the impacts of climate change on electricity consumption in South Korea using a temperature response curve. Specifically, we analyze future changes in electricity consumption based on the latest climate change scenarios used in the IPCC 6th Assessment Report. As climate change is a gradual process taking place over a long-time period, studies estimating climate change impacts contain significant uncertainties. To address this uncertainty, this study represents changes in electricity consumption as probability distributions through randomized simulations. To achieve this, the study utilizes the results of four climate models and the estimates of the temperature response curve. The findings of this study indicate that in the period from 2081 to 2100, residential and general electricity consumption in South Korea is projected to increase by 4% to 25% per household under the SSP585 scenario due to climate change. However, changes in electricity consumption attributable to climate change vary by season and region. Specifically, the increase in electricity consumption is most pronounced during the summer when cooling demand is high, whereas winter electricity consumption decreases as heating demand declines.



Biography

Hyun-gyu Kim is an economist specializing in energy and environmental issues. He currently holds the position of Research Fellow at the Korean Environment Institute (KEI). His research focuses on assessing the impacts of climate change on the energy sector and developing electricity optimization planning models.

Before joining KEI, Dr. Kim worked as a Post-Doctoral Researcher at the University of Hawaii Economic Research Organization (UHERO). Additionally, he has gained professional experience as an analyst at KPMG Korea and Roubini Global Economics in New York. Dr. Kim holds a Ph.D. in Economics from the University of Hawaii at Manoa and a Master's degree from New York University.



Takashi Michikata

Associate Professor
Interfaculty Initiative in Information Studies
The University of Tokyo
Japan

Education

M.S. , The University of Tokyo

M.S. , Public Policy and Management, Carnegie Mellon University

Research Interests/ Field of Expertise

Information and Communication Technology (ICT) Policy

Smart Cities

Machine Learning

Green Energy



Changsub Won

Chief Technology Officer
Scotra
Korea

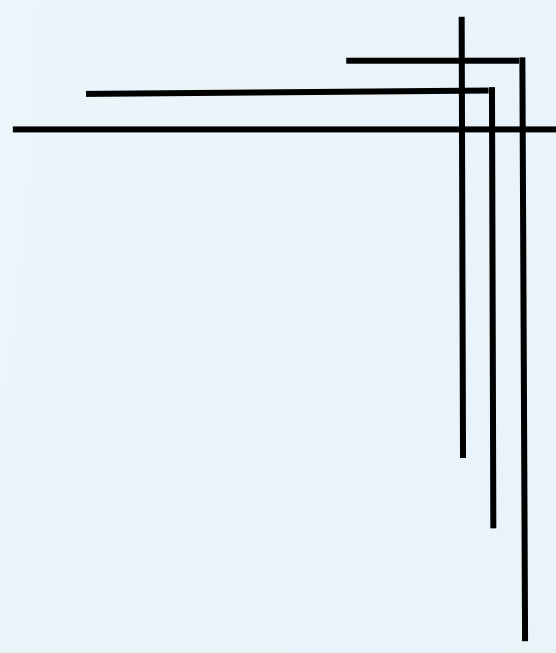
Speech Title

Current and Future of Floating Photovoltaic technology

Abstract

The space utilization problem is a problem to be solved in solar power generation. In response to this, floating photovoltaic technology using idle space on the water surface has been actively researched and projected since the early 2010' s. After installing and operating the initial FPV testbed, we discovered several advantages that were different from solving the space problem. In the case of the Korean environment, civil engineering work to remove trees and forests is carried out when installing land solar power facilities, which is not beneficial in terms of maintaining nature or economically. Since the FPV system is installed on the water, no work is needed to create a horizontal surface. In addition, the shade created by the FPV system was able to prevent evaporation of the reservoir, create a space for young fish to live, and reduce green algae. Due to these advantages, the installation capacity of the FPV system is increasing despite the increase in installation costs due to the addition of floating facilities.

Recently, FPV systems are developing technologies to install them in places with rougher natural environments where blow and waves are high. The area of the ocean can provide almost infinite space in terms of solar power generation. However, in terms of system development, high waves require a physically strong system. In addition, salt in the sea causes corrosion of the system, which requires a chemically stable system to prevent this. Research on this is in progress.



In this presentation, I would like to provide a brief introduction to the FPV System with short video clips and pictures. Through this introduction, we will be able to see whether the FPV System exhibits superior characteristics compared to previously used solar power generation systems. Next, I will explain the FPV Systems installed so far, the current market status, and market potential. And I would like to introduce the FPV System test bed installed in dams, reservoirs, and the sea, and the current status of technology development. Lastly, I would like to briefly explain the future FPV system.

