

Technical Program

Version June 22, 2022

We take this opportunity to thank and welcome everyone to Responsible Engineering & Living 2022 and Engineering to Thrive 2022. We hope that you will have a wonderful time in the Southernmost city of Canada.

Sincerely,
REAL2022 Committee
ET2022 Committee

Website

Please refer to <https://real2022.ca/> and/or <https://et2022.ca/> for updates and details.

The banquet will be on Thursday June 23. Please advise us of any dietary restriction, special needs, etc. by emailing to TELab@uwindsor.ca

Notes:

This conference is for paid delegates only. If you have not registered, please do so at <https://www.uwindsor.ca/engineering/research/495/mitigating-climate-change-2022-symposium-industry-summit>
Remember to save the receipt as you checkout.

ET2022 is running parallel to REAL2022. Only one registration is needed to attend both conferences. If the number of presentations is small, ET2022 presentations will be scheduled in series with REAL2022 presentations. If required, the presentations will run in parallel to fit all presentations into the two days. Selected papers for ET2022 will be published via University of Windsor Leddy Library, <https://scholar.uwindsor.ca/wtel/2022/>, like Thriving Through Climate Change and Pandemic 2021, <https://scholar.uwindsor.ca/tccap/2021/>. The authors will retain 100% of the copyright, allowing them to further their manuscripts and disseminate them as standard journal papers subsequently.

Please limit your presentation to 15 minutes, leaving 3 minutes for discussion, and 2 minutes for changeover. In case of a no-show, the next presentation(s) will be advanced accordingly.

Selected papers for REAL2022 will be considered for a Refereed Conference Proceeding, a Reviewed Volume with Springer Nature.

Notation

- * presenting author
- † corresponding author

Paper/presentation Status

- 🗨️ presentation / abstract only
- 📄 presentation + full-length paper
- 🕒 reviews conveyed, waiting for revision
- 😊 paper accepted to be published via University of Windsor Leddy Library
- ✓ paper accepted for the Springer Nature Proceeding
- ✈️ pending visa approval and/or registration confirmation

Thursday, June 23, 2022	
08:15–08:45	Centre of Engineering Innovation (CEI) Atrium <u>Breakfast</u> Registration Package Pickup Poster Display
08:45–09:00	Welcome and Opening Remarks (Room 1101 CEI) Rupp Carriveau VP Research – (Heather Pratt), Dean of Engineering – Bill van Heyst
09:00–09:40	Plenary Lecture #1 (Room 1101 CEI) Engineering: Cleaning Water, Producing Food, Building Shelters – Graham T. Reader
09:40–10:00	Poster Display <u>Coffee Break</u>
	Renewable & Environment, Room 1101. Co-Chairs: Graham Reader & Lindsay Miller-Branovacki
10:00–10:20	✔ Solar Rooftop Test Cell – Experimental Methodology and Results of Multivariable Sensitivity Analysis Alex Nauta*, William David Lubitz†, Syeda Humaira Tasnim School of Engineering, University of Guelph, Canada
10:20–10:40	© Accounting for the greenhouse gas (GHS) emission double-counting in Greater Toronto and Hamilton Area (GTHA) Tharindu C. Dodanwala*, Dilusha Hemaal Kankanamge, Rajeev Ruparathna† Department of Civil and Environmental Engineering, University of Windsor, Canada
10:40–11:00	© Realizing clean combustion with ether fuels Simon LeBlanc*, Long Jin, Alex Bastable, Xiao Yu, Jimi Tjong, Ming Zheng† Clean Combustion Engine Laboratory, University of Windsor, Canada
11:00–11:20	⌘ Investigation of solar-driven adsorbate-based thermochemical energy storage systems with an illuminated adsorption bed Kapil Narwal*, Roger Kempers, Paul G. O’Brien† Department of Mechanical Engineering, Lassonde School of Engineering, York University, Canada
11:20–11:40	⌘ Challenges to the energy transition in transportation sector Navjot S. Sandhu*, Xiao Yu, Ming Zheng†, David S-K. Ting Clean Combustion Engine Laboratory, University of Windsor, Canada
11:40–12:00	⌘ Decomposing uncertainty in climate change impact assessments using ANOVA Tejith Pogakula*, Tirupati Boliseti† Department of Civil and Environmental Engineering, University of Windsor, Canada
12:00–13:00	Poster Evaluation Judges: Fadi Al-Daoud, David Lubitz, Lindsay Miller-Branovacki, Pual O’Brien, Jacqueline Stagner, Ahmad Vasel-Be-Hagh <u>Lunch</u>

