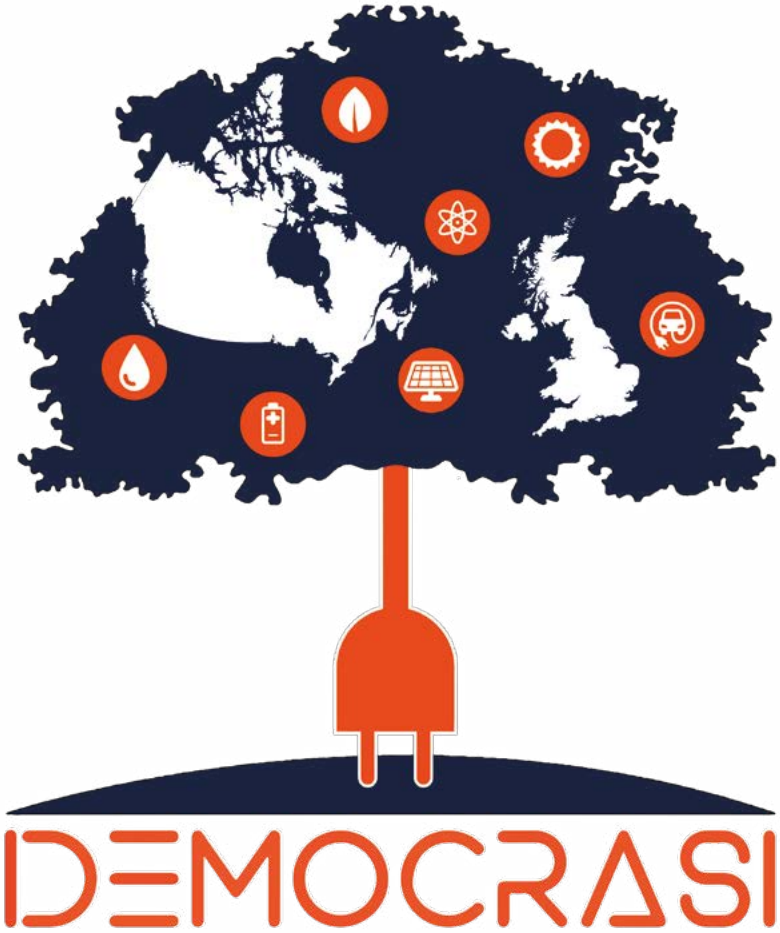
DEMOCRASI project summary report

Policy comparison and review



Funded by: Department for Business, Energy & Industrial Strategy; Natural Resources Canada; Ressources naturelles Canada

Lakeland Holding Ltd. is the parent company of Lakeland Power Distribution Ltd. , Bracebridge Generation and Lakeland Energy/Networks. The company is wholly owned by the Ontario municipalities of Bracebridge, Parry Sound, Huntsville, Burk's Falls, Sundridge and Magnetawan.

Bracebridge Generation maintains 9 hydroelectric plants in Ontario producing 15 MW. Bracebridge Generation is the lead partner in the DEMOCRASI project and related SPEEDIER project. **www.bracebridgegeneration.com** **www.speedier.ca/democrasi**

Lakeland Power Distribution Ltd. distributes electricity to over 14,000 customers in Bracebridge, Burk's Falls, Huntsville, Magnetawan, Parry Sound, and Sundridge. Lakeland Power is the Local Distribution Company for Parry Sound, the location of the DEMOCRASI project in Ontario. **www.lakelandpower.on.ca**

Opus One Solutions is a software and solutions company with the vision of a digitalized, decentralized and decarbonized planet. Its intelligent energy network analysis platform, GridOS®, optimizes complex power flows to deliver operational time-frame energy management and integrated planning to distribution utilities and other managers of distributed energy resources. GridOS is modular, scalable, and integrates seamlessly with existing data systems to unlock greater potential for distributed energy resources, including renewable generation, energy storage, and responsive demand. **www.opusonesolutions.com**

Kiwi Power simplifies participation in power markets across the globe for global sustainability impact through maximising the value of distributed energy resources. Based in the UK, the company has over 10 years' experience across 10 countries, with 1 GW of assets under management. The proprietary software KiwicoreTM provides the user interface, aggregator functionality and control in the DEMOCRASI project. **www.kiwipowered.com**

This designed report was completed by Regen, an independent centre of energy expertise, market insight and analysis, dedicated to transforming the energy system for a zero carbon future. We are a team of energy system and zero carbon technology experts based in Great Britain (GB), using detailed analysis and evidence-based research to underpin all aspects of our work. This report summarises a more detailed technical policy review and comparison report produced for Bracebridge Generation in May 2021.

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Project overview

DEMOCRASI - Dispatchable Energy Market Optimized Constraint Real-time Aggregated System Interface.