Biography

Dr. Chang-sub Won is the CTO of Scotra Co., Ltd., Korea's most famous floating PV system company. he has been active in research on floating PV modules and floating PV systems for the past 13 years. he is the inventor of 14 FPV patents during that period.

Dr. Won participates in Korea's technology development roadmap development committee for changing climate and green energy, contributing policy to Korea's response to changing climate. And he has been working as a visiting researcher at UNSW University in Australia since the fall of 2022 to develop floating photovoltaic and hydrogen production fusion technology.

Speaker of Session II



Sam Hwang

Executive Vice President
SK Ocean Plant
Korea

Speech Title

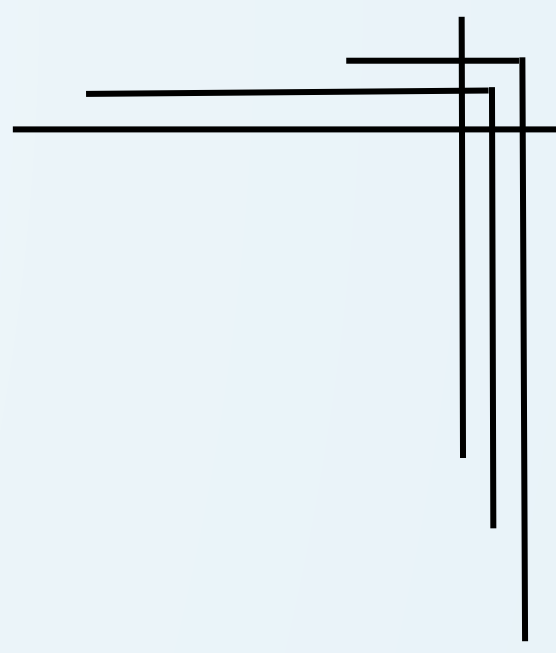
Contribution in Offshore Wind-Energy

Abstract

Climate change is making us to change our way of life for our survival and we are in the position we have to take an action now. No one can free from this critical issue and all parties shall put our heads together to find a solution. In an effort to alleviate the impact of climate change, we believe ‘Net-Zero’ declaration shall be fulfilled as many countries and companies did. We would like to say SK Oceanplant is joining this periodical request for that.

In terms of whole groupwise we belong to, SK group is in the lead which focusing on renewable energy into their business among the Korean conglomerates. Under the hydrogen supply chain which SK Ecoplant (Parent company) established, we SK Oceanplant is performing our role as a one of responsible entity. Considering ultimate goals of hydrogen eco system is providing the ‘green hydrogen’, renewable energy, especially offshore wind we are targeting is on the frontline of the whole supply chain.

As we known well, wind is limitless and natural resource we can use without environmental pollutants or greenhouse gases. SK Oceanplant has an ambition to be an iconic & representative player by providing the solution for ‘Net-Zero’ in offshore wind industries. Having our track record in APAC region, we are expanding our business to the global market with State-of-the-Art Technology (By commercializing the K-Floater). Not only K-Floater but also securing the new yard for construction will be contribute to our multi-goal, making more greener world and contribution to local economy.



Biography

Sam Hwang is an expert with a vast knowledge and majored in civil engineering. He has been working for Engineering & Construction company more than thirty (30) years. He was responsible for Business Development, Marketing and Project Management while he was working for SK Ecoplant (ex. SK E&C) as chief representative of Middle East for ten (10) years with extensive human network.

Currently, he is a key executive at SK Oceanplant and interacts with people from various industries to find a solution prevent the threat to our lives from climate change, a common issue around the world, and to achieve the 'net-zero' which is essential for sustainable growth.

In addition, he focuses on expanding the business territory in cooperation with leading clients to promote the benefits and application of offshore wind power, and SK Oceanplant's leap into a global player in this field.



Jen-Hsin Teng

Researcher

Marine Meteorology and Climate Division

Central Weather Administration

Chinese Taipei

Speech Title

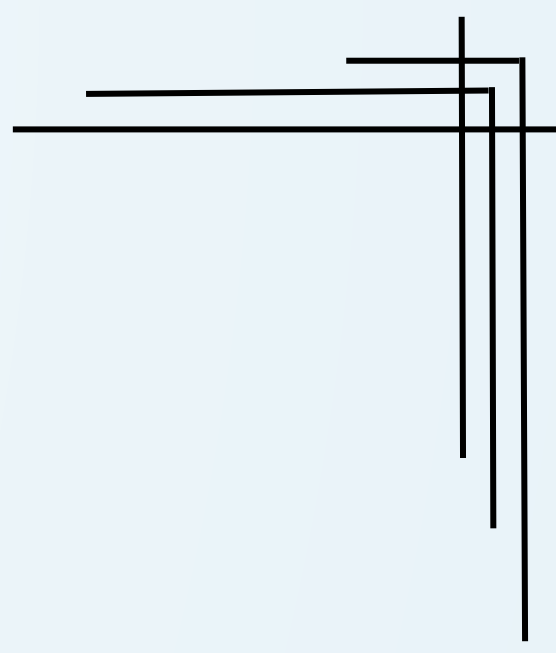
Meteorological Information Application Service in Green Energy

