



World Renewable Energy Congress XXI


MU Murdoch University

Renewable Energy: A Pathway to Economic Recovery & Climate Change Mitigation

Murdoch University, Perth, Western Australia, 4 – 9 December, 2022

Conference Program

Sunday 4th December 2022

Time	Event
8:00am	Short Course registration 1: The Hydrogen Economy and Technology - Kim Beazley Lecture Theatre
8.30am to 12.00pm	Short course
12:00pm	Lunch
12.45pm	Short course 2 registration - Kim Beazley Lecture Theatre
1:00pm	Short Course 2: Lithium Valley, Renewable Energy, and the Battery Storage Revolution
1:00pm to 4.30pm	Workshop 1: Energy Transition with Hydrogen – ECL2 lecture theatre
5:00pm	Early conference registration: Student Hub
5:30pm to 8:30pm	Welcome reception BBQ: Student Hub sponsored by  Powerledger Sponsor's message: Dr Vivek Bhandari, Chief Technology Officer at Powerledger.

Monday 5th December

Time	Event
7:30am	Registration ECL Atrium.
8:30am	Conference Inauguration: ECL1 Chair: A. Prof Martin Anda , <i>Chair of Environmental Engineering, Murdoch University.</i> <ol style="list-style-type: none">1. Welcome to Country: Mrs. Marie Taylor, <i>Aboriginal Noongar Elder.</i>2. Welcome from Murdoch University: Prof Andrew Deeks, <i>Vice Chancellor, Murdoch University.</i>3. Welcome from World Renewable Energy Network (WREN): Prof Ali Sayigh, <i>Director General, WREN.</i>4. Conference inauguration: Dr Brad Pettitt, <i>MLC Member for the South Metropolitan Region Greens, Western Australia.</i> <i>Leadership and Opportunity in the Laggard State: renewable energy and climate action.</i>
9:00am	Keynote Speeches: ECL1 Chair: Prof. Tania Urmee , <i>Murdoch University.</i> <ol style="list-style-type: none">1. Prof. Ali Sayigh, <i>Director General, World Renewable Energy Network.</i> <i>Progress and Innovative Applications in Renewable Energy.</i>2. Prof. Martin Green, <i>University of New South Wales.</i> <i>“Era of insanely cheap solar power”.</i>3. Prof. Peter Newman, <i>John Curtin Distinguished Professor, Curtin University Sustainability Policy Institute Perth.</i> <i>The Rise and Rise of Renewable Cities.</i>
10:00am	Exhibition Opening and Morning Refreshments
10:30am	Common Session 1: ECL1 Topic: Renewable Energy, Policy, and Practice Chair: Professor Parisa A. Bahri , <i>President of Academic Council / Head of Engineering & Energy College of Science, Health, Engineering & Education, Murdoch University.</i> <ol style="list-style-type: none">1. Prof. Bill Hare, <i>CEO Climate Analytics & Adj. Prof. Murdoch University.</i> <i>Rapidly Decarbonizing the Global Power Sector is Crucial for Keeping the 1.5°C Goal Alive.</i>2. Mr. Mike Houlahan, <i>Chief Financial Officer, Horizon Power, Perth.</i> <i>Decarbonization and digitization of regional energy systems.</i>3. Prof. Ross Garnaut, <i>Professorial Fellow of Economics, University of Melbourne</i> <i>Negative emissions and zero carbon feedstocks: the critical role of biomass (pre-recorded).</i>

11:30am – 12.30pm	
<p>Common Session 2: ECL1</p> <p>Topic: Bioenergy and Global & Developing Countries Chair: Ms. Colleen Yates, CEO Regional Development Australia, Perth.</p> <p>1. Dr Nugroho Adi Sasongko, Divisional Head, National research & Innovation Agency (BRIN), Jakarta, Indonesia. Technical Review of Biomass Utilization for Co-Firing Fuel in Boilers at Coal-Fired Power Plants.</p> <p>2. Prof. Tania Urmee, Murdoch University. Transition to Net Zero Energy -What we need to do?</p> <p>3. Dr Jana Orszaghova, Blue Economy CRC and University of Western Australia. Paving the way for Australian offshore renewable energy solutions.</p> <p>4. Mr. Tony Book, Tony Book Consultancy, UK. Renewable energy - management and savings (online)</p>	<p>Workshop 2: Sustainable Power for Aboriginal & Torres Strait Islander Communities: Room 460.2.031 (level 2 opposite ECL1)</p> <p>Chair: Dr Biji Kurup, Adj. Senior Lecturer, Murdoch University.</p> <p>1. Mrs. Mara West, Chair Homelands Water and Energy Group, Prof. Rhonda Marriott, AM, Pro Vice Chancellor, Ngangk Yira Institute for Change, Murdoch University. Recommendations from Aboriginal and Torres Strait Islander Co-design Workshop on Water and Sanitation, 2021.</p> <p>2. Associate Professor Roz Walker, Ngangk Yira Institute for Change, Murdoch University. Strengthening Aboriginal Community Capacity for Sustainable Futures: Key Recommendations from Aboriginal Environmental Health Review.</p> <p>3. Ms. Sharon Wood-Kenney & Mr. David Rice, Engineers Australia: Implementing Sustainability from an Indigenous Perspective: Lessons for Engineering.</p>
12:30PM	Lunch

1.30pm – 3.00pm			
<p>Parallel Session 2A: ECL1</p> <p>Topic: Solar Power Chair: Prof. Adam Osseiran, Hydrogen Society of Australia.</p> <p>1. Dr. Rui Costa Neto, IST, Portugal. Phase Change Materials in a Hybrid Solar Thermal/Photovoltaic Energy</p>	<p>Parallel Session 2B: ECL3</p> <p>Topic: Energy Storage and Management</p> <p>Chair: Dr. GM Shafiullah, Murdoch University.</p> <p>1. Dr. Terry Humphries, Curtin University.</p>	<p><u>Workshop 2..... continued</u></p> <p>Sustainable Power for Aboriginal Communities: Room 460.2.031 (level 2 opposite ECL1)</p>	<p><u>Workshop 3</u></p> <p>Biomass for Bioenergy: Kim Beazley Lecture Theatre</p>
		<p>Chair: Prof Rhonda Marriott, Ngank Yira Research Institute, Murdoch University.</p> <p>Welcome: Mrs. Mara West, Chair, Homelands Power and Water Group</p> <p>1. Ms. Patricia Riley, CEO Pandanus Park WA.</p>	<p>Topic: Policy and Progress Chair: Dr. Simon Dawkins, Oil Mallee Association.</p> <p>1. Prof. Richard Harper, Murdoch University.</p>

