DEC
Decentralised Energy Canada

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Three-Year International Business Development Strategy (2020-2023)

With support from

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Executive Summary

This three-year international business development strategy is designed to provide Canadian Decentralised Energy (DE) companies with greater access to foreign markets. The goal is to stimulate international trade and to increase the value and competitiveness of Canada's DE industry. The proposed strategy was developed based on structured consultations with executive-level managers and companies active in the DE industry.

DE is defined as heating, cooling or electrical energy that is produced, managed and/or stored at the point of consumption. Established in 2002, Decentralised Energy Canada (DEC) is a national industry association serving the needs of this rapidly growing industry.

Drivers that are behind the rapid growth of this industry include global commitments to emissions reduction, greater demand for resiliency, and increased interconnectivity between electric devices and digitalised controls. Digitalisation is having a substantial impact on the way we generate, deliver and consume energy. The economic opportunity from digitalisation of the electricity sector alone is USD$1.3 trillion between 2016 and 2025.

To maintain Canada's competitive edge in foreign markets, DEC plays a strategic role in defining the ecosystem and setting in place the activities for international business development. An international market development and stakeholder engagement model was developed leveraging existing Trade Commissioner Service (TCS) and partner relationships. The model seeks active engagement of local and market trade resources early and often.

Given DEC's history of developing commercial relationships for Canadian DE companies, this strategy is an international extension of DEC's core offerings. The strategy will identify international stakeholders that have an interest in partnering with Canadian DE companies. Anticipated commercial results include: enhanced understanding of the target international markets, increased revenue for Canadian DE companies - the progress of which DEC will report annually to the TCS, and the opening of new markets and building of a commercial brand for Canadian businesses within target international markets.

In year one, DEC will provide subject matter expertise to support international business development. There will be one focal at DEC to track, engage and collaborate with the Canadian Network. The U.S. and the Caribbean will be the initial focus of international business development efforts. In year two, DEC will assemble and test learnings. The model can be used by the DEC team and individual DE companies that want to participate in the outputs. Year three will entail working directly with DE companies with a focus on maintaining international business relationships. The strategy will shift from one of opportunity identification to one of resource enablement. DEC will enable the model and the DE companies will take the lead.

DEC's Export Commitment

Decentralised Energy Canada (DEC) is a national industry association that was established in 2002 to serve the needs of an emerging and rapidly growing industry. The association has become Canada's market access hub serving over 10,000 businesses and companies. DEC compiles and disseminates the latest market intelligence and works with industry participants to drive innovation, build competitive excellence, and improve financial performance.

Canada's Decentralised Energy (DE) industry is active in domestic and export markets with some segments of the industry relying more on export business than others. DEC's commitment to further develop international trade of Canadian DE products and services includes assessing market entry options and formulating entry strategies including support services for direct export and international partnerships.

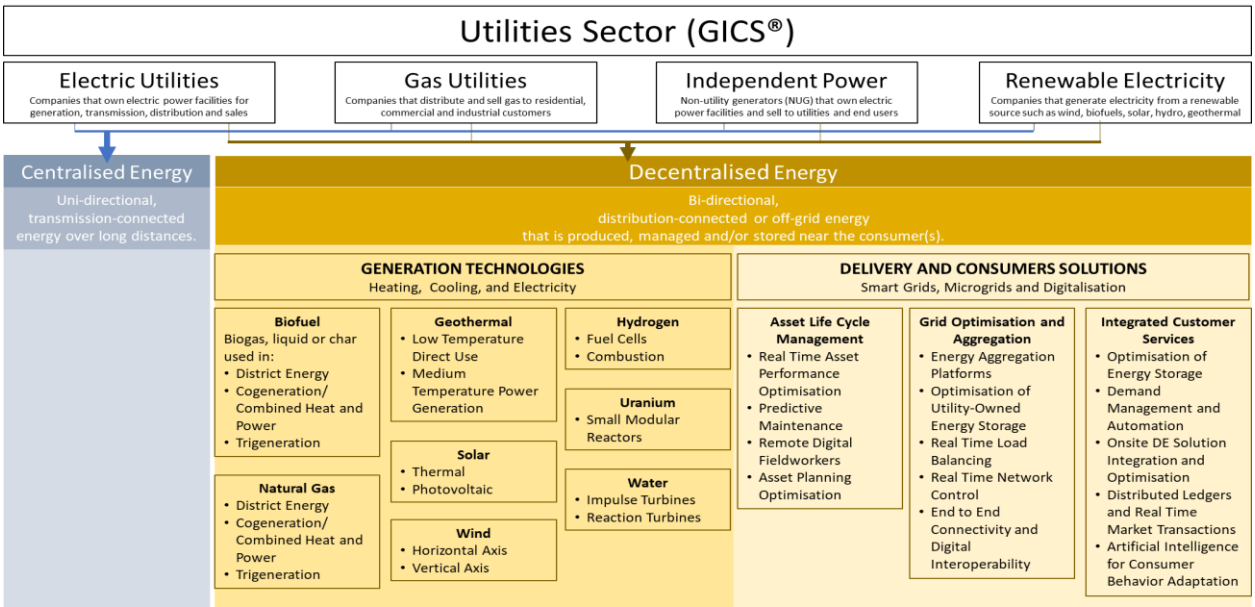
State of the DE Industry, Market Outlook and Key Trends

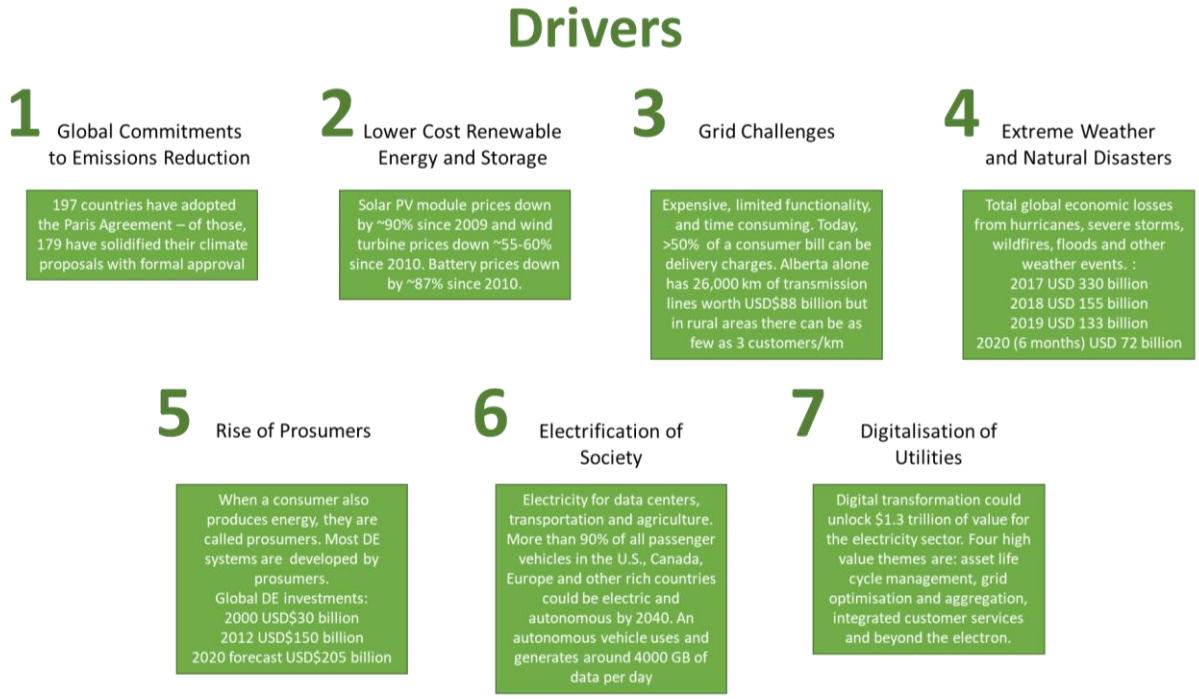
The DE Industry

The DE industry is unique and far reaching. It can be challenging to understand how it aligns to Canada's economic sectors. Today DE is often referred to as being part of the cleantech sector, but a more business-focused way to look at it is from the perspective of the Global Industry Classification Standard (GICS®) which was designed by the financial community in response to its need for accurate, complete and standard industry definitions. In this context, decentralised energy is a sub-industry that spans the utility sector.