Thursday, June 23, 2022

Engineering to Thrive, Room 1101. Co-Chairs: Fadi Al-Daoud & Paul O'Brien	
13:00–13:20	☺ Energy intensity of human transportation William David Lubitz*† School of Engineering, University of Guelph, Canada
13:20–13:40	☼ Bioinspired thermal effects on NACA0012 an airfoil Mohd Sahil Akhtar*, David S-K. Ting† Department of Chemical Engineering, National Institute of Technology Karnataka, India Turbulence & Energy Lab, University of Windsor, Canada
13:40–14:00	☼ Improving the performance of a single effect solar absorption cooling system Mahdiah Abbasi*, Graham T. Reader, David S-K. Ting† Turbulence & Energy Lab, University of Windsor, Canada
14:00–14:20	Poster Display <u>Coffee Break</u>
Engineering Systems, Room 1101. Co-Chairs: Ahmad Reza Vasel-Be-Hagh & Lindsay Miller-Branovacki	
14:20–14:40	✓ Review and evaluation of Archimedes screw pump design guidance Scott Simmons*, Murray Lyons, Lian Miller, William David Lubitz† Department of Mechanical Engineering and Metaphysics, University of the Yukon, Canada School of Engineering, University of Guelph, Canada
14:40–15:00	☼ Influence of the leg geometry on the performance of the variable cross-sectional thermoelectric generators William X. Wang*, Paul F. Henshaw†, David S-K. Ting Turbulence & Energy Lab, University of Windsor, Canada
15:00–15:20	☼ Shark skin denticles and a circular cylinder in laminar cross-flow Disha Sharma*, Vivek Joshi, David S-K. Ting† Department of Mechanical Engineering, MRS Punjab Technical University, India Turbulence & Energy Lab, University of Windsor, Canada
15:20–15:40	Poster Display <u>Coffee Break</u>
Industrial Forum on Energy, Room 1101. Co-Chairs: Paul O'Brien & Rajeev Ruparathna	
15:40–16:00	☼ Drying rice seeds using a solar dryer with phase change material: A case study in northern Iran Fatemeh Hosseini Fashami*, David S-K. Ting†, Graham T. Reader Turbulence & Energy Lab, University of Windsor, Canada
16:00–16:20	☼ Characteristics of flow around an inclined circular cylinder Ran Wang*†, Shaohong Cheng, David S-K. Ting Turbulence & Energy Lab, University of Windsor, Canada
16:20–16:40	☼ Toward zero energy residential buildings design Safa F. Zinati*, Graham T. Reader, David S-K. Ting† Turbulence & Energy Lab, University of Windsor, Canada
16:45	Bus leaves CEI, University of Windsor (@ 4:45 pm) for Banquet
18:00–20:00	Banquet at Cooper's Hawk
20:00	Bus returns from banquet (Cooper's Hawk ~ 8:00 pm) to CEI, & then, hotels, as needed

