

ACTIVITY 3: ENERGY DRAGONS: INVEST IN THIS!	
OVERVIEW	Students represent various stakeholders and must convince the “Dragons” to invest in their idea rooted in NEB visualizations. The idea can either be based on the current trend or by arguing that their idea could significantly change the trajectory.
LEARNING OUTCOMES	<ul style="list-style-type: none"> • Recognize that a visualization tool may be manipulated to support arguments from various stakeholders • Provide scientific evidence to support a decision to pursue an idea and to persuade an audience
MATERIALS	<ul style="list-style-type: none"> • Activity description and stakeholder profiles, including judging rubric (double-sided) • CanGeo Energy IQ map found at https://energyiq.canadiangeographic.ca/main/energy_map#1&-197&84&1&0&1
WHAT TO DO	<ol style="list-style-type: none"> 1. In groups of 2 or 3, provide students with a stakeholder profile as well as a copy of the CanGeo Energy IQ map (link above). There are 16 stakeholder profiles. TEACHER TIP: students will be more motivated if they get to choose their own profile. Although more than one group may choose a profile, their interpretation of it will be different. 2. Explain that each group will have to make a “pitch” to the Dragons (one or several teachers) to invest in an idea that is supported by one or more NEB visualizations. The idea can either be based on the current trend or by arguing that their idea could significantly change the trajectory. 3. The Dragons use the evaluation sheet to rate the ideas.
EXTENSION ACTIVITIES	<ul style="list-style-type: none"> • Assign students in the class to be Dragons for their classmates, in order to stimulate participation. Each dragon receives an evaluation sheet and is encouraged to ask questions. • The audience (other students) may choose to support (if alliance is possible to their service or product) or argue against the idea. • Have students record their pitch in a two-minute video. • Pair up with another group and record a mini Dragons episode: each group pitches their idea to the other team’s Dragons. Although they may include comedic relief, the Dragons must provide at least 2–3 reasons why they choose to support or not to support an idea. Share the episodes in class with popcorn!
NEB VISUALIZATION(S)	<ul style="list-style-type: none"> • All may be used



REFERENCE MATERIALS FOR STUDENTS	<ul style="list-style-type: none"> • Canadian Geographic's Provincial/Territorial Energy Snapshot Infographic • NEB Energy Market Snapshots www.neb-one.gc.ca/nrg/ntgrtd/mrkt/snpst/index-eng.html • Energy Markets Feature Articles www.neb-one.gc.ca/nrg/ntgrtd/mrkt/fttrtcl/index-eng.html • Provincial and Territorial Energy Profiles www.neb-one.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/index-eng.html • Inter-American Development Bank (ideas for inspiration; energy datasets for various countries, including Canada) www.iadb.org/en/dataset-energy-database • Hydro Quebec, Comparison of Electricity Prices, www.hydroquebec.com/residential/customer-space/account-and-billing/understanding-bill/comparison-electricity-prices.html
PORTALS TO GEOGRAPHICAL THINKING	<ul style="list-style-type: none"> • spatial significance • patterns and trends • interrelationships • geographical perspective • evidence and interpretation • ethical ment

Below are the profile descriptions along with some suggested questions and ideas, to inspire students in their brainstorming session (should they require inspiration!).

<p>1. TOURISM: You are a tourism operator looking to promote a region's eco-friendly energy approach. You must propose a strategy to the Dragons that either highlights an existing eco-friendly area or an investment opportunity to develop an eco-friendly area.</p>	<p>What types of energy-friendly technologies would tourists be interested in? Do certain energy installations change the landscape?</p>
<p>2. SERVICE INDUSTRY: You are seeking an investment from the Dragons to develop a personal service to individuals living in a certain area, or a professional service to businesses or organizations operating in a certain area.</p>	<p>What types of services might various energy-related companies require? For example, a catering service for oil and gas companies operating in remote areas, or a relocation service for companies requiring highly-skilled labourers from other parts of the country.</p>
<p>3. EXTRACTION EQUIPMENT MANUFACTURER: You are currently an oil rig manufacturer seeking to expand your business to develop equipment for a new industrial sector.</p>	<p>Which areas have high energy consumption by the industrial sector? Which industries might these be?</p>
<p>4. LEED ARCHITECT: You are a young architect who has been working on LEED projects (Leadership in Energy and Environmental Design) for the past five years. You are seeking an investment from the Dragons to build a model commercial building that encourages sustainable practices design.</p>	<p>Which areas have high electricity and heating prices? Which areas have tight energy production vs. demand? These are areas where an incentive to introduce energy efficiencies is the highest.</p>