The industry hierarchy illustrated below distinguishes between traditional centralised energy and progressive decentralised energy. Businesses and companies in the DE industry offer an array of technologies that generate and deliver local energy. The part of the industry that is evolving the fastest is delivery infrastructure including microgrids and enhanced customer services.

The primary drivers behind DE industry growth are shown in the infographic below with notable supporting evidence.





Data Sources for Drivers:

[1] Natural Resources Defense Council (NRDC)
[2a] International Renewable Energy Agency (IRENA)
[2b] Bloomberg New Energy Finance (BNEF)
[3] Alberta Utilities Commission (AUC)
[4] Suisse RE Sigma Research
[5] General Electric (The Rise of Distributed Power)
[6a] National Geographic
[6b] Intel Corporation
[7] World Economic Forum

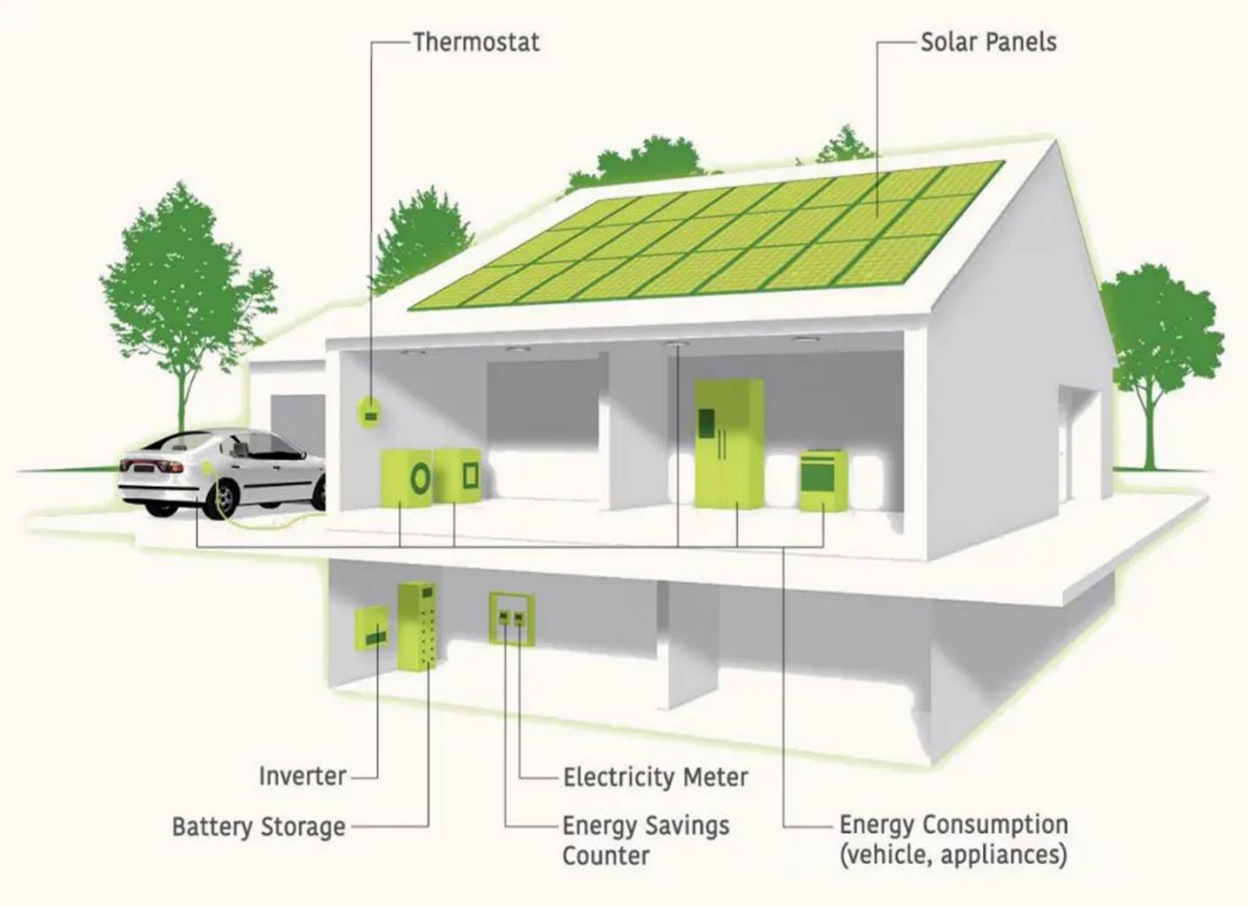
Markets

All utility sectors need to develop advanced digitalisation capabilities to adequately serve the growing DE markets. Three markets are seeing the fastest growth rates in term of DE uptake. They are: buildings, agriculture and transportation.

Buildings

Residential

- Single family
- Small multi-family
- Large multi-family
- Movable dwelling

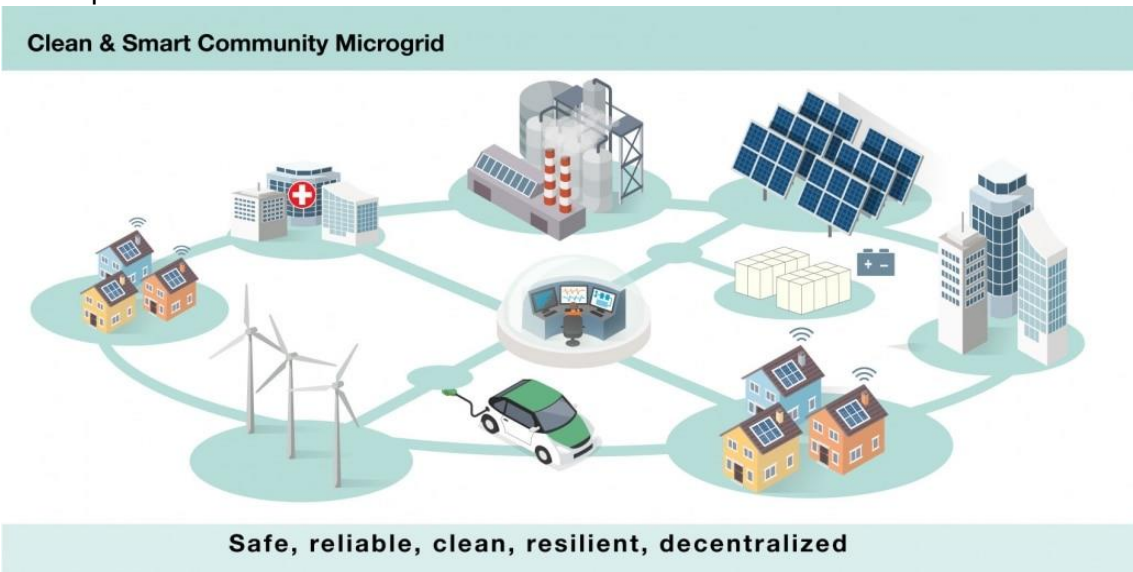


Commercial

- Industrial
- Retail
- Office
- Hotel
- Restaurant

Public

- Municipality
- University
- School
- Hospital



Agriculture

- Machinery
- Vehicles
- Drying operations
- Greenhouse/Vertical Farms

TECHNOLOGY	BASIC ELECTRICITY ACCESS FOR GENERAL ACTIVITIES		FOOD PRODUCTION POST-HARVESTING ACTIVITIES INCLUDING AGRO-PROCESSING AND FOOD PRESERVATION FOR STORAGE AND TRANSPORT	POST-HARVESTING ACTIVITIES INCLUDING AGROPROCESSING AND FOOD PRESERVATION FOR STORAGE AND TRANSPORT			FOOD PREPARATION AND WATER PURIFICATION
	LIGHTING AND PHONE CHARGING	LIGHTING AND COMMUNICATIONS (TVs, RADIOS, PHONES, INTERNET)	WATER PUMPING FOR IRRIGATION	DRYING PRODUCE (CROPS, FISH, ETC.)	AGRO-PROCESSING (MILLING, GRINDING, PRESSING, PASTEURISING DAIRIES, ETC.)	REFRIGERATION (COOLING PRODUCE FOR TRANSPORT AND VACCINE STORAGE)	COOKING AND HEATING WATER (HOMES AND COMMERCIAL STOVES)
Pico-scale PV	◆						
Stand-alone solar PV system, including solar home system	◆	◆			◆	◆	
Solar thermal					◆	◆	
Solar cooker							◆
Solar dryer				◆			
Solar/mechanical/wind pump			◆				
Water mill					◆		
Water mill with electrification	◆	◆	◆		◆	◆	
Wind mill					◆		
Wind mill with electrification	◆	◆	◆		◆	◆	◆
Biogas digester							
Biogas digester with electrifi-cation/biomass gasifier	◆	◆	◆		◆	◆	◆
Improved cook stove (ICS)							◆

Source: based on IRENA, 2012.

