

## Agenda

Tues., Jan. 13 – Support Structures Subgroup Meeting – NREL, RSF – Beaver Creek B & C

11:30a **Registration and Lunch**

1:00p **Overview and Status of SMART Wind Consortium and Project**

*Trudy Forsyth, Wind Advisors Team, SMART Wind Technical Lead, Support Structure subgroup chair*

*Brent Summerville, Summerville Wind & Sun, SMART Wind Technical Co-lead, Support Structure subgroup co- chair*

1:20p **Introduce Subgroup Leaders**

*Dr. Rick Damiani, NREL*

*Roger Dixon, Skylands Renewable Energy*

*Dr. Asad Esmaily, Kansas State University*

**Objective:** For participants of the SMART Wind Support Structures Subgroup to meet each other, identify gaps and opportunities, learn about state-of-the art manufacturing methods and technologies, and capture information for Roadmap.

1:30p **Self-Introductions by Subgroup Participants**

What do you hope this project will accomplish? What are your areas of expertise?

1:50p **Overview of Different Tower and Foundation Types**

*Roger Dixon, Skylands Renewable Energy, LLC*

Streamlining of foundations and safe installation practices

2:30p **Tower/Foundation Gaps and Needs**

*Trudy Forsyth, Wind Advisors Team, SMART Wind Technical Lead, Support Structure subgroup chair*

3:00p Break

3:30p **Support Structure Technical Panel**

*Dr. Rick Damiani, NREL – Support Structure Design Optimization*

*Gunes Demirbas, P.E., G-Tower – Cost and Material Advances in Tower Design*

4:30p **Support Structure Coatings**

*Krent Aberle, Sherwin Williams – Protective Coatings for Wind Energy*

*Dave Wixson, TMS Metalizing – Corrosion Coating Metalizing Overview (presentation given by Brent Summerville)*

5:15p Adjourn

6:00p **“Dutch Treat” Dinner for All Participants – Mimi's Café, 14265 West Colfax Avenue, Golden, CO 80401**

Wed., Jan. 14 – Support Structures Subgroup Meeting – NREL, RSF – Beaver Creek B & C

8:00a Welcome Back, Any New Ideas?

8:15a **Panel of Tower Manufacturers, Overview of Other Tower Manufacturers**

*Paul Migliore, AnemErgonics (virtual)*

*Mike Bergey, Bergey Windpower*

9:30a Break

10:00a **Panel on Foundation and Anchoring Systems**

*David Blittersdorf, AllEarth Renewables (virtual)*

*Tim Olsen, Advanced Energy Systems LLC*

*Charles Newcomb, Endurance Wind Power*

11:30a **Report from Rapporteur**

*Ruth Baranowski, Wind Advisors Team*

Review of compiled ideas/actions

Brainstorm and refine actions

12:30p **Close of Meeting, Box Lunch Provided**

Wed., Jan. 14 – Wrap-Up Meeting, Invitation Only for Subgroup Leaders & DWEA OEM Steering Group

1:00p Debrief Support Structure Subgroup Meeting 3:15p Break

1:30p Thoughts from DWEA OEM Steering Group Members 3:30p Next (virtual) meetings – topics, month, speakers

2:45p Thoughts from Subgroup Leads 4:00p Adjourn



## **Krent Aberle - Sherwin-Williams**

Krent has worked with Sherwin-Williams since 1991 with a variety of assignments including Management, Sales, Technical, Marketing and Business Development roles. He has been a NACE 3 Certified Coating Inspector since 2002 and is also SSPC-C1 Certified. He's an expert in Corrosion Control Coating Specifications as well as Failure Analysis. Krent developed the coating specification for Clipper Windpower's first Liberty 2.5 MW tower in 2005 and monitored the painting. At the time, it was the largest tower erected in North America. He resides in Oshkosh, WI.



