

AGENDA & SESSION ABSTRACTS

Powering Decisions

Optimization Summit 2026

 April 21–22, 2026 |  Denver, Colorado

Where optimization meets real-world utility decisions.
Hilton City Center, Denver.



Hosted by



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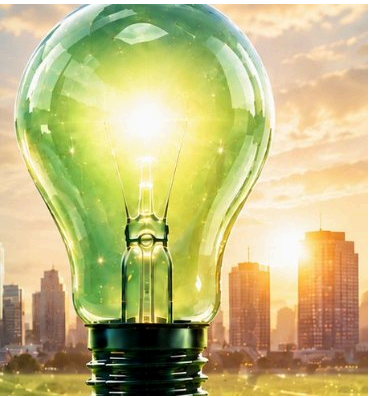
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DAY 01

Day One

Tuesday, April 21, 2026



Breakfast • Denver 1&2 (Meal Room)

07:30AM–08:30AM

Check-in and Badge Pickup • Sponsor Lounge

07:30AM–08:30AM

Welcome to the event! Badge pickup and check-in will be available during breakfast. Please stop by the registration desk to pick up your badge. Opening session begins at 8:30—we look forward to seeing you there.

To access the Denver ballroom, check-in and sponsor lounge:

- Take the escalators from the lobby
- Continue down both sets of escalators to the bottom level
- Follow signs to Lower Level 2 and the Denver Ballroom

Floormap is available in your app for reference.

GENERAL SESSION

08:30AM–08:45AM • Denver 3&4 (Main Session Room)

Opening Remarks: Gurobi

Jason Morris

Account Director, Power & Utilities

Gurobi Optimization

KEYNOTE

08:45AM–09:45AM • Denver 3&4 (Main Session Room)

Keynote: Grand Challenges and Opportunities in Energy Sustainability

Dr. Owen Wu

Associate Professor

Indiana University

This talk explores the grand challenges of making clean energy dependable and scalable. It examines the energy transition through three linked perspectives: system, firm, and partnership. Key system challenges include matching renewable supply with demand across time and space through storage, transport, and demand management. Key firm challenges arise from capital allocation under uncertainty and financing constraints. Key partnership challenges involve coordinating infrastructure, supply chains, policy, and local development across many stakeholders. Drawing on examples including solar and battery storage investment, liquid organic hydrogen carriers, EV charging, data center demand response, solar panel recycling, behavioral energy efficiency, the talk shows why operations research belongs at the center of energy sustainability.

GENERAL SESSION

09:45AM–10:30AM • Denver 3&4 (Main Session Room)

Power Market Design and Computing

Dr. Richard O'Neill

Former Chief Economic Advisor, FERC

Consultant

Solving old problems faster and better is a noble pursuit, but mostly an academic achievement. We may be solving the wrong problems. Over the last two decades, the US has moved significantly from vertically integrated utilities cost-of-service regulation to ISO markets. The ISO energy markets have not dealt well with renewables and the pricing is inefficient and a weak investment signal. The system can no longer assume fixed demand for larger consumers. They need to participate in the market by bidding. This is beneficial to consumers and the efficiency of the markets, but may take longer to clear. The interconnection process and transmission expansion rules were written for vertically integrated utilities and ISO have been shoehorned into the process. N-1 reliability is becoming old school and reliability needs to add extreme weather management. The analysis is different and more interesting. AI may present problems for regulators because the results have often been 'black box' answers, but has great potential. That said solving the ACOPF, topology optimization, and stochastic planning models all need more attention.

Morning Break • Sponsor Lounge

10:30AM–11:00AM

PANEL

11:00AM–12:00PM • Denver 3&4 (Main Session Room)

Modern Electric Grid Challenges: Recent Developments in Modeling, Simulation, and Optimization

