

# Technical Program

Version June 19, 2019

We would like to take this opportunity to thank and welcome everyone to Energy and Resources for Tomorrow 2019. Your efforts and contributions have made this conference a success. We hope that you will have a wonderful time in the Southernmost city of Canada, and we look forward to welcoming you back for a similar conference next year.

Sincerely,  
EART2019 Committee

## Website

Please refer to <https://eart2019.ca/> for updates and details.

The banquet will be on Thursday June 20. Please advise us of any dietary restriction, special needs, etc. by emailing to [TELab@uwindsor.ca](mailto:TELab@uwindsor.ca)

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## Notes:

This conference is **restricted to paid delegates**. If you have not registered, please do so with your credit card at <https://webapps.uwindsor.ca/conferences/TandE/index.php>

Remember to save the receipt as you checkout, and email a copy to [TELab@uwindsor.ca](mailto:TELab@uwindsor.ca).

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 will be considered for a Refereed Conference Proceedings, a Reviewed Book Chapter, and/or a Special Journal Issue.

For last year's conference, Energy & Sustainability 2018 Symposium & Industry Summit, <https://eas2018.ca/>, selected papers have been published in:

Special Issue in Sustainable Energy Technologies and Assessments, Natural Resources and Energy Usage, see <https://www.sciencedirect.com/journal/sustainable-energy-technologies-and-assessments/special-issue/10FQCNL9CNC>

Advances in Sustainable Energy with Springer, see <https://www.amazon.ca/Advances-Sustainable-Energy-Ahmad-Vasel/dp/303005635X>  
or,  
<https://www.bookdepository.com/Advances-Sustainable-Energy/9783030056353>

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## Notation

\* presenting author

### Paper/presentation Status

- ☒ presentation / abstract only
- Ⓜ full-length paper under review, in addition to confirmed presentation
- 📄 full-length paper, pending finalized version from the author(s), in addition to confirmed presentation
- ✈ pending visa approval and/or registration confirmation

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## Student Awards Information

In order to encourage student participation and showcase the talents of students, there will be **two awards for best student's presentations** sponsored by **Ryerson University**: cash prizes of \$300 to 1<sup>st</sup> place winner and \$200 to 2<sup>nd</sup> place winner. Both winners will get certificates acknowledging their performances.

<b>Thursday, June 20</b>	
08:00–08:30	<b>Centre of Engineering Innovation (CEI) Atrium</b> Breakfast & Registration Package Pickup
08:30–08:40	<b>Welcome and Opening Remarks (Room 1101 CEI)</b> Rupp Carriveau, VP Research, Dean of Engineering
08:40–09:20	<b>Plenary Lecture #1 (Room 1101 CEI)</b> ☞ Tomorrow’s Energy, Renewables Alone? – Graham T. Reader
	<b>Energy, Room 1101. Co-Chairs: Elsayed Elbeshbishy &amp; Lindsay Miller</b>
09:20–09:40	☒ Energy-1. Energy system transformations and emergent occupations – a framework for curriculum development and strategic training Lindsay Miller, Rupp Carriveau, Michelle Branigan*, Mark Chapeskie Environmental Energy Institute, University of Windsor / Electricity Human Resources Canada, Canada
09:40–10:00	☒ Energy-2. Impact of hydrothermal pretreatment on volatile fatty acids production from two types of waste streams Farokh Laqa Kakar*, Ehssan Hosseini Koupaie, Hisham Hafaz, Elsayed Elbeshbishy Civil Engineering, Ryerson University, Canada Greenfield Global, Canada
10:00–10:20	<a href="#"><u>Coffee Break</u></a>
	<b>Engine &amp; Environment, Room 1101. Co-Chairs: Eldina Salkanović &amp; Rajeev Ruparathna</b>
10:20–10:40	☞ Engine-1. Quality of energy resources and its impact on transportation application: from fossil fuel to battery Xiao Yu, Navjot Sandhu*, Zhenyi Yang, Ming Zheng, David S.-K. Ting Clean Combustion Lab, University of Windsor, Canada
10:40–11:00	☞ Engine-2. High pressure DME spray for compression ignition engines Simon Leblanc*, Xiao Yu, Ming Zheng Clean Combustion Lab, University of Windsor, Canada
11:00–11:20	☞ Engine-3. Energy and exergy analyses of Whispergen Stirling engine Akash Mathew*, Graham T. Reader, David S.-K. Ting Turbulence & Energy Lab, University of Windsor, Canada
11:20–11:40	☞ Environment-1. Application of modern satellite earth observation technologies for monitoring environmental processes in Ontario lakes Daniel Spitzer*, Rene Dirks, Jesse Vermaire, Xiaohong Xu A-MAPS Environmental Inc Institute of Environmental Science & Department of Geography & Environmental Studies, Carleton University Department of Civil and Environmental Engineering, University of Windsor, Canada
11:40–12:00	☒ Environment-2. Financial model of a carbon-neutral microgrid at an Ontario high school Lindsay Miller*, Rupp Carriveau, Jim Fonger, Steven Costa Environmental Energy Institute, University of Windsor / Ameresco Canada Inc., Canada
12:00–13:00	Lunch & <a href="#"><u>Poster Display?</u></a> (Co-chairs: Eldina Salkanović & Lindsay Miller)