<p>Storage System for a Residential House.</p> <p>2. Prof. John Boland, <i>University of South Australia</i>. Probabilistic forecasting of solar energy using quantile regression.</p> <p>3. Mr. Daniel Dodzi yao Setsoafia, <i>Charles Darwin University, Darwin</i>. Density Functional Theory Simulation of photovoltaic properties of small molecule based organic solar cells.</p> <p>4. Dr. Saad Odeh, <i>Western Sydney University</i>. Performance Analysis of a Residential PV/ Thermal Hybrid System in Sydney.</p> <p>5. Mr. Nikhil Jayaraj, <i>Curtin University, WA</i> The transition towards solar energy storage in Western Australia: a multi-level perspective (online).</p>	<p>Saline hydrides with aluminum doping as a thermochemical battery material.</p> <p>2. Mr. Wai Qian Tham, <i>University of Dublin</i>. Investigating Luminescent Materials for Circadian Rhythm Regulation using Daylight.</p> <p>3. Mr. Manoj Kumar Yadav, <i>Department of Energy Science and Engineering, Indian Institute of Technology Bombay</i>. Optical analysis of a compound parabolic collector with aerogel and polycarbonate cover.</p> <p>4. Dr. Saleh Almsater, <i>University of South Australia</i>. Comparison between bare and finned heat pipes as a heat transfer enhancement technique on the overall performance of the thermal storage system for concentrating solar power applications.</p> <p>5. A Prof. Carlos Santos Silva, <i>IST Lisbon, Portugal</i>. Reliable - Real Time Dashboard on Buildings occupants' risk during extreme weather events</p>	<p>2. Ms. Joyce Drummond, <i>Education & Training, IBN Group, Wakathuni</i>.</p> <p>3. Mr. William Davis, <i>Project Manager, Pilbara Solar Pty Ltd</i>.</p> <p>4. Ms. Brigette McDowell, <i>CEO, Cheeditha Energy, Karratha, WA</i>.</p> <p>5. Mr. Geoff Haerewa, <i>President, Shire of Derby</i></p> <p>6. Mr. Benny Abraham, <i>Hon Research Fellow, Murdoch University</i>. Water and Power Solutions for remote Indigenous communities using Solar PV – Hydrogen – Fuel Cell - Battery system.</p> <p>7. Ms. Katie Quail, <i>UNSW, Sydney</i>. Large-Scale Renewable Energy Developments on the Indigenous Estate: How can we ensure participation and benefits for Aboriginal and Torres Strait Islander Peoples?</p> <p>8. Assoc Prof. Martin Anda, <i>Murdoch University</i>. Hydrogen Energy for Homeland Communities: A 100% renewable energy stand-alone microgrid.</p>	<p>Bioenergy and other land-based carbon mitigation options.</p> <p>2. Dr Kim Brooksbank, <i>Department of Primary Industries and Regional Development, WA</i>. Biomass in the Western Australian Wheatbelt - A new resource for agriculture and energy.</p> <p>3. Dr Annette Cowie – <i>Department of Primary Industries, NSW</i>. Quantifying the climate effects of bioenergy (online).</p>
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3.00pm Coffee break				
3.30pm – 5.30pm				
<p>Parallel Session 3A: ECL 1</p> <p>Topic: Energy Source and Practice Chair: Dr.Gloria Rupf, Murdoch University.</p> <p>1. Prof. Phillippe Lauret, University of Reunion Island. How to verify solar probabilistic forecasts?</p> <p>2. Dr. Ali Moradi Amani, RMIT University. Energy resources and storage systems in power distribution grids: The importance of data-driven simulation tools.</p> <p>3. Dr. Ryota Kuzuki, The Japan Gas Association. Developing e-methane value chain for carbon neutral city gas supply in Japan (online).</p> <p>4. Mr. Subhash Chandra, Trinity College, Dublin. Assessment of large-area luminescent solar concentrators as building</p>	<p>Parallel Session 3B: ECL 3</p> <p>Topic: Renewable Energy Possibilities. Chair: Prof. Phillip Jennings, Murdoch University.</p> <p>1.Mr. Liaqat Ali, Powerledger WA, Flexibilities and the distribution marketplaces.</p> <p>2. Ms Liz Baggetta, Synergy WA. Is a ‘Just Transition’ from Coal to Renewables Possible?</p> <p>3. Ms. Wan Nur Atikah Binti Haji Wan Nafi, UNSW Canberra. Synthesis of green materials for removal of PFAS from aqueous solution.</p> <p>4.Dr. Alex Prichard, Carnegie Clean Energy. MoorPower: Using wave energy to decarbonize the aquaculture industry.</p>	<p>Parallel session 3C: ECL 4</p> <p>Topic: Policy and Sustainable Development Chair: Dr Jana Orszaghova, University of Western Australia.</p> <p>1.Prof. Norbert Wohlgemuth, University of Klagenfurt, Austria. Trade-offs and synergies between renewable energy policies and sustainable development objectives.</p> <p>2. Mr. Alan Jones, Avertas Energy. Better Practice.</p> <p>3. Dr. Genevieve Simpson, Curtin University. Workforce requirements for the energy transition: Challenges and Opportunities.</p> <p>4. Mr. William Spencer, Murdoch University.</p>	<p>Workshop 2 continued: Sustainable Power for Aboriginal Communities: Room 460.2.031</p> <p>Panel discussion to include all previous speakers.</p> <p>Coordinator: Mrs. Mara West.</p> <p>Facilitator: Ms. Susan Kreemer -Pickford, General Manager, WA Division, Engineers Australia.</p> <p>5.00pm Recommendations</p> <p>5.20pm Close + Refreshments & networking: Kim Beazley Lecture Theatre</p>	<p>Workshop 3 continued: Kim Beazley Lecture Theatre</p> <p>Topic: Industry Perspectives Chair: Dr Simon Dawkins, Oil Mallee Association.</p> <p>1. Dr. Beren Spencer-Grayling, Inpex New Energy, Japan, ANZ and Qantas. Carbon farming and biofuel production in Western Australia</p> <p>2. Ms. Jennifer Lauber Patterson, Managing Director Frontier Impact Group. Renewable fuel generation in the Wheatbelt.</p> <p>3. Mr. Kevin Bingwa, CEO B &Co Operational, Singapore ByoMax for molecular conversion.</p> <p>4. Dr. Adriana Downie - Senior Commercialization Officer, Licella Biomass to Biocrude: Licellas Cat- HTR technology.</p> <p>5.20pm Concluding remarks: Prof Richard Harper, Murdoch University.</p> <p>5:30pm Close + Refreshments & networking: Kim Beazley Theatre</p>

<p>integrated geodesic dome panels (online).</p> <p>5. Mr. Aaron Glenn, <i>Trinity College, Dublin.</i> Design, Fabrication, Optimization and Large-Scale Preliminary Testing of Plasmonic Luminescent Solar Concentrator Devices (online).</p>	<p>5. Prof. Navid Moheimani, <i>Algae Research Centre, Murdoch University.</i> Continuous non-destructive hydrocarbon extraction from <i>Botryococcus braunii</i> BOT-22 (online)</p>	<p>Bioproducts were produced by reacting Western Australian wood and ilmenite/iron ore.</p> <p>5. Prof. Ming Jun Huang, <i>Ulster University.</i> Experimental Analysis on Advanced Plc Controlle Air-Source Heat Pump For Residential PCM Underfloor Heating And Hot Water Supply (online)</p>		
<p>6.00 to 6.15pm: 2 Coaches leave from the Chancellery for the Gala Dinner on the Crystal Swan floating restaurant, Barrack Street Jetty.</p> <p>7.00on to 9.30pm Coaches return to Murdoch University (1 @ 9.30pm and 1 later).</p> <p>Delegates can make their own way, but <u>boarding will only be permitted at 7pm</u></p>				