Abstract

Renewable energy is one of the key and an important way to help public and private sectors reducing greenhouse gas (GHG) emission. However, renewable energy cannot always consistently produce energy at all hours of the day and highly rely on weather condition. The government of Taiwan plans to achieve the goal of net-zero carbon in 2050 by enhancing the share of renewable energy in the energy mix and taking related measures. Because of the intermittency of renewable energy, we should pay attention to the security of grid and the prediction of green power generation when the penetration of renewable energy is increasing.

In this regard, the Central Weather Administration (CWA) has building up a green energy service system to support Taiwan's increased development and use of renewable energy. In addition, CWA is also keen to establish links with the green energy industry so that the private sector can correctly utilize weather information and work together to achieve the success of the energy transition.

First, the climate service needs and priorities of the energy sector under the GFCS framework are introduced, as well as the meteorological information and services required at different stages. Then the “Meteorological -Information Based Green Energy Operation Center” is introduced. This is a green energy service system established by the CWA in response to some meteorological information that is urgently needed by the private sector under the current development of renewable energy in Taiwan. In addition, we share our experience in promoting public-private partnerships with green energy entities and propose some steps to implement public-private partnerships.



Biography

Have more than 25 years of experience in meteorological information application research. For the past 7 years, as a technical leader, have been implementing renewable energy projects within the Central Weather Administration. Believed that under the trend of vigorously developing renewable energy in response to climate change, meteorological information and knowledge are very important.

Moderator of Session III



Yuan-Lung Lo

Professor

National Taipei University of Technology
Chinese Taipei

Education

Ph.D. in Environmental Studies, University of Tokyo, Japan

Biography

Dr. Yuan-Lung Lo serves as an Associate Professor in the Department of Civil Engineering at the National Taipei University of Technology. His primary research focus is on wind-resistant design of structures, wind tunnel tests, reliability analysis, and structural dynamics. Dr. Lo is actively involved in various activities within the Chinese Institute of Civil and Hydraulic Engineering and the Taiwan Association for Wind Engineering. Currently, he is responsible for implementing revisions to Taiwan's building code for wind-resistant design specifications, conducting wind tunnel tests for offshore photovoltaic systems and rooftop solar photovoltaic systems of buildings, and investigating the meteorological characteristics of offshore wind farms in the Taiwan area.



Shih-Yun Kuo

Assistant Research Specialist
Research Center for Environmental Changes
Academia Sinica
Chinese Taipei

Speech Title

Climate Service Platform for Energy Application: Corporate Climate Risk or Opportunities?

Abstract

Climate change and the related extreme events have affected nearly every country and everyone around the world. The financial sector, especially insurance companies, has been cautious about potential financial risks so an initiative, called, ask Force on Climate Related Financial Disclosures (TCFD), has been advocated. Businesses have been instructed to conduct their physical and transition climate risk assessment and have been urged to disclose such information. The localized, affordable, and easy-to-use climate risk data and information are demanded by companies. Hence, the project Climate Change Risk Assessment for Business (CCRAB) has developed a user-friendly climate service platform, called Corporate Climate Carbon Risk platform. This web provides climate information for individual companies to assess their own risks, such as heat stress, flooding, and drought. With the warming temperature and the need to reduce greenhouse gas emissions, the platform also provides several energy-related tools for users to assess their electricity consumption and to get to know the potential of solar and wind energy in Taiwan. Hopefully, such climate services can assist business to manage their climate risk and energy transition decisions.



Biography

Dr. Shih-Yun Kuo received her Ph.D. in Environmental Science (Policy Concentration) at New Jersey Institute of Technology in 2010. She is an environmental social scientist and interested in exploring the sociological and political dimensions of environmental and sustainability problems. Dr. Kuo is recently involved in various climate change research projects including: Climate Change Risk Assessment for Business; Fighting climate change with bamboo: feasibility assessment for Taiwan; Belmont Forum project: Biosphere and Land Use Exchanges with Groundwater and soils in Earth system Models (BLUEGEM).



