

**MINUTES OF
ENERGY NORTHWEST
SPECIAL EXECUTIVE BOARD DINNER MEETING
ANTHONY'S EVENT CENTER
COLUMBIA POINT DRIVE
RICHLAND, WASHINGTON
SEPTEMBER 25, 2013 – 6:30 P.M.**

The Executive Board meeting convened at 6:30 p.m. for a social and dinner. Vice Chair Jack Janda called the meeting to order at 7:10 p.m. and welcomed all in attendance.

Roll Call:

Jack Janda, Vice Chair
Marc Daudon
Dan Gunkel
Skip Orser
Lori Sanders
Tim Sheldon
Kathy Vaughn

Others Present:

Board of Directors members L. Gott, Mason County PUD No. 3; Steve Houston Okanogan PUD, and Bill Gordon and L. Gordon (spouse); S. Sanders spouse of L. Sanders; and guest speaker Dr. Pete McGrail.

Staff Present:

M. Reddemann, D. Atkinson, M. Paoli, B. Ridge, L. Willey, and P. Lilly.

Vice Chair Janda welcomed Dr. Pete McGrail back as a presenter to the Energy Northwest Executive Board and provided a biographical sketch and overview of Dr. McGrail's research and career. Vice Chair Janda stated that Dr. McGrail has been a staff member at Pacific Northwest National Laboratory (PNNL) for over 30 years and has attained the position of Laboratory Fellow, the highest level of scientific achievement at the laboratory. Dr. McGrail spent the first half of his career on nuclear waste research projects, work that often took him to Europe and Japan and even prompted a three year marginally successful study of the Japanese language.

Beginning in the late 1990s, Dr. McGrail transitioned his research work into then emerging fields associated with gas hydrate production on the Alaska North slope, advanced materials for renewable energy and efficiency, and the capture and storage of CO₂ for global climate change mitigation. Those efforts have blossomed into multiple cutting-edge research projects covering subjects from basic chemistry of supercritical CO₂-brine mixtures to novel applications of metal-organic nanomaterials in chemical separations, heat pumps, and nanofluids.

Dr. McGrail has won four nationally competed research grant awards from the Department of Energy (DOE) agency ARPA-E, more than any other researcher in the United States. He also recently completed the first technical and economic feasibility study of compressed air energy storage in the Pacific Northwest to help mitigate over generation events that are impacting electric grid stability. Dr. McGrail has over 230 scientific publications and presentations at international conferences on his research as well as four patents and patent-pending applications.

Dr. McGrail's showed his presentation Leveraging CO₂ Capture and Sequestration R&D in the Pacific Northwest: Unexpected Spinoffs for Advanced Energy Technology Development and discussed the following topics:

- Climate change is a long-term strategic problem with implications for today
- Why CO₂ Storage in Basalts?
- Mineralization Chemistry (Indirect)
- Wallula Pilot Overview
- Drilling the Basalt Well
- Stratigraphy at Wallula Pilot
- Resistivity Log Detail Near Injection Zone
- Cores and Image Log From Test Zone
- CO₂ Injection at Wallula Pilot
- Public Outreach
- CCS Science Reporting?
- IS³ – In Situ Supercritical Suite
- Conventional Capture System Technology
- PNNL's Low-Cost Capture Technology Pipeline
- MOFs for Mixed Gas Capture
- Adsorption Chiller Technology: The Basics
- HMOF-3 Adsorption Results
- World's First MOF-Based Adsorption Chiller
- Utilization of CO₂ in Enhanced Gas Recovery Operations
- Subsurface Energy Storage in the PNW
- Selected Sites for CAES Study
- Different CAES Designs for Site Conditions
- LCOE Analysis for CAES Plants

Vice Chair Janda thanked the Dr. McGrail for his presentation and adjourned the dinner meeting at 8:42 p.m.

Respectfully submitted,

P. J. Lilly, Supervisor
Visual Communications