

2026 AI FOR ENERGY WORKSHOP



4.20.MON - 4.21.TUE 09:30 - 16:30

Korea Institute of Energy Research (KIER),
Daejeon Headquarters

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CEREMONY REMARKS

Opening Remarks

On behalf of the Ministry of Climate, Energy and Environment, I would like to warmly welcome all participants to the 2026 AI for Energy Workshop.

We are at a critical turning point where climate action and digital transformation are advancing simultaneously. As AI infrastructure continues to expand, electricity demand is rapidly increasing, bringing new challenges in ensuring both a stable power supply and the achievement of carbon neutrality.

In this context, ensuring both the stability and efficiency of energy systems is becoming increasingly important. AI technologies are expected to play a key role in enhancing energy demand management and optimizing power system operations, and their importance in the energy transition will continue to grow. Moving forward, the government will continue to work closely with relevant ministries and research institutions to generate meaningful outcomes in the convergence of AI and energy and to further expand international collaboration.



Hohyeon Lee Vice Minister
Ministry of Climate, Energy and Environment

Welcome Remarks

On behalf of the National Research Council of Science & Technology (NST), I would like to warmly welcome all participants to the 2026 AI for Energy Workshop.

Artificial intelligence (AI) is transforming the paradigm of scientific research, rapidly expanding as a new research approach that integrates data and automation. In this context, The convergence of AI and energy technologies becomes one of the key areas driving research innovation to achieve carbon neutrality and energy security.

As an open collaborative platform connecting 23 government-funded research institutes, NST is strengthening inter-institutional cooperation and convergence research, while establishing a National AI for Science center as a key hub for AI-driven scientific innovation.

Moving forward, NST will continue to expand joint research in the field of AI through collaboration with global research networks, including RD20, and further strengthen the



Yeungshik Kim Chairperson
National Research Council of Science & Technology

Congratulatory Remarks

Distinguished guests, colleagues, and participants,

On behalf of the Korea Institute of Energy Research (KIER), it is my great pleasure to welcome you to the 2026 AI for Energy Workshop in Daejeon.

Artificial intelligence (AI) is transforming scientific research, evolving into a new paradigm that integrates data and automation. In this context, AI for Energy is accelerating innovation across energy technologies, while the expansion of AI infrastructure is increasing the importance of reliable and sustainable power supply, highlighting the growing need for Energy for AI.

At the same time, global initiatives such as the U.S. Genesis Mission and Korea's K-Moonshot are driving AI-based research innovation and enhancing research productivity. These developments further emphasize the importance of international collaboration in the convergence of AI and energy.

I hope this workshop will serve as a platform to explore new opportunities for collaboration in AI for Energy and Energy for AI, and to initiate meaningful discussions for future partnerships. Thank you.

Chang-Keun Yi President
Korea Institute of Energy Research (KIER)



ABOUT KIER

Energy Technology R&D for National Growth and Economic Development

Below 1° to keep the Earth livable

Roles and Responsibilities (R&R)



Articles of Association

MTP*

Strategic Goals

K-Energy** a New Growth Engine for the Country

* Massive Transformative Purpose
** Technologies packaged for transfer to businesses, entry into global markets

