

How to Achieve a Sustainability Breakthrough by Looking at Data Differently

Rich Argentieri, President, NextEra Analytics, Inc.

KEY TAKEAWAYS

- Conventional paradigms must be broken to achieve a sustainable future.
- A sustainable future depends on higher-resolution data.
- Avoiding IT pitfalls is key to effective data management.
- NextEra 360™ increases data resolution to change paradigms, improving financials and sustainability.



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How to Achieve a Sustainability Breakthrough by Looking at Data Differently

OVERVIEW

Many corporations are tasked with achieving aggressive sustainability goals. However, despite an ever-growing amount of data, utilities frequently struggle to make meaningful gains toward those goals. Traditional paradigms can create barriers to creative problem solving, resulting in little to no progress on these goals. Viewing data differently can help companies shift limiting paradigms and achieve breakthroughs in their decarbonization efforts.

NextEra Analytics develops forecasting and optimization software solutions to enable low-cost, sustainable power systems. The company's NextEra 360™ platform, comprehensive energy management software, was originally developed for NextEra Energy Resources to achieve breakthrough sustainability outcomes. Today, NextEra 360 can be implemented at any utility to increase operational efficiency, reduce cost, and accelerate energy goals. With NextEra 360, corporations no longer have to undertake large-scale, do-everything IT projects to gain a higher-resolution view of their data and can cast aside the overcomplicated thinking of the past.

CONTEXT

Rich Argentieri discussed the importance of high-resolution data in achieving sustainability goals and how NextEra 360 enables high-resolution data capture and analysis for commercial and industrial companies and utilities.

KEY TAKEAWAYS

Conventional paradigms must be broken to achieve a sustainable future.

From astronomy to neuroscience, particle physics to climate science, advancement in technology that provides increasingly higher resolutions has led to breakthroughs in understanding and application. The sustainability journey is no different. The sustainable future requires breakthroughs born of increased data resolution.

NextEra has set its own breakthrough goals, captured in the Real Zero campaign to decarbonize America. The first phase of Real Zero focuses on decarbonizing NextEra Energy, both internally and for its customers, before moving into the next phase of decarbonizing the U.S. power sector, then ultimately the broader U.S. economy.

In addition to high-resolution data comprising billions of data points measuring how NextEra generation fleets operate, plus emissions data, financials, weather forecast, and more, achieving these ambitious goals requires breaking a lot of paradigms: those decision-making matrices or filters that inform quick decisions in day-to-day operations. This is because, despite increased data resolution, current paradigms hide results by creating bias and cognitive dissonance.

For example, in 1976, *Popular Science* magazine rated the Gremlin, a car manufactured by American Motors Corporation, as the most fuel-efficient car of the time. Weighing approximately 2,500 pounds, the Gremlin went from 0 to 60 mph in 12 seconds, with fuel efficiency of 21 mpg with a 128-hp engine.

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This was not, however, the most fuel-efficient car in existence at the time. A similarly sized vehicle that could do 0 to 60 in 8 seconds, with a fuel efficiency of 77 mpg with a mere 16-hp engine, was built by an advanced hydraulics lab at Hennepin Technical College in Minnesota. The car was significantly more fuel efficient and measurably faster—why was it not adopted by car manufacturers?

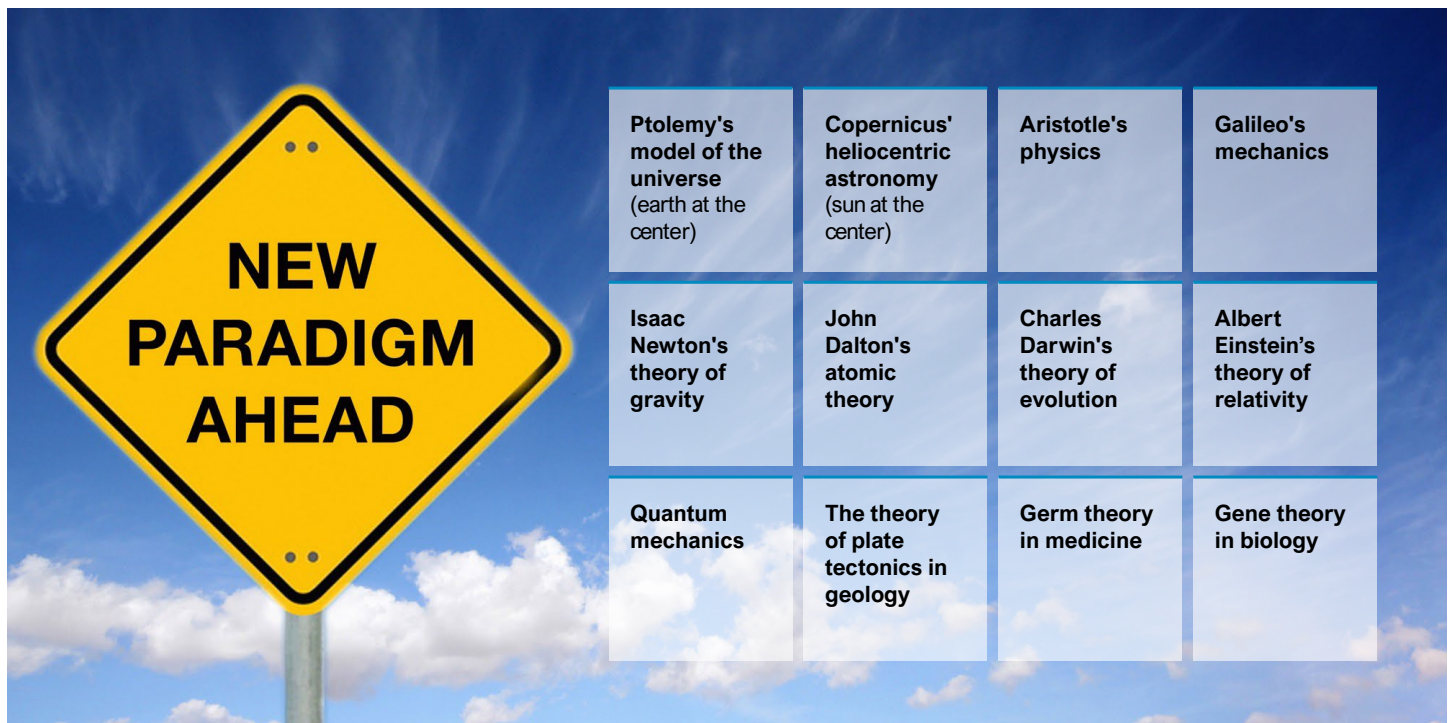
The paradigm at the time demanded that car design and manufacturing originate in the conventional auto industry. Adopting a car invented outside of the industry would require breaking that paradigm.

“Every major breakthrough—every big innovation—has always come through that change of paradigm. This is one of the most important pieces we need to focus on and take away in our organizations.”

Rich Argentieri, NextEra Analytics, Inc.

Much like other breakthroughs, achieving true zero will require casting aside conventional notions about whether sustainability or decarbonization goals are attainable. Shifting paradigms requires high-resolution data.

Figure 1: Examples of breakthroughs that required breaking paradigms



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A sustainable future depends on higher-resolution data.

For decades, operations were relatively simple within the energy industry, with few sources of uncertainty. For the conventional generation, the greatest uncertainty centered on equipment outages or unexpected weather-related loads. Today, however, the problem has grown much bigger. Weather impacts not only loads but also renewable resources. Distributed generation and distributed resource management compound the complexity of operations and add uncertainty.

To not only solve for this complexity but also reach breakthrough goals such as true zero, conventional advice might recommend breaking down the problem into smaller pieces and solving each in a one-by-one approach. However, this preemptively removes the step of problem formulation, where a different large-scale solution might be realized upon better understanding the problem.

