Contents

2021-2022 中日高层次科学家研讨交流活动（零碳增长）

日中ハイレベル研究者交流会（脱炭素成長）

China-Japan High-level Expert Symposium on Zero-emission Growth

Introduction

The China-Japan High-level Expert Symposium in the field of Zero-emission Growth will focus on zero-emission transportation, zero-emission technologies for urban-rural habitat, and zero emission roadmap of urban-rural development and transportation. Top scientists and experts from China and Japan are invited for presentations and dialogues on cutting-edge research and practice of zero-emission growth, and to explore the best way to achieve carbon neutrality in the fast-growing world confronted with global climate change and sustainability challenges. It is fully expected that this symposium will provide a consultation and reference for the policymaking and industrial development in China, Japan, and other countries as well.

Chairs

He Kebin
Academician, Chinese Academy of Engineering
Dean, the Institute for Carbon Neutrality, Tsinghua University

Asuka Jusen
Professor, Center for Northeast Asian Studies and Graduate School of Environmental Studies, Tohoku University

Hosts

Department of Foreign Expert Services, Ministry of Science and Technology of the People's Republic of China

Sakura Science Program Headquarters, Japan Science and Technology Agency

Organizers

Foreign Talent Research Center, Ministry of Science and Technology of the People's Republic of China

Tsinghua University

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Foreign Talent Research Center, MOST

The Foreign Talent Research Center, Ministry of Science and Technology of the People's Republic of China, a public institution directly affiliated to China's Ministry of Science and Technology, is mainly responsible for: carrying out research on the development of foreign talent and the theories, strategies, policies, and development status of scientific and technological innovation; developing foreign talent think-tanks and promoting networks of theoretical achievements during overseas expertise introduction; undertaking the construction, operation, maintenance and development of foreign talent resource pools; providing resources, platforms and other services for the overseas expertise introduction; editing and publishing professional media articles for the overseas expertise introduction, and undertaking the publicity work entrusted by the Ministry; organizing professional meetings and major events for overseas expertise introduction as well as scientific and technological exchanges; providing services including evaluation, consultation, introduction, information, and training for foreign talent; managing the China Society for Research on International Exchange and Personnel Development; and undertaking other tasks assigned by the CPC Leading Group, MOST and leaders of the Ministry and tasks entrusted by relevant departments and bureaus.

Sakura Science Program Headquarters, JST

Japan Science and Technology Agency (JST) plays a central role in Japan's Science and

Technology Basic Plan. Based on science and technology targets issued by the government, we fund strategic basic research, academia-industry collaboration and technology transfer. In recent years, we promote international joint research and the fostering of next generation human resources. JST also provides information services to support R & D activities. Our comprehensive contribution stimulates substantive progress in science and technology and helps tackle a variety of social issues.

JST continues to strengthen our close relationship with universities, research institutes and industry in and outside Japan, create collaborative science and technology innovation and ensure sustainable development of our society.

Sakura Science Program invites talented young people from other countries and regions to Japan in a form of industry-academia-government collaboration, to introduce and offer experience in science and technology. Beginning in 2014, over 33,000 young people have visited Japan through this program.

By exchanging ideas in the field of science and technology among the participants of Sakura Science Program, we:

-Support the development of talented people overseas who have the potential to contribute to the innovation in science and technology; and support continuous interaction between Japan and other countries and regions.

-Promote globalization of Japanese educational and research institutes.

-Strengthen good relationship between Japan and other countries and regions and ultimately pursue the development of science and technology in Japan and worldwide.

Tsinghua University

Founded in 1911, Tsinghua University is one of the most prestigious higher education institutions in China for nurturing talented students and promoting advanced scientific research. At present, the university has 21 schools and 59 departments with faculties in science, engineering, humanities, law, medicine, history, philosophy, economics, management, education and art. The faculty greatly valued the interaction between Chinese and Western cultures, the sciences and humanities, the ancient and modern. Tsinghua scholars Wang Guowei, Liang Qichao, Chen Yinque and Zhao Yuanren, renowned as the "Four Tutors" in the Institute of Chinese Classics, advocated this belief and had a profound impact on Tsinghua's later development. With the motto of "Self-discipline and Social Commitment" and the spirit of "Actions Speak Louder than Words", Tsinghua University is dedicated to the well-being of Chinese society and to world development. As one of China's most prestigious and influential universities, Tsinghua is committed to cultivating global citizens who will thrive in today's world and become tomorrow's leaders. Through the pursuit of education and research at the highest level of excellence, Tsinghua is developing innovative solutions that will help solve pressing problems in China and the world.

Institute for Carbon Neutrality, Tsinghua University

The Institute for Carbon Neutrality is established against the backdrop of the global and national carbon neutrality goals. Climate change has become an urgent global challenge facing mankind in today's society. The Paris Agreement on climate change charts the course for the world to

transition to green and carbon neutral future. All countries on the earth are obligated to take decisive steps to implement this agreement. China announced that it will scale up its Nationally Determined Contributions by adopting more vigorous policies and measures, aiming to have CO_2 emissions peak before 2030 and achieve carbon neutrality before 2060. As a top comprehensive research university in China, Tsinghua University has unique advantages in innovation research of carbon neutral technologies. The aim of the new institute is to facilitate the realization of the national carbon neutrality strategy and to contribute to global carbon neutral actions. The institute will work closely with our partners, both domestic and overseas, to seize the historic opportunities to resolve the global ecological crisis together and jointly pursue the carbon neutral goals.

School of Environment (SOE), Tsinghua University

SOE as a fast-growing institution, was placed No. 9 by the QS World University Subject Rankings 2022, and has been a major national teaching base and a scientific research center in the field of environmental protection. SOE boasts a strong team of faculty with the leadership of four academicians of the Chinese Academy of Engineering, Qian Yi, Hao Jiming, Qu Jiuhui and He Kebin. Each year, SOE attracts hundreds of the most talented young people from both China and abroad to study here, and nurtures many outstanding environmental engineers, scientists and administrators. Moreover, SOE provides technical services and theoretical support to the sustainable development of the country, and has been involved in the decision making on some most critical environmental issues in China. SOE will stand firm with the two principles of combining and interconnecting engineering and sciences, technology and management, and keeping an open, innovative and practical mind to build the world's top school in environmental sciences and engineering.

School of Vehicle and Mobility (SVM), Tsinghua University

Established in 1980, SVM is the earliest department in China that conducted education and research in vehicle engineering. Currently, it contains four independent research institutes: Advanced Automotive Powertrain Institute, Vehicle Engineering Institute, Intelligent Transport Institute and Special Vehicle and Power Institute. In the past decade, leading by Prof. Ouyang Minggao, advanced powertrain technologies for carbon neural targets are deeply researched in SVM. Novel technologies for lithium batteries, Proton Exchange Membrane (PEM) fuel cell, hybrid powertrains, electric driving systems and advanced combustion engines are developed and implemented in industry. In future, SVM will focus on three key targets:

(1) Highly safe storage battery with high energy density: to construct fundamentally safe battery material system, to establish a serial of highly efficient and reliable production technologies.