Transportation

- Rail
- Road
- Air
- Water

Trends

Cleantech

The DE Industry has strong alignment with the cleantech sector and is often considered in this sector's analytics. ECO Canada's 2020 report projects that clean innovation will be worth $2.5 trillion by 2022 and will support economic development for Canada's cleantech sector as well as the natural resources, utilities, energy, manufacturing, and agriculture sectors. The global export market in cleantech grew was estimated to be $1.150 trillion in 2015 with Canada ranked 16th in terms of market share.

Digitalisation

The World Economic Forum estimates that rapid digital transformation in the electricity sector could capture $1.3 trillion of value globally from 2016-2025. They have identified four themes - high value digital themes– asset life cycle management, grid optimisation and aggregation, integrated customer services and beyond the electron – emerge for creating value (see graphic below). Within each theme, a number of digital initiatives can be pursued, each with our estimated 'value at stake' to enable prioritisation.

Grid Edge Resources

Wood Mackenzie Power & Renewables released a market report in June 2020 **United States distributed energy resources outlook: DER installations and forecasts 2016-2025E** that pulls together disparate technologies into a broad-ranging forecast. By 2025, the combined capacity of these distributed energy resources (DERs) will reach 387 gigawatts, driven by $110.3 billion in cumulative investment between 2020 and 2025.

Electrification of Society

The International Energy Agency released its flagship report **World Energy Outlook 2019** in November 2019. The report states that electricity is 'at the heart of modern economies.' Electrification of transport, heat, air conditioning and a growing demand for digital connected devices is expected to increase electricity's share in total final energy consumption from 19% in 2018 to 24% or 31% in 2040 depending on whether we follow a Stated Policies Scenario or a Sustainable Development Scenario. The leading drivers of global electricity demand growth are motors in industry (over 30% of the total growth to 2040), space cooling (17%), and large appliances, small appliances and electric vehicles (10% each).

Electric vehicles may only represent 10% of the growth in electricity demands but it represents a substantial market opportunity. Allied Market Research reported that the global electric vehicle market was valued at $162.34 billion in 2019 and is projected to reach $802.81 billion by 2027.

Resilient Communities

Suisse RE Sigma Research released a mid-year report in August 2020 reporting global economic losses from natural catastrophes of USD $72 billion, up from USD $52 billion in the year-earlier period. Economic losses from man-made disasters were down from USD $5 billion to USD $3 billion partly due to the COVID-19 pandemic, with lockdowns across the world bringing economic activity in many countries to a near halt.

In North America, severe convective storms (thunderstorms with tornadoes, floods and hail) caused insured losses of over USD $21 billion in the first half of the year. This was the highest since the first half of 2011, when losses from this peril alone were around USD $30 billion. In June, Calgary in Canada suffered losses of USD $1 billion from hail damage, the costliest hailstorm event ever in Canada.

Economic losses due to wildfires could be record setting in 2020. Although still very early in the wildfire season, on September 17, 2020 the National Interagency Coordination Center Incident Management Situation Report reported that the year-to-date total is 42,512 fires that have burned 6,927,327 acres. The total economic impact of the fires this year could cost between $130 billion and $150 billion. The North American wildfire season alone could make 2020 one of the worst years of economic loss from natural disasters ever recorded.

Decentralised energy solutions can be installed quickly, often in a matter of days or weeks compared to years for traditional centralised power solutions. The scalability of DE systems requires less money to buy, build and operate and are easier to finance because they avoid the challenges associated with raising hundreds of millions of dollars to finance large infrastructure projects. The smaller size and scalability also provide a more flexible microgrid solution to aggregate and control DE systems and match the level of demand with the level of supply.

Outline of Strategy and Methodology

This strategy is designed to provide Canadian Decentralised Energy (DE) companies with greater access to foreign markets. The goal is to stimulate international trade and ultimately increase the value and competitiveness of Canada's decentralised energy industry. The development of this strategy involved structured consultations with executive level managers companies that are active in the DE industry.

The plan and activities in the strategy consider the full value chain of DE industry participants including the enabling services such as investors, utilities, and regulatory bodies.

The strategy development process included structured consultations with an industry advisory group consisting of over 30 executive level industry experts. Consultations took place as one-on-one meetings or facilitated business cohort sessions. The input from the Industry Advisory Group was compiled into an international business activity model to best reflect the opportunities and challenges identified by industry stakeholders. The Industry Advisory Group reviewed and provided feedback on the draft Strategy.

Strategic Objectives

Canadian companies see the growth potential for their businesses in these markets; however, they want to gain a better understanding of:

- Where to start? How do I start to know what I do not know?
- What the scope of the opportunities are?
- How difficult will it be to exploit these opportunities?
- What supports exist to assist them in expansion?
- What other Canadian government information and financial services can they rely on for support?
- What people, time and money investment will they need to make so they can plan their own international expansions accordingly?
- What are the best organisations and partners (industry, special interest, government sponsorship) in the foreign market for me to align with?
- How do I engage with these organisations?
- How do I find out more about my competition?
- What other Canadian government information and financial services can I rely on for support?
- Are trade missions, research and other existing CanExport services effective for my needs or are they geared toward larger organisations and government?

The following are international business development strategic objectives for Canadian DE companies:

1. Increase Canadian DE business activity in international markets.
2. Ensure increased access to foreign investments in the decentralised energy industry by proving the strategy in year one and measuring Canadian DE company participation in years two and three.
3. Grow strategic partnerships for Canadian DE companies in foreign markets with the Trade Commissioner Service and other key stakeholders.
4. Increase Canada's share in foreign markets for decentralised energy products and services solidifying Canada's position as an industry innovator.
5. Create net new partnerships to ensure cross learning and ongoing growth.
6. Partner with customers to provide solutions.

7. Improve Canada's reputation as a research partner in decentralised energy solution innovation.
8. Continue to leverage Canada's reputation as a leader in decentralised energy solutions.
9. Recession-proof Canadian DE businesses.

Canada's Current International Business Position

Canada's DE industry has a presence primarily in the United States (US) but also in Australia, the United Kingdom (UK) and India. On analysing these opportunities with Canadian DE companies – in the context of this strategy – most of the opportunities were relationship-driven. However, these relationships were not necessarily founded by traditional trade missions. Our consultations with Canadian DE companies found that although the TCS provided valuable information, neither the company nor the TCS was sufficiently informed as to who in the target market was best to initiate business development opportunities with.

As a result of this analysis DEC understands that any successful international business development strategy requires in-depth knowledge of the target market including local knowledge. This local knowledge is gained through leveraging existing knowledge networks. Therefore, design of this strategy is heavily influenced by these findings.

Role of DEC in Strategy Execution

With the goal of understanding Canada's competitive edge in foreign markets, DEC's role is to define the ecosystem and set in place the activities that generate international business development action.

This three-year strategy crosses the chasm between the idea of the foreign market to the validated accessibility of that market in DE industry offering context. The final deliverable is a strategic plan placing DEC in a position of consultation, guidance and activity execution for where Canadian DE companies should spend their time in those markets.

Trade Commissioner Service (TCS) and Canada's Decentralised Energy Industry

The Trade Commissioner Service is part of Global Affairs Canada (GAC). It is a network of more than 1000 trade professionals working in Canadian embassies, high commissions, and consulates located in 161 cities around the world and with offices across Canada. TCS and other domestic government programs provide excellent business development resources. For example, GAC administers the CanExport program which provides funding for exporters,

innovators, associations and communities. The feedback from Canadian DE companies availing of these opportunities is exceptional. However, these supports cannot always be decentralised energy specific. The decentralised energy industry is advancing rapidly, and policies, subsidies and stakeholders are changing quickly. The role of the industry association is to keep up with the latest market intelligence and identify opportunities and challenges associated with Canada's competitive position.

