

EWAN G. D. PRITCHARD, PHD, P.E.

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EDUCATION

Ph.D., Mechanical Engineering, NCSU, December 2010

Dissertation Title: “Torque Converter Interactions in a Parallel Post Transmission Hybrid Driveline”

Advisor: Dr. Richard Gould

M.S. Mechanical Engineering, NCSU, May 2004

Thesis title: “Performance Modeling of Hybrid and Plug-In Hybrid Electric School Buses using ADVISOR”

Advisor: Dr. Richard Johnson

B. S. Mechanical Engineering, NCSU, May 1997

PROFESSIONAL EXPERIENCE

Associate Director, Future Renewable Electric Energy Delivery and Management (FREEDM) Systems Center, North Carolina State University 2012 – Present

- Provide technical guidance on the overall vision for the center
- Spearhead annual reporting to the NSF and center membership
- Manage relationships and reviews with the center’s Scientific Advisory Board
- Work with Program Partners to Build Research and Funding Profile
- Establish and Set-up Center Facilities Including Use Agreements and Funding Plans
- Establish and Develop Center’s Business Sustainability Plan
- Secure long term center funding through strategic partnerships and grants
- Establish a long term center vision that can sustain beyond seed funding

Director of Industry, Collaboration and Innovation, Future Renewable Electric Energy Delivery and Management (FREEDM) Systems Center, North Carolina State University 2010-2012

- Interact with industrial members of the center to ensure clear communication between
- Manage and facilitate the Industrial Advisory Board for the center
- Present to the National Science Foundation on the industry and innovation programs within the center
- Work with industrial members, center faculty, students and staff to create innovation programs to quickly bring ideas to programs and programs to products

Program Manager, Advanced Transportation Energy Center, North Carolina State University 2009-2012

- Serve as the Future Renewable Electric Energy Delivery and Management (FREEDM) Systems Center Plug-in Hybrid (PHEV) and Plug-in Electric Vehicle (PEV) test bed leader for the NSF funded Engineering Research Center
- Manage the proposal and implementation of center grant programs
- Industrial liaison between automotive members of ATEC and center researchers
- Perform system level vehicle modeling research on behalf of the center
- Serve as guest lecturer for the center on vehicle related matters
- Manage the image of ATEC within the research and vehicle community
- Work with center directors to effectively manage the center funding and workload

Hybrid Program Manager, Advanced Energy, 2002-2008

- Investigated the technical benefits and feasibility of plug-in hybrid technology for school buses and developed the Plug-In Hybrid School Bus program at Advanced Energy
- Assembled a group of potential purchasers, the Hybrid School Bus Buyers Consortium, which pools over 10% of North American demand for school buses, and worked to build a national purchase
- Secured over \$4 million in grants and funding for the purchase of up to 20 plug-in hybrid school buses
- Established as an industry leader in plug-in hybrid technology

- Facilitated the contract and purchase of plug-in hybrid school buses from International Truck and Engine to be delivered February 2007

NC GreenPower Resource Manager, Advanced Energy, 2005-2008

- Coordinated over 40 million kWh per year of solar, wind, hydroelectric, and landfill methane energy being added to the utility grid through the NC GreenPower program
- Provide recommendations to the resource committee based on review of proposed suppliers
- Primary technical resource for interconnection and renewables in day to day operation of the program

Energy Consultant and Trainer, Advanced Energy, 1997-2008

- Conducted energy audits and analyses in the commercial sector to determine opportunities for significant operational savings with minimal investment cost
- Primary areas of expertise in lighting, daylighting, HVAC and building envelope
- Certified Building Commissioning Professional through the Association of Energy Engineers
- Created training and presentations on various energy topics for utility and energy professionals
- Primary presenter on renewables and energy efficiency including lighting, process heating, solar photovoltaic, wind, and landfill gas
- Consulted with both utilities and industry across the county about process heating solutions
- Increased energy efficiency for manufacturing lines with the use of electric process heating technologies by using analytical skill and creativity to increase quality while reducing cost
- Specific technology expertise in infrared, radio frequency, induction and microwave heating

