

BLACKGRID LABS

Infrastructure Beneath the World

Helios Grid

A research proposal for coordinating electricity exchanges between Canadian grids with decisions that operators can inspect and reproduce.

BGL/HG-01 | PUBLIC RESEARCH

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In essence

Why we are talking about this

Electricity crosses provincial borders, but the rules and responsibilities on either side can differ. A useful coordination proposal has to explain both the physical exchange and who can approve it.

Purpose

Test whether a shared evidence record can help operators compare proposed exchanges while keeping their own dispatch authority.

What we found and focus on

- Provincial authority has to be part of the design, alongside federal responsibilities. [1]
- Ontario's renewed market illustrates that scheduling and pricing rules change over time. [2]
- A proposed exchange needs a dated record of its inputs and applicable rules.
- A line's design rating is not enough to establish what can be delivered at a given hour.
- Repeatable calculations help review a decision; they do not prove the inputs are true.
- Reliability constraints, costs and distribution of benefits need separate checks.
- The proposed layer would support operators rather than take control of dispatch.
- A bounded trial with an independent reviewer is the next useful test.

Conclusion and next steps

Start with one interface and one agreed use case. Freeze the data and rules, compare against an operator baseline, and publish the errors and limits before proposing wider use.

Full revised research

The coordination question

Helios Grid asks a practical question: can two operators review the same proposed electricity exchange and understand why it was recommended? The problem includes power flows, operating rules, contracts and responsibility for the result. Software addresses only part of it.

Section 92A establishes provincial powers over electrical generation, with additional provisions on exports and federal authority. A coordination design needs to respect that framework rather than assume a single national decision maker. [1]

What the public record establishes

Ontario's renewed electricity market launched on May 1, 2025. That is a concrete example of rules changing within an operating system. A cross-border calculation needs the rules in force for its particular interval. [2]

The Electricity Advisory Council's 2024 report addresses cooperation and investment in Canada's electricity transition. It supplies policy context, not evidence that the BGL proposal has been accepted or demonstrated. [3]

The proposed evidence record

For each candidate exchange, record the time interval, input origin, transfer limit, reservations, losses, price assumptions and approval conditions. Keep measured values separate from forecasts. If a source changes, issue a new version rather than silently replace the old value.

The recommendation should identify the constraints that bind and the assumptions that drive its benefit. A reviewer should be able to rerun the calculation using the frozen record and compare it with the operator's existing method.

Reliability and authority

PJM's operations manual is a useful reference for the detail required in scheduling and dispatch. Its rules are not automatically applicable to a Canadian interface. Local operators must specify the actual reliability and market requirements. [4]

A cost reduction in a simplified model does not establish an executable exchange. The proposal must also pass delivery, contingency and settlement checks. Operators retain responsibility for approval, and an unresolved rule should stop the affected recommendation.

How to test the proposal

Use a small, agreed historical dataset before live shadow operation. Establish a baseline and score feasibility errors, replay consistency, explanation quality and review time. Include outages, stale measurements, unavailable capacity and contradictory inputs.

An independent reviewer needs the data, model version, tolerances and complete failure record. A repeatable wrong answer is still wrong. The test should measure correctness against the agreed model and acknowledge what that model leaves out.

Conclusion and next steps

The useful research outcome is a checkable method for reviewing an exchange. This edition does not establish grid-wide savings, production readiness or superiority over existing operator tools.

Agree on one interface, collect the necessary data, define acceptance criteria and run a controlled comparison. Expand only if the evidence supports it.

Sources

Numbered citations refer to these sources. Proposed methods and next steps are BGL research proposals, not results established by the cited publications. Links checked for this revision on October 11, 2026.

[1] Department of Justice Canada: Constitution Act, 1867, section 92A

https://laws-lois.justice.gc.ca/eng/const/page-3.html

[2] IESO: Renewed Market Advisory Forum, market launched May 1, 2025

https://ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Renewed-Market-Advisory-Forum

[3] Canada Electricity Advisory Council: Powering Canada, a blueprint for success (2024)

https://natural-resources.canada.ca/energy-sources/powering-canada-blueprint-success

[4] PJM: Manual 11, Energy and Ancillary Services Market Operations

https://www.pjm.com/-/media/DotCom/documents/manuals/m11.pdf