NextEra recommends doing the opposite: **enlarge the problem to make it more solvable**. With a more expansive boundary around a tough problem, there are more insights and options—offering more opportunities to solve it. For example, to make a vehicle go faster, the answer is not necessarily to

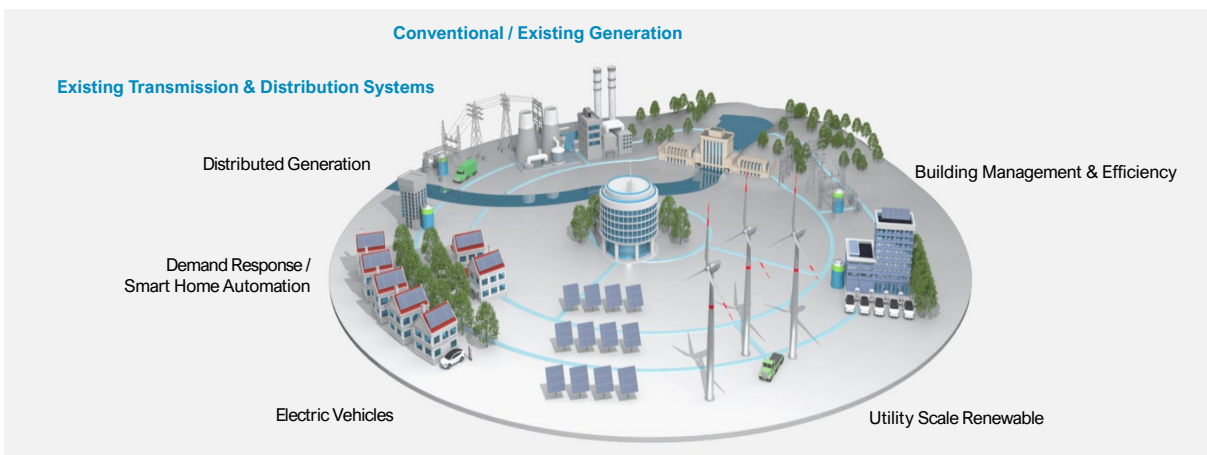
work only within the confines of what already exists and simply enlarge the engine. Instead, stepping back and viewing the larger vehicle, considering the application of materials science to lighten the weight of the body panels and/or the interior, control systems around how the engine is fired, or other options to improve speed facilitates solving the same problem in an easier, more effective way.

Solving the complex challenges of utilities and developing the grid of the future requires the same approach—instead of tackling the problems of each component. A more holistic approach will yield a more impactful result.

For NextEra, this holistic approach has allowed the company to achieve ambitious goals, including:

- Using computational fluid dynamics and atmospheric modeling to provide better, faster customer responses.
- Recognizing voltage patterns across nearly five million smart meters to predict failures in near real-time.
- Improving generation forecasts by incorporating real-time operational performance data.
- Analyzing 30 billion rows of operating data to identify underperforming assets every morning.

Figure 2: Enlarging the system provides more options and produces better solutions



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Avoiding IT pitfalls is key to effective data management.

Optimizing for decarbonization goes hand in hand with cost savings. Greater competition between sources can successfully lower the cost of sustainable generators, increasing sustainability by default of renewables being the more cost-effective choice. Many major utilities are raising their prices, making distributed solar projects more attractive for customers. With a high likelihood that carbon reporting will be required as part of SEC filings starting in 2024, publicly traded companies over a certain size will need to have the capabilities in place to measure and report their carbon. As investors begin taking those sustainability metrics into account, improved sustainability becomes a financial imperative. These larger financial incentives are often coupled with disincentives, such as local carbon tax laws—all coming together to make a strong case for decarbonization.

However, with so many different data sources that exist today that were not available in the past, utilities face a new set of challenges in their journey to sustainability. The velocity, volume, and variety of data is changing rapidly—and is expanding exponentially.

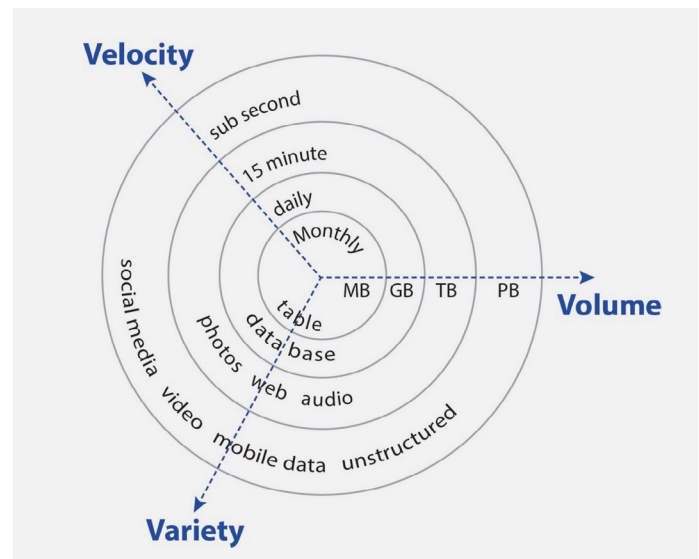
As a result, data projects have a reputation for taking too long and being too expensive for companies to be able to meet sustainability goals.