Tuesday 6th December

<p>8:30am</p>	<p>Common Session 4: ECL 1 Topic: Energy Policy Chair: A. Prof John Ruprecht, Harry Butler Institute, Murdoch University.</p> <ol style="list-style-type: none"> Ms. Kate Chaney MP, Independent Federal Member for Curtin. “The current policy landscape: progress so far and where we need to be.” Prof Wasim Saman, Emeritus Professor of Sustainable Energy Engineering, University of South Australia. Global Consequences of Covid-19 on Energy Use and Emissions.
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	<p>3. Mr. Deny Waskitho Sigit, PT PLN (Persero), Indonesia. Indonesian State-Owned Electricity Company (PT PLN) Role in Indonesia Energy Transition: Opportunities & Challenges.</p>		
9.30am	Parallel Sessions 4		
<p>Session 4A: ECL1</p> <p>Topic: Production & Practice Chair: Mr. Chris Oughton, Kwinana Industry Authority</p> <p>1. Mr. Mashawar Javed Kalair, Pioneer Electric System (Pesco) Pakistan. Design of a 100kW Photovoltaic System.</p> <p>2. Prof. Hyung-Man Kim, Dept of Nanoscience and Engineering, INJE University, South Korea. Development of an Anion Exchange Membrane-based Unitized Regenerative Fuel Cell for the Utilization of Renewable Energy Sources.</p> <p>3. Dr. Naser Waheeb Alnaser, University of Bahrain. The Performance of Four Domestic Rooftop 7.8 kW, PV in the Kingdom of Bahrain (online).</p>	<p>Session 4B: ECL2</p> <p>Topic: Energy Policy Chair: Prof. Geon Ho, Murdoch University.</p> <p>1. Ms Elona Rey-Costa, University of New South Wales. Unlocking the Ignored Superpower: The role of surplus clean energy for widespread economic and industrial transformation in Australia.</p> <p>2. Dr. Alexander Akimov, Griffith University, Qld. Are Australian Regulatory & Policy Frameworks ready for a DER-led Energy Transition?</p> <p>3. Prof. William Grace, University of Western Australia. Optimizing generation and energy storage in the energy transition to net zero power networks.</p>	<p>Session 4C: ECL3</p> <p>Topic: Hydrogen Chair: Ms. Lorie Jones – Hydrogen Society of Australia.</p> <p>1. Mr. Mark Ferron, Murdoch University. Hydrogen as the New Zero Carbon Fuel for Brick Kilns: Conversion trials and future strategy.</p> <p>2. Dr. Nasir Mahamood, RMIT University. Advanced catalysts to produce low-cost hydrogen from water splitting.</p> <p>3. Prof. Bashir Ahmmad, Yamagata University, Japan. Biomolecule decorated photocatalysts of metal sulfides for highly efficient hydrogen production via water splitting (online).</p>	<p>Session 4D: ECL4</p> <p>Topic: Sustainable Energy Chair: Mr. Warren Phillips, Development WA.1</p> <p>1. Ms. Delwara Khanom Chemonics International, Bangladesh. Private Sector Led Solar Energy Systems for Sustainable Economic Development in Rural Bangladesh.</p> <p>2. Prof. Uwe W Schulz, Lucerne University of Applied Sciences and Arts, Switzerland. Fossil-free village simulation game.</p> <p>3. Dr. MD Islam, Khalifa University of Science and Technology, Abu Dhabi. UAE Experimental Study on Energy Harvesting from Flow-Induced Vibration</p>
10:30am	Coffee Break		
11:00am	<p>Parallel Session 5A: ECL 2</p> <p>Topic: Energy Production and Storage.</p>	<p>Parallel Session 5B: ECL 3</p> <p>Topic: Energy and Environment.</p>	<p>Workshop 4: ECL 1</p> <p>Sustainable Community Development</p>