(2) Low working lifetime and high power hydrogen power system: to construct kW~MW level hydrogen power system, including PEM fuel cell, Solid Oxide Fuel Cell (SOFC), and hydrogen/ammonia combustion engine.

(3) V2X technologies for NEVs: to breakthrough V2X system technologies for large-scale BEVs and national grids, to establish intelligent photovoltaic energy storage system platforms.

School of Architecture (SA), Tsinghua University

SA was transformed in 1988 from the former Department of Architecture which was established by Prof. Liang Sicheng in 1946. Currently, it is composed of four departments, nine research institutes, three professional practical sites, and three ministerial laboratories. SA has insisted on the goal of cultivating professional leaders of architecture and gradually confirmed its development strategy of being based on the Sciences of Human Settlements, paying due attention to the requirements of China's construction and development and the challenges of academic frontiers, and combining education with research and practice. In the past decades, SA has finished over a hundred research projects commissioned by the government of various levels, as well as international collaborative research projects, which cover the fields of regional study, urban and rural study, urban planning and design, housing, architectural design and theory, architectural history and historic preservation, landscape planning & design, tourism planning and natural preservation, ecological planning and green architecture, built environment simulation and building energy-saving, computer aided design GIS and remote sensing, and so on.

Institute of Climate Change and Sustainable Development (ICCSD), Tsinghua University

ICCSD was founded in 2017. ICCSD views its mission as proposing coordinated goals, strategies, pathways, and policies to decision-makers in China and providing solutions to global climate change and sustainability challenges. ICCSD's vision is to become a world-leading "think and do" tank in the field of climate change and sustainable development, as well as an open and synergetic platform for interdisciplinary research, talent training and policy dialogues.

Agenda **Japan Time**

September 21th, 2022	
Opening Ceremony	
Moderator: He Kebin	
09:30-10:00	**Opening Address** ● Li Xin, Deputy Director General, Department of Foreign Expert Services, Ministry of Science and Technology of the People's Republic of China ● Kishi Teruo, Director General, Sakura Science Program Headquarters, Japan Science and Technology Agency ● Zeng Rong, Vice President, Tsinghua University ● Asuka Jusen, Professor, Center for Northeast Asian Studies and Graduate School of Environmental Studies, Tohoku University
10:00-10:05	**Group Photo**
Session I **Zero-emission Transportation**	
Moderator: Wang Hewu	
10:05-10:25	Keynote Speech 1: Progress of Research on New Energy Powertrain for Electric Vehicles ● Ouyang Minggao
10:25-10:45	Keynote Speech 2: Challenges in Diffusing Fuel Cell Electric Vehicles in Japan and the Development of Next-generation Mobility Technologies (CASE & MaaS) to Meet the Needs of an Aging Society ● Gregory Trencher
10:45-11:05	Keynote Speech 3: SiC Motor Drive Technology in NEV Application ● Wen Xuhui
11:05-11:15	**Break**

Session II Zero-emission Technologies for Urban-rural Habitat	
Moderator: Yang Xudong	
11:15-11:35	Keynote Speech 4: Low Carbon Transition of China's Building Sector ● Jiang Yi
11:35-11:55	Keynote Speech 5: Net Zero Energy Building ● Tanabe Shin-ichi
11:55-12:15	Keynote Speech 6: The Paths for Urban Carbon Reduction in Three Common Fields ● Qiu Baoxing
12:15-12:35	Keynote Speech 7: To Realize Necessary Reduction of Energy Consumption in the Building Sector in Japan toward 2030 and 2050 ● Sawachi Takao
12:35-14:00	**Lunch**
Session III **The Zero Emission Roadmap of Urban-rural Development and Transportation**	
Moderator: Li Zheng	
14:00-14:20	Keynote Speech 8: Energy Efficiency Improvement Scenario for Decarbonization in Japan ● Utagawa Manabu
14:20-14:40	Keynote Speech 9: Synergy Pathway to Carbon Neutrality and Clean Air in China ● He Kebin
14:40-15:00	Keynote Speech 10: Japanese Scenario of Renewable Energy Supply ● Tsuchiya Haruki
15:00-15:20	Keynote Speech 11: The Logic of Energy Transition in the Context of Zero Carbon Growth ● Li Junfeng
15:20-15:40	Keynote Speech 12: Economic Impacts of the Zero-Carbon Scenario for Japan ● Asuka Jusen
15:40-15:50	**Break**

Virtual Research	
Moderator: Yang Xudong	
15:50-16:10	**Chinese Pioneer Case Research**
16:10-16:30	**Japanese Pioneer Case Research**
Roundtable Discussion	
16:30-18:00	● Zero-emission Transportation Moderator: Wang Hewu Attendees: Lian Yubo, Naito Katsuhiko, Fang Haifeng, Gregory Trencher, Liu Yongdong, Utagawa Manabu ● Zero-emission Technologies for Urban-rural Habitat Moderator: Yang Xudong Attendees: Yoshino Hiroshi, Xu Wei, Ito Kazuhide, Li Xiaojiang, Amano Kenji, Zhang Jie ● The Zero Emission Roadmap of Urban-rural Development and Transportation Moderator: Li Zheng Attendees: Takase Kae, Ou Xunmin, Asuka Jusen, Yang Xiu, Tsuchiya Haruki
Closing Ceremony	
Moderator: Asuka Jusen	
18:00-18:20	**Concluding Remarks** ● He Kebin, Dean, the Institute for Carbon Neutrality, Tsinghua University ● Asuka Jusen, Professor, Center for Northeast Asian Studies and Graduate School of Environmental Studies, Tohoku University
18:20-18:30	**Closing Address** Yoneyama Haruko, Executive Officer, Japan Science and Technology Agency

Chairs

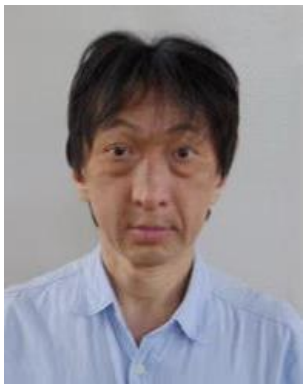
He Kebin

Academician, Chinese Academy of Engineering
Dean, the Institute for Carbon Neutrality, Tsinghua University

He Kebin is the Professor of the School of Environment of Tsinghua University, the Director of Environment & Light and Textile Industries Engineering Division of Chinese Academy of Engineering, the Vice Chairman of the National Expert Committee for Ecology and Environmental Protection, and the Chairman of the National Teaching Steering Committee for Environmental Science and Engineering. He focused on the research of complex air pollution. He conducted researches on the fields of the identification of particulate matters and complex air pollution, characterization of complicated emission sources and multi-pollutant control, and the coordinated control of air pollution and greenhouse gases. He was selected as the Highly Cited Chinese Researcher by Elsevier (2014-2021) and the World Highly Cited Researcher by Clarivate Analytics (2018-2021).