Harry van der Weijde

Head of Research & Market Development

Open Energy Transition

Jose Daniel Lara

Principal Engineer

National Laboratory of the Rockies

Carlo Brancucci

CEO

encoord

Dr. Jonathan Snodgrass MODERATOR

Senior Research Engineer

Texas A&M University

Arthur Barnes

R&D Engineer

Los Alamos National Laboratory

The electric power system is transforming faster than the tools designed to plan and operate it, as variable renewables, new large loads, inverter-based resources, evolving markets, and rare-but-severe contingencies push legacy workflows — and the siloed boundaries between economic planning, reliability analysis, and dynamic simulation — past their design assumptions. This panel brings together four leaders working at the frontier of grid modeling, simulation, and optimization: Harry van der Weijde (Head of Research & Market Development, Open Energy Transition) on the role of open-source tools in power system planning, with particular depth on PyPSA and large-scale, sector-coupled energy system modeling; Carlo Brancucci (CEO, Encoord) on SAInt, an integrated platform that unifies security-constrained economic optimization with AC power flow and contingency analysis in a single planning workflow; Art Barnes (Los Alamos National Laboratory) on modeling and mitigation of geomagnetic disturbance risk through PowerModelsGMD.jl, along with the scaling limits of optimization and the emerging role of AI methods; and Jose Daniel Lara (National Laboratory of the Rockies) on the Sienna platform, a modular Julia-based ecosystem spanning data management, scheduling, and dynamic simulation for systems with high shares of inverter-based resources. Moderated by Dr. Jonathan Snodgrass (Assistant Director, Smart Grid Center, Texas A&M University), the discussion will examine where the field has made real progress, where it still falls short, and how open-source and commercial tools can better serve utilities, regulators, operators, and researchers navigating a rapidly changing grid.

Lunch · Denver 1&2 (Meal Room)

12:00PM–01:00PM

TECHNICAL ADVANCES IN ENERGY TRACK

01:00PM–01:30PM · Denver 3&4 (Main Session Room)

Co-optimizing Capacity and Day-Ahead Markets for Grid Reliability and Affordability Considering Large Electric Loads

Nawaf Nazir

Senior Research Scientist

Pacific Northwest National Laboratory

The rapid growth of emerging technologies, such as artificial intelligence (AI) and electric vehicles (EVs), is fundamentally altering energy consumption patterns and posing new challenges to electricity markets to support these new loads in a reliable and cost-effective manner. This challenge requires innovative approaches to electricity market optimization, particularly for capacity markets. When securing grid generation capacity, it now becomes important to consider the daily and seasonal variations in large electric loads. The motivation behind Co-optimizing capacity and day-ahead markets is to develop a generalized framework that secures the right capacity of generation that can cost-effectively meet the unique demand profiles of large electric loads (like AI data centers) in the coming years. Traditional capacity market designs focus only on peak demand when securing generation capacity, potentially leading to spikes in electricity prices for consumers. A Co-optimized approach allows for simultaneous consideration of long-term capacity planning and short-term operational adjustments, leading to overall societal benefits in terms of reduced energy costs as well as improved grid reliability. The methodology employed here uses the Alternating Direction Method of Multipliers (ADMM) to integrate capacity and day-ahead markets, by decomposing the problem into a Master (Capacity Market Clearing) and Sub-problem (Day-Ahead Clearing). Such a strategy aims to facilitate the efficient integration of new large electric loads, enabling a seamless accommodation of novel consumption patterns.

POLICY & OPERATIONS TRACK

01:00PM–01:30PM · Denver 5&6

Robust Virtual Power Plants: Turning Customer-Sited Resources into Grid Assets

Michael Blonsky

Senior Control and Optimization Engineer

EnergyHub

Virtual power plants (VPPs)—aggregations of customer-sited flexible loads and distributed energy storage—represent a rapidly growing resource with gigawatts of potential to provide capacity, enhance grid reliability, and reduce system costs. Despite this promise, grid operators remain skeptical of VPPs' ability to perform comparably to conventional power plants. Key concerns include variable output, uncertainty in available capacity, and limited real-time visibility and control. Addressing these challenges is critical to maximize VPP value and to broaden VPP adoption in utility programs and wholesale markets.

This presentation describes EnergyHub's approach to improving the reliability and predictability of VPPs through advanced optimization methods. Through coordination of diverse customer-owned devices, we can deliver up to six hours of sustained grid services while respecting customer comfort, cost constraints, and device-specific operational limits. The solution incorporates real-world considerations such as heterogeneous device capabilities, manufacturer requirements, and communication constraints. We will share an overview of the optimization framework, discuss preliminary performance results from deployed VPPs, and provide a utility perspective on why consistent, dependable capacity delivery is essential for grid operator confidence. Together, these insights demonstrate how VPPs can evolve from experimental resources into trusted components of the modern power system.