<p>5. CRYPTOCURRENCY START-UP: You are an entrepreneur looking to start a cryptocurrency mining datacentre. You are asking the Dragons to invest in your start-up.</p>	<p>Where are there cheap electricity prices and abundant sources with low demand? That means that you have room to demand a lot more without putting pressure on the system to increase prices (cryptocurrency requires large amounts of electricity).</p>
<p>6. ELECTRIC VEHICLE MANUFACTURER: You are an electric vehicle manufacturer who has had a lot of success in California. You are asking the Dragons to invest in a charging station pilot project in a specific area of Canada.</p>	<p>Which provinces provide the most/best incentives to buy EVs? Which seem most aggressive with regards to lowering the carbon footprint? Add prices of gasoline and electricity to create an appealing story where demand would switch from hydrocarbons to electricity in transportation by virtue of price differential.</p>
<p>7. ENVIRONMENTAL ENTERPRISE: You seek an investment to develop a product or offer a service that benefits the environment. Your idea could have national potential or could target a specific province or territory.</p>	<p>Are there places that could benefit from lowering their carbon footprint?</p>
<p>8. TECHNOLOGICAL INNOVATION DEVELOPER: You are seeking an investment from the Dragons to develop an energy-related technological product or service, such as an app or a technological tool for a specific industry. This product or service could be marketed to manufacturers, governments, or citizens.</p>	<p>Technology to increase energy efficiency (e.g. biofuels or increased efficiency of wood waste, battery storage to increase range of renewable energy), digital technology to create efficiencies or virtual imaging to test the construction of infrastructure projects to detect errors prior to physical construction (save millions), smart grids.</p>
<p>9. OIL AND GAS PRODUCER: You have had much success in Western Canada and are looking to expand your business in another Canadian territory or province.</p>	<p>Where are current resources (oil and gas) located? Are there some provinces that don't produce oil and gas whereas their neighbours do? Perhaps this is a good place to discuss the emergence of fracturing technology to develop unconventional resources.</p>
<p>10. TRANSPORTATION COMPANY: Your company is looking to expand its business and provide transportation of energy products from areas of supply to potential areas of demand. For example, you can build pipelines to move natural gas and crude oil, and power lines to move electricity.</p>	<p>Finding matches between high-production areas with high demand areas. Or combining ideas that will create higher demand growth (policymaker groups suggesting policies that will create economic growth) and this group would ensure that energy was delivered to or from to complete the circle. Could they even expand into the transportation of people?</p>
<p>11. RENEWABLE ENERGY DEVELOPER: Your company has had much success in developing solar, wind, algal, geothermal, and tidal energy projects in Norway and India. You are looking for an investment from the Dragons to develop a new renewable energy project in a specific province in Canada.</p>	<p>Look at demand growth combined with solar radiation and wind maps. Combine renewable energy projects with Smart Grids technology for inserting renewable energy into existing grids. Are there articles that relate to technologies not yet being used, such as algal-based energy?</p>



<p>12. INDIGENOUS ENTERPRISE: You are an entrepreneur based in an Indigenous community. Use the visualization tool to justify creating a product or service with a positive impact on Indigenous communities.</p>	<p>There are numerous examples in Canada where indigenous communities have entered into relationships with energy producers/providers to achieve best results for their communities. You can look for examples and use them for this exercise.</p>
<p>13. ENVIRONMENTAL NGO: You are a non-governmental organization that seeks to promote environmental conservation with respect to energy production and consumption. You are seeking funding from the Dragons' not-for-profit fund, to further your cause in either a specific province or territory (or nationally).</p>	<p>The visualizations would help choose areas of interest where improvements can be made. For instance, examine Northern Canada where the use of hydrocarbons is prevalent. Focus on how technology and adaptation of new energy technologies to northern conditions will advance sustainability in the North.</p>
<p>14. RESEARCHER: You lead a team of Canadian researchers with various research interests (e.g. policy impact, social impact, science, technology, environmental). You are seeking funding from the Dragons to research a specific energy-related topic for one of your research team members, located in a specific university.</p>	<p>This holds many opportunities. Could they collaborate with any of the other stakeholders to research impact or need?</p>
<p>15. POLICYMAKER: You are a policymaker looking for an investment in a specific sector to stimulate economic growth, or to speed up/slow down predicted trends in your province or territory.</p>	<p>There is much that can be done if you can combine the different sources' production and demand with data on prices and population. For instance, abundant electricity generation combined with low demand and low prices could be a good spot to develop "computing clouds." Note that the scenarios reflect policies that are already in place, hence, the analysis has to take this into consideration.</p>
<p>16. DATA VISUALIZATION DESIGNER: You are looking for an investment in your new business creating data visualizations, to help companies share and analyze their information.</p>	<p>Looking at the regions that have either high production and/or high demand, you would identify where and if there is a concentration of headquarters and capital cities for provincial governments. These are likely to be the best markets for data visualization services.</p>



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1. Read your stakeholder profile.