DEC shall actively engage local and target market Trade Commissioners early and often. This engagement will be bi-directional. Canadian DE companies need access to more targeted knowledge about who would be interested in their respective value propositions. This knowledge gap represents a barrier to international market entry for Canadian DE companies. However, given DEC's experience navigating the public/private sector knowledge and relationships required, we present the international business development strategy complete with activities and an execution plan so that the TCS is well informed with requisite knowledge of who and what to look for in the target market. The TCS is an established and credible service supported by expert networkers in their geographies. DEC will inform its network of Canadian DE companies about how best to leverage this partnership. The strategy presented here scales information to make sense to both DEC and the TCS.

This approach is in direct response to feedback from Canadian DE companies that they 'don't know where to start' when referring to how they will enter new markets. For example, the requirements and timing, the Government of Canada's Clean Growth Hub, created to advance cleantech solutions and accelerate a Canadian DE companies' entry into international markets, may serve as springboard along the commercialisation path. However, for the relationship piece, what are the initial steps that Canadian DE companies must take and how do they know they are on the right path?

Anticipated Key Results

This strategy identifies, from an industry association's perspective, global stakeholders that have an interest in partnering with Canadian DE companies as they explore and engage in international markets. The strategy also:

- delivers a framework for relationship building with key industry stakeholders by identifying a Canadian network of support (this includes periodic, directed activities)
- identifies select markets as a starting point in year one of the strategy
- identifies a DEC-specific market access network
- provides a plan to achieve the above strategic objectives for all three years of this strategy complete with an activity update strategy
- outlines activities that will be undertaken to support this plan's execution.

Anticipated commercial results include:

- An enhanced understanding of the target international markets that will provide the Canadian DE industry with an ability to invest in validated, authentic business opportunities, specifically:
    - five signed NDAs or MOUs between Canadian DE companies and international partners or potential customers,
    - collaboration with market access partners such as the Rocky Mountain Institute (RMI) to identify two million dollars worth of projects in the Caribbean and sub-Saharan Africa where Canadian DE companies have an offering, and
    - partnerships with international events as identified by RMI, IEEE and other market access partners leading to 12 new business development opportunities and/or industry partnerships.
- For participating Canadian companies, DEC anticipates an increase in revenue as engagement opportunities will be continually validated by multiple parties. DEC will report annually on the progression of these opportunities to the TCS.
- Overall, the advancement of Canadian DE businesses will open new markets and build a commercial brand for Canadian businesses in the target international markets.

DEC has a successful history of developing the necessary commercial relationships for Canadian DE companies. This strategy is an international extension of some core offerings:

- **Client opportunity qualification and pre-screening**. DEC will leverage its relationships with the stakeholder ecosystem defined below and the relationship with the Trade Commissioner Service.
    - Success will be measured by a target of 10 pre-screenings of client opportunities in the next three years.
    - DEC is targeting participation in at least one trade event per year for the duration of the International Business Development Strategy. DEC will work closely on included targeted matchmaking opportunities with assistance of the Trade Commissioner Service.
- **Technology and project evaluation.** Through DEC's relationship with international energy-focussed NGOs, Canadian DE companies will have exposure to project opportunities driving innovation. DEC has the market relationship and experience to vet for participating companies.
    - Success will be measured by the quality of engagement. DEC will vet projects and understand opportunities for participating companies. DEC would expect two projects per year and estimates a further three technologies per year vetted from international clients and partners. More relevant opportunities will be presented to Canadian companies and less time will be needed to support export efforts by the Trade Commissioner Service, other Canadian funding agencies such as BDC or EDC and DEC itself.

    - Success will be measured by DEC working closely with Trade Commissioners to ensure all barriers to entry are identified and removed as appropriate, i.e., that participating Canadian companies are set up for success and projects are enabled with the right financial and relationship supports.
- **Investment funding and attraction, e.g., investment matchmaking** will be a key feature of how DEC will support Canadian companies for the duration of this international business development strategy.
    - Success will be measured by ensuring no less than three Canadian DE companies have funding hurdles removed as a barrier to expansion into a foreign market.

Industry Consultations

This strategy was developed in consultation with an industry advisory group consisting of 30 Canadian DE companies. We grouped the companies into business streams to minimise the time spent on requirements gathering. Refer to the 'State of the Industry' section for more details about sector segmentation. Specific details about the industry advisory group are summarised in Appendix B.

The DE industry was grouped as follows.

1) **District energy** tools for project concept screening, planning, design and execution methodologies and frameworks for community generation capacity building, this includes:
    a. Community enablement and **innovative collaborative models,** projects, power distribution and other training.
2) **Cogeneration** supporting technology innovation, business case building and investment in power cogeneration projects.
3) **Solar Energy** including PV, CSP and STE industry and emerging technologies.
4) **Earth Energy** including proven effective geothermal technologies, solutions and professional services and **Biogas** including proven biogas technologies, solutions and professional services.
5) **Internet of Things (IoT)[1], Professional Services** including business case building, technology viability and solution validation.

To facilitate input, we formed specific cohorts to gather engage companies in three distinct phases of the work:

1) Strategy objectives development
2) Strategy design

[1] Data mining and machine learning was also included in this cohort.

3) Case study development and lessons learned

Where possible, this strategy also identifies a Market Access Network in some initial target markets. Partner associations involved in the development of this strategy included:

- Rocky Mountain Institute (RMI) – U.S., Caribbean and Africa
- National Resources Research Institute (NRRI) – U.S.
- IEEE, Institute for Electrical and Electronics Engineers – International

Foreign Market Access Enablers

The U.S. Department of Commerce identifies ways to enter the U.S. market.[2] They are offered here:

- Selling to a dedicated Distributor
- eCommerce
- Direct exporting
- Partnering
- Joint Ventures
- Piggybacking
- Turnkey projects
- Licensing
- Franchising
- Buying a company

While these approaches are useful, the outstanding question is where does the DE company start in forging these relationships? There is some prerequisite knowledge of the target market that is required. Defining this level of subject matter expertise or intelligence represents a knowledge gap that can be a barrier to entry for many DE companies. Many of our members have limited international business development resources. The time required researching, choosing, and building relationships in the target market often hinders the DE company from getting engaged in the first place. If this knowledge gap could be filled and could further target their specific area of strategic offering, they could engage in international markets.

Program Targets

To drive international growth DEC and TCS must bridge the following knowledge gaps to engage with the target markets:

- knowledge in the international target market, i.e., market outlook for decentralised energy,

[2] https://legacy.trade.gov/topmarkets/renewable-energy.asp

- knowledge of how to leverage new trade agreements facilitating market entry, e.g., CPTPP, CUSMA, CETA,
- knowledge of *where to start* as companies start attributing resources,
- understanding of success factors for market entry beyond revenue, i.e., how does the DE company know when they are experiencing success, and
- network relationships with target markets to assist foreign market entry.

The Canadian decentralised energy industry has several opportunities for expansion especially in developing countries. Projects for grid diversification, energy decentralisation, battery storage and micro-generation are seeing international government funding and support programs administered by organisations like RMI (Rocky Mountain Institute). These represent direct opportunities for the Canadian DE industry. DEC will facilitate the early competitive relationships needed to advance DE company engagement and growth.

Targeting Markets that Matter

DE companies expressed that they do not need additional support for determining what international conferences are a good fit for their relationship building and international business development activities. Where support is needed is in aligning their unique value proposition with a market that is ready to take action.

This strategy aligns with the Canada's Global Markets Action Plan and is influenced by these key strategies cited from this plan[3]. Key features of this plan are repeated here:

1) *Accessing emerging markets with broad Canadian interests & established markets*
2) *Accessing emerging markets with specific opportunities for Canadian businesses*
3) *Deepening Canada's competitive advantage in established markets*
4) *Entrenching Economic Diplomacy: A New Trade Promotion Plan*
5) *Focusing resources and services to maximise success*
6) *Promoting Canada's foreign trade zone advantage*
7) *Promoting Canada's innovation advantage*
8) *A Focused Pro-trade and Investment Plan to Open New Markets*
9) *Prioritising trade and trade-related agreements*
10) *Enhancing Canada's Competitive Edge*
11) *An agile and adaptable trade strategy*
12) *Renewed and strengthened stakeholder linkages*
13) *Initiatives that play to Canada's strengths*
14) *Setting goals and measuring success*

[3] https://www.international.gc.ca/global-markets-marches-mondiaux/assets/pdfs/plan-eng.pdf

Enabling Market Access through the Trade Commissioner Service (TCS)

TCS has been helping companies navigate international markets and can provide key business insights and access to a network of international contacts.[4]

Export Development Canada (EDC) and Trade Commissioners should be involved early and often. Success in one international market does not necessarily mean success in a second international market. Among other cultural norm differences, there are cultural business decision making differences in all countries particularly with timelines for closing business.