TECHNICAL ADVANCES IN ENERGY TRACK

01:30PM–02:00PM • Denver 3&4 (Main Session Room)

ERCOT Day-Ahead Market Clearing

Wenlei Bai

Sr Market Management System Developer

ERCOT

The Electric Reliability Council of Texas (ERCOT) Day-Ahead Market (DAM) serves as a critical financial arena for scheduling energy and ancillary services to ensure grid reliability and cost-efficiency. This talk explores the mathematical formulation of the DAM, which is characterized by complex, large-scale optimization challenges. At its core, the market utilizes mixed-integer programming (MIP) and nonlinear equations to solve for optimal power flow and capacity allocation, aiming to minimize total system costs while adhering to stringent transmission and reliability constraints.

The talk includes the performance of various industrial-grade solvers is evaluated, comparing the efficiency and convergence rates of engines such as CPLEX, Gurobi in real-time Linux environments. By analyzing these solvers, we highlight the computational trade-offs between mathematical rigor and the necessity for rapid market clearing. Furthermore, the integration of advanced optimization techniques ensures the Texas grid remains resilient under varying load conditions, providing a foundation for a modern, competitive electricity marketplace.

POLICY & OPERATIONS TRACK

01:30PM–02:00PM • Denver 5&6

Battery Dispatch Optimization

Kendra Williamson

Senior Principal Optimization Engineer

Key Capture Energy

The rapid integration of renewable energy sources into power grids has presented growing opportunities for Battery Energy Storage Systems (BESS) to bridge the timing gap between solar/wind supply and electricity demand. BESS are playing a critical role in enhancing grid stability and supporting a more efficient and less emissive power grid, and mathematical optimization is a fitting tool for determining optimal dispatch schedules. This talk will explore how Key Capture Energy has realized the benefits of optimization-based models for BESS dispatch, and how this comes into play in ERCOT's new Real-time Co-optimization model - a modernization that allows ERCOT to be the most dynamic energy market in the U.S.

The presentation will cover considerations for optimizing BESS dispatch under various market and operational constraints and explore challenges associated with real-world BESS dispatch. Attendees will gain insights into how optimization comes into play for effective benchmarking as well as intelligent, flexible operations.

Afternoon Break • Sponsor Lounge

02:00PM–02:30PM

TECHNICAL ADVANCES IN ENERGY TRACK

02:30PM–03:00PM • Denver 3&4 (Main Session Room)

Pathway to Scalable Distribution Optimization Methods

Rabayet Sadnan

Research Scientist

Modern electric distribution systems are transforming into ultra-large-scale systems-of-systems, presenting unprecedented computational challenges in coordinating millions of decision variables across multiple temporal and organizational scales to reliably extract grid services from flexible grid-edge resources. The proliferation of distributed energy resources (DERs) at the network periphery, combined with an increasingly complex web of interacting stakeholders—DSOs coordinating with TSOs/ISOs, DER aggregators and owners with heterogeneous objectives, and emerging aggregator-to-wholesale-market pathways bypassing direct DSO visibility—materially increases operational uncertainty and computational complexity. Distribution-level flexibility has become central to resource adequacy, resilience, and affordability, providing critical services during normal operations and extreme events. Additionally, the temporal coupling introduced by storage and other stateful assets further compounds these challenges by extending problem horizons across multiple timescales. Addressing these imperatives necessitates advanced decomposition techniques, parallel computing frameworks leveraging high-performance computing architectures, and novel algorithmic approaches capable of tractably solving ultra-large-scale problems while maintaining solution quality—critical capabilities for enabling the grid flexibility, affordability, and resilience required in our rapidly evolving energy landscape.