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PROGRAM

Time	Day 1 – April 20 (Monday)		
09:30-10:00	• Registration and Networking		
10:00-12:00	• Topic 1: AI for Energy (Chairs: Ray Grout ^{NLR} , Mincheol Cho ^{AIST})		
	① AI for Energy Systems and Innovation - Global Grid Intelligence: Democratizing AI for Power Systems through International Collaboration	NLR (USA)	Ray Grout
	② From Fluid Dynamics to System-Level Simulation: Toward Green Hydrogen- and Biomass-Based Energy Systems	RIKEN CSRS (Japan)	Keiichi Mochida
	③ AI Applications in Japanese Home Energy Big Data and Development of External Control Technology for Home Demand-side Resources	AIST (Japan)	Mincheol Cho, Tomonori Honda
	④ Physics-Informed Machine Learning for Optimal Operation of Multi-Energy Systems	CNRS, IMT Atlantique (France)	Mohamed Tahar Mabrouk
12:00-13:30	• Lunch		
13:30-13:45	• Opening Ceremony		
	- Opening Remarks	Vice Minister - Ministry of Climate, Energy and Environment	Hohyeon Lee
	- Welcome Remarks	Chairperson of NST	Yeungshik Kim
	- Congratulatory Remarks	President of KIER	Chang-Keun Yi
13:45-14:35	• Plenary Talks		
	- AI for Accelerating Materials Discovery, Synthesis and Characterization	NLR (USA)	Anthony Burrell
	- How AI Will Change the Future of the World: Substitution, Reconfiguration, and New Paradigm	Former KT CEO, KAIST Professor (Korea)	Hyeonmo Ku
14:35-14:50	• Coffee Break for Workshop Participants		
14:50-15:50	• Topic 1: AI for Energy (Chairs: Ray Grout ^{NLR} , Byunggu Yoo ^{OCTR Tech.})		
	⑤ AI Based Forecasting for Renewables and Demand-side	TUBITAK MRC (Türkiye)	Dogan Gezer
	⑥ AI-Driven Autonomous Buildings: Redefining Energy Efficiency through Smart Automation	OCTR Technologies (Korea)	Byunggu Yoo, Hassan Imran
	⑦ A Study on the Effectiveness of Deep Learning in Time-Series Energy Forecasting	KIER (Korea)	Myeongchan Oh
15:50-17:50	• Lab Tour for Workshop Participants (For speakers only, CAST)		
18:30-	• Banquet (For speakers only)		

Time	Day 2 – April 21 (Tuesday)		
09:30-10:50	• Topic 2: AI for Autonomous Discovery (Chairs: Jae Yong Lee ^{KIER} , Scott Smith ^{NRC})		
	① AI Multi-Agent Driven Energy Facility Operation	KIER (Korea)	Jae Yong Lee
	② Integrating Open Source Data with Self-Driving Laboratory Design for AI Driven Materials Discovery or Process Optimization	NRC (Canada)	Scott Smith
	③ Policy, Regulation and Risks in AI and Digitalisation for Energy	UKERC, Imperial College London (UK)	Aidan Rhodes
10:50-11:05	• Coffee Break		
11:05-12:05	• Topic 2: AI for Autonomous Discovery (Chairs: Jae Yong Lee ^{KIER} , Scott Smith ^{NRC})		
	④ AI-Powered Automated MOF Discovery	KAIST (Korea)	Jihan Kim
	⑤ Accelerating Green Energy Electrocatalyst Development through AI-Integrated Multiscale Modeling and Experimental Studies	PKNU (Korea)	Min Ho Seo
	⑥ MARK: AI Materials Scientist for Nanomaterials	KIST (Korea)	Sang Soo Han
12:05-13:10	• Lunch		
13:10-14:50	• Topic 3: Energy for AI (Chairs: Taha Selim Ustun ^{AIST} , Chi-Young Jung ^{KIER})		
	① Predictive Maintenance in Power Systems for Increased Performance and Reliability	AIST (Japan)	Taha Selim Ustun
	② Modeling the Nexus of Generative AI Expansion and Power System Reliability: Quantitative Projections for 2038 Grid Stability	KIER (Korea)	Chang Ki Kim
	③ Intelligent Buildings: Leveraging AI for Electrification, Operation and Optimization	NRC (Canada)	Saptak Dutta
	④ Visual AI-Based Defect Diagnosis for PEMFC and PEMWE Electrode	KIER (Korea)	Chi-Young Jung
	⑤ AI-Driven Next-Generation EMS in Korea: Recent Advances and Real-Time Node-Level Forecasting of Distributed PV Generation	KERI (Korea)	Jae-Kyeong Kim
14:50-15:05	• Coffee Break		
15:05-16:25	• Joint Session (Chairs: Anthony Burrell ^{NLR} , Hyunkeong Kim ^{KETEP})		
	- Summary of the 3 Sessions		Chairs of each session
	- Further Collaboration Opportunities for International Collaboration	RD20	All
	- Future Direction of AI Workshop for RD20		
16:25-	• Wrap-Up and Closing		

SHORT BIO

PLENARY TALKS



Anthony Burrell
*Joint Session Chairs

AI for Accelerating Materials Discovery, Synthesis and Characterization

Chief technologist for energy storage | National Laboratory of the Rockies (NLR)
Anthony K. Burrell has been working in the areas of energy science and technology since the early 1990s with a specific focus on energy storage. Recently, he was the department head for electrochemical energy storage at Argonne National Laboratory and he is now the chief technologist for energy storage at NLR.



