

# **Webinar Series**

# Disease Resilient and Energy-Efficient Centralized Air-Conditioning Systems

Session Coordinated by ADB TA 6563

# Webinar 4 – Refrigerant Management for Centralized Air-conditioning Systems

In collaboration with ADB TA6730

Date: 29<sup>th</sup> September 2021 Time: 4.00– 5.30 PM (Manila Time – GMT +08.00 Hours)

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### Background

Studies show that transmission of viruses, such as the coronavirus causing COVID-19, can be prompted by airconditioned ventilation. In developing member countries (DMC), the risks of virus transmission are higher because of poor hygiene including the use of old air-conditioning equipment, lack of regular maintenance, and overcrowding in closed spaces. Additionally, inefficient centralized air-conditioning (CAC) systems in many DMCs account up to 50% of energy consumption in public buildings. Advanced air-conditioning systems with energysaving technologies used in combination with demand-side management techniques could bring up to 45% energy savings. CACs also rely heavily on hydrofluorocarbons (HFCs), a greenhouse gas potentially thousands of times more potent than carbon dioxide. Proper management of HFCs are critical to addressing greenhouse gas emissions from CAC systems. The Asian Development Bank (ADB) is implementing a knowledge and support technical assistance (TA), Regional Support to Build Disease Resilient and Energy Efficient Centralized Air-conditioning Systems, to promote disease-resilient clean energy development in developing member countries of ADB. The TA supports DMCs of ADB to improve energy efficiency, mitigate the risks of virus transmission, and ensure safe working conditions in public buildings by deploying efficient, clean, and smart CAC systems.

### Objective

The TA will support DMCs to improve energy efficiency, mitigate the risks of virus transmission, and ensure safe working conditions in public buildings by deploying efficient, clean, and smart centralized air-conditioning (CAC) systems. The TA program will assess the energy efficiency and virus transmission risks of CAC systems; make appropriate recommendations; and pilot the operation of smart, energy-efficient, and disease-resilient CAC systems in selected DMCs. The TA program will genreate three major outputs noted below:

- Developing knowledge on energy efficiency and virus transmission risks of centralized air-conditioning systems in typical public buildings,
- Identifying innovative centralized air-conditioning systems using digital technologies, and
- Developing awareness on energy conservation and containing indoor virus transmission in typical public buildings located at DMCs.

This webinar series aims to increase awareness of disease-resilient, energy-efficient, and smart CAC systems in DMCs. Since the topic of Webinar 4 is about refrigerant management, this session is organized in collaboration with TA6730 "Promoting Life Cycle Management of Fluorocarbons". TA6730 will help DMCs to promote (i) developing, manufacturing, and using climate-friendly refrigerants with zero or low global warming potential (GWP) as an alternative to HFCs with high GWP, which includes replacing old cooling equipment (upstream); and (ii) recovering, recycling, and destroying the discarded fluorocarbons (midstream and downstream).

### Registration of the event

https://adb-org.zoom.us/webinar/register/WN\_FKgzC78sSS6v6eetlZmQrw

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Time	Торіс	Speaker
4:00 - 4:05	Welcome Speech and Introduction to TA	Jinmiao Xu, Energy Specialist, Energy Sector Group,
	6563:	Sustainable Development and Climate Change, ADB
	Introducing TA-6563: Regional Support to	
	Build Disease Resilient and Energy Efficient	
	Centralized Air-conditioning Systems	
4:05 - 4:20	Expert Address 1:	Yashkumar Shukla, Executive Director, Center for
	Overview of Refrigerant Management for	Advanced Research in Building Science and Energy,
	Centralized Air-conditioning System	CEPT University
4:20 - 4:35	Expert Address 2:	Omar Abdelziz, Assistant Professor, American
	Alternative refrigerants for centralized air	University in Cairo
	conditioning systems	
4:35 - 4:50	Expert Address 3:	Sukumar Devotta, Former Director, NEERI, Nagpur,
	CAC vis-a-vis Montreal Protocol and Climate	India
	Change – Challenges for Developing	
	Countries	
4:50 - 5:05	Expert Address 4:	Shintaro Fujii, Environment and Climate Change
	Introducing TA-6730: Promoting Life Cycle	Specialist, Sustainable Development and Climate
	Management of Fluorocarbons	Change Department, ADB
5:05 - 5:25	Question and Answer Session	Yashkumar Shukla, Executive Director, Center for
		Advanced Research in Building Science and Energy,
		CEPT University
5:25 - 5:30	Closing Remarks	Xiaohong Yang, Chief of Thematic Officer, Asian
		Development Bank