POLICY & OPERATIONS TRACK

02:30PM–03:00PM • Denver 5&6

Modernizing Resource Adequacy at ISO New England

Shuo Xu

Lead Applied Scientist, Software and Optimization

ISO New England

Resource Adequacy Analysis is a foundational power system planning methodology that assesses whether a system possesses sufficient generation and transmission capacity to reliably serve future demand. As the resource mix evolves toward weather-dependent renewables, energy-limited storage, and electrified loads, legacy tools such as GE MARS — built on energy stack models before the competitive market era — can no longer capture the fuel supply constraints, load-resource correlations, and operational complexities that define modern grid reliability challenges. ISO New England is developing Petra, an in-house production cost model-based platform that formulates resource adequacy as a large-scale probabilistic optimization problem, minimizing total system operation cost while ensuring supply meets demand across thousands of scenarios. Leveraging state-of-the-art commercial solvers including Gurobi, cloud computing for parallel scenario execution, and AI-assisted screening to reduce computational burden, Petra is designed to address New England's unique challenges — end-of-pipeline gas supply, rapidly growing winter peaks, fuel co-optimization, and hybrid resource dispatch uncertainty — while advancing toward multi-metric reliability criteria beyond traditional LOLE.

TECHNICAL ADVANCES IN ENERGY TRACK

03:00PM–03:30PM • Denver 3&4 (Main Session Room)

Electric Power System Planning in the Data Center Era

Rachel Moglen

Research Scientist

EPRI

This talk presents recent EPRI research investigating how incorporating stochastic optimization techniques in long-term resource planning/IRP affects optimal portfolio decisions, using an applied case study where data center and other large loads are uncertain. Uncertainty in the magnitude, location, and timing of large loads are considered, and optimal portfolios are compared with and without ...

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Electric Power System Planning in the Data Center Era

uncertainty. Results focus on highlighting optimal hedge investments for all futures considered and "no regrets" resource planning solutions. This research was conducted using an open-source model employing the Gurobi solver, but the methods and techniques are vendor/tool neutral.

POLICY & OPERATIONS TRACK

03:00PM–03:30PM • Denver 5&6

Toward a Common Language for Grid Models: Developing an Open-Source Data Translator**David Paoletta**

Director of Research and Analytics

BE-GRIDS

Grid modelers routinely spend a large share of their time not modeling but preparing data—reformatting inputs, reconciling units, and manually mapping fields between platforms. This friction limits the ability of utilities to evaluate emerging tools and methods, slows regulatory review of planning cases, and creates barriers to linking models into integrated planning workflows.

BE-GRIDS and TransitionZero are developing an open-source Grid Model Data Translator to address this challenge. The tool uses a hub-and-spoke architecture built off NREL's SiennaGridDB as a common data schema, with format-specific parsers and converters for commercial and open-source data platforms including PLEXOS, PyPSA, Sienna, and others. The translator will support capacity expansion, production cost, and power flow model formats, with built-in validation to ensure data integrity across translations.

This session will briefly introduce the translator's design approach and potential near-term use cases (e.g., enabling utility modeling teams to test open-source methods alongside their existing commercial tools or enabling regulators and the public to independently review IRP modeling cases using free or low-cost tools). The bulk of the session is dedicated to discussion with attendees about their own experiences with data portability challenges in grid modeling, how those challenges are currently addressed, and what features would make a translator tool most useful in practice. We are actively seeking organizations interested in piloting the tool as beta testers.

GENERAL SESSION

03:30PM–04:30PM • Denver 3&4 (Main Session Room)

Energy Market Evolution Panel**Xiangjun Xu**

Manager GMS Technology Development, Market

ERCOT

Bishnu Bhattarai

Grid Transformation Lead

ERCOT

Ben Snyder

Director of Sales

PingThings

Ashmin Mansingh

Principal, Power Systems & Market Technology

CAISO

Apoorv Mathur

Product Manager

Siemens

Today's electricity grid is undergoing several transformations – surging demand not seen in over a decade, integration of renewables – increasingly volatile supply and demand, distributed energy resources (DERs). Grid operators must continuously balance a real-time electricity supply chain, making high-stakes decisions under tight latency, accuracy, and reliability requirements. This panel will investigate these challenges and how the ISOs are managing these challenges from a market initiatives and decision intelligence systems perspective – around the forecasting, simulations, optimization to support decision making.

