Title: **Bulk Energy Storage**

Speaker: *Rick Winter, UE Technologies*

Location: **MOR 220, UW campus**

Map: [http://www.washington.edu/maps/?l=MOR](http://www.washington.edu/maps/?l=MOR)

Time and Date: **4:00 PM, Thursday, October 12, 2017**

**Abstract:** For the past 100 years, electric utilities have moved with glacial majesty to reliably and safely operate the world’s most complex machine – the US electric grid. Today we move into a new era with upwards of 40% of our energy coming from variable renewable sources, driven by the overwhelming appeal of free fuel forever. Once renewable assets are depreciated, they continue to generate power for decades, virtually for free, with the only caveat being a complete disregard for our highly optimized work/life balance. Electricity is the only commodity that must be created the instant it is consumed. This must change. As our renewable generation technologies become “too cheap to meter”, value is no longer found in making electricity. Value is being found in managing electricity and electricity security. This has brought about the dawn of bulk electricity storage on a massive scale. It is projected this nascent industry will grow at a CAGR of 33% to 2.5GW deployed within 5 years in the US alone. This digitally controlled buffer capacity will facilitate even greater deployments of renewable resources in an amplifying feedback loop.

The trouble with this renewable utopia is that batteries are delicate electrochemical systems that typically don’t have the toughness to perform six months of perpetual cycling, let alone decades. Despite billions being invested globally, there are very few technologies that even come close to the true requirements of this market. One successful technology is the vanadium redox flow battery being produced just north of Seattle at UET. Rather than seeking out dreamium or unobtanium to solve the problem of bulk energy storage, UET has been able to leverage a breakthrough from the national labs in the innovative use of a more common material – vanadium.

Winner of the highest US Government Awards for Excellence in Technology Transfer and the Presidential Green Chemistry Challenge, UET is leveraging a vertically integrated global supply chain to deliver bulk electricity storage to the electric grid in the form of 40 ton batteries.

This presentation will dive into the technology of change that will create the utility of the future. From molecules to megawatts through the development cycle of a field rugged product, to the implications for our future where grid security can be achieved to an unprecedented degree through renewable resources and bulk electricity storage. Grid 2.0, made up of an aggregation of self-healing microgrids, will rely on a backbone of electricity storage plants for stability, reliability and resiliency.
Rick Winter is President and COO of UET with 28 years’ experience in innovating and commercializing storage technologies in the utility power infrastructure. He has been deeply involved in the emergence of the grid storage industry from its early stages, having been awarded the ESA Phil Symons award for his “instrumental role in the evolution of storage technologies in both the utility and battery manufacturing industries”, and the NAATBatt Lifetime Achievement Award. During this time, he was a founding member of the Electricity Storage Association in 1991, serving twice as chairman and as a board member for 18 years.

Mr. Winter’s experience ranges from deploying microgrids in Australia’s Torres Strait to managing the Storage Technologies Program at Pacific Gas & Electric Company, America’s largest investor-owned utility. He has led product development at five advanced battery companies, in the process creating the world’s first commercial flow battery product (the 100kW/100kWh PowerBlock™), and inventing the single loop flow battery in his garage (Pat#8039161). With a focus on technology and product strategy for real world applications, Mr. Winter holds 17 US patents with several pending and numerous abroad.

Rick is now President and COO at UniEnergy Technologies (UET), manufacturing the only containerized flow battery product available with multiple MW-scale field installations. UET’s product leverages a $350MM manufacturing consortium, PNNL’s breakthrough vanadium chemistry and extensive industrial engineering. Key attributes of UET’s fully recyclable product include no capacity fade and 100% duty cycle flexibility over a 20-year life. UET is currently in production ramp with several hundred MWh of projects deployed, ordered, or awarded, based out of a 60,000ft² manufacturing facility in Seattle.