Takashi Michikata

Associate Professor
Interfaculty Initiative in Information Studies
The University of Tokyo
Japan

Speech Title

An Experiment on Precise and Secure Calculation on GHG Emission

Abstract

Biography

Takashi Michikata has strong qualifications on information and communication technology (ICT) with over 20 years of experiences in public sectors, an international organization, a research institution, and an academic sector. He received his master's degree from the University of Tokyo as well as master's degree of public policy and management from Carnegie Mellon University. He has worked at many ICT related organizations including the national government of Japan, an international organization, and a research institution. In his current role as Associate Professor at The University of Tokyo, Takashi Michikata works on many research projects of smart cities, machine learning, and green energy as researcher and gives series of lectures of information technology and its policies as educator.



Cheol-Han Bang

Director

Weather & Climate Big Data Center
Industrial Growth Department
Korea Meteorological Institute
Korea

Speech Title

Operation of Weather & Climate Big Data Platform and Its Application of Energy Section in Korea

Abstract

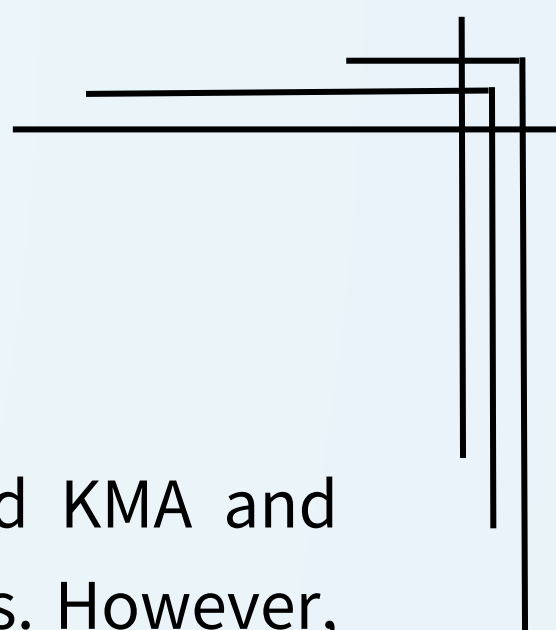
As agreed in the Paris Agreement, the international community must achieve "net zero" global carbon dioxide emissions by 2050 to limit global average temperature rise below 1.5°C by the end of the century. In general, final energy consumption is largely divided into electricity and thermal energy. In the case of thermal energy produced through oil, coal, gas, etc., reducing the proportion of thermal energy and increasing the proportion of electricity is of paramount importance to carbon neutrality because there are few ways to reduce carbon emissions.

Renewable energy should be made at 70% of global electricity consumption by 2050, according to the report "Electricity Market Report 2023" released by the International Energy Agency (IEA). Therefore, global renewable energy generation is increasing rapidly.

Renewable energy costs little fuel or operating costs because it utilizes the power of weather phenomena, but it is difficult to maintain a certain amount of power and is quite difficult to predict.

The power system operates stably only when the supply and demand are maintained, but if production suddenly increases or decreases, such as renewable energy, it can generate a load on the power system and cause a large-scale black out, so curtailment is sometimes enforced to prevent this.

Therefore, power generation forecasting reflecting weather climate information is a key area for expanding renewable energy, and its importance is growing as renewable energy generation increases.



Power generation forecasting has been led by the public sector, and KMA and government agencies still provide direct power generation forecasting maps. However, since power generation prediction has different industrial structures and meteorological characteristics by region, it is necessary to develop a power generation prediction algorithm suitable for each power plant. Therefore, many companies in the private sector are working to improve their algorithms and develop technologies that reflect weather climate information, and are forming a new market.

Currently, about 70 companies in the weather service sector are registered as meteorological companies in Korea, and many can operate numerical models, and many have power generation prediction technology.

In order for the companies to stably predict power generation, the supply of high-quality weather and climate data must be smooth. Korea is upgrading a data platform that can satisfy these conditions, and this presentation intends to share related current situations.

Biography

I graduated from Yonsei University with a master's degree in atmospheric science and a doctorate in information & industrial engineering.

I was a visiting researcher at the Earth and Sun Systems Laboratory (ESSL) of the National Center for Atmospheric Research (NCAR) (2005), and a researcher at the National Institute of Environmental Research (NIER) (2007-2010).

In addition, I have served as a member of WMO's CCI (Commission for climatology) ET-CRM (Expert Team on Climate Risk Management) and RA2 EG-CS (Expert Group on Climate Services) (2017-2022).

Currently, I am working at the Weather & Climate Big Data Center under the Korea Meteorological Institute (KMI) under the KMA.