## **Ruth Baranowski - Communications Director Wind Advisors Team**

Ruth serves as the Secretary for the SMART Wind Consortium, documenting meetings and outcomes, and is the editor for the Roadmap. Her 11 years of experience working with the wind industry, including serving as the communications coordinator for the DOE's Wind Powering America initiative, provides a solid foundation for understanding key concepts and terminology. Ruth holds a BA in mass communications with a political science minor from Colorado State University Pueblo, and a MS in technical communications from the University of Colorado Denver.



## **Ian Baring-Gould, Wind & Water Technology Deployment Manager, NWTCC**

E. Ian Baring-Gould graduated with a MSME from the University of Massachusetts Renewable Energy Research Laboratory in 1995 and started working at the National Renewable Energy Laboratory (NREL) of the United States. Ian's work at NREL has focused in three primary areas; applications engineering for Renewable Energy (RE) technologies, assistance in RE uses and educational outreach for renewable energy technologies, primarily wind. Ian is currently the Wind Technology Deployment Manager at NREL, focusing on assisting organizations deploy wind technologies and addressing barriers to the implementation of wind energy through programs including DOE's Wind Powering America and WINDEXchange.



## **Bret Barker - Distributed Wind Analyst New West Technologies**

Bret Barker is a subject matter expert for distributed wind energy systems. His primary role is as a strategic planner, identifying opportunities to reduce the cost of wind energy from distributed systems and linking them to Program R&D priorities and investments. In addition, Bret provides management support for a portfolio of public investments in wind technology development, market acceleration, and outreach initiatives. Bret holds a BFA degree in Industrial Design from the RI School of Design.



## **Mike Bergey - President, Bergey Windpower**

A co-founder of Bergey Windpower and president since 1987, Mike Bergey is a mechanical engineer and an internationally recognized expert in the field of small wind turbines, distributed generation, and rural electrification. He holds one patent in the wind energy field. He has twice served as president of the American Wind Energy Association (AWEA) and served on the AWEA Board of Directors from 1981 to 2007. He is a past chairman of the U.S. Export Council for Renewable Energy, member of the U.S. Department of Commerce "Environmental Technology Trade Advisory Committee", and a past president of the Oklahoma Renewable Energy Council. Mr. Bergey is the acting-president of the Distributed Wind Energy Association.



## **David Blittersdorf - AllEarth Renewables**

David earned his bachelor's degree in mechanical engineering from the University of Vermont in 1981. He founded NRG Systems in 1982, and over the next 22 years developed it into a global leader in wind measurement technology. He stepped down as CEO of NRG Systems in 2004 to launch his second company, AllEarth Renewables, which originally developed a 2.5 kW direct-drive residential wind turbine before switching gears to design and manufacture grid-tied solar PV tracking systems. In addition to running AllEarth, he volunteers his time to various non-profit organizations connected with renewable energy, education, and preparing for a post-peak-oil world.



## **Dr. Rick Damiani, PhD, PE - Senior Engineer National Renewable Energy Laboratory**

Dr. Rick Damiani has been a consultant to the wind industry for the last 15 years. He focuses on aeroelastic modeling of turbines and structural design and analysis of blades and support structures. For the National Wind Technology Center (NREL), he supports various technical projects from offshore wind to DWT. He holds a PhD in Aeronautical Engineering and is a Licensed Professional Engineer.



## **Gunes Demirbas - G-Tower**

Gunes has over 10 years of engineering and project management experience specializing in tower business including wind towers (< 1.5 MW), electric transmission & distribution towers (< 600 kV), telecommunication towers and lighting poles. Prior to starting his own firm, G-Tower, he worked for well-known tower manufacturers; Valmont Industries, Falcon Steel and Mitas Energy. He holds M.Sc. (Geotechnical) and B.Sc. Degrees in Civil Engineering from Middle East Technical University. He studied MBA in University of Alabama at Birmingham. He is a currently licensed professional engineer in Texas and Alabama.