Asuka Jusen

Professor, Center for Northeast Asian Studies and Graduate School of Environmental Studies, Tohoku University



Asuka Jusen received his Ph.D. from the Graduate School of Engineering, University of Tokyo. He had also worked for the Institute for Global Environmental Strategies (IGES) in Hayama, Japan as the Director of the climate change group from 2010 to 2013. His primary areas of interest are energy policy and environmental policy such as climate policy and air pollution policy, and international environmental/energy cooperation. He is regularly involved in expert networks as well as policy making on energy/climate policy issues of Japan. Recently, his specific interests are to promote the green recovery and energy transition which Japan is lagging behind other countries.

Moderators

Wang Hewu

Director, Zero Carbon Transportation Center, Institute for Carbon Neutrality, Tsinghua University

Wang Hewu is the Doctoral Supervisor of the School of Vehicle and Mobility of Tsinghua University, the Deputy Secretary General of the China Electric Vehicle Association (China EV100), and the Deputy Director of the China-US Clean Vehicle Consortium. He carried out long-term research on vehicle energy efficiency, emission, technology roadmap and development strategy. He has undertaken a number of basic science and technology development projects such as National Natural Science Foundation of China and 863 Program, as well as research projects commissioned by international automobile companies. He has published 70 journal papers.

Yang Xudong

Professor, Vice Dean, School of Architecture, Tsinghua University

Yang Xudong is the Editor-in-Chief of *Building and Environment*, the Executive Committee Member and the Representative of China of the International Energy Agency's Energy in Buildings and Communities (IEA-EBC) program, the Expert of the Scattered Coal Governance Project in Beijing, the Expert Committee Member of Energy Conservation and Green Building of Ministry of Housing and Urban-Rural Development of the People's Republic of China, and the Vice President of China Association of Building Energy Efficiency. He has long been committed to the research of building energy efficiency and renewable energy utilization in buildings. He put forward the concept and technical measures of "coal-free villages" based on the clean utilization of renewable energy, and the "Four-one" model of the sustainable development of clean heating in rural areas in northern China. He led the development and large-scale application of several key technologies, such as low-ambient-temperature air-source heat pump, biomass clean heating stove, and solar hot air heating system. Since the promotion of clean heating in north China in 2017, he was invited by Hebi City, Qingdao City, Shanghe County, Qingyun County and many other local governments to guide the implementation of local clean heating renovation work and successfully created the national model project "Hebi Model" and "Shanghe Model".

Li Zheng

Executive Vice President, Institute of Climate Change and Sustainable Development, Tsinghua University

Li Zheng is the Chang Jiang Scholar, and the Director of the Laboratory of Low Carbon Energy, Tsinghua University. He is also the Secretary General of Global Alliance of Universities on Climate (GAUC). His researches include energy system modeling and transition analysis, low carbon development and strategies as well as modeling and optimization of thermal power systems. He is leading several national and international research projects on energy/climate policies and technologies.

Speakers

Ouyang Minggao

Academician, Chinese Academy of Sciences
Professor, Tsinghua University

Ouyang Minggao is the Changjiang Distinguished Professor, the Leader of New Energy Powertrain System team at Tsinghua University, and the Editor-in-chief of the international journal of *eTransportation*. He received his Ph.D. in Energy Engineering from the Technical University of Denmark in 1993, and has been the Chief Scientist of the China National Key R&D Program of New Energy Vehicles from 2007 to 2021. He is responsible for directing the research and development of lithium-ion battery safety design and management, Proton Exchange Membrane (PEM) fuel cell powertrain and hydrogen systems, engine control and hybrid powertrains, and smart battery and smart energy systems. His science and technology achievements got many national and international awards. He has published over 300 SCI papers, was listed as the Highly Cited Chinese Researcher by Elsevier (2015-2021) and the World Highly Cited Researcher by Clarivate Analytics (2017, 2019, 2020, 2021).

Title: Progress of Research on New Energy Powertrain for Electric Vehicles

Abstract

In order to realize the target of carbon neutrality in 2060, it is necessary to develop new energy technologies for almost every aspect of our human society. New Energy Vehicles (NEVs), including Battery Electric Vehicles (BEVs), hydrogen fuel cell vehicles and internal combustion engine hybrid vehicles, have been developing very fast in the past decade. The successful experience of NEVs inspires us to development new energy technologies in a similar way, where the energy storage technology is the key of all. Different roadmaps of energy storage technologies, such as Vehicle to Grid (V2G) technologies based on BEVs, water electrolyzers for hydrogen, are investigated and compared. Successful stories and experiences are to be shared.

Gregory Trencher

Associate Professor, the Graduate School of Global Environmental Studies, Kyoto University

Gregory Trencher serves as the Editor of *Energy Research & Social Science* as well as *Frontiers in Sustainable Cities*. He received his Ph.D. in Sustainability Science from the University of Tokyo, and worked as the Associate Professor at Tohoku University and Clark University. His research specializes in innovation processes and policies for advancing urban sustainability and transitioning to a sustainable energy system. His current research examines the governance strategies used by government and industry in Japan, China and Korea to accelerate the transitioning to electric mobility, as well as the phase-out of gasoline vehicles. He is also examining coal divestment in Japan, and the policies and company strategies influencing the decarbonization of Japan's electricity market. At the same time, he leads a project on the phase-out of environmentally unsustainable substances, technologies and processes. He also conducts research on urban sustainability, with an interest in smart cities aimed at solving social challenges. He has published more than 35 publications in leading journals like *PLOS One*, *Energy Policy*, *Energy Research & Social Science*, and *Global Environmental Change*.