Shoichi Tateno

Team Leader
Public Private Partnership & Sustainability
Weathernews Inc. Global Center
Japan

Speech Title

Challenges for Climate Change Risk Reduction with Cutting-Edge Technologies in Weather and Climate Services

Abstract

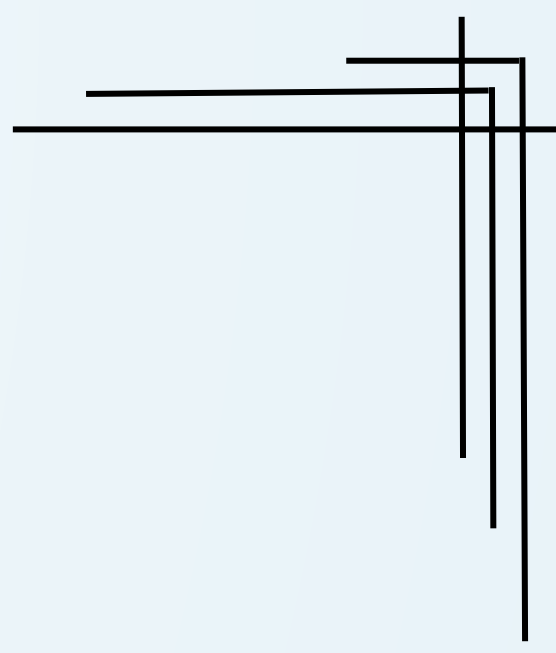
Weathernews Inc. (WNI), as a private meteorological service company based in Japan, provides BtoB and BtoS weather and climate services in/for 44 fields of industries and individuals all over the world.

Due to the recent increase of the number and intensity of severe weather induced by the global warming, the customers have high expectations for reducing their risks. WNI provides them with risk management solutions in terms of both “adaptation” of and “mitigation” to the climate change.

For adaptation, WNI has contributed to building resilience and risk assessment for natural disasters for a long time. Especially in the industries of transportation, such as maritime, aviation, railways/road management, WNI has a remarkable experience to support, with its high-quality forecasts and original observation networks, in optimizing the customers’ operation for the severe weather condition.

For mitigation, WNI provides global ship routing services which optimize both engine speed and fuel consumption. Along with safety support services, WNI is challenging in monitoring and visualizing CO2 reduction. WNI is also providing services to energy markets to analyze the climate risk and predict demand/supply balance, which lead to minimizing the loss and optimizing the power generation in our society.

In this session, WNI will share the experiences through the global business activities based on the efficient framework of Public Private Engagement and Partnership.



Biography

Mr. Tateno has been working in Weathernews Inc. (WNI) since 2004. His 19 years' experience at WNI has started from President's Office and Human Resources and spent about the half of his career in Global Media (Mobile & Internet, and Broadcasting) Business Division.

From 2017, he has started his career in Data Strategy and Public Private Engagement/ Partnership activities with the collaboration of international and national & local public organizations. He is also in charge of a secretariat of the Sustainability Committee of the company.

Born in Tokyo, and holds BA in Psychology from California State University Northridge, USA.



Muneo Matsukawa

Advisor
Environment and Energy Department
Japan Weather Association
Japan

Speech Title

Introduction of JWA's services for the Energy sectors and Power Demand Forecast Using AI

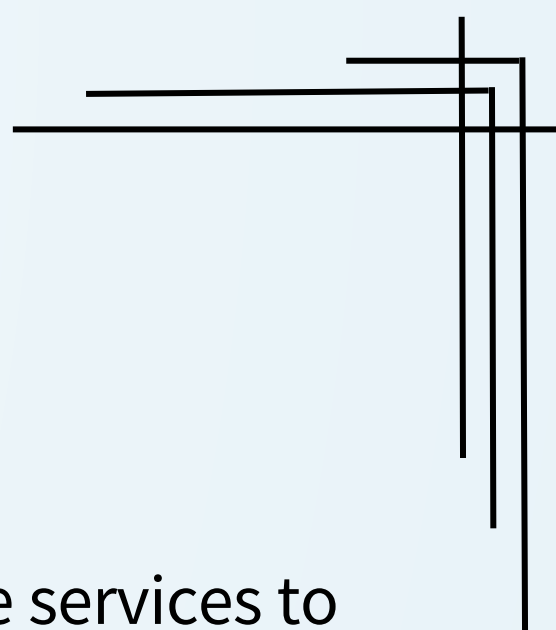
Abstract

Climate change and the increase in extreme weather have become apparent worldwide, and there are concerns about their impact on major industries, including the energy sector.

It is hence our responsibility to understand and cope with those impacts. Expanding renewable energy for the promotion of a net-zero emission society and climate change mitigation is indispensable. However, various issues such as the instability of the power sources and the environmental trade-offs are to be addressed to obtain a large scale of renewable expansion.

