

## **Ready or Not, Here Comes the Smart Grid!**

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Utilities and regulators in many countries and jurisdictions are rushing to roll out the “smart grid,” which has been hailed as a technological panacea for the multiple challenges facing electric utility industries globally: Consumers can be empowered to manage their electricity usage, the problem of integrating large-scale renewable and non-dispatchable energy sources into utility power grids can be solved, and economically costly blackouts can be averted. The U.S. federal government has dedicated tens of billions of dollars of economic stimulus funding to smart-grid deployment projects, and a number of U.S. states are implementing policies aimed at a rapid implementation of smart grid technologies. If the promise and challenges of the smart grid were an area that had been exhaustively studied, then this enthusiasm would be warranted. Unfortunately, only half of the previous statement is true – the promise of the smart grid has been written, broadcasted and blogged about but the swell of enthusiasm has drowned out much of the real analysis of the smart grid’s potential and limitations. The smart grid is not snake-oil, but there is a widespread lack of understanding among policymakers, the general public, and researchers regarding what the smart grid actually is and how it can improve the reliability and sustainability of our electricity systems. The smart grid is being deployed faster than our ability to think through how it should be deployed, leaving important technical and social issues by the wayside. The purpose of this talk will be to provide a clear understanding of the “smart grid” as more than advanced “smart meters” or digital sensors for transmission grids. The essence of the smart grid is to bring modern communications and control systems to the production and delivery of electricity. The potential for improving the reliability and sustainability of electricity consumption and allowing for more decentralized decision-making is real, but the smart grid will inevitably evolve towards greater coupling of multiple infrastructure networks (electricity, communications, fuels and potentially transportation) with emerging and difficult-to-predict implications for cyber-security, infrastructure vulnerability and consumer privacy. These are not necessarily reasons to reject the smart grid (though regulators in some jurisdictions have done so) but policymakers and the public need to consider the real promise and perils of the smart grid before endorsing aggressive deployment.