Title: Challenges in Diffusing Fuel Cell Electric Vehicles in Japan and the Development of Next-generation Mobility Technologies (CASE & MaaS) to Meet the Needs of an Aging Society

Abstract

This presentation will cover two topics that illustrate the state of efforts to accelerate the production and diffusion of electric mobility in Japan. The first part will focus on Japan's strategy to diffuse Fuel Cell Electric Vehicles (FCEVs) in the passenger market and explain the challenges faced so far. It will be examined from four perspectives: vehicle production, supporting infrastructure, vehicle demand, and institutions. The second part will examine Japan's efforts to develop next-generation mobility technologies–namely CASE (Connected, Autonomous, Shared and Electric) and MaaS (Mobility as a Service). It will especially focus on collaborative efforts across government, industry and research institutions to employ these technologies as tools for tackling the challenges caused by an aging society. This presentation will also provide a key overview of the characteristics of the field demonstrations that have received national funding over the past three years. It will illustrate the key technologies employed, mobility services provided, and societal challenges addressed. It will also provide a brief case study on some notable initiatives, simultaneously discussing observed obstacles to widespread adoption of CASE and MaaS technologies. China is currently making great efforts to accelerate the diffusion of hydrogen mobility and autonomous driving. In addition, it is also facing the looming challenge of an aging society. For these reasons, it is expected that both aforementioned topics will provide important insights for the development of China's automotive industry in a way that serves the need to use technology for promoting societal well-being.

Wen Xuhui

Professor, Institute of Electrical Engineering, Chinese Academy of Sciences (IEE CAS)

Wen Xuhui is the Doctoral Supervisor and the Vice Supervisor of academic degree commission of IEE CAS, the Chairman of Electric Vehicle Committee of China Electrotechnical Society, and the Senior Member of Institute of Electrical and Electronics Engineers (IEEE). Her main research includes high power density e-motor drive and power electronic technology Hitherto. She authored and co-authored more than 300 papers and more than 10 patents issued. She won several national and industrial scientific and technological awards.

Title: SiC Motor Drive Technology in NEV Application

Abstract

It is very effective to improve the density of on-board inverter by using SiC device's high temperature and high frequency characteristics in New Energy Vehicles (NEV) motor drive applications. This presentation summarizes the state-of-art automobile semiconductor power module technology and high-density SiC motor drive system technology. The development of 47.8kW/L 105°C SiC motor drive inverter is presented. An active and passive combined Electromagnetic Interference (EMI) filter design is proposed to suppress the wide band EMI problems caused by SiC switching.

Jiang Yi

Academician, Chinese Academy of Engineering
Director, Building Energy Research Center, Tsinghua University

Jiang Yi is the Member of Energy Advisory Committee of the State Council, the Member of the National Committee of Experts on Climate Change, and the Chief Editor of the series of Annual Report of Building Energy Efficiency in China. He has been the Faculty Member of Tsinghua University since 1985. He has been involved in a number of international collaboration projects such as International Energy Agency (IEA) Annex 21, 25, 34, 53 and 59. His major research field is building energy efficiency. He received 4 national science awards for controls of district heating system, liquid desiccant air-process, indirect evaporative cooling, and building energy simulation (DeST).

Title: Low Carbon Transition of China's Building Sector

Abstract

The building sector is one of the three major sectors of energy consumption (industry, transportation and building), and one of the main areas of responsibility for direct and indirect carbon emissions. Strive to achieve carbon emission peaks by 2030 and carbon neutrality by 2060, this is a clear goal and timetable set by Chinese government on low carbon development. Carbon neutrality in building sector means zero emissions, which means that the CO_2 emissions and other greenhouse gas emissions caused by activities in buildings sector equal to zero. China currently emits more than 2 billion tons of CO_2 annually in building operations, in addition to 1.6 billion tons of embodied carbon emissions from building construction. The low carbon and green transition of China's building sector needs revolution on building construction and operation. In construction sector, main tasks to reduce building embodied emission are: top designing of total building stock, switch to deep renovation on existing building, with low carbon building materials and construction methods. In building operation phase, three main tasks to achieve zero carbon emission are: electrification, contribute to electricity decarbonization process to achieve zero carbon emission from electricity, and decarbonization heating system of northern urban area. Besides technology innovation and development, corresponding policy mechanisms are required to promote the decarbonization process of China's building sector.

Tanabe Shin-ichi

Professor, the Department of Architecture, Waseda University

Tanabe Shin-ichi is the President of Architectural Institute of Japan (AIJ), the Council member of Science Council of Japan, the Fellow Member of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), and the Chair of ISO/TC146/SC6 (Indoor Air). He served as the Former President of the Society of Heating and Air-Conditioning and Sanitary engineers of Japan, and the President of International Society of Indoor Air Quality and Climate (ISIAQ) Academy of Fellows. He graduated from the Department of Architecture, Waseda University, and worked as the Visiting Scholar of University of California, Berkeley and Lawrence Berkeley National Laboratory (LBNL), and the Guest Professor of the Technical University of Denmark. He contributed to the theory of thermal comfort and indoor air quality towards to the Zero energy buildings.

Title: Net Zero Energy Building

Abstract

Issues around energy efficiency, demand side management, renewable energy, and embodied carbon will be discussed. We declared that by 2050 Japan will aim to reduce greenhouse gas emissions to net-zero, that is, to realize a carbon-neutral, decarbonized society. In Japan, 91% of greenhouse gases are CO_2. Also, 85% is of energy origin. There are also other greenhouse gases. Building sector including housing emits 1/3 of total ones. We need to reduce CO_2 emissions, reduce energy consumption and reduce the CO_2 emission intensity per energy. A net zero energy building (ZEB) is defined as a building that has high energy savings through load reduction, natural energy use, and highly efficient systems and appliances without decreasing the environmental quality of both indoors and outdoors. With the introduction of on-site renewable energies, the on-site energy supply will be equal to or greater than the energy demand within the building during the course of a year. In Japan, definition of ZEB is based on Society of Heating, Air-Conditioning and Sanitary Engineers of Japan (SHASE) guidelines of 2015. As a government initiative, the Roadmap Committee under the Ministry of Economy, Trade and Industry was organized, and it published the definition of ZEB and Zero Energy Home (ZEH) in December 2015. The ZEB family consists of ZEB, nearly ZEB, ZEB Ready, and ZEB Oriented. Examples of ZEH and ZEB are shown in the presentation. We have to use renewable energy like PV and wind wisely because they are change valuable by time to time. We aim to achieve excellent results demanded by the society by creating an environment where people interact and develop technology, such as smart houses equipped with smart meters and appliances with communication function, Demand Response Automated Servers (DRAS), and simulators to verify the state of the power system.