## Speakers

Jinmao Xu Energy Specialist, Energy Sector Group, Sustainable Development and Climate Change, Asian Development Bank Mr. Xu has more than 16 years of experience in the energy field. He is responsible for work related to carbon capture, utilization, and storage (CCUS) in the Energy Sector Group of the Sustainable Development and Climate Change Department (SDSC-ENE) of ADB. He also administers several regional technical assistance projects focused on CCUS, low-carbon energy technology roadmaps, and advanced centralized air conditioning systems. His expertise includes energy and environmental technologies, policies, and programs. He received BS in Environmental Engineering from North China Electric Power University in 2005, and MS in Thermal Engineering from Tsinghua University in 2011.
Yashkumar Shukla Executive Director, CARBSE, CEPT University
Dr. Yashkumar Shukla is Executive Director at Centre for Advanced Research in Building Science and Energy (CARBSE) at CEPT University, India. He has more than fifteen years of international experience in building energy-efficiency research and serves as a lead on several groundbreaking energy-efficiency research projects at CARBSE. He currently serves as a team lead of the technical assistance (TA) program by the The Asian Development Bank (ADB) that supports developing member countries to improve energy efficiency, mitigate the risks of virus transmission, and ensure safe working conditions in public buildings by deploying efficient, clean, and smart centralized air-conditioning (CAC) systems.
Omar Abdelziz Assistant Professor, American University in Cairo
Dr. Abdelaziz is an assistant professor of thermofluids with more than 15 years of R&D and project management experience in energy-efficient building technologies, sustainable energy production and utilization, alternative cooling and heating technologies, and alternative lower global warming refrigerants. He led the building equipment research group and was responsible for a diverse research program with an annual budget of \$18M. In September 2017, Abdelaziz moved to Dubai, UAE and established CLEAT-Consulting where he catered state-of-the-art consulting and R&D services for green buildings globally. He actively collaborates with leading appliance and equipment manufacturers on the development of advanced and state of the art HVAC&R equipment. Dr. Abdelaziz is currently a member of the United Nations Ozone Secretariat Technoeconomic Assessment Panel (TEAP) and a co-chair of its Refrigeration, Air Conditioning, and Heat Pump Technical Options Committee (RTOC). He has published more than 100 peer-reviewed papers and holds several patents.

	Sukumar Devotta
A CONTRACTOR	Former Director, NEERI, Nagpur, India
	Dr. Devotta has immensely contributed to the field of Energy, Environment and Green Technologies. He has served and continues to serve in many prestigious National & International Committees, including Montreal Protocol-Ozone Cell, MOEFCC (Since 1992); UNEP Technical Option Committee on Refrigeration, AC& Heat Pumps (Since 1991). Dr. Devotta was awarded the US EPA "Stratospheric Ozone Protection Award" for 1997. As a member of IPCC, he also received the citations from IPCC, which was awarded the Nobel Peace Prize in 2007. He was awarded Distinguished Alumni Achievement Award by Salford University, UK in 2017 and AC Tech Distinguished Alumni Award in 2021. Dr. Devotta was listed in the Stanford University Top 2% World Most-cited Scientists in Environmental Science and Engineering (2020). Dr. Devotta has guided 25 research students for Ph.D. and ME/M. Tech. in Chemical/ Mechanical/Environmental Engineering. He has co-authored many books and Chapters in books and also published more than 220 research papers in international journals.
	Shintaro Fujii
	Environment and Climate Change Specialist, Sustainable Development and Climate Change Department, Asian Development Bank
	Mr. Shintaro Fujii manages the Japan Fund for the Joint Crediting Mechanism (JFJCM), which promotes advanced low-carbon technologies. He also supports the operations on climate change and environmental issues. Prior to joining ADB, he worked for the Ministry of the Environment of Japan for more than 15 years.
	Xiaohong Yang Chief of Thematic Officer, Asian Developement Bank
	Ms. Xiaohong Yang joined ADB's Sustainable Development and Climate Change Department as Chief Thematic Officer on 31 March 2021. Prior to this appointment, she was the ADB's Country Director for Pakistan since early 2017, where she led the ADB's operational, knowledge and partnership efforts to building up key infrastructure, institutions and reforms in the area of energy, transport, water, urban, agriculture, finance, social sector, and public-private partnerships.
	She joined ADB in 1998. Her extensive experience in sustainable development includes two decades leading the ADB's work in two regional operational departments. Between 2013 and 2016, she was the Director for Transport and Communications Division working for ten Central and West Asia Countries, and from 2002 to 2012 she held increasingly responsible positions including principal transport economist and lead transport specialist in the East Asia Department. Prior to joining ADB, she worked with the World Bank as a financial specialist for five years. Ms. Yang holds a postgraduate master's degree in Economics from

Peking University, and a Bachelor of Arts degree in Finance from the Shanghai
University of Finance and Economics, PRC. She is a Certified Public Accountant.

### About the Organizer

#### Asian Development Bank

The Asian Development Bank (ADB) was conceived in the early 1960s as a financial institution that would be Asian in character and foster economic growth and cooperation in one of the poorest regions in the world. ADB assists its members, and partners, by providing loans, technical assistance, grants, and equity investments to promote social and economic development. ADB is composed of 68 members, 49 of which are from the Asia and Pacific region.

### About the Technical Assistance Donors

### High-Level Technology Fund

The High-Level Technology (HLT) Fund is a multi-donor trust fund established in 2017 with the Government of Japan as the first donor. It provides grant financing to promote the integration of HLT and innovative solutions into ADB-financed and administered sovereign and nonsovereign projects throughout the project cycle—from identification to implementation and operation. The fund encourages more widespread adoption of HLT to address development challenges in ADB developing member countries.

### Clean Energy Fund (CEF) under the Clean Energy Financing Partnership Facility

The Clean Energy Fund (CEF) under the Clean Energy Financing Partnership Facility (CEFPF) was established in 2007 to help developing member countries of the Asian Development Bank (ADB) improve their energy security and decrease the rate of climate change through increased use of clean energy. The CEF is supported by the Governments of Australia, Norway, Spain, Sweden, and the United Kingdom.

### Asian Clean Energy Fund (ACEF) under the Clean Energy Financing Partnership Facility

The Asian Clean Energy Fund (ACEF) under the CEFPF was established in 2008 to support developing members countries of ADB in their efforts toward reducing greenhouse gases through the utilization of renewable energy and energy efficiency technologies. The ACEF is supported by the Government of Japan.