	<p>Chair: Mr. Ro Richardson, <i>Dept of Water and Environmental Regulation, WA.</i></p> <p>1. Prof. Kanzumba Kusakana, <i>Central University of Technology, South Africa.</i> A review of Rubber Tyred Gantry cranes energy efficiency improvements based on energy monitoring, energy storage systems and optimal operation control strategies.</p> <p>2. Ms. Ashlee Jones, <i>Power Research and Development.</i> Pumped-Up Walpole, a distribution connected bulk energy storage facility (in construction) - a case study.</p> <p>3. Mr. Muhammad Hasnan Sazzad, <i>UNSW Sydney, Australia.</i> Low-temperature waste heat recovery through thermos radiative power generation.</p> <p>4. Mr. Keith Wingard, <i>Solar Cookers International, Sacramento, USA.</i> Solar Cooking: A solution for climate change and economic savings (online).</p> <p>5. Mr. Mohammad Bany Issa, <i>Universidade de Santiago de Compostela, Spain.</i> Simple Solution of DC-Offset Rejection Based Phase-Locked Loop for Single-Phase Grid- Connected Converter (online).</p>	<p>Chair: Mr. Manoj Kumar Yadav, IIT Bombay, Mumbai (India).</p> <p>1. Cr. Peter Long, <i>City of Karratha, WA.</i> Issues with the coming renewable energy boom in the Pilbara.</p> <p>2. Prof. Genku Kayo, <i>Tokyo City University.</i> Study on district scale renewable-based heat potentials in Tokyo urban region.</p> <p>3. Dr. David Galloway, <i>Curtin University.</i> Tech is useless unless it's installed ... and works.</p> <p>4. Mr. Bill Cass, <i>Trinity College, Dublin.</i> Understanding the impact of environmental conditions on the Development & Application of LDS on Photovoltaics (online).</p> <p>5. Dr. Shaakirah Madhi, <i>Trinity College Dublin.</i> Phosphorescent Layers for Photovoltaic Efficiency Enhancement (online).</p>	<p>Chair: Prof. Garry Baverstock, AM. <i>Time Arrow Innovation Hub, WA.</i></p> <p>11:00am - Mr. Mike Hulme, <i>Witchcliffe Ecovillage, WA.</i> Sustainable Settlements – Witchcliffe Ecovillage</p> <p>11:30am Mr. Warren Phillips, <i>Development WA.</i> East Village, S. Fremantle.</p> <p>11:45am Mr. Jey Shivakumar, <i>Energy Transformation Services, WA.</i> Microgrids for a Sustainable Energy Future.</p> <p>12:00 pm Dr. Mikhail Vasiliev, <i>Clearvue PV, Perth.</i> High-transparency clear glass windows and agrivoltaics with large PV energy outputs. ClearVuePV – Smart window power.</p> <p>12:15 pm Panel discussion to include all speakers.</p>
12:30pm	Lunch break		

<p>1:30pm</p>	<p>Coaches leave from the Chancellery for the Field Visits Choose your visit, group 1 or 2 and add your email address to the list at registration.</p> <p>Field Visit Group 1 (WEST)</p> <ol style="list-style-type: none"> 1. Carnegie Clean Energy Ltd, Rouse Head, North Fremantle Energy from ocean waves and converts it into electricity. 2. East Village battery by DWA, S. Fremantle. Homes powered by renewable energy and a shared community 670kW battery. 3. WGV battery by DWA, S. Fremantle Community battery storage. 4. Hazer hydrogen plant, Woodman Point WWTP Clean and economically competitive hydrogen production. 5. Synergy's Kwinana FOM battery. Synergy and Kwinana Big Battery load shifting. <p>Field Visit Group 2 (EAST)</p> <ol style="list-style-type: none"> 1. ClearvuePV Glasshouses, Murdoch University. The World first glasshouse glazing producing power. 2. Balance Group, Airport Park. Battery and microgrid development 3. Time Arrow Innovation Hub, Bayswater., Kewdale. Innovation centre. 4. ATCO, Jandakot. Renewable hydrogen at the clean energy hub. 5. Richgro-Biogass, Jandakot. Anaerobic digestion of food waste on a commercial scale to procure energy
<p>6:00pm</p>	<p>Coaches return</p>

6:00pm to 8:00pm	Food & drinks in the Winter Garden. (see campus map)
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Wednesday 7th December

8.30am	<p>Common Session 6: ECL 1</p> <p>Topic: New World order Chair: Mr. Benny Abraham, Murdoch University.</p> <p>1. Mr Rainer Hinrichs-Rahlwes, Board Member, German Renewable Energy Federation and VP, European Renewable Energies Federation (EREF). The European Green Deal and REPowerEU – Accelerating the Renewable Energy Transformation.</p> <p>2. Ms Colleen Yates, Regional Development Australia. Energy Metals Supply Chains: A New World Order?</p> <p>3. Assoc Prof Sven Teske, University Technology, Sydney. Achieving the Paris Climate Agreement Goals - Science-based target setting for the finance industry: Net-Zero Sectoral 1.5°C pathways for real economy sectors.</p>
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9.30am	Parallel Sessions 6			
<p>Session 6A: ECL1</p> <p>Topic: Electric Vehicle & Transport Chair: Assoc. Prof Ahmad Zahedi, James Cook University.</p> <p>1. Mr. Alan Dunn, Murdoch University. An energy consumption model for EV uptake in Australia from 2020 to 2050</p> <p>2. Mr. Ben Rose, Cleanenergymodelling.com.au</p>	<p>Session 6B: ECL2</p> <p>Topic: Climate Change Chair: Councillor Peter Long, City of Karratha</p> <p>1. Mr. Duoyong Zhang, Shanghai Jiao Tong University, China. Simulation Design and Optimization of Multiphase Reactor for CO2 Capture.</p>	<p>Session 6C: ECL3</p> <p>Topic: Decarbonizing Chair: Dr. Genevieve Simpson, Curtin University.</p> <p>1. Mr. Hanrong Huang, University of New South Wales, Sydney. Prospects of Decarbonizing Mining in Australia.</p> <p>2. Mr. Dorian Hernandez, Polytechnique Montréal, Canada.</p>	<p>Session 6D: ECL4</p> <p>Topic: Smart Grid Chair: Prof. John Boland, University of South Australia.</p> <p>1. Dr. Kosala Gunawardane, Blue Economy CRC, New Zealand. A review: Integration of fuel cell technologies into DC-Microgrids.</p> <p>2. Dr. GM Shafiullah, Murdoch University.</p>	

