

C0032664

Energy Control Centre – Optimization Tools

NON-CONFIDENTIAL

December 1, 2025



NSEB APPROVAL SHEET

Project Title: Energy Control Centre - Optimization Tools

CI Number: C0032664

Date: December 1, 2025

Expenditure Profile			Type of Filing	
Year	Budget Amount	Project Estimate	☒	Capital Project Authorization
2021	199,139	199,139	☐	Unforeseen and Unbudgeted (U&U)
2022	358,284	358,284	☐	Planned & Advanced (P&A)
2023	788,855	913,494	☒	Subsequent Approval Item
2024	1,245,073	1,917,622	☐	Authorization to Overspend (ATO)
2025	1,737,800	3,207,436	☐	Scope Change
2026		890,093	☐	Final Cost (FIN)
Total	\$4,329,150	\$7,486,068		

COMMENTS

Submitted on behalf of NOVA SCOTIA POWER INCORPORATED



Authorized Signatory
Dave Pickles
Chief Operating Officer

DATE

November 27, 2025

Approved on behalf of NOVA SCOTIA ENERGY BOARD

DATE

CI Number: C0032664**Title: Energy Control Centre - Optimization Tools**

Start Date: 2021/06
In-Service Date: 2025/03
Final Cost Date: 2026/09
Function: General Plant
Forecast Amount: \$7,486,068

DESCRIPTION:

The project scope includes implementation of three new technology solutions along with new and revised business processes across key areas related to system commitment, operational planning, and dispatch functions at the Energy Control Centre.

- The first technology solution is the Energy Control Centre Portfolio Optimization tool (ECCPO). The ECCPO will support automation and enhancement of real time economic dispatch optimization at the System Operator Energy Desk by leveraging a more detailed dataset to System Operators for system dispatch decision making.
- The second technology solution is a System Dispatch Dashboard (SDD). The SDD will be displayed on the NS Power OASIS site and will provide a summary of the most recent dispatch data for Market Participant awareness.
- The third technology solution is an Outage Request Platform that will automate the process for requesting, analyzing, and prioritizing planned outages related to the NS Power Transmission, Substation, Generation and Telecommunications assets. The current management of planned outages is a manual process utilizing limited SharePoint functionalities. This implementation will help to support anticipated future system complexities.

In response to evolving provincial and federal renewable and decarbonization targets, NS Power initiated efforts to streamline processes and pursue automation for key system operation functions. The three initiatives detailed above assist with managing generation and load variability, while addressing the need for accelerated communication between NS Power and stakeholders.

The 2018-2019 FAM Audit Dispatch Study (M09548), conducted by Concentric Energy Advisors with input from NS Power and stakeholders, was filed on February 10, 2022. NS Power accepted all recommendations outlined in the report. This project includes deliverables designed to support the implementation of those recommendations through the noted software, as well as the development of new and enhanced interfaces, business processes, and stakeholder communications.

Summary of Related CIs +/- 2 years:

Pursuant to Section 11.2 of the CEJC, related CIs for General Plant projects include “Work completed on the same asset (application, building, etc.).”

- No other projects in 2023, 2024, 2025, 2026 or 2027.

Depreciation Class: General Plant – Computer Application Software

Estimated Life of the Asset: 20 years

JUSTIFICATION:

Justification Criteria: Work Support Facilities

Sub Criteria: Telecontrol & Telecommunications

Why do this project?

As the NS Power power system evolves to meet provincial and federal renewable energy and decarbonization targets, it will increasingly incorporate variable energy resources and phase out dispatchable coal-fired thermal generation plants. Currently, real-time dispatch optimization of the power system relies on optimized plans provided by NS Power Marketing several hours in advance, combined with operator subject matter expertise. However, with the planned growth in both volume and variability of renewable resources over the next 2-3 years, maintaining an effective dispatch optimization and managing both planned and unplanned outages using existing technologies and manual processes will become unsustainable.