GENERAL SESSION

04:30PM–05:00PM • Denver 3&4 (Main Session Room)

Open-Source Grid Modeling as Public Good: Breakthrough Energy's Vision for Modernizing Energy Planning

Alice Yake

VP, GRIDS

Breakthrough Energy

Electricity demand is growing at its fastest pace in decades—nearly 1,000 TWh globally of additional energy growth each year through 2035—driven by electrification, data center buildouts, and economic development. Every megawatt of new capacity requires a plan, yet the planning process itself has become a bottleneck. Grid modeling today is fragmented across proprietary tools, duplicative datasets, and siloed workflows, with analysts spending the majority of their time assembling inputs rather than analyzing results. This slows infrastructure decisions, raises costs, and creates particular barriers for emerging economies seeking to expand energy access while decarbonizing.

Drawing on 25 years of experience in the energy industry, including her tenure as chief planning officer at Xcel Energy, Alice Yake will present Breakthrough Energy's vision for transforming grid planning through open-source tools and shared data infrastructure. She will describe the OpenGrid initiative—a philanthropically seeded effort to build the interoperability backbone that the modeling ecosystem currently lacks, including common data standards, translation tools between commercial and open-source platforms, and a curated data hub for model-ready datasets.

Alice will outline the phased roadmap from philanthropic seed funding to a multi-stakeholder institution and discuss how organizations in this room can participate in shaping an ecosystem designed to make rigorous grid planning accessible globally.

Networking Reception • Sponsor Lounge

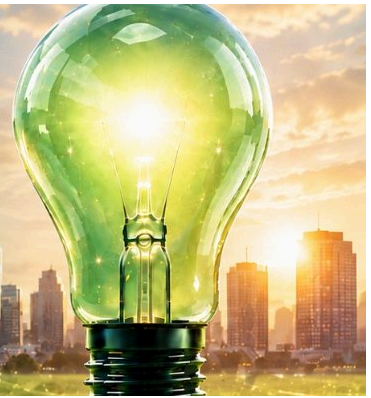
05:00PM–06:30PM

A casual evening reception for all attendees, speakers, and sponsors to connect.

DAY 02

Day Two

Wednesday, April 22, 2026

**Breakfast** • Denver 1&2 (Meal Room)

07:30AM–08:30AM

GENERAL SESSION

08:30AM–08:45AM • Denver 3&4 (Main Session Room)

Opening Remarks: Black & Veatch

Joe Zhou

VP, Infrastructure Advisory

Black & Veatch**KEYNOTE**

08:45AM–09:45AM • Denver 3&4 (Main Session Room)

Keynote: Reliable AI for Energy Systems

Dr. Pascal Van Hentenryck

Head of AI Innovation Lab

Gurobi Optimization

In many power systems applications, the same optimization problem is solved repeatedly for instances taken from a distribution that can be learned or forecasted. This talk studies how to speed up these parametric optimization problems to meet real-time constraints present in many applications. It introduces the concept of optimization proxies that fuse AI and optimization to that learn the input/output mappings of parametric optimization problems. The impact of this novel methodology is demonstrated on several grid optimization applications, including economic dispatch, real-time risk assessment, security-constrained optimal power flows, and the scheduling of hydro-resources. These experimental results indicate that the fusion of AI and Optimization can deliver outcomes that the two technologies cannot achieve independently.

Morning Break • Sponsor Lounge

09:45AM–10:00AM

TECHNICAL ADVANCES IN ENERGY TRACK

10:00AM–11:00AM · Denver 3&4 (Main Session Room)

EV Flash Talks

Elaine Hale

Senior Research Engineer

National Laboratory of the Rockies (formerly NREL)**Dr. Jonathan Snodgrass**

Senior Research Engineer

Texas A&M University**Zongjie Wang**

Director, Grid Modernization Initiative, Assistant Professor, ECE Department

Colorado State University**Dr. Maitreyee Marathe**

Postdoctoral Fellow and Lecturer

University of Massachusetts Amherst

Electric vehicle adoption is reshaping the grid from the distribution feeder up to the bulk power system, and the optimization community sits at the center of nearly every decision that determines whether that transition is affordable, reliable, and equitable. This flash talks panel brings together four complementary perspectives on where mathematical programming is actively shaping EV integration: workplace charger portfolio design, price-responsive managed charging at bulk system scale, resilience-aware co-planning of charging and storage, and bottom-up load forecasting at feeder and substation resolution. Each talk surfaces a different decision layer — the parking lot, the balancing authority, the distribution feeder, and the planning horizon — and each pairs a concrete optimization formulation with a real-world deployment question utilities, employers, and planners are facing right now.

