



# WORKSHOP ON ENERGY EFFICIENCY

NAIROBI, KENYA

22 OCT 2023



ozone  
secretariat



Vienna Convention  
**MONTREAL PROTOCOL**

The workshop is being convened to share information, experiences and lessons learned and assess challenges related to the availability and accessibility of energy-efficient equipment and equipment using low- or zero-global-warming potential alternatives during the implementation of the Kigali Amendment.

The outcomes of the workshop will be presented to the Thirty-Fifth Meeting of the Parties to the Montreal Protocol to be held immediately after the workshop for further consideration and to recommend a way forward as appropriate.

## AGENDA

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Session 1 - Energy efficiency landscape

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Session 2 - Technologies

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Session 3 - Policy options to enhance adoption

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Session 4 - Enabling policies

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Session 5 - Wrap up

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# PANELISTS BIOGRAPHIES



## OMAR ABDELAZIZ

Mr. Omar Abdelaziz is an Assistant Professor of Thermofluids at the American University in Cairo focusing on energy-efficient building technologies, sustainable energy production, alternative cooling and heating technologies, and lower global warming refrigerants. He started his career at Oak Ridge National Laboratory in 2009 and later joined the US Department of Energy Building Technologies Office as a Senior Fellow.

Mr. Abdelaziz led the building equipment research group at ORNL. He collaborates with leading appliance manufacturers

on developing advanced HVAC and refrigeration equipment.

He is a member of the United Nations Ozone Secretariat Techno-economic Assessment Panel and a member of the American Society of Heating Refrigeration and Air Conditioning Engineering. He has received numerous awards, has published over 100 peer-reviewed papers, and holds several patents.



## KOFI AGYARKO

Mr. Kofi Agyarko is the Director of Renewable Energy, Energy Efficiency and Climate Change at the Ghana Energy Commission. With over 20 years' experience in the energy sector, he has designed and successfully implemented a number of energy efficiency projects including the project on Energy Efficient Refrigerators and Market Transformation in Ghana.

Mr. Agyarko has served as a member of the UNEP-GEF lighting and refrigerating task force to develop policy guidelines for accelerating the global adoption of

quality, energy-efficient lighting and refrigerating appliances.

He is a member of the Energy Efficiency Task Force of the TEAP, and chairs the Cool Coalition Working group on dumping of used products in Africa as well as a regular resource person in the International Energy Agency's Global Conference on Energy Efficiency and the Vienna Energy Forum.



## YAQOUB AL-MATOUQ

Yaqoub Al-Matouq was the President of the 29th Meeting of the Parties to the Montreal Protocol and is a member of the National Ozone & Climate Change Committee in the Environmental Protection Agency of Kuwait. He received his BA in mechanical engineering.

His career in the HVACR sector started in 1992 and with UNEP started in 2003. Yaqoub participated as a lead negotiator for Kuwait delegation and the GCC in Montreal Protocol meetings, as a coordinator of A5 parties under the

Montreal Protocol, coordinator of the Asia Pacific group region, member of the Executive Committee for the Multilateral Fund of the Montreal Protocol since 2008, and refrigeration consultant in UNIDO and UNEP projects in West Asia. He is also a lecturer in HVACR related courses.



## STEPHEN O. ANDERSEN

Mr. Stephen O. Andersen is the Director of Research at the Institute for Governance & Sustainable Development (IGSD) and previously Deputy Director of the United States Environmental Protection Agency (USEPA) Stratospheric Protection Division and EPA Liaison to the US Department of Defence on Ozone and Climate Protection.

His start on atmospheric protection was in 1974 as a member of the Climatic Impact Assessment Project (CIAP) on the atmospheric effects of supersonic transport airliners (SSTs).

Mr. Andersen created the first US EPA voluntary partnerships and helped organize and manage the USEPA Stratospheric Ozone and Climate Protection Awards.

He founded and co-chaired TEAP from 1989-2012 and with Samira Korban-de Gobert and Marco Gonzalez, Stephen launched the Montreal Protocol Who's Who.



