

Friday 17th November 2017

09:30	Welcome Back and Recap Kevin Laboe, FCA Group	
09:45	Rankine Cycle Based Power Systems: Past, Present and Future Perspectives Vincent Grelet, PhD – <i>Tenneco Clean Air Europe</i>	
	Technical Session SIX: Expander Technologies	Technical Session SEVEN: Heat Exchanger Technologies
10:30	Proof of Concept Project for the Development of a Linear Motion Piston Expander Device Dr Luke Blades – <i>Queen's University Belfast</i>	System-Level Optimization Approach of Cross-Flow ORC Evaporators Adrian Folgueira – <i>BorgWarner</i>
11:00	Design Optimization of Scroll Expander for Waste Heat Recovery from Stationary Internal Combustion Engines Kunal Bansal – <i>Air Squared Inc.</i>	Material Choice for Liquid Cooled Condensers Using an Ethanol / Water Mixture as a Working Fluid Adam Kimmel – <i>Modine Manufacturing Company</i>
11:30	Closing Remarks Kevin Laboe – <i>FCA Group</i>	
12:00	Lunch and Networking	

Organizing Committee

- Kevin Laboe, FCA (chair)
- Paul Ansel, BorgWarner
- Thomas Cromie, AgriAd
- Arnaud Desrentes, Exoes
- Roy Douglas, Queen's University Belfast
- Oliver Dingel, IAV
- Steve Glover, Queen's University Belfast
- Gary Hunter, AVL
- Vincent Lemort, University of Liège
- Tony Li, Yinlun
- Bryce Shaffer, Air Squared
- Kirk Shaffer, Air Squared

Supported by:



Exhibitors

A range of organisations will be exhibiting throughout the conference. Please take time to view their stands within the foyer.

We look forward to welcoming you to the 5th Annual Engine ORC Workshop taking place in Lyon, France in September 2018.





The 4th Annual Engine Organic Rankine Cycle Consortium Workshop 2017

For the automotive and stationary engine industries

**Detroit, Michigan,
November 15th – 17th 2017**

Welcome to Detroit and to the 4th Annual Engine Organic Rankine Cycle Consortium Workshop 2017 – an open forum for technical sharing and learning about mobile and stationary ORC systems. This event will provide a perfect platform to explore issues of common interest. It has been generously supported by our sponsors Zhejiang Yinlun Machinery Co., Ltd; Modine Manufacturing Company; Faurecia; Tenneco; IAV GmbH; BorgWarner; and Siemens.

Through this annual event, we hope to share successful practices and experiences and debate new concepts with a view to increasing the level of our collaboration and collective impact. I look forward to meeting you and hearing your contributions over the next few days.

I hope you have an enjoyable and productive conference.

Kevin Laboe
EORCC Chair



Engine ORC
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Wednesday 15th November 2017

09:00	Registration	
09:45	Welcome and Introduction Kevin Laboe – FCA Group	
10:10	Vehicle of the Future – Electric, Connected, Shared, Autonomous Dr Gary Smyth, Executive Director, Global Research and Development, GM	
	Technical Session ONE: WHR Applications	Technical Session TWO: Systems Modeling
11:00	Improving the Total Cost of Ownership of Exhaust Heat Recovery Systems by Utilizing the Engine Coolant Heat – Test Stand Investigations on an Internal Combustion Engine Thomas Arnold – IAV GmbH	
11:30	Coffee	
12:00	A Comparison Between Achievement from Orc System and Other Technologies for Heavy-duty Combination Tractors Yousef Jeihouni FEV – North America Inc	Waste Heat Recovery Potential Analysis for Heavy Duty Truck Applications Based on Transient Road Cycle Simulations Thomas Reiche – Volvo
12:30	Efficiency Gains Using Waste Heat to Power on Reciprocating Engines by Electratherm, Inc. John Fox – ElectraTherm	
13:00	Lunch	
	Technical Session ONE: WHR Applications	Technical Session TWO: Systems Modeling
14:00	Organic Rankine Cycle Waste Heat Recovery System Net Power Optimization Utilizing Dynamic Programming in Heavy Duty Diesel Engine Applications Dr Bin Xu – Clemson University	Efficiency Maps of Reciprocating-Piston Expanders for ORC Applications Dr Christos Markides – Imperial College London
14:30	High Temperature Waste Heat Recovery from Gensets with Integrated Pump-Expander Assembly Alejandro Lavernia – Purdue University	Waste Heat Recovery from ICE Employing Two-Phase Engine Coolant as Working Fluid Davide Ziviani – Purdue University
15:00	Rankine Cycle, from Thermodynamic Equation to Road Test Thibault Fouquet – Faurecia Clean Mobility	Dynamic Performance Analysis of an Ethanol Organic Rankine Cycle as Part of a Natural Aspirated Gasoline Engine and Vehicle Model over a Realistic Drive Cycle Using Simcenter Amesim Himanshu Kalra – Siemens PLM Software
15:30	Coffee	
16:00	Panel Discussion on Challenges and Obstacles for the Mass Production of Automotive ORC-Systems Paul Ansel – BorgWarner, Thomas Howell – AVL and Dr Gary Smyth – GM	
16:45	Wrap Up and Close Kevin Laboe – FCA Group	
17:00	Welcome Reception and Networking	

Thursday 16th November 2017

09:30	Welcome Back and Recap Kevin Laboe – <i>FCA Group</i>	
09:45	PDSim: A Generalized Modeling Approach to Predict the Performance of Fixed Volume Ratio Expanders Prof Eckhard Groll, Professor of Mechanical Engineering – <i>Purdue University</i>	
	Technical Session TWO: Systems Modeling	Technical Session THREE: Testing
10:30	Optimization of Internal Combustion Engine Coupled with Organic Rankine Cycle with Exergo-Economic Approach Wayne A. Thelen – <i>Ricardo</i>	Oil Circulating Rate Impact in Organic Rankine Cycles for Exhaust Heat Recovery in Heavy Duty Trucks Rémi Daccord – <i>EXOES</i>
11:00	Multi-Objective Optimization of Organic Rankine Cycle Power Systems for Waste Heat Recovery on Heavy-Duty Vehicles Dr Muhammad Imran – <i>Technical University of Denmark</i>	Experimentation and Modeling of a 1.5 Kw Axial Turbine for Waste Heat Recovery on a Passenger Car Through the Use of a Rankine Cycle Olivier Dumont – <i>University of Liège</i>
11:30	Coffee	
	Technical Session FOUR: System Controls	Technical Session THREE: Testing
12:00	Model Predictive Control for Organic Rankine Cycle Applied to Hybrid Vehicles Alan Agurto Goya – <i>Jaguar Land Rover</i>	Experimental Investigation of Waste Heat Recovery Using an Organic Rankine Cycle for Heavy Duty Trucks Max Hombsch – <i>Dana Belgium NV</i>
12:30	Control of Organic Rankine Cycle Based Waste Heat Recovery System Prof. Roy Douglas – <i>Queen's University Belfast</i>	
13:00	Lunch	
	Technical Session FIVE: Working Fluids	
14:00	Low Gwp Working Fluids for Low Temperature Organic Rankine Cycles in Waste Heat Recovery Applications Jason Juhasz – <i>Chemours</i>	
14:30	Study on Turbomachinery Configurations for Automotive Waste Heat Recovery Considering Various Working Fluids Clement Joly – <i>SoftInWay</i>	
15:00	Coffee	
	Technical Session FIVE: Working Fluids	Technical Session SIX: Expander Technologies
15:30	A Moving Boundary Modeling Approach for ORC Heat Exchangers Operating with Binary Mixtures Donghun Kim – <i>Purdue University</i>	Sliding Vane Rotary Expander in ORC-Based Plat for Exhaust Heat Recovery Prof. Roberto Cipollone – <i>University of L'Aquila</i>
16:00	Panel Discussion on ORC Working Fluids Vincent Grelet – <i>Tenneco Clean Air Europe</i> , Jason Juhasz – <i>Chemours</i> and Vincent Lemort – <i>University of Liège</i>	
16:45	Wrap Up and Close Kevin Laboe, FCA Group	
19:00	Conference Dinner	



Thank you to our sponsors who have contributed to the success of this year's Engine ORC workshop.



Engine ORC Consortium



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Tenneco serves customers from 91 manufacturing facilities and 15 engineering and technical centers around the world, delivering advanced technologies, quality products, powerful brands and outstanding engineering and manufacturing capabilities. Headquartered in Lake Forest, Illinois, Tenneco employs 31,000 people worldwide.



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