DEC Action: Collaborate with DE companies and aggregate knowledge of offerings and target customer prospects where possible. Evaluate lessons learned and share with TCS (this is a bi-directional relationship).

Navigating the Trade Support Network

There are some known timelines and logistics for CanExport funding of activities such as trade missions and matchmaking visits. For example, applications must be completed three months in advance of the funds needed and the decision to award funding or not requires an additional 60 business days, i.e., approximately another three months, so elapsed time could be looking at six months before funding is awarded. This is contingent on the DE company meeting the award criteria.

Part of DEC's scope of work is to ensure that all foreign market opportunity exploration is a collaboration of the entire ecosystem and there is a transfer of knowledge around timelines and necessary activities.

[4] https://www.tradecommissioner.gc.ca/index.aspx?lang=eng

DEC Action: Understand funding alternatives from the DE company perspective.

Funding Application Support

There are many EDC grants available to DE companies as they travel to, attend conferences, and engage in matchmaking opportunities in foreign markets. DEC has developed knowledge of requirements for completing grant application and can network with other companies as they seek funding for international business development activities.

Although the TCS can make introductions in the target markets for purposes of this strategy, DE companies understand the need to collaborate with the TCS to identify key resources. For example, the DE company must articulate the types of companies, investors and other business relationships needed in the target market. The forum for this information is offered in the proposed international business development strategy model below.

Where the DE company doesn't know the optimal target business relationship or investor, they cannot provide proper guidance to the TCS. This is where DEC can play a role in formulating common target stakeholder profiles and relationships and organising information events. For purposes of this strategy, DEC has assembled an ecosystem of organisations and stakeholders as well as a set of activities to develop international business connections for the DE industry.

DEC will provide support to optimise the impact of these funding programs to customise foreign market access. This will enable effective dissemination of accurate DE company specifics.

DEC's International Ecosystem

DEC understands that tuning in to the right knowledge and business relationships in the target market is key to executing an international business development strategy. The outstanding question, however, is how does a DE company navigate the people, processes and knowledge to be engaged with the right information at the right time?

The strategy will extend the reach of the DE company into international markets. DEC will enhance the industry's understanding of target markets' trends in policy, subsidies and needs. The model presented below first identifies who will provide this support.

Strategically speaking, the following organisational entities provide current knowledge on target markets and form a DEC international business strategy ecosystem.

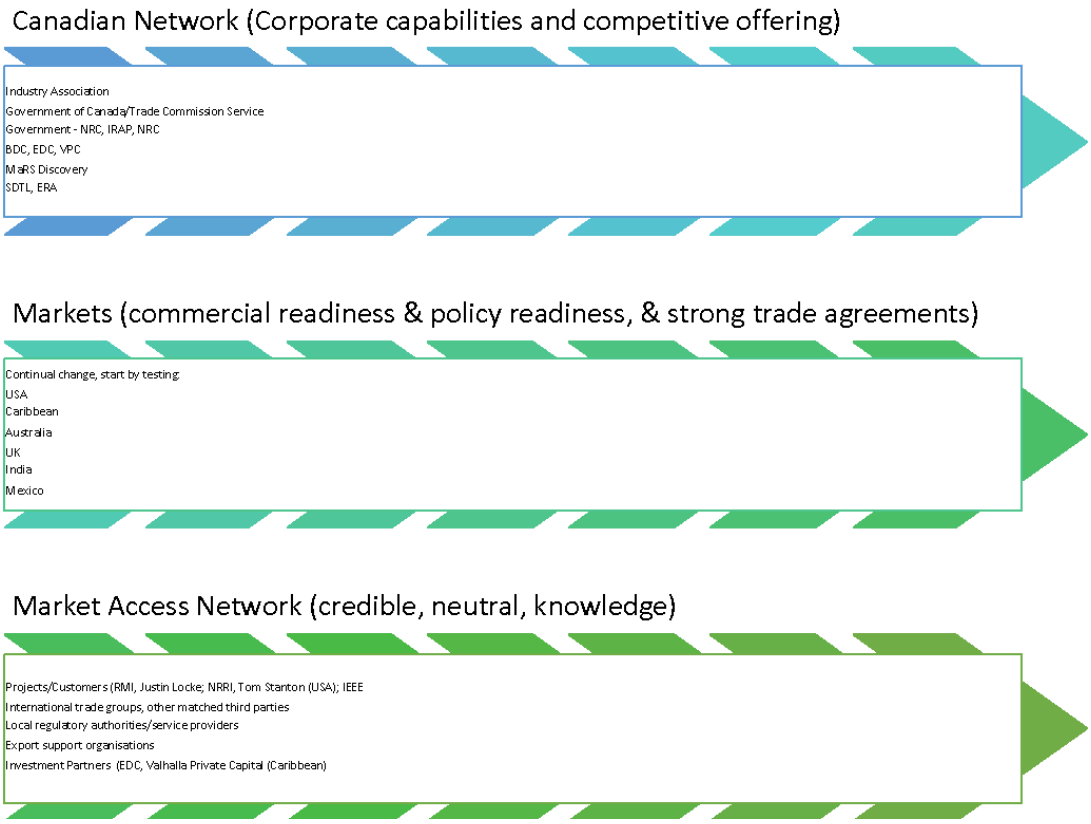
The organisational groupings in the ecosystem are as follows:

1) The **Canadian Network**: Those Canadian organisations that have the ability to facilitate one or more aspects of international business development. Members of this network consist primarily of industry associations, federal government and Crown Corporations. Canada's support system for trade-oriented expertise involves:
    - Women in Renewable Energy (WiRE) and other renewable energy industry associations such as the Canadian Geothermal Energy Association (CANGEA)
    - Government of Canada (GoC), Global Affairs Canada (GAC), Trade Commissioner Service (TCS)
    - NRC (IRAP), NRCan
    - Business Development Bank of Canada (BDC), Export Development Canada (EDC), Valhalla Private Capital
    - MaRS Discovery (Cleantech)
    - Institute of Electrical and Electronics Engineers (IEEE)
    - SDTC, ERA

2) Knowledge of the target **Markets** themselves: Are these markets ready for what DE companies have to offer? Acquire knowledge of the target market by gauging commercial and policy readiness along with strong trade agreements such as:
    - CPTPP - Comprehensive and Progressive Agreement for Trans-Pacific Partnership
    - CETA – Comprehensive Economic Trade Agreement (Canada Europe)
    - CUSMA – Canada-United States-Mexico Agreement

3) The **Market Access Network**: The organisations that can give DE companies an intelligent 'leg up' in the target market, members of this network include:
    - Rocky Mountain Institute and Institute of Electrical and Electronics Engineers – Projects/Customers/Market Research
    - National Regulatory Research Institute – U.S. Local Service Providers
    - Export Development Canada and Valhalla Private Capital - Investment Partners
    - Other collaborations - New Energy Events[5]

[5] https://newenergyevents.com/



The Canadian Network

Given the volume of potentially useful information coming out of these groups, the amount of material is simply too large for a busy entrepreneur to digest. DEC's role in international business development strategy execution is to synthesise and prioritise information. With input from other, related member organisations such as WiRE whose "mission is to advance the role and recognition of women working in the energy sector"[6] and who also increasingly has a global reach, relationships like these contribute balance and diversity in our approach to these markets.

In the case of solar and wind, the types of business relationships needed are increasingly clear for TCS. For example, power companies own transmission lines, so this type of business connection/relationship is clear. In the case of an energy storage technology, the international business relationship required is more ambiguous. While an understanding of the needs for power storage in the target market is clear, what may be less clear is how the DE industry enables product sales, e.g., through which channels and in what level of the supply chain needs to be engaged.

[6] https://www.womeninrenewableenergy.ca/

Leveraging Canada's Trade Network

Canada's trade agreements represent a significant opportunity for DE companies to move competitively into target markets. However, there is currently a gap in understanding how these trade agreements can specifically benefit DE companies. Tariff barriers can drive up the cost to the international end user. The elimination or loosening of these tariffs is a definite advantage and important piece of the value proposition puzzle for new markets.