Similarly, the manual communication of real-time system conditions, such as load, wind generation, system constraints, ancillary service requirements, etc., from the system operator to NS Power Marketing and other market participants via OASIS postings, email, and phone calls will become increasingly unsustainable. As system variability grows, this manual approach will exceed the capabilities and capacity of system operators. Suitable tools enabling automation of system analysis, status updates (online/offline), reporting, and communications must be incorporated to accommodate the planned increase in variability of system conditions that will occur. This capability is vital to maintain the economic optimization of day-ahead and intraday dispatch, as well as overall grid reliability.

Continuing to rely on manual processes in an increasingly complex, variable, and labour-intensive operating environment could result in inefficient real-time dispatch and may lead to deterioration of economic optimization and increased system reliability concerns.

This project will also address the recommendations of the 2018-2019 FAM Audit Dispatch Study, as well as those from the subsequent 2022-2023 review. By commissioning the 2018-2019 FAM Audit Dispatch Study and accepting its recommendations, NS Power agreed that its dispatch programs and tracking tools require further enhancements so that future dispatch decisions are more automated and based on models that fully capture the multitude of near real-time system constraints that will emerge with the increased integration of renewable energy sources.

Equipping System Operators and System Security Engineers with the tools to manage a larger fleet of variable energy resources, more complex maintenance plans and schedules, along with a diminishing fleet of coal-fired thermal generators will require investment in the tools described above. These tools are essential to bring NSPSO in line with those leveraged by other system operators.

Why do this project now?

The planned addition of significant volumes of variable energy resources, including at least 1,000 Megawatts of contracted variable renewable generation by 2030, combined with the mandated retirement of coal-fired generation plants over the coming years, requires NS Power to promptly initiate the implementation of tools that support automation, agility, and continued reliability in the dispatch and management of the NS Power Bulk Electric System.

In addition to NS Power's internal plans to enhance its capability to manage increased variability associated with renewable energy dispatch, the 2018–2019 FAM Audit Dispatch Study, along with subsequent recommendations, emphasized the urgency of adopting these capabilities to ensure compliance, operational efficiency, and system reliability.

The project was deemed to be in service in March 2025 when the first technology implementation (the Outage Request Platform) went live. The Final Cost Date (September 2026) is listed as six months after the remaining Technology Solutions go live (forecast to be in March 2026).

Why do this project this way?

Software tools for Optimization of real-time dispatch and information sharing for communicating real-time power system conditions, including the management of planned and unplanned system outages, are available and standard across the electric utility industry.

Failing to adopt such tools and continued reliance on legacy and manual processes could result in inefficient dispatch operations and reliability issues in the future, with the potential for increased costs for FAM customers.

NS Power has received confirmation of funding for this project under Natural Resources Canada (NRCan) for their Electricity Predevelopment Program (EPP), which supports the acceleration of large-scale clean electricity infrastructure projects. This funding results in a capital contribution of approximately \$6 million for this project.

Contingency Statement

Contingency for this project has been determined using a combination of internal subject matter expertise (program managers), experience in managing projects that incorporate a high number of system-to-system interfaces, and in conjunction with the non-binding contingency guidelines. Consistent with the maturity matrix, this project is being filed as a Class 1 estimate with a contingency of 2 percent. Contingency is intended to account for risks associated with unforeseen issues to achieve the complex integration between newly implemented technology and legacy systems or potential issues that may arise throughout the implementation.

Reason for Variance

The increase of approximately \$3,156,918 from the 2024 ACE Plan subsequent submittal estimate of \$4,329,150 is due to changes to the eligibility dates for Federal Funding which initially extended into the end of Q1 2026. Changes to the funding program resulted in cost eligibility ending at the end of Q1 2025.