## **Roger Dixon - Skylands Renewable Energy**

Roger has been involved with the evolution of wind electric for 38 years. Mr. Dixon is a charter member of the NJ Small Wind Working Group (NJSWWG), chairing the NJSWWG Highlands Committee, Economics Committee and the Small Wind Model Zoning Ordinance and Siting Committee. He has also been a participant in the New Jersey Board of Public Utilities (NJ BPU) Renewable Energy committee meetings and sat on the NJ BPU Solar Alternative Compliance Payment/Alternative Compliance Payment (SACP/ACP) Advisory Committee representing small wind developers. Mr. Dixon is a founding member of DWEA.



## **Patrick Gilman, Wind Energy Deployment Manager, US Department of Energy**

In DOE/EERE's Office of Wind and Water Power Technologies, Patrick leads a team of federal staff and contractors to plan and execute DOE's strategy to overcome policy and other non-technology barriers (such as financing, siting, permitting) to the deployment of land-based and offshore wind energy technologies. He advises senior DOE officials on wind energy market, policy and regulatory issues, and is responsible for a portfolio of R&D activities totaling more than \$10 million annually. Patrick also currently serves as DOE's acting Offshore Wind Technology Manager.



## **Asad Esmaeily - Kansas State University**

Dr. Esmaeily is a professor of Structural Engineering at the Kansas State University civil engineering department. He holds a Ph.D. and MS in Structural Engineering and MS in Electrical Engineering from University of Southern California (USC). His research interests include a wide range of topics within the structural area, especially structural dynamics and earthquake resistant structures.



## **Gary Harcourt - Manager and Co-owner, Great Rock Windpower; Commissioning Engineer, Endurance Windpower**

With Great Rock Windpower, Gary Harcourt helped install and helps maintain a small fleet of turbines in Massachusetts. Gary also travels for Endurance Windpower as a commissioning engineer training installers and technicians in North America and Europe. On the NABCEP small wind exam committee, he helped craft the first installer certification exam (he was certified as a NABCEP Level III small wind installer). He currently serves on the DWEA Planning and Zoning committee and is a board member for the Small Wind Certification Council.



## **Trudy Forsyth - Managing Director Wind Advisors Team**

Trudy has more than 20 years of experience in wind technology. She led the DOE/NREL small and distributed wind program for 18 years where she helped design new US small wind turbines, test prototypes and commercial turbines to standards, develop international and national standards, and develop distributed wind marketing and education materials. She worked closely with DOE program managers to develop multi-year strategies and implement program objectives. She is currently the president of the SWCC Board, past president for Women of Wind Energy and a DWEA board member. She holds a BS and MS in mechanical engineering.



## **Jennifer Jenkins - Executive Director Distributed Wind Energy Association**

Jennifer has more than 10 years of experience in the wind industry, including at Southwest Windpower in their Government Affairs department. She was an integral part of the team that successfully sought passage of the Federal 30% tax credit for small wind systems. In her current role as Executive Director of DWEA, she works directly with members, stakeholders, and policy makers to find opportunities to grow the distributed wind market. She earned a BS in environmental science with an emphasis on policy and public administration from Northern Arizona University.



## **Aimee Gardere - Event & Membership Coordinator, DWEA**

Ms. Gardere is a recent graduate of Fort Lewis College in Durango, Colorado where she earned a Bachelor of Arts in English-Communications. Aimee has experience in many fields of communication from event planning, marketing, writing, social media, and much more. In her role, she focuses on current members as well as reaching out to potential new supporters and partners. She also helps plan and organize DWEA events at a regional and national level. When Aimee isn't in the office or on the road for DWEA, she is most likely enjoying the adventure and beauty her town Durango, Colorado has to offer.



## **Paul Migliore - AnemErgonics**

Dr. Migliore has 35 years' experience in virtually all aspects of wind energy, including research and teaching in academia, wind farm development, engineering design, manufacturing, consulting, and project management. Since retiring from NREL in 2005, he has consulted for numerous wind turbine manufacturers, primarily in the areas of aerodynamics, aeroacoustics, foundations, and tower design. Dr. Migliore has his BS, MS, and PhD in aerospace engineering from West Virginia University and an MS in systems management from the University of Southern California.