Japan Weather Association (JWA) has been supporting the expansion of renewable energy (solar and wind energy) in Japan by conducting surveys and contributing to environmental conservation through the implementation of EIAs for power plants. JWA has also carried out various surveys on the impact of climate change and adapting strategies to enhance the resilience of power companies.

The first part of the presentation focuses on our efforts for climate change mitigation and adaptation in Japan's energy sector such as the secretariat supporting the IPCC, and our support for renewable power plants in different phases as planning, designing, and operations.



In the planning and design phases of solar power plants, I will introduce the services to predict solar radiation based on the observed values of irradiation and/or meteorological satellite images. Meanwhile, for wind power plants, I will explain different technologies for wind profiling in both onshore and offshore wind farms.

In the solar power plant operation phase, I will explain three technologies for output estimation/forecasts in the function of solar radiation. Regarding wind power plants, the forecasts of wind profile and the monitoring system to determine bird strikes using marine radars.

In the latter part of my presentation, I will talk about the power demand forecast based on AI technologies as our prominent service for domestic power companies. Power companies have responsibilities to manage and regulate power generation (especially thermal ones) to lessen CO2 emissions. An accurate demand forecast is therefore significantly important for power companies.

Due to the time limitation of the presentation, only the basic concept of this service provided by JWA will be explained.

Biography

Since I started my activities at the Japan Weather Association, I have been involved in many energy and environment-related projects in Japan and overseas.

My engagement in energy-related projects is the provision of meteorological information. This service includes the forecast of the maximum temperature of the day, which is highly demanded by Japanese power companies.

Besides, I have participated in a JICA project in Sri Lanka for the establishment of an output forecasting system for renewable power plants such as wind power and solar power.



2023 APEC Climate Symposium and Asia Pacific Climate Services Workshop Joint Conference

Day 3 : 10/19 (Thu)

Session IV

**Best Practices or Policy Efforts to Enhance
Energy Security**

Panel Discussion

**Policy Recommendations and Discussion on
Energy System Transition and Energy Security in the
Context of Climate Change Adaptation
– What is our Challenges and Opportunities?**



Moderator of Session IV



Kyungwon Park

Research Fellow
APEC Climate Center
Korea

Education

Ph.D, Pukyong National University, Korea

Work Experience

Post-Doc, Jet Propulsion Laboratory



Raoul Kubitschek

Board Member / Managing Director
Taiwan Renewable Energy Alliance / NIRAS Taiwan Ltd.
Chinese Taipei

Speech Title

Renewable Energy as a Key to Energy Security – A Case Study of Chinese Taipei

Abstract

Energy security has come to the forefront with the Russian invasion of the Ukraine in 2022 that roiled energy markets in Europe but also globally. The effects have been felt deeply across Asia as well – with gas and oil prices skyrocketing fueling inflation exacerbating the already heavy effects of a post-pandemic global economy.

While this man-made disaster is stressing energy markets in the short-term – in the mid- and long-term they are also faced with an ever-growing challenge of climate change and new weather patterns. Climate Change will lead to changes in geography, for example changing coast lines, and new pattern for irradiation for solar and wind patterns for wind energy. This change in climate poses a challenge for not only traditional fossil fuels but also renewable energy.

To create resilient energy systems and encapsulate them against external shocks from global energy markets and change in weather data models, renewable energies play an important role, as they are not reliant on fuel imports and are usually also heavily decentralized. For Chinese Taipei renewable energy policy is mainly driven by a nuclear free homeland policy – meaning that the proliferation of renewables is only meant to replace nuclear power by 2025., But due to its unique geography Chinese Taipei has for decades emphasized it' s need to reduce its energy dependency. This presentation will discuss Chinese Taipei' s efforts to promote renewable energies, upgrading their planning to changing weather and climate, as well as changes in geography and the tools it employs to encapsulate its economy against external price shocks and give an outlook on how renewable energy policy and Net Zero 2050 goals will inadvertently support energy security.



Biography

Raoul Kubitschek is an experienced policy expert for Renewable Energy and a founding and board member of the CSO Taiwan Renewable Energy Alliance (TRENA). From 2008 – 2015 he has been working in bilateral trade facilitating trade and policy exchanges between Germany and Taiwan among others on renewable energies with a focus on Energy Transition. Since 2015 he is working in the Offshore Wind sector and since 2020 serves as Managing Director for NIRAS Taiwan. He brings a deep understanding of policy and social drivers for energy transition working on projects in Chinese Taipei, the Philippines and Japan.