GRANTS AND AWARDS

1. USTDA/Positive Energies “Microgrid Design Study for US Export Development to the Dominican Republic” \$322,000, June 2015
2. US DOE “PowerAmerica: The Next Generation Power Electronics Manufacturing Innovation Institute” \$146M, December 2014
3. American Public Power Association “Vehicle Energy Storage & Solar Demonstration” \$48,000, July 2012
4. US DOE/Duke Energy “Fast Charging Demonstration and Parking Deck Control Architecture” \$344,771, April 2011
5. US DOE/Celgard “Battery Separators Containing Electrospun Nanofibers” \$499,000, March 2010
6. State of NC/Duke Energy/Progress Energy “Advanced Transportation Energy Center” \$5M, June 2008
7. NASEO “Plug-In Hybrid School Bus Demonstration and Deployment” \$1.9M, June 2005

PUBLICATIONS

1. **E. Pritchard**, D. Gregory, S. Srdic, “The dc Revolution,” IEEE Electrification Magazine, June 2016
2. D. Zhu, **E. Pritchard**, "NCSU Year Three Final Technical Report," SAE 2014 International Powertrain, Fuels & Lubricants Meeting, October, 2014
3. **E. Pritchard**, R. Johnson, R. Gould, “A Fluid Model Extension of the Torque Converter into the Overrunning Regime,” SAE 2014 World Congress & Exhibition; Detroit, Michigan, April 2014
4. **E. Pritchard**, R. Johnson, R. Gould, “Torque Converter Interactions in a Parallel Post Transmission Hybrid Driveline ,” IEEE Vehicle Power and Propulsion Conference; Chicago, Illinois, September 2011
5. S. Sadiq, A. Emadi, **E. Pritchard**, “Plug-In Hybrid Market Transformation by Leveraging a Niche Market: School Buses,” IEEE Vehicle Power and Propulsion Conference; Arlington, Texas, September 2007
6. **E. Pritchard**, R. Johnson, “Technical Performance Modeling of Hybrid and Plug-In Hybrid Electric School Buses Using ADVISOR,” IMECE2005-79530, International Mechanical Engineering Conference & Exhibition; Orlando, Florida, November 2005
7. **E. Pritchard**, R. Johnson, “Hybrid Electric School Bus Technical Feasibility,” 05CV9, SAE Commercial Vehicle Exhibition; Chicago, Illinois, November 2005
8. **E. Pritchard**, B. Zickefoose, K. Dulaney, “Hybrid Electric School Bus Preliminary Business Feasibility”, Advanced Energy, June 2005
9. **E. Pritchard**. “Performance Modeling of Hybrid and Plug-In Hybrid Electric School Buses using ADVISOR”, NCSU ETD, April 2004

PUBLICITY

1. B. Schrader, "NCSU leads the charge for plug-in cars", WRAL September 2013
<http://www.wral.com/ncsu-leads-the-charge-for-plug-in-cars/12859789/>
2. D. Wax, "A Case for the Smart Grid", Appalachian Voices, April 2013
<http://appvoices.org/2013/04/16/a-case-for-the-smart-grid/>
3. A. Nimocks, F. Stasio, "It's Electric", The State of Things, WUNC, June 2011
<http://wunc.org/post/its-electric>
4. B. Geary, "How the Electric Car will Save Us", Indy Week, July 2010
<http://www.indyweek.com/indyweek/how-the-electric-car-will-save-us/Content?oid=1520228>
5. T. Grose, "Mechanical Engineering is on the Rise", US News and World Report, March 2008
<http://www.usnews.com/education/articles/2008/03/26/mechanical-engineering-is-on-the-rise>
6. Ron Barnett, "States Test Drive Hybrid School Buses", USA Today, November 2007
http://usatoday30.usatoday.com/news/nation/2007-11-14-hybridbus_N.htm
7. Mark Clayton, "The Basic Yellow School Bus Turns Green", USA Today, April 2007
http://usatoday30.usatoday.com/tech/news/techinnovations/2007-04-01-hybrid-buses_N.htm

