



XVI TTMD INTERNATIONAL HVAC&R TECHNOLOGIES SYMPOSIUM

Embodied Energy & Carbon Emissions in
HVAC System

22-24 October 2024

PROGRAM



ONLINE

www.symposium.ttmd.org.tr

symposium@ttmd.org.tr



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Embodied Energy & Carbon Emissions in HVAC System

22-24
October
2024



TURKISH TIME 13:00 | GMT/UTC +3

22 October 2024, Tuesday

13:00 - 14:15

Opening Remarks

13:00 - 13:30

Opening Session

Chair: **Murat Çakan**, Co-Chair: **Ahmet Arısoy**

Tuba Bingöl Altıok, Nermin Köroğlu Isın, Yunus Yener, Zeki Poyraz

13:30 - 14:15

Opening Speech

From Energy Efficiency to Carbon Neutrality: The new EPBD Framework for Building Regulations in Europe

Francis Allard

14:15 - 14:30

Coffee Break

14:30 - 16:00

Technical Session-1: Embodied Carbon/Energy in Buildings and Their HVAC Systems

Chair: **Murat Çakan**, Co-Chair: **Nermin Köroğlu Isın**

14:30 - 15:00

IEQ Metric as a Prerequisite for Sustainable Development

Pawel Wargocki

15:00 - 15:30

HVAC Efficiency – the Goldmine in Building Renovation Projects

Doruk Kuban

15:30 - 16:00

Update: Recent Developments on Sustainability and Circular Economy

Gülcan Ergün

16:00 - 16:15

Coffee Break

16:15 - 18:15

Technical Session-2: Zero Emission Buildings

Chair: **Murat Çakan**, Co-Chair: **Gülsu Ulukavak Harputlugil**

16:15 - 16:45

Latent Heat Storage Applications for Zero Emission Buildings

Halime Paksoy

16:45 - 17:15

Water-to-Water Heat Pump Utilization for Waste Heat Recovery from Cooling Towers in Tire Production

Orhan Gürson

17:15 - 17:45

Mitigating Strategies to Decrease the Heat Island Effect and to Improve the Thermal Comfort in Urban Outdoor Spaces

Ece Kalaycıoğlu Özdemir

17:45 - 18:15

Cool Up Programme Towards Sustainable Cooling Solutions

Zeynep Gökçen Aşan



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23 October 2024, Wednesday

13:00 - 15:10

Technical Session-3: Novel HVAC System Design Approaches
Chair: **Murat Çakan**, Co-Chair: **Neşe Ganiç Sağlam**

13:00 - 13:30

Energy Efficient Retrofitting in Buildings: Sector Coupling and Sustainability
Sinem Gündoğdu Kalkın

13:30 - 13:50

HVAC System Commissioning Process in Data Centers
Emre Özmen

13:50 - 14:10

Performance of the Hybrid Cooling System for Different Climates
Ahmet Arısoy

14:10 - 14:30

Project Sandstar
Alper Üzmezler

14:30 - 14:50

Synthesis of Al₂O₃ /HFE-7000 Nanorefrigerant for Domestic Refrigeration Application
Munish Digra

14:50 - 15:10

Energy-Efficient Building with Filterless Air Pollution Abatement (APA) Solution
Fabio Galatioto / Kağan Demirdöven

15:10 - 15:20

Coffee Break

15:20 - 16:30

Technical Session-4: Novel HVAC System Design Approach
Chair: **Murat Çakan**, Co-Chair: **Ziya Haktan Karadeniz**

15:20 - 15:50

From Data to Impact: Exposing the Reality of Refrigeration Performance Discrepancies
Tim Kroeger

15:50 - 16:10

Comparison of the Environmental Effects of Regenerative and Recuperative Burners
Sema Güneş

16:10 - 16:30

Renewal of Circulation Pumps Used in HVAC Systems and the Effect of Pump Management Functions on Energy Efficiency
Emre ÖZER

16:30 - 16:40

Coffee Break



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23 October 2024, Wednesday

16:40 - 18:00

Technical Session-5: Modeling, Simulations and Integrated Design
Chair: **Murat Çakan**, Co-Chair: **Ece Kalaycıoğlu Özdemir**

16:40 - 17:00

Four Exergy-Optimum Prongs of Carbon Footprint in Geothermal District Heating
Biröl Kilkış

17:00 - 17:20

An Introductory Overview of Urban Building Energy Models
Said Bolluk

17:20 - 17:40

Utilization of Full Factorial Experimental Design in Indoor Thermal Comfort Estimation in a Classroom
Ahmetcan Yetiş

17:40 - 18:00

Experimental Investigation of the Characteristics of Triply Periodic Minimal Surface Heat Exchangers
Alper Mete Genç



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24 October 2024, Thursday

13:00 - 14:20

Technical Session-6: High Performance Buildings
Chair: **Murat Çakan**, Co-Chair: **Kemal Gani Bayraktar**

13:00 - 13:20

Examination of the Most Sustainable LEED Certified (v4.1) Building in Turkey in the Context of Energy and Atmosphere Criteria: IDA JES ADM Building Sample
Gözde Çakır Kiasif

13:20 - 13:40

The Importance of Double Skin Facade in Energy Efficient Office Design
Mustafa Serhan Ünlütürk

13:40 - 14:00

Multi-Objective Optimization of Glazing Design and Attached Shaders for Enhanced Thermal Comfort and Reduced Energy Demand in Classroom Environments
Bita Akhgar

14:00 - 14:20

Roles of Waste Based Packed Bed Thermal Energy Storage System on Carbon Footprint Reduction of Buildings
Burcu Koçak

14:20 - 14:30

Coffee Break

14:30 - 15:30

PANEL

Session 1: Contribution of HVAC-Systems to Minimize Greenhouse Gas Emissions in the Whole Life Cycle of Buildings

Moderator: **Gülsu Ulukavak Harputlugil**

Speakers: **Thomas Lütkendorf, Freja Nygaard Rasmussen, Julia Goerke**

The Overall Landscape of WLC-Assessment for Buildings

Thomas Lütkendorf

HVAC in Life Cycle Assessment of Buildings – Nordic Experiences

Freja Nygaard Rasmussen

Requirements and Use of Environmental Product Declarations (EPDs) for HVAC Systems

Julia Goerke

15:30 - 16:30

PANEL

Session 2: Contribution of HVAC-Systems to Minimize Greenhouse Gas Emissions in the Whole Life Cycle of Buildings

Moderator: **Gülsu Ulukavak Harputlugil**

Speakers: **Samet Yilanci, Nuri Cihan Kayaçetin**

Targets for Buildings and Building Systems on the Path to Net Zero Carbon 2053 – EKB, NSEB, YEStr and the Roadmap for Net Zero Carbon

Samet Yilanci

Environmental Impact Assessment of HVAC systems for Zero Carbon Buildings

Nuri Cihan Kayaçetin

16:30 - 17:00

Closing Remarks

Murat Çakan, Tuba Bingöl Altıok, Nermin Köroğlu Isın