This is especially true when utilities undertake IT projects by starting with the framework, rather than the problem. Implementing a data lake and infrastructure to help manage data, but without hard requirements driven by business outcomes, usually results in a system that can do everything yet accomplishes nothing.

“All too often, [when] we talk to our customers . . . the price tag and the commitment for the technology is what scares them away from wanting to approach a project like this. But you don’t need an enterprise data lake to make impacts today on your sustainability or carbon goals.”

Rich Argentieri, NextEra Analytics, Inc.

Figure 3: Exponential increase in data sources leads to a new set of challenges for utilities



How to Achieve a Sustainability Breakthrough by Looking at Data Differently

NextEra 360 increases data resolution to change paradigms, improving financials and sustainability.

NextEra Analytics develops forecasting and optimization software solutions to enable low-cost, sustainable power systems. Derived from the company's expertise using data and artificial intelligence to create energy solutions, NextEra 360 is comprehensive energy management software, which increases operational efficiency, reduces costs, and accelerates decarbonization.

In addition to producing NextEra 360, the most comprehensive carbon emissions, energy management, and optimization software, NextEra uses its deep operational expertise to help utilities successfully implement high-resolution data projects in support of shifting paradigms to enable breakthroughs.

Energy Resources, the world's largest generator of renewable energy from the wind and sun, and a world leader in battery storage, uses NextEra 360 in house to manage and optimize more than \$50 billion of its own renewable assets. Since 2020, NextEra 360 has reduced revenue/generation losses at NextEra Energy by nearly 30% while simultaneously reducing operations and management costs by 16%.

"Our operating paradigm really changes our focus. The operating paradigm here at NextEra Analytics—we call it a Zero Distance P&L—stays focused on very specific outcomes. By leveraging a lot of these technologies we were able to help improve a number of outcomes."

Rich Argentieri, NextEra Analytics, Inc.

Figure 4: NextEra Energy uses its own NextEra 360™ to improve O&M



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ADDITIONAL INFORMATION

To learn more about **NextEra 360** comprehensive energy management software, visit www.nextera360.com

BIOGRAPHY



Rich Argentieri

President, NextEra Analytics, Inc.

Richard “Rich” Argentieri is president of NextEra Analytics, Inc., a subsidiary of NextEra Energy Resources, the world’s largest generator of renewable energy from the wind and sun, a world leader in battery storage and a driving force in the development of the green hydrogen economy. NEA develops forecasting and optimization solutions that enable low-cost sustainable power systems. Mr. Argentieri is responsible for the company’s strategic planning, research, product execution, operations and business performance. He also leads NEA in supporting NextEra Energy Resources’ growth in the competitive energy generation business. Mr. Argentieri was appointed to his role in January 2011.

Previously, Mr. Argentieri was senior director of integrated supply chain at Florida Power & Light Company, NextEra Energy Resources’ sister company, where he directed strategic sourcing initiatives for its \$8 billion supply chain. Prior to joining NextEra Energy in 2008, Mr. Argentieri directed the transformation of the transportation management and third-party logistics businesses at Ryder Systems, a leading transportation and logistics firm. Before that, Mr. Argentieri managed a global workforce at General Electric (GE) charged with improving the installation, maintenance and reliability of GE’s wind turbine business. He is a graduate of the GE leadership program.

Mr. Argentieri is a Lean Six Sigma Master Black Belt and has led countless Kaizen and Six Sigma engagements at over a dozen Fortune 500 companies. He holds a bachelor’s degree in computer information systems from Rensselaer Polytechnic Institute.

This summary is based on an August 22, 2023 live webinar.