Friday, June 24, 2022	
08:15–08:45	Centre of Engineering Innovation (CEI) Atrium <u>Breakfast</u> Registration Package Pickup
08:45–09:00	Gift Draw (Room 1101 CEI) Rupp Carriveau, Dean of Engineering?
09:00–09:40	Plenary Lecture #2 (Room 1101 CEI) The Growing Greenhouse Vegetable Sector in Ontario – Opportunities and Challenges – Fadi Al-Daoud
09:40–10:00	Poster Display <u>Coffee Break</u>
Greenhouse and Energy, Room 1101. Co-Chairs: Fadi Al-Daoud & Paul Henshaw	
10:20–10:40	☞ Comparison of the spectral and intensity response of light sensors used to measure greenhouse light emissions Benjamin Snow*, William Lubitz†, Syeda Tasnim, Thomas Graham, David Llewellyn, Fadi-Al-Daoud, Chevonne Dayboll School of Engineering, School of Environmental Science, University of Guelph Ontario Ministry of Agriculture, Food and Rural Affairs, Canada
10:40–11:00	© Evaluation of pond water performance for greenhouse irrigation cooling: A case study in southwestern Canada Sedigheh Khademi*, Rupp Carriveau†, David S-K. Ting, Lucas Semple Turbulence and Energy Laboratory, University of Windsor Under Sun Acres, Leamington, Canada
11:00–11:20	✓ Methodology and validation of a new climate prediction model for commercial and small-scale greenhouses Alex Nauta*, William David Lubitz†, Syeda Humaira Tasnim, Jingjing Han School of Engineering, University of Guelph
11:20–11:40	☞ Geographical effect of a North American office building energy consumption Naveen S. Bhoopal*, Jacqueline A. Stagner†, David S-K. Ting Turbulence & Energy Lab, University of Windsor, Canada
11:40–12:00	☞ A life cycle assessment of solar photovoltaic electricity production Ehsan Alam*†, Xiaohong Xu Department of Civil and Environmental Engineering, University of Windsor, Canada
12:00–13:00	Poster Evaluation Judges: Fadi Al-Daoud, David Lubitz, Lindsay Miller-Branovacki, Pual O'Brien, Jacqueline Stagner, Ahmad Vassel-Be-Hagh <u>Lunch</u>

Friday, June 24, 2022	
Wind, Water & Power, Room 1101. Co-Chairs: David Lubitz & Rupp Carriveau	
13:00–13:20	<ul style="list-style-type: none"> ✓ Wind turbine wake redirection via external vanes Reza Nouri, Ryan R. Nash, Ahmad Vasel-Be-Hagh*† Fluid Mechanics Research Lab, Department of Mechanical Engineering, Tennessee Tech University, USA
13:20–13:40	<ul style="list-style-type: none"> ⌘ PCM for reducing heating and cooling loads Oselen J. Imafidon*, David S-K. Ting† Turbulence and Energy Laboratory, University of Windsor, Canada
13:40–14:00	<ul style="list-style-type: none"> ⌘ Urban water supply systems resilience under earthquake hazard Mo'tamad Bata*, Rupp Carriveau†, David S-K. Ting Turbulence and Energy Laboratory, University of Windsor, Canada
14:00–14:20	Final Poster Display Coffee Break
Food & Weather, Room 1101. Co-Chairs: Rajeev Ruparathna & Jacqueline Stagner	
14:20–14:40	<ul style="list-style-type: none"> ⌘ The effects of underside reflectors on the performance of radiative cooling structures Atousa Pirvaram*, Nima Talebzadeh, Sui Ning Leung,, Paul G. O'Brien† Department of Mechanical Engineering, Lassonde School of Engineering, York University, Canada
14:40–15:00	<ul style="list-style-type: none"> ⌘ Modelling a five greenhouse network in Ontario with distributed energy resource designs Lysandra Naom*, Rupp Carriveau†, Lindsay Miller-Branovacki Environmental Energy Institute / Turbulence and Energy Laboratory, University of Windsor, Canada
15:00–15:20	<ul style="list-style-type: none"> ⌘ Hydrogen integrated greenhouse horticultural energy – getting HIGH off the ground Abbey Morneau*, Rupp Carriveau†, David S-K Ting, Aaron Coristine, J J Davis Turbulence & Energy Laboratory, University of Windsor, Canada Ontario Greenhouse Vegetable Growers Kruger Energy
15:20–15:35	Oral & Poster Awards Committee Meet Committee: Fadi Al-Daoud, David Lubitz, Lindsay Miller-Branovacki, Paul O'Brien (Chair), Jacqueline Stagner, Ahmad Vasel-Be-Hagh
15:35–15:50	Awards¹ Presentation in Room 1101
Thank you for your contribution. We look forward to seeing you next year.	

¹The 6 awards are:

- REAL2022 Exceptional Student Oral Presentation
- REAL2022 Excellent Student Oral Presentation
- REAL2022 Outstanding Student Oral Presentation
- REAL2022 Exceptional Student Poster Presentation
- REAL2022 Excellent Student Poster Presentation
- REAL2022 Outstanding Student Poster Presentation

Engineering to Adapt 2023, June 22-23, 2023. Information will become available at www.eta2023.ca (currently under construction).

Reclaiming Eden – Engineering a Brighter Tomorrow 2023, June 22-23, 2023. Information will become available at www.reebt2023.ca (currently under construction).