**Charles Newcomb - Director of Technical Strategy, Endurance Windpower**

Charles serves as Endurance's Director of Technical Strategy to align the company's technical solutions with business strategies. He brings more than 15 years of experience in nearly all aspects of the wind industry from sales and project development of wind projects to procurement and implementation strategies. He works with Endurance's technical team on the company's future product roadmap and business models. Prior to joining EWP Newcomb held several senior engineering roles at NREL.



**Eric Smith – Keystone Tower Systems**

Eric is CEO of Keystone Tower Systems. Keystone has developed a new manufacturing process that enables spiral welding of tapered steel monopole towers. While ultimately targeted at utility scale towers, the process may also be useful for smaller scale towers. Eric holds graduate degrees in Mechanical and Electrical Engineering from the Massachusetts Institute of Technology. Eric has also taught wind turbine engineering in the Mechanical Engineering Department at MIT.



**Tim Olsen - Advanced Energy Systems LLC**

Tim Olsen has directed Advanced Energy Systems LLC for 24 years, providing engineering and project management consulting for wind and solar energy project development worldwide, plus wind turbine design, solar hybrid system engineering and installation, energy efficiency design, and stakeholder mediation. Tim's degrees include BSME from CU Boulder, MSME from VPI&SU, and he is active with many civic organizations, including WorldDenver (YP Board), CO Renewable Energy Society (2006 president), and Engineers Without Borders (2005 co-chair). His certifications include Colorado Professional Engineer, NABCEP wind and solar, and BPI energy analyst.



**Joseph Spossey - Technical Expert, Wind Intertek Energy Services**

Joseph currently serves as Technical Expert and Wind Power category lead for Intertek's wind turbine testing and certification team. Joe earned his BSME from Rochester Institute of Technology, and since joining Intertek in 2009, his primary focus was the development of Intertek's Small Wind Regional Test Center. Joe participates on numerous committees supporting the advancement of the IEC 61400 series of wind turbine standards, and is a voting member of the AWEA Wind Standards Committee.



**Alice Orrell, PE - Energy Analyst Pacific Northwest National Laboratory**

Alice Orrell works for PNNL as an Energy Analyst where she provides renewable energy assessments and wind power project development support for Department of Defense clients and distributed wind market research and analysis for the Department of Energy. Alice is a member of Women of Wind Energy and the Society of Women Engineers. Alice is a Professional Engineer in the state of Washington and has a BSME from University of Vermont and a MBA from University of Washington.



**Brent Summerville, PE - Principal Engineer and President, Summerville Wind & Sun**

After working as a manufacturing engineer for a decade, Brent started his career in renewable energy at Appalachian State University by designing, installing, troubleshooting and providing training on renewable energy projects. He gained extensive experience testing small wind turbines while serving as the manager of the ASU Small Wind Research & Demonstration Site on Beech Mountain. He is currently the Technical Director of the Small Wind Certification Council and Technical Co-Lead for the DWEA SMART Consortium project. He has a BS in Mechanical Engineering from North Carolina State University and a Masters in Appropriate Technology from Appalachian State University.



**Heather Rhoads-Weaver - Principal Consultant eFormative Options LLC**

Heather is the founder of eFormative Options, providing market and policy analysis, project and organizational development, and stakeholder communications focused on forming and advancing sustainable endeavors. Heather is the elected Secretary for DWEA's Board of Directors and serves as DWEA's State Policy Director. eFormative is a subcontractor to the Clean Energy States Alliance compiling the NARUC Energy Zones policy inventory, drawing on experience developing other policy analysis dashboard tools and managing complex datasets. She holds an M.S. from the University of Northern Iowa and a B.A. from Wesleyan University.



**Jay Yeager, Senior Applications Engineer XZERES Corp**

Jay is a wind industry veteran with extensive background and experience in small wind turbine technologies, manufacturing, field testing, wind turbine certification, product development and design, project management and distributed wind systems development around the world. He has focused greatly on village electrification in underserved and remote locations with full cycle involvement from resource assessment to siting to modeling and system design, funding, deployment, installation and commissioning.