## MANUEL P. AZUCENA

Mr. Manuel P. Azucena is the coordinator of the Cold Chain Innovation-Hub and technical expert of the UNited Nations Industrial Development Organization (UNIDO) for the hydrofluorocarbons phase out management plan (HPMP) in the Philippines.

He is also the International Master Trainer of the Refrigerant Driving License, an initiative by UNEP and AHRI, introducing pilot technician certification for Rwanda, Maldives, Sri Lanka and Grenada.

In the Philippines, he is the National Lead Assessor of refrigeration and air conditioning of the Technical Education and Skills Development Authority (TESDA) and on the Board of Directors of the Refrigeration and Air conditioning Technicians for Development of the Philippines (RACTAP, Inc.).

Mr. Azucena obtained his B.A. of Science and Industrial Education at the Marikina Institute of Science and Technology, and pursued advanced studies in refrigeration and air conditioning at Boxhill College of



## SHIKHA BHASIN

Ms. Shikha Bhasin is a Senior Advisor at the UNEP-based Cool Coalition. She is a public policy professional with 14 years of work experience cutting through research and strategic outreach in the space of climate policies, in particular mitigation technologies, climate negotiations, and sustainable cooling.

A co-author of the India Cooling Action Plan (ICAP), Ms. Bhasin has been actively engaged in advocating – and developing – the policy ecosystem for sustainable cooling particularly with advisory on R&D, servicing sector, solar radiation

management, HFC management regulations, and philanthropic strategies for India.

She is currently serving as a Coordinating Author for the Global Cooling Stocktake Report being developed by UNEP.



## PHILIPPE CHEMOUNY

Mr. Philippe Chemouny is the manager of the Montreal Protocol Program at Environment and Climate Change Canada and is responsible for coordinating Canada's international engagement in the Protocol.

He has represented Canada at Montreal Protocol and Multilateral Fund meetings over the past 25 years, contributing to key amendments, decisions and funding guidelines, and twice chairing the Executive Committee of the Multilateral Fund.

Mr. Chemouny also manages a bilateral program to reduce controlled substances in developing countries, under which several projects have integrated energy efficiency goals while supporting the phase-down of HFCs.

He has also led Canada's role in the HFC and cooling initiatives of the Climate and Clean Air Coalition, partnering internationally to develop strategies and projects to achieve the phase-down of HFCs while enhancing energy efficiency.



## PHILIPP DENZINGER

Mr. Philipp Denzinger works as a project manager for GIZ Proklima and is in charge of implementing projects under the Montreal Protocol and Paris Agreement financed by the following German Ministries responsible for Economic Cooperation and Development (BMZ/MLF), Environment (BMUV), Climate Action (BMWK) and other donors (AfD; KliK Foundation; etc.).

He is currently overseeing projects in around 25 countries and always trying to link the Montreal Protocol with the Paris Agreement.



## AYMAN ELTALOUNY

Mr. Ayman Eltalouny is the Head of the Saudi Environmental Sustainability Programme of UNEP. He has over 30 years' experience in the field, starting with a decade in the refrigeration and air-conditioning industry and before serving as Montreal Protocol Advisor to the Ministry of Environment of Egypt.

Working with UNEP OzonAction since 2003 he oversaw the technical portfolio in West Asia region and then the OzonAction International Partnership portfolio from 2016.

He also supported UNEP in coordinating the collaboration with the League of Arab States for several years.

Mr. Eltalouny is an active member of international professional associations and has represented UNEP in various technical committees and working groups worldwide, specifically in the cooling sector. Since the end of 2022, he is the UNEP programme lead in Saudi Arabia managing the joint UNEP-Saudi Arabia Environment Sustainability Programme.



## CONOR GASK

Mr. Conor Gask is an Energy Efficiency Analyst at the International Energy Agency (IEA) where he works as part of the Energy Efficiency in Emerging Economies Team. He leads engagement with policy and industry partners in China and Africa on energy efficiency in buildings, industry, and appliances sectors.

Additionally, he works on broader demand side management and flexibility issues, working to promote increased awareness of investment in these areas for promoting overall power system resilience and affordable energy.