Qiu Baoxing

Former Vice Minister, Ministry of Housing and Urban-Rural Development of the People's Republic of China
President, Chinese Society for Urban Studies

Qiu Baoxing is the Deputy Head of the expert group of the State Council's Coordination Group for Promoting Governmental Function Change and Streamline Administration and Delegate Powers Reform of Government Functions, the Chairman of the International Water Association (IWA) China Committee, the Member of the National Committee of Experts on Climate Change, and the Academician of the International Eurasian Academy of Sciences. He served as the Former Deputy Director of the Committee on Population, Resources and Environment of the National Committee of the Chinese People's Political Consultative Conference (CPPCC), and the Former Counselor of the State Council. He has in charge of party committee affairs in three cities of Yueqing, Jinhua and Hangzhou for nearly 18 years. As the Visiting Scholar, he went to Harvard University to participate in related project research. He was in charge of construction technology, urban planning, and construction for 13 years. More than 40 consulting reports compiled by him have been approved by the Premier of the State Council.

Title: The Paths for Urban Carbon Reduction in Three Common Fields

Abstract

Cities are the main source of man-made Greenhouse Gas (GHG) emissions, accounting for 75% of the total man-made GHG emissions. The development of urban carbon reduction is the "bull nose" to deal with climate change. To implement the "carbon peaking and carbon neutrality" strategy with cities as the main body, it can be divided into five modules: industry, carbon sink of agriculture and rural areas, construction, transportation and waste disposal (municipal). Among them, the urban traffic, construction, municipal and waste disposal areas are common for any city. On this basis, promoting fair competition of per capita carbon emissions among cities will help to achieve the goal of "carbon peaking and carbon neutrality".

Sawachi Takao

President, Building Research Institute

Sawachi Takao graduated from the University of Tokyo with Doctor of Engineering in 1985, and then served as the Research Associate of Toyohashi National University of Technology in Construction Engineering. He served as the Chief Research Engineer of Department of Environmental Engineering, Building Research Institute in 2002, the Director of Housing Department and the Director of Building Department of National Institute for Land and Infrastructure Management, Ministry of Land, Infrastructure, Transport and Tourism in 2014 and 2015, respectively, the Vice President of Building Research Institute in 2017, and the Deputy Director of Building Technology Research Institute, The Building Center of Japan in 2021. He has been working in the field of energy and environmental performance of buildings for more than 35 years. He has been leading the team for developing energy calculation methodologies of residential and non-residential buildings since 2001, and the outputs have been applied for evaluation tools of Japanese Building Energy Standards, such as those used to prepare proofs for certifications of zero-energy houses and buildings.

Title: To Realize Necessary Reduction of Energy Consumption in the Building Sector in Japan toward 2030 and 2050

Abstract

For global warming mitigation, many nations have agreed on the target in 2050, that is zero carbon emission, and have made their concrete plans for reduction of CO_2 emission toward 2030. The plans consist of improving energy efficiencies in various sectors and decarbonization of supplied energy. In Japan's national plan for 2030, compared with 2013, the overall reduction target of CO_2 emissions is -46%, and the targets for the commercial sector and the household sector are -51% and -66%, respectively. In order to realize these reductions of end-use energy, Japan's main strategy is to strengthen the building energy standards, a key indicator of which is the primary energy consumption estimated from the design of each building before construction begins. The mandatory requirement in 2030 for residential buildings is planned to be the zero-energy-house level, and that for non-residential buildings is planned to be the zero-energy-ready-building level, of which standard of primary energy use is 30-40% less than the present standard.

This presentation will focus on the building-related sector, introduce how to improve the energy efficiency of buildings, and overview the characteristics of the Japanese national calculation methods of building energy use for space heating/cooling, domestic hot water, ventilation for outdoor air intake, lighting and electricity production by PV and co-generation systems, as well as their background philosophy and examples of the energy calculation.

Utagawa Manabu

Senior Researcher, National Institute of Advanced Industrial Science and Technology (AIST)

Utagawa Manabu works in the Sustainability and System Analysis Research Group of the Research Institute of Science for Safety and Sustainability, National Institute of Advanced Industrial Science and Technology. He got his Ph.D. from Tohoku University in 2006. His research interests are mechanical engineering and environmental engineering. He has long been committed to the evaluation of decarbonization measures, and the decarbonization and energy scenario research for countries and regions, and has contributed to the achievement of sustainable society through the provision of two key technologies: sustainability assessment models and indicators, and system analysis for sustainability.

Title: Energy Efficiency Improvement Scenario for Decarbonization in Japan

Abstract

In order to avoid adverse effects of climate change, the reduction of Japan's energy-derived CO_2 emissions will be considered. The study is done using a bottom-up model. The energy-saving scenario evaluation was conducted based on the timing of the introduction of energy-saving equipment, thermally insulated buildings, energy-saving vehicles, and electric vehicles at the time of renewal.

Calculations are divided into the case of commercialized technology and its improved technology, and the case of using new technology. Most of the technologies that have been commercialized are cost-effective, with a return on investment through reduced utility costs. By introducing energy-saving equipment, thermally insulated buildings, energy-saving vehicles, and electric vehicles at the time of renewal, and prioritizing the reduction of coal over fossil fuels, final energy consumption will be reduced by more than 30% in 2030 and more than 60% in 2050 from 2013. CO_2 emissions are described as reference values. Energy-derived CO_2 will be reduced by more than 60% in 2030 compared to 2013, and will be reduced by 97% in 2050 with commercialized and improved technologies.

The measures can significantly reduce the cost of importing fossil fuels. Domestic utility costs can also be greatly reduced. While equipment costs are required for countermeasures, however, this can be covered by the reduction in utility costs. In addition, domestic companies can receive orders for equipment costs and increase employment.

He Kebin

Academician, Chinese Academy of Engineering
Dean, the Institute for Carbon Neutrality, Tsinghua University

He Kebin is the Professor of the School of Environment of Tsinghua University, the Director of Environment & Light and Textile Industries Engineering Division of Chinese Academy of Engineering, the Vice Chairman of the National Expert Committee for Ecology and Environmental Protection, and the Chairman of the National Teaching Steering Committee for Environmental Science and Engineering. He focused on the research of complex air pollution. He conducted researches on the fields of the identification of particulate matters and complex air pollution, characterization of complicated emission sources and multi-pollutant control, and the coordinated control of air pollution and greenhouse gases. He was selected as the Highly Cited Chinese Researcher by Elsevier (2014-2021) and the World Highly Cited Researcher by Clarivate Analytics (2018-2021).

Title: Synergy Pathway to Carbon Neutrality and Clean Air in China

Abstract

Climate change mitigation measures can yield substantial air quality improvements while emerging clean air measures in China can also lead to CO_2 emission mitigation co-benefits by affecting the local energy system. Clean air policies in China have substantially reduced particulate matter (PM2.5) air pollution in recent years, primarily by curbing end-of-pipe emissions. Meanwhile, these efforts to tackle air pollution induce considerable climate benefit, and measures with remarkable CO_2 reduction co-benefits deserve further attention in future policy design. In future, with the exhaustion of emission reduction potentials from the end-of-pipe controls, China's carbon neutrality goals will play a critical role in reducing air pollution exposure to the level of the WHO guidelines and protecting public health. Carbon neutrality goal's efforts to improve its air quality will entail a thorough shift from end-of-pipe-oriented to climate-mitigation-oriented emission reductions, which fuel the power to long-term air quality improvement in China. Such a transition relies heavily on solar and wind resources, while spatial and temporal mismatches between resource availability and electricity demand may challenge system reliability, however, additional reliability gains in these systems that would be achieved as a consequence of specific regional connections. Our analysis thus points to a synergy pathway to carbon neutrality and clean air in China.