<p>Switching From Today's Cars to Shared Micro-Ev's Could Reduce Vehicle Related Deaths By >90% (online).</p> <p>3. Mrs. Ira Djarot, <i>Research Center for Sustainable Production System and Life Cycle Assessment, Indonesia</i>. Scenario Planning for Battery Electric Vehicle Public Transportation in Depok City (online).</p>	<p>2. Mr Shoeib Faraji Abdolmaleki, <i>Universidade de Santiago de Compostela, Spain</i>. Finding sustainable countries in renewable energy sector: a case study for an EU energy system (online).</p> <p>3.Mr. Trevor Lee, Exemplary Energy, Act, Australia. Improving Real-Time Year Weather Data Services (online).</p>	<p>Numerical modelling of a sedimentation tank for enhancing sediment removal in open loop Ground Source Heat Pump system.</p> <p>3. Mr. James Purtill, <i>Queensland Mine Rehabilitation Commissioner</i>. Decarbonizing the resources sector - renewables energy's role in mine rehabilitation.</p>	<p>Optimal Design and Assessment of a Grid Connected solar PV/Wind Hybrid Microgrid for Dept. of EECE, PUST Considering Dispatch Strategies.</p> <p>3. Mr. Remember Samu, Murdoch University Australia. Centralized control of remote islanded microgrids: A novel approach integrating nowcasting and virtual power plant concepts (online).</p>
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10.30am	Coffee break
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11.00am	<p>Common Session 7: ECL 1</p> <p>Topic: Built Environment and Decarbonization. Chair: Mr. Fraser Maywood, <i>Sustainable Energy Now</i>.</p> <p>1. Prof Garry Baverstock, AM, <i>Time Arrow Innovation Hub, WA</i>. Built Environment Strategies to reduce Anthropoc Carbon by at least 30% by 2040.</p> <p>2. Mr. Chris Oughton, <i>Kwinana Industries Council, Western Australia</i>. Decarbonization governance for a complex industrial area – Kwinana as a case study.</p> <p>3. Ms. Summer Qi, <i>Altech Chemicals Ltd</i>. Increasing EV Battery Capacity through Silumina Anodes.</p>
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12.00pm	Parallel Sessions 7
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<p>Session 7A: ECL1</p> <p>Topic: Sustainable Energy Chair: Ms. Delwara Khanom <i>Chemonics International, Bangladesh</i>.</p>	<p>Session 7B: ECL2</p> <p>Topic: Energy Systems Chair: Prof. Wasim Saman, <i>University of South Australia</i>.</p>	<p>Session 7C: ECL3</p> <p>Topic: Bioenergy Chair: Mr. Ian Porter, <i>Sustainable Energy Now (SEN), Perth</i>.</p>	<p>Session 7D: ECL4</p> <p>Topic: Thermal Energy</p>
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<p>1. Mr. Elliot Lee, Water Corporation WA. Water utilities transition to net-zero greenhouse gas emissions from wastewater treatment.</p> <p>2.Mr. Zaid A Al Muala, Universidade de Santiago de Compostela, Spain. Realistic Home Energy Management System Considering the Life Cycle of photovoltaic and Energy Storage System (online).</p>	<p>1. Dr. Alexander Ilyushechkin, CSIRO Energy, Canberra. Characteristics of biosolids processed under different thermochemical treatment options and their by-products.</p> <p>2. Dr Xiao Luo, Shanghai Jiaotong University, China. Enhanced Freshwater Harvesting with Interfacial Evaporation Based on a Hybrid Solar Still(online).</p>	<p>1. Prof. Geon Ho, Emeritus Prof. Murdoch University. Bio electrochemical upgrading of anaerobic digester biogas under thermophilic conditions.</p> <p>2. Prof. Oluwaseun Oyekola, Cape Peninsula University of Technology, Cape Town, South Africa. Performance of selected biomass catalysts for biodiesel production from waste vegetable oil in a continuous reactor system.</p>	<p>Chair: Dr Shyam Nandwani, , Retired Prof. Universidad Nacional, Costa Rica.</p> <p>1. Ms Polyxeni Martzeli, Trinity College, Dublin. Investigation of biomimetic designs and the use of phase change materials for improving efficiencies in solar thermal energy systems (online).</p> <p>2.Mr. Adrian Bacaoanu, Trinity College Dublin. Phase Change for a Radiant Floor Coupled to a Heat Pump and a Geothermal Heat Exchanger (online).</p>
<p>12.30pm</p>	<p>Lunch break</p>		
<p>1.30pm</p>	<p>Common Session 8 (ECL 1)</p> <p>Topic: Energy Production and Usage Chair: Dr Jonathan Whale, Murdoch University.</p> <p>1. Dr Shyam S Nandwani, Retired Prof. Universidad Nacional, Costa Rica. Forty-two Years of Experience with Research, Promotion and Use of Solar Cookers to Save Conventional Fuels and Reduce Carbon Emission.</p> <p>2.Associate Prof Ahmad Zahedi, James Cook University, Qld. Optimal Performance of Wind Farm.</p> <p>3. Prof. Alistair Sproul, UNSW. Improving Solar Pumps to Conserve Energy and Materials.</p> <p>4. Mr.Simon Schrapel, Chief Executive, Uniting Communities, South Australia. Creating A Low Carbon Footprint Through Social and Organizational Leadership (online.)</p>		