Problem statement

Network operators cannot see or optimise the behaviour of the Distributed Energy Resources (DERs) connected to the electricity network. A large increase in uptake in DERs is expected and their behaviour can cause operational problems (e.g. outages and asset degradation). The solution is to give system operators, network operators, and aggregators more control and visibility of DERs and manage their behaviour within the limits of the network.

Project definition

DEMOCRASI is a leading international smart grid innovation project based in the town of Parry Sound in Ontario, Canada. This project develops software products that give greater visibility and control of the behaviour of DERs to the main actors that are responsible for the operation of the electricity system. By combining products from KiwiPower (GB) and Opus One Solutions (Canada) into a joint solution, this project delivers better outcomes for the network and system operators, and lower costs for consumers.


Controls and monitoring


Network visibility


Solar PV


Electric Vehicle chargers


Battery storage

Introduction

The DEMOCRASI project is partially funded under the Power Forward Challenge, a Canada-UK joint competition on Smart Energy Systems, funded by Natural Resources Canada (NRCan) and the Department for Business, Energy and Industrial Strategy (BEIS).

This summary report is a condensed version of a more detailed report produced for Bracebridge Generation in May 2021. The purpose of this work was to assess the potential to apply the DEMOCRASI solution in GB.

Therefore, we carried out a high-level policy review, summarising the similarities and differences between the Ontario and GB electricity sectors.

We also assessed the barriers for implementation and opportunities for the DEMOCRASI project in GB. In addition, we identified the lessons learnt from GB that could apply in Ontario and other European markets that are suitable for DEMOCRASI products. Finally, we developed a set of recommendations for the project.

Our findings are summarised on the following pages.

Similarities between Ontario and GB electricity sectors

	**Energy policy context**		The governance structure shares some similarities with overarching decisions coming from government but regulated independently.
	**Networks**		Networks are split into high-voltage transmission and low-voltage distribution. However, there is more competition between network operators in Ontario than GB.
	**Generation**		Strong shift away from coal generation and towards renewable energy.
	**Retail**		Smart metering and fixed time of use tariffs are already in place with relatively low levels of competition in Ontario. In contrast, the smart meter rollout in GB has been slow, but there is more competition between suppliers. Both markets are liberalised.
	**Energy system operation and markets**		An electricity system operator operates markets to manage the power system. Regarding the markets, similar focus on DSR, capacity markets and flexibility.

Differences between Ontario and GB electricity sectors

	GB	Ontario
Energy policy context	A strong centralised decarbonisation policy framework in the legally binding Climate Change Act.	Canada has an overarching framework and pricing scheme, but policies and implementation vary by province.
Networks	Distribution Network Operators (DNOs) are privately-owned, regulated monopolies based on location and are separate entities to the electricity suppliers.	There are currently 60 Local Distribution Companies (LDCs) who act as both network operator and customer utility based on location, and they are a mix of municipally owned and privately-owned companies.
Status of flexibility markets	Both jurisdictions are undergoing a transition in their electricity systems and significant reforms to their respective markets and services.	
	The National Grid ESO is replacing and reforming services and DNO-led local flexibility market auctions are increasing in size.	The Independent Electricity System Operator (IESO) is also reviewing the markets and services available but no LDC-led local flexibility markets are active.

Opportunities in GB market

Energy System Operator services

- A changing set of service requirements including new reserve and frequency response services are set out in the National Grid ESO market roadmap to 2025.
- More focus on whole system and locational aspects to new services with emerging regional constraint management markets, including voltage, reactive power, stability and inertia services.

DSO services

- Local flexibility markets are growing in scale and importance under the new business plans being developed, including a 'flexibility first' approach to network investment decisions.

Opportunities in GB market

Network charging

- There are likely to be changes that reduce the upfront connection costs for new DER projects, particularly in areas of network constraint that could increase deployment. The overall net impact on DERs will vary across the country and depend on how the methodologies are developed and applied.
- More investment by DNOs in network monitoring, internal capabilities and local flexibility markets will be needed in order to implement the changes.

Sale of energy (wholesale and retail)

- New opportunities are emerging for DERs to access the wholesale electricity markets without going via a licenced supplier - improving market access.
- Changes to the electricity retail market are likely to be implemented that will help improve local energy offers and propositions.