INVITED TALKS AND TUTORIALS

1. **E. Pritchard**, "2015 Smart Grid Trends in the US" UK Consulate Invited Speaker, 2015 UK-China-US Smart Grid Workshop; Birmingham, UK, September 2015
2. **E. Pritchard**, "Current Trends in the Energy Marketplace" Invited Keynote, Science Boot Camp for Librarians Conference; Raleigh, NC, July 2014
3. **E. Pritchard**, "History of the Electric Vehicle" Invited Speaker, Apex Founders Festival, February 2014
4. **E. Pritchard**, "Grid Innovation at the FREEDM Systems Center" US Consulate Guest, US-Mexico Smart Grid Technology & Business Forum, Mexico City, Mexico, March 2013
5. **E. Pritchard**, "Smart Grid, Smarter Grid" Invited Speaker, Siemens Solar Exchange East; Raleigh, NC, September 2011
6. **E. Pritchard**, "Smart Grid, Smarter Grid" Invited Speaker, North Carolina Smart Grid Leadership Forum; Chapel Hill, NC, August 2011
7. **E. Pritchard**, "Wheels in Motion: The promise of Plug-In Hybrid Vehicles," Invited Speaker, Alternate Fuels and Vehicles 2009; Orlando, Florida, April 2009
8. **E. Pritchard**, "Heavy Duty Plug-In Programs," Invited Speaker, Plug-In 2008; San Jose, California, July 2008
9. **E. Pritchard**, "The Marketplace for Plug-In Hybrid Vehicles," Invited Speaker, Alternate Fuel Vehicle Institute; Las Vegas, Nevada, May 2008
10. **E. Pritchard**, "Plug-In Hybrid School Bus Performance," Invited Speaker, Power-Up Conference; Wenatchee, Washington, May 2008
11. **E. Pritchard**, "Plug-In Hybrid Market Transformation," Invited Speaker, EVS 23; Anaheim, California, December 2007
12. **E. Pritchard**, "PHEV's, How to Transform a Marketplace," Keynote Speaker, PHEV-2007; Winnipeg, Canada, November 2007
13. **E. Pritchard**, "Nationwide Hybrid Electric School Bus Commercialization," Invited Speaker, Transportation Research Board; Washington, DC, January 2005
14. **E. Pritchard**, "Plug-In Hybrid Electric School Buses," Invited Speaker, DOE 21st Century Truck Group; Golden, Colorado, July 2004

BOARDS AND ASSOCIATIONS

NC GreenPower

Spring 2015 - Present: New Technology Board Seat

This seat is a nominated position by appointment publicly announced and approved by the NC Utilities Commission. In this position, I work alongside of C level utility executives and business leaders to guide the NC GreenPower Program. I also sit on the Solar Schools Selection Subcommittee.

Carolina Electric Vehicle Coalition

2015-Present: Board Vice-President

2008-2014: Board President

In this position I help to guide the K-12 hands on engineering program called the EV Challenge. The program has worked for over 25 years to inspire kids to pursue a career in sustainable engineering. This program is growing and will soon be held on Centennial Campus of NC State University in 2016.

Research Triangle Cleantech Cluster

2016-Present: Advisory Board Member

American Society of Mechanical Engineers

Egg Drop Chairman - 2001

Eastern NC Section Chairman - 2000

Eastern NC Section Vice-Chairman - 1999

NCSU Student Chapter Chairman - 1996

NCSU Student Chapter Vice-Chairman - 1995

NCSU Student Chapter Programs Chairman - 1994

ADVISING

PhD

Landon Mackey, MSEE Expected, May 2017

Di Zhu, PhDME Expected, May 2016

Changjian Hu, PhDME December 2014 "A Comprehensive Study of Control Methodology for Plug-in Hybrid Electric Vehicles"

Jon Lohr, MSME May 2014 - Committee Member, Mentor "Design of a Multi-Engine Test Stand with Eddy Current Dynamometer"

Tyler Dobbins, REU Dec. 2013 - REU Mentor

Jason Markijohn, MSEE May 2013 - Mentor, Project Advisor "Design of Electric Vehicle Energy Storage System with Performance Analysis Using ADVISOR"

Matthew Frahm, MSME May 2013 - Committee Member, Mentor, "Electromagnetic Interference Shielding Effectiveness of Composite Materials"

Josh Lawrence, MSME December 2012 - Committee Member, Mentor, Project Sponsor "Torque Converter Predictive Modeling Validation in a Post Transmission Parallel Hybrid Drive Train"

Sriram Sankaran, MSME, June 2012, "Retrofitting an Effective Air Conditioning System for a Hybrid Vehicle Conversion"