On July 1st, 2020 the Canada U.S. Mexico Trade Agreement[7] (CUSMA) was brought in to replace the former NAFTA agreement. There is an energy provisions summary which deals mainly with energy policy relating to fossil fuels. CUSMA maintains the benefits of NAFTA's tariff elimination and goes further to loosening limitations on energy exports. NAFTA's *proportionality clause* has been eliminated ensuring enhanced energy security between the three countries. The impact to the DE company would appear to be the elimination of energy-related tariffs.

In the above model, DEC would become progressively more familiar with CUSMA details as it relates to doing business. DEC, the DE company and the TCS would work together in understanding specific details of this agreement.

Another Canadian trade agreement that exists to enable decentralised energy exports is the Canada-European Comprehensive Economic and Trade Agreement (CETA) which was ratified in November 2018. This agreement removes tariff and non-tariff barriers such as conformity assessments[8] in clean tech services. While this agreement recognises other Canadian clean energy programs such as the Clean Growth Program (CGP) and the Green Infrastructure Programs, DEC will need to inform itself of agreement details for each DEC sector.

Canada and the UK also have technology Memorandum's of Understanding (MOUs) as they relate to technology which is also of interest for the DE company. In addition, the scope of CGP and the Green Infrastructure Programs may have advantages for DE companies; however, these programs also support the energy, mining and forestry sectors. Many DE company solution offerings are resource sector agnostic. Therefore, DEC will need to build current knowledge of these MOUs and programs which will require an ongoing time investment. Provision for this time investment is built into the above model.

[7] https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/cusma-aceum/index.aspx?lang=eng

[8] https://euccan.com/ceta-will-help-bring-the-best-of-european-clean-tech-to-the-canadian-market/

Investment Partners

Valhalla Private Capital has a close relationship with DEC. The Market Access Network assumes a 'dot connector' role. For example, as part of DEC's long-time scope of offering for its members, DEC offers investment funding, attraction and training for those members seeking financial growth assistance. Examples include a collaborative offering training such as their Entrepreneur-Financial literacy base camp. Valhalla has done this type of work in 30 countries. They also have relationships in the Caribbean.

Valhalla has discussed what types of activities DEC could undertake to move into foreign markets with members. Valhalla could coach DEC to pursue MOUs with Alberta Investment Management Corporation (AIMCo) (formerly the Alberta Heritage Trust Fund) to seek funding to create and administer a DEC international business development pool. DEC could create this pool with government funding. The private sector with the same interests could match the funding or create a pool of foreign companies.

DE Industry Approach to Foreign Markets

How do DE companies approach these markets over the next three years? By using the model above, executed by a DEC International Business Development Coordinator, the DE company has access to curated knowledge that they can choose to use to advance their business. They become aware of private and public incentives to learn more about and eventually purchase their solutions.

As a result of this strategy, DEC will maintain an information dissemination pathway to the TCS so engagement in the foreign market will be targeted. DE companies will continue to seek out the expertise of our designated Trade Commissioners. The key change using this model is that both parties, the DE company and the TCS service is better informed about niche offerings in the context of the target market.

DEC Action: DEC designate works with each cohort group to determine an achievable scope of work.

Market Access Network

The Market Access Network premise is that it enhances DE companies' knowledge of the target market through the lens of organisations whose mandate is to advance clean energy in both the United States and/or developing regions like the Caribbean and sub-Saharan Africa. RMI has offices in Asia and India as well. In the case of the stakeholders identified for this strategy, DEC shall keep current with events, webinars and projects in the Market Access Network. DEC will suggest participation in such events to its members when appropriate.

The Rocky Mountain Institute (RMI) advances clean energy initiatives in developing countries. Currently RMI has market intelligence of interest to the Canadian DE industry in the Caribbean, Sub-Saharan Africa and developing intelligence in Southeast Asia. Specifically, in any given region where RMI is intervening, RMI has put together an integrated resource plan (IRP). This plan has a list of projects and sub-projects that will be of interest to various DE companies. Should DEC be resourced to execute this strategy, DEC can act on behalf of the DE industry to matchmake opportunities in developing countries. DEC could also seek out Export Development Canada funding to assist the DE company. RMI is willing to share this intelligence with DE companies and looks at Canadian companies favourably in slower moving, developing markets like the Caribbean and Sub-Saharan Africa.

Under RMI's leadership, currently there are USD$1 Billion worth of projects in pipeline in the Caribbean and USD$.5 Billion in Africa for development via RMI. DEC is working with TCS on a framework for facilitating Canadian DE industry entry into these markets.

According to RMI, from a decision-making cultural alignment perspective, Canadian companies tend to be more patient with longer decision-making cycles when advancing business in developing nations. Markets are unique in these jurisdictions and tend to have different entry points. For this reason, RMI has a positive view of DEC and the Canadian DE industry and will support these companies via our International Business Development strategy access network.

The U.S.-based National Regulatory Research Institute (NRRI) provides comprehensive information on decentralised energy trends in the United States. The National Association of Regulatory Utility Commissioners (NARUC) works with NRRI and U.S. regulators on innovative power projects in challenging power producing areas like Puerto Rico and Hawaii.

DEC may also have other collaborations with organisations like New Energy Events (a U.S. based private company that organises clean energy events) to understand potential business opportunities and connect with other partners offering complementary decentralised energy solutions. New Energy Events has received Canada Export funding for their upcoming Caribbean Renewables Energy Forum (CREF).

Military markets also represent an opportunity for DE companies for off-grid energy production. These opportunities will also be sought after in target markets. Advantages that Canada's trade agreements bring will also be explored.

The IEEE (Institute of Electrical and Electronics Engineers) is actively interested in collaborating on international events with DEC. As part of its scope, IEEE Technology and Engineering Management Society (TEMS) specialises in artificial intelligence and smart cities.

DEC has built the necessary credibility and trust with IEEE to leverage international opportunities as a result of this relationship.

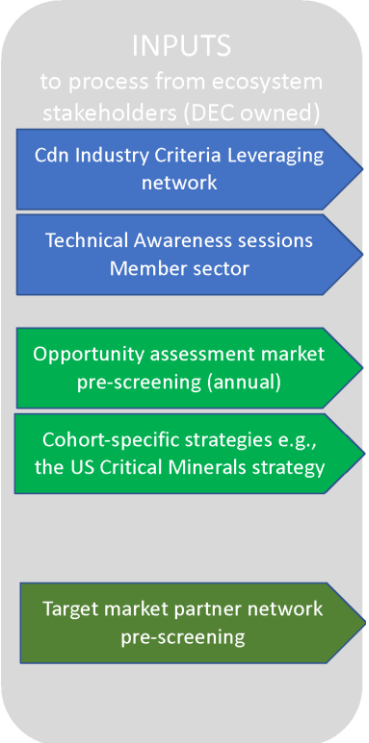
The IEEE will also help DEC concentrate on services for good in smart communities in developing nations (Africa, India, China). DEC projects such as the EEA (Energy Efficiency Alberta)-funded Community Energy publications are also of interest to the IEEE and could represent ongoing collaboration opportunities. IEEE and DEC share an executed MOU (memorandum of understanding) covering scope between DEC and IEEE is for conferences and also has sufficient scope for coverage of this International Business Development Strategy model. DEC is also in the process of identifying 2021 opportunities to collaborate while there is continued interest in collaborating on events worldwide.

DEC Action: Evaluate events from the Market Access Network and highlight ones where specific DE companies should attend.

DEC Action: Review RMI project clearing house and identify projects that DEC would be available to bid on. DEC could also engage the Trade Commissioner Service (TCS) to make introductions into the target market where needed.

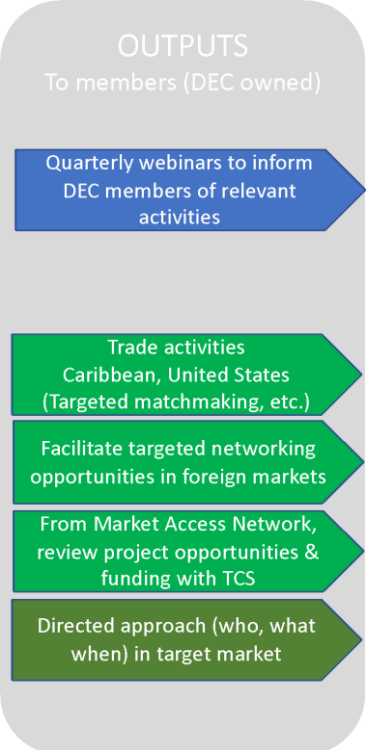
Activities to Advance International Business: Inputs and Outputs

Using the stakeholder ecosystem, DEC will feed inputs to these groups to understand what activities DE companies can take in identified markets to advance business. A prerequisite to this approach is that DEC understands the unique business value proposition of each participating company and prequalifies their participation in some form. DEC will collect inputs from Canadian industry leveraging the market access and Canadian networks using the above examples such as the Market Access Network or Canada's progressive trade agreements. This will include awareness sessions, opportunity assessments, as follows. Sample inputs are represented in the graphic image below.

