



INNOVATION SANDBOXES

Enter The Sandbox: Developing Innovation Sandboxes for the Energy Sector

September 16, 2020



POLLUTION PROBE

- + Pollution Probe is Canada's oldest homegrown environmental charity
- + Pollution Probe aims to improve the health and well-being of Canadians by advancing policy that achieves positive, tangible outcomes in favour of consumers and the environment
- + Recent energy work:
 - + Future of Natural Gas
 - + Post-Pickering: GTA's Energy Transition
- + More at www.pollutionprobe.org



QUEST

- + QUEST is a national non-government organization that works to accelerate the adoption of efficient and integrated community-scale energy systems in Canada by informing, inspiring, and connecting decision-makers.
- + QUEST recognizes communities that have embraced these principles by referring to them as **Smart Energy Communities**.
- + Recent projects:



INNOVATION SANDBOX PROJECT OVERVIEW

- + Innovation Sandboxes Project will help accelerate Canadian energy systems to a low-emissions future
- + A 4-year initiative to develop policy frameworks for creating Innovation Sandboxes across Canada
- + Phase 1 (Oct 2019-Dec 2020) has been focused on research
- + Create Innovation Sandbox policy frameworks using a multi-sectoral collaborative process in up to eight jurisdictions

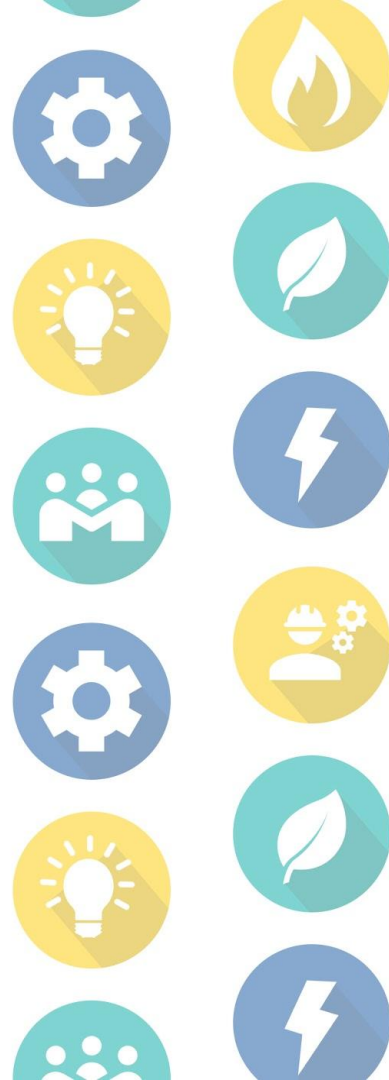
OVERVIEW

1. WHY INNOVATION SANDBOXES?
2. ENTER THE SANDBOX: KEY FINDINGS
3. EXAMPLES OF INNOVATION SANDBOXES
4. LESSONS LEARNED TO DESIGN SUCCESSFUL SANDBOXES
5. WHAT'S NEXT?

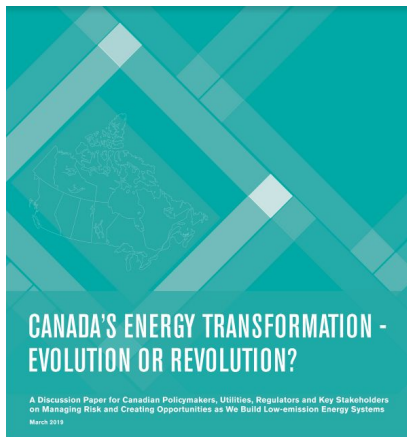




WHY INNOVATION SANDBOXES?



BARRIERS TO INNOVATION



QUEST



“
There is also a consensus that the current framework overseeing the energy landscape is not agile enough to overcome barriers and not well equipped to cope with uncertainties and unintended consequences that come with changes.
”

BARRIERS TO INNOVATION

**Technology is not
the main barrier**

“
The challenge will be to integrate innovation and allow new services, new entrants and new ways of meeting energy needs without losing what is valuable from the current energy policy and regulatory framework.
”

WHAT ARE INNOVATION SANDBOXES?

Innovation Sandboxes are policy tools that use **collaboration** to create **conditions** for a **safe** and **controlled** space in which new **energy products, services, and business models** can be **tested** in a real-world environment.

They provide the opportunity to **change** how **processes, procedures, policies, rules or regulations** are applied in a controlled manner, with the ultimate goal of **informing lasting systemic change** to enable innovations that benefit the energy sector, consumers, and society.



Innovation Sandboxes

Mature technologies (scaling up)

Address policy and regulatory barriers

Intention to harness new knowledge and inform policies, regulations, business models

Collaborative

Ecosystem approach, to transform the system

Demonstration projects

Non-mature technologies (R&D)

Rely on public funding

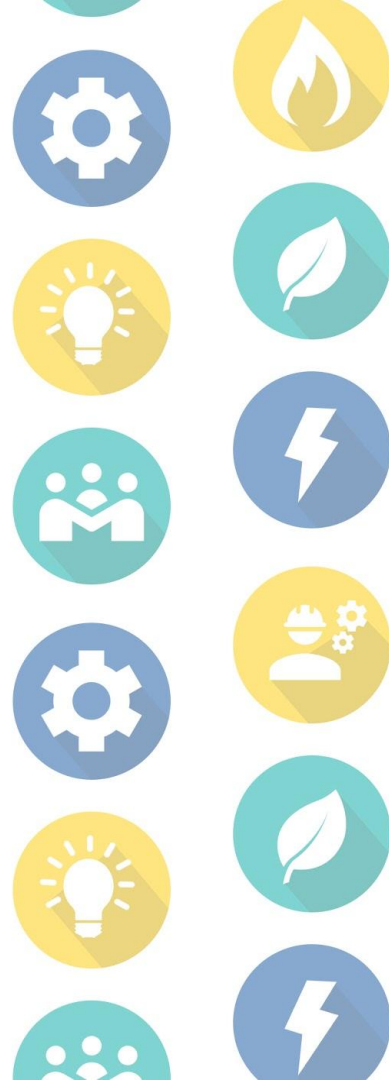
Showing market feasibility with hope of market uptake

Collaborative or not collaborative

In-a-bubble approach, to fit in the system



ENTER THE SANDBOX: KEY FINDINGS



THREE FINDINGS

Finding #1: INNOVATIONS SANDBOXES ARE A TOOLKIT OF POLICY & PROGRAMS

Finding #2: MULTIPLE BENEFITS OF SANDBOXES

Finding #3: DIVERSITY: SHOW ME YOUR SANDBOX

INTERNATIONAL RESEARCH

Jurisdictions that have Innovation Sandboxes

- + Belgium
- + France
- + Germany
- + Italy
- + Netherlands
- + Ontario
- + Singapore
- + UK

Jurisdictions that are developing Innovation Sandboxes

- + Austria
- + Australia



ENTER THE SANDBOX

DEVELOPING INNOVATION SANDBOXES FOR THE ENERGY SECTOR

QUEST
POLYTECH PARTNERS

The graphic features a central 3D box with the text 'INNOVATION SANDBOXES' on its sides. The box is surrounded by a grid of icons representing various energy and innovation concepts, including gears, lightbulbs, lightning bolts, and flames. Below the box, the text 'ENTER THE SANDBOX' and 'DEVELOPING INNOVATION SANDBOXES FOR THE ENERGY SECTOR' is displayed in a blue box. Below this, the logos for 'QUEST' and 'POLYTECH PARTNERS' are shown.

Finding #1:

A TOOLKIT OF POLICY & PROGRAMS

INNOVATION SANDBOXES

INNOVATION HUBS

- Places of collaboration among diverse stakeholders
- Assistance to conduct trials under existing rules
- Knowledge exchange and information sharing to ensure transparency
- Pathway to other tools

ENQUIRY SERVICE

- Customized guidance to help innovators navigate the system and overcome perceived barriers
- Written assurances that the project does not raise compliance concerns

REGULATORY TRIALS

- Time-bound derogation or exemption to existing rules for specific trials
- Development of new rules or changes in existing rules
- Formal and publicly available assessment and evaluation
- Only used when necessary

REGULATORY AND POLICY LEARNING

Results and outcomes will be used by regulators, policymakers, and others to inform discussion on the future of energy transition

Finding #2:

MULTIPLE BENEFITS OF SANDBOXES

- + Can help remove non-technological barriers to innovation and deployment
 - + *We have the technology, the problem is systems integration*
- + Value learning-by-doing to remove perceived barriers and create pragmatic and practical change
 - + *Clarifying what can & cannot be done in existing systems*
 - + *Informing policy, regulatory and business change*

Finding #2:

MULTIPLE BENEFITS OF SANDBOXES

- + Protect consumers
 - + *Controlled change and mitigated risks*
- + Can flexibly work with different forms of energy
 - + *Electricity has been the focus of many, but most are expanding to natural gas and transportation*
 - + *Focus on DERs and Community Energy; Grid stabilization and Orchestration; Integration of New Entrants; Rate Structure and Rate Incentives*
- + Promote collaboration to identify problems and frame solutions
 - + *Collective brain makes $1 + 1 = 3$*

Finding #3:

DIVERSITY: SHOW ME YOUR SANDBOX

Jurisdiction	Objective
Australia	Business model transformation
Austria	Reducing emissions
Belgium	Business model transformation
France	Reducing emissions Business model transformation
Italy	Energy systems optimization
UK	Competition and improving customer experiences Reduce emissions

Finding #3:

DIVERSITY: TOOLBOX

Innovation Sandbox Jurisdiction	Innovation Hubs	Enquiry Service	Regulatory Trials	Regulatory and Policy Learning
Australia*	✓	✓	✓	✓
Austria*	✓	✓	✓	✓
Belgium	✓			
France			✓	✓
Germany			✓	✓
Italy	✓		✓	✓
Netherlands			✓	✓
Ontario		✓	✓	
Singapore		✓	✓	
United Kingdom	✓	✓	✓	✓

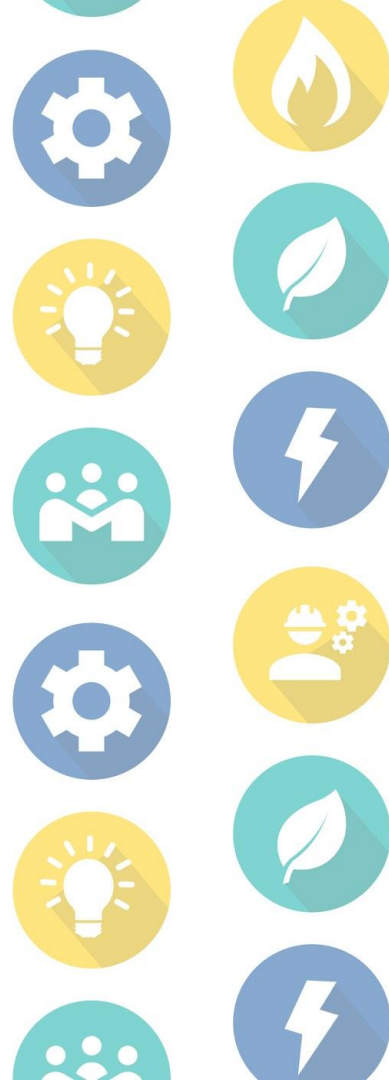
Finding #3:

DIVERSITY: STRUCTURE

- + Diverse in who is creating and implementing them
 - Regulators, governments, even industry*
- + Diverse in the energy sources
 - Electricity has been the focus of many, but most are expanding*
- + Diverse in policy tools
 - Can include funding, data sharing and academic research*
- + Diverse in the scope of regulatory trials
 - + *Differ in timelines, what is considered “innovative”*
 - + *“Open” versus “thematic” calls (and now hybrid)*



EXAMPLES OF INNOVATION SANDBOXES



INNOVATION LINK – UK

- + Run by Ofgem, and was the first energy Innovation Sandbox
- + Innovation Link operates as an Innovation Hub and Enquiry Service
- + Innovation Link also has Regulatory Trials (gas and electric),
 - + Two windows in 2017 and 2018: 69 applicants; 7 successful



INNOVATION LINK — UK

- + Lessons learned
 - + Innovators want advice, greater regulatory certainty and reduced risk
 - + Innovators want to start businesses, not run trials
 - + Not all barriers are due to regulation (codes, norms, licenses)
 - + Innovation everywhere, especially in local energy supply



INNOVATION LINK — PROJECTS

- + Of the 7 regulatory trials, projects included peer-to-peer energy trading; demand response with smart storage heaters; and residential solar and storage to provide grid support
- + The 3rd Window continuing with open call, but considering thematic calls if no projects in certain areas are submitted



INNOVATION LINK — PROJECTS

- + *OVO Energy*
Testing a smart tariff that uses smart devices and smart heating to provide grid balancing services.
- + *Chase Community Solar*
Fitted solar panels to council-owned homes with solar, storage and smart meters/devices to optimize using/exporting power to grid



ITALY: PHASE 1 - REGULATORY PILOTS (2012-2015)

Initiative	Derogation requested	Size and number of projects	Public investment	Major players
Smart (electricity) grids	Extra remuneration on higher risk capital	7 projects were successful	EUR15 million	Distribution utilities
Energy Storage and Dynamic Thermal Rating	Derogation to EU unbundling rules to allow the TSO to own and operate the storage systems	3 energy storage sites were developed, all operated by Terna	EUR155 million	Terna, transmission system operators
EV charging	A specific EV charging tariff without a fixed element	4 projects carried out, and 500 charging stations installed	EUR2 million	Charging providers

ITALY: PHASE 1 - REGULATORY PILOTS (2012-2015)

Example: Electric Vehicle Charging Regulatory Pilot

- + To identify a business model by testing three different models:
 - + A DSO model
 - + An area-licensed service providers model
 - + A competitive providers model



ITALY: PHASE 2 - REGULATORY EXPERIMENTATION (2015 - PRESENT)

System-level regulatory experiment

Initiative	Derogation requested	Size and number of projects	Public investment	Major players
Interoperability of in-home smart devices	No derogation, but future expectation that derogation on meter communications may be needed	1 nation-wide trial, around 100 customers	None	Distribution utilities and smart home appliance manufacturers
Flexibility and demand response	Minimum threshold for participation in the ancillary market was reduced to 1 MW, and aggregation of small-scale renewable energy systems was allowed	94 MW (number of projects unknown)	Under evaluation	Developers, balancing system providers, transmission system operator

ENERGIE.FREI.RAUM — AUSTRIA (1)

- + Under development by FFG (*Forschungsförderungsgesellschaft*, the Austrian Research Promotion Agency, directed by Government)
- + E-Control is part of discussion, but not leading
- + Three “pillars”:
 - + helping innovators
 - + regulatory trials
 - + using results to inform regulatory policy
- + Design being informed through numerous working groups and research commissioned by FFG

ENERGIE.FREI.RAUM — AUSTRIA (2)

- + Goal: To support early-stage renewable energy systems, storage and energy efficiency projects to reduce emissions.
- + Focus areas:
 - + Grid stabilization
 - + EVs and distribution networks.
 - + Local energy communities and peer-to-peer energy trading.
 - + Integration of storage



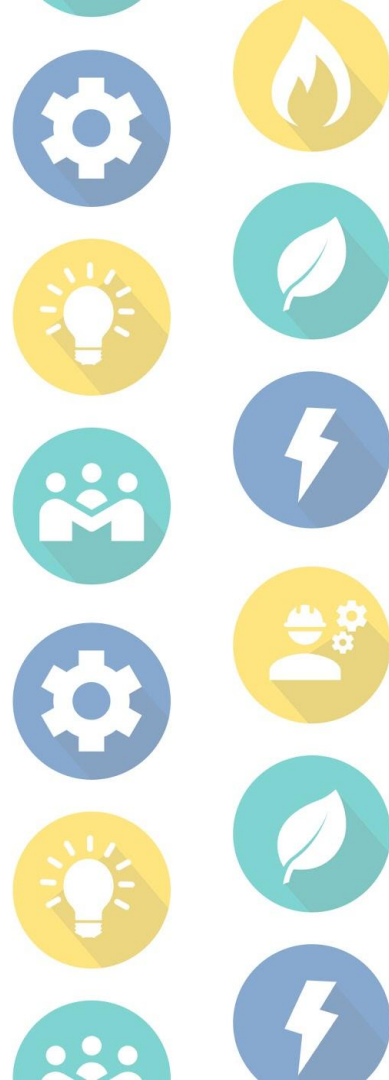
ENERGIE.FREI.RAUM — AUSTRIA (3)

- + Expected to run 2020-2025
- + First regulator trials in 2021 on network tariffs, and €5 million in public funding available
- + Consortia are expected, and academic will be involved





