

CASE STUDY

Distributed System Operator (DSO) Roadmap

BACKGROUND

Grid Smart City (GSC) derives its strength from its individual local distribution company members and the communities they serve. With 16 LDC members managing approximately \$2.5 billion in assets, GSC provides service to nearly 918,000 customers. As one of Ontario's leading consortiums, it plays a pivotal role in delivering innovative and reliable solutions to its customers.

CHALLENGE

Ontario's electricity sector is undergoing rapid transformation to combat climate change, electrify transportation and heating, and meet growing energy demands from industrial and agricultural expansion. These shifts, coupled with the refurbishment of nuclear generation, strain existing electricity supplies. At the same time, distributed energy resources (DER) like solar, wind, batteries, and electric vehicles are becoming more accessible, offering opportunities for grid resilience and flexibility. However, effectively integrating DERs requires local distribution companies (LDCs) to adapt quickly. To address these challenges and maximize DER opportunities, GSC has engaged Sussex Strategy Group and Electric Power engineers to develop a DSO strategy for the member LDCs.

SOLUTION

The primary objective of this project is to assess the readiness of GSC Cooperative member LDCs to transition to DSOs. The study aims to develop a unified DSO readiness strategy that aligns with provincial policies, regulatory requirements, and technological advancements, ensuring LDCs are prepared to manage the complexities of DER integration, grid modernization, and enhanced customer engagement. Key areas of focus for this study included the following:

DSO Model Landscape, DSO Roles and Responsibilities and Provincial Activities

Assessing various DSO model frameworks to determine the most suitable framework for GSC Cooperative member LDCs. This includes an evaluation of established models such as the Total DSO model and the Dual Participation model, existing pilot projects like Essex PowerShare Project with an emphasis on their applicability to GSC LDCs and alignment with Ontario market landscape. The analysis also examined the roles and responsibilities of LDCs within the chosen model, ensuring alignment, enhanced customer engagement, and efficient grid operations.

LDC Current State Assessment and Gap Analysis

The current state assessment was conducted via a survey with approximately 140 questions covering aspects like DER integration, technological infrastructure, operational processes, system planning, customer engagement and workforce capabilities. This involved a comprehensive review of existing systems and practices to identify gaps for transition to a DSO. The gap analysis highlighted areas requiring improvement such as business process development, system planning enhancements, DER monitoring, measurement verification & settlement, workforce training and more, enabling the development of targeted solutions. This assessment ensured that the strategy is rooted in a deep understanding of the unique needs and readiness levels of each LDC.

DSO Strategy Development

Building on the findings of DSO Model analysis, LDC roles and responsibilities being a DSO and LDC Current State Assessment and Gap Analysis a unified DSO strategy for GSC Cooperative member LDCs is developed. The strategy outlines an actionable roadmap with clear milestones, timelines, and resource requirements, addressing the technical, operational, and regulatory dimensions of the transition. It also incorporates collaborative opportunities among LDCs to standardize processes and share resources, fostering cost efficiency and operational consistency. The proposed strategy aims to equip member LDCs with the tools and frameworks needed to successfully adopt the DSO model, ensuring a reliable and customer-focused energy future.

CLIENT



TYPE

Cooperative

SECTOR

Grid Modernization & DER

ISO

IESO

LINE OF BUSINESS

Grid Modernization

SERVICES PROVIDED

- DSO Readiness Assessment and Strategy Development

LOCATION

Ontario, Canada

COMPLETED DATES

2024



Delivering Energy Intelligence