STAKEHOLDER PROFILE: TOURISM

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WHAT TO DO?

1. Read your stakeholder profile.

STAKEHOLDER PROFILE: TRANSPORTATION COMPANY

Your company is looking to expand its business and provide transportation of energy products from areas of supply to potential areas of demand. For example, you could build pipelines to move natural gas and crude oil, and power lines to move electricity.

2. Find out more about the energy profiles of various Canadian provinces and territories by using the following resources:
 - Canadian Geographic's Provincial/Territorial Energy Snapshot Infographic
 - Exploring Canada's Energy Future visualization tool <http://bit.ly/2iTOcg9>
 - NEB Energy Market Snapshots <https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/snpsht/index-eng.html>
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HELPFUL HINTS FOR INSPIRATION

- Think about what you want to see in the future. Do you want to change the trajectories?
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WHAT TO DO?

1. Read your stakeholder profile.

STAKEHOLDER PROFILE: RENEWABLE ENERGY DEVELOPER

Your company has had much success in developing solar, wind, algal, geothermal and tidal energy projects in Norway and India. You are looking for an investment from the Dragons to develop a new renewable energy project in a specific province in Canada.

2. Find out more about the energy profiles of various Canadian provinces and territories by using the following resources:
 - Canadian Geographic's Provincial/Territorial Energy Snapshot Infographic
 - Exploring Canada's Energy Future visualization tool <http://bit.ly/2iTOcg9>
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WHAT TO DO?

1. Read your stakeholder profile.

STAKEHOLDER PROFILE: INDIGENOUS ENTERPRISE

You are an entrepreneur based in an Indigenous community. Use the visualization tool to justify creating a product or service with a positive impact on Indigenous communities.

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WHAT TO DO?

1. Read your stakeholder profile.

STAKEHOLDER PROFILE: ENVIRONMENTAL NGO

You are a non-governmental organization that seeks to promote environmental conservation with respect to energy production and consumption. You are seeking funding from the Dragons' not-for profit fund to further your cause, either nationally or in a specific province or territory.

2. Find out more about the energy profiles of various Canadian provinces and territories by using the following resources:
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WHAT TO DO?

1. Read your stakeholder profile.

STAKEHOLDER PROFILE: RESEARCHER

You lead a team of Canadian researchers with various research interests (e.g. policy impact, social impact, science, technology, environmental). You are seeking funding from the Dragons to research a specific energy-related topic for one of your research team members located in a specific university.

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WHAT TO DO?

1. Read your stakeholder profile.

STAKEHOLDER PROFILE: DATA VISUALIZATION DESIGNER

You are looking for an investment in your new business creating data visualizations, to help companies share and analyze their information.

2. Find out more about the energy profiles of various Canadian provinces and territories by using the following resources:
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WHAT TO DO?

1. Read your stakeholder profile.

STAKEHOLDER PROFILE: POLICYMAKER

You are a policymaker looking for an investment in a specific sector to stimulate economic growth, or to speed up/slow down predicted trends in your province or territory.

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Team members: _____

Stakeholder Profile: _____ Due by: _____

Remit this rubric to the Dragons on pitch day

CRITERIA	LEVEL 1 Does not meet expectations	LEVEL 2 Minimally meets expectations	LEVEL 3 Fully meets expectations	LEVEL 4 Exceeds expectations
VIABILITY OF PRODUCT, SERVICE OR INVENTION (30%)				
Identifies a specific need to be addressed, a gap to be filled or a problem to be solved.				
Describes strategies that produce a positive, lasting impact on their target market.				
Clearly identifies and describes their target market.				
CREATIVITY AND INNOVATION (30%)				
Demonstrates a clear action plan.				
Demonstrates creativity and innovation in identifying strategies to meet the need, to fill the gap or or to solve the problem.				
COMMUNICATION AND PURSUASIVENESS (40%)				
Effectively uses evidence from the NEB's visualization tool to support the idea.				
Effectively uses existing information relating to province or territory of choice to justify the idea.				
Presents a clear, concise, creative and informative sales pitch targeted to the Dragons.				
Effectively uses branding (company name, logo, taglines) to present a professional image.				
Creates a memorable and effective closing (call to action).				

NOTES: