



Total Grid Orchestration (TGO)

A holistic approach to manage risks and optimize performance across the entire grid.

A Changing Energy Landscape

Utilities across the U.S. are facing unprecedented challenges striving to transition towards a more sustainable and resilient energy future. Practically every utility is pursuing grid modernization projects in line with decarbonization strategies.

Operating the future grid will become increasingly complex. Customer loads will become increasingly dynamic. DER growth will continue to drive utility 'duck curves', and combined with large, central utility owned generators owned being replaced by smaller, energy limited resources, will create an

exponential increase of variability between supply and demand.

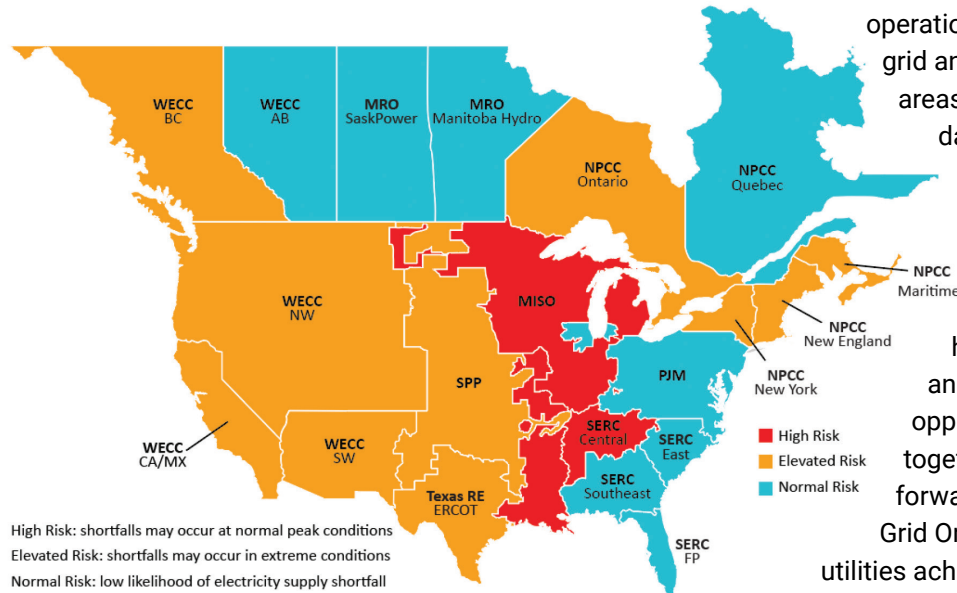
Consequently, utilities across North America face resource capacity or energy risks if they cannot keep pace with accelerating electricity demand, energy needs, and transmission system adequacy as the resource mix transitions.¹

These changes require new planning, operating philosophy, tools, and capabilities to maintain grid reliability, resiliency, and security. A holistic

¹[NERC 2023 Long-Term Reliability Assessment, December 2023](#)

approach is needed to bring all their efforts across Generation, Transmission, Distribution, and Behind the Meter (BTM) resources together to maximize the benefits of grid investments. More importantly, there are no market-ready tools to help operationally manage the

supply and demand variability. TGO can potentially inform a much more granular and optimized BESS management and dispatching schedule by evaluating the total grid condition and risks. TGO aims to inform and improve situational awareness and reduce the risk for Generation, Transmission, and Distribution operations by analyzing the entire grid and using risk factors to note areas of concern to operators days ahead of grid-constrained events.



ever-increasing variability of supply and demand across the entire grid, especially from real-time and near-real-time horizons. This puts the grid at a much higher risk of failure, especially during extreme events.

Total Grid Orchestration

Black & Veatch, working with several utilities, developed the concept of “Total Grid Orchestration” or “TGO” to support clients who have recognized this problem and are pursuing DOE GRIP Program funding to address it.

TGO is a coordinated approach to manage the risks across the entire grid, thereby optimizing the performance of the energy grid, especially in extreme reliability and resiliency situations. It uses the Probabilistic Risk Assessment (PRA) method, which has been proven in the nuclear industry, as the basis for a risk-informed optimization solution for grid supply and demand orchestration across generation, transmission, distribution, and BTM resources. For example, utilities are deploying large-scale Battery Energy Storage Systems (BESS) to counterbalance increasing

TGO is proving to be an effective approach and tool for enabling holistic grid management, and we believe there’s an opportunity to bring utilities together to drive this concept forward. The idea of Total Grid Orchestration can help utilities achieve decarbonization and resiliency goals through system-wide coordination, situational awareness, and risk management. We hope that we can engage utilities with diverse market constructs, generation portfolios and T&D infrastructure to drive improved practices and standards, technology solutions, and policy enhancements in the industry.

An Opportunity

We believe the formation of an alliance could foster collaboration, innovation, and best practices, which ultimately can drive the marketplace to build a comprehensive solution for TGO.



We would like you to consider joining us in collaborating with leading energy industry stakeholders committed to advancing the energy grid's performance, reliability, and efficiency.

The alliance could offer opportunities to participate in:

Collaboration & Alignment

Share, collaborate, and align on critical needs, priorities, and requirements for TGO, including:

- Discuss operational philosophy, approach, and impact of risk-informed decision-making.
- The policy and process impact of risk-based grid orchestration.
- Operational technology capability and solution gaps.

Roadmap for the Alliance

- Discuss the TGO Alliance mission, objective and charter.
- Discuss working groups, cadence and deliverables.

Let's Talk!

Kayleigh HasBrouck | Managing Consultant
P 646 779 8351 | E HasBrouckK@bv.com

TGO Summit

Denver, CO

June 25-27, 2024

Proposed Topics:

Total Grid Orchestration Panel(s) and Workshops

- Needs Assessment
- Solution Landscape
- Policy/Process Impact

TGO Alliance Formation

- Goals & Objectives
- Member Expectations
- Defining Workstreams (e.g., process, technology, standards)