3.00pm	Coffee break		
3.30pm	<p>Common Session 9: ECL 1</p> <p>Topic: UN Sustainable Development Goals Chair: Dr David Goodfield, Murdoch University.</p> <p>1. Mr. Randhir Amoganthan, President UN Association of Australia (WA), An introduction connecting international, national and state obligations to the SDGs and the required response to climate change.</p> <p>2. Ms. Jessica Shaw MLA, Parliamentary Secretary to the Deputy Premier and Minister for WA State Development, Jobs and Trade, Tourism, Commerce and Science. Transforming the energy sector – a State Government perspective. Giving effect to the SDG 7: A view from the sub-national level.</p> <p>3. Mr. Michael Williamson, Section Chief, Sustainable Energy Development, United Nations Economic and Social Commission for Asia and the Pacific Status of SDG 7 in the Asia Pacific region. Key gaps and opportunities in sustainable energy.</p> <p>4. Ms. Gloria Zhang, Intlang Corporate Consulting Pty Ltd. Private sector perspective – role of the private sector in accelerating SDG 7 in Australia and Asia.</p>		
4.30pm	Parallel Sessions 9		
<p>Workshop 5: Room 460.2.031</p> <p>Facilitator: Randhir Amoganthan, UNAA(WA)</p> <p>Panel discussion and Q & A on UN Sustainable Development Goals</p>	<p>Session 9A: ECL2</p> <p>Topic: Energy Production Chair: Dr Martina Calais Murdoch University.</p> <p>1. Dr. Seung Ho Lee, Isothermix, South Australia. Smoothing cooling demand with PCM thermal batteries.</p> <p>2. Mr. Amin Mirabbasi, Murdoch University</p>	<p>Session 9B: ECL3</p> <p>Topic: Sustainable Energy Chair: Mr. Furat Dawood, Horizon Power.</p> <p>1.Mr. Kofi Ampaw Nyarko, Murdoch University. Overcoming challenges of decentralized RE-based mini-grids to ensure sustainability in low-income communities.</p>	<p>Session 9C: ECL 4</p> <p>Topic: Energy Management Chair: Mr. William Spencer, Murdoch University.</p> <p>1. A Prof Carlos Santos Silva, IST, Lisbon, Portugal. Smart energy management in net-zero energy buildings: case study in Lisbon Portugal.</p>

	<p>Integration of algal cultures into modern architecture.</p> <p>3.Dr. Maryam Singery, University of Texas. The Role of Wood in the Architectural History of Mosques in the Middle East (online).</p>	<p>2.Assoc Prof. Martin Anda, Murdoch University. Hydrogen Energy for Homeland Communities: A 100% renewable energy stand-alone microgrid.</p> <p>3. Mr. Peter Kasprzak, ABACUS Policy Institute. Zero Emission Highway - Drive Towards Carbon-Free Transport.</p>	<p>2. Mr. Duoyong Zhang, Shanghai Jiao Tong University, China. Simulation Design and Optimization of Multiphase Reactor for CO2 Capture.</p> <p>3. Mr. Andrew Blaver, Western Power, WA. Project Symphony: WA's largest DER Orchestration Pilot.(online)</p>
5.30pm	<p>Closing Session: ECL 1 Concluding Remarks: Prof Ali Sayigh, Director General World Renewable Energy Network. Architectural Competition Prize Awards: Ms. Jessica Shaw, MLA. Final Comments and Recommendations: Assoc. Prof Martin Anda , Chair of the Conference.</p>		
6:00pm to 8:30pm	<p>Closing Ceremony Food & drinks in the Summer Garden (see campus map)</p>		

See below poster list for Technical Tours and the two-day tour to the SW of Western Australia.

