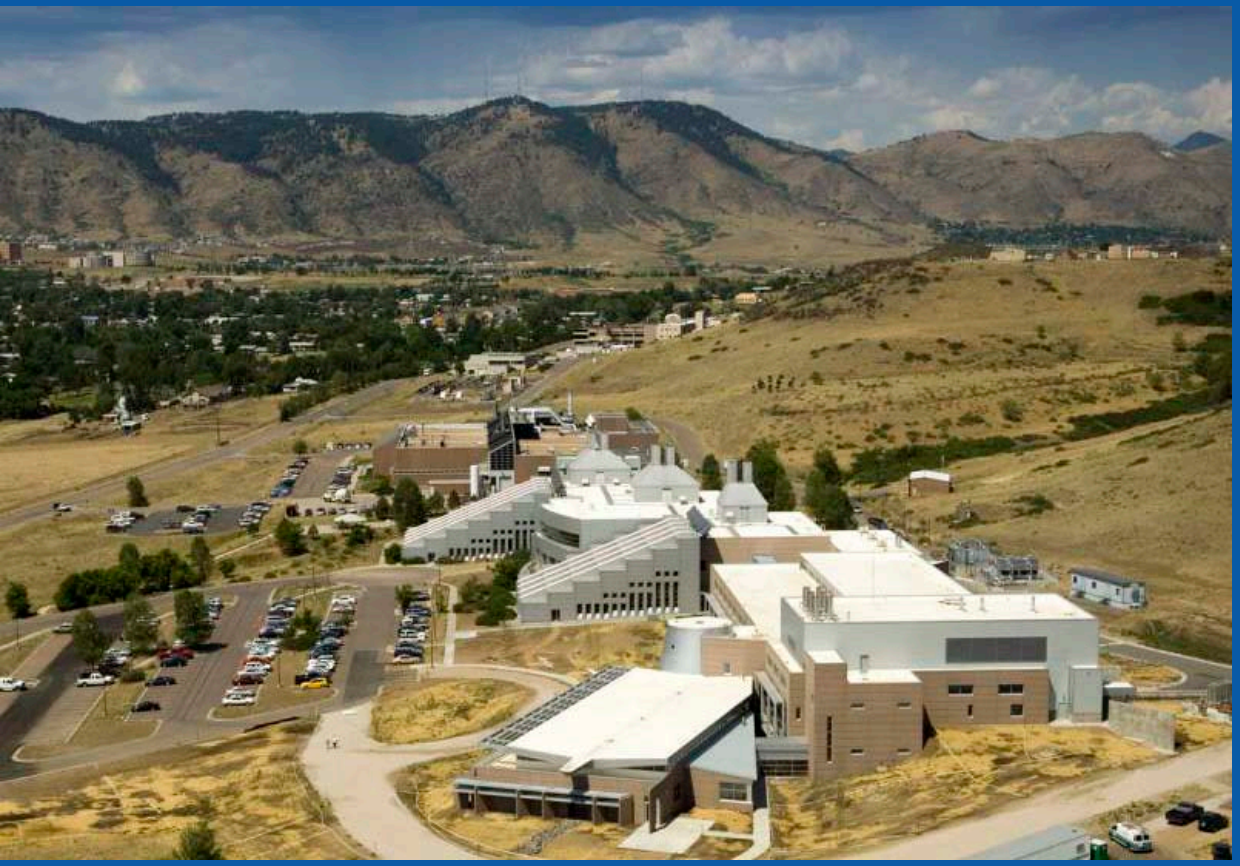
National Renewable Energy Laboratory
Innovation for Our Energy Future

Commercial, Technical and Policy Challenges of Wind-Diesel Applications



2009
International Wind Diesel Workshop

Ottawa, Canada

E. Ian Baring-Gould
National Renewable Energy Laboratory

June 1-2, 2009

Industry Challenges – Technical

- Availability of modern wind turbines in the appropriate size range to incorporate into wind-diesel applications.
- Development of lower-cost turbine foundations and installation processes that don't require the use of cranes.
- Expanded development of packaged systems that combine all of the needed components prior to installation in a rural community.
- Ability to upgrade re-manufactured turbines with performance monitoring equipment to allow for better management and early failure detection.
- Better understanding, use, and implementation of smart grid technologies, including a more flexible plug-and-play control architecture, allowing better use of dispachable and secondary loads.
- Development of standards or guidelines for wind-diesel systems and controllers, including defined commissioning procedures to ensure acceptable system operation following installation.
- Increase remote system and health monitoring capabilities, both for diesel engines and wind turbines.
- Continued improvements in diesel performance and control capabilities.
- Expanded development of lower-cost storage and grid stabilizing technology, allowing high-penetration systems to be implemented at lower cost.
- Lack of trained and skilled people to address the real high level technical issues

Industry Challenges – Institutional

- Poor understanding of the technology by decision makers.
- Lack of collection, analysis, and dissemination of wind-diesel power system performance and cost information to document a track record for the technology and provide data for further assessment.
- Lack of trained personnel and the ability to keep trained personnel in communities.
- Vested interests in maintaining the existing infrastructure and systems.
- Environmental, siting, or other development concerns.
- Preserved risk and associated higher financial costs .
- Little understanding of different and new ownership models, including power purchase agreements, and how they might be applied to remote communities.
- Continued efforts to increase the amount of information regarding wind technologies.
- Development of regional implementation approaches to support the co-development of systems in a number of communities, resulting in economies of scale for system implementation and leading to a viable operation and maintenance infrastructure.

Industry Challenges - Policy

- Lack of consideration of environmental impacts of diesel power generation.
- Creation or streamlining of policy and funding to support the development of diesel alternative systems – addressing the sustainability of rural communities.
- Fuel or energy subsidy policy should ensure that projects that reduce fuel use should be able to capture at least a portion of the state's cost savings from that fuel reduction.
- Lack of a policy to consider the risks and impacts of investment in diesel power generation as compared to other generation solutions; environmental, fuel stability, reduced fuel storage needs.
- Streamlining of permitting processes and coordination of different permitting agencies reduce the time and funding necessary to develop projects.
- Lack of funding to further develop and "proof" the technology

Conclusions

- No shortage of challenges.
- But also no shortage of people doing interesting things to address some of these challenges.
- Some shortage of funding and organizations that are in a position to work on addressing the remaining challenges.

However –

- Strong movement in Alaska and some other high profile projects – good legs to stand on.
- Reinvigoration of Canadian market.
- With high fuel costs – expanding interest from island and remote communities from across the globe

Things look bright…

National Renewable Energy Laboratory
Innovation for Our Energy Future

Carpe Ventem

E. Ian Baring-Gould

National Wind Technology Center & Deployment & Industrial Partnerships Centers

303-384-7021

Ian.baring.gould@nrel.gov