Capital Project Detailed Estimate

Location: General Plant C# : C0032664 Title: Energy Control Centre - Optimization Tools Execution Year: 2021-2025					
Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference
Regular Labour					
IT Security	PD	25	375	\$ 9,375	
IT Middleware (Integration Specialist)	PD	120	375	\$ 45,000	
IT Tech Lead	PD	23	375	\$ 8,625	
IT Architect	PD	23	375	\$ 8,625	
BI Architect	PD	50	375	\$ 18,750	
Energy Dispatch Specialists	PD	982	325	\$ 319,150	
OT Technology Analysts	PD	506	325	\$ 164,450	
Sr. System Operator SME Energy	PD	350	670	\$ 234,500	
System Operator SME Transmission	PD	335	670	\$ 224,450	
Sr SCADA Engineer	PD	299	425	\$ 127,075	
Marketing SME	PD	32	425	\$ 13,600	
Compliance SME	PD	274	325	\$ 89,050	
Power System Engineers	PD	440	375	\$ 165,000	
Sr. Power System Engineer	PD	286	475	\$ 135,850	
Interconnection Plan Coordinator	PD	286	325	\$ 92,950	
Interconnection Engineer	PD	220	375	\$ 82,500	
Outage Plan Coordinator	PD	286	325	\$ 92,950	
Power System Engineer Mar	PD	272	475	\$ 129,200	
P&C Technologist	PD	285	375	\$ 106,875	
P&C Engineer	PD	21	425	\$ 8,925	
Sr. BI Architect	PD	65	425	\$ 27,625	
		Sub-Total		\$ 2,104,525	
OT Labour					
IT Middleware (Integration Specialist)	PD	28	\$ 750	\$ 20,625	
		Sub-Total		\$ 20,625	
Term Labour					
Program Manager	PD	507	\$ 490	\$ 248,430	
SME System Operator	PD	271	\$ 466	\$ 126,286	
		Sub-Total		\$ 374,716	
OT Term Labour					
Program Manager	PD	220	\$ 490	\$ 107,800	
		Sub-Total		\$ 107,800	
Travel Expense					
Mileage for meetings	Each	1	\$ 241	\$ 241	
		Sub-Total		\$ 241	
Office Supplies					
Application Switching Desktop tools	Each	1	\$ 895	\$ 895	
		Sub-Total		\$ 895	
Materials					
SCADA Technology Mounting Equipment	Each	1	\$ 9,921	\$ 9,921	
		Sub-Total		\$ 9,921	
Contracts					
Training Room SCADA Equipment	Each	1	\$ 28,511	\$ 28,511	
Systems Furniture	Each	1	\$ 26,227	\$ 26,227	
Business Intelligence Development	Each	1	\$ 73,927	\$ 73,927	
System Operator Training Room set up	Each	1	\$ 433,925	\$ 433,925	
SCADA Equipment Wall supports	Each	1	\$ 9,723	\$ 9,723	
Data Analysis Contractor	Each	1	\$ 14,517	\$ 14,517	
Engineering Services Contract	Each	1	\$ 200,000	\$ 200,000	
Training room wiring	Each	1	\$ 792	\$ 792	
		Sub-Total		\$ 787,722	
Consulting					
System Dispatch Study SME	PD	178	\$ 2,813	\$ 500,714	
GIS SME	PD	180	\$ 1,150	\$ 207,000	
Business Analyst	PD	230	\$ 925	\$ 212,750	
Business Analyst	PD	785	\$ 825	\$ 647,625	
Business Analyst	PD	785	\$ 800	\$ 628,000	
Business Analyst	PD	850	\$ 900	\$ 765,000	
Project Manager	PD	875	\$ 1,150	\$ 1,006,250	
Business Analyst	PD	75	\$ 720	\$ 54,000	
Business Analyst	PD	80	\$ 1,150	\$ 92,000	
Technology Integration Specialist	PD	262	\$ 1,538	\$ 402,956	
SCADA Specialist	PD	65	\$ 1,450	\$ 94,250	
SME Lead Engineer	PD	325	\$ 1,275	\$ 414,375	
Optimization Solution Developer	PD	225	\$ 1,500	\$ 337,500	
Data extract, transformation and load Consultant	PD	74	\$ 1,050	\$ 77,700	
Firewall Security Developer	PD	50	\$ 1,060	\$ 53,000	
Change Management Lead	PD	238	\$ 925	\$ 220,150	
		Sub-Total		\$ 5,713,270	
Software					
System Operator Training Solution	Lot	1	\$ 95,365	\$ 95,365	
Outage Request Solution	Lot	1	\$ 614,000	\$ 614,000	
Economic Dispatch Optimization solution	Lot	1	\$ 708,841	\$ 1,168,903	
System Dispatch Dashboard	Lot	1	\$ 290,000	\$ 290,000	
		Sub-Total		\$ 2,168,268	
Hardware					
SCADA Processing Hardware	Lot	1	\$ 27,595	\$ 27,595	
		Sub-Total		\$ 27,595	
Meals					
Workshop lunches	Lot	1	\$ 3,305	\$ 3,305	
		Sub-Total		\$ 3,305	
Other Goods & Services					
Contingency	%	2%	\$ 11,318,884	\$ 226,378	
		Sub-Total		\$ 226,378	
Interest Capitalized					
AFUDC				\$ 286,666	
		Sub-Total		\$ 286,666	
Administrative Overhead					
Labour AO				\$ 1,489,295	
Contractor AO				\$ 120,664	
		Sub-Total		\$ 1,609,959	
SUB-TOTAL (no AO, AFUDC)					
				\$ 11,545,261	
				\$ (5,955,818)	
TOTAL (AO, AFUDC included)					
				\$ 7,486,068	
Original Cost					
				\$ -	

Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes.

Note 2: Small differences in totals are attributable to rounding.



Instructions: Select option in Column B.
Columns C through G will auto-populate.

Document No: XXX-XX-XXXX-XXXX

Project Cost Estimate Input Checklist and Maturity Matrix						
Equipment Replacement	Required fields:	Estimate Classification				
Project Name: Energy Control Centre - Optimization Tools - C0032664	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete					
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
B. Capacity						
Not Applicable						
C. Project Location						
Energy Control Centre (ECC); Distribution Control Centre (DCC); Back Up Control Centre	Defined (D)	P	P	D	D	D
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Legislative Requirements	Defined (D)	NR	P	D	D	D
E. Technology Selection						
Design/Technology	Defined (D)	NR	P	D	D	D
F. Strategy						
Internal/External Resourcing	Defined (D)	NR	P	D	D	D
Solution Contracting / RFP	Defined (D)	NR	P	D	D	D
G. Planning						
Cross Team Planning (i.e., ECC/Power Generation/Corporate Security/IT Security)	Defined (D)	P	P	P	D	D
Integrated Project Plan	Defined (D)	NR	P	D	D	D
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Defined (D)	NR	P	D	D	D
ECC Leadership (Sponsor) approval to proceed	Defined (D)	NR	P	D	D	D
Risk Register	Defined (D)	NR	P	D	D	D
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Work Breakdown Structure (WBS)	Defined (D)	NR	P	D	D	D
Cut Over and Go Live Planning	Defined (D)	NR	P	P/D	D	D
Technical Deliverables (Specifications and/or Drawings)						
Network Infrastructure	Complete (C)	P	P	C	C	C
Data Architecture	Complete (C)	P	P	C	C	C
Security Assessment	Complete (C)	NR	P	C	C	C
Solution Integration	Complete (C)	NR	P	C	C	C
Information Systems/Telecommunication Drawings	Complete (C)	NR	P	C	C	C
Total Responses	Total # Deliverables for this Project	5	21	21	21	21
Percentage	% Defined/Complete towards Class Estimate	100%	100%	100%	100%	100%

Comments:

Consistent with the maturity matrix, this project is being filed as an AACE Class 1 estimate with a contingency of 2 percent based on the level of project completion. Contingency is intended to account for risks associated with unforeseen issues to achieve the complex integration between newly implemented technology and legacy systems or potential issues that may arise throughout the implementation due to the complexity of system development.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.