Hyeonmo Ku

How AI will change the future of the world? Substitution, Reconfiguration and New Paradigm

Adjunct Professor | KAIST
Hyeonmo Ku was a CEO of Korea Telecom, the largest telco in Korea and board member of GSMA. He led the early stage of AI in Korea and is focusing on the AI transformation of incumbent industries.

TOPIC 1. AI FOR ENERGY



Ray Grout

AI for Energy Systems and Innovation

Computational Science Center Director | National Laboratory of the Rockies
Dr. Grout is the director of NREL's Computational Science Center, where oversees R&D and operations focused on advancing energy solutions through computational innovation.



Keiichi Mochida

From Fluid Dynamics to System-Level Simulation: Toward Green Hydrogen- and Biomass-Based Energy Systems

Team Director | RIKEN Center for Sustainable Resource Science (CSRS)
Keiichi Mochida is focusing on biomass productivity improvement for carbon capture and utilization and leading collaborative research with Indonesia on green hydrogen production and biomass co-firing.



Mincheol Cho

AI Applications in Japanese Home Energy Big Data and Development of External Control Technology for Home Demand-side Resources

Researcher | National Institute of Advanced Industrial Science and Technology (AIST), Global Zero Emission Research Center (GZR)
Mincheol Cho is a researcher at AIST, focusing on demand-side energy management systems and distributed energy resources, including big data and AI for energy applications.



Tomonori Honda

AI Applications in Japanese Home Energy Big Data and Development of External Control Technology for Home Demand-side Resources (w/ Cho Mincheol)

Leader of Data-Driven Smart Society Systems Research Team | AIST (National Institute of Advanced Industrial Science and Technology)
Tomonori Honda at AIST specializes in home energy control and AI development using massive household datasets, leading multiple large-scale research projects including international NEDO initiatives.



Mohamed Tahar Mabrouk

Physics-informed Machine Learning for Optimal Operation of Multi-energy Systems

Assoc. Professor | IMT Atlantique, CNRS
Mohamed's work focuses on energy systems modeling and optimization, from individual technologies to energy networks, with growing emphasis on AI and hybrid modeling approaches.



Dogan Gezer

AI based Forecasting for Renewables and Demand-side

Head of Energy Technologies Division | TUBITAK Marmara Research Center
Dr. Doğan Gezer serves as Head of the Energy Technologies Division at TÜBİTAK Marmara Research Center. He coordinates research groups specialized in renewable energy, power electronics, power systems, and energy monitoring & forecasting. He leads a working group at COST Action Pen@Hydropower.



Byunggu Yoo

AI for Energy: Autonomous Buildings and the Future of Decarbonizing the Built Environment

Chief Executive Officer | OCTR Technologies
Byunggu Yoo is Founder and CEO of OCTR Technologies, an AI-driven building energy startup. He previously advised and managed over \$20B in commercial real estate investments and served as CSO of robotics startup RoboVertical.



Hassan Imran

AI for Energy: Autonomous Buildings and the Future of Decarbonizing the Built Environment

Chief Executive Officer | OCTR Technologies
Hassan Imran is Co-Founder and CTO of OCTR Technologies, developing AI-driven autonomous HVAC optimization for commercial buildings using reinforcement learning and sensor networks to deliver scalable energy efficiency and decarbonization.



Myeongchan Oh

A Study on the Effectiveness of Deep Learning in Time-Series Energy Forecasting

Senior Researcher | Korea Institute of Energy Research
Myeongchan Oh is conducting research at the Renewable Energy Big Data Laboratory by integrating AI with various national-level datasets.