Prior to joining the IEA, he was Head of Renewables and Power Sector at the British Embassy in Beijing, where he focused on China's supply and demand side power market reforms. Conor has also held positions at engineering consultancy Mott MacDonald, the United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP).



## RAY GLUCKMAN

A highly experienced technical and management consultant with over 40 years of experience in refrigeration, energy efficiency and climate change, Mr. Ray Gluckman is the Director of Gluckman Consulting Limited.

He is a leading authority on reducing emissions of the powerful fluorinated greenhouse gases. He has worked on related projects for over 30 years and has acted as a technical advisor in this field to many private and public entities including the UK Government, the European Commission, the United Nations and the World Bank.

Mr. Gluckman has an engineering degree from Cambridge University. He was President of the UK Institute of Refrigeration in 1995 and 1996 and received the Cooling Industry Gold Award in 2011. He is a senior advisor to the Montreal Protocol TEAP and a member of the RTOC.



## ETIENNE GONIN

Mr. Etienne Gonin is a Sustainable Cooling, Chemicals and Waste Management Technical Specialist for the Chemicals and Waste Hub of the United Nations Development Programme (UNDP).

He has worked on the Montreal Protocol since 2003, including with the Compliance Assistance Programme of UNEP, the Green Customs Initiative, and as Regional technical Advisor (focused on Africa) with UNDP's Montreal Protocol Unit.

He currently co-leads the National Cooling Action Plan Working group of the Cool Coalition. At UNDP, he supports the implementation of the Sustainable Offer, combining efforts at energy efficiency improvements and refrigerants management.

He has been supporting projects funded by bilateral donors, such as the Cool Up programme or the French Facility for Global Environment (FFEM) funded project on Abating Greenhouse Gas Emissions from Obsolete Refrigeration and Air Conditioning equipment (AGORA).



## BRIAN HOLUJ

Mr. Brian Holuj is a Programme Management Officer, United for Efficiency, at UNEP overseeing a diverse portfolio of projects. Since joining UNEP in 2017, he has secured more than US\$30 million in grants including: Africa and India Centres of Excellence for Sustainable Cooling and Cold-Chain; Model Regulation Guidelines for refrigerators, ACs and fans; Sustainable Public Procurement Toolkit; ECOWAS Refrigerators and Air Conditioners Initiative; Abating GHG Emissions from Obsolete RAC Equipment in West Africa (AGORA), among others.

He is also a consulting expert for the Montreal Protocol TEAP Energy Efficiency task force. From 2009–2017, he led international clean energy initiatives as US Department of Energy Senior Advisor, and previously in robotics and aerospace. He has an MPA and a Masters in International Relations from Syracuse's Maxwell School, and a BSc in Human Factors from the University of Illinois.



## TOM VAN IERLAND

Mr. Tom van Ierland joined the European Commission in 2006. Within the Directorate-General for Climate he leads the 'Low carbon solutions (I): Montreal Protocol, clean cooling & heating, twin transitions' unit.

This unit is responsible for European Union (EU) policies related to F-gases and ozone depleting substances. The unit furthermore looks into the interconnections of the policies fields of climate, energy, digitalisation and standardisation.

He has been closely involved in the development of the overall EU climate change policy framework and the economic modelling underpinning it.

He holds academic degrees in Applied Economics, Environmental Economics and Computer Sciences from the University of Leuven and University College London.



## THANAVAT JUNCHAYA

Mr. Thanavat Junchaya is the Senior Environmental Engineer at the World Bank with extensive expertise in planning and implementing Montreal Protocol projects. Recently he has been working with World Bank country teams to develop Kigali Implementation Plans to phase-down HFCs with energy efficiency component.

Prior to joining the World Bank, he worked as Regional Network Coordinator at United Nations Environment Programme Regional Office for Asia and the Pacific. In this role, he dedicated himself to coordinating and

strengthening partnerships between ozone officers within the region to share their Montreal Protocol experiences.

He received his Doctor of Philosophy in Transportation Engineering from the University of Maryland at College Park, and his Master of Science in Industrial Engineering from Northwestern University.