<b>Thursday, June 20</b>	
	<b>Heat Transfer, Room 1101. Co-Chairs: Rajesh Seth &amp; Quade Digweed</b>
13:00–13:20	<p>☞ Heat Transfer-1. Numerical investigation of deteriorated heat transfer phenomenon for supercritical water flow in vertical circular tubes Rohit Maitri, Huirui Han*, Chao Zhang, Goutam Dutta, Jin Jiang Department of Mechanical &amp; Materials Engineering / Department of Electrical &amp; Computer Engineering Western University, Canada</p>
13:20–13:40	<p>☞ Heat Transfer-2. Enhancing heat convective from a flat plate using a pair of winglets Siddharth Koushik Mohanakrishnan*, Junguo Wang, David S.-K. Ting, Steve Ray Turbulence &amp; Energy Lab, University of Windsor, Canada Essex Energy, Canada</p>
13:40–14:00	<p>☞ Heat Transfer-3. Convective heat transfer enhancement downstream of an orificed perforated plate Jirra Charan*, Yang Yang, Jacqueline A. Stagner, David S.-K. Ting, Steve Ray National Institute of Technology, Tiruchirappalli, India Turbulence &amp; Energy Lab, University of Windsor, Canada Essex Energy, Canada</p>
14:00–14:20	<a href="#"><u>Coffee Break</u></a>
	<b>Heat &amp; Energy, Room 1101. Co-Chairs: Rajeev Ruparathna &amp; Ahmad Reza Vassel-Be-Hagh</b>
14:20–14:40	<p>☞ Heat-1. Characterization of a co-axial heat exchanger using CFD R. Reeghesh*, J. Wang, T. Bolisetti, D.S.-K. Ting, S. Reitsma Turbulence &amp; Energy Lab, University of Windsor, Canada Geosource Energy, Canada</p>
14:40–15:00	<p>☞ Heat-2. Exergy analysis of a ground-source heat pump with a latent heat storage unit for greenhouse application Raghuvveera Sai Sarath Dittakavi*, Rupp Carriveau, David S.-K. Ting Turbulence &amp; Energy Lab, University of Windsor, Canada</p>
15:00–15:20	<p>☞ Energy-3. Chemical pretreatment of thickened waste activated sludge using free nitrous acid and hydrogen peroxide Salomeh Chegini*, Frances Okoye, Elsayed Elbeshbishy Department of Civil Engineering, Ryerson University, Canada</p>
15:20–15:40	<a href="#"><u>Coffee Break</u></a>
	<b>Industrial Forum on Energy, Sustainability &amp; Waste, Room 1101. Chair: Lindsay Miller</b>
15:40–16:40	<p>☞ James Butler, National Research Council of Canada, Canada ☞ Cora Carriveau, Enbridge Gas Inc, Canada</p>
16:45	Bus leaves CEI, University of Windsor (@ 4:45 pm) for Banquet
18:00–20:00	Banquet at Oxley Estate Winery
20:00	Bus returns from banquet (Oxley Estate Winery @ 8:00 pm) to CEI, & then, hotels, as needed