Christopher Doleman

Senior Researcher

Asia Pacific Energy Research Centre

Japan

Speech Title

Bolstering APEC Oil and Gas Security Now and During the Energy Transition

Abstract

APEC member economies account for 60% of oil demand, over half of global gas demand, and almost two-thirds of LNG imports. According to the Carbon Neutrality scenario of the 8th APEC Energy Demand and Supply Outlook, the APEC region will continue to rely on oil and gas throughout this decade even if it embarks on a path to carbon neutrality. While lower oil and gas supply requirements will reduce the impact of oil and gas supply disruptions throughout the 2020s, reliance on oil and gas will continue to make APEC members susceptible to oil and gas disruptions. The reality of higher oil and gas prices and the potential for acute shortages over the next several years could inflict large economic costs on APEC economies. Recent years have illustrated that extreme weather can exacerbate energy security issues by challenging all types of fuel reliability and prompting demand peaks that exceed forecaster expectations. However, APEC still possesses the ability to soften the impact of the crisis. In addition to vast oil and gas resources, some APEC members are adept at initiating and sustaining demand response measures during energy shortages, and others have illustrated a history of cooperating to reduce the impact of previous supply disruptions through measures like collective oil stockpile releases and LNG re-exports.



Biography

Chris brings a decade of experience as an energy market analyst, including his current role at APERC as Canada's resident expert and project coordinator of the Oil and Gas Security Studies (OGSS) reports. He also models oil and gas supply for the 21 APEC economies in APERC's flagship report, the APEC Energy Demand and Supply Outlook. Prior to his time in Tokyo, he worked at the Canadian Energy Regulator in Calgary and spent two years as a laborer in Fort McMurray's oil sands.



Noritake Nishide

Specially Appointed Professor / Executive Advisor
Tohoku University / Fujitsu Limited
Japan

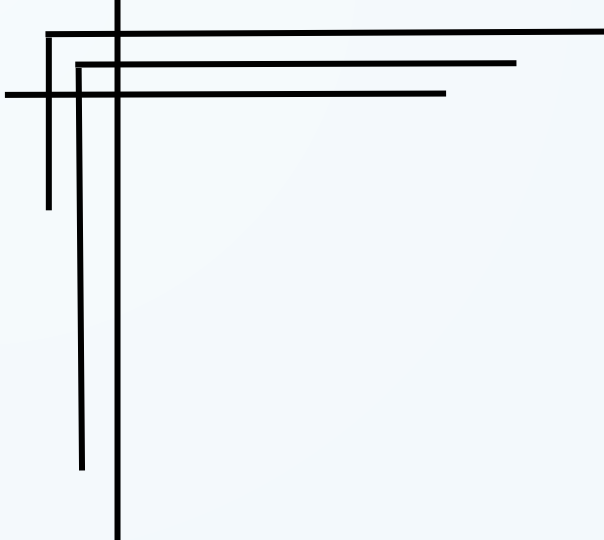
Speech Title

*Climate Change and the Intensification of Meteorological Phenomena
—Approach to Stationary Linear Mesoscale Convective Systems Forecasting*

Abstract

In Japan, temperatures have increased for more than one hundred years, based on the accumulated observation data from the Japan Meteorological Agency (JMA). The number of days with heavy rain has also increased over the long term. This trend will continue in the future, as described in detail by "Japan's Climate Change 2020," published by the Ministry of Education, Culture, Sports, Science and Technology and the Japan Meteorological Agency in December 2020. This report states that the annual number of short bursts of heavy rain will increase significantly by the end of this century. In Japan, we have experienced heavy rain and record hot temperatures every year recently.

Based on numerical experiments, the increase in temperature due to global warming has clearly produced more precipitation. It has been recognized that recent heavy rain events have included stationary linear mesoscale convective systems (SLMCSs). JMA began issuing information on significant heavy rain in 2021. At the first stage, JMA started providing information on the occurrence of SLMCSs. In the next stage, JMA is working on forecasting the occurrence of SLMCSs. To achieve this, JMA is strengthening observations and enhancing forecasting.



A supercomputer, the FUJITSU Supercomputer PRIMEHPC FX1000 (Fugaku-based commercial system), was installed in March 2023 to improve the numerical forecast model scheduled for the end of FY 2023. The supercomputer will accelerate the development of the numerical forecast model. Additionally, a numerical forecasting model is under development using the Fugaku supercomputer.

Since May of this year, JMA has been able to report a sense of danger of heavy rain due to SLMCSs more quickly by using forecasts 30 minutes earlier than ever before. Concerning the wide-area forecasts from half a day in advance, available in June 2022, out of 17 calls, 11 cases were followed by heavy rains with precipitation of 150 mm or more per 3 hours. JMA will continue its efforts to improve the accuracy of observations and forecasts.

Fujitsu will comprehensively support activities such as technology development, disaster prevention, and mitigation. Fujitsu is committed to addressing social issues.