Serial no	Author(s)	Abstract Title
1	Dr. Shyam Nandwani	My Favorite Solar Gadget: Multipurpose Hybrid Solar Electric Oven.
2	Mr. Rohit Bomma	Comparison, energy and cost analysis of Renewable energy powered Reverse Osmosis system and Diesel-powered Reverse Osmosis system for small communities.
3		Design and manufacture of a heliostatic illuminator using 3D printing technology.

	Mr. Jesus Lopez- Sanchez, Marta Varo-Martinez, Manuel Torres-Roldan, Javier Gomez-Uceda, Rafael Lopez-Luque, Francisco J Casares de la Torre	
4	Mr. Jesus Lopez- Sanchez, Rafael Lopez-Luque, Luis Manuel Fernandez-Ahumada, Jose C Ramirez-Faz, Marta Varo-Martinez	Scale Model Evaluation of a Daylighting System Based on Heliostatic Technology.
5	Mr. Shoeib Faraji Abdolmaleki, Daniel Esfandiary Abdolmaleki, Pstora Maria Bello Bugallo	Evaluating renewable energy and ranking 17 autonomous communities in Spain: a TOPSIS method.
6	Mr. Zaid A Al Muala, Hugo J Bello Gutiérrez, Pstora M Bello Bugallo	Antecedents of Energy Consumption Intention to Usage by Home Energy Management System: A Case Study of Galicia's Homes (online).
7	Mr. Sam Hosseini-Moghaddam, Branav Gnanamoorthy, Thomas Liang, Luc Bernier	The Aggregated Leapfrogging Estimate: A Novel Quantitative Approach to Defining Energy Leapfrogging.
8	Mr. Masashi Barada, Wataru Kitamura	The assessment of potential impact of small wind turbines on birds in Japan.
9	Dr. MD Islam, Mubinul Islam	Design and Evaluation of a desiccant-based solar still for atmospheric water collection
10	Mr. John Boland	Seasonality of Solar Radiation and Solar Farm Output
11	Mr. Hanrong Huang	Prospects for Green Mining in Australia
12	Dr. Alexander Ilyushechkin	Characteristics of alloys and compacts exposed to various H2 processing conditions.
13	Mr. Trevor Lee	Extreme Climate Data Files for Design Resilience.
14	Mr. Mohammad Bany Issa	Grid-connected renewable energy sources: a new approach for phase-locked loop with Dc-offset removal.
15	Prof. Navid Moheimani	

		Biomass production of marine microalga Tetraselmis suecica using biogas and wastewater as nutrients.
16	Mr. Ashmore Mawire, Dr. Oyirwoth Patrick Abedigamba, Mr. Frank Sayuni Mndeme	Heat utilization characteristics of two sensible heat storage materials for domestic applications.
17	Dr. Youwhan Shin	Development of a Screw-Finned Heat Exchanger For Microencapsulated Phase Change Material Slurry.
18	Mr. Masood Ul Hassan, Mr. Abhnil Prasad, Mr. Stephen Bremner , Mr. Chris Menictas and Mr. Merlinde Kay.	Identifying and characterising cloud enhancement events and their impact on solar energy output for a rooftop solar system.
19	Dr. Seyed Saeed Madani.	Thermal Study of Lithium Titanate Oxide-based Lithium-ion Batteries.
20	Mr. Alan Dunn, Dr. Martina Calais, Mr. Gareth Lee	The impact of the COVID-19 pandemic on Australian EV uptake and liquid fuel security to 2022.
21	Dr Biji Kurup	Net Positive Carbon for Climate Mitigation and Economic Recovery.
22	Prof. Carlos Santos Silva	Building Hope – A energy management tool for smart urban environments.

Thursday 8th December

Technical tours **Coaches will leave from the Chancellery at 8.00am**

Tour 1:

- Gingin Roadhouse, coffee break
- Yandin Wind Farm, Dandaragan.

- Emu Downs Solar Farm, Badgingarra.
- Lobster Shack, Solar PV and battery storage, Cervantes.
 - Lobster Shack, lunch.
- Pinnacles Desert, Nambung.

- Return to Murdoch University.

Tour 2:

- Kwinana Industrial Association offices.
- Guided tour of Kwinana Industrial Council region.
 - Lunch on Rockingham seafront.
- Return to KIA offices for KIA presentations.
 - Afternoon tea.
- Presentations by KIA Director, C Oughton, and Biji Kurup, Murdoch University.
- Q + A session.

- Return to Murdoch University.

Friday 9th and Saturday 10th December

Conference tour to the SW of Western Australia Latest booking time 12noon Monday 5th December.

Coach will leave from the Chancellery at 7.30am

See website at <https://www.wrec2022.com/post-conference-tour.php> for details.

Return to Murdoch University 10.30pm Saturday night.