## LUKAS KAHLEN

Mr. Lukas Kahlen of the NewClimate Institute focuses on climate finance and sustainable development-related topics. He has over ten years of experience in climate and development cooperation. He currently specialises in the provision of climate policy advice on financing mitigation strategies related to renewable energy and energy efficiency both to public and private stakeholders in a range of sectors, including the RAC sector.

Mr. Kahlen has also worked on green public procurement, where he developed strategies and guidelines

for RAC appliances. Prior to joining the NewClimate Institute, he worked as a consultant supporting financial institutions internationally for the implementation of green energy loan programs.

He holds a Master's in International and Development Economics from the University of Applied Science, and a B.A. in Economics and Regional Studies Iberoamerica.



## SATISH KUMAR

Mr. Satish Kumar serves as the President and Executive Director of the Alliance for an Energy Efficient Economy (AEEE). An international expert in thermal comfort, passive cooling design and integrative building design, he has been part of the leadership team in numerous national and international initiatives.

Prior to AEEE, he was the Energy Efficiency Ambassador and led the Energy Management business at Schneider Electric India.

Mr. Kumar also worked as a Scientist at the US Department of Energy's Lawrence Berkeley National Laboratory and served on Montreal Protocol's Energy Efficiency Task Force. He has a Ph.D. from Carnegie Mellon and a B. Arch from IIT Roorkee. He is the author of over 150 book chapters, journal articles, conference papers, and industry reports.



## SERGIO MERINO

Mr. Sergio Merino is the National Ozone Officer at Mexico's Secretary of Environment and Natural Resources. With previous experience working as an officer in the Secretary of Economy of Mexico he has more than 15 years' experience on the design, implementation and evaluation of industrial policy projects in several sectors, as well as on the improvement of the regulatory framework and the investment environment in the country.

Mr. Merino provides the National Ozone Unit team with broad coordination and strengthening of

collaborative networks with different stakeholders necessary for the adequate implementation of Mexico's HPMP, currently on the 5th tranche of its second stage, and the preparation of its Kigali Implementation Plan.



## PATRICIA KAMERI-MBOTE

Ms. Patricia Kameri-Mbote is the Director of the Law Division at UNEP. Previously, Ms. Kameri-Mbote served as the Founding Research Director of the International Environmental Law Research Centre and was the Programme Director for Africa for over 20 years.

She has an in-depth knowledge and experience in environmental law and has consulted for UNEP in the review of programmes, legal instruments, and the rules of engagement of major groups.

She is also a member of the Governing Board of the International Council on Environmental Law (ICEL).

Academically, Ms. Kameri-Mbote holds a Doctorate and Master's degrees in Law from Stanford University and a Higher Doctorate from the University of Nairobi. She was awarded an Honorary Degree in Law by the University of Oslo in 2017.



## GREG PICKER

Mr. Greg Picker of Refrigerants Australia has 25 years' experience in climate change and energy policy, with a particular focus on ozone depleting substances, HFCs and related energy efficiency policy issues, beginning his professional journey in climate policy with the (UNFCCC).

In 2013, Mr. Picker became Executive Director of Refrigerants Australia. Prior to accepting the role with Refrigerant Australia, he had worked as a consultant

assisting companies manage and minimise their greenhouse emissions and energy usage.

His earlier experience included roles with the Australian Greenhouse Office, where he led policy development on the reform of the Ozone Protection and Synthetic Greenhouse Gas Management Act. This included a globally leading licensing programme for all technicians that handled both ozone depleting and HFC refrigerants.



## RAJAN RAWAL

Mr. Rajan Rawal is a Professor at CEPT University, Ahmedabad and Senior Advisor of the "Centre for Advanced Studies in Building Science and Energy" (CARBSE) at CEPT Research and Development Foundation (CRDF).

His current focus of work is on Passive Design Strategies, Building and City interaction at an Urban Scale using modelling techniques, Net Zero Energy Buildings and Communities, and Personal Thermal Comfort Systems.