Biography

To deal with intensifying natural phenomena and their impact on our society, it is necessary to gather wisdom from various perspectives.

As a senior advisor at Fujitsu, a specially appointed professor at Tohoku University (volcanology), an advisor for TV Asahi, and with extensive experience in the Japan Meteorological Agency, I am aiming for comprehensive measures against disasters.

Work Experience

Member of the Seismological Society of Japan

Member of the Volcanological Society of Japan

Member of the Meteorological Society of Japan

Member of the Japan Society for Disaster Information Studies

M.Sc. in Seismology.

Graduate School of Science, University of Tokyo, 1979



Simon Wang

Professor
Utah State University
USA

Biography

Dr. Wang specializes in climate variability, extreme weather, and prediction. He authored the first monograph, 'Climate Extremes: Patterns and Mechanisms,' for the American Geophysical Union. His work includes over 170 peer-reviewed publications, book chapters, and media features. He led R&D at the Utah Climate Center and now directs an international program in agriculture, climate, and environment. Dr. Wang advocates for climate services. Previously, he served as an Air Force weather officer and freelance photographer.

Panelist of Panel Discussion



Saurabh Trivedi

Research Analyst

Institute for Energy Economics and Financial Analysis
Australia

Biography

Saurabh Trivedi is an Energy Finance Analyst at IEEFA, where he examines the role of sustainable finance in facilitating the transition of Indian economy to low carbon economy. Previously, he worked as a Senior Analyst at the Climate Policy Initiative, conducting research on sustainable finance for renewable energy and electric vehicles. He was also involved in the Global Innovation Lab for Climate Finance, where he helped develop innovative financial solutions for green infrastructure in India. Saurabh has prior experience at JP Morgan Chase and Alexandria Real Estate Equities, and he holds an MBA with a specialization in finance. Currently, he is a full-time industry PhD student at Macquarie University, sponsored by the Rozetta Institute with a full scholarship. His doctoral research focuses on Climate Finance and the credit derivative markets

Panelist of Panel Discussion



Tae-Hwan Yoon

CEO
Root Energy
Korea

Biography

Taehwan Yoon founded Root Energy with a mission to develop solutions to solve the climate crisis by accelerating a 100% transition to renewable energy and net zero carbon. Majored in wind energy engineering at the Technical University of Denmark, he is advising on government energy policy, including serving as an advisory member of the Presidential Carbon Neutrality Committee.



Christopher Doleman

Senior Researcher

Asia Pacific Energy Research Centre

Japan

Biography

Chris brings a decade of experience as an energy market analyst, including his current role at APERC as Canada's resident expert and project coordinator of the Oil and Gas Security Studies (OGSS) reports. He also models oil and gas supply for the 21 APEC economies in APERC's flagship report, the APEC Energy Demand and Supply Outlook. Prior to his time in Tokyo, he worked at the Canadian Energy Regulator in Calgary and spent two years as a laborer in Fort McMurray's oil sands.



Wan-Ling Tseng

Project Assistant Professor
International Degree Program in Climate Change and
Sustainable Development
National Taiwan University
Chinese Taipei

Biography

Dr. Wan-Ling Tseng works as an Assistant Professor for the International Degree Program in Climate Change and Sustainable Development in National Taiwan University. She became a Research Scientist in the Ministry of Science and Technology, Research Center for Environmental Changes, Academia Sinica in Taiwan, where she had been a Postdoctoral Research Fellow from 2013 to 2020.

She studied her PhD at Helmholtz Centre for Ocean Research Kiel (GEOMAR) in Germany. Her research interests are tropical climate, large-scale circulation and climate change, ocean-atmosphere interaction, decadal prediction, attribution of extreme climate events, extreme climate risk, and the impact of atmospheric circulation on ecosystem.

Panelist of Panel Discussion



Suhyun You

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Biography

Suhyun is a climate change consultant with over 13 years of experience advising governments and the private sector.

She specializes in climate change policy and strategy. Her consultancy services encompass various aspects of the carbon market, national energy efficiency and transition projects, MRV (Measurement, Reporting, and Verification) systems, and climate mitigation measures in the private sector. She has also been engaged with K-ETS since its early stages and worked as an international non-key expert in the EU-ROK ETS project.

At present, she is actively involved in international mitigation projects and Green ODA (Official Development Assistance) strategies under Article 6 of the Paris Agreement. She is also involved in designing and delivering Technical Assistance (TA) programs for developing countries while holding a lead position in the international business development dept. at Ecosian.

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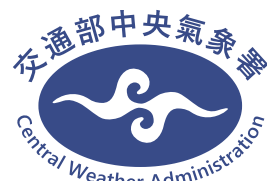
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