Tsuchiya Haruki

President, Research Institute for Systems Technology

Tsuchiya Haruki worked as the Adviser of Global Environment Center of National Institute for Environmental Studies. He received his Ph.D. in Mechanical Engineering from the Graduate School of University of Tokyo. He founded Research Institute for Systems Technology. He published the book *Energy Cultivating Civilization* in 1980, presenting energy future switching from fossil fuel to renewable energy as the human history shows the transition from hunting food to agriculture. He wrote many papers and books on renewable energy and energy future, such as *Learning Curve Cost Analysis on Renewable Energy*. He contributed for 2nd IPCC Report in 1995. He worked for World Wide Fund for Nature or World Wildlife Fund (WWF) Japan on 100% renewable energy scenario for 2050.

Title: Japanese Scenario of Renewable Energy Supply

Abstract

The risks of climate change are urgent. We see heavy rains, river floods and heat waves in recent years. We do not have enough time. If we consume carbon budgets as present trend, the air temperature rise will be more than 1.5℃ in the end of 21st century.

This presentation shows a Japanese scenario of renewable energy supply. We assumed that the energy demand in 2050 will be less than a half of present level, mainly because the population will decrease to 80% of 2015 level, and changes in industrial structure and efficiency improvements will also decrease energy demand more. We show potentials of renewable energy in Japan. Renewable electricity will be supplied to conventional electricity demand. The excess electricity will be supplied to produce hydrogen. Hydrogen will be supplied to steel production, high temperature thermal demand, cargo truck, ships and aircraft. We performed Energy Simulation for 2030 and 2050. The dynamic simulation is hourly energy supply based on weather data collected by Automated Meteorological Data Acquisition System (AMeDAS). As the results of simulation, we will show necessary land areas for PV and wind power, carbon emission, and investment cost. In 2030, coal fire plants will be phased out, renewable power will account for 50% of the electricity supply, CO_2 emission will be 50% lower than in 2013. In 2050, renewable energy will have 100% share, CO_2 emission will be zero, and renewable energy (PV-360GW, wind-153GW) will account for 3% of the country's land area.

Li Junfeng

Standing Director, China Energy Research Society (CERS)
First Director General, National Center for Climate Change Strategy and International Cooperation (NCSC)

Li Junfeng is the Doctoral Supervisor of Renmin University of China. He served as the Deputy Director General of Energy Research Institute of National Development and Reform Commission, the Member of the National Energy Advisory Committee, the National Committee of Experts on Climate Change, and the National Expert Committee for Ecological and Environmental Protection, the Specially Invited Advisor of China Council for International Cooperation on Environment and Development, and the Consultant for low-carbon development of Beijing, Shanghai and Shanxi Provincial People's Government. He has long been engaged in energy economics and the theory of energy and environment research, successively organized and presided over the drafting work on *Renewable Energy Law of the People's Republic of China* and *National Medium and Long-term Energy Plan*, participated in research and drafting of *National Program for Medium and Long-term Scientific and Technological Development* and other important documents. He has organized major national development strategy research projects such as research on China's energy development strategy, China's low-carbon development macro strategy, etc. He won the Lifetime Achievement Award of the 9th Annual Zayed Future Energy Prize in 2017.

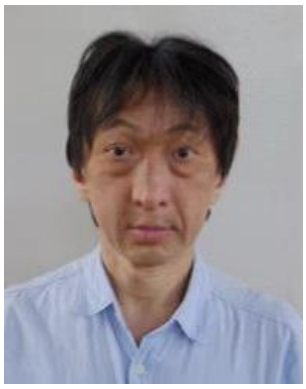
Title: The Logic of Energy Transition in the Context of Zero Carbon Growth

Abstract

Energy transition is an important support for zero-carbon growth. The presentation analyzes the basic logic of energy transition in the context of zero-carbon growth. First, the carbon neutral vision and zero-carbon growth require that the energy transition must conform to the target logic of green and low carbon. Second, the path logic of energy transition is discussed, and it is pointed out that the path logic of energy transition is from resource dependence to technological dependence. Third, the situation, technology and concept challenges faced by the energy transition, as well as the options to face the challenges are discussed. The presentation concludes with several policy recommendations, the energy transition must be pursued unswervingly, follow the principles of simultaneous reformation and innovation and gradual progress, and properly handle the contradiction between transformation and security.

Asuka Jusen

Professor, Center for Northeast Asian Studies and Graduate School of Environmental Studies, Tohoku University



Asuka Jusen received his Ph.D. from the Graduate School of Engineering, University of Tokyo. He had also worked for the Institute for Global Environmental Strategies (IGES) in Hayama, Japan as the Director of the climate change group from 2010 to 2013. His primary areas of interest are energy policy and environmental policy such as climate policy and air pollution policy, and international environmental/energy cooperation. He is regularly involved in expert networks as well as policy making on energy/climate policy issues of Japan. Recently, his specific interests are to promote the green recovery and energy transition which Japan is lagging behind other countries.

Title: Economic Impacts of the Zero-Carbon Scenario for Japan

Abstract

In Japan, former Prime Minister Suga announced in October 2020 a new goal of "carbon neutrality by 2050" However, the energy/climate policy issued by the government after the announcement did not show any major changes in the current targets or policies. At this rate, there is a very high possibility that "carbon neutrality by 2050" and the current "46% reduction by 2030 compared with 2013" pledge will become nothing but a mere political slogan. In February 2021, the Research Group of the Energy Transition for the Future published *Report 2030: A Roadmap to 2030 for Green Recovery and Carbon Neutrality in 2050* as a Japanese version of the Green New Deal. This is an alternative to the government's current energy/climate policies. This report presents a concrete roadmap to the year 2030 which clarifies Japan’s essential aims and actions to be realized by 2030 in order to achieve carbon neutrality by 2050. Specifically, the report draws a specific and systematic roadmap for actual investment amount needed for each sector, positive economic benefits, greenhouse gas emission reduction amounts, air pollution control benefits, job creation and specific policy for each sector by 2030. This presentation will provide a brief picture of this Green New Deal plan for Japan by conveying the essence of the report as well as its comparison with the *Inflation Reduction Act* which U.S. Congress has just passed.