Taken together, the four talks trace a throughline that runs from how we forecast EV demand, to how we site and size the physical infrastructure, to how we operate it once it is in the ground. The session is designed to let practitioners from both the operations research community and the utility planning community leave with a sharper sense of which modeling choices actually move the needle, where data realism is the binding constraint, and which methodological tradeoffs are still genuinely contested across the field.

FLASH TALKS

10:00AM–10:15AM

Electric Vehicle Managed Charging: The Relative Value of Different Dispatch Mechanisms**Elaine Hale**, Senior Research Engineer, National Laboratory of the Rockies (formerly NREL)

10:15AM–10:30AM

The Role of EV Charging in Grid Resilience and Infrastructure Planning**Zongjie Wang**, Director, Grid Modernization Initiative, Assistant Professor, ECE Department, Colorado State University

10:30AM–10:45AM

Affordable Workplace EV Charging: Optimizing Charger Investments and Hidden Costs**Dr. Maitreyee Marathe**, Postdoctoral Fellow and Lecturer, University of Massachusetts Amherst

POLICY & OPERATIONS TRACK

10:00AM–10:30AM · Denver 5&6

Total Grid Orchestration

Eric Gupta

Principal Consultant, Infrastructure Transformation

Black & Veatch

As the electric grid becomes more flexible and complex, resources increasingly are going to need to be understood and coordinated across traditional Distribution, Transmission and Generation boundaries. Existing tools like DERMS provide some of this capability, but being able to fully understand and coordinate hundreds or thousands of flexible and virtual resources in utility future states will require more. Utilities are ...

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Total Grid Orchestration

exploring using a risk model as one solution. With this, all relevant risks like weather, maintenance schedules and local constraints can be considered together to allow utilities to provide situational awareness and better contingency planning.

This concept is being termed Total Grid Orchestration, and a group of vendors and utilities are working together to further define it and start to create solutions around it. This session will describe the concept, its value and how it can contribute to assisting utilities with optimization to maximize their resource pools.

POLICY & OPERATIONS TRACK

10:30AM–11:00AM · Denver 5&6

Optimizing Hybrid Energy Systems with Scalable Scenario Modeling and Decision Intelligence

Danielle Labruzzo

Director of Analytics

BrightNight

As data centers, AI infrastructure, and electrification drive unprecedented load growth, utilities and developers are increasingly turning to hybrid energy systems—combining renewable generation, storage, thermal generation, and grid interaction—to deliver reliable, cost-effective power under real-world constraints. Designing these systems, however, is not a static sizing exercise. It is a high-resolution, multi-objective optimization problem spanning hundreds of uncertain market and policy scenarios.

This session explores how scalable scenario modeling and decision intelligence can bridge the gap between optimization theory and actionable planning decisions for hybrid energy systems. Drawing on real-world applications from utility-scale and behind-the-meter deployments, the discussion will highlight how advanced optimization frameworks evaluate tradeoffs across cost, reliability, emissions, and grid dependence—while accounting for operational constraints such as emissions and interconnection limits.

Participants will learn why single-scenario analyses and spreadsheet-based tools fall short, and how running hundreds of scenarios in parallel enables more robust decisions around asset sizing, dispatch strategy, and market exposure. The session will also demonstrate how interactive tradeoff visualization and sensitivity analysis improve alignment among utilities, developers, and stakeholders.

TECHNICAL ADVANCES IN ENERGY TRACK

11:00AM–11:30AM · Denver 3&4 (Main Session Room)

Remanufacture or Salvage? Reverse Logistics Optimization for Wind Turbines with Imperfect Sorting

Dr. Siqiang Guo

Assistant Professor

University of Missouri - St. Louis

The common practice of salvaging turbines is to recycle the metal material and landfill the blades, the latter being highly controversial and wasteful. Remanufacturing is regarded as a more sustainable approach to address this problem. However, it faces multiple challenges, including expensive and complex transportation of large turbine components and imperfect on-site sorting (i.e., preliminary checking that decides turbine's remanufacturability with less than 100% accuracy). Sending non-remanufacturable turbines to remanufacturing wastes transportation resources in particular, along with other associated costs, whereas salvaging remanufacturable turbines forfeits valuable opportunities. This study presents an optimization model to decide how many and which ones among a retired turbine population should be sent to remanufacturing considering the imperfect sorting result. Based on confusion matrix properties and closed-form solutions from the model, we explore and explain the system's behavior under various conditions. We find that the proposed easy-to-implement optimal policy ...