LESSONS LEARNED TO DESIGN SUCCESSFUL SANDBOXES

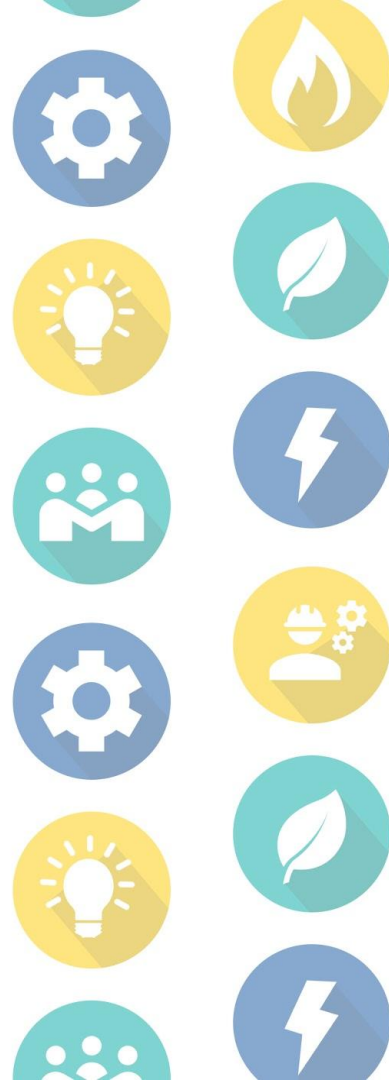


SIX LESSONS TO APPLY

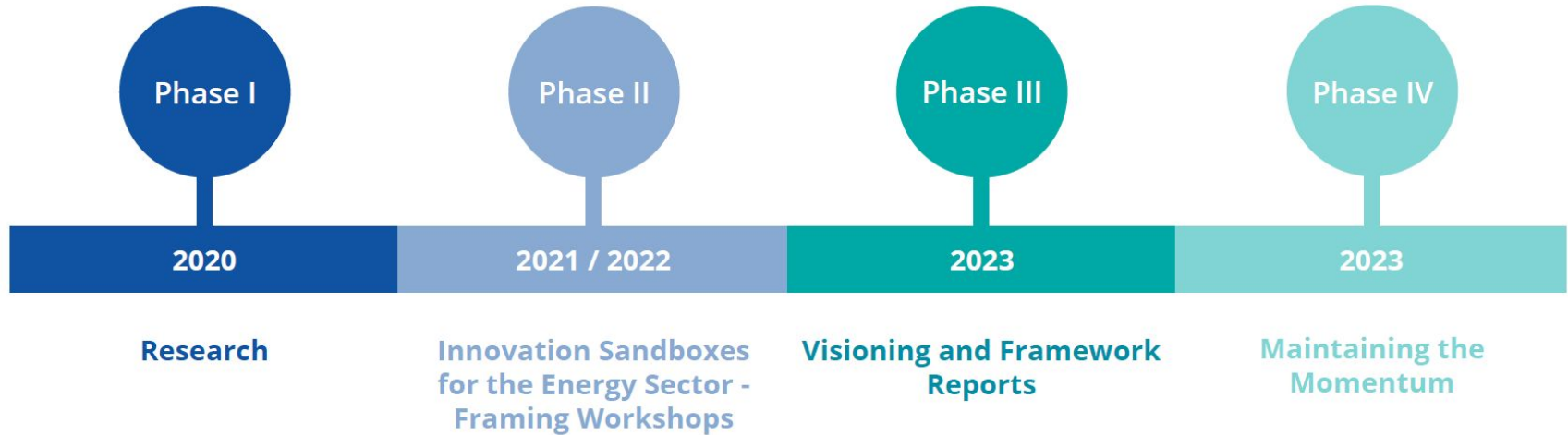
1. Prioritize ongoing learning
2. Prioritize collaboration, transparency and knowledge sharing
3. Need for a culture of innovation and leadership
4. Regulators' roles will need to change to be part of the energy future
5. Need to promote real innovation that benefits and protects consumers
6. Objectives will dictate the design of Sandboxes



WHAT'S NEXT?



PROJECT TIMELINE



STAKEHOLDER GROUPS

- + Provincial / Territorial governments
- + Provincial / Territorial regulators
- + Utilities (gas, electric)
- + Indigenous economic development organizations
- + Businesses
 - + Tech and service providers
 - + Large industrials
- + Low-income energy consumer advocates
- + Financiers / Investors
- + Others relevant to each jurisdiction

WHAT CAN YOU DO?

- + Join the mailing list to stay up to date on project updates
questcanada.org/sandboxes
- + [Take the survey!](#)
- + Contact us

FULL REPORT AVAILABLE ONLINE



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ENERGY SECTOR



www.questcanada.org/sandboxes

www.pollutionprobe.org/innovation-sandboxes-project/



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