



INTERSECT 2018 OVERVIEW

Energy in an Information Age

Strategic Energy Institute

Intersect 2018: Energy in an Information Age

Introduction

Energy is arguably the single most important issue of our modern times. Few sectors have a greater direct impact on our economy or every aspect of life — from household comforts and conveniences to transportation, manufacturing, and communications, it is omnipresent. Networked, digital systems that are connected to the traditional, physical energy infrastructure are growing exponentially. The overlap between these systems and computing, big data, and physical infrastructure is creating a need for new resources, particularly in regards to the safety and security of operational structures and personal consumer information.

Energy in an Information Age

Earlier this year, the Georgia Institute of Technology's Strategic Energy Institute and Energy, Policy, and Innovation Center assembled and hosted a diverse group of researchers, academics, and executives to discuss the challenges and opportunities presented by the rapidly evolving energy industry. The theme of this second annual Intersect conference, "*Energy in an Information Age*", included perspectives from thought leaders, such as Southern Company CEO Tom Fanning, Georgia Public Service Commissioner Tim Echols, and New York Power Authority CEO Gil Quiniones, as well as panels covering technology, business models, policy and equity. The keynote, delivered by Admiral Bob Willard of the Institute of Nuclear Power Operations, highlighted the call for a new generation of leaders to take a strategic, bold and long term approach to guide the transformation towards a new energy future.



Advances in technology, the ability to access and process data, and the evolving role of individual consumers are driving disruptions in the energy industry at a pace that is challenging paradigms that were originally built around multi-decade investment and policy cycles. Demonstrating this, Richard Simmons drew a parallel to how even those closest to an industry can underestimate how fast change can occur: in 1901 Wilbur Wright projected that man would not fly for fifty years, yet the first flight occurred just two years later.

The Intersect conference emphasized the potential of this energy transition, while reminding stakeholders to be wary of creating unintended consequences. Four themes ultimately emerged as key challenges facing our evolving energy sector: balancing equity, managing digitalization and data, assuring resilience, and engaging stakeholders throughout the transition.

Conference Themes

Digitalization and **big data** offers the potential to unlock previously untapped value within our energy infrastructure. For example, Gil Quiniones pointed out that the current electricity system is utilized at about 60% capacity, compared to over 90% capacity for the airline industry, which relies heavily on revenue data systems. Ownership and access to data will determine the winners and losers of the new energy economy, not to mention the extent to which societal objectives and benefits can complement innovative business models. Doing this well however, demands trust between industry and consumers. Southface President, Andrea Pinabell, commented on this, acknowledging that “data is power.” Tim Lieuwen then stated that the biggest inhibitor to research is the absence of good data, confirming that opening access to data is key for spurring innovation.



Resilience was another resonant theme, given its various forms and potential implications on progress in other sectors. We want to evolve rapidly, while simultaneously providing reliable electricity. Hans Kobler, CEO of Energy Impact Partners, noted that the “laws of physics are unforgiving”, particularly in an economy that is continuously becoming more electrified and digitized. Some panelists noted that new technologies and distributed resources offer the promise of improved local resilience.

However, utilities must live with their decisions concerning integration and infrastructure for decades, amplifying concerns over potential unintended consequences on reliability. As a result, new technologies may face a “death by pilot” scenario, given that the timeline from pilot to large scale adoption is 8-10 years.

Cyber security and **data privacy** are key concerns, as the number of interconnected devices and industry players proliferate. “Every little sensor can be a potential vulnerability”, said Georgia Tech’s Deepak Divan. Electric Power Research Institute CEO Mike Howard offered that a distributed system may actually reduce overall security threats in comparison to large centralized systems, assuming it can isolate and localize cyber threats quickly before a central network is breached.

In the opening leadership panel, **Equity** was noted as one of the biggest threats both to and from the energy transition. Lieuwen noted that while technology has been identified as an “enabler, field leveler, and democratizer,” it can also be an amplifier of existing differences in areas like access, resources, and talent. Without care in setting policy, options such as smart thermostats and rooftop solar may be out of reach for low income groups when up-front costs are high and benefits accrue over long periods. Panelists agreed that a greater need exists for innovative multi-stakeholder solutions to relieve high “energy burdens” on low income customers, who pay a significant percentage of their income on electricity and natural gas services.

Stakeholders are also forging a new role in the energy sector, as the “prosumer” is challenging long held notions of the make/move/sell model. Tech companies, such as Microsoft, find themselves simultaneously consuming as much power as a small country and juggling the management of equivalent backup generation. The current utility business model “does not work for us” in some areas, noted Jim Collins of Microsoft. Gaps in understanding and experience will challenge us all: civil society, regulators, and policy makers, suggesting that collaboration will be critical. A fundamental question consequently arose: Will the “invisible hand” of the marketplace succeed or do we need a more



integrated decision approach for an industry that is bound to their investments for over 30 years? In addition to this, the disaggregation of the business model also poses a challenge in quantifying and monetizing cost and value. Commissioner Tim Echols noted the success of integrated resource planning as a model for broad engagement and intentionality in a setting a course.

Despite the challenges of navigating the energy sector’s evolving transition, there was an underlying optimism that these changes will

collectively bring value. Admiral Willard thus challenged the audience, “Who will be the leaders of this new model? You will find them at Intersect 2019!”

Additional Major Takeaways

- Ownership and access to data will determine the winners and losers in the new economy emerging around digitalization.
- Guaranteeing resilience will be challenging for all existing and future energy infrastructure. Assuming the attainment of strong data and isolation capabilities, innovative distributed and hybrid grid models may present opportunities for reducing threats and increasing cybersecurity.
- New solutions are needed to understand and improve energy equity, and to ensure that the benefits of technological innovation are distributed evenly across society.
- The changing role of customers, including prosumers and novel business models, will make collaboration in the new energy era essential.
- Regionally-focused efforts and multi-stakeholder processes that incorporate a breadth of perspectives, as well as timely data and tolls, will become imperative instruments in developing strategic and robust resource plans.