Roundtable Discussion Attendees

Wang Xi

Deputy General Manager, Green Development Research Center, China Construction Science & Technology Group Co., Ltd

Wang Xi is the Chartered Builder of Chartered Institute of Building (CIOB), the Leadership in Energy and Environmental Design (LEED) AP/BD+C certified Expert of U.S. Green Building Council, and the Senior Engineer of Green Building. He serves as the Expert Committee Member of the Architectural Society of China, Chinese Society for Urban Studies, China Association for Engineering Construction Standardization, Guangdong Civil Engineering Society and other social organizations. He was selected as one of the Shenzhen overseas high-level talents. He received his Ph.D. from the University of Sheffield. He is mainly engaged in the planning and design of green buildings, future communities, eco-cities, and new urban infrastructure construction, as well as the development of industry and financial investment. He hosted and participated in a number of ministerial and provincial level science and technology research programs and projects. He has published more than 30 articles in SCI, EI and Chinese core journals (PKU).

Lian Yubo

Executive Vice President, Chief Engineer of Automotive, BYD Company Limited

Lian Yubo served as the Member of the National Key R&D Program of China of NEV expert group, and the Chairman of Electric Vehicle Sub-Committee of National Automotive Standardization Technical Committee. He joined the BYD Company Limited in 2004. He is in complete charge of the key component-level and vehicle-level technology research and development of the Internal Combustion Engine Vehicle (ICEV) and NEV, and has created high-performance electric vehicle power system. He has developed a series of NEVs, including the world's first Plug-in Hybrid Electric Vehicle (PHEV) and China's first electric passenger vehicle with the sale of more than 2 million. He led the research and development of China's NEV technology and industrialization. He participated in many national and provincial key science and technology projects as the Project Leader or Main Finisher, and won 1 second prize of National Science and Technology Progress Award and 1 special prize of Guangdong Science and Technology Progress Award as the First Finisher. As the Main Draftsman, he participated in the formulation of many national and local standards, including the Three Mandatory Standards for Electric Vehicle (EV).

Naito Katsuhiko

Professor, Graduate School of Economics, Kyoto University

Naito Katsuhiko graduated from the Department of Applied Physics, Graduate School of Engineering, University of Tokyo in 1982, and joined the Environment Agency in the same year. He served as the Coordinator of Global Warming Countermeasures Division, Global Environment Bureau, Ministry of the Environment, the Director of Recall Countermeasures Office, Technology and Safety Department, Automobile Transportation Bureau, Ministry of Land, Infrastructure, Transport and Tourism, the Director of Environmental Impact Assessment Office, General Environmental Policy Bureau, Ministry of the Environment, the Director of Automobile Environmental Measures Division, Water and Air Environment Bureau, Ministry of the Environment, and the Deputy Mayor of Minato City. His main research interests are environmental policy and energy policy. He has published several books, including *Enjoyable Town Development with Five Senses*, *International Comparison of Renewable Energy Policy*, *2050 Strategy*, *European and American Electricity System Reform*, *U.S. Grid Policy Holds the Key to the Spread of Renewable Energy*, *Introduction Renewable Energy and Power Systems*, *U.S. Power Transmission System Holds the Key to Innovation*, *Gas Systems in Europe and America*, etc.

Fang Haifeng

Vice Director, Chief Expert, Center for Automotive Strategy and Policy Research, China Automotive Technology & Research Center Co., Ltd (CATARC)

Fang Haifeng graduated from Hunan University with Doctor of Engineering. He is responsible for the research on NEV projects and has participated directly in the research on a number of major policies in the field of NEV, referring to development plans, promotion and application, innovative programs, finances and taxes incentives, government procurement, charging infrastructures, technology roadmaps, power batteries, Fuel Cell Electric Vehicle (FCEV), Low-speed Electric Vehicle (LSEV), etc. As the Person Responsible or Key Member for the projects, he has participated in multiple research projects on the state and the principle level, published over 80 academic essays totally, organized and participated in some treatises on NEV, and won several research awards. He has rich experience in the policy research on NEV, and is responsible for seeing to the compilation of the policies and the planning for NEV among China's provinces and cities.

Liu Yongdong

Deputy Secretary General, Director, Standardization Center, China Electricity Council

Liu Yongdong is the Professorate Senior Engineer, the Secretary General of the Standardization Technical Committee of Electric Vehicle Charging Facilities in Energy Industry, and the Vice Chairman of the Standardization Technical Committee of Ultra-High Voltage (UHV) Alternating Current (AC) Transmission. He has been engaged in power research and power standardization for a long time, and is familiar with power system and power standardization. Combined with the construction of UHV projects in China, he formulated the UHV technical standard system in China. He carried out comprehensive standardization construction in the smart grid, providing a complete set of standard systems for smart substations and new energy grid connection in China. He led the completion of the standard system of conductive charging, wireless charging and battery replacement of electric vehicles in China, and organized the formulation of the charging interface standard, charging equipment standard and charging service platform information exchange series standards of electric vehicles in China. He took the lead in organizing the pre-research of the next generation conductive Direct Current (DC) charging technology and standards to promote the internationalization of super charging project. He has won 1 first prize and 1 second prize of the China Standard Innovation Contribution Award, and 1 third prize of China Electric Power Science and Technology Progress Award. He has published more than 15 domestic papers.

Yoshino Hiroshi

Professor Emeritus, Tohoku University

Yoshino Hiroshi is the Academician of the Engineering Academy of Japan, the Distinguished Professor of Chongqing University, and the Professor of Yangtze Delta Region Institute of Tsinghua University, Zhejiang. He served as the Council Member of Science Council of Japan from 2011 to 2017 and the President of Architectural Institute of Japan from 2013 to 2015. He has been involving in research subjects for building science such as indoor environment and energy conservation, ventilation and indoor air quality, occupant's health and indoor environment, and passive solar system performance. He is one of the contributors to the reports of the Intergovernmental Panel on Climate Change (IPCC), which was awarded the Nobel Peace Prize in 2007. He used to be the Operating Agent at International Energy Agency's Energy in Buildings and Communities Programme, responsible to the Annex 53 Total Energy Use in Buildings. He has won the Grants-in-Aid from Ministry of Education of the People's Republic of China for scientific research 4 times to conduct research on indoor environment and energy consumption in Chinese houses.