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Remanufacture or Salvage? Reverse Logistics Optimization for Wind Turbines with Imperfect Sorting

can generate significant profit gains (10+%) for certain turbine populations compared to the benchmark policy even when the sorting accuracy is relatively high (e.g., accuracy = 70%). Moreover, improving sorting accuracy can have significant impact on the total profit (45+%), and the value of sorting accuracy strongly depends on factors such as the fraction of truly remanufacturable units in the turbine population, remanufacturing profit, and transportation cost, among others. There are three cases in which improving sorting accuracy is worth consideration: (1) Both remanufacturing profit and the fraction of truly non-remanufacturable units are high; (2) Both transportation cost and the fraction of truly remanufacturable units are high; and (3) The remanufacturing profit and transportation cost are greater than \$600K/unit and \$100K/unit, respectively, while the fraction of truly non-remanufacturable units is between 0.7 and 0.9. Comprehensive numerical experiments are conducted with results and managerial insights discussed.

POLICY & OPERATIONS TRACK

11:00AM–11:30AM · Denver 5&6

Optimizing Optimization: Building Trust and Adoption for Prescriptive Analytics at Avista**Kathryn Walter**

Senior Operations Research Analyst

Avista Corporation

Over the past 15 years, Avista has transitioned from minimal use of mathematical modeling to embedding custom optimization across daily operations and long-term planning. Their internally developed Avista Decision Support System (ADSS) now helps teams optimize everything from maintenance scheduling to generation forecasting and battery integration.

This session explores how Avista built a digital twin of its generation portfolio using prescriptive analytics—and, more importantly, how they gained and sustained user trust in the tool. From cross-departmental collaboration to designing for usability, this story offers practical strategies to help analytics teams develop tools that are not only technically sound but also widely adopted.

Whether you're building a new optimization platform or struggling with user engagement, you'll gain actionable insights from Avista's journey toward enterprise-wide analytics acceptance.

Takeaways:

- Learn how Avista created a digital twin of its generation portfolio to support strategic and operational decision-making.
- Explore how users across departments leverage prescriptive analytics through the ADSS platform.
- Discover best practices for gaining and maintaining user trust in analytics-based tools.
- Understand what mathematical optimization is and how it can improve decision-making across utility operations.

TECHNICAL ADVANCES IN ENERGY TRACK

11:30AM–12:00PM · Denver 3&4 (Main Session Room)

Optimal Frequency-Constrained Energy Scheduling for Low-Inertia Power Systems**Dr. Xingpeng Li**

Associate Professor

University of Houston

To ensure power systems operate in a reliable and efficient manner, optimal energy scheduling is performed at different timescales from day-ahead energy scheduling to real-time economic dispatch. Maintaining system frequency within acceptable limits is critical for power system stability. However, with increasing penetration of low-inertia inverter-based resources (IBR) like wind and solar power in ...

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Optimal Frequency-Constrained Energy Scheduling for Low-Inertia Power Systems

the grid, conventional synchronous generators with relatively high marginal generation cost will be committed less. This results in a significant reduction in system synchronous inertia, which would negatively affect system frequency stability. This makes it necessary to enforce inertia requirements in optimal energy scheduling for future renewable energy-dominated low-inertia power grids. To address this issue, this talk will describe a general procedure for enforcing grid frequency dynamic performance in look-ahead optimal energy scheduling models. Particularly, the talk will demonstrate this procedure by explaining how to create a machine learning-based frequency stability prediction model that is then integrated into optimal energy scheduling models including both day-ahead unit commitment and real-time optimal power flow, creating novel inertia-constrained grid operation models.

POLICY & OPERATIONS TRACK

11:30AM–12:00PM · Denver 5&6

Optimizing an ISO**Dr. Robert Randall**

Senior Optimization Specialist

Princeton Consultants

An Independent System Operator responsible for managing a major regional electric grid relies on optimization models that run every day to keep the lights on at the lowest possible cost. One model decides which power plants to turn on over a 24-hour period. A linked set of models then determines how much power each of those plants should produce, hour by hour, to meet demand while minimizing cost and satisfying the grid's business and reliability rules. The results of the first model feed directly into the second as inputs and constraints, making the overall process a tightly coupled pipeline that must run reliably and on time.

