Promoting System Impact through Innovation Programs

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- The **Office of Energy Research and Development (OERD)** is the Government of Canada’s co-ordinator of energy research, development, and demonstration (RD&D) funding.

- OERD has led federal efforts on energy innovation over decades and is currently delivering over $900M in **energy innovation and cleantech** programming.

- Our focus is on influencing the **pace and direction** of energy system transformation.

“Accelerating widespread clean energy innovation is an indispensable part of an effective, long-term global response to our shared climate challenge.”

*Mission Innovation Launch Statement, 2015*
Driving Energy System Change Through Innovation

• We are facing a significant challenge – we need to rapidly change an incredibly complex, deeply integrated system that is central to the economy, human health and security.

• In order to succeed we are targeting the most impactful technologies and innovate in how we deliver to maximize environmental and economic outcomes.

• OERD’s programs target four key “missions” to realize a clean energy future and a sustainable natural resources sector for Canadians.

1. Improve Energy Efficiency and Processes to Reduce Emissions from Energy End-Use
3. Develop Cleaner Hydrocarbon and Renewable Fuels Pathways
4. Maintain Safe and Resilient Energy Systems to Protect Canadians in the Changing Energy Landscape
Rethinking the RD&D Logic Model

1. OERD funds RD&D
   • Immediate outcomes

2. Take-up by public and private actors
   • Intermediate Outcomes

3. Knowledge/technology results in system level change
   • Long-term Outcomes

What was funded?

What was learned?

What is the relevance to policy objectives?

Realignment

Assessment over various timescales

Assessment

30 years

15 years

10 years

5 years
From

OERD funds power generation research → Power Plants operators were provided the reports and analysis → Power Plant Economic and Environmental Performance Improves

To

What problem should we solve?

This research was targeted at solving X problem with Y type of power plant providing Z energy service → Y Power Plants provide Z energy service more effectively and/or efficiently

Did X problem matter?

At which timescales did it matter?

5 years

10 years

15 years

20 years
Innovation Systems Analysis

- Innovation Systems Analysis involves defining an objective and related technologies.

- It asks three basic questions about each technology in reference to the objective:
  - (How well) Does the technology work? (Technical Readiness)
  - Will people and/or organizations want to adopt it? (Market Readiness)
  - Do people and/or organizations have the ability to adopt it in the current policy environment? (Policy Readiness)

- The ISAT breaks down these questions into additional readiness levels to produce more granular results for use when assessing specific technologies.
Applying Mission-driven Innovation in Practice

By categorizing projects by their outcomes we created a new way to manage our investments as a portfolio designed to induce system change.

In the past, it was easy to categorize project by “technology area,” but energy systems are becoming increasingly integrated.

An outcomes based approach facilitates our experts’ ability to work across silos to determine the multi-faceted potential impact of different projects.
Renewed Internal Project Reporting Approach

FROM

- A few open-ended questions
- Time-consuming quality assurance of content
- High-level Understanding of Potential Impacts
- Difficulty framing system impact at project level

TO

- More questions, targeting shorter and more focussed responses
- Grounded in Innovation Theory
- Portfolio-level understanding of system impact
- Project-level understanding of system impact
Putting it all together …

These new approaches are designed to:

- Strengthen understanding of the impacts of innovation investments
- Better set the direction of system change through deeper analysis of the system
- Increase the pace of change by better coordinating efforts
- More quickly identify and limit unproductive efforts

Drive energy system change to deliver on our innovation missions