Lessons learnt from GB that could apply in Ontario

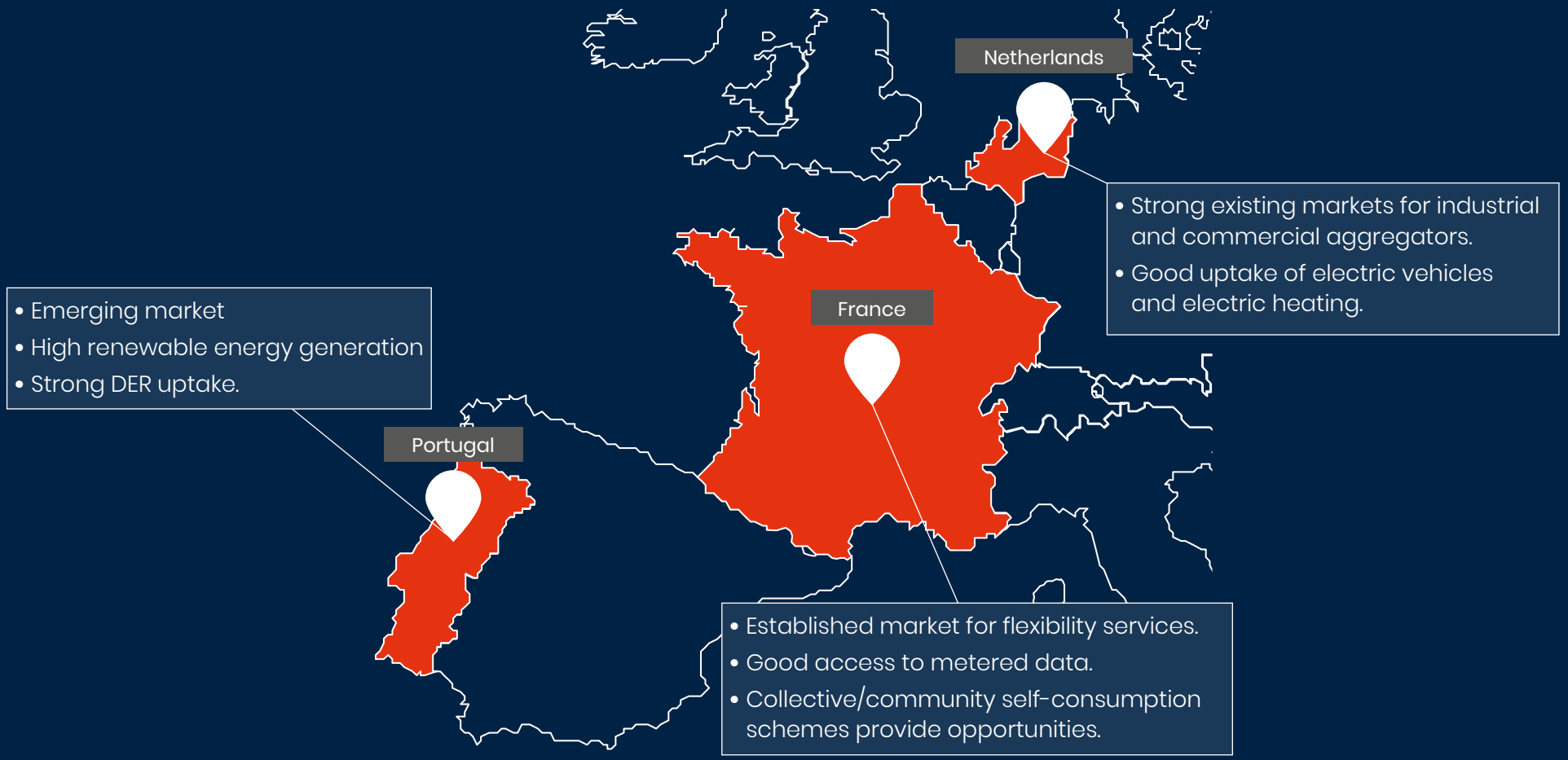
Retail liberalisation - Competition and liberalisation in the retail market means that there is an opportunity for new entrants and innovative models to enter the market.

Data availability and standardisation - Requirements for all network operators to produce Digitalisation Strategies that meet minimum requirements set by the regulator and enable a move towards more open-source data and greater innovation.

DSO model – The energy regulator has required DNOs to become Distribution System Operators (DSOs), taking a proactive approach to develop and use their networks more efficiently and identify flexible alternatives to network reinforcement.

Other European markets

After a high level review of EU markets that looked at DER deployment and existing flexibility services, France, Netherlands and Portugal, were selected as potential options for market entry.



Recommendations

1. **Continue to build relationships and engage with DNOs.** We recommend contacting each DNO to share the learning from the DEMOCRASI project and opportunities to work together, whether through trials or rolling out as business as usual.

2. **Identify and develop market opportunities,** including: capitalise on the maturing local flexibility markets in GB; engage in the formation of new regional constraint management markets; and closely monitor new services being developed by National Grid ESO.

3. **Engage with the network companies on their Digitalisation Strategies.** Put pressure on DNOs to provide CIM standard network data and support them to identify use cases for other datasets.

4. **Provide more content that communicates the DEMOCRASI project to a wider audience.** Additional non-technical content made available online that defines the project and shares the latest updates would help increase awareness. The upcoming webinar on 9 September 2021 is a good opportunity for further project dissemination.

DEMOCRASI