Mr. Rawal's work on city-scale energy modelling and urban heat island have helped policymakers to make informed decisions about urban design leading to a reduction in energy consumption and GHG emissions. He is one of the most cited authors in the area of buildings and Climate in India having more than 120 peer-reviewed publications.



## TAO REN

Mr. Tao Ren is the R&D director at Qingdao Haier Air Conditioning Electronics Co., Ltd. He received his PhD degree in refrigeration and cryogenics from Shanghai Jiao Tong University in 2014. He worked at Shanghai Jiao Tong University from 2014 to 2018 as a postdoctoral fellow, focusing on heat exchanger and air conditioner system simulation design tools development.

Mr. Ren joined Haier in 2018, focusing on heat transfer enhancement and manufacturing of heat exchangers, energy efficiency improvement of

air conditioners and heat pumps using natural environmental-friendly refrigerants (e.g. R290) and A2L refrigerants (e.g. R32, R454B); charge control for air conditioning and heat pump systems using A2L and A3 refrigerants, and innovative air conditioner and heat pump system. .



## MADI SAKANDÉ

Mr. Madi Sakandé holds a Master's degree in the field of Refrigeration. He is a trainer at Centro Studi Galileo in Italy member of the ATF (Associazione dei Tecnici del Freddo) and international expert and consultant for United Nations agencies (UNIDO, UNDP and UNEP) on the implementation of projects related to the Montreal Protocol and its Kigali Amendment.

He is also an Expert Trainer and Assessor for the European certification of refrigeration and air conditioning technicians – F-gas Regulations.

Mr. Sakandé is a member of the RTOC (Refrigeration Technical Options Committee of the OS). He is the current President of the Union of Associations of African Actors in Refrigeration and air Conditioning where he develops capacity building trainings for African technicians' best practices and energy efficiency of refrigeration installations.



## CLAUDIA SANCHEZ

Ms. Claudia Sánchez is the Executive Director of the Colombian Association of Air Conditioning, Refrigeration and Thermal Districts – ACAIRE. She is also the Executive Secretary of the Ibero-American Federation of HVACR Associations - FAIAR. She is based in Bogota, Colombia.

She is a member of the advisory network of TechEmerge Sustainable Cooling – Agri Value Chains Andean Countries, an IFC/World Bank project. She has been panelist in national and international events.

Ms. Sanchez holds a Master's degree in Architecture and Interdisciplinary Studies from the School of Design, NC State University, Raleigh, NC., and a Bachelor's degree in Architecture from the National University of Colombia.



## BETTINA SCHRECK

Ms. Bettina Schreck is the Industrial Development Officer for Montreal Protocol Division at the United Nations Industrial Development Organization (UNIDO). She has been with UNIDO since 2009, dedicated to projects in energy, climate change and the environment.

Her work focuses on the development of government led policy programs promoting inclusive and sustainable industrialization. In 2022, she was appointed as gender officer.

Before UNIDO, she had roles in the private sector in energy firms,

including the Irish National Utility, ESBI; British Maritime Technologies, as UK engineering and risk management consultancies, and Repsol YPF, the Spanish oil and gas firm.

Ms. Schreck has degrees in Chemical Engineering from the Buenos Aires Institute of Technology, and Environmental Management from the Austral University, a Master's degree in Sustainable Development from the University of Cambridge and a Postgraduate in Disruptive Innovation from the University of Aachen.



## FRANCESCO SCUDERI

Mr. Francesco Scuderi holds a Master's degree in Electrical-Energy Engineering and he is the Secretary General of Eurovent, Europe's Industry Association for Indoor Climate, Process Cooling, and Food Cold Chain Technologies.

With more than 15 years of experience in the heating, ventilation, and air conditioning and refrigeration (HVACR) industry, his expertise encompasses technical and regulatory affairs, marketing, and technology review. Francesco's contributions extend to European legislation (including

horizontal issues such as Energy Labelling, Ecodesign, F-Gas, and Market Surveillance) and standardisation, where he also served as the Convenor for CEN/TC 44/WG 6 and ISO/TC86/SC7/WG 2.

Prior to his role at Eurovent, he worked as IP and Regulatory Affairs Engineer at a leading global player in commercial refrigeration. Francesco is widely recognised for his industry contributions, which includes publications, patents, and affiliations with various organisations.