TOPIC 2. AI FOR AUTONOMOUS DISCOVERY



Jae Yong Lee

AI for Energy: Agentic AI for Autonomous Operation of Complex Energy Systems

Chief, Energy AI Agents Strategic Research Center | Korea Institute of Energy Research
Jae Yong Lee is Chief of the Energy AI Agents Strategic Research Center at KIER, leading agentic AI and multi-energy optimization research for autonomous, efficient energy systems.



Scott Smith

Integrating Open Source Data with Self-Driving Laboratory Design for AI Driven Materials Discovery or Process Optimization

Team Lead and Research Officer | National Research Council Canada
Scott Smith is a research officer at NRC Canada, focusing on self-driving labs for accelerating clean energy R&D, including Li-ion batteries, critical mineral processing, and carbon capture.



Aidan Rhodes

Policy, Regulation and Risks in AI and Digitalisation for Energy

Research Fellow | Imperial College London
Aidan Rhodes is a Research Fellow at Imperial College and UKERC, specialising in policy outputs and briefs, with research interests in AI and digitalisation of the electricity system.



Jihan Kim

AI-powered Automated MOF Discovery

Professor | KAIST
Jihan Kim is a professor at the KAIST Department of Chemical and Biomolecular Engineering, focusing on AI for Energy and environmental related applications.



Min Ho Seo

Accelerating Green Energy Electrocatalyst Development through AI-Integrated Multiscale Modeling and Experimental Studies

Associate Professor | Major of Nanotechnology Engineering, Division of Nanotechnology Semiconductor Engineering, Pukyong National University
Min Ho Seo is an Associate Professor at Pukyong National University working on AI-driven design of electrocatalysts and advanced materials for electrochemical energy conversion systems including fuel cells, water electrolysis, and metal-air batteries.



Sang Soo Han

MARK: AI Materials Scientist for Nanomaterials

Head, Computational Science Research Center | Korea Institute of Science and Technology
Sang Soo Han is a head of computational science research center at KIST, focusing on AI for materials including self-driving laboratories, inverse design, and agentic AI.

TOPIC 3. ENERGY FOR AI



Taha Selim USTUN

Predictive Maintenance in Power Systems for Increased Performance and Reliability

Senior Researcher | Fukushima Renewable Energy Institute, AIST
Visiting researcher | TUBITAK MAM, Türkiye
Dr Ustun is a senior researcher at FREA, focusing on AI for Energy applications, including grid optimization and forecasting in international collaboration projects.



Chang Ki Kim

Modeling the Nexus of Generative AI Expansion and Power System Reliability: Quantitative Projections for 2038 Grid Stability

Chief of Renewable Energy Big Data Laboratory | Korea Institute of Energy Research
Dr. Chang Ki Kim is a principal researcher at the Korea Institute of Energy Research specializing in satellite-based solar irradiance estimation, solar resource assessment, and photovoltaic power forecasting.



Saptak Dutta

Intelligent Buildings: Leveraging AI for Electrification, Operation and Optimization

Research Officer | National Research Council Canada
Saptak Dutta is a Research Officer at the National Research Council of Canada specializing in using data-driven machine learning techniques to optimize the operations and maintenance of large building portfolios.



Chiyoung Jung

KIER's Global Collaboration Activities

Chief of Hydrogen Research & Demonstration Center | Korea Institute of Energy Research
Chiyoung Jung is a principal researcher at KIER, focusing on AI-based real-time diagnosis of defects on the membrane, electrode and porous transport layer for fuel cell and electrolyzer applications.



Jae-Kyeong Kim

AI-Driven Next-Generation EMS in Korea: Recent Advances and Real-Time Node-Level Forecasting of Distributed PV Generation

Senior Researcher | Korea Electrotechnology Research Institute
Jae-Kyeong Kim is a senior researcher at KERI, focusing on dynamic modeling, validation, stability analysis, and data-driven approaches in power systems.

JOINT SESSION



Hyunkeong Kim

Executive Director | Korea Institute of Energy Technology Evaluation and Planning
Hyunkeong Kim serves as the Head of the Strategy Office at KETEP, overseeing energy R&D policy formulation, R&D program planning, and evaluation.



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