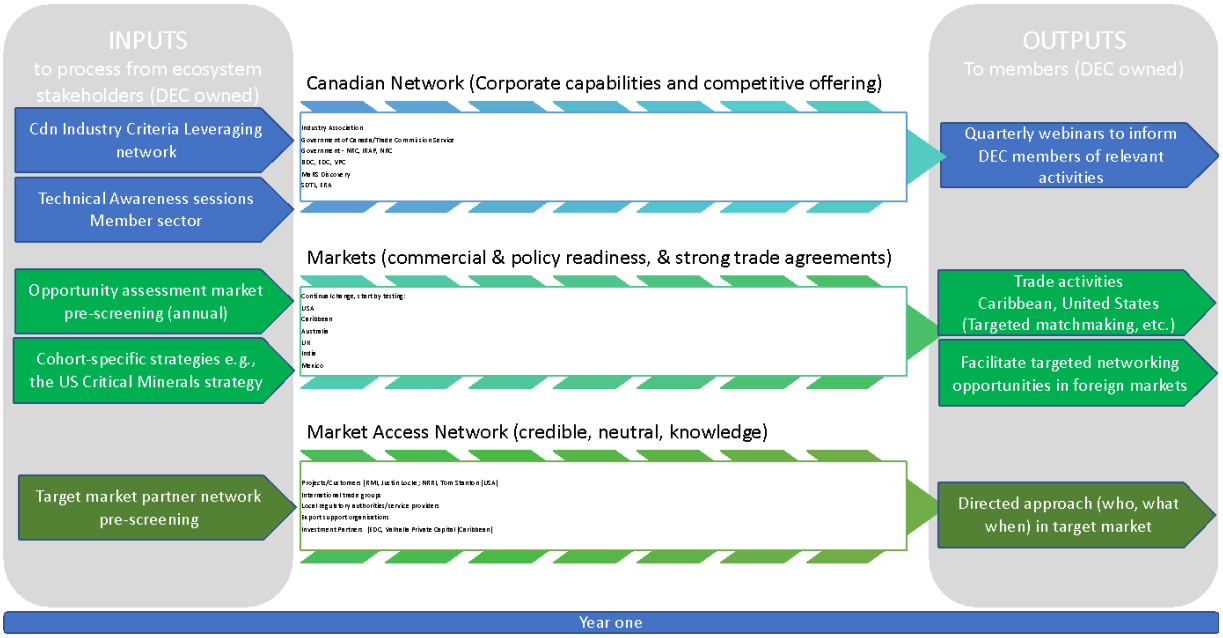


Once DEC exposes these inputs to identified stakeholders, there are targeted outputs that will assist DE companies in better leveraging the ecosystem and knowledge gained for their entry into the target market. These outputs will inform subsequent international business development activities. Examples of outputs include DEC driven quarterly webinars, market-specific trade activities and or

Once inputs and outputs are grouped with the stakeholder ecosystem, it becomes apparent the flow of effort DEC will undertake. It also becomes apparent the value DE companies will gain from being engaged in the process. Being actively engaged in the process will ensure knowledge, commercial and network relationship value.



The framework below integrates inputs, stakeholders and outputs in Year One of this international business development strategy.



Year One

DEC will assume a subject matter expert role (or coordination role). There will be one position at DEC to track, engage and collaborate with events in the Canadian Network. The U.S. and the Caribbean will be initially the focus of international business development efforts. However, markets may shift, and the model above accommodates for those market changes through consistent collaboration with model stakeholders and understanding of new, emerging business value propositions from DE companies.

A good example of market shifts is currently evident in the COVID-19 pandemic. DEC understands that the entire ecosystem above may be under economic environment pressures. This model builds in resiliency to those shifts.

This first year will be spent searching out partners that can expand our initiatives using the above-mentioned ecosystem as a base.

Activities include:

1) Research to build a DE company-specific business case to engage in the US market.[9]
2) Benchmark knowledge of the DE company international business development intentions/goals for year one, for example:
    - Which companies have a presence that needs growth support in the US market?
    - Which companies are interested in pursuing the US market?
3) Coordination of activities offered and partner-identified projects by stakeholders in the Canadian Network and Market Access Networks. Answer the following questions:
    - Which companies can collaborate?
    - Follow ups with specific DE companies to gauge engagement that matters to company growth.
    - What resources are required to enable bidding on international projects?

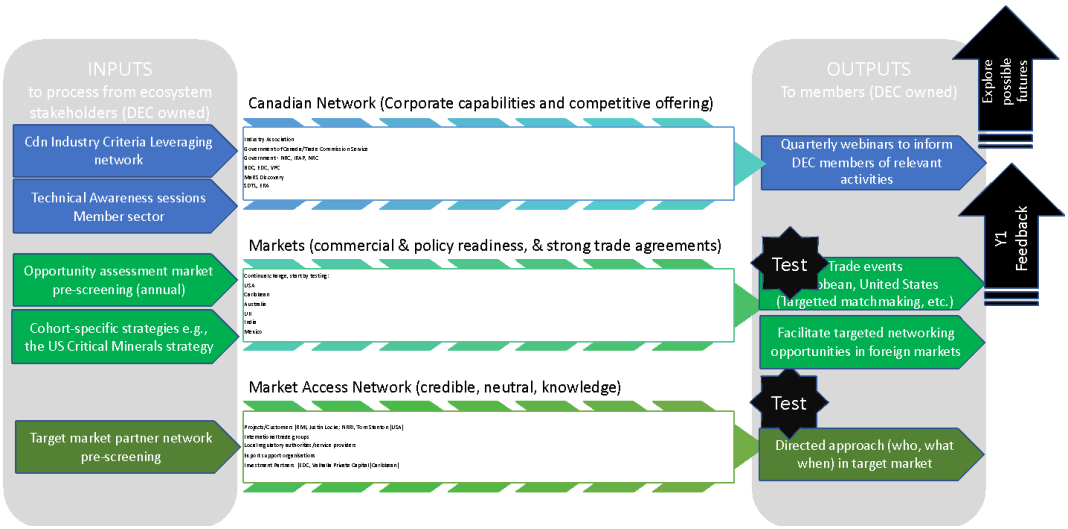
Year Two

DEC will assemble and test learnings in year two. This model can be used by DEC as a group, by the assembled cohorts (detailed above) or by individual DE companies who want to participate in the outputs.

These tests enable a feedback loop for year two when companies will have the opportunity to feedback what worked and did not work. They will also have the opportunity to explore and evaluate possible futures and gauge whether or not they feel it would be of value in the second and third years to be engaged as they were in the first year.

This information will be collected to adjust year two's actions. Year two might entail moving from one target market to another, e.g., the U.S. to Australia. This move could come about where there are new or changing policies and projects that fit well with DE company competencies.

[9] DEC acknowledges markets may shift suddenly. Price points for product and the market for DE may change. Therefore, the U.S. is starting point.



DEC will create opportunities for companies based on international knowledge on research funding to policy change initiatives that match DE company offerings.

Year Three

Year three will entail working directly with DE companies on maintaining their own business relationships in the three stakeholder areas. The strategy will shift from one of opportunity identification to one of resource enablement. Instead of DEC leading the strategy execution, DEC will continue to enable the above model and the DE company will take the lead.

DE companies will have learned in years one and two what people, processes and technologies they will need to lead their own strategies in year three. This is part of an overall maturity model approach. Over time, DEC builds competency in its own members and they think of their respective international markets in more intimate ways than they had previously. For example, in year three, DE companies are now identifying their own opportunities and asking DEC for specific assistance in other, more progressive areas driving change and requirements for GAC, TCS, CanExport and the model's Canadian Network.