## NIHAR SHAH

Mr. Nihar Shah is Presidential Director of the Global Cooling Efficiency Program at Lawrence Berkeley National Laboratory, leading research on refrigerants and cooling efficiency in India, China, South-east Asia, and various emerging economies including development of the UNEP U4E model regulation guidelines.

He also collaborates with RMI and CCC on the deployment of the Global Cooling Prize winning technology. He serves on the Refrigeration, Air-conditioning and Heat Pump Technical Options Committee (RTOC).

Mr. Shah received a Ph.D. in Mechanical Engineering from the University of California, Berkeley, an M.Tech. in Thermal and Fluids Engineering and a B.Tech. in Mechanical Engineering from the Indian Institute of Technology, Bombay. He is a licensed Professional Mechanical Engineer in the State of California.



## NABIL SHAHIN

Mr. Nabil Shahin is the Managing Director of the Air-Conditioning, Heating, and Refrigeration Institute's (AHRI) Middle East and North Africa (MENA) office with over 25 years of experience in the heating, ventilation and air-conditioning (HVAC) industry.

Mr. Shahin has held numerous technical and commercial positions in both the residential and commercial HVAC sectors. He served as the Director of Engineering for several global HVAC companies.

His expertise spans equipment product research and development, design, testing, and manufacturing.

Additionally, Mr. Shahin possesses marketing and sales experience in the MENA region, working with HVAC stakeholders ranging from customers and contractors to governments and regulatory bodies.

He is well-versed in various international HVAC regulations and standards across the US, Europe, Middle East, and Africa. At AHRI, Nabil oversees technical standards subcommittees. He holds a Master's degree in Mechanical Engineering from Tennessee State University, USA.



## ANDREA VOIGT

Ms. Andrea Voigt is the Head of Global Public Affairs and Communication at Danfoss Climate Solutions. Her experience in the heating and cooling industry spans over two decades.

In 2021, she joined Danfoss Climate Solutions as Head of Global Public Affairs and Member of the Strategy and Sustainability Leadership Team.

Prior to Danfoss, she was leading the European Partnership for Energy and the Environment (EPEE), a major Brussels based industry association advocating for sustainable heating and cooling

technologies at the European Union and at global level for 12 years.

Ms. Voigt is a member of the RTOC and TEAP Energy Efficiency Task Force under the Montreal Protocol and a Board member of the UN hosted Cool Coalition, as well as the Global Food Cold Chain Council and the European Heat Pump Association (EHPA).



## MONIKA WAMBUI

Ms. Monika Wambui is a Manager at Clasp, an international Non-Governmental Organization working to improve the energy and environmental performance of everyday appliances and equipment and to accelerate our transition to a more sustainable world.

She has been working in the Africa region supporting policymakers adopt efficiency standards for cooling and lighting products, including efforts under the Energy Efficiency and Lightning Appliances (EELA) programme in the East African Community (EAC) and the Southern

African Development Community (SADC). She also leads the Clean Lighting Coalition's government engagement in the Africa region under Clasp's Minamata Convention efforts.

Ms. Wambui holds a Bachelor's degree in Telecommunication and Information Engineering and is currently pursuing a Master of Science in Global Environment and Sustainability from the University of London.



## RYAN OOI CHEAN WEAI

Mr. Ryan Ooi Chean Weai has worked for the Department of Environment (DOE), Malaysia for over 19 years, gaining expertise in the Environmental Quality Act 1974, Rules, and Regulations.

He was involved in the department's and ministry's technical and operational support for the development and execution of the country's environmental policy and regulations.

Before the current position, he worked for about 10 years as an environmental enforcement officer in various DOE state offices.

He currently serves as the Senior Principal Assistant Director at the Air Division, Department of Environment, Malaysia, leading the Ozone Protection Section.

He has been involved with the Montreal Protocol since 2019, executed HPMP Stage II, and the preparation of Malaysia's Kigali Implementation Plan. He holds a bachelor's degree with honors in Environmental Science.