<b>Friday, June 21</b>	
08:00–08:30	<b>Centre of Engineering Innovation (CEI) Atrium</b> Breakfast & Registration Package Pickup
08:30–08:40	<b>Gift Draw (Room 1101 CEI)</b> Rupp Carriveau, VP Research, Dean of Engineering
08:40–09:20	<b>Plenary Lecture #2 (Room 1101 CEI)</b> ☒ Renewable Energy Production from Municipal Solid Waste – Elsayed Elbeshbishy
	<b>Energy, Room 1101. Co-Chairs: Farokh Kakar &amp; Lindsay Miller</b>
09:20–09:40	☒ Energy-4. Optimization of anaerobic co-digestion of multi substrates for bio-methane recovery Anahita Rabii*, Saad Aldin, Yaser, Dahman, Elsayed Elbeshbishy Civil Engineering / Chemical Engineering, Ryerson University, Canada
09:40–10:00	☒ Energy-5. Preliminary study on vertical farm energy consumption with multiple lighting strategies Quade Digweed*, Xiuming Hao Harrow Research and Development Centre, Agriculture and Agri-Food Canada, Canada
10:00–10:20	<a href="#"><u>Coffee Break</u></a>
	<b>Wind &amp; Sustainability, Room 1101. Co-Chairs: James Butler &amp; Rupp Carriveau</b>
10:20–10:40	☞ Wind-1. Applying AI-based solutions to avoid bird collisions at wind parks Eldina Salkanović*, Peter Enevoldsen, George Xydis Department of Business Development and Technology, Aarhus University, Denmark Vesta Wind Systems A/S, Denmark
10:40–11:00	☞ Wind-2. Negative yaw versus positive yaw: the impact of Coriolis or the direction of rotation of the blades Reza Nouri, Ahmad Vassel-Be-Hagh* Mechanical Engineering, Tennessee Tech University, USA
11:00–11:20	☒ Wind-3. Survey of generation characteristics for power production Veronika Byra*, Lindsay Miller, Rupp Carriveau Environmental Energy Institute, University of Windsor, Canada
11:20–11:40	☒ Wind-4. Identifying generator faults using SCADA data and principal component analysis Luke Norman*, David S.-K. Ting, Rupp Carriveau Turbulence & Energy Lab, University of Windsor, Canada
11:40–12:00	☒ Sustainability-1. Sustainable Road Infrastructure Management using Building Information Modeling (BIM) Kartik Patel*, Rajeev Ruparathna Civil & Environmental Engineering, University of Windsor, Canada
12:00–13:00	Lunch

## Friday, June 21

<b>Heat &amp; Storage, Room 1101. Co-Chairs: Graham Reader &amp; Ahmad Reza Vasel-Be-Hagh</b>	
13:00–13:20	<p>☞ Heat-3. Boosting heat convection from a hot PV panel via an array of finite height cylinders Saarah Akhand*, David S.-K. Ting, Graham T. Reader Turbulence &amp; Energy Lab, University of Windsor, Canada</p>
13:20–13:40	<p>☞ Heat-4. Design and development of heat recovery steam generation system for automotive engines R. Reeghesh*, R. Udayakumar, C. Periasamy, A. Baburaj Birla Institute of Technology and Science Dubai Campus, UAE</p>
13:40–14:00	<p>☞ Heat-5. The effects of geometry and substrate material on thermoelectric generator performance Xi Wang*, David S.-K. Ting, Paul Henshaw Turbulence &amp; Energy Lab, University of Windsor, Canada</p>
14:00–14:20	<p>☞ Storage-1. The effect of weather condition on the performance of cavern-based compressed air energy storage plants Rupp Carriveau*, Mehdi Ebrahimi, David S.-K. Ting Turbulence &amp; Energy Lab, University of Windsor, Canada</p>
14:20–14:40	<a href="#"><u>Coffee Break</u></a>
<b>Water, Room 1101. Co-Chairs: Rajesh Seth &amp; David Ting</b>	
14:40–15:00	<p>☒ Water-1. Assessing the water availability in Kruger National Park, South Africa A.R. Talukder, T. Bolisetti, E. Riddell Department of Civil and Environmental Engineering, University of Windsor, Canada. SANPARKS Skukuza, South Africa.</p>
15:00–15:20	<p>☒ Water-2. Sewage Contaminated Lake Water Quality Remediation through In-Situ Aeration Dylan Verburg, Rajesh Seth*, Raman Sharma, S.K. Goyal, Rakesh Kumar Department of Civil &amp; Environmental Engineering, University of Windsor Canada CSIR-National Environmental Engineering Research Institute Delhi Zonal Center, New Delhi / Nagpur, India</p>
15:20–15:40	<p>☒ Water-3. Review of polymer gels for conformance control in oil reservoirs Saman Kazemi*, Tirupati Bolisetti, Xiaohong Xu Department of Civil and Environmental Engineering, University of Windsor, Canada.</p>
15:40–16:00	<p>☞ Water-4. Implementing the water-energy-food nexus in southern Africa: mechanisms and a roadmap for WEF nexus operationalisation D. Naidoo, T. Mabhaudhi, L. Nhamo, S. Mpandeli, C. Nhemachena, A. Senzanje*, S. Liphadzi, A.T. Modi Water Research Commission of South Africa University of KwaZulu-Natal / International Water Management Institute / University of Venda South Africa</p>
Thank you for your contribution	