As the grid began integrating Energy Storage Resources — large-scale batteries that can both store and supply power — the operator saw significant performance degradation in one of the downstream models. The more storage units were added, the longer the models took to solve, to the point where scaling to a realistic number of ESR units was not viable. The operator needed a solution: better performance across both models, with a target of handling a full complement of storage resources with no observable slowdown.

Princeton Consultants was engaged to review the models, diagnose the root causes of the degradation, and recommend improvements that could be deployed at different time horizons. The team's approach combined three strategies: tuning the solver's configuration to better match the structure of these specific problems, rewriting key constraints to eliminate numerical issues that were slowing the solver down, and recommending a longer-term reformulation of the model architecture to improve both stability and flexibility. The results were dramatic — runtimes improved by up to 10x, and problems that had previously taken over five minutes to solve could now be solved in under a minute, even with a full set of energy storage resources in the model. This initial engagement laid the foundation for an ongoing partnership spanning five years and multiple projects across the operator's optimization portfolio.

Lunch · Denver 1&2 (Meal Room)

12:00PM–01:00PM

PANEL

01:00PM–02:00PM · Denver 3&4 (Main Session Room)

Data Center Integration & Optimization

Dr. Kyri Baker
Associate Professor
University of Colorado Boulder

Dr. Amir Sajadi
Principal Innovation Engineer
Pacific Gas and Electric Company

Rajarshi Roychowdhury
Manager, Transmission Planning
Xcel Energy

Nidhi Santen
Strategic Lead, Data Center Informed Energy Supply, Data Center Flexible Load Initiative (DCFlex) & Area Manager, Integrated Energy Systems Planning
EPRI International, Inc.

Dr. Jonathan Snodgrass
Senior Research Engineer
Texas A&M University

As AI-driven data center loads scale at unprecedented speed — atop grids already strained by electrification, aging infrastructure, and evolving generation portfolios — the central question facing planners and operators is no longer whether to integrate large new loads, but how to do so without sacrificing reliability, affordability, or speed-to-power. This panel convenes four leading voices whose work spans the full stack of that challenge, from optimization-informed planning frameworks and flexible interconnection controls to the modeling rigor demanded by modern interconnection studies.

Dr. Kyri Baker (University of Colorado Boulder) brings an academic and systems perspective on grid-interactive data centers, behind-the-meter flexibility, and the distinct grid implications of training versus inference workloads. Dr. Amir Sajadi (Pacific Gas & Electric) will introduce T-Flex, a first-of-its-kind advanced transmission control technology that unlocks dynamic headroom on existing infrastructure through real-time coordination with data center operators and CAISO. Dr. Nidhi Santen (EPRI) will share a practical, planner-oriented framework for system-level headroom assessment that treats modern data centers as active grid participants rather than static loads. Dr. Rajarshi Roychowdhury (Xcel Energy – PSCo) will address the interconnection and modeling frontier — including EMT and dynamic studies — that accompanies large, fast-ramping loads. Together, the panelists will explore where planning frameworks, operational controls, and flexibility mechanisms converge, and where they remain in productive tension, as the industry works to power the next generation of digital infrastructure.

PANEL

02:00PM–03:00PM · Denver 3&4 (Main Session Room)

Final Session: Where Do We Go from Here

Dr. Kyri Baker
Associate Professor
University of Colorado Boulder

Bishnu Bhattarai
Grid Transformation Lead
ERCOT

Carlo Brancucci
CEO
encoord

Harry van der Weijde
Head of Research & Market Development
Open Energy Transition

Nidhi Santen
Strategic Lead, Data Center Informed Energy Supply, Data Center Flexible Load Initiative (DCFlex) & Area Manager, Integrated Energy Systems Planning
EPRI International, Inc.

Dr. Jonathan Snodgrass
Senior Research Engineer
Texas A&M University

Dr. Richard O'Neill
Former Chief Economic Advisor, FERC
Consultant

Rachel Moglen
Research Scientist
EPRI

Ramkumar Karuppiiah
Managing Director
Black & Veatch