Xu Wei

Chief Engineer, China Academy of Building Research

Xu Wei is the Director General of Institute of Building Environment and Energy at the China Academy of Building Research, the Director of National Center for Quality Supervision and Inspection of Building Energy Efficiency, the Chairman of China Committee of Heating, Ventilation & Air-Conditioning (HVAC), and the President of China Alliance of Nearly Zero Energy Building. He has devoted himself to research in the fields of HVAC, building energy and green building, and achieved innovative results. He is the Chief Editor of plenty of over 20 national standards and code in HVAC and building energy. He has won the Special Government Allowances of the State Council as the Outstanding National Expert, and was selected into the National Key Talent Project.

Ito Kazuhide

Professor, Faculty of Engineering Sciences, Kyushu University

Ito Kazuhide is the Visiting Professor of Royal Melbourne Institute of Technology. He graduated from the University of Tokyo with Doctor of Engineering in 2000. Before he joined Kyushu University, he was the Faculty Member at Tokyo Polytechnic University. His current research topics include silico human modeling, indoor environment, Computational Fluid Dynamics (CFD), public health, energy-efficient and sustainable building design and analysis. He has published over 300 journal and conference papers. He has received several awards from Japanese government, Architectural Institute of Japan (AIJ) and Society of Heating, Air-Conditioning and Sanitary Engineers of Japan (SHASE), such as the Commendation for Japan Society for the Promotion of Science (JSPS Prize), SHASE Award of Technical Paper, the Encouragement Prized of AIJ, the Maeda Engineering Foundation Award, etc. He also received SAGE Best Paper Award of Indoor and Built Environment in 2013 and 2019, and Best Paper Award of *Journal of Asian Architecture & Building Engineering* in 2011.

Li Xiaojiang

Special Advisor, China Council for International Cooperation on Environment and Development (CCICED)
Former President, China Academy of Urban Planning and Design

Li Xiaojiang has deeply involved in the research of Beijing-Tianjin-Hebei cooperative development strategy, and has been studying the planning and construction of the Pearl River Delta region and cities such as Guangzhou and Shenzhen for a long time. He has presided over the completion of Beijing, Shanghai, Tianjin, Shenzhen, Guangzhou, and other mega-city master plans or strategic planning studies, as well as the planning of agglomerations such as the Pearl River Delta agglomeration and the West Coast agglomeration. In recent years, he has directed and participated in *Study on the Development Strategy of New Urbanization with Chinese Characteristics*, *Study on the Urbanization of Chinese Counties*, *Study on the Sustainable Development Strategy of China's Urban Construction*, etc. of the Chinese Academy of Engineering. Internationally, he has led the CCICED Special Policy Studies "Urbanization of Ecological Civilization" project in cooperation with Netherland and Germany, "The Major Green Technology Innovation and Implementation Mechanism" (Phase I and Phase II) in cooperation with World Economic Forum, and the Energy Foundation's "Study on the application of green energy-saving technologies in China's urban renewal" and other major consulting projects.

Amano Kenji

General Manager, Daikin Open Innovation Lab. Shenzhen (DOSZ)

Amano Kenji graduated from Kyushu University with a Master's degree in Mechanical Science in 2009, and joined Daikin Industries, Ltd. to conduct research on mechanical design and simulation of compressors as the Research Engineer. He had been engaging in collaborative projects with startup companies and universities. He moved to Shenzhen in 2020 and served as the General Manager of DOSZ, which is the second open innovation lab launched by Daikin, the other is located in San Jose, California, U.S. He is involved in several R&D themes related to healthcare and energy solution, both of which are important strategies of Daikin until 2025. Indoor Air Quality (IAQ) is an important factor affecting individual health, so he is leading a team to investigate the relationship between IAQ and health, and to find opportunities for data applications in this field. As an energy-saving device, HVAC plays an important role in environmental protection. At the same time, he also seeks effective solutions from control and cooperation with energy grid.

Zhang Jie

Professor, School of Architecture, Tsinghua University
Dean, School of Architecture and Urban Planning, Beijing University of Civil Engineering and Architecture

Zhang Jie is the National Master of Engineering Design and Geotechnique Investigation in China, the Chartered Member of Royal Institute of British Architects (RIBA), and the Chairholder of the UNESCO on Heritage Conservation Planning and Sustainable Social Development. His research lies in the inter-discipline of architecture and conservation and in investigating a sustainable development model for cities undergoing drastic changes, considering culture, ecology, economy, and community improvement in the context of rapid urbanization. He has published 20 academic monographs and more than 100 academic papers. He has won 5 international design awards from UNESCO and others, and more than 40 national awards in China by his representative works, including Jingdezhen Ceramic Industry Museum, Conservation of Sanfang Qixiang, and Jingdezhen Pengjia Alley Compound. His works were displayed in the Chinese Architecture Exhibition of the 27th World Congress of Architects, the China Pavilion at Venice Biennale 2020, and China Architecture exhibition in Lyon, France.

Takase Kae

Associate Director, Carbon Disclosure Project (CDP)-Worldwide Japan

Takase Kae is the Member of Tokyo Metro Environmental Committee, and other committees hosted by the national or sub-national governments. She served as the Economist at Institute of Energy Economics, Japan, and her specialty is econometric modeling of energy supply and demand, and renewable policy. She received her Ph.D. in environmental studies from Graduate School of Frontier Science, University of Tokyo. She has worked at Research Institute of Innovative Technology for the Earth, Center for Low Carbon Society Strategy, Japan Science and Technology Agency, and University of Tokyo. She has been successful in engaging Japanese companies to join Science-based Target (SBT) initiative, and in engaging government to consider better corporate renewable sourcing environment, as the technical partner of Renewable Energy 100% (RE100).

Ou Xunmin

Associate Professor, Tsinghua University

Ou Xunmin serves as the Subject Editor of the Energy and Transportation cross-section of *Energy*. His main expertise is in the area of transport-sector energy strategy and life cycle analysis of energy pathways. He has been selected as one of the Lead Authors of 6th *Climate Change Assessment Report* of Intergovernmental Panel on Climate Change (IPCC), United Nations (UN). He presided over more than 30 projects, wrote 10 monographs, and published more than 50 SCI/SSCI papers.

Yang Xiu

Associate Professor, Tsinghua University

Yang Xiu is the Director of the research department at Institute of Climate Change and Sustainable Development, Tsinghua University. She got her Ph.D. from Tsinghua University in 2010, and worked for National Center for Climate Change Strategy and International Cooperation as the Director of Policy and Regulation Department and Senior Researcher from 2012 to 2020. She has long been engaged in research on energy economics, energy and environmental policies, and analysis of climate change related strategies and policies. She has led and participated in a number of key research projects in the field of energy and climate change policy, including legislation to address climate change, total greenhouse gas emission control system, low carbon city indicator system, energy revolution and climate change, and pilot assessment of low carbon provinces and cities. She has co-authored more than 10 publications, received 5 provincial and ministerial awards, and published more than 50 papers in core journals.