DEC will update the strategy in year three to accommodate learnings and changes as members progress.

Matchmaking Visits

The TCS conducts trade missions for a variety of Canadian business sectors. The TCS is widely used amongst DE companies and they rely on this service. Matchmaking visits are customised and prearranged in the target markets. Matchmaking the right foreign buyer with the DE company solution can involve much analysis and dedication to detail. This model will facilitate this process and increase the chances of successful business matches.

Feedback from DE companies is that the match-making visits are the best opportunities to develop business. However, the effort required to meet these targets can take months. In the model, the analysis and relationship building during the output analysis phase will deliver more clarity to DE companies

DEC will take a leadership role for the DE industry in organising criteria and proposing the makeup of matchmaking visits.

Market Intelligence (Market Access Partners)

For DE companies, in the context of this strategy, market intelligence will provide knowledge of the target market and consider this intelligence in two dimensions:

1) Commercial readiness of the target market, i.e., that market's potential need for the DE company technology or service,
2) Public policy readiness in the target market, i.e., where there is substantial decentralised energy capacity or regulatory drivers related to microgeneration, small scale energy or community energy.

However, it is important to note that much of the information available in market intelligence is not as targeted as needed. Market intelligence is also expensive and requires people to sift through the content to ensure it is relevant. In addition, to be useful it must also be recently acquired. The decentralised energy market changes so quickly, intelligence that is a year old can already be out of date.

Tariff and Non-Tariff Trade Barriers

Tariff barriers, or taxes imposed by the foreign government can increase the cost of the DE company offering and make it less attractive for the foreign importer. Where Canada has trade agreements with other countries, such as the Canada US and Mexico trade agreement (CUSMA), there are fewer tariff barriers for Canadian products but there may be non-tariff trade barriers. Tariff barriers for Canadian companies include:

- Hardware tariffs (technology dependent)
- Software tariffs (specifics depend on the software solution)

Non-tariff trade barriers, as the name would indicate, are target market policies that potentially cause hinderances for DE companies as they move their goods and services into foreign markets. Non-tariff trade barriers can negatively impact the exporters ability to grow their business and can also have a financial impact on the exporter's business as the cost of product modifications for compliance purposes may put the target market value proposition out of reach for the DE company. This is where knowledge of specific target market

requirements for the product are important. International standards organisations are also included in the DEC International Business Development strategy model for this reason.

Examples of non-tariff trade barriers include safety standards on electrical equipment, emissions standards for vehicles influencing climate change and other regulatory barriers. These types of non-tariff barriers impact 90% of global trade. Regulatory measures are present in every country and DE companies will need to be aware of measures that impact their ability to export product or perform professional services. The UN states that non-tariff barriers are three times likely to raise trade costs than regular tariffs.[10] Compliance and procedural costs can mount quickly.

As part of this strategy DEC will work closely with the TCS to identify new or challenging tariff and non-tariff trade barriers. DEC will have first-hand knowledge of technology specific barriers, for example:

- Standards compliance
- Knowledge and construction worker certifications and other education requirements
- Work permits, VISAs

As knowledge emerges in year one of the strategy, DEC will inform its members of trade barriers and how important it is to engage TCS is understanding the impact and crossing them.

Strategy to Execution

Once the international business development strategy is in place, DE companies have a number of approaches they can take for execution. There are five global expansion opportunities to consider.[11]

1) Pick the right partners for your expansion

This was a key lesson learned from Jan Bujik of AB Energy. AB Energy expanded almost seamlessly into the Canadian market by acquiring European Power. The non-tariff trade barriers for the Italian company were completely overcome by purchasing a local company. Relationships with partners and existing customers were also established quickly. Ramping up new people resources in the target market can prove to be time consuming.

2) Seek out professional associations in the new markets

DE companies that already have an international presence either use DEC relationships to join international professional associations or their own networks.

[10] https://unctad.org/en/Pages/DITC/Trade-Analysis/Non-Tariff-Measures.aspx

[11] https://www.thepayrolledge.com/blog/5-global-expansion-strategies-to-consider

Brent Harris of Eguana Technologies mentioned that Eguana already knows what conferences to attend in the target market. They know the business associations they need. They simply need a repeatable model for finding those direct relationships where there is a business need and favourable decentralised energy policies.

3) Adopt a clear strategy for your product or service
4) Think proactively
5) Plan the work, work the plan

In addition to the above, DEC will add measurement. It is necessary to know what success looks like and be able to measure that success. Then strategy execution can pivot accordingly.

Appendix A - Further Reading

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- Burger, C., Froggatt, A., Mitchell, C. and Weinmann, J. 2020. Decentralised Energy — a Global Game Changer. London: Ubiquity Press. DOI: https://doi.org/10.5334/bcf. License: CC-BY 4.0
- World Economic Forum. January 2016. White Paper, Digital Transformation of Industries: Electricity Industry. http://reports.weforum.org/digital-transformation/electricity-an-industry-ready-for-digitization/

Appendix B – Other organisations providing market intelligence

The U.S. Clean Energy States Alliance contains member states and their activities. This Alliance

Existing Canadian resources for export development assistance.

1) CanExport Development
2) Trade Commissioner Service (TCS)
3) National Research Council (NRC)
4) Natural Resources Canada (NRCan)

DEC Cohorts for international strategy co-development

For purposes of developing this strategy, DE companies were grouped in cohorts for requirements gathering. We have provided a collaborative strategic approach. DEC contacted each member to explain the intent of the international business strategy in an effort to understand how each organisation saw itself in the strategy and whether or not it was considered useful. In addition, reaching out to members in this way, we also built overall buy in for the approach.

The next step saw these cohorts in 90-minute facilitated strategy co-creation sessions to coordinate efforts and share lessons learned in what had or had not worked for these members in the past. When analysing DE company requirements for business development in international markets, we did not make assumptions about their needs and their internal resources to dedicate to this initiative.

Therefore, we assembled cohorts of existing DE companies and contacted each individual DE company to personally gauge interest and further validate the selected cohort.
This resulted in the formation of the following cohorts:

Cohort	Members
Internet of Things (IoT)/Professional Services/Consultancy	Arcus Power eDecisions GSS Energy Innovative Power Internat Overview Business Consulting RVM Developers
Smart and Micro Grids	Modern Huts Braintoy Unico Power GSS Energy

Solar and Wind	CLEM Geo Energy WiRE (Women in Renewable Energy)
Energy Storage	AB Energy Just Freehold Energy Corporation
Earth Energy	Canadian Geothermal Energy Association (CanGEA) Eavor Technologies GSS Energy
Community Energy	Various

The knowledge offering from DE companies is significant. However, commercialisation or knowledge selling through consultation, academic curriculum or applied support from publications such as DEC's Community Energy Capacity Building (CGCB) will require slightly different business relationships and approaches. For example, matchmaking will require some prerequisite understanding of the sector's business priorities and the stakeholders involved in the matchmaking.

DEC's role in this matchmaking is to articulate DE company value propositions to those who support such activities in the target market.

DEC Member Market Priorities – Current State

Prior to the creation of this strategy, the following target markets for DE companies were identified with strong alignment to Canada's trade and export activities, i.e., where there are favourable decentralised energy policies and trade agreements. Key influences for selecting these markets as a focus were:

1) DEC Member input
2) Canadian federal export program support for these same markets
3) Trade agreements with countries in those markets

These were the US, UK, the Caribbean, Australia, Europe and Japan. Most DEC cohort sessions fed back that their shorter-term priority market was the US. They felt that their unique technologies and expertise set them in good stead for moving into the US.

Other markets such as Northern Europe, South Africa were mentioned in the strategy co-creation sessions but there was consensus on the US.

The following table supports the initial target markets identified for this strategy from those members who responded to queries:

	United States	**Australia**	**UK**	**India**	**Caribbean**	**China**	**Europe**
eDecisions Solutions	X		X	X			
Eguana Tech	X	X	X		X		Germany
Arcus Power	X	X	X				
Modern Huts	X	X	X		X		X
Stash	X	X		X			
First Nations Power Authority	X		X			x	

DEC has strong relationships with the Market Access Network identified previously predominantly in the U.S. Those parties were also contacted to ensure they support activities identified in this strategy.

It is worth noting that India, the Caribbean, and China represent excellent opportunities for Canadian DE technologies. However, unless there is an existing relationship, e.g., academic, these markets are difficult to develop if the DE company has limited business development resources.