

Lead Organization: Illinois Institute of Technology  
Principal Investigator: Mohammad Shahidehpour  
Title: A World-Class University-Industry Consortium for Wind Energy Research,  
Education, and Workforce Development

The Illinois Institute of Technology (IIT), which offers an ABET accredited engineering program, leads an extensive effort in forming a world-class wind energy consortium of multiple universities (domestic and international) and multiple industry participants (all types of wind energy stakeholders). The consortium members perform a focused research on critical wind energy challenges identified in the “20% Wind Energy by 2030” report, including wind technology challenge, grid system integration, and workforce challenge. The technical phases of the project include: **Phase I:** Partnership for Wind Unit Installation; **Phase II:** Wind Turbine Reliability Research; **Phase III:** Wind Energy Research and Development; **Phase IV:** Workforce Development for Sustaining the Wind Energy Research and Development in US; and **Phase V:** Final Reporting. These phases and the corresponding task are discussed thoroughly in the proposal.

The wind energy consortium works closely with the world-leading wind energy developer, Invenergy, to procure a 1.5MW GE wind turbine and perform turbine reliability studies. The site for the GE wind turbine is in Grand Ridge, Illinois. Invenergy’s extensive experience in deploying large numbers of wind turbines helps the wind consortium conduct a world-class wind energy research and development. The consortium also works with the world-leading small wind turbine manufacturer, Viryd Technologies, to procure and install an 8KW Viryd wind turbine at IIT campus, and deliver the second turbine at one of the IIT’s engineering laboratories to perform turbine reliability studies. The wind energy consortium members have offered graduate and undergraduate courses on wind energy and engaged 20 graduate students with the state of the art research on wind energy technology development and integration.

The principal investigator of the wind energy consortium project is Dr. Mohammad Shahidehpour, who is the Bodine Chair and Director of the Center for Electricity Innovation at IIT. Dr. Shahidehpour is currently leading a DOE-funded perfect power project, a DOE-funded wind integration project, a DOE-funded smart grid education and training project, and several NSF-funded projects on wind energy deployment and operation. These projects are managed by the Center for Electricity Innovation. The Center brings together over 100 faculty, students, researchers, industry, government, innovators, and entrepreneurs who collaborate to improve the reliability, security and efficiency of the electric grid and overcome obstacles to the national adoption and implementation of smart grid and sustainable energy.

The lead organization of the wind energy consortium is IIT, which has a long history of offering one of the finest electric power programs since 1930’s. Other university consortium members include the world-renowned University of Chicago, Southern Illinois University which is a leading university in clean energy research, and four internationally prestigious universities with a strong wind energy program: University of Castilla-La Mancha (Spain), University of São Paulo (Brazil), Aristotle University of Thessaloniki (Greece), and Polytechnic University of Bucharest (Romania). Faculty and students from the international university members are invited to IIT to attend consortium workshops in the United States and to share their innovative ideas with their American counterparts. The industry consortium members include all types of wind energy stakeholders: **wind turbine companies** (GE Energy, Viryd Technologies, Acciona Wind Energy USA), **wind energy developers** (Invenergy, Pampa Energia Eolica (Brazil), PS Wind Management (Romania)), **power transmission system operators** (ComEd/Exelon, ISO New England, British Columbia Transmission Corporation), **wind energy control devices and software companies** (Dakota Power, EnerNex Corporation, SmartSignal Corporation, Innovation Technology Applications Company) and **energy system consultants** (Keyworks, Electric Power Research Institute, AREVA T&D, Intelligent Power Solutions, McCoy Energy, Wiedman Power System Consulting).

In September 2010, the wind energy consortium held a successful symposium at IIT which was attended by 180 members and associates of the consortium. The consortium will hold a wind energy conference at IIT in 2011.